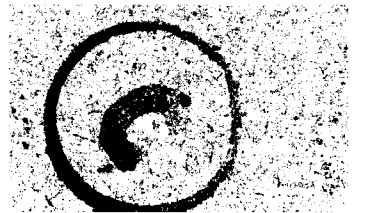


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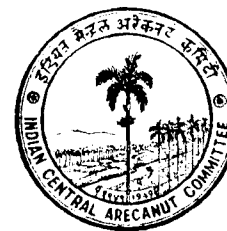


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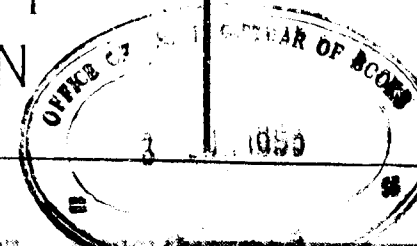
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ARECANUT BULLETIN

- 1) Areca Cultivation.
- 2) Cardamoms.
- 3) Growing Rice, the Japanese Way.
- 4) Indian Council of Agricultural Research, New Delhi.



A garden showing the stem-breaking
of arecanut palm in South Kanara.

ISSUED BY

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(Under the Ministry of Food & Agriculture, Government of India)

KOZHIKODE, (Malabar.)

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As the information in this Bulletin has been collected from various sources, the Indian Central Arecanut Committee cannot take responsibility for its correctness.

"ARECANUTS IN MALAYA"

BY

K. K. NAMBIAR,

Secretary, Indian Central Arecanut Committee,
CALICUT.

A lucid account of the agricultural conditions with
special reference to arecanuts in Malaya & Singapore.

Price As 8 only—Postage extra.

ARECA CULTIVATION

NEAR THIRTHAHALLI—SHIMOGA DISTRICT.

(From notes kindly furnished by Mr. Puttu Rao of Karodi near
Thirthahalli; and compiled by V. K. Badami, L. Ag., Senior Assistant
Botanist, Department of Agriculture, Mysore State).

(Reproduced from the Journal of the Mysore Agricultural and Experimental Union
Vol. II July 1920 No. 3)

The general elevation of the valleys round about Thirthahalli is about 2,000 feet and they are narrow strips of lowlands winding amidst rugged groups of hills, well-wooded and well-watered. The soil is very poor and barren being only a thin crust overlying deep layers of laterite. Owing to the great fall in the lay of the land there is splendid drainage. The valleys that open out to N. E. direction are considered to be very good for areca gardens. The Areca Palm does not stand the western wind and the western sun scorches the exposed trunks. The palm requires plenty of moisture for successful growth and therefore a heavy rainfall, a perennial stream or a tank are quite necessary for an Areca garden.

Nursery.— A well-drained moist situation is selected for this purpose, and drains are opened round about it. Ripe bunches are set apart for seed purposes and care is taken to protect them from rats. When a few ripe nuts begin to fall, the bunches are removed from the palm. There are many varieties recognised here but a small nut is very popular. A late-maturing, long, thin, thin-shelled variety is considered to be

the best in the locality. In this type the nut fills the whole fruit and it does not easily shed from the bunch.

The nuts are laid in baskets in layers of nuts and compost and the basket is placed in a moist place. The compost is made of equal parts of sand, manure and red earth and is well sifted.

The nuts germinate in about 1½ months. After they germinate they are transplanted in beds 6 inches apart and the whole bed is covered with dry leaf mulch. When the seedlings are about ½ a foot high ½ an inch layer of manure is spread over the bed and nicely incorporated into the soil. A dose of manure is given every year after the Magha Rain in September. In the second year all sickly and undesirable seedlings are rejected. A second transplantation is done at this stage when, the seedlings are planted a foot to a foot and a half apart. The seedlings are transplanted a third time in the third year. They are finally planted in the upland places in the Aridra (June and July) rains and in the low moist places during the Magha rains. The seedlings are lifted with a ball of earth for

planting. The pits are generally 2½ x 2½ x 2½ feet. Half the pit is filled and the seedling is planted and trampled round. As the plant grows the pit is gradually filled up in a few year's time.

Planting—Many systems are followed in planting but planting in rows 18 ft. 6 in. apart is considered to be the best and it is the famous "Daya" system of Sivapanaik. The main object is to plant as many palms as possible in the garden without retarding their growth and to get the maximum yield. Planting the garden in three stages as described below would have the largest number of palms in a garden and in this case no two palm heads would be nearer than 18½ feet. This system would therefore give plenty of air and light for full development.

A new suggestion for planting areca palms:—

A 9½ ft.	C 9½ ft.	B 9½ ft.	A
—6' 2"—			
C	B	A	C
B	A	C	B
A	C	B	A
C	B	A	C
B	A	C	B
A	C	B	A
C	B	A	C
B	A	C	B
A	C	B	A

A—First planting.
B—Second "
C—Third "

Regular planting is done after digging the whole garden, breaking the clods and levelling it. After the first planting the plants are 18½ ft. apart in the rows and the rows themselves are 9½ ft. apart. This begin to bear in the 7th year. Second planting is then

done. In the 14th year the third planting is done and at this time the whole garden gets full of plants. In 21 years they would all be in bearing. To afford them shade in the early stages cardamoms and plantains are planted along the water channels. The plants would be in full bearing from 15 to 20 years. They bear well up to even 50 years and they are supposed to live and pay up to a 100 years.

Cultivation.—A garden is divided into three parts for the purposes of cultivation. One portion is given a good digging, good manuring and a layer of fresh earth. The second portion receives a dose of green leaf in the shape of a mulch in December and a manuring just before the break of the monsoon. The third portion is left fallow without any sort of cultivation during the year. Channels filled up with silt are cleaned once in ten years and at this time a bund is raised in the centre of the bed to a height of a yard with fresh earth. The top of this bund is used for running the irrigation channel. Drainage channels are opened out in the place of former irrigation channels in the centre of the beds to a depth of 2—2½ ft. with a width of 1½ ft. at the top and 1 ft. at the bottom.

