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BULLETIN

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THE INDIAN CENTRAL COCONUT COMMITTEE

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DO NOT PLANT YOUR COCONUT TREES TOO CLOSELY

IT is not often appreciated that the growth and development of the coconut trees depend upon the nourishment and sunlight they receive, and that the space allotted between trees has considerable influence on these aspects. An acre of land cannot support an unlimited number of coconut palms. Depending upon the need for nourishment, light etc., there must be a limit to the number of trees that should be planted in an acre of land. If the land is not planted with the proper number of trees the yield will naturally suffer. On the other hand, if too many trees are grown, then also the yield will be reduced as a result of over-crowding. The number of trees that an acre can support is influenced by several factors of which mention may be made of the texture and fertility of the soil, climatic conditions etc. The growth of the tree is considerably assisted in light soil and on well cultivated lands which have been properly broken up and aerated. In areas where rains are fairly plentiful it may be possible to plant more trees to the acre.

Disadvantages of over-crowding

Of the disadvantages of over-crowding mention may be made of the following:—

(1) Trees do not get enough root room and adequate supply of nourishment and sunlight. Consequently they grow tall and lanky in their struggle to get at light

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and considerable energy is expended in producing a tall trunk at the expense of yield.

(2) In closely planted gardens rat trouble may be serious as the rats find easy access from tree to tree due to overlapping of leaves.

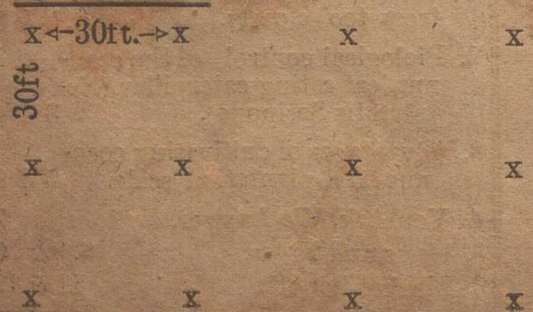
(3) Considerable difficulty is experienced in inter-cultivating the over-crowded gardens.

The majority of coconut gardens in India contain more trees per acre than the soil could support. There is no doubt that in Malabar, Travancore and Cochin over-planting has been encouraged by the system of land tenure in force under which a mortgage lasting 12 years is possible between the landlord and the tenant. The tenant is entitled, on eviction, to compensation for the trees he plants and the improvements he effects. In order, therefore, to strengthen his position and make the compensation as high as possible and eviction difficult, the tenant plants as many coconut trees to the acre as possible. Against this practice of over-planting on the part of the tenants it must be pointed out that the trees are widely spaced out when they are planted by landlords.

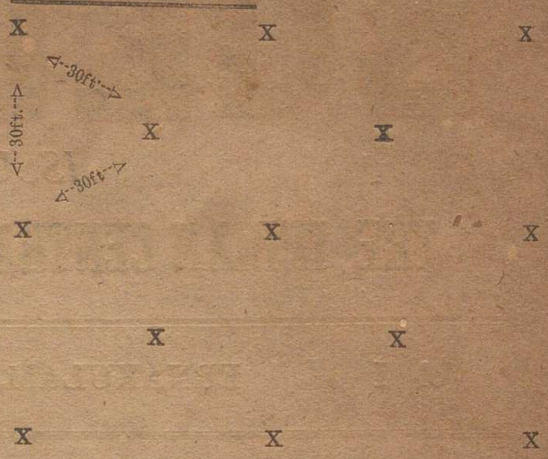
Square and Triangular Planting Methods

There are two methods of planting commonly adopted, namely, the square method and the triangular method. The methods are indicated below:—

Square Method



Triangular Method



It has been observed that for the same spacing more trees can be accommodated in an acre under the triangular method than in the square method. In the former, nearly 15 per cent more trees can be planted than in the latter.

Maximum number of Trees per Acre

The maximum number of trees that may be planted per acre under the conditions obtaining in the important areas of the Madras Presidency is roughly given as 70 with a spacing of 25 ft. between the trees, although a spacing of 27 to 30 ft. with about 55 trees per acre will suit most of the tracts. In any case, it is not desirable at all to have more than 70 trees to an acre. In Travancore, coconut palms spaced at the rate of 50 per acre are reported to give good yields. In Cochin, however, 60 to 70 trees per acre are recommended. More than 70 trees per acre is expected to result in over-crowding, thereby affecting the growth and yield of the tree.

