VOL. XVII NO. 2
MAY 1963

PUBLISHED MONTHLY

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Coconut bulletin

CONTENTS

Editorial		30
Importance of Organic Matter in Agriculture	A. S. Mathew	31
The Papaya	Muhammad Edachal	34
Palms are a Fascinating Study	K. Satyabalan	36
July & August in Coconut Gardens		47
You Ask, We Answer		49
Gleanings from Other Journals		51
Market Surveys		54
Market Reports		56
Weather Review		61
News and Notes		62

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Issued by

THE INDIAN CENTRAL COCONUT COMMITTEE
(MINISTRY OF FOOD & AGRICULTURE, GOVT. OF INDIA)

ERNAKULAM, S. INDIA.

Editorial

Coconut Day

IT IS PERHAPS INEVITABLE THAT A MOVEMENT HOWEVER GOOD IT MAY BE AND whatever dynamism it may have displayed in its initial stages, should in course of time lose its original momentum and become rather commonplace and ordinary, even if it escapes the fate of extinction. But where a movement has great potential for national good it is never prudent to let it slow down. Every effort should be made to keep it going full steam ahead.

THE VANMAHOTSAVA MOVEMENT STARTED IN THIS COUNTRY ABOUT A DECADE ago is one which, we are afraid, the people have tended to take for granted and for which popular enthusiasm has tended to wane somewhat. This, however, should not be allowed to happen. The conservation and development of the forest wealth of the country, the covering of the denuded countryside with trees that would yield fruits for food, wood for fuel and building and leaves for green manuring—these today are as important problems as they were some years ago and will continue to be for years to come. No slackening of the tempo of the Vanmahotsava movement can therefore be permitted.

IN THE PAST WE HAVE ADVOCATED THE PLANTING OF QUALITY COCONUT seedlings as part of the Vanmahotsava celebrations and the observance of a "Coconut Day" during the Vanmahotsava week has been a feature of that week in many places in the coconut-growing states. This "Day" has been successfully utilized to focus attention on the various aspects of coconut cultivation a knowledge of which is essential to make coconut growing a profitable occupation and to increase coconut production. Ceremonial planting of coconut seedlings by celebrities, public meetings, addresses and processions, the organization of exhibitions, the supply of quality coconut seedlings and seeds and cuttings of green manure plants etc. have been features of the "Coconut Day" celebrations.

TODAY THE NEED IS GREATER THAN EVER BEFORE TO OBSERVE "COCONUT Day" with vigour and enthusiasm. As foreign exchange has to be carefully conserved for defence needs import of coconut products has to be cut to the minimum.

THE OBVIOUS COROLLARY TO THIS IS TO TAKE ALL POSSIBLE STEPS TO increase indigenous coconut production and proper celebration of "Coconut Day" during Vanmahotsava Week will surely go a long way to prepare the ground for increased production.

WE HOPE THAT THE AUTHORITIES CONCERNED WILL DO THEIR BEST TO celebrate "Coconut Day" in a fitting manner during the ensuing Vanmahotsava Week.

Importance of Organic Matter in Agriculture

By
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AGRICULTURE plays a very important and prominent part in the national economy of India. Since the majority of the people depend very much on agriculture for their livelihood, old methods of cultivation require a radical change in order that production may be enhanced to meet the growing demand for food grains and also to increase the quantum of output of cash crops. During the post-war period, people have become more fertilizer conscious than at any other time. The production and use of synthetic fertilizers are very common in almost all countries. Because of the sudden improvement in crop yields obtained by the application of synthetic fertilizers, farmers are using more and more of this type of fertilizers than our conventional manures such as cow dung, ash and green manures. It is true that in order to step up production, agriculturists are inclined to use more of synthetic manures. But it may be noted that these manures have only limited residual value. The manures used and methods of manuring adopted at present would suggest that the agriculturists are not aware of natural manures or that they are ignoring these manures which played an important role in our erstwhile agricultural practices. Though it is necessary to advice the use of synthetic fertilizers in the light of recent advances in agricultural science, it appears to be worthwhile to enlighten the cultivators about the beneficial effects of organic manures.

In the first Five-Year Plan the importance of organic manures was not stressed

properly. During the later years significance of these organic manures was realised and necessary advice and technical information regarding compost making, green manuring etc. were given. Ryots may not be aware of the constituents of the soil. It may be a wonder to them that microscopic organisms exist in the soil. A soil that is rich in plant residues may contain thirty million or more bacteria in a gram of soil. These small organisms make the soil fertile and render nutrients soluble and available to plants There is a lot of difference between a virgin soil and a cultivated soil. The former is rich in available nutrients whereas the latter is deficient in nutrients even though we may be adding certain manures every year to the cultivated soil. The low yield even after proper manuring may be attributted to depletetion of organic matter and the consequent reduction of the biological population of the soil. Thus it is seen that the growth and general activity of the micro-organisms are closely associated with the contents of organic matter in the soil. Where the amount of organic matter increases, the microbial number and activity also increase.

The sources of organic matter are different. It can be derived from plant as well as animal remains. The common source is the remnants of the plants themselves. It may be from roots and leaves of crops, cattle manure, compost or from the dead remains of small organisms and micro-organisms that live in the soil. Organic manures may be classified into two types viz., bulky and concentrated. Farmyard manure and household wastes come under the former category. In preserving cowdung and cow's urine great care should be taken to prevent the loss of nitrogen. Farmers seldom take care of cow's urine which contains a lot of nitrogen and potash. A considerable quantity of dung is used as fuel and in consequence the dung available for application in fields is proportionately less. So efforts should be made to preserve the quantity and quality of these manures. Organic wastes play an important role in giving soil organic matter. Organic wastes may be converted to manure by composting Compost is a fertilizing mixture of partially decomposed organic matter derived from plant or animal. If compost is made from a variety of plants and residues, the manurial value will be increased. There are so many advantages in using compost as a manure in the soil. It requires no soil water for decomposition and reduces the loss of water from the soil. There is a chance of destroying the seeds of weeds and pathogenic organisms, if any, during composting. Moreover, it readily supplies the nutrients as well as organic matter.

Production of green manures in abundance is a cheap way of producing nitrogen. Legumes are recommended for this process since they fix atmospheric nitrogen. Seventy million pounds of atmospheric nitrogen or 0.2 million tons equivalent ammonium sulphate occur over an acre of land. The amount of nitrogen fixed depends on the variety of legume grown and the level of phosphate and potash in the soil. There are several varieties of legumes. So selection of a suitable plant presents no difficulty In our country there are enough potentialities for adopting this practice to increase the nitrogen content of soil. In the third Five-Year Plan the target is to grow green manure crops in about forty million acres. Both legumes and non-

legumes are used as green manure. But among them sunn-hemp has become popular in all the states of India. This is a quick growing and succulent green manure plant which can be grown *in situ* extensively. About thirty to forty pounds of seeds of sunn-hemp will be sufficient to cover an acre of land. This will give about 5,000 to 7,000 lb. of green manure if the climatic and soil conditions are favourable. There are certain other plants which deserve mention. Among them are daincha, wild sunn-hemp, cowgram, wild Indigo, gliricidia etc. When sowing these green manure crops in the fields, soil and climatic conditions have to be taken into consideration

Green leaf manuring is also a very desirable practice. Leaves of certain plants are known to contain a lot of nitrogen. Their addition to soil will definitely increase the nitrogen content. Green leaves brought from outside are used for this purpose. The practice of green manuring and green leaf manuring also helps to add organic matter to the soil.

Organic matter contains plant nutrients like nitrogen, phosphorus, potassium and trace elements but they are found in lower concentrations. Because of the action of micro-organisms such as bacteria on organic matter, carbon dioxide is produced and this dissolves in water and forms acid. This acid dissolves nutrient containing minerals. In using organic matter which is low in nitrogen it is necessary to add a small quantity of nitrogenous fertilizers also. The reason is that micro-organisms require nitrogen for their body building. For this they go to the soil. Thereby a temporary depletion of nitrogen in soil occurs.

There are many advantages in using organic matter in agriculture. In certain soils, i. e. in sandy soil or loamy sand scarcity of water is a limiting factor for the development of crops. In such soils preservation of moisture is necessary and the use of organic matter which will enhance the water-holding capacity of the soil, is highly desirable during the dry months. Organic matter regulates the soil temperature and also improves the structure of the soil.

In coconut plantations as in other crops the normal manures are essential for the better growth of the palms. There also the case of organic matter arises To meet the demand of organic matter in plantations it is always better to grow leguminous plants *in situ*. This is specially important in respect of extensive areas under coconut in sandy soils which are particularly deficient in organic matter. In growing such crops the soil does not lose any of the nutrients but will be enriched with more of nitrogen. In places where good green leaves are available the addition of such leaves will suffice.