Thus the irrigation channels and the drainage channels change places. Within ten years the raised bund in the beds get washed out and the drains get scoured to great depth, hence the necessity for change.

Bearing.—There are two main crops in a year—Pushya and

Magha. Phalguna flowers set and ripen into fruits in 9½ months and are ready for gathering in November, December and January, and this is the late crop. The early crop is ready for gathering a month earlier in October or November or December. The second gathering is supposed to yield the best nuts. Generally there are three gatherings in a season. There is an interval of 20 to 40 days between each gathering but if the nuts are picked out earlier there would be few "Bettays" (overripe nuts).

Preparation of nuts. The bunches keep good for a week after they are gathered. Those that are shed from the tree are immediately boiled. Boiling is done generally between 4 A. M. and 7 A. M. The boiled nuts are spread over a mat and allowed to dry in the sun for 7 days. They are generally placed over a 'machan' (overhead platform) in open yard and left undisturbed during the whole period. The dew acts on them during the night and increases the colour and appearance. But too much exposure to dew blackens the nuts and lessens their value. During the rainy season the nuts are collected and covered over by mats and crops gathered during the rainy period are generally dried on a machan over a smouldering fire.

Boiling. For the preparation of Chogaru(1), Nerala(2), Raktha-

honne(3), Manjatti root(4), Rama adikay kayi(5), Ambadi vildele(6) jaggery and gingelly oil are the articles used. Any amount of Manjatti, a piece of Raktahonne, and a big bundle of Nerale bark are put in a boiler after pounding. Betel leaves and a lump of lime about the size of an orange are then added to it and the whole thing is boiled to get a decoction having the constituency of gummy water. The whole thing is filtered and kept for use.

While boiling add ½ seer of jaggery, one pav of oil and a bunch of green plantains. To boil 2 mds of nuts we require 2 kodas (one kerosine tin), of chogaru an equal quantity of water, and 75 measuring seers of green nuts. There is much skill required in boiling the nuts to the proper point and this knowledge is acquired only by practice. At this stage the germ is easily pressed out of its own accord in the boiler owing to the swelling of the nuts. The nuts are boiled for 3 hours before they are spread in the sun. The liquid left after boiling is good chogaru and this is added to the original stock. Thus as the season continues the chogaru improves and in many cases the chogaru of one season is kept over for another season. In this case the floating thick mass is washed, dried and added to the fresh chogaru in the next season.

- 1 Colouring mixture.
- 2 Jamoon. (Eugenia Jambolana Linn.)
- 3 Red sandal wood (Pterocarpus Santalinus Linn.)
- 4 Redwood tree (Adenanthera Pavonia Linn.)
- 5 A coarse big variety of arecanut.
- 6 A variety of betel leaf.

Classification of boiled nuts.—Classifying the boiled nuts is an important work in preparing the article for the market.

- Class A. 1. Hassa or Chikkani¹
 2. Sanna Bettan²
 3. Dodda Bettay³
 B. 4. Sanna dala or van-thige⁴
 5. Yesala bettay⁵
 6. Rajalu or (Dodda hassa)⁶
 C. 7. Pheeton⁷ (conical ones in Hassa)
 8. Gotu⁸
 9. Gorugulu⁹
 10. Bennumury or Sanyasi¹⁰ generally bought by Korachars.

- 1 First Class.
- 2 Nuts from slightly ripe kernels.
- 3 Nuts from ripe kernels.
- 4 Small nuts separated from Hassa and used in counting nuts while grading.
- 5 Slightly inferior to Hassa. These are from kernels which have begun to get hard.
- 6 Bigger nuts in Hassa are sometimes separated into a grade extra first quality.
- 7 Conical nuts in Hassa, small nuts in Hassa. They are from the crown ends of the nuts and fetch the highest price.
- 8 Over ripe uncut kernels.
- 9 Scraps from all grades.

10 Nuts from Sann Bettay and other good grades. Owing to defective boiling the outer surface gets a pale brown colour and the cut surface a dark brown colour.

In this type the outside is pale brown and the cut surface is dark coloured.

Yield per acre.—On an average there would be about 1200 plants in an acre and of these about 800 might be bearing. As the yields between young and old trees would vary we may take 400 as the number of full bearing trees. An acre would bear somewhere between 20 to 40 mds.

In an average crop the different grades of nuts would be in the following proportions:—

Soft kernel — (Hassa) 60–75%.

Hard but not ripe nuts (Bettay sanna) 10–20½%

Large-sized ripe nuts — (Dodda bettay) 10–12½%

Over-ripe nuts — (Gotu and Kharab) 5–7½%,

SUBSIDIARY CROPS.

Cardamom There are two varieties, Mala — a big one and Thirupathi — a small one but of better quality. Plants raised from seeds begin to bear in 4 years. whereas those raised from rhizomes bear in 3 years. They flower in May or June and the crop is ready for harvest in October. The capsules are dried over a slow fire or in the sun. A clump gives from ½ a seer to one seer and the price of the article is now about Rs. 18 to 22 per maund.

Pepper. One to two pieces of vine about a yard in length are planted near an areca palm in Magha or Aridra (June and July) rain and the plant begins to bear

in 5 years' time. Harvesting is done generally in the months of February or March (Magha or Phalguna). Each tree bears about 5–10 seers. The seeds germinate in about 15 days and plants are transplanted when they are one year old. But they bear in 6 years.

The green pepper is dried in the sun for 6 days. For making white pepper the fruits are steeped in water for 5 days, the outer skin is washed out and the pepper is then dried. One plant yields about one adi-seer.

An average garden contains 10 acres.

3,600 bearing trees.

2,900 non-bearing trees.

Pepper 100–200 creepers.

Plantains 1,200 pits.

The following types of plantains are usually grown:—

Kare bale,	Dinde bale.
a green type.	
Vata bale.	Huvvu bale.
Puttu bale.	Nayndra bale.
Bude bale.	Pacha bale.
Rasa bale.	Salem bale.
Chandra bale.	Kalyane bale.
Betta bale.	

The following betel leaves are commonly grown in this locality:—

Kalasa vally.
 Gobbara vally.
 Lakka vally.
 Karapooru vally,
 Pancha vally.
 Ambady.

