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EDITORIAL

The Civil Services and Agricultural Progress. Addressing the Civil Services Association of Mysore Mr. T. G. Rama Ayyar, Director of Agriculture, Mysore, and a senior member of the Mysore Civil Service stated that as a result of four years' study of agricultural problems of the state, he was convinced that close co-operation and zealous support of the members of the civil services would definitely ensure the expansion of the state's agricultural production and the prosperity of the people. Coming as it does from one of the few civil servants in India who can speak at once from first-hand knowledge of agricultural conditions of the country and the vast opportunities that lie in the path of the great fraternity of civil servants, we welcome this bold statement as one of great significance. We feel sure that what is true of Mysore is equally true of other parts of India where more than seventy percent of the adult population live on the country's national industry—Agriculture. It is well known that while the departments of Agriculture in the Indian provinces and states are striving hard to the best of their abilities and to the limited extent of their resources to collect sufficient knowledge and to take such knowledge to the door of the cultivator, these efforts at their best have so far touched only the fringe of a colossal problem that awaits solution. It should be within the experience of several workers in the development departments that a kindly interest displayed by a revenue officer can so often produce marvellous results. A district Collector holding a *Jamabandi* camp and questioning the village officials of their knowledge of the contents of the latest edition of the *Villagers' Calendar* or on the progress of a particular pest or disease campaign has often achieved results incomparably disproportionate to the little time or labour expended on an activity outside the rule-of-thumb revenue procedure. It is a matter of gratification to us that civil servants engrossingly interesting themselves in the activities of sister departments do exist, but alas! they are so few and far between. We commend the ripe experience of Mr. Rama Ayyar to the members of the Civil Services in Madras and elsewhere and trust that his appeal for their zealous co-operation will not go in vain. A vast field lies open to them where "the harvest is plentiful, but the labourers are few".

A Welcome Reform. Though the Government of Madras were always alive to the urgent need for the dissemination of knowledge of scientific agriculture, financial considerations have thwarted the immediate employment of an agency adequate to the task. It is a matter of satisfaction to us that the objective has all along been kept in view by successive directors and the Government, and the much needed expansion is being accomplished in stages. About four years ago the cadre of demonstrators was strengthened in order to provide one demonstrator for each taluk. In keeping with this policy a storekeeper was appointed for each agricultural depot and this step not only enhanced the utility of the depots but also prevented the dissipation of the demonstrators' valuable time spent on office routine. As a natural sequel to the expansion, the need was felt for a greater number of supervising officers for more effective guidance and control of the propaganda staff. We are glad to note that Government have now passed orders sanctioning one District Agricultural Officer for each district. Though the latest stage of reform was made possible by the surrender of some existing posts of Deputy Directors and demonstrators, the effect of which it is hazardous to predict, we trust that the new scheme will be given a fair trial. Should the experience gained in the working of the new system demand the restoration of the retrenched posts, we feel no doubt that the Government would hasten to take suitable action.

A Scientist Honoured. A bold spirit of scientific adventure and extraordinary acumen should be the qualities of a botanist who spurns the orthodox systematic botanists' time-honoured concepts of generic affinities and defies the imperfectly known canons of genetic laws when he attempts and succeeds in making intergeneric crosses among widely separated genera like *Sacharum*, *Sorghum* and *Bambusa*. India has produced only few scientists of this calibre and one such in the field of Botany is Rao Bahadur T. S. Venkataraman C. I. E., whose epoch-making contributions to the prosperity of the Indian Sugar-cane Industry have earned for him a place among the outstanding devotees to the cause of Agricultural science in the world. It is gratifying that some measure of recognition has come from the Government of India and His Majesty's Government in the award of the title of Rao Bahadur, the conferment of a Companionship of the Indian Empire and the extension of his period of service by three years to continue his valuable researches. We are glad that at long last one of the less hide-bound of the Indian Universities has decided to honour this eminent scientist (and incidently to honour itself) by conferring on him the honorary degree of Doctor of Science. We congratulate the Andhra University on its wise choice and the Rao Bahadur on an honour very richly deserved.

A few important cultivated and wild leafy vegetables of South India.

By S. N. CHANDRASEKHARAN, M. A.,

Lecturer in Botany, Agricultural College, Coimbatore.

That vegetables have played a very important part in the past and continue to do so in modern dietetics and that they are a very necessary menu in the every day meal of each and every person has been admitted on all hands. Among vegetables, leafy vegetables should be given the first and foremost place as they rank very high in the present day dietetics. In the first place they are the sources of calcium in abundance. Of all the metals calcium is the most important one as it is very essential for the building up of bones and teeth. Deficiency of calcium in the diet has been responsible for a number of diseases. At the present day bad teeth are so common even among young people that one has to think well about the diet one should adopt to avoid this trouble. Very naturally therefore greens such as amaranth, cabbage, fenugreek, spinach etc. are advocated to one and all especially to young children and expectant and nursing mothers. In the second place leafy vegetables contain the pigment carotene which is said to fulfil the physiological function of Vitamin A in the body. The importance of vitamins is so well recognised that it need not be dealt with in this short note. In the third place, the leaves are the repositories of valuable food materials such as the various mineral salts, sugars, proteins, oils, fats, etc. and as such a few of leafy vegetables consumed every day go to make the diet complete, nutritious and wholesome. Dr. Aykroyd remarks ' in the East it will usually be found that the easiest and cheapest way of ensuring sufficiency of Vitamin A units is to increase intake of green leafy vegetables'.* For example, 3 ounces (about 85 grammes) of amaranth leaves will supply more than 3,000 international units and cover adult requirements. The needs of children of school age, which may possibly exceed those of adults can be covered in the same way by a high intake of leafy vegetables. In the case of leafy vegetables, a good rough indication of carotene content is their greenness. The greener they are the better and they are best in the fresh condition. Ordinary cooking does not destroy the carotene present in leafy vegetables. Intake of green leafy vegetables should be not less than 4 ounces per head per day. The cheaper varieties—amaranth leaves, coriander, drumstick leaves, etc. are as nutritious as the more expensive ones such as lettuce. In children's homes the available supply of green leafy vegetables could often be increased by creating a vegetable garden to be tended by the children themselves.*

* Aykroyd, W. R. (1938) *The nutritive value of Indian foods and the planning of satisfactory diets.* Health Bulletin No. 23. Manager of Publications, Delhi.

** *Ibid*

In India we have a great many of these plants in use in different parts of the country. It was therefore felt that at least some of the commonest ones should be brought together and given a wider publicity than they are now receiving at the hands of the educated public. The plants are arranged in alphabetical order with a short note for each touching on the salient characters, 'the family to which the plant belongs and the popular name by which it is known (an index of the popular names is also given). Care has been taken to steer clear of the druggists' domain and confine oneself strictly to the sphere of the vegetable consumer. The distribution of the plants is given only for the Presidency of Madras.

1. *Abutilon indicum*, G. Don. Fam. Malvaceae, Eng. The country mallow; Tam, Tutti; Tel, Tuthru benda, Adavibenda.

An erect woody herb, 3-5 feet high, commonly met with in all waste places and in all districts especially in the hills. The stem is covered with smooth close tomentum. Leaves ovate, cordate, stipulate. Flowers yellow and showy opening in the evenings. The tender leaves are used as a 'pot' herb. Propagated from seed.

2. *Acalypha indica* Linn. Fam. Euphorbiaceae. Tam. and Mal. Kuppaimeni; Tel. Muripindaku, kuppinta chettu.

An erect herbaceous plant, about 2 feet high, growing wild in all waste places. Leaves simple, alternate, ovate. Flowers minute green, unisexual, monoecious. Leaves are cooked as a 'pot' herb and have laxative properties also. Propagated from seed.

3. *Achyranthes aspera* Linn. Fam. Amarantaceae. Tam. Nayuruvi.

A very common and very extensively growing weed in waste places. The plant is an erect small herb with a deep tap root. Branches minutely hairy, Leaves obovate up to 4" long. Flowers in terminal spikes. The leaves are used as a 'pot' herb especially by the poorer classes. Propagated from seed.

4. *Alternanthera triandra* Lam. Fam. Amarantaceae. Tam. Ponnangani.

A prostrate herb rooting at the nodes, grows wild in moist places all over the province. Stem glabrous, leaves obtuse or acute, up to 2" long. Flowers white in small heads in the axils of leaves. The leaves are very highly valued as a 'pot' herb. It is reported to be rich in iron. Propagated from seed.

5. *Amaranthus gangeticus* L. Fam. Amarantaceae. Tam. Thandu Kirai. Tel: Mokka Thotakura.

A very common, tall, leafy herb, both wild and cultivated. Practically every house which has a small kitchen garden grows this plant. Leaves large but variable up to 5" long and 3" broad. Flowers clustered in lower axils, gradually joined in a long terminal spiciform panicle. Flowers are green unisexual and polygamous.

The leaves and the young stem are cooked and consumed. A very highly valued 'pot' herb. Propagated from seed.

6. *Amaranthus gangeticus* var. *tristes* Pr. Fam. Amarantaceae. Tam. Araikirai. Tel: Koyya Thotakura.

The plant is a herb branching densely at the base and most widely cultivated throughout the presidency. It is a favourite with the people of the Coimbatore, Tanjore, Trichy, Malabar and Tinnevely districts. The young branches are frequently cut several times a year. It is also the cheapest of vegetables. It is reported to be rich in iron and other nutrients. Propagated from seed.

7. *Amaranthus paniculatus* L. Fam. Amarantaceae. Tam. Pungi kirai.

The plant is a tall annual herb both wild and cultivated. Very much like the other Amaranths. Leaves are used as a 'pot' herb. Propagated from seed.

8. *Amaranthus spinosus* L. Fam. Amarantaceae. Tam. Mullukirai. Tel. Mullathotakura.

A common herbaceous annual weed, full of spines and resembles closely the other members of the genus *Amaranthus*. Stem is hard and often reddish. The leaves are used as 'pot' herb by the poorer classes. Propagated by seeds.

9. *Amaranthus viridis* L. Fam. Amarantaceae. Tam. Kuppaikirai.

An erect glabrous annual. Very much like the other members of the genus. The leaves are very commonly used as a 'pot' herb particularly by poor people. Propagated by seeds.

10. *Basella rubra* Linn. Fam. Chenopodiaceae. Eng. Indian Spinach. Tam. Pasalai kirai. Tel. Batchalakura.

A glabrous succulent climbing herb with small white or red flowers, grown in all districts and also wild. The leaves are alternate, broad, cordate up to 5" long and 3" board. It is a very popular vegetable in South Kanara and now grown all over the Presidency. The plant is easily propagated both by seeds and by stem cuttings.

11. *Brassica Juncea* Hook. and Thomas. Fam. Cruciferae. Eng. The Mustard; Tam. Kadugu; Tel. Avalu.

The plant which is a juicy herb is grown more in northern India than in the South for the sake of its seeds which are used as a spice and from which an edible oil also is extracted. The leaves of the plant are used as 'pot' herb by some people. Propagated by seeds.

12. *Brassica oleracea* Linn. var. *capitata*. Fam. Cruciferae. Eng. Cabbage. Tam. and Mal. Motta Khos or Khos kirai. Tel. Gosugadda,

The most popular European vegetable among the Indians is the *Cabbage*. The plant is a low herbaceous annual thriving best 3000 feet above sea level, and therefore very widely cultivated on the hills and in all plains districts where there is a fairly cold winter. The cabbage has the best reputation among leafy vegetable being very rich as a food material. Propagation is by seed.

13. *Cardiospermum halicacabum* Linn. Fam. Sapindaceae. Eng. Baloon vine; Tam. Modakithan.

A herbaceous tendril climber common in wet lands, on the bunds of paddy, fields and banana and sugarcane plantations and other moist situations such as arecanut and coconut *topes* distributed throughout the East and the West Coast. The leaves are used as a 'pot' herb and they have distinct laxative properties. The plant is easily distinguished by its inflated capsules and tendrils. Propagated from seeds.

14. *Cassia tora* Linn. Fam. Caesalpinioideae. Tam. Tagara. Tel. Tantipu; Tulu. Twajang.

It is a common low shrub growing wild in waste places and fallow lands all over the Presidency and very luxuriant in Malabar and South Kanara. It is also to be met with on the hills up to 4000'. The flowers are yellow and the pods long and curved. The leaves are edible and various preparations are made of them. Propagated by seeds.

15. *Celosia argentea* L. Fam. Amarantaceae. Eng. The white cock's-comb; Tam. Korangu val chedi; Mal. Kozhi pulu.

The plant is a herbaceous annual, grows wild as a weed in dry soils often in such rank fashion that one easily mistakes it for a crop. The flowers are arranged in cylindrical spikes which are pinkish in the beginning and then become glistening white. These spikes are very conspicuous and enables one to identify the plant easily. Leaves are used as a 'pot' herb especially by the poorer classes of people. Propagated from seed.

16. *Celosia polygonoides* Retz. Fam. Amarantaceae. Tam. Eli katu kirai.

A perennial herb of the Deccan and the Carnatic tracts and not found outside India. The plant is found wild in waste places. The leaves are used as a 'pot' herb by poor people. Propagated by seeds.

17. *Centella asiatica* Urban. Fam. Umbelliferae. Eng. Indian Pennywort; Tamil. Vallarai keerai; Mal. Kodangal. Tel. Saraswathi aku.

A prostrate stoloniferous herb very common in moist places, particularly on the bunds of paddy field, sugarcane and banana plantations and also in coconut and arecanut *topes*, easily made out by its reniform fleshy leaves. The leaves are widely used as a 'pot' herb, considered to be a blood purifier. It is a good fodder and increases the secretion of milk in cows. Propagation by stolons and seeds.

18. *Chenopodium album* Linn. Fam. Chenopodiaceae. Eng. White goose-foot. Tam. Paruppu Kirai.

An erect annual herb growing sometimes up to 10 feet high and clammy to the touch. The plant is green or grey with white granular mealiness, the stems usually striped green or purple. Leaves are rhomboid, deltoid, entire or toothed. The leaves are considered very valuable as a pot herb and are therefore very popular and widely cultivated all over the Presidency. It is usually cooked with green gram. Propagated by seeds.

19. *Cissus quadrangularis*, Linn. Fam. Vitaceae. Tam. Perandai; Tel. Nalleru.

A much rambling shrub, the branches climbing over bushes to a long distance and found distributed in all the dry regions of the Madras Presidency. The quadrangular fleshy stem, the terminal tendrils and the small fleshy leaves enable the plant to be easily made out. The tender leaves and the young stem are after a little roasting made into a preparation called chutney or Thogaiyal. It is regarded as a tonic and stomachic. The plant propagates itself by its stem.

20. *Coleus amboinicus*, Lour. Fam. Labiatae. Tam. Karpuravallithashai.

This is a native of Malaya, a fleshy aromatic spreading herb, both wild and cultivated. The leaves which are fleshy are also very juicy and aromatic. They form a good leafy vegetable. Propagation is by soft wood cuttings.

21. *Colocasia antiquorum* Schott. Fam. Araceae. Tam. Sembu or Seppan, Tel. Kaladi, Chama.

A common herbaceous plant common in all moist situations from sea level up to 3000' above S. L., both wild and cultivated. The sagittate leaves are characteristic of the plant and form an excellent pot herb. It is both wild and cultivated and there are a number of varieties also. The plant is propagated by the corm.