The organic matter content of soils can be raised by the regular addition of green manures, farmyard manure, compost etc. It is not difficult for the common agriculturists to grow green manure plants in their compounds. At least they can grow some plants as hedge-plants. The regular addition of green manures, farmyard manure, compost etc. to the cultivated soil increases the capacity of the soil to supply more nutrients to the plants.

the papaya

muhammad edachal

THE papaya is one of the many fruit plants that can be successfully cultivated as an intercrop in coconut gardens. Cultivation of intercrops like fruits and vegetables, besides being an additional source of income to the growers, benefits the coconut palms themselves. The cultural and manurial operations done for the intercrops are useful to the proper growth of the palms in the garden.

The papaya has a short span of life, living for about 15 to 20 years. It begins to yield within a year of transplanting the seedling and produces fruits abundantly for four or five years.

The papaya will grow up and yield well in all loose soils with proper drainage. Water-logging is its greatest enemy.

Varieties

There are many varieties of papaya. Of these, some are indigenous and others exotic. These varieties bear fruits which vary a good deal in quality and shape. It is difficult to establish well defined varieties of papaya. *Washington* is a variety with violet leaf stalks, bearing big fruits. A fruit of this variety weighs 3–4 lb. Another variety yields elongated cucumber-like fruits and still another yellow fruits. *Singapore, Ceylon* and *Honey Dew* (Madhubindu) are some of the varieties cultivated in different parts of India.

A new strain of papaya called *Co 1* evolved by the Madras Department of Agriculture is an excellent variety. It bears fruits at a height of 2½ ft. This is a strain of the well known *Ranchi*

variety, but the unfavourable odour of the *Ranchi* is almost absent in the new strain. The fruits weigh 3 lb. on an average.

Propagation

The papaya is universally propagated from seeds. The seeds are dibbled in a wide-mouthed earthenware pot filled with garden soil. From the seedlings that come up, the better ones are selected and transplanted in the fields.

In the papaya there are male and female plants The male plants can be distinguished from the female ones by the pendulous bunches of male flowers. In the female plants, female flowers appear at the leaf axils. A good papaya plant yields about 50 fruits in a year.

Manuring

The papaya requires heavy manuring. Usually pits 3 ft. x 3 ft. x 3ft. are dug 10 ft. apart The pits are filled with rubbish, farm-yard manure etc. and covered with loose soil, at the commencement of the South west monsoon. The best time to plant seedlings is July-August. It is better to apply manures by the beginning of the South-west monsoon and again during November-December. Every time 50 lb. of farm-yard manure and 2 lb. of castor cake should be applied per plant. The plants are watered after each manuring. Where municipal compost is available, papaya cultivation becomes very easy.

Diseases

Foot rot is a disease found mostly in badly drained and ill-ventilated soils. This is caused by a fungus. At first, the root collar of the affected plant shows a water-soaked appearance. Later, the bark cracks and a foul smelling liquid oozes out. The rooting spreads up and down the stem and finally the plant falls down. The disease spreads rapidly during the rainy season.

The disease can be controlled in the early stages by preventing stagnation of water near the base of the trunk. Good drainage is most important in avoiding the disease. In advanced cases the diseased plants have to be removed and destroyed by burning.

Shedding of flowers is another disease in papaya This can be controlled by spraying the plants with Bordeaux mixture.

Uses

The ripe fruits of papaya add flavour to the breakfast table. The green fruits are used for preparing several curries. Thin slices of papaya are dipped in a mixture of rice flour, chillies, salt, water etc., dried and preserved for further frying in coconut oil. A little of green papaya taken everyday will prevent intestinal worms in children.

The ripe fruits of papaya induce good motion to the bowels.

Papain, the milky juice collected by making longitudinal incisions on the fruits, is highly valued as an industrial product in preparing various digestive medicines and foods.

PALMS ARE A FASCINATING STUDY

By
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INDIA abounds in many types of palms. Some types of palms have their original habitat in India and some have been introduced. Among the different types, some are cultivated for their products of commercial value, some for ornamental purposes and many others grow wild.

Palms belong to the main botanical family *Palmae*. They come under the group Monocotyledons in which, as the name indicates, the embryo has only one cotyledon or seed leaf. The family *Palmae* contains about 1200 species distributed among about 140 genera.

Palms are mainly confined to the tropics and sub-tropics They are pre-eminent in the vegetable world for their grandeur which is especially remarkable in regions where palms grow naturally to their full luxuriance. Linnaeus appropriately styled them as "Princess of the vegetable kingdom". The palms may be divided into two main classes: (1) Feather or pinnate leaved like the coconut palm, arecanut palm , toddy palm, date palm, nipa palm, etc., and (2) Fan or flabelliform leaved as in palmyra palm, talipot palm, etc. About two-thirds of the species come under the former class.

The diversity of characters exhibited by this group is really fantastic and will amply repay an intensive study. A general idea can be obtained from the account given below.

Vegetative habit

The vegetative habit of the palms is familiar and is seen typically in the palmyra palm–a tall straight stem with a crown of leaves either of fan or of feather shape at the top. The two most familiar departure from this are the coconut which has a stem that rises in a curve, perhaps due to reaction to light and the toddy palm which has its large much branched feather leaves scattered over quite a considerable length of the top of the stem.

Branching is a rare occurrence in the tall aerial stems of palms. The exceptions to this rule are very few and are mostly limited to the Doum palm of Egypt (*Hyphaene thebaica*) and a few other species of *Hyphaene*. Though unbranched stems form a prominent feature in palms, yet great variations are found in size and habit of the stems. Generally, the adult palm has a tall woody stem having its circumference ring marked with the bases of leaves which have perished. In some palms like the African oil palm, wild date palm, etc., the trunks are clothed with the persistent bases of the leaves.

The stem exhibits various forms. The stem in the case of certain palms hardly come above the ground while in others they rise to a height of even 500 feet. Many palms like the sago palm, have rhizomes which creep along below the ground, bending up at the end when about to flower and others chiefly the rattans have climbing stems which climb by aid of stout prickles that replace leaflets at the outer ends of the large leaves. The stem is often ring marked or covered with the remains old leaf sheaths or is thorny. In most of the palms it is a sturdy pillar like structure and it grows slowly in thickness. Some palms are

Doum palm

dwarfish in stature, flowering and fruiting at a height of but a few feet. Owing to the fact that older leaves fall off as the younger ones come on, the area exposed to the wind does not increase as the palm grows older and the stem, though it increases in height does not appreciably increase in thickness after it has once in its youth reached its full diameter. On the other hand, the strain at the base increases as it grows taller and this is met by the formation of numerous adventitious or buttress roots which give it a better grip for the necessary mechanical rigidity on the soil.

Leaf

The leaf of the palms is very characteristic and has very few like it outside the family. The leaves are few and large, often very large. Two types of leaves are easily distinguished, the palmate and pinnate, giving rise to popular terms fan palm and feather palm. The leaf, which may be of either pinnate or palmate form, arises by a peculiar process of development. In monocots leaf fall is not a predetermined process as in dicots. It gradually falls when the leaf reaches the end of its life period. The leaf is usually very large and at the base of the petiole is a sheath which makes a firmer attachment to the stem than a mere articulation. The sheath contains many bundles of fibres which remain after the decay of the softer tissues. As the leaf is large it must have a very good attachment to the stem to prevent it being torn away. This is provided by the fibrous sheath which in many cases form valuable sources of commercial coarse fibre. The pinnae are folded when they join the rachis or main stalk of the leaf sometimes upwards (induplicate V in section), sometimes downwards (reduplicate V in section). The leaf emerges from the bud in an almost vertical line and thus escapes excessive radiation and transpiration. The surface of the leaf itself is glossy owing to the presence of a thick cuticle and is rarely arranged perpendicular to the incident rays of the sun, for the palms are pronounced sun plants and show xerophytic characters in their leaves. The young leaf does not spread out and expose the comparatively thin blades to the sun till it is nearly mature. Often the leaf is corrugated or placed at an angle by the twisting or upward slope of the stalk; sometimes the leaflets slope upwards. Thus considerable protection against excessive transpiration is provided in the case of all palms which are considered generally as sun plants.