CARDAMOMS.

IN SOUTH WESTERN INDIA.

Planting and Commerce, Vol. II, No. 42, November 6th 1954.

While the Malabar Coast of Western India has perhaps been somewhat over shadowed by the romantic glamour of Ceylon and the islands of the East Indies as sources of the spices which played such a major part in the commercial exploration of the Indian Ocean, yet it has a history in the spice trade probably older than either. Pepper was exported from Malabar to Alexandria as early as the 1st century A. D. and traded around the shores of the Arabian Sea and overland to the Mediterranean civilisation probably included spices for centuries before that. Pepper still remains an important Malabar export along with several other spices, coconut products and the more recent products, tea, coffee, cashewnuts and rubber.

Among the spices of Malabar, Cardamoms play an important part and the conditions of their production are of considerable agricultural interest. The Western Ghats of Southern India produce practically the whole of this crop which reaches world's markets, affording a somewhat unusual instance of the major commercial production of a tropical crop taking place within its natural habitat. Furthermore, the conditions of production range over the whole gamut of tropical agricultural systems and provide an illustration of the satisfactory utilisation of one of the most difficult vegetation zones - the wet monsoon forests.

The Cardamom Plant.

The cardamoms of commerce are the seed capsules of *Elettaria Cardamomi*, a member of the Zingiberaceae, somewhat similar in habit of growth to ginger. The plant consists of a branching rhizome running in the superficial soil layers, from which arise pseudostems consisting of sheathing leaf bases, each expanding into a lanceolate leaf blade some feet in length. The leafy pseudostems may reach 10 to 15 ft. in height in the larger varieties. Flowering panicles arise from the bulbous bases of the pseudostems and develop either vertically or horizontally, according to the variety. These may be 2 or 3 feet in length and each consists of a main rachis with short alternate peduncles bearing some half a dozen short, closely-set alternating and second pedicles. The flowers borne on these pedicles are about an inch across with three white spreading corolla lobes delicately veined with violet. The inferior capsule varies considerably in shape from subglobose to fusiform and is three-celled, each cell containing five to seven small black rugose, angular seeds. The seeds are the actual commercially used product but most cardamoms reach the marketing centres in the dried capsules - a system of marketing which helps to preserve the essential oil in the seed and to discourage adulteration.

Distribution and Habitat

The cardamom occurs throughout

the monsoon forests of South India from South Travancore to North Mysore at elevations between about 2,500 ft. and 4,500 ft. in the Western Ghats. In many parts of these forests, it is a characteristic element in the succession which develops when a large tree dies and lets in the light to the forest floor. In such sites it grows and flourishes until the canopy closes in again.

The climatic conditions in this range are characterised by a heavy annual rainfall varying between 100 and 300 inches mainly concentrated in the months June to September, when the South Western monsoon blows, but there is usually adequate rainfall from April to November. The dry season varies in length from not more than about three months in the South to some five months in the North. The length of this dry season appears to be the main factor in determining the natural range of the species. In the more Southern regions the plant occurs in areas of lower annual rainfall and somewhat lighter forest than in the North. Thus the cardamom Hills of Central and North Travancore in latitude 10° to 11° N. experience a rainfall hardly exceeding 120 in. whereas in Mysore and Coorg some 250 miles to the North, the wild cardamom is restricted to the heaviest forests near the westerly edge of the hills with 350 in. of rain.

Although the plant develops with lightening of shade by the death of forest trees, it cannot stand continuous exposure and its light requirements cover a rather narrow range of intensity. It must be regarded, therefore, as a relatively ephemeral species developing

in one site to reproduction and then being squeezed out by the developing shade canopy, to spring up again in another as forest veterans crash down into decay.

Commercial exploitation.

The earliest detailed account of the cultivation of cardamoms to reach the West is contained in Buchanan - Hamilton's description of his journeys through the west coast of India published in 1807. This account is based on a system he saw in North Kanara and, although it still exists in that area, its importance is negligible both with respect to area and to production. Even at that time it could have only accounted for a small portion of the quantities entering commerce, but the balance then was collected as minor forest produce and fell outside the sphere of agriculture. The most that could be said was that the collectors of cardamoms probably assisted nature by the selective felling of trees to produce the desirable ecological conditions for cardamom development. In Coorg, such a refinement of jungle collection developed into a more or less regular system in the 19th century and this system "the malai" - is still the principal type of cardamom production in that province.

As a plantation crop, cardamoms came into some prominence as a secondary crop in the wetter and more heavily shaded parts of coffee estates in Mysore, quite early in the history of East Indian coffee, but the major development occurred at the end of the 19th century, when the Travancore Government gave up its monopoly over the cardamom trade and permitted producers to sell their own

produce where they pleased. From that time the industry took on its modern aspect.

The modern cardamom industry.

The area under cardamoms in South India is now somewhere in the region of 100,000 acres scattered through the hill forest zone of the Western Ghats. Some 60% of the area lies in Travancore and Mysore follows next in importance. There are substantial areas also in Madras and Coorg and a smaller area in the extreme south of Bombay. Statistics of production are even less reliable than those of area and any figure can be little more than an informed guess, since considerable quantities pass into internal trade through small local markets. However, a figure of some 2,000 tons annually is probably a not unreasonable estimate of production, of which perhaps 30% are exported.

It is characteristic of what are commonly called plantation crops in Southern India that they have developed in holdings of a wide variety of size and organisation and cardamoms are no exception. There are estates of 200 to 1,000 acres organised on lines similar to coffee, tea and rubber plantations, with resident labour forces and skilled managements. At the other end of the scale are small holdings of a few acres employing casual labour seasonally for weeding and harvesting. In many coffee estates in Mysore, cardamoms are grown as a secondary crop in ravines and other sites too moist for the main crop. In North Kanara they form an element in garden cultivation under the shade of areca palms and aided by irrigation, while in

Coorg the "malai" system represents but one step from primitive jungle collection.