It is interesting to note that wider spacing between coconut palms has been recommended in other important coconut growing countries. In Malaya, a planting distance of 30 ft. has been recommended; about 35 ft. in the Dutch East

Biological Control of the Coconut Leaf Eating Caterpillar

(Nephantis Serinopa)

"SET a thief to catch a thief" - that appears to be the idea underlying the biological control of pests. The coconut caterpillar, *Nephantis Serinopa*, causes great damage to the coconut palms growing in about every part of India. The pest lives on the underside of leaves and eats up the green tissues thus causing the leaves to dry up.

Its parasitic activity is in its caterpillar stage. The caterpillar is slender, pale grey in colour and has a distinctively blackish head. It feeds on the green matter of the leaves and constructs around it a gallery made of silk. When it has grown to about an inch in size it changes into a brownish pupa and it remains within its cocoon during the pupation period. At the end of this period it comes out as a white moth which lays small batches of scale-like eggs on the underside of mature coconut leaves. The eggs on hatching bring forth the caterpillars which immediately start feeding on the leaves.

This pest has some natural enemies, the most important of which, as far as West Coast conditions are concerned, is the Eulophid pupal parasite, *Trichospilus pupivora*. This attacks the pest in

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Indies, 30 to 33 ft. in the Seychelles and about 30 ft. in Ceylon.

Remove Unproductive Trees

From a close observation of the conditions prevailing in different parts of the country and an estimate of the yields of trees planted with different spacing by the growers there is no doubt that a spacing of 25 to 30 ft. between trees should be adopted depending upon local condition. Closer than 25 ft. or wider than 30 ft. may be considered as definitely uneconomic under most of the prevailing conditions. In other words an acre of coconut land should not be planted with more than 70 trees. It may be that in certain rich soils it is possible to grow more than that number under favourable conditions, but such cases are rare and exceptional.

The remedy for over-crowding, which results in reduced yield, is thinning out of unproductive or uneconomic trees until the right number of trees is left in the gardens. There is no doubt that the yield from over-crowded plantations can be increased by judicious cutting down of poor and unproductive trees to provide adequate space between the remaining trees so that they may give good yields. The most unproductive trees should be removed first to be followed by others where necessary according to the yield of the palms.

Do not, therefore, plant more than 70 coconut trees per acre and if your gardens are over-crowded it is better to thin out the plants by removing the unproductive ones.

its pupal stage. A parasitised pupa will appear to have a darker brownish colour. A week to ten days after parasitisation, the pupa bursts and a large number of the eulophid parasites emerge. They immediately attack the pupae of the ***Nephantis Serinopa*** and destroy them. Thus by artificially rearing and liberating these eulophid parasites in large numbers in infected gardens it is possible to control the pest.

Some practical details and hints for rearing the parasites are described hereunder for the information and guidance of the intelligent coconut grower. The equipment necessary for this consists of about a dozen specimen tubes 4 x 1 inch with corks, two or three glass petridishes and about two ounces of honey. First of all collect some pupae from nature, clean them carefully and place them in petridishes. Pupa infected in nature can easily be identified by its darkish brown colour. These may be collected and stored in specimen tubes--two pupae in each tube. These should be examined everyday for a week. Within this period the pupa bursts open liberating a large number of the eulophid parasites. They may be released on fresh tender pupae collected and kept in petridishes. The parasites vigorously attack the pupae, penetrate into their interior and lay their eggs inside. After two or three days infected pupae can be distinguished as before by their darker colour. They may be removed and placed in specimen tubes. When they burst, a strip of filter paper smeared with honey may be inserted into the specimen tubes to serve as food for the parasites. If this is done it is possible to keep the organisms alive for nearly five to six days. It is important to note that the span of life of the parasites is from four to five days and that they should be liberated in infected coconut gardens one or two days after they emerge from infected pupa in tubes. For releasing the parasites a climber goes up an infected coconut palm and when he reaches the top he opens the cork and holds the tube within the outer whorls of leaves. The parasites are very active and they immediately fly out and go in search of *Nephantis Pupae*.

In artificially rearing the parasites it is not absolutely necessary always to have *Nephantis Serinopa* pupae. The pupae of some other caterpillars like those of Bhindi (lady's finger) have been utilised for this purpose with advantage.—Dr. K. P. V. Menon, Plant Pathologist, Quilon.