22. *Coriandrum sativum*, Linn. Fam. Umbelliferae. Tam. Kothamalli; Tel. Kothameir, Daniyalu.

A low much branched aromatic annual herb widely cultivated throughout the presidency. It has a deep tap root and the leaves are decomposed. The

plant is grown both for the leaves and the seeds which are used as a spice. Propagated by seeds.

23. *Digera arvensis* Fam. Amarantaceae. Tam. Thooyya kirai; Tel. Chenchalikoora.

One of the most common herbaceous weeds growing in all kinds of soils and at its best in loamy soils of the cultivated fields. The plant is very popular as a pot herb with poor people. Propagated by seeds.

24. *Hibiscus cannabinus* L. Fam. Malvaceae. Eng. Bimilipatam Jute; Tel. Gonkura; Tam. Pulimanchi.

A tall undershrub with a sparsely prickly stem and a fairly deep tap root, commonly cultivated throughout the province and more extensively in the Circars and the Ceded Districts. The leaves on the main stem and on the axillary branches at the base are often undivided while those given off from the upper portion are palmately deeply lobed the number of lobes being from 3-5. The leaves taste slightly acidic and are a favourite with the Andhras. Recently the taste for the Gonkura preparations has extended into the Tamilian districts also. Propagation is by seeds.

25. *Hibiscus Sabdariffa* L. Fam. Malvaceae. Eng. The Red Sorrel, the Roselle.

This resembles very closely the former species and differs from it mainly in being pigmented. There is a red tinge about the whole plant, the pigmentation being marked in the stem and in the veins and in the calyx and the epicalyx of the flower. The leaves are slightly acidic as in the former case and are used in the same manner. Propagation is by seeds.

26. *Mentha Viridis* L. Fam. Labiatae. Eng. Spearmint. Tam. Putheena. Tel. Putheena.

A dwarf aromatic herbaceous perennial native to the temperate regions and therefore widely cultivated in the hills. It comes up well in the plains also. The leaves are used as a flavouring ingredient in various culinary preparations. It is considered to be a good stomachic. Propagated by cuttings.

27. *Moringa oleifera* Lamk. Fam. Moringaceae. Eng. The horse radish tree; Tam. Murungai. Tel. Munaga,

A graceful tree most popular and cultivated throughout the presidency, practically every house which enjoys a compound having one or more plants of this tree. The leaves are very good as a pot herb. It is easily propagated by stem cuttings and also by seeds.

28. *Murraya Koenigii* Spreng. Fam. Rutaceae. Tam. Kari vempu. Tel. Karepaku. Kan. Kari bevi.

A very common small tree, thrives very well in the Coimbatore district as also in other parts of Deccan and northern Circars. The leaves are rich in an aromatic oil. The plant is easily propagated by seeds. Root suckers are also employed in multiplying the plant. The leaves of coriander and murraya are the favourite flavouring leaves in all Indian preparations. Apart from its flavouring value, the leaves by themselves are an excellent food.

29. *Nelumbium speciosum* Willd. Fam. Nymphaeaceae. Eng. The sacred Lotus; Tam. and Tel. Thamarai,

A typical aquatic plant both wild and cultivated throughout the Presidency and a favourite with the Hindus as the flowers of the plant are used in worship in all temples. In all tanks especially in Malabar in or round about the temples

in the province this is grown. The petioles of the leaves are cut into small pieces, salted, sun-dried and fried in ghee or oil whenever required. Propagated both by rhizomes and seeds.

30. *Oxalis corniculata* Linn, Fam. Geraniaceae. Eng. Yellow wood Sorrel; Tam. Pulichai keerai.

A perennial stoloniferous herb wild in all moist places and in all elevations. The leaves are 3 foliolate. The plant has a preference for somewhat moist and stony localities in gardens and under fence and along ditches. The leaves are used by the poor people. Propagation by stolon and seed.

31. *Pisonia morindifolia* R. Br. Fam. Nyctaginaceae. Eng. The tree lettuce, Tam. Thevadiakirai; Tel. Lanjamunda aku.

The plant is small tree and a native of the beach forests of the Andaman islands. It is now very widely grown all over the Presidency as an ornamental plant on account of its pale green leaves. The tender leaves are used as a pot herb. Propagation easily effected by stem cuttings.

32. *Portulaca oleracea* Linn. Fam. Portulacaceae.

A prostrate succulent small herb common in all dry districts. The leaves are small and succulent. As the plant comes up profusely with rains, the poor people make use of the leaves as a vegetable. Propagation by seeds.

33. *Premna serratifolia* Linn. Fam. Verbenaceae. Tam. Minnal ilai, Minna kirai.

A small tree common on the coromandel coast. The leaves have a peculiar aroma and are used in flavouring culinary preparations. Propagation from seeds.

34. *Rumex Vesicarius* Linn. Fam. Polygonaceae. Tam. Sokka Kirai.

An annual herb cultivated very widely for the sake of its much relished leaves. The plant is recognised by the membranous pink or white reticulate inner fruiting perianth. Propagation by seeds.

35. *Sesbania grandiflora* Pers. Fam. Papilionatae. Tam. Agathi Kirai, Tel. Avrsaku.

The plant is a small soft-wooded tree reaching 20—30 feet high large showy red or white flowers and long cylindrical pods about a foot or more long. The leaves are pinnate compound, leaflets numerous and linear oblong. The young leaves are relished as a pot herb and in every orthodox Hindu house the leaves are cooked on the Dwadasi day. Throughout South India, milking cows are fed with it as it is believed to increase the secretion of milk. The plant is usually grown in betel vine gardens where it forms the support for the vine. Propagation is by seeds.

36. *Solanum nigrum* Linn. Fam. Solanaceae. Tam. Manathakali.

A common erect annual herbaceous plant growing as a weed both in waste places and cultivated fields in all Districts and at all elevations. The leaves are used as a pot herb. Propagation by seeds.

37. *Solanum trilobatum* Linn. Fam. Solanaceae. Tam. Thuthuvalai.

This is a prickly trailing or climbing undershrub. It is commonly met with as a weed in waste places. It thrives very well along the coast and also in black soils. The leaves are used as a pot herb. Propagation by seeds.

38. *Trigonella foenum-graecum*, Linn. Fam. Papilionatae. Eng. The Fenu-greek; Tam. Venthayakirai. Kan. Menthe soppu.

It is a herbaceous annual growing to a height of 10 to 12 inches. Leaves pinnately trifoliolate. The young plants are used very widely as a pot herb and are considered very nutritive. Propagation by seeds.

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Posters for Agricultural Propaganda.

By R. RATNAM, B. A.,

Madras Agricultural Department.

Objectives. The primary object of issuing a poster is to secure attention from the public with regard to the message contained therein. The reader should be instigated to think of the contents of the poster. People moving about in vehicles or on foot who see the poster should be attracted by it. Since such people should get at its meaning in a short space of time, brevity is an absolute necessity. In the field of trade, posters are used to remind people of the merits of known products, to create an interest in new things, and to inform the public of the locality wherefrom particular services or products can be had. By their very nature, posters cannot replace leaflets, since they can never be as comprehensive as leaflets can be. Posters appear to be necessary adjuncts to such popular literature.

Language. The Madras Province has as many as four major Indian languages, viz., Telugu, Tamil, Malayalam, and Kanarese. Posters which are useful exclusively for the rural folk and such others a majority of whom do not know English, have to be issued only in the language of the districts. There are, however, certain themes, for instance, those relating to trade or industry, which are intended primarily for urban areas where a large majority of English-knowing people are found, where it may be found more economical to issue only English posters.

Size. In foreign countries huge posters having a printing surface of 104 inches in height and 234 inches in width appear to be used particularly by commercial concerns. To serve as last minute reminders near point of sales, less huge posters measuring 48 inches in width and 82 inches in height are frequently used. In any case it appears very desirable to have uniformity in size for posters of the Agricultural Department as it would ultimately enable the Department to periodically change posters attached to permanent signboards that may in the long run be erected by the Department in permanent centres.

Use of Pictures. Inclusion in posters of pictures—either coloured, photographed or otherwise—seems to be of paramount importance in securing attention and for an effective setting and interpretation of the theme in the poster. Where the motive of any picture does not warrant the use of colours, it is a common experience to find that the background is always given in colour.

In dealing with the motive behind pictures which are used in posters advertising technique generally takes the following important points into consideration :—

1. Amidst the many details of the picture, the figure of the crop or other product which forms the subject matter of the poster should be included in the picture. For instance an advertisement for Ovaltine, a tooth paste or a boot polish invariably gives the exact figure of the package.

2. As regards the other details, the motive of the picture should be relevant to the subject matter. As an instance some of the photographs or drawings of men and women in happy pose included in advertisements for cigarettes or foods and drinks may be cited.

3. Grim suggestions which create a depressing attitude of mind should be avoided. For example, a picture of a coconut plantation or a single coconut tree devastated by the rhinoceros beetle would not be so appealing as a poster with the pictures of both good and bad plantations or trees, or merely the latter. Always the pleasanter or brighter side of any practice should be emphasized.

4. The pictures should be simple and not very puzzling to the reader. He should grasp its significance in the shortest space of time.

Head-lines. Without proper headlines, the poster is sure to lose its attractiveness. A mere mention of the subject, for instance, *Manuring Coconuts, Preparation of Cream Jaggery or Control of Mahali Disease of Arecanuts* would be less attractive than some of the following headlines: *Here's a CHEAP Manure for Coconuts, How to Prepare BETTER and CLEANER Jaggery, Save your arecanut Crop from Mahali Disease—Here's a Tested Method.* In compiling headlines it is a recognised principle to follow some of the following points:—

1. Headlines should be direct, sincere and simple.

2. They should suggest to the reader that the theme of the poster contains something which would benefit him and that too easily (e. g., the word *cheap* in the above headline for the manure for coconuts).

3. Headlines should not give a gloomy or negative side of any practice or circumstance. For instance, a headline with the words "Mahali disease is a terrible disease of arecanuts" is not desirable.

4. Brevity is absolutely essential.

5. If possible some "news" item may be added. For instance, if there is anything specially achieved by a manurial or cultural practice or by a new seed strain which is the subject matter of the poster, that "news" may well be included in the headline. (The words *a tested method* in the headline about arecanuts indicated in the foregoing paragraph pertain to a news item).

6. No headline should be in the manner of a puzzle, brain-teaser or a curiosity.

Message. In any poster the headline is followed by the message. Simple style of language centering round one or two ideas alone should be included in a single poster. A catchy but clear style may come in handy. No poster ever attempts to be exhaustive, and so suggestive phrases may well replace complete sentences. Variation in typography is an absolute necessity to relieve strain on the reader's attention. Finally the reader should be made to feel an urge to do a particular thing.

Testing the Effectiveness of a poster. Commercial concerns invariably test their advertisements for effectiveness before they are finally issued in view of the high cost involved. Several methods have been evolved and one of such methods is as below. A set of several posters on a single subject is got up with the variations in the picture, the headline, the wording of the message and different layouts in typography. Each poster differs from the other in only the detail, such as the picture, the headline etc. A number of persons who are truly representative of the group to whose benefit the posters are issued is chosen as a jury. The posters are mailed to them or presented by personal interviewers and they are asked the question: "Which poster would you be most likely to read first?". They are asked to give their preference and that poster which gets a high degree of preference is chosen for final printing and distribution. Where possible some such method may perhaps be followed in the Department to secure most effective posters.

Location. Posters should be found in places where the subject matter of particular posters are of general interest relating to the activities of the Department. For instance, a poster on proper harvesting of groundnuts should be found in a groundnut growing area, a poster on proper grading of ghee in a place where this work is being carried on, and a poster on cholam malt as a valuable infant and invalid food should be located in towns where a large number of people who are interested in the dietary requirements of infants and invalids live.

Season. So also the distribution of posters relating to subject matters of seasonal interest should synchronise with the appropriate season. For instance a poster on the avoidance of damping groundnuts before shelling should be situated not only in a place where decortication of groundnuts is done but should also be put up at the season when the harvest of groundnuts is just over and when the produce comes to factories for shelling. Instructions on the method of sowing or the recommendation of a new seed strain should synchronise with the sowing season of the particular crop in a given tract.

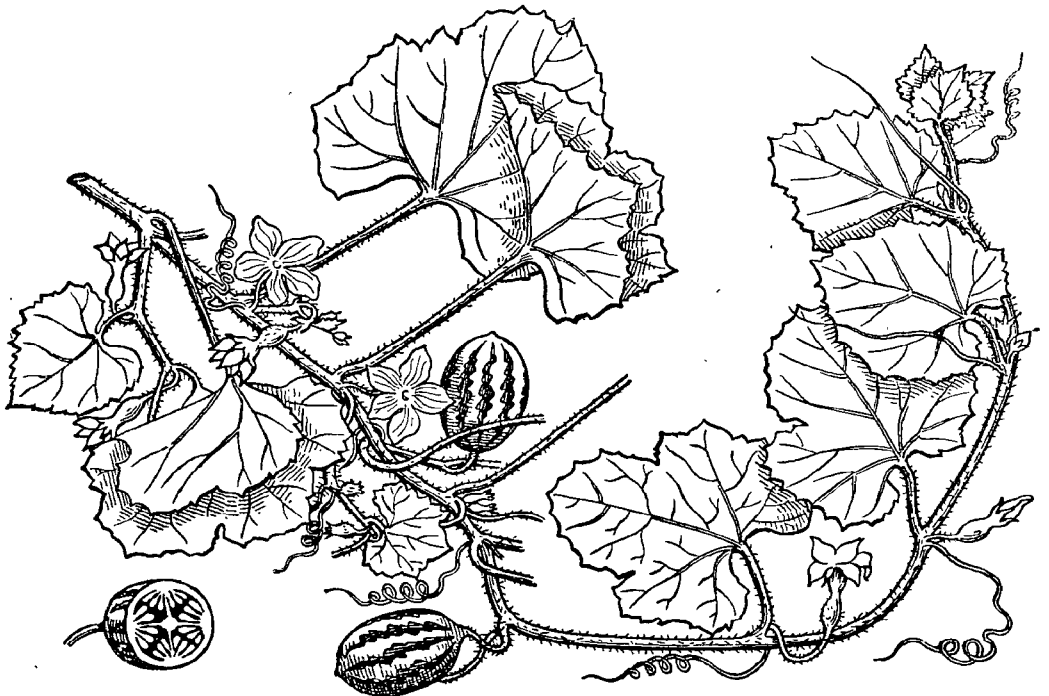
References.

1. Caples (1938). *Advertising Ideas*. McGraw-Hill Book Co., Inc., New York.
2. Mercer, F. A. and Gaunt, W. (1938). *Modern Publicity*. The Studio Ltd., 44, Leicester Square, London, W. C. 2.
3. Sandage, C. H. (1939). *Advertising Theory and Practice*. Business Publications, Inc., Chicago.

Budama kaya (*Cucumis pubescens* Willd.)—an economic cucurbitaceous plant.

By K. CHERIAN JACOB, L. Ag., F. L. S.,
Agricultural Research Institute, Coimbatore.