The North Kanara System

Although this mode of cardamom production is of very minor importance, it is of interest as a highly developed horticultural system. Rising steeply from a narrow coastal plain, the uplands of North Kanara form a broken plateau of broad paddy-filled valleys and low laterite hills clothed with small jungle or poor grass. The paddy is irrigated from the heads of the valleys and where the streams debouch into the broad terraced paddy lands there are the homesteads each with the little garden area of areca palms. Under the palms are the cardamoms, possibly patches of vegetables and perhaps some flowering shrubs. Similar gardens, dominated by palms - arecanut or coconut - are common both in the hills of Mysore and Coorg and in the plains of foothills of Malabar, Cochin and Travancore, but only in North Kanara is the understorey crop provided by cardamom.

This production of cardamoms is dependent on irrigation as the dry season is very long and often exceeds six months in duration. The system has declined considerably in the past 20 years or so and it is doubtful whether there are more than a thousand acres all told. The decline has been associated with a very severe virus disease-mosaic or "marble disease" which would have undoubtedly eliminated production altogether if it had been any more than a very subsidiary cash crop. As it is, custom would appear to have ensured survival when strict economics would have killed it. Re-

cently, the adoption of vigorous sanitary measures has given new hope to the cardamom grower and with recent high values may revive this form of production to some degree.

The Coorg Malai System.

The system of production in the heavy evergreen forests of Coorg takes us back to the very origins of agriculture. The cardamom is indigenous to these forests and the "malai" is simply a more or less standardised method of creating the most suitable natural environment for the spontaneous appearance of the crop, with the additional insurance of the provision of plants to supplement the natural seeding. It is, of course, a simple step, now the general rule, to plant the site prepared at regular spacing.

In an area of jungle, small sites usually less than half an acre in area and longer than they are broad, with the longer axis running roughly north and south are felled in the dry season. Each strip is separated from another by at least half a chain, and usually more of unfelled forest. As a rule, only a few large trees are felled and there is a strong belief that the heavier the fall the better for the subsequent development of wild cardamom seedlings. The felled area is weeded once a year; harvests commence about the third year and continue annually for seven or eight years, when the land is allowed to go back to jungle. The size of the plots is such that regeneration is reasonably rapid and, like all methods of shifting cultivation, the system is not seriously destructive provided the pressure on the total area of forest is light.

On the other hand, yields are small and much subject to the depreciations of rats and miscellaneous insects. For considerable periods in the south western monsoon the plots are completely left to themselves and may be damaged by monkey and elephants, as well as by the smaller fauna. Harvesting takes place from September to January, but, since ripening of the fruit commences as early as July, much crop is lost.

It is curious that, although there are similar forest areas in Mysore to the North and in Malabar, Cochin and Travancore to the South, this mode of cardamom production is restricted to Coorg. The actual area under "Malai" cultivation is difficult to estimate, but there are some 40,000 acres of forest let out for this type of utilisation and perhaps one-tenth is actually under cardamoms at any given time.

The Plantation System.

At present by far the greater acreage of cardamoms consists of plantations and small holdings employing generally similar cultural methods. For the most part they lie in the section of the Western Ghats south of the Nilgiris and the Palghat gap, with the main concentration in the Cardamom Hills of Travancore. There is, of course, a good deal of variation in the efficiency of management and, while the larger units are usually the soundest agriculturally, this is not always the case and many small holdings are well run.

The fundamental basis of the system is the selection of suitable jungle, the removal of the undergrowth, and the thinning of the overhead canopy to create an

environment in which cardamoms can be planted and cropped at an economic level of productivity.

Planting material is obtained either by splitting up established clumps or by growing seedling in prepared nurseries. The former method has the advantages of simplicity and earlier cropping, but is open to objection in that it has been shown to facilitate the spread of virus disease and may lead to the development of monoclonal patches, which, since cardamoms are self-sterile, could interfere with fruit setting. The nursery production of seedlings is therefore more satisfactory and is now the usual practice on the larger estates, but it demands careful management since in the early stages seedlings are delicate and very liable to "damp off".

Field planting, whether of seedlings of rhizome cuttings is normally made in shallow pits some 6 to 8 ft. apart.

Cardamom Estate management—Obviously, the management of the shade canopy is the primary operation and presents a nice problem in applied ecology, approached in practice on entirely empirical lines. It involves the removal of trees unfavourable to cardamoms, the sparing of seedlings of suitable species as future elements in the canopy and, in some cases, the planting of shade trees where natural regeneration is inadequate. The special peculiarity of the cardamom is that it normally constitutes a major element in an early stage of a comparatively rapid succession back to the forest climax and the efforts of the cardamom planter are directed to stabilising this stage for as long as

possible. The degree of success varies, but it is rare for a planting to remain at an economic level of productivity for more than 15 to 20 years.

In addition to shade management, other cultural treatments have until recently rarely involved more than weeding and sometimes the removal of older leafy shoots, although the necessity for the latter treatment is not universally accepted. In recent times there have been some developments in the direction of disease and pest control, and there is evidence that mulching with vegetable debris can be helpful in maintaining productivity.

Diseases and Pests.—A virus disease and an insect pest have played a major part in the recent history of the industry. Of these two, the latter—a species of thrips—has had the most spectacular history. It appeared first in 1934 in the Anamalai Hills in Madras Province and by 1940 had affected all cardamoms except for a small area in the extreme south of Madras Province and the cardamom gardens of North Kanara. The former area was invaded in 1941 but the latter still remains free from the pest. Its effects were very serious and in many areas reduced crops to barely a third of their former level, and the capsules which were harvested were marred by scab tissue resulting from feeding injuries on the young developing fruitlets. The insect has, however, proved susceptible to benzene hexachloride and use of this insecticide has led to quite spectacular crop increases.

The virus disease, evident as a mottling of the leaves and gradual

decline of the plants, is less spectacular, but is capable of rapidly wiping out a plantation unless careful attention is given to regular roguing. Its original appearance is wrapped in obscurity, but it appears first to have attracted attention in North Kanara. It is now present in nearly all Districts, though its importance is very variable.