Inflorescence

The inflorescence is large and much branched in most palms. A few palms are monocarpic. After many years' growth and the production of a stout, woody trunk, the growing point ceases to produce leaves and develops a gigantic inflorescence. This so exhausts the plant that after fruiting it dies. The talipot palm and the sago palm are monocarpic. The great majority of palms are however polycarpic, bearing, when mature, axillary inflorescences which wither away after fruiting. These are formed in the sheathed axil of the leaves but in some palms they do not develop until after the subtending leaf has fallen when the flowering spike is therefore below the crown. The talipot palm which is monocarpic, produces a huge terminal inflorescence which may contain several million flowers. This and the vast number of fruits which follow it are produced at the expense of

the enormous quantity of reserves which the palm has been storing up in the stem and when the fruits are ripe, the tree gets exhausted and the palm soon dies. Even in a palm like the coconut which flowers all its life there is a great rush of sap from reserves to the inflorescence and this is taken advantage of by the drawers of toddy who tap the young inflorescence to obtain the sap which forms toddy and when fermented yields alcohol or when evaporated yields sugar.

The inflorescences arise in different ways in different palms. Sometimes the inflorsecences are in the axils of the current leaves, sometimes lower on the stem; in the toddy palm for instance they appear in descending order along the stem while in coconut, in ascending order. The inflorescence which carries the flowers may or may not be enclosed in a sheath-like structure usually known as spathe. The form and branching of the inflorescence varies much. The individual flowers are sometimes free but very often they are sunk in the tissue of the stalk. Then the inflorescence is termed as spadix. Some palms are dioecious (male and female flowers on different plants) as the date palm, palmyra palm etc., some are monoecious (both male and female flowers are borne on the same plant) as the coconut palm, arecanut palm, African oil palm, etc. In monoecious palms the flowers may be arranged on separate inflorescences on the same palm as in African oil palm or both male and female flowers are borne on the same inflorescence as in coconut palm. In some monoecious palms like the toddy palm, the flowers are in little cymes of three, one female between two males.

The flower

The flowers of palms in general are not specially attractive either in size or in colour. They are small and inconspicuous and are produced in large numbers. It has usually a perianth in two whorls of three leaves alike in colour and texture. The stamens are also in two whorls of three and the carpels three single or united, in the latter case forming a single or three locular ovary. The flowers are sometimes pollinated by wind, sometimes by insects or by both.

The fruit

Great variety characterises palm fruits. Compared to the size of the plants, the fruits are generally small except the coconut which is one of the largest. The fruit is a berry or a drupe with the endocarp usually united to the seed. In many species there is a hard fibrous coating to the fruit as in coconut while in some others the seed is free but often it adheres to the inner coat of the fruit. In the sago palm and others of that group of the family it is covered with hard scales. The seed has a large endosperm which in the case of the date, the vegetable ivory and others is formed of cellulose deposited upon the cell walls and making the seed extremely hard. The fruits which contain only one seed is more or less rounded as in coconut or long as in date.

The seed

Seeds of palms are also found in many sizes and various shapes ranging from the size of a pea to the unweildy big fruit of coconut, double coconut, etc.

Some common palms

Some common palms met with in different parts of India are described with special reference to their peculiar characteristics.

Coconut palm

Arecanut palm

Palmyra palm

1. COCONUT PALM
(Cocos nucifera Linn)

The coconut palm belongs to the Cocos tribe which comprises tall or dwarf palms with slender or robust ringed spineless trunks. The most important palms in India are the cultivated species of which the chief is perhaps the coconut. The coconut which is rightly called the queen of palms is one of the important agricultural crop plants of the world, and is cultivated over large and extending areas in the tropics. In coconut there are two varieties, namely, the Tall and the Dwarf. The tall variety palm grows to a height of even 100 feet or more under favourable conditions while the dwarf variety palm is short in stature, delicate and short lived. Under favourable conditions the tall variety begins to bear in six to eight years after planting while the dwarf takes only three to four years for its initial flowering. The palms of the tall variety are generally cross pollinated in nature while those of the dwarf variety are mostly self pollinated. Even the nut and copra characters of these two varieties vary a lot.

The coconut flowerst hroughout its life unlike other palms which flower only once in their lifetime or those which flower only during certain seasons. The inflorescence which is known as spadix arises at the axils of leaves in the ascending order, that is from the older leaves to younger ones. The palm produces one inflorescence a month normally. The inflorescence is monoecious, the female flowers being at the bottom and male flowers at the top of the inflorescence.

2. ARECANUT PALM
(Areca catechu)

Arecanut palm belongs to the areca tribe which characterises graceful and well known group of spineless palms, the trunks of which are either solitary or form a ring like clump. This is a tall slender palm growing to a height of 40 to 60 feet. The inflorescence is a spadix and is monoecious as in coconut, bearing female flowers at the bottom and male flowers at the top. The peculiarity in this palm is that the inflorescence appears from the axil of the leaf which begins to drop. Usually the inflorescences appear during the period December to June. Each tree normally yields 2 to 3 bunches a year, each bunch containing about 200 to 250 small fruits. In a season usually not more than five spadices appear and the average is about 2 to 3. Even though the fruit is like a miniature coconut, the product obtained from it, namely the arecanut, is entirely different from the coconut of the coconut palm.

3. PALMYRA PALM
(Borassus flabellifer Linn)

Palmyra palm belongs to the Borassus tribe the palms of which are characterised by tall, spineless, stout, ringed trunks. The palmyra palm is also known as the Deleb palm in Central Africa where it is a characteristic feature and whence it has spread to India where it is known as the palmyra. This gigantic palm attains a height of 40 to 60 feet (sometimes even 100 feet) and has 30-40 large fan like leaves on the terminal crown. This palm is dioecious–that is the male and female inflorescences are borne on different palms. So in palmyra we have both the male and female palms. The palmyra palm produces inflorescences in the leaf axils only in a particular season of the year which is found to vary to some extent from tract to tract. While

Toddy or fish tail palm

Talipot palm (after flowering)

Wild date palm

flowering of the palmyra takes place as early as August in the West Coast of India, it is considerably delayed in the East Coast particularly in the Circars and takes place in December–January. There appears to be no regularity in the production of inflorescences. It has also been noticed that the inflorescences do not arise from all the leaf axils.

4. TODDY OR FISH TAIL PALM
(Caryota urens L.)

Toddy or fish tail palm also belongs to Areca tribe. They belong to spineless, monocarpic palms with tall, stout ringed trunks at length bearing suckers. Toddy palm is also known as Kittul tree or Indian Sago palm. This palm grows to a height of 40–60 feet and bears large much branched (bipinnate) feather leaves scattered over quite a considerable length of the stem. It flowers mostly throughout the year. This palm attains its full size in about 15 years and yields for about 7 years. The peculiarity of this palm is that its big inflorescences appear in descending order along the stem. The first inflorescence is of big size and arises from the axil of the upper leaf. The second is from a lower axil and slightly smaller and so on downwards until the tree gets exhausted and dies. The inflorescence is very long, pendulous and resembles a huge docked horse-tail. The flowers are in little cymes of three, one female between two males.

5. TALIPOT PALM
(Corypha umbraculifera L.)

The talipot palm belongs to the Corypha tribe. They are tall fan–leaved palms with spineless stout trunks. The talipot palm is considered to be a native of North Malabar of Kerala where it is found abundantly in low, moist coastal regions. It is monocarpic. The talipot grows vegetatively for 40–70 years and then at last produces a huge terminal inflorescence which may reach a height of even 20 to 30 feet and may contain several million flowers. This palm, when it attains full maturity say when 30 or 40 years old, flowers during the beginning of the hot season and dies soon after the seeds ripen, 9–10 months later. As mentioned in the beginning, the huge inflorescence and the development of the vast number of fruits are produced at the expense of the enormous quantity of reserves which the palm has been storing up in the stem before flowering and when the fruits are ripe, the palm is exhausted and it soon dies.

6. WILD DATE PALM
(Phoenix sylvestris Roxb.)
and
DATE PALM *(Phoenix dactylifera* L.)

These palms belong to the Phoenix tribe which forms a distinct and exceedingly useful genus of palms planted for fruit, ornament and shade. Phoenixes differ from all other pinnate–leaved palms in having the leaves folded upwards and lengthwise and in the peculiar form of the seed as seen in the date. The plants are either male or female.

The wild date palm is common throughout India. It is cultivated for its sap which yields sugar and toddy. The trunk when it attains a height of about 4 feet is tapped. The palm continues to yield about 8 maunds of sugar a year. The dense almost spherical crown with the gracefully bending leaves is quite different from the real date palm which has been introduced into India during early times. The wild date palm grows

Cane palm

Sugar palm

African oil palm

to a height of 30–50 feet. The trunk of the palm is rough due to the persistent bases of the leaf stalks. It flowers during the beginning of the hot season and the fruit ripens in September and October months.

