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Panch Sheel Of Coconut Culture

THE SIX MONTHS FROM NOW ON ARE VERY IMPORTANT TO EVERY COCONUT grower who would do his duty by his coconut palms as he expects them to do by him. For, as in all other transactions in this world, coconut cultivation is also a two-way traffic. The grower gives his palms the essentials of food, water, "medical" aid and favourable environmental conditions and the palms which are more than grateful, give him of their best ungrudgingly round the year.

WHAT THE COCONUT GROWER HAS TO DO MAY BE REDUCED TO A FIVE-point programme which not inaptly may be styled the *panch sheel* of coconut culture.

WHAT ARE THEY?

THEY ARE

1. the growing of green manure crops in coconut gardens;
2. the application to the palms of fertilisers, manures, sand, silt or clay according to suitability;
3. the cultivation of the soil by digging or ploughing and the removal of weeds;
4. timely control of pests and diseases; and
5. irrigation of coconut gardens wherever necessary.

RIGHT NOW WE ARE IN THE MIDDLE OF THE HOT SEASON AND IN MOST coconut gardens the water-table would have sunk so low that there

(*Continued on page 394*)

Soil Survey of Coconut-growing Villages in Kasaragod Taluk

Survey and classification of soils on a scientific basis yield information and data to serve as basis for research and extension work

By M. P. SANKARANARAYANAN,
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and K. M. PANDALAI
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THE fundamental purpose of soil survey is utilitarian and is to make predictions on land use capability. It serves to give an intimate knowledge of the soil resources of an area so vital in assessing its potential value for efficient and sustained crop production. Modern soil survey includes those researches necessary to determine the important characteristics of soils to classify them into well-defined types and other classification units, to delineate their distribution on a soil map and to correlate and predict the suitability and

adaptability of soils to various farming and agronomic practices, for pasturing, irrigation, soil conservation, afforestation and engineering purposes. Soil classification is an important and integral part of agricultural planning and development. A scientific classification according to uniform standards enables the proper utilisation of experimental results of manuring, cultural practices, etc., obtained in one soil-climatic region to be applied with a degree of certainty to soils with similar characteristics occurring elsewhere.

Soil survey for agricultural development

Standard soil survey takes into account all soil characteristics that influence the various uses to which it can be put. Prior to 1928, soil survey for classification of lands was done in India mainly for revenue purposes and in selected areas for agricultural use such as improving the productivity of the soil. During the last decade, a number of States started soil survey as an integral part of their agricultural development programme. Adoption of a standard soil survey with uniform procedure and technique is of very recent origin in this country, with the initiation of an All India Soil Survey Scheme in 1956, by the Indian Agricultural Research Institute, New Delhi. A committee of experts appointed earlier by the Government to review the research work of the Central Coconut Research Stations, recommended that a detailed soil survey of the entire coconut-growing regions should be conducted, the object of the scheme being classification of the soils on a scientific basis, preparation of soil maps and assessment of the inherent fertility status of the different regions so that the valuable information and data collected thereby may serve as the basis for research and extension work in coconut development projects as well as to meet the urgent needs of the growers in knowing about the fertility status of their soils for increasing productivity of their gardens. The scheme started functioning in 1960, commencing the survey from Kasaragod Taluk of Kerala State, adopting the same technique and procedure as that of the All India Soil Survey Scheme. The salient features of the survey carried out in the major coconut-growing villages of this taluk are presented in this paper.