Introduction. There is considerable confusion in the nomenclature of *Cucumis pubescens* Willd. It is described by Hooker (1879) as *Cucumis trigonus* Roxb. Roxburgh (1832) describes this plant as *Cucumis madraspatanus* Willd. which the *Index Kewensis* (1895) incorrectly cites as a synonym of *Cucumis Melo* L.—the well known water-melon. It is figured in Wight's (1845) *Icones* tablet 496 under the Tamil name *Thummatti kai* and the Telugu name *Budama kaya*.



Cucumis pubescens, willd.

Description of the plant.

A trailing plant. Stems rough with short rigid hairs; branches often 3'–5, long; leaves somewhat reniform, repandy and acutely toothed, scabrid on both surfaces, in some plants they are nearly entire while in others unequally 5-lobed; lamina 4–8.5 cm. by 5–10 cm.; petioles scabrous, 2–10 cm. long. Flowers yellow, petals slightly acute. Fruit ovate, obtuse at both ends, terete, striped dark and light green, 4–5 cm. by 2–2.4 cm. Seeds elliptic, 5 by 2 mm.

Distribution. The plant occurs in the Central and East Coast districts of the Madras Presidency on waste lands. It grows abundantly in many parts of the Salem district. It is a common weed especially in *cumbu* (*Pennisetum typhoides* Stapf et Hubbard) fields and after the harvest of *cumbu*, this plant trails on the ground between rows of field Lablab (*Dolichos Lablab* L.) and castor (*Ricinus communis* L.) which are generally grown

at 8'—10' apart as a mixture with *cumbu*. The *cumbu* crop is generally harvested in December. Lablab and castor are harvested in February—March. In February, the ripe fruits of *Cucumis pubescens* Willd. are collected and cut into 2 or 3 pieces, often cross-wise and spread on bare rocks for drying. The pieces are collected when dried and stored in gunny bags. The tender fruits are bitter in taste. Ripe ones, however, are edible and pleasant to taste. Ripe fruits are used in making vegetable chips (*vattal*). It is a subsidiary occupation of the women-folk and children especially of Andipalayam, Oonjapalayam and other villages in the Salem District.

Each plant produces from 10—20 fruits. About 15 fruits are required to make $\frac{1}{2}$ Madras Measure of the chips (dried stuff) which is known in Tamil as *Karumatta vattal*, *Kummatti vattal* and *Muruku vattol*.

Preparation (further curing). The "vattal" is soaked in good buttermilk in which ground chillies and salt to taste have been added and kept for a day. The next day they are put out in the sun for drying. They are again soaked overnight in the same buttermilk and are dried from the third day till they are completely dry. The finished product will keep for several months and is known to keep for two years. It is fried in oil and used as a savoury preparation to be eaten with rice.

Marketing. Traders either go to Sankaridrug shandy or to the villages where the "vattal" is available and buy and stock it in large quantities. They take it to important towns all through South India, viz., Coimbatore, Pollachi, Palghat, Calicut, Trichinopoly, Madura, Tinnevely and Trichur. It is usually sold at two annas per Madras Measure. "Vattal" is available for purchase from March onwards.

Scope for cultivation. This "vattal" is cheap in Salem as it is produced largely in that district. It can easily be grown in almost all places in waste lands. Seeds can be obtained through the Agricultural Demonstrators in the Salem District.

Selection work in this crop is being done at the Agricultural Research Station, Nandyal, Kurnool District.

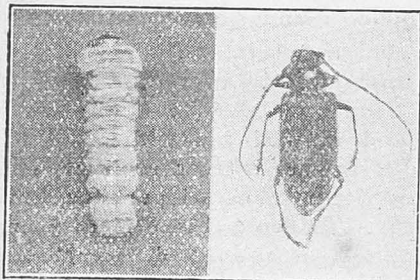
* The following are the analyses of "Budama" fruits and "Budama" chips.

	Budama fruits		Budama chips (Vattal).
	On original moisture basis.	On dry basis.	
	%	%	%
Moisture	89.10	9.22	7.38
Ash	1.31	10.88	10.96
Crude proteins	2.00	16.68	18.57
Ether extractives	1.99	16.56	17.45
Crude fibre	2.93	24.44	30.61
Carbohydrates by difference	2.67	22.22	15.03
Total	100.00	100.00	100.00
Insolubles	0.015	0.12	0.11
Albuminoids	1.58	13.19	13.89
Lime (CaO)	0.060	0.50	0.50
Phosphoric acid (P ₂ O ₅)	0.073	0.61	0.43

* The analyses were done by the Government Agricultural Chemist, Coimbatore, at the instance of the Assistant Director of Agriculture, Cuddapah.

Bibliography.

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| 1. Gamble, J. S. (1919). | <i>The flora of the Presidency of Madras</i> , Adlard and Son, Ltd., London, Part III, p. 535. |
| 2. Hooker, J. D. (1879). | <i>Flora of British India</i> , 2:619. |
| 3. Jackson, B. D. (1895). | <i>Index Kewensis</i> , 1:664 |
| 4. Roxburgh, W. (1832). | <i>Flora Indica</i> , 3:723. |
| 5. Wight, Robert (1845-7). | <i>Incones Plantarum Indiae Orientalis</i> 2: t. 496. |

Research Notes.

Larva and beetle of Cashew stem borer.

A stem boring beetle pest of cashew tree. The cashew tree (*Anacardium occidentale*) is an important money crop in the South Kanara District. The area under the crop in this District is estimated to be 35,000 acres in 1940 and it is steadily increasing. The value of the annual produce of cashewnut in South Kanara amounts to one and a half million rupees in normal years.

No major insect pest of the cashewnut is so far reported. During the last four years, large numbers of cashewnut trees have been found dying all over the West Coast for no apparent cause. Several dead and dying trees were examined. Large numbers of live beetle grubs found inside the trunks were found to have caused damage and death of the trees. Specimens of grubs and adult beetles (plate) collected from the trunk were sent to the Government Entomologist in February 1940 and were identified as *Plocaederus ferrugineus*, Linn. family *Cerambycidae*. This was the first record of its kind in this Presidency; so far no cerambycid beetle grub has been known to attack cashewnut trees and do extensive damage. A survey in the South Kanara District has revealed that up to 10% of the trees were killed by this pest.

From the nature of the attack it is presumed that eggs are laid in the bark at the collar region. The grubs are pale brownheaded fleshy creatures about $1\frac{1}{2}$ "-2" in length. On hatching, they tunnel into the trunk eating their way upwards and inwards into the trunk and also downwards into the roots. They pupate below the bark in the tunnels in small cocoons of thin pale material and are found particularly in the collar region. The adult beetle is reddish brown in colour, about $1\frac{1}{2}$ " long and has long feelers.

The seat of first attack is the collar region of the tree at about the ground level. Usually, large, healthy and robust trees are attacked, small trees being comparatively free from attack. Affected trees are distinguished by characteristic yellowing and withering of leaves which may be confined to a few branches on the entire tree. Occasionally dried up, red coloured gum is observed in the crevices of the bark at the base of the trunk. On tapping the trunk of the affected trees a dull thud indicates the seat of attack. A healthy trunk produces a sharp sound when tapped. The bark when split open (which can be easily done) exposes a thick layer of grey coloured, powdered wood mixed with the excreta of the grubs between the bark and the wood. In neglected cases several months old—the trunk is tunnelled through and through. From one such specimen 250 grubs and a large number of beetles were collected. When the attack is serious the cambium between the bark and the wood is eaten up and the tree is

practically 'ringed' and it cannot be saved. The attack appears to be more severe in summer months.

Trees should be frequently examined at the collar regions for the presence of the pest. Affected parts should be scooped out and beetles and grubs extracted and killed and the operated parts painted with tar. Dead trees should be cut down and burnt, lest they should serve as breeding places for the pest.

Agri. Res. Station, Kasaragod, }
March 1941. }

G. V. Narayana.

ABSTRACT

Mango Budding. Ali Mahomed Ulvi—*Indian Farming* (1940): 222-225. This article relates to propagation of the mango by budding under Sind conditions.

Vegetative propagation. As seedling mango seldom resembles its parent tree either in form or quality of fruit, vegetative propagation by inarching or grafting is the general practice in India. Under Sind conditions this method is expensive due to plant potting, daily watering and preparing platforms on the parent trees for convenience of grafting. Besides the scion trees annually subjected to this grafting method at the Government Fruit Farm, Mirpurkhas, have been found to get devitalized and refuse fruiting. To avoid this difficulty and to meet the increasing demand for mango planting on the Lloyd Barrage and Canal areas, mango budding was tried at this station under field conditions, with 60 per cent success. Some budded varietal plants planted in 1937 yielded a few bunches in 1939, and the fruits were typical of the varieties.

Technique of budding. Washed stones of mature ripe country mangoes of regular croppers, are planted 2 feet apart in previously prepared nursery beds. With light irrigation, top dressing and occasional weeding and hoeing, the stem of the seedling gets pencil thick in about a year, when the best of seedlings of about 3 feet height are budded in nursery beds. To ensure success the stock plants should be 1 to 1½ years old and pencil thick in stem. They should also be stimulated to flush with vigorous sap flow, for easy peeling off of the bark and smooth insertion of the bud.

Selection and treatment of bud wood. Healthy, non-flushing green shoots of 2 or 3 previous growths, carrying prominent and resting buds, are removed of consistently high yielding and vigorous scion parents of over 10 years of age. The top growths are cut. The bud woods of lower growths are divided into one foot long bud sticks, kept cool and moist inside fresh plantain skin, and the buds utilised almost immediately for budding.

The budding operation. About 2 inch long buds are removed from the bud sticks, cleaned off the wood, and inserted at the middle of a longitudinal slit caused by bending at the centre of a 2 to 2½ inch long incision made on the stem of the stock about a foot high from the ground. The budded region of incision is bandaged with moist plantain fibre, just exposing the living bud for growing. Watering, top-dressing, hoeing, removal of adventitious bud sprouts, light and sun are essential for stimulating bud growth. In one year the budded plants are ready for planting in the field after careful lifting with ball of earth. Two or three year old seedlings planted permanently in the field can also be budded *in situ* on the limbs.

S. M. R.

Studies on Browning Root Rot of Cereals. VI. Further contributions on the effects of various soil amendments on the incidence of the disease in wheat T. C. Vanterpool. *Canadian Jou. of Res.* 18 (1940): 240.

Further work has substantiated earlier findings that phosphatic fertilizers and farm manure will give adequate control of *Pythium* root rot of wheat in infested prairie soils. The improvement in growth resulting from these amendments is considered to be due to the production of a larger number of quicker

growing roots which lessens the chances for infection and leaves more roots healthy though the same percentage may be effected as in diseased plants showing severe leaf discolorations. Experiments have failed to indicate that the phosphatic materials increase resistance appreciably. Nitrogenous materials when applied singly had virtually no effect on growth, but once ample phosphorus was added, further nitrogen applications gave substantially greater increases than phosphate alone. Phosphorus is apparently the chief limiting element. No difference was found in preliminary tests in the phosphate-fixing power of browning and normal soils. Typical browning soils responded irregularly to small applications of boron, copper, manganese, or zinc, but were not found to be seriously lacking in these elements. Moderate benefits resulted from heavy applications of gypsum and sulphur. Browning soil was found also to be deficient in phosphate for non-cereals such as alfalfa, buckwheat, carrots, flax, lettuce, and sweet clover. These crops were not attacked by the *Pythium* spp. pathogenic to cereals. Consequently the poor growth of the non-cereals in browning soil appears to be due to nutrient deficiencies, while the poor growth of cereals is due to both root-destroying fungi and nutrient deficiencies. In both instances phosphorus is probably the chief limiting element. Ground cereal straw, sweet clover hay, and weed hay amendments gave moderate increases in the growth of wheat. No consistent differences were found in the carbon-nitrogen ratios of browning and normal soils. The results as a whole suggest that two of the most practicable means of meeting the browning root-rot situation are, firstly, to supply supplemental nutrients in the form of artificial fertilizers, and secondly to add organic residues or farm manure regularly to fields subject to the disease. (Author's abstract.)

Coffee manuring and mulching experiments A. B. Lucy. *Malayan Agr. J.* 29 (1941: 68—77).

The paper records the results of a manurial experiment on Liberian and Robusta coffee laid down in 1933 and of a mulching experiment superimposed on the plots in 1938. There were four manurial treatments viz. NPK, NP, P, P+green manuring and a control all of which were replicated six times. The mulching was done to half-block units after splitting each plot longitudinally so that the mulching did not interfere with the manurial experiment. The application of rock-phosphate at the rate of 4 cwts. per acre per annum gave a mean increase of 26 percent. Green manure dug in at the rate of 2 tons per acre together with 4 cwts. of rock-phosphate gave a mean increase of 55 percent. Small applications of nitrogen and potash in conjunction with phosphate gave no further increases in yield. The bushes showed noticeable improvement four months after the application of mulch, but no appreciable yield was obtained in the first year. During the second year an increase of 127 percent yield was obtained. Mulch alone gave 55 percent greater yield than the best of manurial treatments. The response of Robusta coffee to mulching was similar but less marked than in Liberian coffee. The increase in yield was 59 percent. K. M. T.

A quantitative study of the Subterranean Members of Soybean. Howard J. Dittmer, *Soil Conservation*, 6, (1940), 33—34. Soil samples 3 inches in diameter and 6 inches deep were taken with a cutting tube, and counts and measurements were made of the various root parts and root hairs included in the soil sample. The tool used for sampling was an iron pipe with an inside diameter of 3 inches and a tapered cutting edge to facilitate entrance into soil when driven with a heavy maul. The soybean was selected for this study because it is of great economic importance and is widely used in crop rotation even on fields subject to erosion. The taproot system of soybean is very poorly adapted for erosion control since most of the branching is from one to two inches below the surface thus giving the top soil very little protection. The total surface area of the

root, the number of roots, the total length of roots and total number of root hairs and their surface area were considerably less in soybeans as compared with oats, winter rye and Kentucky bluegrass. It is therefore concluded that the binding capacity of soybean to prevent soil erosion is rather poor though the depth of penetration is rather high. It is also concluded that the soil binding potentialities of a plant may be determined in a very short time by making quantitative studies of its roots and root hairs.

R. R.

The Feeding of Poultry. A. J. Macdonald. *Indian Farming* (1940) 318—322.