The date palm yields the edible date. It is one of the most useful trees in the world. This was probably introduced into India at the time of first Mahomadan conquest of Sind at the beginning of the 8th century. The total area under this palm is confined to Uttar Pradesh, Gujarat and Madhya Pradesh. The palm attains a height of 100 to 120 feet. The base of the palm is often surrounded by a dense mass of root suckers which is never the case in the wild date palm. Leaves of date palm are longer than those of the wild date palm. Date palm flowers in March, April months; the fruit ripens during August to October. The date palm can be vegetatively propagated by the root suckers. The palm raised from seed takes about 8 years and the one propagated by root sucker takes about 4 or 5 years to reach the full bearing stage. The average life of the date palm is about 50 years.

Both the palms are dioecious There are male and female palms, the former bearing the male inflorescences and the later female inflorescences.

7. CANE PALM
(Calamus rotang L.)

Cane palm belongs to the Calamus species which are usually climbing pinnate palms. Their stems are slender, more or less prickly, usually climbing and never bearing a terminal inflorescence. There are more than 200 species most of which inhabit India. Some of the species have stems several hundred feet long which creep over the tops of the tallest trees. The leaves are peculiarly well adapted to assist the plant in climbing. There are hook like processes arranged on the mid ribs of the leaf, with the help of which they climb. In the cane palm the stem is very slender and its flagelliferous sheaths are sparingly armed with short flat spines The leaves are 1½ to 2 feet long, petiole very short and stout and margined with small straight or recurved spines. In most of the Calamus species the stems are long, cylindrical and of uniform thickness, solid, straw yellow in colour and more or less covered by spiny leaf sheaths. The time required for various Indian canes to reach maturity is roughly 5 to 6 years. In these species only the stems are useful because of its remarkable pliability, strength and lengths in which they can be obtained. The growth of each stem in Calamus is indefinite and all inflorescences are lateral. It flowers usually in summer months.

8. SUGAR OR SAGO PALM
(Arenga pinnata Wurumb)

This is the principal sugar yielding palm of Malaya and hence its old name *Arenga saccharifera* Labill. Arengas are tall, usually spineless palms with a thickish ringed trunk, the upper part of which and the leaf stalks are often covered with long black fibres. They are natives of Asia and Australia. Among the eight species known, *Arenga pinnata* is an important economic plant in India. It is found wild in parts of Assam. The palm has a trunk 20-40 feet high with long pinnatisect leaves. It reaches maturity in about 6-10 years and produces a floral axis 6 to 10 feet long covered by a big spathe. It takes about

70 days for the floral axis to emerge from the spathe. The fruit takes about a year to ripen. It flowers throughout the year. In this palm inflorescences arise first from an upper leaf axil and successively from lower ones. So the spadices of the upper axils flower first and often have mature fruit when the lowest come to flower. After producing the first spathe, the palm goes on producing for 2-3 years till the lowermost axil of the leaf is utilised and the tree gets exhausted. The fruit ripens during the year following the appearance of the flowers. After all spadices have matured their seed, the tree dies. It is reported that male and female spadices are produced by the palm though some are of the opinion that the spadices often are unisexual because of the abortion of one type of flowers. Usually the male spadix is chosen for tapping since female spadices do not yield any sugar. The apex of the *Arenga* palm stem forms a rather small inflorescence and then other (sometimes larger) inflorescences arise from the axils of successive leaves downwards. According to some scientists this genus thus combines the terminal inflorescence of some palms (monocarpic) like Metroxylon etc. with the axillary inflorescences of the majority of palms and forms an interesting intermediate case. The black fibre at the leaf bases known as the gomuta fibre is widely used for filters and in the caulking of ships. The sap, obtained when the plant is 10 12 years old, yields sugar commonly referred to as arenga sugar.

9. NIPA PALM
(*Nipa fructicans* Wurumb)

The nipa palm belongs to one species which are found wide-spread along tidal rivers and estuaries. It is abundant in the Sunderbans area of West Bengal. It is a rhizomatus palm which bears peculiar inflorescences on short stems. The morphology of the palm has not been investigated thoroughly due to the large size of the plant and the deep muddy conditions in which it grows.

10. AFRICAN OIL PALM
(*Elaeis guineensis* Jacq.)

The African oil palm was introduced into India nearly twenty years ago and attempts have been made to cultivate it on a commercial scale in some parts of Kerala but it has not attained economic importance anywhere in India.

It is a stately erect monoecious palm growing to a height of 20 to 80 feet with a dense crown of pinnate leaves, 10-17 feet long. The stem of the palm is covered with the bases of dead leaves. It is monoecious (bearing male and female inflorescences on the same palm). The fruits are borne in large bunches. The fruit is a drupe, egg shaped about 1½ inches long and 1 inchin diameter, reddish brown or orange in colour when ripe. The fruits are small and numerous when the tree begins to bear but decrease in number and increase in size in the next few years. The outside portion of the fruit (pericarp) varies in thickness and is composed of a soft fibrous pulp from which the palm oil is extracted. Inside the pericarp is the nut consisting of a hard shell, varying in thickness, enclosing usually a single kernel which is dark reddish brown or almost black externally and internally and consists of a hard white flesh.

(Continued on page 48)

in JULY & AUGUST in COCONUT GARDENS

KERALA

July

Complete the digging up of basins in loamy and laterite soils. Bury a green manure crop or green leaves in the basins and cover.

August

Top-dress with manure in loamy, laterite, sandy and also in alluvial soils.

MYSORE

July

Apply a manure mixture. If a green manure has been sown or if heavy rains are expected, apply this in basins round each palm. Keep in mind that the garden should be free of weeds before you apply your manures. The following manure mixture may be applied to the palms.

1. Superphosphate or bonemeal	1 kg.	per tree per year
2. Ammonium sulphate	1½ kg.	
3. Sulphate or muriate of potash	1kg.	

or

1 Groundnut cake	9 kg.	per tree per year
2. Ash	11 kg.	
3. Bonemeal	1 kg.	

MADRAS

July-August

With the receipt of soaking showers, give a basal dressing of ash at 9 kg. per tree or cattle manure or compost at 21 to 42 kg. per tree.

Sow a green manure crop of sunn-hemp, *crotalaria striata*, *calopogonium mucunoides* or *kolinji*.

In sandy soils or in places where such green manure crops cannot be grown, plant quick-growing, green leaf-yielding plants like *gliricidia maculata* along the borders of the garden.

ORISSA

July

Catch and kill the rhinoceros beetle. Apply manure to your vegetable crops. Transplant gliricidia cuttings from the nurseries round the garden,

August

Dig up grass and weeds and turn them into the soil. Clean the crowns. Tie up tender bunches. Prepare for sowing winter vegetables. Continue controlling rhinoceros beetle.

MAHARASHTRA

July

If possible grow tapioca between coconut rows. For this purpose, make raised beds. When the planted cuttings put forth four or five leaves, apply ash, and earth them up twice at a fortnight's interval.

August

Dig up and turn the grass and weeds and also the green manure into the soil. If there are heavy bunches in the palm, tie them up with a rope to the leaf stalks.

Clean the crowns and put a mixture of sand and BHC in the leaf axils. Pull out the beetles and fill the holes also with the mixture. Spray all manure heaps or rubbish with 0.1 per cent BHC.

WEST BENGAL

July-August

Dibble cowpea or sunn-hemp behind a *desi* plough in June, using a seed-rate of 21 to 27 kg. If it is calopogonium, broadcast the seed at 3½ to 4½ kg. per acre.

When dry coconut husk is available cheap, dig six feet wide and 15 inch deep trenhes between your coconut rows and fill them with the husk at 1000 per tree and cover. The best time to do this is June-July. The trees benefit from this manure for five or six years.

ANDHRA PRADESH

July-August

Bury husk wherever possible.

Apply per tree the following manures.

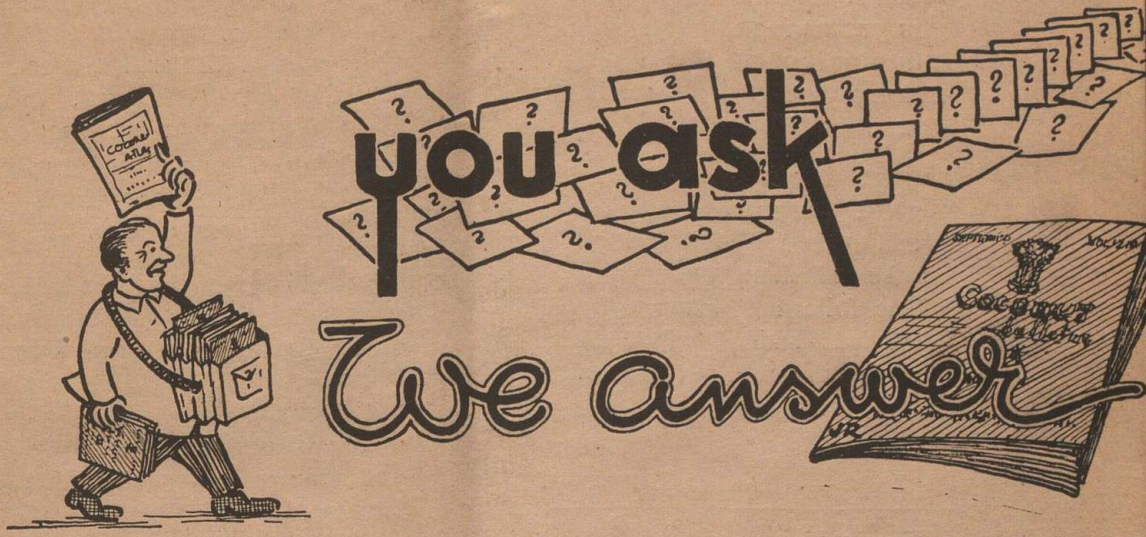
Ammonium sulphate	– 1 – 1⅓ kg.
Muriate of potash	– 1 – 1⅓ kg.
Superphosphate or bonemeal	– 1 kg,

Apply the mixture in basins after the heavy rains are over.