There is in addition, a number of minor disease and pests which occasionally flare up and cause damage. One of these, the caterpillar of an eupterotid moth, sometimes occurs in enormous numbers and strips the foliage from whole areas with an efficiency almost the equal of a swarm of locusts. In some areas, particularly, in Coorg and Mysore, such outbreaks appear to have a periodicity of some 10 to 12 years.

Cardamoms and Coffee.

In Mysore, and to a lesser extent in Coorg, cardamoms are grown as a secondary crop in coffee estates, normally only in the moisture ravines. Methods of management are broadly similar to those employed on pure cardamom estates. The area and the care and attention devoted to them has depended very largely on the fortunes of the main crop. In the late thirties there was a noticeable tendency to extend the cardamoms and to underplant them further up the sides of ravines which carried coffee. With the improvement of the coffee position since the war, and with seasons unfavourable to cardamoms, this tendency has been largely arrested. Nevertheless, coffee estates still produce a substantial amount of good quality cardamoms.

Cardamom crops vary greatly in size, being much affected by climate, more particularly by the rains between December and March which are very variable in quantity. Crops of 100 Lbs. an acre of dried capsules are considered very good, but they are usually lower than this; 40 to 70 Lbs. an acre would represent the more usual level of good crops under the plantation system.

The capsules are harvested just short of full ripeness, before the pericarp turns yellow, and are then dried either in the sun or in specially constructed kilns. The dried capsules lose some 75% of their fresh weight in the course of drying. Sorting on a size basis is usually carried out at assembling centres by the merchants. Cardamoms are sometimes bleached with sulphur, but this practice is not as widely practiced as it once was.

Apart from the classification by size, cardamoms are also classified by shape, long cardamoms usually being derived from the more robust Mysore variety and round cardamoms from the Malabar variety. It has been a cause of much confusion that the latter type is the principal type grown in Mysore, whereas the former is characteristic of the Travancore cardamom areas. It is probable that this anomaly arose from the fact that the trade of the Malabar coast in cardamoms was originally based on the round types grown in Mysore, whereas the Travancore cardamoms usually moved eastwards to assembling centres in Madras.

Use and Commerce. Cardamoms are used as a spice and

MINISTER FOR AGRICULTURE'S CIRCULAR LETTER No. XV.

APPENDIX IX — DRAFT ARTICLE

GROWING RICE THE JAPANESE WAY.

(By Dr. Panjabrao S. Deshmukh, Union Minister for Agriculture).

Signal success has been achieved in the stepping up of rice production in India by the introduction of a new scientific technique of paddy cultivation—popularly

masticatory and are also employed to some extent in medicine. In India they find their way into curries and are handed around in Indian airlines at taking off along with cloves and boiled sweets. The chief overseas markets are in Scandinavian countries, Great Britain and the U. S. A., where, apart from their medicinal uses, they find their way, into spiced bread and cakes, liqueurs and pickles. The oily extracts are not very important medicinally, though they are included in the official British and U. S. pharmacopoeias for their carminative effects and as a flavouring to cover more disagreeable draughts.

Prices have recently been high as a result of the combination of an increasing demand and a series of low crops. While diseases and pests have played no small part in reducing yields, there is no question that the series of dry seasons, which have played such a disastrous part in the food economy of Southern India, have also been of major importance to the fortunes of this small but valuable industry of the Western Ghats.

Mr. W. WILSON MAYNE B. So. writing in the October issue of the *World Crops*.

known as the Japanese method— which was initiated by the Government of India in the middle of March 1953. The encouraging results obtained have been well-high beyond expectations and augur well for the future.

In 1953-54, this improved method was practised more or less on a limited scale in 25 States over an area of a little more than 4 lakh acres, but even so the gains were significant and impressive, recording an estimated yield of nearly 6 lakh tons of paddy in place of about 2 lakh tons at even 1120 Lbs. per acre which is the average production per acre for 1953-54. This average was lower in previous years. The maximum yield obtained in many individual cases exceeded 80 to 100 maunds per acre, while it is reported to be as high as (161½) maunds in West Bengal and 145 maunds in Hyderabad.

The highest average yields per acre secured by the Japanese method last year were 65 maunds in Travancore-Cochin, 60 maunds in Rajasthan and 58 maunds in Madhya Pradesh. The average additional output per acre was the largest in Madhya Pradesh with 38 maunds, followed by 35 maunds in Rajasthan and 28 maunds in Bihar.

Convinced of its usefulness, Government decided to place the campaign for the promotion of the Japanese method on systematic lines and to organise it on a

country wide scale. A concerted drive to intensify it was launched on its first anniversary this year, the target set for 1954-55 being 2 million acres. This objective cannot be regarded as too difficult of fulfilment when the total land under paddy in the country is about 76.6 million acres.

GOVERNMENT MEASURES.

Like last year, field work is at present being carried on primarily through the existing extension staff of the State Governments and village-level workers in the community development projects. In addition, the Government of India have appointed six campaign officers in the different regions. Apart from functioning as the 'eyes and ears' of the Central Government for the purpose of the campaign, these officers render every possible help to the States in their programme of publicity and ensure attainment of the target laid down.

The Central Government have offered all the facilities to the States to take advantage of the new method. Apart from the assistance available under the grow-more-food programme for loans and subsidies for improved varieties of seeds, chemical fertilisers and minor irrigation, facilities have also been extended for specific items of work connected with the campaign such as raising central nurseries, purchase of intercultural implements, projectors and propaganda vans,

exhibition sets, award of community prizes, meeting establishment charges of staff for demonstration and publicity work, etc. etc. Arrangements have also been made for the free supply of substantial quantities of ammonium sulphate, both from imports and indigenous supplies, to the States for demonstration purposes.

Training facilities are provided with financial assistance from the Central Government at the Bombay Government's training centre at Karjat. 8 candidates from the States of Rajasthan, Orissa, Hyderabad and Vindhya Pradesh are at present undergoing a six months' training course there.