Advantages of Cultivating Coconut on a Plantation Scale

INDIA occupies an important place among the coconut producing countries of the world, contributing about 1 .5 million acres to the world's total acreage of 8 million acres under coconut. The bulk of this area lies on the West Coast of India,comprising the districts of Malabar and South Canara and the States of Cochin and Travancore. In these tracts the coconut industry is the mainstay of the cultivator and plays an extremely important role in the rural economy. But a comparison of the production level of other countries with that of India shows that it is below the standard obtained in other countries and that the cost of production is also comparatively high. It is on account of these two factors, that India has not been able to stand foreign competition not only in the international markets but even so far as trade within the country is concerned.

In order to place the coconut industry on a basis which would enable it to increase production to the level obtained in other countries, and reduce the cost of cultivation, it is necessary to look into the causes that contribute to the low yeild of coconuts, and the high cost of cultivation and other production charges. One of the main reasons is that in India, unlike in other countries, coconut cultivation is not carried out on an organised and planned scale in large plantations. Owing to the various socio-economic factors, the holdings are small and uneconomic and the owners have seldom the means to pay proper attention to planned production or efficient marketing. Planting is done in a haphazard manner and scant attention is paid to the maintenance and upkeep of the existing gardens. Manuring, after cultivation adoption of remedial measures against pests and diseases, are indispensable for efficient production and the absence of these in most of the existing coconut areas in this country is one of the main contributory causes for low yield of nuts per acre. Again, the processing of the produce and its marketing have not been rationalised, in a manner conducive to the development of the industry on modern lines. The disjointed holdings have rendered the cost of collection of nuts high, placing a heavy strain on efficient marketing.

To remedy the existing state of affairs in regard to the industry, it is necessary that drastic changes are effected in the method of cultivation, processing and marketing. In order to organize more effectively increased production, the raising of large scale plantations would appear to be the first requisite. The advantages of raising coconuts on a plantation scale are many and are briefly enumerated below:-

1. **Intercultivation**: Experience in other countries and experiments carried out over a series of years in the Coconut Research Stations in the Madras Province have demonstrated beyond doubt that

periodic and systematic intercultivation (tillage) is a sure means of obtaining increased yields. Digging or ploughing the garden twice in the year even without manuring has been found to increase the yield of coconuts over 100 per cent. This practice is not widely adopted as it is a very costly item and may not leave a good margin of profit under existing conditions. The use of labour-saving implements, cattle drawn or power driven, which is the only feasible method of reducing cost is precluded in the existing small holdings which are generally overcrowded and irregularly planted. Large scale plantations enable the grower to make full use of the farm equipment of implements, animal and labour efficiently and economically.

2. **Manuring**: Besides tillage, coconut responds to judicious manuring, and application of the proper dosages of nitrogenous and potassic manures results in considerable increase in yield. The raising of green manure crops and the maximum utilisation of all the green matter available are also facilitated in large scale holdings. Large scale plantations would also enable the cultivator to purchase his requirements of artificial or other fertilisers which will be fairly appreciable at favourable rates from wholesale dealers, whereas the small cultivator has to purchase his requirements from retailers at exorbitantly high rates.

3. **Control of pests and diseases**: Pests and diseases take a heavy toll year after year in coconut plantations and the small cultivator has seldom the means to adopt measures which will keep them checked. The provision of spraying equipment and chemicals needed to control pests and diseases, the command of trained personnel to carry out the remedial measures in time, are within the means of owners of large scale plantations, and the bulk of the loss to coconut plantations caused by depredations of insects or fungus diseases can be reduced to a great extent without appreciably increasing the cost of production. That neglect to take proper notice of diseases and control them at the initial stages will result in great loss of production is clearly evident from the destruction caused by the spread of the root and leaf diseases in Travancore and Cochin which originally started in small holdings.

4. **The evil of uneconomic holdings**:- The small holder does not get sufficient income to maintain himself and his family from the produce of his holding. He, therefore, seeks other avenues of income, with the result that a vicious circle of neglect and deterioration and low yeild is created from which he rarely escapes. Large scale plantation involves whole-time attention, with its consequent advantages.—Mr. C.M. John, Oil Seeds Specialist, Coimbatore.

(To be continued)

YOU ASK, WE ANSWER

I. Mr. K. C., Thalavady writes:

"I request you to be good enough to give me the address of the companies from which I can buy Spraying Machines (hand machine or pump machine) and their approximate price".

Good American-make hand sprayers are obtainable from Water Supply Specialists Ltd., Gopathi Road, Thyagarajanagar, Madras. 2½ gallons Kwik fill sprayer made of galvanized iron costs 5.25 dollars. The same in brass costs 9.50 dollars.