Palms are a fascinating study ... ... *(Continued from page 46)*

The African oil palm is foremost among the useful palms of West Africa. Oil is obtained from the mesocarp as well as the kernel of the fruit.

Thus it is interesting to note that palms exhibit different characteristics with regard to their vegetative habit and other morphological characters. In this note only a few of the common palms met with in India and their peculiar characteristics are described. Still there are a number of palms which grow wild and those which are grown for ornamentel purpose which are yet to be studied. Such a study will reveal the still unsolved mysteries of the palms and will lead to a better understanding of them.



Question: I planted some 100 coconut seedlings during last February–March. They were watered during the summer months and during May–June ash was applied to them at the rate of about 4 lb. per seedling. As the soil of our place is lateritic the seedlings have been planted in pits which are 3 ft. deep. Please mention the steps that should be taken to make the seedlings grow up quickly.

Answer: Manures such as groundnut oil cakes and ammonium sulphate should be applied to the seedlings thrice or four times a year in small quantities to make them register quick growth. These manures should be applied when there are rains. Otherwise the palms should be watered well. Ammonium sulphate should not be mixed with ash as it will lead to loss of ammonia from the ammonium sulphate. Ash may be applied at the commencement of the south–west monsoon and the application of ammonium sulphate may start about 15 days hence. Ammonium sulphate should be applied in 4 or 5 doses. The following table shows the rate of application:–

Age of seedling	Ash	Rate of application of the manures (approximate) G. N. cake or Amm. sulphate (per dose.)
1 year.	4 lb.	1 lb. or ¼ lb.
2 years.	6 lb.	1½ lb. ,, 3/8 lb.
3 years.	8 lb.	2 lb. ,, ½ lb.
4 years.	12 lb.	3 lb. ,, ¾ lb.

Question. If a green manure crop is grown in the coconut garden and polughed into the soil, is there need to apply other manures?

Answer: In addition to ploughing in green manure, it is desirable to add to the soil some groundnut oil cake and ammonium sulphate also The following manures must be applied and ploughed in before sowing the green manure seeds:–

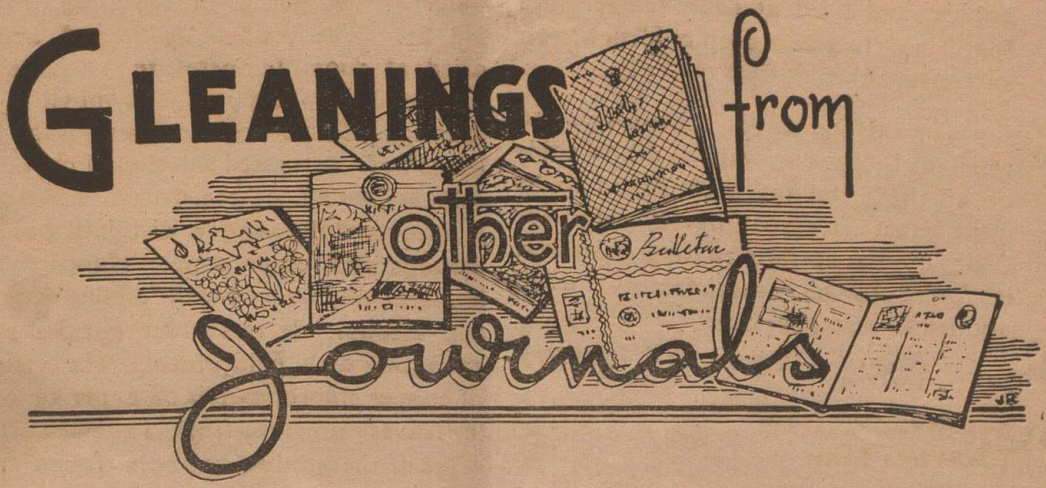
Manure	Quantity per acre.
Farmyard manure or compost	200 baskets
Ash	50 tins
Bonemeal or superphosphate	1 cwt.

The green manure plants then grow up luxuriantly and fix a lot of nitrogen in their root nodules. Thus when they are slashed down and incorporated into the soil, they give back to it the manures they used for growing up and the store of nitrogen they had accumulated while growing. It is better to apply the available manures to grow the green manure crop and incorporate it into the soil rather than apply the manures in basins dug round the palms.

Question: Coconut growers open up trenches on one side of their palms, fill them with manures and cover them up. In the course of four years trenches are opened on all the four sides of the palms. How far is this practice advantageous?

Answer: As the roots of the coconut spread out all round the tree it would be better to open a broad circular basin all round the tree and put the manures in it. If this is done, all old roots could be removed and the emergence of fresh roots facilitated. By putting manures in a trench on one side only of the palm, the soil on the other three sides is not disturbed and the old roots which have become useless are not removed.

Broad trenches should be dug round the palms until the tender roots appear. This will induce the root to go deeper into the soil. If soil round the palm is not removed the roots would have the tendeney to spread out under the top soil. The manures should not be applied touching the boles of the palms. When trenches are dug there is also the danger of tender roots being cut and damaged. It is, therefore, best to dig broad basins round the palms and put the manures in them.



Surface coating resin from arecanut cutch

Arecanut (*Areca catechu* Linn.) is grown widely in India, especially in the coastal regions of the country. The green kernels are reported to contain about 20 per cent tannins and yield an extract rich in tannins. During the preparation of supari, the kernels obtained from the ripe fruit are sliced and extracted. The sliced kernels are boiled in mixture of water and the previous year's extracts of the nuts for about 1½–3 hr. The decoction obtained is rich in tannins and is dried into a dark shining solid known as Chogaru. This cutch is a byproduct of the arecanut industry of India and accumulates annually to a large extent.

Investigations by the workers of the Regional Research Laboratory, Jorhat (Assam) have resulted in the utilization of this tannin-rich material for the preparation of a surface coating resin by reaction with formaldehyde. Unlike in the preparation of a similar composition from the polyphenolic constituents of tea waste reported earlier (Res. & Ind. 7 (1962), 179) in the present composition phenol need not be used at all. The pot life of the composition, however, is only about 24 hr. at the laboratory temperature. It is, therefore, necessary that surface coats be applied on the same day on which the resin is prepared.

In the process, the cutch is finely ground and extracted with water by stirring and gently heating the contents. Only 58 per cent of the cutch is found to be soluble in water. Boiling is to be avoided as otherwise gelation is found to occur rapidly. The tannin is found to be extremely reactive. The aqueous extract is cooled and filtered through fine cloth. The filtrate (900 ml.) containing soluble cutch (58 g.) mixed with 37 per cent formaldehyde (50 ml.) and 10 per cent sodium hydroxide (40 ml.). The mixture is thoroughly shaken after the addition of each reagent. The viscous

dark product is painted on wooden bobbins and dried at room temperature for 30 min. to give a deep reddish brown surface coat.

The surface coat is quite tough and resistant to water as well as dilute acids or alkalies, and has been found to be quite intact after soaking in water for 7 days. The surface coating, however, is found to be unsatisfactory when applied to metal surfaces.

— *Research & Industry*.

Chlorophyll from *Cassia tora* Linn.

Chlorophyll is finding increasing application as an ingredient in deodorant tablets, tooth pastes, chewing gums, mouth washes, facial creams and ethical ointments. Copper chlorophyll which is a copper complex of phaeophytin and imparts brilliant shades of green is used as a colourant for soaps and hair oils; it is used also for the preparation of pharmaceutical chlorophyll, namely the water soluble chlorophyllins.

Cassia tora Linn. (Fam. Leguminosae) occurs throughout India as a weed and is abundantly available in Jammu Province. The leaves of *Cassia tora* Linn. have been utilized at the Regional Research Laboratory, Jammu, for the preparation of copper chlorophyll on a pilot plant scale.