The other steps taken by Government relate to the setting up of centres for training farmers in the new technique, laying of demonstration plots on the cultivators' fields as well as on Government farms, reduction in the price of fertilisers, establishment of a larger number of depots for the distribution of seeds and fertilisers and provision of short-term credit facilities to farmers for purchasing seeds and fertilisers. Three hundred specimens of paddy-weeders (250 wooden and 50 steel) have been fabricated and distributed to the States free of cost for purpose of popularisation.

A large volume of publicity material, explaining the main cultural practices in the Japanese process, in the form of posters, leaflets, folders, flannel-graphs and film-strips, has been supplied to the States, the actual propaganda work and field demonstration being the responsibility of the State Governments. The States have also been promised financial help for expenditure on

printing publicity literature in local languages. About 50 films in English and Hindi, obtained from the U. S. Technical Co-operation Mission, have been distributed to the States free of cost.

Apart from the Central and State Governments, non-official agencies are as well playing an active role in the furtherance of the campaign. The Government of India have in particular received valuable help from the Kora Gramodyog Kendra and the Gandhi Samarak Nidhi. The Bharat Sewak Samaj is also co-operating in this effort.

NOT ENTIRELY NEW.

The Japanese method is not entirely new to India. Some of the practices employed by paddy-growers show that most of its important features have already been in vogue in several parts of the country. What is aimed at now is to evolve and propagate a unified system incorporating all the essential features, with such variations as are necessary to suit local conditions. In Japan, the system has been perfected and is being extended with outstanding success.

The principal features of the method are (1) preparation of raised seed-beds — about three inches above the ground level — leaving enough elbow-room between them for weed-clearance, (2) selection of the right type of seeds, (3) lesser seed-rate, which may be as low as 10-12-lbs., (4) Transplanting in lines, (5) Reduced number of seedlings per hill, (6) proper interculturaling, and (7) heavy application of manure and fertiliser.

The doses of fertilisers vary from place to place, depending upon a number of factors, such as manurial requirements of soil, time of transplanting, economic position of the cultivators, availability of irrigational facilities and climatic conditions. However, the doses recommended by the Centre are 100 lbs. of ammonium sulphate mixed with 100 lbs. of superphosphate per acre twice—first just before puddling the soil and second after transplanting the seedlings, but these quantities are subject to local adjustments.

PRODUCTION ESTIMATES.

Rice production in 1953-54 has exceeded the 1952-53 figure by 4.6 million tons to establish an all-time record of 27.1 million tons, as against the calculated target of 25.2 million tons for 1953-54. This more or less equals the target of 27.2 million tons fixed in the Five-Year Plan for 1955-56. The Japanese method, which was adopted during 1953-54, by way of an experiment and a venture, has contributed a great deal to this tremendous increase. It is also a patent fact that the essentials of the method have as a result of our repeated appeals to the cultivators been applied to cereal production such as bajra, maize and jowar.

According to the 1953-54 estimate, the production of all the foodgrains (cereals and pulses) in India is nearly 66 million tons, exceeding the 1955-56 plan target by 4.4 million tons. The per capita consumption of foodgrains at the end of the plan period was envisaged at 15.81 ounces per adult per day and the balanced diet laid down by the Nutrition Advisory Committee is 17 ounces

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INDIAN COUNCIL OF AGRICULTURAL RESEARCH, NEW DELHI.

Farm News Release No. 15.

BETTER RETURNS WITH GREEN MANURES.

Simple Rules to Follow.

New Delhi: Farmers have come to realise the value of ploughing in a green manure crop before a grain crop is raised, and the practice is gaining popularity everywhere.

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

The green manure crop should be used at a stage when it is still succulent and not yet turned fibrous. Secondly, a period of six to eight weeks should elapse between the ploughing in of the green matter and the sowing of the next crop. The other equally important rule to be followed is to see that enough moisture is in the soil to allow the green matter

per adult per day. The population of India on March 31, 1954, was estimated at 374 millions, according to which the present per capita availability of foodgrains works out to 17.65 ounce higher than the balanced diet.

High hopes have been raised by the remarkable success that has attended the Japanese method of rice-growing. We are already well on the road to greater production and have now become not only self-sufficient in this coveted cereal but also in a position to export some of its better varieties to our traditional customers.

to decompose and the next crop germinate. If too little rain is received, the field will have to be given irrigations to satisfy this condition.

Farm News Release No. 19.

SUN AS FER STERILIZER. EASY TREATMENT OF SEED AGAINST DISEASE.

New Delhi: The sterilizing effect of the sun can be made use of for keeping the smut disease of wheat in check. The disease is found wherever wheat is grown and causes heavy loss of grain.

In the sun treatment the infested wheat grain is immersed in water at ordinary room temperature for four hours. Infested wheat comes from field in which black heads have appeared.

The seed thus soaked is spread out for drying in the sun. The grain is thoroughly dried and stored till required for sowing. The practice gives excellent results wherever the temperature of the sun is high. Where it is low, the seed after soaking in water should be spread on a concrete surface, which is hot enough to kill the fungus causing the disease.

This treatment of seed is successfully applied to control loose smut in barley and grain smut of jowar with good results at the Indian Agricultural Research Institute, New Delhi.

Farm News Release No. 20.

CHECKING WHITE ANT ATTACK.

METHOD OF USING REPEL- LANT WITH IRRIGATION.

New Delhi: Farmers having white ant trouble in their field will get good relief if they use crude oil emulsion with irrigation water.

Crude oil emulsion is used in the form of a solution in the proportion of one pound of the emulsion in four gallons of water. This can be used for irrigating the infested plants, also the semi-solid emulsion can be placed in the irrigation water by putting the oil in a gunny cloth and placing it in the flowing current. Since the repulsive smell of the emulsion lasts only for a few days, the operation has to be repeated after eight to ten days. Instead of crude oil emulsion, five per cent kerosene emulsion may also be used.

Clean cultivation, removing the stubbles away from the field after harvest, deeper ploughing and following crop rotations are other methods suggested that help in removing the white ant trouble.

Farm News Release No. 21.

NEW VARIETY OF SWEET POTATO BEATS ALL LOCAL VARIETIES IN YIELD.

New Delhi: F. A. 17, a white Chinese variety of sweet potato has been out-yielding local varieties grown by the farmers in the north as well as the south.