India has lagged very far behind other countries in poultry breeding and possesses only a very small percentage of pure-bred fowls. The ordinary country fowl is a comparatively slow grower and the average annual production of a bird is calculated to be only 52 eggs. This production is less than one half of that obtained in many other countries. The average egg size is also very much smaller than the standard 2 oz. eggs of well-bred strains of poultry. Efforts at improvement by breeding without corresponding advances in management and feeding are, however, of doubtful value for it is only logical to assume that fast growing high producing stock must receive more nutritive foods than ordinary unimproved country stock. Points to be observed regarding poultry rations:

(a) Fowls can deal fairly effectively with rations containing up to 10% fibre, but better results are obtained from rations containing only 6—7%. (b) Stale musty foods of any description are harmful as they are unpalatable and cause serious digestive disturbances. (c) Cereals as a class are deficient both in the quantity and quality of their proteins thus making it necessary to balance these deficiencies with suitable protein supplements. (d) The early stages of growth are the most critical period in the life of the fowl and it is during this time that the biggest losses occur from malnutrition. Numerous growth experiments have demonstrated that the best growth results obtained during the first eight weeks of life are derived from rations containing not less than 18% proteins and that rations containing less than 15% proteins result in very poor growth and high mortality. (e) The best protein supplement to cereal rations for young chicks is undoubtedly milk in some form. Fresh milk, sour milk and buttermilk have equal feeding values. (f) When milk is not available, good results can be obtained by feeding cooked meat offals mixed with other ingredients in the mash. (g) In coastal areas where fish is plentiful, good results can be secured by using fish as the protein supplement—20% cooked fish or 10% fish meal or sun dried fish should prove satisfactory. (h) Vegetable proteins in the form of soya bean meal or earthnut meal may be given when other protein supplements are not available. Satisfactory results with vegetable proteins can, however, only be obtained in conjunction with $\frac{1}{2}$ —1% common salt. (i) The protein requirements of well-grown chicks are considerably smaller after 10 weeks and, consequently, it is less essential. (j) Cereals are badly balanced and deficient in their mineral content. Calcium in the form of limestone or other shell products given generously will produce good results. (k) The feeding of complex mineral mixtures is neither necessary nor advisable. (l) The protein requirements for egg production are not so high as those for young chicks. Satisfactory egg production can be maintained on a ration consisting only 12.5% protein but as most cereals contain less, it is advisable to feed some extra protein of either animal or vegetable origin. (m) Vitamin requirements: Vitamin A, is most likely to be deficient, more especially if the birds are confined in small runs. Deficiency of this vitamin results in poor growth, abnormal infection of the eggs, poor hatchability and low egg production. Yellow maize is a fairly good source of this vitamin and it should form one of the main cereals in the ration. Succulent green food must be fed abundantly. Vitamin B. (growth promoting vitamin).

Deficiency can be guarded by feeding separated milk and green food. (n) A mixture of grains should always be used in preference to a single grain as the proteins of a mixture are more likely to be well balanced than the proteins from any one source. (o) Wet mash is more palatable than dry mash but wet mash feeding requires more labour and involves a higher degree of skill in its use. Experimental work points to there being little to choose between the two systems.

M, K. R.

Gleanings.

The Soya Bean in Dietetics. The soya bean has been described as vitally important to Germany from the nutritional, the economic, and the military standpoint. A correspondent in the "Times" described a few weeks ago (Times, April 23, 1940) how these "Nazi Food Pills" were playing a dominant part in supplying the protein missing in a diet in which foodstuffs of animal origin were likely to be deficient. A flour from the soya bean containing 40 to 45 per cent. of protein has been made and is incorporated in soups, sausages, bread, biscuits, macaroni, etc., in such a way that flavour is unimpaired and the food value greatly increased. From the military aspect it has been openly boasted in Germany that without soya flour the rapid advances of mechanized units, cut off by distance from food supplies, would not have been possible. Even allowing for the flights of imagination which colour reports from the Reich, it is clear that the possibilities of the soya bean require more consideration than is usually given to them by dietetic experts in this country. A recent account (Arch. Dis. Childh., 1940, 151) by Dr. Helen Mackay of the use of soya bean flour in infant feeding is therefore of more than usual interest. The flour used contained over 40 per cent. of protein, 20 per cent. fat, and 20 per cent. carbohydrate. It contained about a quarter as much calcium, half as much phosphorus, and about eight times as much iron as dried cow's milk. For the investigation the soya flour was mixed with equal parts by weight of full-cream dried milk. When reconstituted with the usual "one in eight" dilution this mixture gave a feed with a caloric value equal to that of liquid cow's milk. Babies were given this milk, while a control group had dried milk with added iron. All babies received orange juice and some form of vitamin D and from 6 months of age all began mixed feeding. Babies accepted for the final comparison of results numbered 150. It was found that those receiving the soya flour milk gained on the average a little more slowly in weight than the controls, but the difference was less than two ounces a month. The haemoglobin levels of the soya flour groups remained very slightly below that of the controls, who had extra iron, and the total morbidity rates were almost the same in the two groups. There was, however, a greater tendency to loose stools when soya bean flour was used, and apparently it was not so well tolerated as full-cream dried milk and must be introduced more gradually. Calcification of the bones was as good in the soya bean groups as in the controls. Dr. Mackay has proved that in the mixture described, soya bean flour can play a part in infant feeds and soya bean flour should make it possible to market a milk plus flour powder at a price much lower than that of full-cream dried milk. Writing at a time when the possible stringencies of war economy were not fully realised, Dr. Mackay concluded that "owing to its relative cheapness it (the soya bean flour milk mixture) merits an extended trial in countries where, for economic reasons, a satisfactory substitute for breast milk has hitherto been unobtainable." The story of the "food pills" in Germany suggests an even wider application of soya flour. Infant feeding provides a delicate test for a substitute material, and out of such a test in Dr. Mackay's hands the soya bean emerges with great credit. The main sources of the plant are Manchuria, the united States of America, the Balkans, and South Russia. It

is to be hoped that someone in the Ministry of food is interested in the Soya Bean. (*Jour. Jam. Agri. Soc.* 42 (1940) : 397.)

School children and rats. The Hawaiian coffee industry in Kona coast suffered a great damage by rats in 1929. The rodents climbed the bush, ate the tender young shoots and knocked off half the ripe cherries to the ground. During 1936 the Agricultural Adjustment administration set aside 4000 dollars for the eradication of the rodents and in recent years private subscriptions plus an assessment of 20 cents per acre of coffee was levied. Both poisons and trapping have been resorted to.

"Probably the school children of Kona have taken the greatest interest in the eradication progress because they received a *bounty* of 1 cent per tail. The school children brought the tails to school and were—there. They generally brought the whole rat along!" *Extension Service Review* Vol. II. 1940.

GUMMOSIS OF CITRUS

Symptoms. An examination of a tree affected with this disease will show that infection usually starts at the base of the trunk or on the crown roots and works rapidly both upward and laterally. The lesions are usually found on the trunk near the soil and the larger main roots and may occasionally be found on the branches higher in the tree. Patches of bark are killed and often large quantities of gum are exuded.

The bark of an infected tree is killed entirely through to the wood, thus including the cambium. Occasionally in the earlier stages of the disease the exuding gum is the only external symptom readily observed. By lightly scraping the bark at this time the margin between the sound and invaded tissue is shown indefinitely only by a gradual shading of the normal green colour to a drab. Only after a considerable time does the bark shrink and crack longitudinally. The inner bark and finally the wood underneath frequently decay and develop, especially in humid climates, an ill-smelling odour. The bark eventually dies and breaks away in patches leaving bare, dead areas.

The effect of this disease on the foliage often does not appear for many weeks or even months after the bark has been killed. The leaves on the side of a tree badly affected, or all over a tree that has been girdled, first fade to a yellowish green and later become yellow or chlorotic and finally fall leaving bare branches. The green bark on the twigs also turn yellow later and smaller twigs die at their tips. Trees attacked by this disease at times put on temporarily a heavy crop of inferior fruit.

METHODS OF CONTROL.

Preventive Measures. Keep the soil pulled away from the base of the tree trunk until the tops of the first main roots are exposed. Keep the soil next to the trunk from becoming excessively wet. Avoid injuries to the bark. Paint the trunks with a fungicide, such as Bordeaux paste. Use good sour orange or other resistant stocks budded high for all new planting, especially on heavy clay soil.

Treatment of diseased trees. The disease may be treated when not too far advanced by cutting away the invaded, killed bark, but not necessarily the outer gummous zone, and painting the wood with Bordeaux paste. After a few days and so as to prevent duck ants, other wood boring insects or rots from attacking the exposed wood, paint the wood with white lead. When branches are already dead or greatly weakened by the disease, sever them cleanly by using a saw and then paint the cut surface with white lead well under the diseased part. Cut back or thin the tops of trees severely affected. *Jou. Jam. Agr. Soc.* 44 (1940) 274—275.

Thin Napier Grass. In our search for a drought resistant grass, we came across, in our old collections, a tall thin variety which we have named dry land thin Napier grass. As generally recognized, Napier grass or *Pennisetum purpureum* is a tall, heavy stemmed grass with rank growth, but the one we have chosen is a thin stemmed variety. The heavy stemmed variety has a longer flower spike than the thin stemmed one. In 1937, enough seeds of this grass were collected for planting 15 acres. The seeds are light, with long hairs. The best method of establishing a pasture with this grass is as follows:

A raised seed bed is prepared similar to the one used for raising a tobacco nursery and manured with farmyard manure. The seeds are sown and the soil lightly raked and watered so as to fix the seeds in the soil lest they should be blown off by the wind. To facilitate sowing, the seeds may be mixed up with a small quantity of fine dry earth. The seeds germinate readily and the seedlings grow up to a height of about nine inches after 40 to 50 days.

With seedlings raised from a pound of grass seeds, an area of about $1\frac{1}{2}$ acre can be planted. The land intended for planting with grass needs only to be ploughed up. It is not even necessary to manure the land, though no doubt manuring will result in a more luxuriant pasture. The seedlings are transplanted during the rainy season. A little occasional cultivation helps to keep down undesirable weeds, but even this may not be essential if we have an inter-crop.

Long after the other grasses have dried up, the thin Napier grass kept its fresh green verdure. It grows up to a height of five feet on the poorest land and will reach up to six feet on ordinary cultivable soils. Three cuttings can be taken in a year giving a yield of seven tons per acre of green fodder. By these repeated cuttings, the grass remains tender and does not become fibrous. It furnishes green fodder for nearly nine months in the year. Cattle and sheep relish the grass. On the Hebbal Farm our Merino flock, imported from South Africa, graze with avidity on the Napier Grass pasture of 15 acres. Given irrigation facilities and a mind to apply manure, the output of green fodder will be more than doubled.

It must be mentioned that Napier grass has grown well, not only in dry areas with only 18 inches of rainfall but in areas with rainfall of 120 inches.

Indian Farming 1 (1940): 586—587.

DEODORISING COCONUT OIL.

The following process was worked out at the Harcourt Butler Technological Institute Cawnpore.

The process consists in boiling for a few hours the coconut oil to be deodorised with a 2 per cent solution of sodium silicate, removing the soap formed and finally washing and drying the oil. The weight of sodium silicate used for a given quantity of oil depends upon the free fatty acid content of the oil and the alkalinity of the silicate. The quantity of sodium silicate taken is such that its alkalinity is exactly equivalent to the acidity of the oil. Usually with an oil of 3 per cent acidity, the quantity of sodium silicate of 240°Tw. required is 1.6 lbs per 100 lbs. of the oil.

The oil, taken in a vessel with a tapering bottom and a stopcock, is heated to about 80°C. and its equivalent of 2 per cent. silicate solution previously warmed to about 50°C. is poured slowly into it with vigorous stirring. The heating is continued for some time till the liquid comes to boiling. Then as the boiling goes on, water is poured in from time to time to make up the loss by evaporation and this is continued for 2½ hours. By this time the issuing steam is found to have hardly any odour of coconut oil. At this stage, about 5 lbs. of powdered common salt are added, and the whole boiled for a few minutes to coagulate the

soap formed. The liquid is then allowed to stand, and the emulsion of soap and silicic acid is carefully drawn off from the bottom. The residual oil is given two or three washings with hot water, till the wash-liquid no longer gives any alkaline reaction. After every washing the wash water is drawn off from the bottom. The washed oil is then heated in a shallow dish with constant stirring to drive off any residual moisture.

The oil may finally be mixed with 1 per cent "diatomite earth" (Fuller's earth) and filtered, when the oil is perfectly clear, bright and without any perceptible odour. *Industry* 31 (1940): 518.

Reviews.

Fruit culture (with special reference to East Godavari District) by Rao Sahib G. Jogiraju, Retired Assistant Director of Agriculture, Pithapuram. Price As. 4.

This book-let of about 30 pages was published under the auspices of the East Godavari Horticultural Society, Cocanada. It deals briefly with the main principles of fruit culture and also offers some practical hints with special reference to the conditions prevailing in the East Godavari District. This book along with the author's other publications *Fruit* (parts I & II) in Telugu, supplies a long felt need of the fruit growers of the Northern Circars. No emphasis is laid on the importance of propagation from parent trees of proved merit. Bud selection is an important aspect of fruit culture especially in commercial orcharding and we hope in subsequent publications this aspect will also be included. T. N.

Report on the Marketing of wheat in India, issued by Agricultural Marketing Adviser, Government of India. *Manager of Publications, Delhi. Re. 2-4.*

Wheat appears to have been cultivated in India from time immemorial. Grains unearthed from the 3,000 years old ruins of Mohenjo-daro in the Indus valley have been identified as *Triticum compactum* (dwarf) and *Triticum sphaerococcum*.

Supply. The world production of wheat in 1909-1913, including Russia was approximately 100.6 million tons, of which India's share was 9.5 millions. According to the latest available statistics covering the crop year 1935-1936, India produced 7.8% of the world crop. The estimated annual production in the Madras Presidency ranged from 2,300 to 3,800 tons.

Exports of wheat were a normal feature of India's foreign trade before the last war. In the five years immediately after the war owing to increasing domestic consumption and declining exports, Indian shipments had fallen to less than 3% of the average crop. Between 1928-1929 and 1931-1932 India was a net importer of wheat.

Distribution of area. Ninety-six per cent of the total wheat crop is found north and west of a line drawn across the Peninsula from Bombay to Calcutta.

The total area of wheat in India based on the average of the seasons 1925-1926 to 1934-1935 is 33.2 million acres and represents rather more than one-tenth of the total cultivated area in the country.

Average area under wheat

	Million acres.	Percentage of all-India acreage.
British India.		
Punjab	9.4	28.2
United Provinces	7.5	22.6
Central Provinces	3.4	10.2
Bombay	1.6	4.8
Sind	.6	1.8
Other Provinces	2.4	7.2
Indian States	8.3	25.0
Total.	33.2	100.0

In the Madras Presidency the average area under wheat in the ten years 1925—1926 to 1934—1935 was 18,232 acres. Taking the average yield to be 350 lb. per acre, the average annual production is about 2 630 tons.

Area under wheat in Madras Presidency. 1934—1935.

	Acres	<i>Percentage of total area in the Presidency.</i>	
Bellary	4 158	24·9	
Nilgiris	2,294	13·8	
Anantapur	2,238	13·4	
Vizagapatam	2,050	12·3	
Kurnool	1 577	9·5	
Salem	1,469	8·8	
Madura	1,059	6·3	
Cuddapah	910	5·5	
Guntur	432	2·6	
Chittoor	272	1·6	
Rest	below 100	below 1%	
	16,669		99·8

Area of irrigated and unirrigated wheat in India.

Quinquennial averages in million acres.

<i>Year.</i>	<i>Irrigated.</i>	<i>Unirrigated.</i>
a) 1909-10—1913-14.	10·0	17·6
b) 1929-30—1933-34.	12·1	19·6

Approximate yields of wheat in certain countries of the world (lb. per acre)

United States	846
Canada	972
Australia	714
Argentina	780
Europe	1,146
Russia	636
India	636

Average yield of wheat in certain provinces of India (lb per acre).

Punjab	738
United Provinces	786
Central Provinces	444
Bombay	447
Bihar and Orissa	882
Sind	593
Hyderabad	231
Madras	350

Periodicity. Wheat takes 3 to 6 months to ripen according to the location and variety. In the south, the growing period is shorter than the north. By the beginning of December, the entire wheat crop is seeded in India.