Air-dried leaves are powdered, moistened with copper sulphate solution and extracted with alcohol in a stainless steel soxhlet. After recovery of the solvent, the concentrated extract is refluxed with oxalic acid (3 per cent on the wt. of the leaves) for about an hour, when the dull coloured phaeophytin separates out. It is then refluxed with water (1 ml. per g. of the drug) for 2-3 hr. The product is filtered and dried at room temperature. It is then converted into copper chlorophyll by refluxing with alcoholic copper sulphate (80 ml. of a saturated solution of copper sulphate per kg. of the drug). Alcohol is recovered by simple distillation and the separated crude copper chlorophyll is thoroughly washed with boiling water and alcohol. It is further purified by extracting with chloroform. The yield of copper chlorophyll is 58 g. per kg. of the leaves (moisture-free). The tinctorial value of the product has been found to be 100 per cent.

Soluble chlorophyll — Copper chlorophyll (100 g.) is refluxed with alcoholic sodium hydroxide (2000 ml. of 1 per cent) for 2 hr. Alcohol is recovered and the residue dissolved in a few ml. of water. The alkaline solution is acidified with hydrochloric acid when copper chlorophyllin separates out. This is filtered and washed thoroughly with boiling water. The product is then dissolved in ether and shaken with a few pellets of sodium hydroxide. Sodium copper chlorophyllin precipitates out from the ether solution on standing. After the precipitation is complete, the unused sodium hydroxide pellets are removed and the precipitate is filtered and dried.

— *Research & Industry*

Heavy fertilisation gives higher turmeric yields

For higher yields of turmeric, heavy fertilisation is recommended by specialists of the Agricultural College and Research Institute, Coimbatore, Madras State.

Turmeric, which is a very exhausting crop, removes fairly large quantities of plant food from the soil. For better yields, the field should be manured with 20 cartloads of good cattle manure along with 150 kilograms of superphosphate per acre. In potash deficient soils about 40 kg. of muriate of potash per acre will help get better results.

Top dressing with calcium ammonium nitrate or ammonium sulphate at the rate of 100 kg. per acre should be done in two doses. The first dose is to be applied two months after planting, and the second a month later. The fertiliser should be placed in bands on the sides of the crop four inches away and at about the same depth.

— Fertiliser News

Treat seed before sowing to keep crop disease free

Treating the paddy seed with an organo-mercurial fungicide before sowing, is a good safety measure that all farmers should adopt.

The seed you sow may be carrying the germs of the diseases like foot-rot and brown leaf spot. These will grow along with the seed and destroy the crop. The only way to prevent this loss is to kill the germs (spores) before the seed is sown.

For this, treat the seed with 'Ceresan' or 'Agrosan' GN. One ounce of the chemical for thirty pounds of seed will be sufficient. Mix the chemical well by rotating the seed and the chemical in a closed drum. If the drum is not available use a mud pot with a narrow neck and a lid instead. Rotate this till the chemical is well-mixed with the seed. *Do not use the pot or the treated seed for other purposes as the chemical is poisonous.*

— Farm News

Grow your cashew by air-layering

India's export of cashew kernels to western countries is increasing. In 1961 we exported 4,700 tons to East European countries and in 1962 it increased to 7,900 tons. This is expected to increase still further.

In the International Exhibition held in Seattle, (U.S.A.), recently there was a lot of enquiry for Indian cashewnuts.

Farmers owning cashew gardens should take advantage of the increase in overseas demand for our cashewnut and produce more per tree.

Researches made through many years by leading experts in cashew crop cultivation have proved that cashew trees grown through air-layering are the only best producers. About 75 per cent of the air-layers grew into good plants.

Air-layering is an easy job. Farmers can get detailed instructions on air-layering from the nearest Agricultural Extension Officer.

— Farm News

Market Surveys

Foreign Markets

General Trend

According to the April issue of the "Oilworld", Hamburg, the price development in the world markets for oilseeds, oils and fats was rather mixed in the two weeks ending with the 9th April 1963. Among edible materials the prices of soyabeans, soyabean oil, groundnuts, groundnut oil, rapeseed, lard and cotton seed oil showed a downward trend.

As against this, the prices for copra, coconut oil, palm kernels, marine oils, sunflower seed and cotton seed advanced more or less sizably. Most other edible materials remained steady. Among the non-edible materials, the recovery of U. S. tallow was the most noteworthy event. Castor oil and tung oil were weak. There was hardly any change with the other non-edible materials. Oilcakes and meals appeared to have reached the bottom, following a rapid downward movement for several weeks prior to 9th April 1963. The prices generally had begun to stabilise on the substantially reduced levels though this was not a reversal of trend.

SINGAPORE

April 1963

COPRA

During the month of April 1963 the undertone of the Singapore copra market remained weak on both loose and F. O. B. copra due to lack of buying support.

On the 5th April, price per picul (133⅓ lb.) F. O. B. copra fair mixed was quoted at M$ 29.50 and remained at the level till the 11th April. But on the 19th the price slightly declined to M$ 29.25 and it was quoted at the same level on the 26th April 1963.

COCONUT OIL

In the month of April 1963 the Singapore coconut oil market ruled easy for both bulk and drum oil. The market witnessed a slow trade in the drum oil market and an easier tendency was seen in the overseas bulk oil market.

The price quoted for a picul (133⅓ lb.) of coconut oil in second hand drums on the 6th April 1963 was M$ 45.38 which declined to M$ 45.00 on the 10th and the 19th. The market closed on the 26th at M$ 45.25 per picul.

CEYLON

April 1963

COPRA

During the month of April 1963 the Colombo copra market remained strong and the market witnessed almost a steady trend in prices.

On the 6th April 1963 copra Estate No. 1 was quoted at Rs. 180.00 per candy (560 lb.) which slightly declined

to Rs. 178.00 on the 13th. But it rose to Rs. 180.00 on the 20th and closed on the 27th at the same level.

The market more or less presented a similar trend in prices in the case of milling copra. On the 6th April 1963 a candy of milling copra was quoted at Rs. 177.75 which slightly came down to Rs. 175.00 and was quoted at the same level on the 20th and the 27th.

COCONUT OIL

The coconut oil market in Colombo during April 1963 displayed a steady trend.

On the 6th April 1963, a ton of coconut oil was quoted at Rs. 1015.00 which slightly advanced to Rs. 1020.00 on the 13th. On the 20th a ton of coconut oil was priced at Rs. 1010.00 and closed on the 27th at the same level.

Indian Markets

COCHIN

April 16th to May 15th 1963

When the Cochin coconut oil market opened on the 16th April 1963, a quintal of ready oil was quoted at Rs. 269.00. During the third week of April, buoyant condition prevailed and the market became firm on account of the good demand for ready oil from upcountry markets and the increased purchase of both ready oil and futures by the exporters. Purchase of good quantity of both ready oil and futures by a leading soap manufacturing concern further strengthened the firm trend in prices. On the 17th a quintal of ready oil was priced at Rs. 274.00 and remained at the level on the next day and closed on the 20th at Rs. 269.00.

During the last week of April, the ready oil market remained more or less firm as there was continued demand for oil. But the fairly good arrivals of ready oil in the market tended the market to be steady. The market opened on the 22nd at Rs. 268.00 per quintal and slightly fluctuated within a narrow limit in the next four days. On the 29th a quintal of ready oil was valued at Rs. 269.50 and closed for the month end on the 30th at Rs. 268.50

The 1st of May, 1963 was a holiday and the market opened on the 2nd at Rs. 272.50. The market throughout presented a mixed trend with the prices declining till the 13th May as arrivals of both copra and coconut oil were reported to be more than the demand for them and moreover there was selling pressure from the millers. On the 3rd a quintal of oil was quoted at Rs. 264.00 which declined to Rs. 262.50 on the 6th and Rs. 261.00 on the 7th. The price slightly improved to Rs. 263.00 on the 10th but again went down to Rs. 261.50 on the 11th and the 13th. The price, however, slightly improved to Rs. 265.00 on the 14th and closed on the 15th at the same level.