Extensive trials conducted by the Indian Agricultural Research Institute, New Delhi, over a variety of soil and climatic conditions

showed that the variety yielded from 125 to 255 maunds per acre.

F. A. 17, white combines a high yielding capacity with all the quantities of a good table variety. When cooked, the flesh is a moist, less fibrous and very sweet.

Farm News Release No. 22.

EASURING GOOD CALVES ATTENTION SHOULD GO TO THE MOTHER.

New Delhi: If you want healthy vigorous calves to be born, you must give the best attention to the pregnant cow, say dairy experts.

The dry period of a pregnant cow, experts point out, should be at least 60 days. This will ensure her getting sufficient rest and putting on better flesh and more milk.

Attention must go to the proper feeding of the cow during the dry period so that they may meet the nutritional requirements of the growing calf and also keep sufficient reserves in store for further milk production.

Poor conditions of calving time lowers milk production and affects badly the health of the new born calf. Other disorders may also follow.

The dry pregnant cow should get plenty of good green fodder. A combination of legume hay with a concentrate mixture such as wheat bran, oil cake and gram is advised. Three to six pounds of concentrate mixture with plenty of hay or green fodder will meet her requirements.

Farm News Release No. 27.

BEST RESULTS WITH HATCHING

POINTS IN SELECTION OF EGGS.

New Delhi: Poultry keepers will have to pay sufficient attention to the selection of eggs for hatching, if they want the best chickens.

For improved breeds, setting eggs should not be more than two ounces in weight each. The eggs should be of a good regular oval shape. Eggs of an abnormal size or shape, too pointed or round, or otherwise not symmetrical should be avoided. A simple test to find out whether the eggs selected are sound would be to tap two eggs together. If any egg is weak or as a cracked shell, it will produce a dull sound.

Dirty eggs should be avoided for hatching. If a dirty egg is otherwise sound, it should be cleaned with a knife or stiff brush and not by washing.

Eight to ten eggs are a convenient number for setting under Desi hens. Fresh eggs should always be used and they should be stored in a cool and somewhat moist atmosphere. In the winter or in the hills, eggs can be stored for seven to ten days and in the summer or in the plains for three or four days.

PLANTING POTATO RIGHT SIZE OF PLANTING MATERIAL.

New Delhi: Experiments at the Indian Agricultural Research Institute, New Delhi, show that the bigger the size of the potato tuber used in planting, the lower is the percentage of large-sized tubers produced.

This behaviour of the potato can be used to profit. If, for example, the crop is being grown for seed purposes, where big-sized tubers are not required, seed tubers of a bigger size should be planted. If a greater percentage of big-sized tubers is desired in the produce, seed tubers of a comparatively smaller size should be planted.

Farm News Release No. 29.

SELECT YOUR OWN SEED BETTER SEED LEADS TO HIGHER MAIZE YIELD.

New Delhi: Maize, like other crops, yields better if selected seed is used for sowing. Experience in maize cultivation on research farms shows that selection of seed is best done when the crop is still in the field.

Large sized, well filled cobs should be selected from plants bearing more than one good cob. Only healthy plants growing under normal conditions, and not such as those growing near water channels or on the borders. Cobs should be selected from plants bearing them at a height of three to four feet above the ground. If cobs are borne higher, plants are liable to lodge, and if too low, wild animals will damage them.

In unirrigated areas, plants with narrow leaves should be preferred while for irrigated lands broad-leaved plants should be selected.

After the cobs are selected, they must be thoroughly dried in the sun before storing. Shelling at the time of sowing should be done by hand, and not by beating them with sticks.

NEWS AND NOTES.

I. Availability of Arecanut Seedlings.

About 50,000 areca seedlings under one year old will be available from the Committee's arecanut nursery, Kunnoth by July 1955. The seedlings are priced at two annas each ex-the

Farm News Release No. 30.

DRESSING SEED WITH FUNGICIDE—EFFECTIVE CONTROL AGAINST SMUT.

New Delhi: Treating maize, jowar or bajra seed with a fungicide such as Agrosan G. N. before sowing is being widely recommended to farmers as an effective measure against smut disease.

The Agrosan G. N. is thoroughly mixed with the seed in a drum at the rate of three chataks per maund of seed.

This sample treatment has been found not only to control the diseases in the young and later stages, but also found to result in a better germination of the seed and more vigorous growth. Farmers are advised to adopt this fungicide treatment as a matter of routine.

nursery, packing and forwarding charges being extra. Intending purchasers are requested to apply to the Secretary, Indian Central Arecanut Committee, Post Box No. 14, Calicut on or before 15th May 1955. The full value of the seedlings and the packing and forwarding charges will have to be remitted in full in advance on allotment of seedlings.

2. Secretary's tour.

The Secretary toured in the areca tracts of Travancore-Cochin State from 15th March to 24th March and inspected sites affected by the yellow Leaf disease of arecanuts for organising the spraying scheme sanctioned under the joint auspices of the Travancore-Cochin State and this Committee. He returned to headquarters on the 25th March.

3. Cooperative Marketing Officer's Tour.

The Co-operative Marketing Officer of the Committee was on tour till 21st March in the States of Bombay, Mysore and Madras studying the grading practices prevailing in the important assembling markets and also collected and despatched samples for the analysis in progress at the

Agriculture College and Research Institute, Coimbatore.

4. Meeting of the Special Technical Sub-Committee.

The Special Technical Sub-Committee constituted for the scrutiny of the report on the Survey of waste lands suitable for expansion of arecanut cultivation and other developmental schemes sponsored by the State Governments is to meet in the office of the Committee at 2 P.M. on 25th April 1955.

5. New Members of the Indian Central Arecanut Committee :-

The Government of India have been pleased to nominate Shri K. S. Krishnaswamy, Joint Secretary to the Government of India, (Ministry of Finance) as a member of this Committee to represent the Expenditure division of the Finance Ministry. Shri K. Narayanan Nambudiripad, B. A., Kurumathur, North Malabar and Shri C. T. Ittiachan, B. Sc. (Ag.), Challisery, South Malabar have been nominated to represent Arecanut growers on the Committee in place of Shri N. T. Narayanan Nambiar, Iritty and Shri P. V. Chitran Nambudiripad, Pakaravoor, South Malabar respectively.