Between 50 and 60 per cent of the total supply is marketed soon after harvest from the beginning of April until the middle of July before the monsoon interferes with the free movement of produce in the interior.

In the Madras Presidency the crop is sown early in November and is harvested by February—March. The produce arrives in the market from the end of February to October.

Qualities and types. The two main kinds of wheat grown in India are those belonging to the *vulgare* and *durum* sub-species of *Triticum*. A third type (*Triticum dicoccum*) referred to as 'spelt' in some recent publications is found in

the Bombay Presidency, and to a very small extent in Madras and Mysore. Dwarf wheats *T. Compactum* were formerly cultivated on a fairly large scale in the south and south-west Punjab, but the production of this species appears to have declined and is at all events of no special commercial importance.

Triticum vulgare. These are the common wheats used in large quantities by the milling industry for the manufacture of flour. They are grown extensively under irrigated and unirrigated conditions in the north. The grains are usually of medium size, and may be white or red, while the kernel structure ranges from soft to hard. All the improved varieties may be classified as white wheats. The total area under improved wheats in India is now about 6.5 million acres representing 19% of the total wheat acreage.

Triticum dicoccum. Summer wheat is found only in the south of India and mainly in the Bombay Presidency. A number of recent publications refer to this wheat as "spelt". The grain is red, hard and flinty, slender and pointed and is enclosed in the glumes when threshed.

Triticum compactum. This is grown in the south-west Punjab. The grains are usually white, small and rounded.

Triticum durum. These are also known as Macaroni wheats. The ears are long, pointed, hard and flinty. This has a high gluten content. The wheat is usually white or amber coloured and sometimes red.

Trade descriptions. There is a confusing multiplicity of trade names and descriptions of wheat throughout India so that buyers and sellers using the same term may often mean something entirely different. The more generally understood descriptions perhaps are "sharbati" for hard, white wheat and "pissi" for soft wheat (*Triticum vulgare*). "Dara" approximates to "fair average quality" in different districts and "bansi", "jalalia" and "khandwa" refer to different types of *durum*.

Imports. The wheat imports amount to very little and only partly off-set the exports. During the ten years ending 1929-1930, imports represented only about half the exports. Australia provides nearly all the imported supplies.

Imports of wheat into India by sea.

Year.	Thousand tons.
1930-1931.	232
1935-1936.	13

Sea-borne imports of wheat into the Madras Presidency were as follows:—

Year.	Tons.
1930-1931	6,655
1934-1935	8,331

Exports. The exports of wheat mainly to the United Kingdom has always been irregular and the average in recent years has been small.

Exports and re-exports of wheat from India by sea.

Year.	Thousand tons.
1930-1931	197
1935-1936	10

The exports of wheat from Madras Presidency to foreign countries are negligible, as they averaged less than a ton per year.

Wheat flour. The overseas trade in wheat flour and other wheat products is comparatively small. Imports of flour are almost negligible.

Utilization and demand. The consumption of wheat is as high as 350 lb. per head a year in some of the cities in Northern India. In the south, in Madras Presidency, the per capita consumption is as low as 4 lb. per year.

Ata is the main product made from wheat. Next to *Ata*, *Suji* (coarse semolina) and *rawa* (fine semolina) are the most important chiefly *Suji*. The hard *durum* wheats are eminently suitable for the manufacture of these products.

Whole-sale prices. White wheats command a premium generally of about Re. 0—2—0 per maund over red wheats. Soft wheat *pissi* is at a discount of about 5 per cent compared with hard wheat *sharbati*. Durums, the hardest wheats of all, sometimes sell in some markets at high premiums over other wheats.

Average whole-sale prices of wheat (per maund of 82·2 lb.) at some of the important markets in India.

	1931.	1935.
Lyallpur	Rs. 1-13-6	3-3-9
Karachi	„ 2-6-3	2-14-10
Calcutta	„ 2-14-7	3-6-2
Hapur	„ 2-2-4	2-8-7
Bombay	„ 2-9-9	3-2-6

There is a seasonal depression in prices of wheat at harvest time. The producers lack facilities to be in touch with the "futures" markets.

Classification, grading and standardization. It is quite necessary to classify the different types of wheat into their various categories. *Triticum vulgare* may be classified as hard or semi-hard white wheats, soft white wheats hard or semi hard red wheat and soft red. Durum may also be classified as white (or amber) and red.

Conservation. Many and various are the methods of storage practised throughout India from small woven *phallis* or *thekkas* in the villages holding only a few maunds each to the large godowns at the posts capable of storing hundreds of tons. Owing to defective storage, large losses are incurred every year by dampness and weevils as well as other vermin such as rats and white ants. The total loss is about 3 lakh tons a year valued at over Rs. 24 crores. Every inducement and encouragement should be given to trade associations or others operating in the large up country assembling markets to concentrate and improve the storage accommodation and to make available a reliable system of 'hedging' wheat stocks on the basis of standard 'futures' contracts capable of being dealt in not only by local traders, but also by buyers in the more distant consuming markets.

The processing and distribution of wheat products and the sources of supply and methods of distribution of seed are also exhaustively dealt with in the concluding chapters of the report.

On the whole the report is a compendium of valuable information on the importance of wheat to India, the varieties cultivated, the internal and external markets etc. The inter-chapters which form a feature of the reports in this series furnish the outstanding information in a nutshell. The facts are presented in lucid language and form interesting reading. The price of Re. 1-4-0 is very moderate for such a valuable book which should find a place on the book-shelf of every person interested in Indian wheat.

P. A. V.

Crop and Trade Reports.

Statistics—Crop—Groundnut—1941—First report. The area sown with summer or irrigated groundnut during the three months January to March 1941 is estimated at 33,500 acres. When compared with the estimated area of 42,800 acres for the corresponding period of last year, there is a decrease of 21·7 per cent, the decrease being due mainly to the low price of groundnut.

Figures by districts are given below :—

District.	Estimate of area sown with irrigated groundnut from January to March		Increase (+) or decrease (-) of the area in col. (2) as compared with the area in column (3)
	1941	1940	
(1)	(2)	(3)	(4)
	Acres.	Acres.	Acres.
Anantapur	200	200	Nil
Cuddapah	1,500	2,000	- 500
Nellore	100	100	Nil
Chingleput	5,000	6,000	-1,000
South Arcot	16,000	20,000	- 4,000
Chittoor	3,500	5,000	- 1,500
North Arcot	1,000	1,500	- 500
Trichinopoly	800	1,000	- 200
Tanjore	1,900	3,000	- 1,100
Madura	2,500	3,000	500
Ramnad	1,000	1,000	Nil
Total	33,500	42,800	- 9,300

The wholesale price of groundnut (shelled) per imperial maund of 82½ lb. (equivalent to 3 200 tolas) as reported from important market centres on 7th April 1941 was Rs. 3-12-0 in Vizagapatam, Rs. 3-10-0 in Guntur, Rs. 3-9-0 in Cuddalore, Rs. 3-8-0 in Vizianagaram, Rs. 3-3-0 in Vellore, Rs. 3-2-0 in Salem, Rs. 3-1-0 in Cuddapah, Rs. 3-0-0 in Bellary, Rs. 2-15-0 in Adoni, Rs. 2-14-0 in Guntakal and Hindupur, Rs. 2-13-0 in Tadpatri and Rs. 2-10-0 in Nandyal. When compared with the prices on or about the same date last year, these prices reveal a fall of approximately 41 per cent in Nandyal, 39 per cent in Tadpatri, 35 per cent in Cuddalore, 33 per cent in Hindupur, 32 per cent in Adoni, Cuddapah and Vellore, 29 per cent in Guntur and Bellary and 26 per cent in Vizagapatam and Vizianagaram.

(From the Director of Industries and Commerce.).

Statistics—Crop—Gingelly—1940-41—Fourth or final report. The average of the areas under gingelly in the Madras Province during the five years ending 1938-39 has represented 16.2 per cent of the total area under gingelly in India.

The area sown with gingelly in 1940-41 is estimated at 752,400 acres. When compared with the area of 803,900 acres estimated for the corresponding period of last year, it reveals a decrease of 6.4 per cent. The present estimate reveals an increase of 2.4 per cent as compared with the finally recorded area of 734,496 acres last year. The area in an average year is estimated at 785,740 acres.

194,100 acres have been reported as sown since the previous forecast report was issued in January as against 202,000 acres during the same period last year. These late sowings were mainly on wet lands in Vizagapatam, East Godavari, West Godavari, Cuddapah, South Arcot, Chittoor, Trichinopoly and the South where gingelly was raised as a second crop after paddy.

The estimated area is the same as that of last year in South Kanara. An increase in area is estimated in East Godavari, Cuddapah, South Arcot (+23,600 acres), Chittoor, Coimbatore, Trichinopoly, Tanjore, Tinnevely (+50,200 acres) and Malabar and a decrease in area in the other districts of the Province, especially in Anantapur (-11,400 acres) and Salem (-33,000 acres). The area estimated for South Arcot is the highest reported in recent years.

The yield is estimated to be above normal in Kurnool (105) and Salem (110), normal in East Godavari, Guntur, Cuddapah, Coimbatore and Madura and below normal in the other districts, especially in Tanjore (74), South Arcot, Chittoor

North Arcot and Ramnad (80 in each), Tinnevely (81) and Malabar (82). The condition of the late sown crop is reported to be satisfactory.

The seasonal factor for the Province as a whole works out to 92 per cent of the average as against 90 per cent according to the Season and Crop Report of last year. On this basis the total yield works out to 92,400 tons. This represents an increase of 2·8 per cent when compared with the estimate of 89,870 tons in the Season and Crop Report of last year. The yield in an average year is estimated at 106,320 tons.

The wholesale price of gingelly seed per Imperial maund of 82½ lbs. (equivalent to 3,200 tolas) as reported from important markets on 7th April 1941 was Rs. 7—0—0 in Cocanada, Rs. 6—12—0 in Tinnevely and Tuticorin, Rs. 6—9—0 in Trichinopoly, Rs. 6—3—0 in Cuddalore, Rs. 6—1—0 in Salem, Rs. 6—0—0 in Vizagapatam and Vizianagaram, Rs. 5—15—0 in Ellore and Rs. 5—14—0 in Rajahmundry. When compared with the prices published in the last report, i. e., those which prevailed on 10th February 1941, these prices reveal a rise of approximately eight per cent in Vizagapatam and Cocanada, four per cent in Ellore, two per cent in Trichinopoly and Tuticorin and one per cent in Rajahmundry and a fall of approximately four per cent in Cuddalore, the prices remaining stationary in Vizianagaram, Salem and Tinnevely.

(From the Director of Industries and Commerce).

Cotton raw in the Madras Presidency. The receipts of loose cotton at presses and spinning mills in the Madras Presidency from 1st February to 11th April 1941 amounted to 102,745 bales of 400 lb. lint as against an estimate of 410,400 bales of the total crop of 1940—41. The receipts in the corresponding period of the previous year were 87,855 bales. 110,208 bales mainly of pressed cotton were received at spinning mills and 21,182 bales were exported by sea while 46,612 bales were imported by sea mainly from Karachi. (From the Director of Agriculture, Madras).

Mofussil News.

Bellary. An Agricultural Exhibition was held during the car festival of Sri. Basaveswara Swami of Rurugodu, from the 13th to 15th of March by the Agricultural Demonstrator, Bellary. This was the first time that an exhibition was staged at this place. Improved ploughs suitable for both black and red soils, improved strains of seed suitable for the tract and bee-hives which were on show attracted considerable attention. Leaflets were freely distributed and priced publications were on sale. An attendance of 3000 persons was estimated which should have been doubled had it not been for severe out-break of plague in the surrounding villages. The President and members of the Panchayat Board of Kurugodu have requested the department to make the show an annual feature, as it has been of great educative value to the ryots. K. R. R.

Bhimavaram. A novel kind of exhibition depicting agriculture, cottage industries, and cattle was held from 23rd February to 26th February 1941 for the 1st time at Bhimavaram (West Godavary District) in connection with *Mahasivarathri* festival under the auspices of the local "Crop Loan and Sale Society". Sri. D. Subbaraya Sastri, Revenue Divisional Officer acted as patron and Sri. T. Krishnamurthy, President, District Board accepted the presidentship of the exhibition Committee. This created a feeling of healthy competition among the people of the district in general and of the town of Bhimavaram in particular in trying to excel one another in adopting improvements in all aspects of village life. The exhibition was also open to all the schools in the taluk. The exhibition was divided into 12 sections as detailed below.

1. *The Agricultural section.* This consisted of seeds and crops, implements and green manure seeds, received from the Agricultural Research Station, Maruteru, Agricultural Demonstrators, Tanuku and Bhimavaram and from the ryots of the District.

2. *Fruit and vegetable section.* Different varieties of fruits and vegetables obtained from the Agricultural Depot and garden, Bhimavaram, Prabhu Nursery, and from ryots.

3. *Flower and foliage plant section.* Collections from Prabhu Nursery and from the depot and garden were exhibited.

4. *Industrial section.* (Products from fruits and seeds) Cholam malt, malt biscuits, fruit preserves and buttons manufactured from seed nuts, were among the exhibits provided by the local demonstrator and his family.

5. *Rice marketing section.* Graded 'Ag mark' rice by the marketing recorder and samples of different varieties of graded rice were collected from the local rice mills.

6. *Cottage industries section.* Articles manufactured by school boys and girls of the taluk and by the local ryots and the commercial organisations, buttons manufactured by Sri Krishna Asram, Guntur and brushes manufactured by Sri K. Chellareddy, messenger, office of the Agricultural Demonstrator, Bhimavaram, trained under the demonstrator in the art were exhibited.

7. *Bee-keeping section.* Bee-keeping exhibits supplied by Sri V. Tirumal Rao, Entomology Assistant, Samalkot, and the honey samples exhibited by the Agricultural Demonstrator, Tanuku and by ryots of four villages.

8. *Entomological and Mycological sections.* Attractive coloured pictures, photographs and word posters dealing with crop and vegetable pests and diseases with control measures formed the chief feature of these sections.

9. *Gardening section.* Gardens *in situ* belonging to private individuals were inspected by a committee of judges.

10. *Veterinary section.* Pure Ongole, and Mysore breed working cattle *Kapila govu* and good breeding bulls belonging to private ryots were exhibited. Photographs of various breeds of cattle in India were also exhibited. Among the birds exhibited, a country hen which lay two eggs per day attracted the attention of all the visitors.

11. *Health section.* Posters dealing with health were exhibited by this department.

12. *A. I. C. C. Khaddar section.* This branch exhibited the different varieties of Khaddar which commanded good sales during the exhibition.

The exhibition was opened on 23-2-41 by Sri G. Sitaramasastry Garu of Vinaya Ashramam, Guntur. In the presidential address Sri. Rao Saheb G. Jogi-
raju Pantulu Garu, Retired Assistant Director of Agriculture, pointed out that Government servants should take interest in agriculture and industrial research in addition to their departmental work. He paid a tribute to the All India Cottage Industries Association at Wardha for the useful and substantial work turned out by them. He said that there should be more model farms and exhibitions in different places and industrial centres should be organised to manufacture finished articles from raw products.

Lectures were arranged daily in the evenings on the following subjects :-

1. Village improvement. 2. co-operation. 3. industries. 4. adult education. 5. agriculture and gardening and 6. libraries.