ALLEPPEY

April 16th to May 15th 1963

When the Alleppey coconut oil market opend on the 16th April, a quintal of ready oil was quoted at Rs. 268.00. Due to strong demand for ready oil from upcountry markets the market presented a bullish trend and the

(Continued on page 61)

MARKET REPORTS

I. Cochin, Alleppey & Calicut

The daily prices of coconuts, copra, coconut oil and coconut oil cake at Cochin, Alleppey and Calicut from 16th April 1963 to 15th May 1963 are given below:

Date	Coconuts per thousand without husk			Copra per quintal*			Coconut oil per quintal			Coconut oil cake per quintal		
	Cochin	Alleppey	Calicut	Cochin	Alleppey	Calicut	Cochin	Alleppey	Calicut	Cochin	Alleppey	Calicut
	Rs. nP.	Rs. nP.	Rs. nP.	Rs. nP.	Rs. nP.	Rs. nP.	Rs. nP.	Rs. nP.	Rs. nP.	Rs. nP.	Rs. nP.	Rs. nP.
16 - 4 - 63	235 00	N.R.	N.R.	180 00	185 00	N.R.	269 00	268 00	N.R.	44 50	45 00	N.R.
17 - 4 - 63	235 00	240 00	227 50	183 64	185 00	178 00	274 00	270 00	268 00	45 00	45 00	42 50
18 - 4 - 63	235 00	N.R.	N.R.	183 00	187 00	N.R.	274 50	272 00	N.R.	45 00	46 00	N.R.
19 - 4 - 63	235 00	N.R.	222 50	182 50	185 00	182 75	272 00	268 00	277 25	45 00	47 00	42 50
20 - 4 - 63	235 00	242 50	237 50	182 00	190 00	179 00	269 00	268 00	277 00	49 00	48 00	42 50
21 - 4 - 63	S	U	N	D	A	Y	S	U	N	D	A	Y
22 - 4 - 63	235 00	N.R.	237 50	180 25	187 00	179 00	268 00	269 00	275 00	46 00	49 00	42 50
23 - 4 - 63	235 00	N.R.	237 50	180 00	187 00	179 00	267 50	268 00	275 00	46 00	48 50	40 50
24 - 4 - 63	245 00	242 50	237 50	180 75	188 00	179 50	268 50	268 00	275 00	46 50	48 50	40 50
25 - 4 - 63	245 00	N.R.	237 50	180 00	190 00	179 50	267 00	268 00	275 00	46 50	48 00	41 50
26 - 4 - 63	245 00	N.R.	237 50	180 00	187 00	181 00	267 00	265 00	275 00	46 50	48 00	41 50
27 - 4 - 63	245 00	242 50	237 50	181 00	185 00	181 50	269 00	267 00	275 00	46 50	47 50	42 50

28 - 4 - 63	S	U	N	D	A	Y	S	U	N	D	A	Y
29 - 4 - 63	245 00	N.R.	237 50	182 00	185 00	185 00	269 50	268 00	274 00	48 00	47 50	42 50
30 - 4 - 63	245 00	N.R.	237 50	180 75	185 00	187 50	268 50	266 00	279 00	46 50	47 00	49 00
1 - 5 - 63	H	O	L I	D	A	Y	H	O	L I	D	A	Y
2 - 5 - 63	245 00	N.R.	237 50	179 75	183 00	187 00	272 50	264 00	277 00	48 00	47 00	49 00
3 - 5 - 63	245 00	240 00	237 50	178 50	181 00	187 00	264 00	262 00	277 00	48 00	47 00	49 00
4 - 5 - 63	H	O	L I	D	A	Y	H	O	L I	D	A	Y
5 - 5 - 63	S	U	N	D	A	Y	S	U	N	D	A	Y
6 - 5 - 63	245 00	N.R.	237 50	177 50	178 00	187 00	262 50	259 00	277 00	48 00	47 00	49 00
7 - 5 - 63	245 00	N.R.	237 50	176 50	177 00	185 00	261 00	258 00	273 00	48 00	46 00	50 00
8 - 5 - 63	245 00	240 00	250 00	177 25	177 00	181 25	262 00	257 00	271 00	48 00	46 00	50 00
9 - 5 - 63	245 00	N.R.	250 00	177 50	180 00	181 25	262 50	257 00	271 00	48 00	46 50	50 00
10 - 5 - 63	245 00	N.R.	250 00	177 75	180 00	182 00	263 00	259 00	277 00	48 00	46 00	50 00
11 - 5 - 63	250 00	240 00	245 00	176 88	182 00	182 50	261 50	259 00	277 00	48 00	46 00	50 00
12 - 5 - 63	S	U	N	D	A	Y	S	U	N	D	A	Y
13 - 5 - 63	250 00	N.R.	245 00	177 00	183 00	182 50	261 50	259 00	275 00	48 50	46 00	50 00
14 - 5 - 63	250 00	N.R.	245 00	179 25	185 00	182 00	265 00	260 00	275 00	48 50	46 00	50 00
15 - 5 - 63	250 00	240 00	245 00	179 25	188 00	179 00	265 00	263 00	270 00	48 50	47 00	50 00

Source: (1) **Cochin:** Indian Chamber of Commerce, Cochin. (2) **Alleppey:** The Malavala Manorama. (3) **Calicut:** The Mathrubhumi.
N. R. = No report. * Prices quoted for office pass copra at Cochin and Calicut and for Thelivu copra at Alleppey. 1 Quintal = 220.462 lb.

II. Malabar

Arrivals and sales of coconuts and copra in the different markets in Malabar during the month of April 1963

Commodity - Markets	Carry over	Arrivals	Sales	Balance
Coconuts (in thousands)				
Kozhikode	350	4,200	4,250	300
Badagara	886	1,180	1,376	690
Ponnani	64	222	218	68
Tellicherry and Dharmadam	80	250	310	20
Tirur	84	379	386	77
Cannanore	7	74	75	6
Copra (in quintals)				
Kozhikode	2,460	15,300	14,200	3,560
Badagara	7,690	16,500	17,200	6,990
Cannanore	24	650	630	44

Weekly prices of coconut and copra in some of the Malabar markets during the month of April 1963

Commodity - Markets	1st week Rs. nP.	2nd week Rs. nP.	3rd week Rs. nP.	4th week Rs. nP.
Coconuts (husked for 1000)				
Badagara	255.00	253.00	255.00	263.00
Ponnani	230.00	241.00	233.00	233.00
Tellicherry and Dharmadam	205.00	205.00	203.00	205.00
Tirur	230.00	240.00	225.00	230.00
Cannanore	270.00	278.00	278.00	280.00
Copra at Badagara Market (per quintal)				
Office pass	171.00	173.00	170.00	173.00
Edible Copra				
Madras	203.00	203.00	203.00	203.00
Dilpas	180.00	178.00	183.00	183.00
Rajpur	225.00	224.00	223.00	228.00

General **1. Coconut:** Arrivals and despatches continued to be heavy, the season being at its peak. Prices also showed an upward trend.

2. Copra: Then was heavy arrivals and despatches. Prices were on the increase.

III. Colombo

The weekly prices of coconuts and coconut products at Colombo during the month of April 1963 are given below :-

Commodity	Unit	Week ending 6-4-63 Rs. cts.	Week ending 13-4-63 Rs. cts.	Week ending 20-4-63 Rs. cts.	Week ending 27-4-63 Rs. cts.
Fresh Coconuts - (Husked) used for copra making and local consumption	per 1000 nuts	85.00 to 110.00	150.00	150.00	150.00
Copra - Estate No. 1 quality at Buyers' Stores	per candy of 560 lb.	180.00	178.00	180.00	180.00
Desiccated Coconut - Wharf delivery or Buyers Stores' Medium and fine 50%	per lb.	0.45	0.45	0.44	0.44
Coconut oil - White, naked wharf delivery	per ton	1015.00	1020.00	1010.00	1010.00

Advisory and Information Service

Advice regarding various aspects of coconut cultivation and the coconut industry will be gladly furnished on request, free of charge, by appropriate officers of the Indian Central Coconut Committee.

Enquiries regarding breeding, cultivation, manuring etc. of coconut may be addressed to the **Joint Director, Central Coconut Research Station, Kasaragod,** those about pests and diseases and their control to the **Director, Central Coconut Research Station, Kayangulam, Oachira P. O.,** and requests for information on the coconut industry in general to the **Secretary, Indian Central Coconut Committee, Ernakulam - 1.**

May, 1963

IV. Malaya

SINGAPORE

Weekly prices of copra and coconut oil at Singapore market during the month of April 1963 are given below:-

Date	Copra $	Coconut Oil $
5-4-1963	29.50	45.38
11-4-1963	29.50	45.00
19-4-1963	29.25	45.00
26-4-1963	29.25	45.25

PENANG

Average monthly prices of copra and coconut oil at Penang market during the month of March 1963 are given below:-

Month	Copra $	Coconut Oil $
March 1963	28.75	46.00

NOTE : The prices quoted above are per picul F. O. B. Singapore and Penang inclusive of the cost of containers i. e. second hand drums in the case of coconut oil and second hand gunny bags in the case of copra.

One picul = 133⅓ lb. One M$ = Rs. 1.56.

prices advanced from the previous week's level. On the 17th a quintal of oil was priced at Rs. 270.00 which further increased to Rs 272.00 on the next day and closed on the 20th at Rs. 268.00.