Indian-made one gallon sprayer in copper is obtainable at the Standard Furniture Works, Kallai P.O. (S.Malabar). The approximate cost will be Rs. 40.

Hyject foot pumps are available with Tube Well Corporation, Opposite Chandni Chowk P. O., Delhi. With 80 ft. armoured rubber hose, the approximate cost will be Rs. 300.

II. Mr. P. V., Arpukara writes:

"I shall be glad if you will kindly advise me the right proportions, time and method of manuring the young and bearing coconut trees; and whether the same mixture can be used for paddy fields in the interior".

The coconut responds very favourably to the application of both ammonium sulphate and groundnut cake. They are meant to make good the nitrogen requirement of the coconut and either of these can be used-Ammonium Sulphate at the rate of 3 lbs. per tree and groundnut cake at the rate of 7 lbs.

But in addition to this, good quality firewood ash at the rate of 20 lbs. per tree should also be applied It is not advisable to mix ash with either Ammonium Sulphate or groundnut cake. It has to be applied separately. The best time for the application of manure is May-June before the South-West monsoon. In the case of young non-bearing seedlings it is enough if ash only is applied at the rate of 8—12 lbs. per seedling.

The response of coconut palms to applications of super phosphate and bone meal has not been encouraging. It would be better to use these for manuring paddy fields.

NEWS & NOTES

IN MEMORIUM

As we are sending this issue of the "Bulletin" to press the whole country has been plunged into the deepest sorrow by the tragic demise of MAHATMA GANDHI.

By identifying himself with the poorest, the lowliest and the lost, Gandhiji had grown into the very fibre of our being, and it is with the stunning blow of a personal bereavement that his death has come to each one of us.

The hearts of countless men and women bleed today and the poignancy of their grief is beyond description.

Time, the great healer, may blunt the edge of our grief; but there can be no slackening on our part in the discharge of the duty that has devolved on us by Gandhiji's passing away.

For, in the midst of the surrounding sorrow and gloom his unseen presence still beckons unto us, like a kindly light, to tread the path of Truth and Non-violence; and it enjoins on us to cultivate to that end the qualities of self-reliance, courage, faith, tolerance and forbearance.

Let us then, each in his own sphere and each according to his capacity, endeavour to follow in the footsteps of him who was the LEADER, TEACHER and FATHER of our Nation.

"The Indian Coconut Journal"

THE first issue of "The Indian Coconut Journal", published quarterly by the Indian Central Coconut Committee has just been issued. As Sardar Bahadur Sir Datar Singh, Vice-Chairman, Indian Council of Agricultural Research, and President of the Committee, says in a note entitled "On Ourselves": "There is a large volume of information of scientific and economic importance available in regard to this (the coconut) industry. It will be the function of those responsible for the publication of this Journal to co-ordinate, compile and present this body of information, both indigenous and foreign for the lasting benefit of those connected with the coconut industry."

The issue contains interesting and varied fare. Mr. K. Gopalan, Secretary of the Committee leads off with an article on "The Coconut Industry in India." Rao Sahib A. K. Menon writes an informative and useful article on "Coconut Oil and Its Uses". Next comes Dr. P. J. Thomas with a discussion on coconut prices in recent years. Dr. K. L. Moudgill describes experiments connected with the economic conversion of coconut shell into charcoal and suggests that the production of this charcoal can be taken up as a cottage industry, particularly, in the interior villages. "Soil Conservation with particular reference to coconut cultivation" by Mr. Emil J. Livera, Soil Conservation Officer of the Department of Agriculture, Ceylon, is a very useful contribution and the suggestions contained in it can be missed by no sincere coconut grower. Soil erosion which takes place under our very eyes but unknown to us, has been described as "a creeping death" and it is up to coconut growers to take all steps to prevent such erosion and conserve the soil. Under the heading "The Indian Central Coconut Committee at Work," the Journal also publishes extracts from the Committee's first Annual Report.

The Journal has been launched with messages of good wishes from Dr. Rajendra Prasad (a portrait of whom adorns the Journal as frontispiece) and several Provincial and State Ministers. It is priced at eight annas a copy while the annual subscription is Rs. 2|-.

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Ceylon Copra Quota

It will be recalled that it was published in an earlier issue of the "Bulletin" that 75,000 tons of Ceylon Copra had been allotted to India as this country's annual share of the exportable surplus from the Island. It is now learnt that owing to failure of the crop, the original quota figure for 1947 was reduced to 37,000 tons of which 7000 tons have been earmarked for Pakistan.