Lantern shows also were arranged during nights. The committee of judges appointed examined the various exhibits, cattle and the gardens, and awarded certificates of merit to the best exhibits. The certificates were given away by Sri. K. V. Narasimha Rao Garu, Tahsildar, and Vice President, Exhibition Committee.

Nearly 15,000 people attended the exhibition and many returned home with the idea that they should win the 1st prize in the next exhibition.

It will be interesting to note that certificates of merit were presented to the following who are connected with the department:—

1. The Agricultural Research Station, Maruteru for pure and improved strains of paddy. 2. The Agri-Demonstrator Tanuku for the best honey. 3. The Store-Keeper Mr. E. Bhadrachalam, Demonstrator's Office, Bhimavaram for his agricultural drawings. 4. The messenger K. Chellareddy, Demonstrator's Office, Bhimavaram for the manufacture of brushes. 5. Mrs. Ramalakshmi (wife of Sri. T. Lakshmiopathi Rao, Agricultural Demonstrator, Bhimavaram) for cholam malt and malt biscuits. and 6, Miss Sudarsani (daughter of Sri. T. Lakshmiopathi Rao, Agricultural Demonstrator) for fruit preserves.

The exhibition though organised for the first time in this place was very successful. The hearty co-operation of Sri. Y. G. Krishna Rao, Deputy Director of Agriculture, Cocanada and Sri. S. Sitarama Patrudu, Assistant Director of Agriculture, Rajahmundry Dr. P. S. N. Sarma, the President and Sri. N. Gunneswara Rao, B.A., B.L., Secretary and Sri. K. Narasimha Raju, Assistant Panchayat Officer are gratefully acknowledged.

T. L. R.

Kadiri. An Agricultural Exhibition was held during the local Brahmotsavam festival of Sri. Lakshmi Narasimha Swami at Kadiri from 14th to 20th March 1941. It attracted a number of visitors from neighbouring taluks, States and Districts. About fifteen thousand visitors mostly ryots visited the exhibition. Important strains of paddy, groundnut, gingelly, and castor and specimen crops of sunnhemp, jonna, ragi and sugar-cane were exhibited. Improved implements for tillage and interculture and insecticides for the control of crop pests and diseases were exhibited. A groundnut decorticator worked by the hand was one of the attractions. Illustrated posters in the local language were utilised to explain the exhibits.

M. K.

Putuainipeta. An Agricultural Exhibition was held during the Annual local Harvest festival at Putuainipeta, Pulivendhla taluk on the 14th and 15th March 1941. The exhibition attracted about 3000 visitors from the neighbouring villages, who evinced keen interest by visiting the stall and demonstrations. Paddy varieties, dry land and garden land, cholam and other millets, cotton strains with combed specimens, seeds of green manure crops and oil cakes and other manures were among the exhibits. Interesting pictorial and word posters in the local language and improved ploughs and implements both for tillage and interculturing were most prominently exhibited. Horticultural implements, Bee-keeping appliances and chemicals used in the control of plant pests and diseases attracted large crowds. Model manure heap and pit were also exhibited.

S. V.

Kumbakonam. An Agricultural Exhibition in connection with the Masi Maham festival at Kumbakonam was held in cooperation with the Health Department of the Municipality and Sri. Lakshmiwaraha Iyengar, the Managing Director of the South Indian Nursery at a centrally situated site near the Mahamaham tank for 6 days from 10th to 15th March 1941. The Exhibition though not very large was neatly got up and was very attractive.

Particularly from 10th to 13th the crowd was very considerable, on account of the Maham festival proper on the 12th on which date alone, the visitors to the Exhibition would have numbered 3500.

It is estimated more than 8000 people visited the exhibition during the period it was kept open. In our departmental exhibition, the different strains of paddy, oil seeds, sugarcane, green manure seeds, samples of cotton and ragi strains, plantain bunches of different varieties, bee keeping appliances, spraying and dusting appliances a large range of improved implements including ploughs, Settuu, green manure trampler etc., live specimens of green manure, fodder grasses and English vegetables were all on show. In addition to explaining the significance of the several exhibits to the visitors, they were given information on various agricultural improvements that they could profitably adopt.

The Municipal Commissioner, Kumbakonam and Sri. Lakshmiwaraha Ayyangar, the organiser of the Exhibition took great interest in and helped materially to make the exhibition a success. M. A.

Samalkot. *The District work and Farm subordinates' Conference, at the Agricultural Research Station, Samalkota.* This was conducted by Sri. Sitarama Patrudu Garu, Asst. Director of Agriculture, Rajahmundry and Sri. Y. G. Krishna Rao Naidu Garu, Deputy Director of Agriculture, I circle. Cocanada, from 30-1-41 to 6-2-41. The Director of Agriculture attended the Conference from 2nd to 5th February. He exhorted the members assembled to secure close co-operation of the Revenue and other departments in the spread of the agricultural improvements; to properly record statistics of improvements and plot the same as graphs to visualise progress. The Director of Agriculture also elicited the experiences of those assembled, in regard to the kind of training that is to be given to a recruit before he is sent out as a demonstrator, for work in the districts. The Asst. Director of Agriculture, reviewed the work (1) crop by crop in the form of symposia embracing all aspects of every important crop of the Godavary Division, (2) under improved ploughs (3) under improved Sindevahe furnaces and (4) under Good Farmers' Associations pronounced to be the keystone, for a new orientation in the methods of propaganda, for the rapid spread of Agricultural improvements. Talks were given in Telugu by the subordinate staff, on bee-keeping, sunn-hemp culture and fibre production and folk songs for propagandistic ends. The Director visited the farm museum, inspected the work on the farm and the development in the evolution of new types of paddy, the testing of new types under sugarcane, the sunn-hemp fibre studies etc. The Director inspected the areas under improved cane and the improved Sindewahe furnaces with earthenware chimneys and the work of the Sugarcane Growers' Co-operative Union at Kirlampudi, bee-keeping run as a cottage industry at Santhi Ashramam, Thotapalle hills; the scheme area for the reclamation of saline lands, in the Cocanada taluq: the Good Farmers' Associations at Medapadu and Biccavole and the canning industry at Kadium.

The Conference of Crop Specialists and the District Officers at the Agricultural Research Station, Samalkota. The Conference was got up at the instance of Sri. S. S. Patrudu Garu, Asst. Director of Agriculture, Rajahmundry and lasted six days. The Senior Assistant in-charge of the Maruteru Agricultural Research Station, the Assistant on Chillies' Survey from Guntur, the Farm Manager, Samalkota, the Assistant Marketing Officer, Madras, the Superintendent, Agricultural Research Station, Anakapalle, the Assistant Directors of Agriculture, Vizagapatam, Guntur and Rajahmundry, the Deputy Director of Agriculture, I Circle, Cocanada, the Paddy Specialist and the second Cane Breeding Officer partook in discussions on the programme of research work for the Circle and the Stations of the Circle. Taking cognizance of past work, the cropping scheme of every agricultural station of the Circle was gone into, bearing in mind the problems of the districts the Station is intended to serve. The discussions on the programmes were thorough and searching.

Sri, K. Bhushanam, B. Sc., Ag., of the Agricultural Research Station, Samalkota, left for a month's training for Bilari, Moradabad Dt., U. P. in *gur* and sugar manufacture, in the open system and the Bels system. The present time is an opportune one to develop this cottage industry, with the wide margin prevailing between the rates of sugar and jaggery. M. S. N.

Tiruchendur. The annual cattle fair was held at Tiruchendur, Tinnevely district on the occasion of the Masi Maham festival. This is a famous pilgrim centre where large crowds gather. About 8,000 heads of cattle assembled and most of them were of the local type. A few animals from Mysore side also were brought for sale. Taking advantage of this an Agricultural Exhibition was conducted from the 7th to 22nd of March 1941. Various improved implements and seeds were exhibited. Demonstrations of improved mhothe wheels and other implements were done. Control measures against pest and diseases were demonstrated. Proper methods of bee keeping were shown and economic methods of making palmyra jaggery on a large scale were explained. Two magic lantern lectures were delivered on agricultural subjects. R. C.

Vridhachalam. An Agricultural Exhibition was held at Vridhachalam during the local *Masi Magam* festival from the 7th to 13th March 1941. The President, Panchayat Board kindly permitted the erection of a stall in front of the entrance to the temple adjoining the Public Radio ground. It attracted more than 12,000 visitors from the rural areas of the neighbouring taluks. Paddy and rice samples of improved strains of Adaturai and Palur Agricultural Research Stations, sugarcane varieties, fodder grasses from Palur, specimens of oil seeds collections from the Agricultural Research Station, Tindivanam and bonemeal samples kindly sent by Messrs. Rodrigues & Co., Kadambur were exhibited. The samples were arranged tastefully and were supplemented by pictorial and word posters. Samples of cream jaggery and cream sugar, graded eggs from Palur Farm, appliances and chemicals used in the control of pests and diseases were also among the exhibits. Two lantern lectures and several ordinary lectures were delivered by the local Demonstrator.

A variety of improved agricultural implements was also exhibited neatly outside the main stall on the Radio ground. Malt making demonstration was conducted on 2 days and the dietetic value of malt was explained to the visitors. P. V. H.

College News and Notes.

Students' Corner. The students were busy with their examinations during the first three weeks of the month and the college was closed on the 24th instant.

Honey Week. The annual "Honey Week" was inaugurated this year by A. R. C. Westlake Esq., I. C. S., Collector of Coimbatore on 29-3-41 at 5 p. m., in the premises of the Insectary before a distinguished gathering. An exhibition pertaining to bee-keeping was arranged and kept open to the public from the 29th March to the 4th April.

St. John's Ambulance Brigade. A First Aid training class including officers and students was started on the Agricultural College Estate by the combined efforts of the Principal and Sri. S. E. Narayana Ayyar, Secretary, Red Cross Society. Dr. P. R. Kuppaswamy was in charge of the training. The class started in January 1941 and completed in March, with two classes a week. Examinations were held on 28th and 29th. Forty-three candidates appeared and all passed. A division of St. John's Ambulance Corps consisting of the residents of the Estate is being formed.

Creole Day Celebration. The Creole Day was celebrated on the Agricultural College Estate on the 5th instant, the main feature being the feeding of the

poor. Over 100 poor people drawn from the surrounding area were sumptuously fed, the expenses being borne by Rao Bahadur Sri. G. N. Rangaswami Ayyangar Principal, Agricultural College, Coimbatore.

Hostel Dinner. The Annual 'Moon-light' Dinner arranged by the students took place on the spacious Threshing floors of the Central Farm on the 14th. of last month. A good number of officers responded to the invitation of the Secretary, Hostel Committee. The officers spent a delightful hour with the Students. With the distribution of 'Pan-su-pari' the function came to a close.

Visitors Mr. Hafizuddin Chowdhury, M. L. A. (Bengal) and Mr. J. N. Sen Gupta, M. B. E. Secretary of the Bengal Industrial Survey Committee visited the Research institute and the Imperial Sugarcane station on the 13th and 14th in order to study the sugarcane cultivation in these parts.

Sri. M. R. V. Panikkar, Principal, Madras Veterinary College and Sri. B. Narasimha Iyengar, Director of Agriculture, Mysore (Retd), visited the College in connection with the B. Sc. Ag. examinations.

Mr. R. W. Littlewood, Livestock Development Officer was on a short visit to the estate between the 7th and 9th April.

Weather Review—MARCH 1941.

RAINFALL DATA

Division	Station.	Actual for month	Departure from normal @	Total since January 1st	Division	Station	Actual for month	Departure from normal @	Total since 1st January	
Circars	Gopalpore	0.2	-0.4	0.2	South	Negapatam	0.0	-0.3	3.8	
	Calingapatam	0.0	-0.4	0.4		Aduthurai *	0.0	-1.3	1.7	
	Vizagapatam	1.2	+0.9	2.7		Madura	0.0	-0.5	1.4	
	Anakapalli*	0.7	0.0	2.9		Pamban	1.3	+0.8	7.3	
	Samalkota*					Koilpatti*	0.0	-0.9	1.7	
	Maruteru*	0.0	-0.6	0.2		Palamkottah	0.0	-1.0	1.4	
	Cocanada	0.3	-0.2	1.7						
	Masulipatam	0.0	-0.3	0.1						
	Guntur*	0.0	-0.4	0.1		West Coast	Trivandrum	2.2	0.0	2.7
	Ceded Dists.	Kurnool	0.0	-0.3			0.1	Cochin	0.3	-1.7
Nandyal*		0.0	0.2	0.6	Calicut		0.0	-0.5	0.6	
Hagari *		0.0	-0.2	0.2	Pattambi *		0.0	-0.9	0.0	
Siruguppa*		0.0	-0.3	2.4	Taliparamba *		0.1	-0.1	0.1	
Bellary		0.0	-0.2	0.7	Kasargode *		0.0	-0.6	0.0	
Anantapur		0.0	-0.2	0.8	Nileshwar*		0.0	-0.3	0.2	
Rentachintala		0.0		0.5	Mangalore		0.0	-0.1	0.0	
Cuddapah		0.0	-0.2	0.8						
Anantharajupet*		0.0	-0.6	1.1	Mysore and Coorg		Chitaldrug	0.0	-0.3	0.2
Carnatic		Nellore	0.0	-0.2		0.2	Bangalore	0.0	-0.5	0.2
	Madras	0.0	-0.2	0.7		Mysore	0.0	-0.3	0.1	
	Palur*	0.0	-1.8	2.7		Mercara	0.2	-0.4	0.2	
	Tindivanam *	0.0	-1.4	1.3						
	Cuddalore	0.0	-0.2	4.3	Hills	Kodaikanal	0.0	-2.0	4.5	
Central	Vellore	0.0	-0.2	0.5		Coonoor				
	Gudiyattam*	0.0	-0.4	0.6		Ootacamund *	0.0	-0.5	1.3	
	Salem	0.0	-0.5	0.1		Nanjanad *	0.1	-0.9	1.0	
	Coimbatore	0.0	-0.5	0.8						
	Coimbatore									
A. C. & R. I.*	0.0	-1.6	1.4							
Trichinopoly	0.0	-0.4	0.2							

* Meteorological Stations of the Madras Agricultural Department.

@ From average rainfall for the month calculated up to 1937 (published in Fort St. George Gazette).

Weather Review for March 1941.

Weather was generally dry over the presidency except for scattered thunder showers in the Circars, on the West coast and hills.

Temperatures were generally slightly above normal especially in the Ceded Districts.

Weather Report for the Agricultural College and Research Institute Observatory.
Report No. 3/41.

Absolute maximum in shade.	...	99.5°F
Absolute minimum in shade.	...	62.8°F
Mean maximum in shade.	...	95.7°F
Departure from normal.	...	0.9°F
Mean minimum in shade.	...	69.2°F
Departure from normal.	...	-0.5°F
Total rainfall for the month.	...	nil
Departure from normal.	...	-0.81
Heaviest fall in 24 hours.	...	nil.
Total number of rainy days.	...	nil.
Mean daily wind velocity.	...	1.03 m. p. h.
Departure from normal.	...	-1.64 "
Mean humidity at 8 hours	...	69.1%
Departure from normal.	...	-0.6%

Summary. Dry weather prevailed during the month. The day temperatures were slightly above normal while the nights were slightly below normal. The humidity was normal while the movement of the wind was below normal.

P. V. R. & S. V. K.

Departmental Notifications.