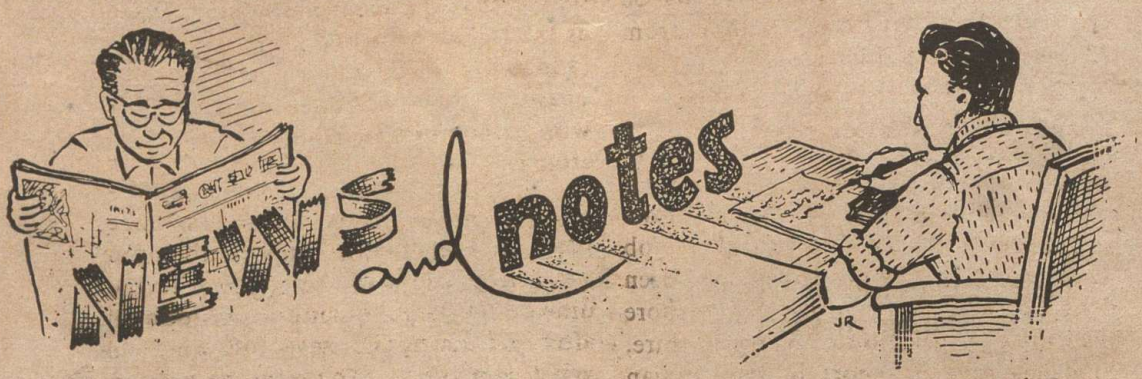
The market opened on the 22nd at Rs. 269.00. During the last week of April, the price slightly decreased due to lack of adequate railway booking facilities. On the 23rd the price of a quintal of oil was Rs. 268.00 which remained at the same level till the 25th. But on the 26th the price went down to Rs. 265.00 per quintal and the market closed on the 30th April at Rs. 266.00

The market opened on the 2nd May, 1963 at Rs. 264.00. In the first half of May, in sympathy with the Cochin market, the Alleppey market throughout displayed a sagging trend in prices. The expected arrivals of imported copra helped to keep the market at lower levels. On the 3rd a quintal of oil was quoted at Rs. 262.00 which gradually declined to Rs. 259.00 on the 6th, Rs. 258.00 on the 7th and Rs. 257.00 on the 8th. But towards the close of the second week the price slightly improved to Rs. 259.00 on the 10th, remained at the same level till the 13th and the market closed on the 15th at Rs. 263.00 per quintal.

WEATHER REVIEW

APRIL 1963

	TEMPERATURE				RAINFALL			Sunshine
	Maximum		Minimum		Quantity in m. m.	Departure from normal	No. of rainy days	Total hrs. of bright sunshine
	Highest	Average	Lowest	Average				
Central Coconut Research Station, Kayangulam	34.6°C	33.1°C	22.1°C	24.4°C	109.7	—24.7	11	265.1
Central Coconut Research Station, Kasaragod	34.5°C	33.5°C	21.9°C	24.5°C	17.8	—23.7	3	297.3



New Members of the Committee

The Government of Kerala have nominated the following persons to the Indian Central Coconut Committee.

Shri A. R. Sulaiman Sait, President, Oil Millers & Merchants Association, Alleppey, to represent the coconut oil industry.

Shri V. O. Abraham B. A., B. L., Kottayam, Shri P. Ramachandran Nair, Porkalangad Farm, Kanipayyur, Kunnamkulam, Shri C. A. Mathew, M. L. A., Thodupuzha and Shri N. Narayanakurup, B.A., B.L., Ex. M.L.A., Lakshmi Sadan, Champakulam P. O. (Alleppey Dist.) to represent coconut growers.

The term of office of the above-mentioned persons will be till the 31st March 1966.

Package programme

The following districts have been recently included in the Package Programme :- Alleppey and Palghat (Kerala), Burdwan (West Bengal), Mandya (Mysore), Sambalpur (Orissa), Surat (Gujarat), Anantnag and Jammu (Jammu and Kashmir), Bhandara (Maharashtra) and Cachar (Assam).

While the programme has been implemented in the first six districts, preliminary work such as selection, appointment and training of the staff has been completed in the four remaining districts. The latest area to be included in the programme is the Union Territory of Delhi.

Agricultural schemes

The Union Food Ministry has, says a report in the 'Indian Farming', asked the States to make higher allocations for agricultural production schemes during 1963-64. This means that funds would have to be diverted from other schemes to food production in view of the emergency. The Ministry has suggested that funds should be specially earmarked for expansion of production of rice, millets, gram, pulses, cotton, oilseeds, fruits and vegetables, milk, meat and eggs. Stress has been laid on agricultural development as laid down by the National Development Council. These include stepping up the targets for minor

irrigation and soil conservation by 50 per cent and that for dry farming from 22 million to 50 million acres.

Lightweight shelter for field workers

A lightweight shelter which allows field workers to carry on with their job of planting in bad weather has been designed and made at the Pershore Institute of Agriculture, Worcestershire, England, says a report in the 'Indian Farming'. It consists of a lightweight tubular framework over which wire netting and heavy guage polythene sheet are stretched. It is light enough for one man to carry, and has been designed to allow room for all operations carried out on the five-foot (1.52 m.) bedding system at the Institute.

Other shelters made with the same materials, but of varied shape, include one for pruning intensive orchard plantations. This is upright in shape with the open end facing the trees to be pruned and one which consists of a large plastic hood built on a rucksack frame which can be strapped on a worker's back.

The inpresso way

"A new method of packaging freshly roasted and ground coffee containers has been developed in Sweden", says a report in the 'Indian Coffee'. The method is developed by Akerlund and Rausing, Lund, in collaboration with Skanska Kaffe AB, Halsingborg. The pack, which is reported to keep the coffee fresh for up to 12 months without loss of quality and aroma, is made of a material based on polyethylene coated polyester film.

The new packaging technique, known as the Inpresso method, removes the air (and hence the oxygen which reduces the quality) from the coffee, and replaces it with carbon dioxide which preserves the aroma.

One of the reasons for the failure of previous attempts to pack fresh coffee was that the coffee produced carbon dioxide in large quantites immediately after and during the days following the grinding process. The resulting pressure caused the flexible packs to swell up and burst. To avoid this, the coffee had to be 'ventilated' a process which impaired the taste and aroma of the product.

The method developed by Akerlund and Rausing consists of chilling, vacumising and grinding the freshly roasted coffee and flushing it with carbon dioxide before packing it in the plastic pouches. The process, which is continuous and complex, is the result of several years experiments on numerous types of flexible materials and machinery designs. It enables the coffee to be packed in pouches leaving sufficient room for the generation of carbon dioxide without causing the pack to swell.

The Swedish consumer's authority responsible for food-stuff considers the 92.5 per cent vacuum is 'high' and permits 1.5 per cent oxygen to remain in the pack. A vacuum of 95 per cent is obtainable with the Inpresso method, which leaves 0.8 per cent oxygen in the containers.

What is reported to be an exclusive feature of the new system is the provision of an automatic continuous arrangement for carrying out an analysis of the contents of each packet of coffee, which

contains 125 grams—a quantity sufficient for a normal 1-2 days' consumption. Four pocuhes are packed in a carton to form a retail package.

Crop diseases calendar

The Indian Council of Agricultural Research, New Delhi has recently brought out a book entitled 'Crop Diseases Calendar'.

The calendar is an authoritative compendium on diseases of agricultural crops in India, which contains a wealth of information about the causal organisms or agencies, the chief symptoms, the time of occurrence of the diseases and the control measures against the diseases. The information is conveniently classified in a tabular form and presented crop-wise. The book deals with 41 crops, which include cereals, millets, oil seeds, sugarcane, cotton, jute, fruits, vegetables and plantation crops. The common names of various diseases are also given in addition to the scientific names. For each crop the various particulars about the diseases are given separately for the northern plains, peninsular India and for the hilly areas, and the time of appearance of these is listed month-wise from January to December. The disease symptoms indicated are very diagnostic and should help in easily detecting the diseases in the field. The control measures recommended include chemical treatment as well as mechanical and cultural practices wherever such have been known to be effective or practicable.

The calendar runs to 115 pages and is printed on art paper and is cloth-bound. It is profusely illustrated with 58 colour plates which are well-prepared and reproduced. Considering the large number of colour plates and the high quality of printing and get-up it is moderately priced at Rs. 11.25. The calendar should prove very useful to agricultural officials, students and institututions as well as to Block Development Officers, Extension workers and others in India who may be engaged or interested in the subject. It should also be of interest to plant pathologists in other countries, who can find in one publication all information on plant diseases, of major importance, of crop plants in India.