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Green Manure for Coconut Trees

Growers in Travancore State will be interested to learn that sunn-hemp seeds for sowing in coconut gardens are available with the Director of Agriculture, Travancore, Trivandrum. Sunn-hemp provides excellent green manure for coconut trees. Green manure serves a two-fold purpose. While it is growing it protects the soil from erosion and when turned under the soil it adds organic matter to it. In the words of Mr. Emil J. Livera, Soil Conservation Officer, Ceylon: "Soil organic matter is the most important of the factors which influence not merely the conservation of the soil but maintains the very fertility of the soil".

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Ash and Ammonium Sulphate

In the article on "Cocouut Cultivation" published in the December 1947 issue of the "Bulletin" it was mentioned that the best of all manures (for the coconut tree) was a mixture of three pounds of ammonium sulphate and twenty pounds of ash applied annually to every tree. Expert opinion, however, has it that while applying these manures they should not be mixed up and applied. They are best applied, it is said, separately with an interval of at least one month between the two applications.

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Growers' Co-operatives

We would like to bring home once more to the minds of coconut growers, particularly of the smaller ones amongst them, the importance of co-operative effort, if the various steps that have to be taken for the improvement of coconut cultivation and the development of the coconut industry are to bear fruit in ample measure. We have received letters from some of our readers asking us how we could expect the small growers to go in for such costly equipments as pump sprayers etc. The answer is obvious and consists of one word: "CO-OPERATION". It should not at all be difficult for growers of a particular locality to start Co-operative Societies which could purchase not only sprayers, but inter-cultivating implements and give them out on hire to those requiring them. These Societies could also stock for sale chemicals for the spraying mixtures, green manure seeds, etc. In many localities it should be possible for the existing Co-operative Societies themselves to undertake the above tasks.

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Valkom-Shertallai Copra Marketing Co-operative Society

It is reported that the above Society did brisk business in the month of Vrischigam 1123 (November-December 1947). It collected Copra of the value of Rs.36,341 and sold Copra valued at Rs. 39,847. Unhusked coconuts were sold at Rs. 130 per thousand. In the month of Dhanu 1123 (December 1947-January 1948) the Society purchased Copra of the value of Rs. 37,704 and sold Rs. 34,344 worth of the commodity.

x x x x

The Narakkal Coconut & Copra Marketing Co-Operative Society

The above Society has come to an understanding with the Tata Oil Mills Co., Ernakulam, to supply the latter regularly with the Copra that the Society is making. It is hoped that the supply and intake will be regular and will help to make the Society more popular and useful.

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Madras Scheme to raise Green Manure

A five-year scheme to increase the yield of coconut trees in Malabar and South Kanara by growing a particular kind of sunn-hemp which yields considerable quantities of green leaves for manurial purposes has been submitted by the Madras Director of Agriculture, Mr. M. S. Sivaraman, to the Government of Madras, according to a report in THE MAIL.

This scheme points out that manurial experiments conducted in S. Kanara (Nileshwar and Kasargode) Coconut Research Stations, had revealed that application of 3 to 4½ lbs. of ammonium sulphate and 20 lbs. of ash as a top dressing with about 100 to 200 lbs. of green leaves, for coconut trees, increased the yield of coconuts. The economic method of applying green leaves was by raising green manure crops during the monsoon season, and incorporating them into the soil. Among the green manure plants it was found that 'Crotalaria Striata' (a kind of sunn-hemp) produced the best yield of 15,000 to 20,000 lbs. of green leaves, which were not eaten by goats. The object of the scheme is to multiply seeds under, seed farm conditions in eight selected taluqs of Malabar and S. Kanara, to increase the quantity of available green leaves to manure about 6,000 acres in each of the eight Taluqs. It is expected that an area, with a total of about 39 lakhs of trees, would be covered by this scheme.

MARKET REPORT

(JANUARY 1948)

Cochin, Alleppey & Calicut

Generally speaking, depression characterised the market during the month of January.

The dawn of the New Year saw the price position as follows:-

1—1—1948

	Cochin			Alleppey			Calicut		
	Rs.	A.	Ps.	Rs.	As.	Ps.	Rs.	As.	Ps.
Coconuts per 1000	125	0	0	--			113	8	0
Copra (per ton)	947	15	0	889	3	0	880	0	0
Coc. Oil (per ton)	1321	6	0	1256	14	0	1280	0	0
Coc. Oil Cake (do.)	392	8	0	376	3	0	416	0	0

The above level was maintained only for the next 3 days and then the fall began. On the 6th, oil in Cochin went under the Rs. 1300 mark and for the rest of the month it was not able to reach or go beyond it.