MARKET REPORTS

Average Weekly Prices of Arecanut during the month of March 1955.
(Price in Rupees per Maund of 82-2/7 Lbs.)

I. At SHIMOGA Market in MYSORE STATE.

Name of quality	WEEK ENDING			
	5th	12th	19th	26th
	Rs.	Rs.	Rs.	Rs.
Pheeton	140 11	140 11	140 11	140 11
Deshawaram	137 7	137 7	138 4	139 1
Rajalu	131 11	131 11	133 5	134 9
Vanti Bette	107 0	107 13	109 0	109 7
Gorabalu	62 9	63 6	67 8	68 5

II. At BOMBAY Market in BOMBAY STATE.

Name of quality	WEEK ENDING			
	5th	12th	19th	26th
	Rs.	Rs.	Rs.	Rs.
Mangalore Navi Vachar Best	105 0	110 0	110 0	112 8
Sirsi Toanchi	237 8	225 0	212 8	225 0
Sirsi Safed	102 8	110 0	107 8	112 8
Ceylon Nuts	110 0	112 0	112 0	105 0
Singapore nuts	105 0	110 0	110 0	109 0

III. At CALCUTTA Market in WEST BENGAL STATE.

Name of quality	WEEK ENDING				
	3rd	10th	17th	24th	31st
	Rs.	Rs.	Rs.	Rs.	Rs.
Sundried (sliced)	100 0	100 0	100 0		
Ceylon nuts	114 0	114 0	116 0		
Singapore nuts	112 0	112 0	116 0		
Penang Nuts	110 0	112 0	112 0		

MONTHLY BULLETINS

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IV. In TRAVANCORE—COCHIN STATE.

Name of market	Name of Quality	WEEK ENDING			
		5th	12th	19th	26th
		Rs.	Rs.	Rs.	Rs.
Trichur	Erasal.	166 2	168 2	174 1	174 1
	Iylon.	156 4	168 2	166 2	166 2
	Choor.	153 2	160 4	163 0	163 0
Alleppey	Assorted.	88 3	91 13	91 13	94 1
	Garbled.	91 13	95 8	94 1	95 8

V. In HINDUPUR Market in ANDHRA STATE.

Name of quality	WEEK ENDING			
	5th	12th	19th	26th
	Rs.	Rs.	Rs.	Rs.
Billa	156 0	152 9	152 9	
Churu	144 0	140 9	140 9	
Podi	85 11	80 9	80 9	

VI AVERAGE WEEKLY PRICES OF ARECANUT DURING THE MONTH OF FEBRUARY 1955 IN MADRAS STATE.

Name of market	Name of variety	WEEK ENDING			
		5th	12th	19th	26th
		Rs.	Rs.	Rs.	Rs.
Mangalore	Supari New	94 7	94 1	103 4	101 7
	Supari Old	N Q.	129 11	128 3	N. Q.
Madras	Koka		No Quotation		
	Singapore nuts	115 3	115 3	115 3	115 3
	Colombo nuts	115 3	115 3	115 3	115 3

I. Average weekly prices of arecanut in Colombo Market in Ceylon during March 1955
(Price in Indian Rupees per Maund of 82-2/7 lbs.)

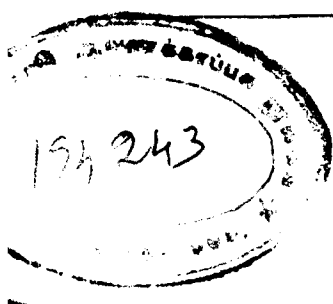
Name of quality.	WEEK ENDING			
	5th	12th	19th	26th
	Rs.	Rs.	Rs.	Rs.
<i>A. Whole arecanuts.</i>				
Average quality.	16 14	16 14	16 14	
Whole No. 5.	22 1	22 1	22 1	
Whole No. 6.	19 8	18 12	18 12	
Whole No. 7.	18 12	18 12	18 12	
Vedial.	1 13	1 13	1 13	
<i>B. Split arecanuts.</i>				
1st Grade	N. R.	86 5	86 5	
2nd Grade	"	64 5	64 5	
3rd Grade	"	38 9	38 9	
Vettai 4A	"	23 14	23 14	
Vettai 4B	"	16 8	16 8	

Statement showing the quantities of arecanut (betelnut) imported into different ports in India and their value during the month of February 1955.

Ports to which imported	Places from which imported							
	CEYLON		SINGAPORE		Federated Malaya States		TOTAL	
	Quantity cwts.	Value Rs.	Quantity cwts.	Value Rs.	Quantity cwts.	Value Rs.	Quantity cwts.	Value Rs.
Bombay								
Culcutta	900	36,647	24,155	8,23,183	1,424	44,264	26,479	9,04,094
Madras	4,380	3,59,131	2,665	85,262	215	9,365	7,260	4,53,758
Saurashtra			45	1,754			45	1,754
Total.								

Average fortnightly prices of arecanut during the months of January, February, March 1955 in Madurai market. MADRAS STATE.

Fortnight ending	Colombo arecanuts				Palai arecanuts			Trichur arecanuts
	Sithanam	Udutharam	Vettai	Whole	Sithanam	Udutharam	Vettai	
15-1-55	189 4	167 15	126 6	110 3	197 5	174 10	117 9	164 9
31-1-55			No Report					
15-2-55	201 10	172 4	126 15	107 12	208 4	180 8	132 4	164 9
28-2-55	197 8	167 15	125 12	107 12	205 11	180 8	129 5	164 9
15-3-55	201 10	155 5	123 7	102 14	209 15	176 5	132 4	167 14



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SECRETARY,
INDIAN CENTRAL ARECANUT COMMITTEE,
P. B. No. 14, KOZHIKODE 1.



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By Sri. K. Kunhikannan Nambiar, B. Sc. (ag.)

Secretary, Indian Central Arecanut Committee, Calicut.

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