Gazetted Services

1. Appointments.

Sri. K. Venkatarama Ayyar, Permanent Assistant Director of Agriculture in category 5, class 1, Madras Agricultural service and officiating Superintendent, Agricultural Research Station, Anakapalle, in category 7, class 1, Madras Agricultural Service, to be District Agricultural Officer, Cuddalore.

Sri. T. G. Anantarama Ayyar, permanent Upper Subordinate II Grade, in the Madras Agricultural Subordinate service is appointed to officiate as District Agricultural Officer, in category 5, class 1, Madras Agricultural service and is posted to Trichinopoly.

Sri. R. Vasudeva Rao Nayudu, permanent upper subordinate, Agricultural section on foreign service, as Secretary to Tobacco Market Committee, Guntur is reverted to British service and is appointed to officiate as Superintendent Agricultural Research Station, Anakapalle, in category 7, class I Madras Agricultural service *vice* Sri. K. Venkatarama Ayyar, posted as District Agricultural Officer, Cuddalore.

2. Transfers.

Name of officers.	From	To
Sri. B. Ramayya,	Dy. D. A., Cuddapah,	Dy. D. A., Coimbatore.
„ C. Ramaswami	Offg. Dy. D. A.,	J. L. A. & Asst. Supdt.
Nayudu,	Coimbatore,	C. F., Coimbatore.

Sri M. Kantiraj Nayudu,	J. L. A. & Asst. Supdt., C. F., Coimbatore,	D. A. O., Chittoor.
„ S. Sitarama Patrudu,	Asst. D. A., Rajamundry,	D. A. O., Cocanada.
„ P. Subrahmaniam,	Asst. D. A., St. Thomas Mount,	D. A. O., Saidapet.
„ M. Anandan,	Asst. D. A., Cuddalore,	D. A. O., Tanjore.
„ R. Chokkalingam Pillai,	Asst. D. A., Tinnevely,	D. A. O., Salem.
„ K. Avudainayakam Pillai,	Asst. D. A., Coimbatore,	D. A. O., Ramnad Dt.
„ M. U. Vellodi,	Asst. D. A., Tellicherry,	D. A. O., Coimbatore.
„ U. Vittal Rao,	Asst. D. A., Pattukottai,	D. A. O., Mangalore.
„ A. Ramaswami Ayyar,	Asst. D. A., Tirupattur,	D. A. O., Vellore.
„ P. Abhishekanatham Pillai,	Curator, Govt. Bot. Garden & Park, Ootacamund,	Curator, Govt. Bot. Garden, & Park, and D. A. O., Nilgiris.
„ Samuel Jobitha Raj,	Asst. D. A., Madura,	D. A. O., Calicut.
„ A. Gopalan Nayar,	(on leave),	D. A. O., Tinnevely.
„ L. Narasimhacharya,	A. D., Chittoor,	D. A. O., Masulipatam.
„ V. N. Subbanna Acharya	Upper Subordinate, Agri. Section,	D. A. O., Anantapur.

Subordinate services.

Appointment.

Sri. T. R. Narayanan, Permanent Assistant, Millets Section, Coimbatore, is appointed as Temporary Assistant in Plant Physiology in the Dry Farming Research Scheme, Hagari with effect from the date of joining.

Transfers.

Name of Officers.	From	To
Mr. N. K. Thomas,	A. D. Calicut	F. M., C. F. Coimbatore.
Sri. S. Krishnamurthi	F. M., C. F. Coimbatore,	F. M. D. F. S., Hagari.
„ K. G. S. Bhandari,	A. D., Mangalore,	A. D., Koondapur.
„ K. Tejappa Shetty,	A. D., Coondapur,	A. D., Kalyandrug.
„ K. C. Thomas,	A. D., Coimbatore,	F. M. A. R. S., Nandyal.
„ A. Raghavan,	F. M. A. R. S., Nandyal,	Asst. in Cotton, Cocanada Cotton Scheme, Narasaraopet.
„ N. Srinivasa Rao.	A. D., Salem,	A. D., Kollegal.
„ U. L. Srinivasa Rao,	A. D., Kollegal.	A. D., Dharampuri.
„ K. Meenakshi- sundaram,	A. D., Dharampuri,	F. M. D. F. S., Hagari.
„ M. A. Balakrishna Ayyar,	A. D., Vellore,	A. D., Wallajah.
„ L. Sankarakumara Pillai,	A. D., Wallajah,	A. D. Nanguneri.
„ S. Ramachandran,	A. D., Tinnevely,	A. D., Koilpatti.
„ M. Kandaswami,	A. D. Koilpatti,	Asst. in cotton section, Coimbatore.
„ S. V. Ramachandran,	A. D. Sattur,	A. D., Tenkasi.
„ A. Krishnaswami Ayyar,	A. D., Madura,	A. D., Thirumangalam.

Sri K. Sanjiva Shetty,	Teaching Asst. in Agriculture, Coimbatore,	A. D., Kudligi.
„ S. Muthuswami.	A. D., Thirumangalam,	F. M. A. R. S., Siruguppa.
„ C. Hanumantha Rao,	F. M. A. R. S., Siruguppa,	F. M. A. R. S., Anakapalle.
„ S. Kuppaswami Ayyangar,	A. D., Trichinopoly,	A. D., Kulitalai.
„ N. Subramania Ayyar,	A. D., Kulitalai,	A. D., Ambasamudram.
„ K. Kuppamuthu,	A. D., Cuddalore,	A. D., Villupuram.
„ E. N. Rangaswami Ayyangar,	Asst. A. D., Villupuram,	Asst. A. D., Kanigiri.
„ K. Varada Acharya,	A. D., Saidapet,	A. D. Gooty.
„ J. Gopala Rao,	A. D., Nellore,	F. M. F. R. S., Koduru.
„ Y. Venkataswami,	A. D., Anantapur,	F. M. A. R. S. Samalkota.
„ K. Rama Rao,	A. D., Bellary,	A. D., Rayadrug.
„ K. Jagannatha Rao,	A. D., Cuddapah,	A. D. Jammalamadugu.
„ A. Venkobachari,	Asst. A. D., Jammala- madugu,	Asst. A. D., Harpanahalli.
„ S. Varadarajulu Nayudu,	A. D., Kurnool,	A. D., Dhone,
„ N. Ranganathachari,	A. D., Dhone,	A. D., Pattikonda.
„ M. Narasimham,	A. D., Guntur,	A. D., Tenali.
„ S. V. Doraiswami Ayyar,	F. M., C. F., Coimbatore,	Teaching Asst. in Agri., Coimbatore.
„ G. Kameswara Rao.	A. D., Ongole,	F. M., A. R. S., Guntur.
„ P. Ramanatha Rao,	A. D., Masulipatam,	A. D., Nuzvid.
„ A. Rammohan Rao.	A. D., Ellore,	A. D., Ellavaram.
„ P. Lakshminarayana,	A. D., Cocanada,	A. D., Chodavaram.
„ M. J. David,	A. D., Mayavaram,	Asst. in Soil Physics D. F. S., Hagari.
„ T. Devasikkamani,	A. D., Proddatur,	A. D., Jammalamadugu,
„ T. V. Srinivasa Acharlu,	A. D., Ambasamudram,	A. D., Hadagalli.
„ D. Viswanatha Reddy,	A. R. S., Anakapalli,	A. D., Proddatur (under training).
„ N. Ramadoss Pantulu,	A. D., Tenali,	A. D., Ongole.
„ V. Ratnaji Rao,	A. D., (on leave),	A. D., Sullurpet.
„ V. Satagopa Ayyangar,	Secy., Groundnut Market Committee, Cuddalore,	A. D., Mayavaram.
„ A. M. Muthayya Nattar,	Supdt., Groundnut Market Committee, Cuddalore,	A. D., Pattukottai.
Janab Shaik Hussain, Sahib	A. D. Working in the Scheme of Dry Farming Experiments in Red Soil area,	A. D., Sidhout.
Sri A. Shanmugasundaram Pillai,	A. D., Pattukottai,	F. M., Pattukottai.
„ K. R. Nagarajan,	F. M., Pattukottai,	Fieldman, A. R. S., Palur.

Leave.

Name of officers.	Period of leave.
Sri. G. Narasimhamurthi, F. M., A. R. S., Siruguppa,	L. a. p. for 30 days from 16-4-41.
„ E. Achuthan Nair, Asst., A. D. (on leave).	Extension of l. a. p. for 2 months with m. c. from 19-4-41.

Sri S. Venkatarama Ayyar, A. D., Sriperambudur.	L. a. p. on m. c. for 3 months from the date of relief.
„ K. Srinivasan, A. D., Kalladakurichi,	L. a. p. for 1 month from 10-5-41.
„ V. Venkatadri Reddy, Nursery F. M., (on leave).	Extension of l. a. p. on m. c. for 5 months and 29 days from 18-3-41.
„ B. N. Padmanaba Ayyar, A. D., Gingee.	Extension of l. a. p. on m. c. for 2 months from 1-5-41
„ M. Gopala Unnithan, A. D., Tirupathur.	L. a. p. for 1 month from 16-4-41.
„ S. Krishnamurthi, F. M. D. F. S., Hagari.	L. a. p. for 2 months from the date of relief.
„ C. S. Sankaranarayana Ayyar, A. D., Hosur.	L. a. p. for 1 month from 21-4-41.
„ T. S. Ramakrishnan, Asst. in Mycology, Coimbatore.	L. a. p. for 1 month and 15 days from 5-5-41.
„ D. Shanmugasundaram Pillai, A. D., Aruppukottai.	L. a. p. for 1 month from 1-5-41.
„ K. Ragbunatha Reddy, Agri. Marketing Asst., Madras.	L. a. p. for 31 days from 1-5-41.

Agricultural College and Research Institute, Coimbatore.

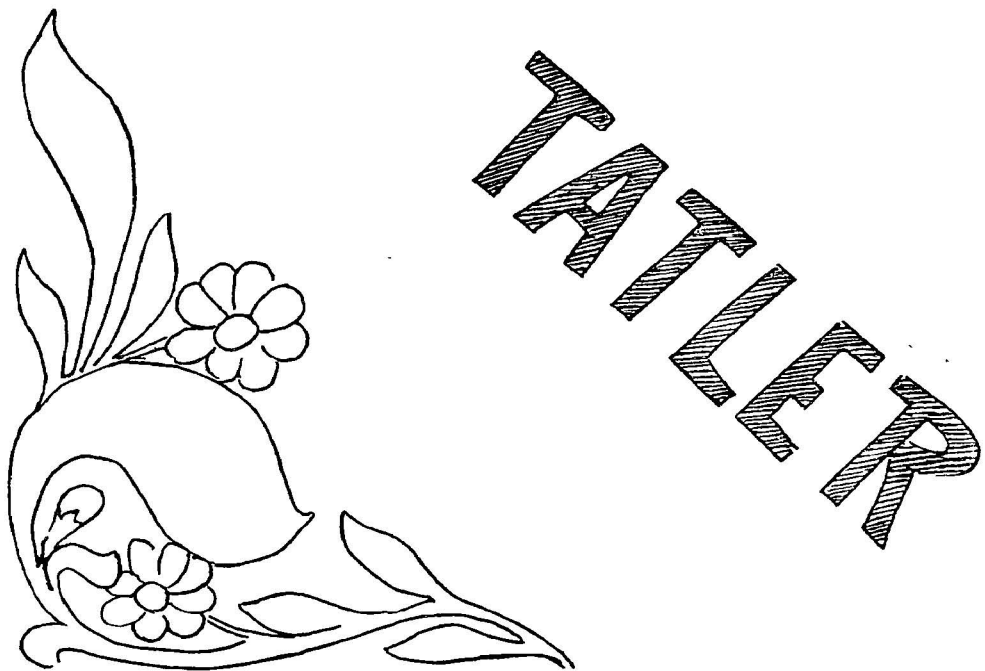
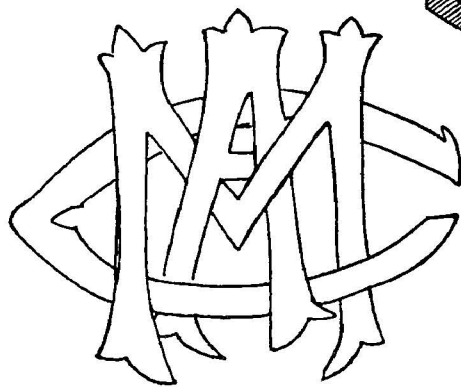
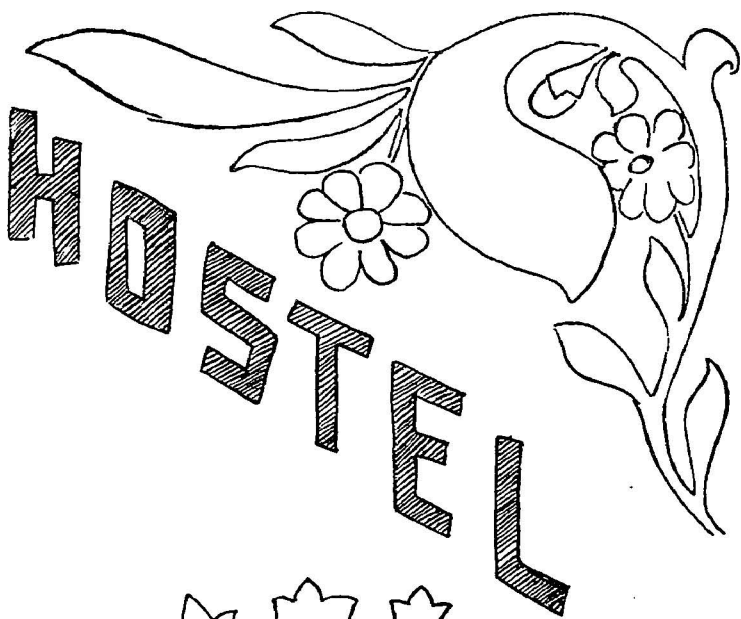
Additions to the Library during the quarter ending 31-3-1941.

A. Books.

- 1 *Anthropology and Agriculture: Selected References*. Mac Leish, K. and Hennefrund, H. E. (1940).
- 2 *Experience in Practical Agriculture (Tamil)*. Nanjappa Gouder, C. V. (1941).
- 3 *Our India*. Minoo Masani. (1940).
- 4 *Repairing Farm Machinery*. Morrison, I. G. (1940).
- 5 *Principles of Gully Erosion in the Piedmont of South Carolina* Ireland, H. A. et al. (1939).
- 6 *Landslides and Related Phenomena: A Study of Mass-movements of Soil and Rock*. Sharpe, C. F. S. (1938).
- 7 *Manures and Manuring*. Garner, H. V. (1940).
- 8 *Principles and Practices of Crop Production in India*. Dutt, C. P. & Pugh, P. M. (1940).
- 9 *Arable Crops of the Farm*. Bond, J. R. (1940).
- 10 *Sugarcane and Its Culture*. Kerr, H. W. & Bell, A. F. (1939).
- 11 *Tobacco Production and Consumption in India and Burma*. Gibbs, J. B. (1939).
- 12 *Report on the Marketing of Potatoes in India and Burma (Agricultural Marketing Service 22)*. (1941).
- 13 *The Biological Campaign Against Prickly Pear*. Dodd, A. P. (1940).
- 14 *The Biology and Control of Wireworms: Review of Literature*. Thomas, C. A. (1940).
- 15 *Further Studies on Cereal Rusts in India*. Metha, K. C. (1940).
- 16 *Hand book of Phytopathogenic Viruses*. Holmes, F. O. (1939).
- 17 *Cooperative Farming*. Dey, S. K. (1940).
- 18 *Indian Indigenous Milk Products*. Davies, W. L. (1940).
- 19 *Mineral Metabolism*. Shoal, A. T. (1939).
- 20 *Vitamin E: A Symposium*. Bacharach, A. I. & Drummand, J. C. (1939).
- 21 *Protein Metabolism in the Plant*. Chibnall, A. C. (1939).
- 22 *Physico-chemical Methods 3rd Edition Rev.* Reilloy, J. & Rao, W. N. (1940).
- 23 *Text Book of Zoology Vol. II*. Parker, T. J. & Haswell, W. A. (1940).
- 24 *Thorpe's Dictionary of Applied Chemistry 4th Edition Rev. Vol. 4 Digallic Acid. Feeding Stuff*. Thorpe, J. F. & Whiteley, M. A. (1940).
- 25 *Indian Economics Vol. II*. Juthar, G. B. & Beri, S. G. (1937).