The price position on the 8th January was reported as hereunder:

8—1—1948

	Cochin			Alleppey			Calicut		
	Rs.	As.	Ps.	Rs.	As.	Ps.	Rs.	As.	Ps
Coconuts per 1000	122	0	0	--			112	8	0
Copra (per ton)	920	11	0	855	0	0	864	0	0
Coconut oil (per ton)	1244	10	0	1197	0	0	1248	0	0
Coconut oil cake (per ton)	395	9	0	369	5	0	416	0	0

During the 2nd week prices of oil and copra showed a slight tendency to look up. Coconuts in Cochin remained at Rs. 122 while cake went down to Rs. 392-2-0.

The report for the 15th January was as follows:—

15—1—1948

	Cochin			Alleppey			Calicut		
	Rs.	As.	Ps.	Rs.	As.	Ps	Rs.	As.	Ps.
Coconuts per 1000	123	0	0	—			117	8	0
Copra (per ton)	954	13	0	889	3	0	912	0	0
Coconut oil (per ton)	1295	13	0	1231	3	0	1312	0	0
Coconut oil cake (per ton)	392	2	0	359	2	0	400	0	0

The third week saw again a downward trend but coconuts were quoted better and the prices were reported to be as follows on the 22nd.

22—1—1948

	Cochin			Alleppey			Calicut		
	Rs.	As.	Ps.	Rs.	As.	Ps.	Rs.	As.	Ps.
Coconuts per 1000	125	0	0	—			120	0	0
Copra (per ton)	886	0	0	889	3	0	864	0	0
Coconut oil (per ton)	1244	10	0	1231	3	0	1248	0	0

ARSIKERE and TIPTUR

(Mysore)

The Chief Marketing Officer in Mysore reports as follows:-

During the period under report, the arrivals of coconuts, Copra and Coconut oil to Arsikere and Tiptur Markets, in general, were rather poor, as the booking at Tiptur remained closed during the entire period. The merchants were also not in a position to export the coconuts and copra outside the State for the same reason. The booking towards Northern India from Arsikere was not favourable and the demand for copra was rather less. The prices of coconuts have shown an upward tendency, while those of copra remained almost steady throughout.

The price position during this period is as follows:-

III WEEK OF DECEMBER 1947.

	Tiptur Rs.	Arsikere Rs.
Coconuts per 1,100	150 to 180	100 to 185
Copra - one satta of 10 mds. or 315 lbs.	270 to 275	260 0 0
Coconut oil per md. of 24 lbs.		
I variety	15 to 18	15|-
II „	13-12-0	
III „	12-0-0	

IV WEEK OF DECEMBER 1947

Coconuts per 1,100	150 to 170	110 to 195
Copra - one satta of 10 mds. or 315 lbs.	250 to 255	245 to 250
Coconut oil per md. of 24 lbs.		
I variety	14|8 to 17	15|-
II „	13|-	
III „	11|8	

I WEEK OF JANUARY 1948

Coconuts per 1,100	150 to 265	110 to 200
Copra - one satta of 10 mds. or 315 lbs.	250 to 265	265|-
Coconut Oil per md. of 24 lbs.		
I Variety	20|-	15|-
II „	13-12-0	
III „	11-4-0	

Coconut oil cake (per ton)	388	11	0	348	13	0	368	0 0

The last week of the month also did not register any appreciable improvement in the market. The prices on the 29th were reported as below:-

29—1—1948

	Cochin			Alleppey			Calicut		
	Rs.	As.	Ps.	Rs.	As.	Ps.	Rs.	As.	Ps.
Coconuts per 1000	124	0	0		---		114	8	0
Copra (per ton)	886	10	0	897	12	0	864	0	0
Coconut oil (per ton)	1270	3	0	1248	5	0	1248	0	0
Coconut oil cake (per ton)	381	14	0	359	2	0	368	0	0

It was reported from Alleppey during the middle of the month that the local Produce Merchants' Association had sent representations to the Government of India taking a serious view of the declining prices.

II WEEK OF JANUARY 1948

Coconuts per 1,100	160 to 200	120 to 200
Copra - one satta of 10 mds. or 315 lbs.	255 to 260	260|-

Coconut oil per md. of 24 lbs.

I Variety	18|12|-	15|-
II „	15/-	
III „	13-4-0	

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