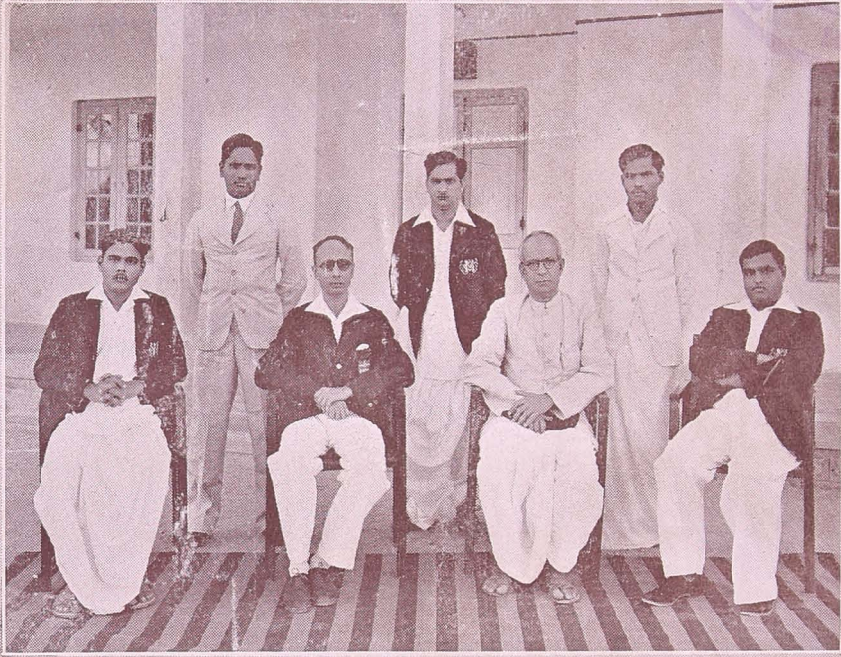
B. Administration Reports of Agricultural Departments

1. Reports of Subordinate Officers of the Department of Agriculture, Madras, for 1939-40. 2. Detailed Report of the Agricultural Chemist, Entomologist and Mycologist of the Department of Agriculture, Madras for 1939-40. 3. Annual Report of the Imperial Council of Agricultural Research—India, 1939-40. 4. Bihar Agricultural Department—Annual Report, 1938-39. 5. Annual Report of the Royal Botanic Gardens, Calcutta for 1939-40. 6. Cochin State Agriculture Department—Administration Report for 1939-40. 7. Punjab Irrigation Research Institute—Annual Report for 1938-39. 8. Ceylon Agri. Dept. Administration Report for 1939. 9. Report of the Minister of Agriculture for the Dominion of Canada for 1939-40. 10. Amari Agricultural Research Station—Annual Report for 1939. 11. Arkansas Agricultural Experiment Station, 1939-40. 12. Jamaica Agricultural Department Annual Report for 1939-40. 13. Colorado Agricultural Experiment Station, 1939-40. 14. New York Agri. Experiment Station, 1939-40. 15. Pennsylvania Agricultural Expt. Station, 1939-40. 16. Puerto Rico Agricultural Experiment Station, 1939.

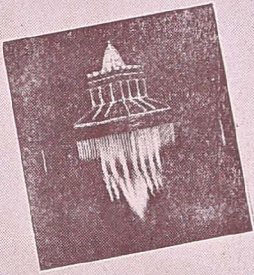




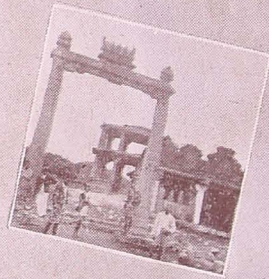
Students of the Agricultural College, Coimbatore 1940—41.
(Photograph taken on the occasion of farewell party to Mr. R. C. Broadfoot).



The Men behind the Hostel Tatler.



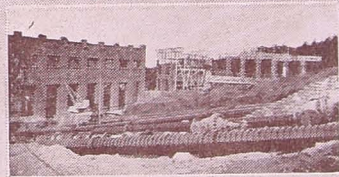
Reflection.



The arch-way—Humpi.

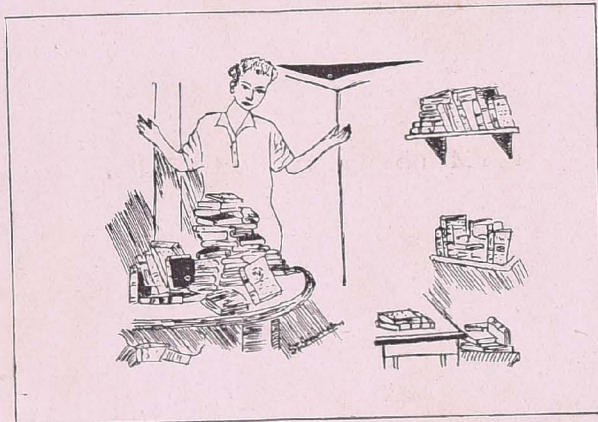
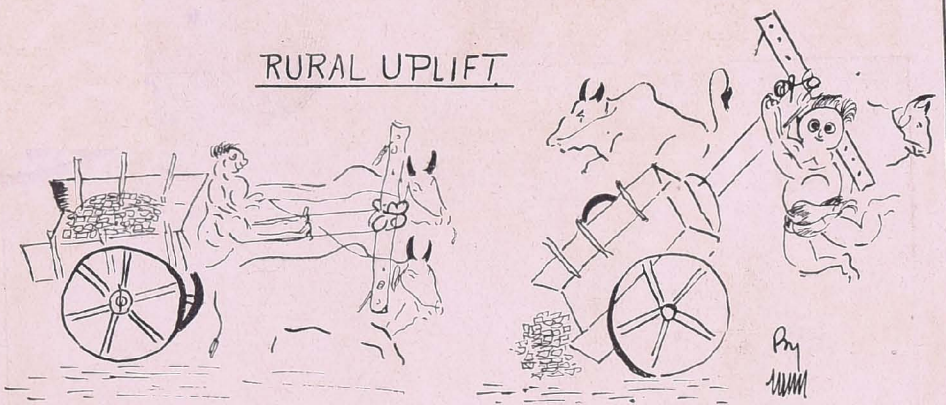


Elephants' Stables.

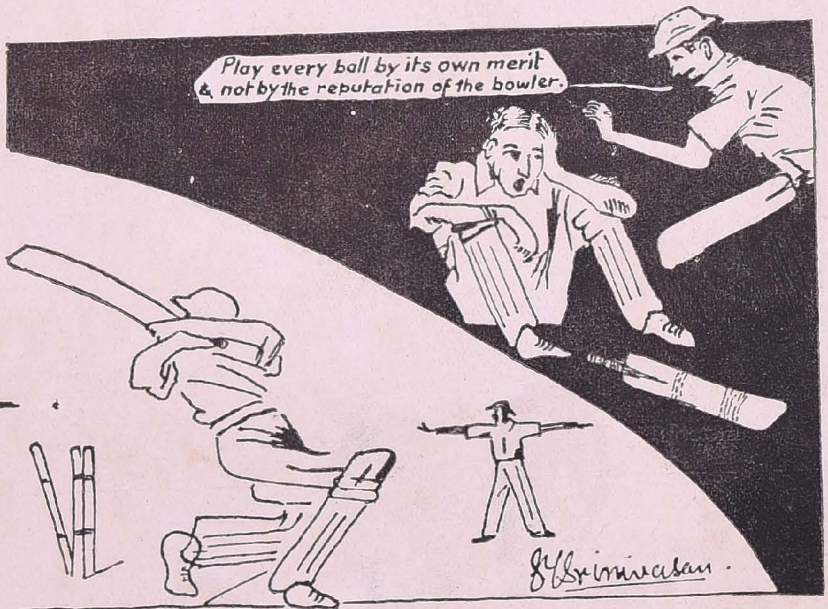


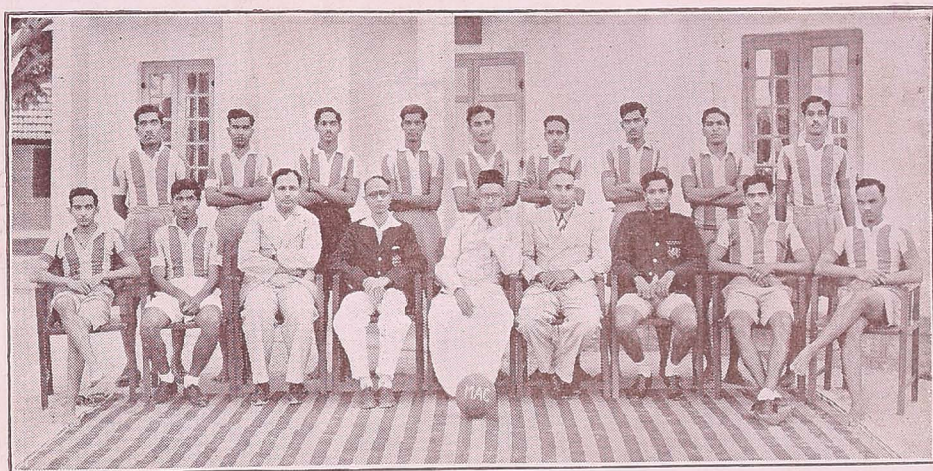
Power House—Mettur.

RURAL UPLIFT.

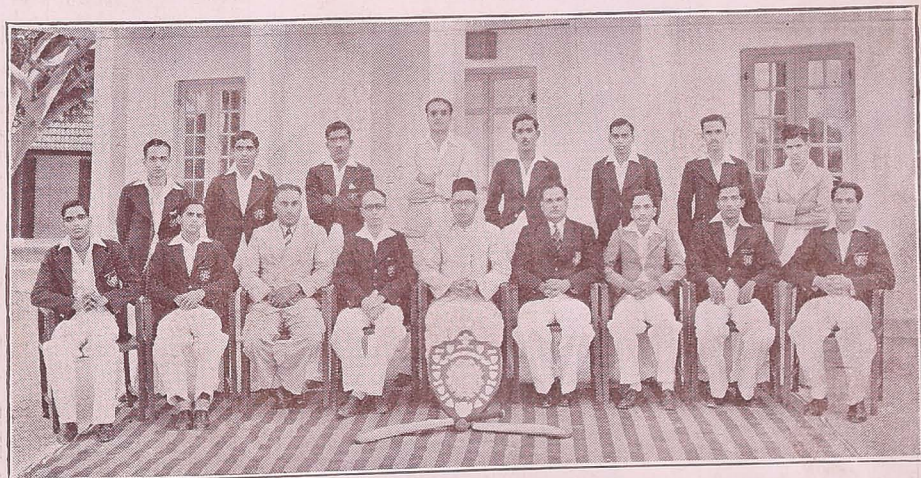


TO BE OR NOT TO BE!

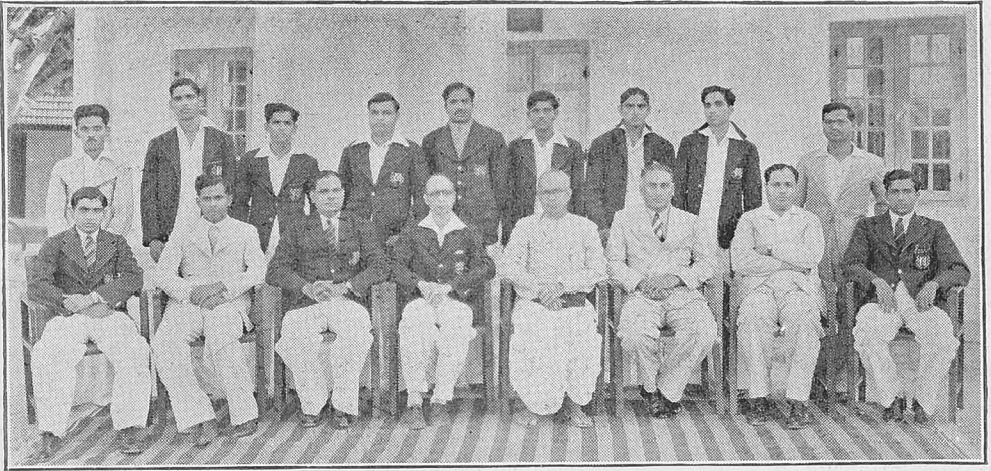




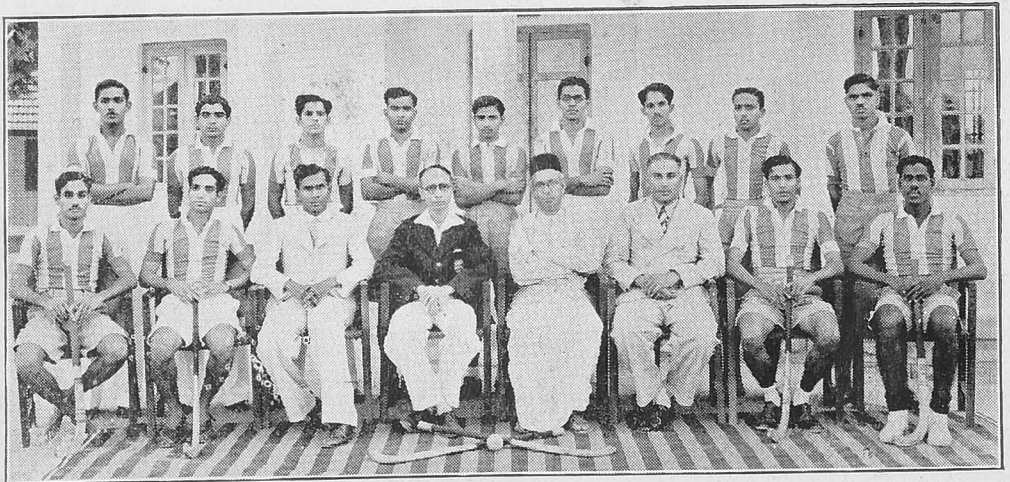
The College Foot-ball Team.



The College Cricket Eleven—Winners of the Rhondy Shield.



The Members of the Executive Committee, Students' Club, 1940—41.



The College Hockey Eleven.