Location

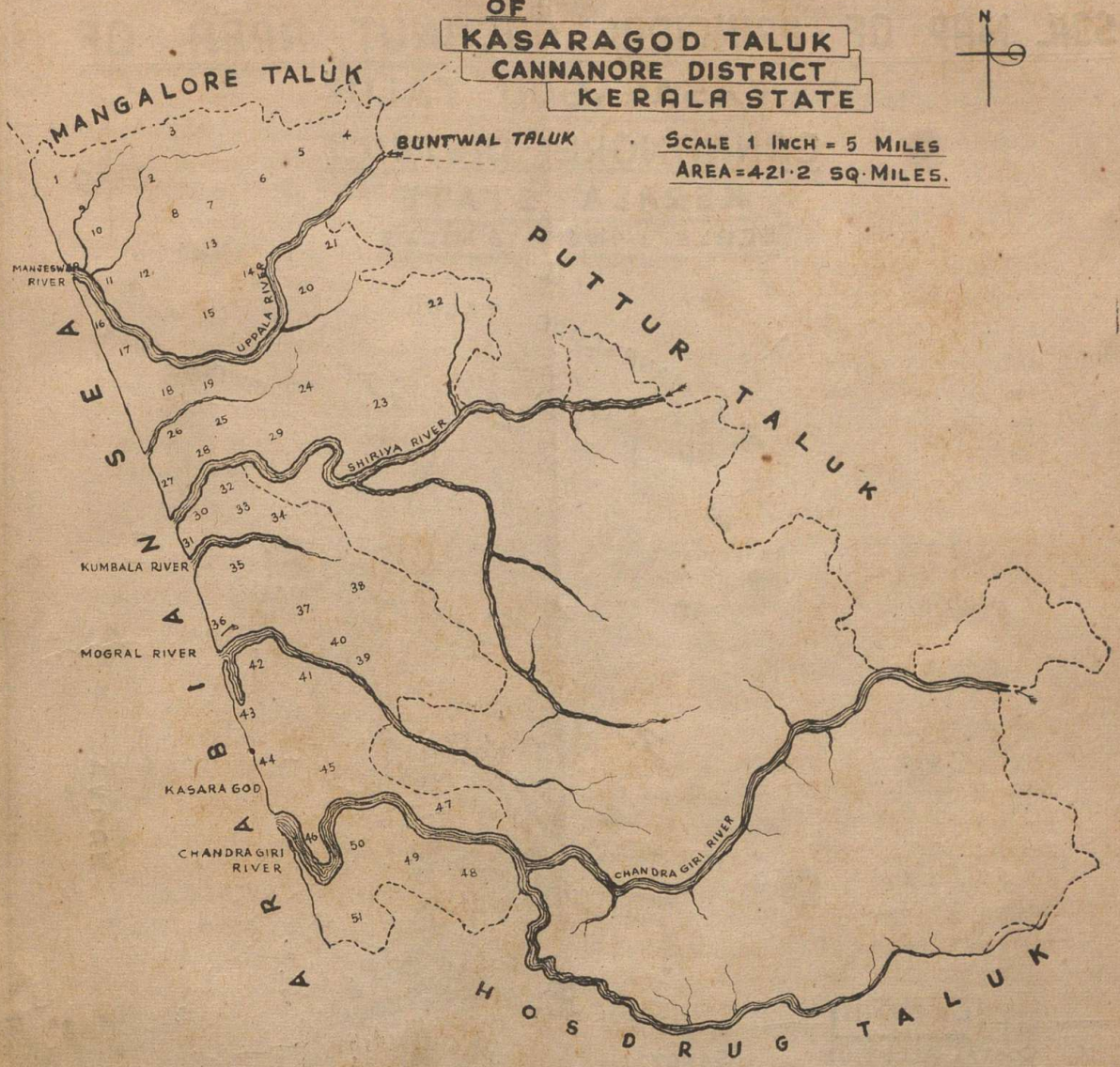
Kasaragod Taluk of Cannanore District has an area of about 462 square miles and it is located at the northern end of Kerala State, bordered by Mysore State on its north and east and bounded by the Arabian Sea on the west and Hosdurg Taluk on the south. The survey covered fifty-one principal coconut-growing villages (represented on map 1) with a total area of 167 square miles, of which the extent of coconut gardens is estimated at 8,000 acres. The names of the villages surveyed, with their total extent and the area under coconut are furnished in Table I (pp. 361 and 362).

Topography, landscape and river system

The coastal belt on the west is flat to level, the middle uplands nearly flat to gently undulating and the hilly terrain on the east is moderately to highly undulating. The Uppala, Shyriya, Kumbla, Mogral and Chandragiri are the important rivers that drain the area,

No. 1

MAP SHOWING THE PRINCIPAL COCONUT GROWING VILLAGES OF KASARAGOD TALUK CANNANORE DISTRICT KERALA STATE



REFERENCE

Villages included in the survey

1. Kunjathur. 2. Pavuru. 3. Vorkadi. 4. Pathuru. 5. Kodlamogaru. 6. Kolyuru. 7. Kaliyuru. 8. Badaje. 9. Udayavara. 10. Hosabettu. 11. Bangramanjeswara. 12. Majibailu. 13. Talekala. 14. Minja. 15. Kuluru. 16. Uppala. 17. Mulinja. 18. Kodibailu. 19. Bekuru. 20. Paivalike. 21. Chipparu. 22. Bayaru. 23. Kudalamerkala. 24. Kayaru. 25. Kubanuru. 26. Mangalpadi. 27. Shyriya. 28. Ichalangode. 29. Herur. 30. Bombrana. 31. Arikadi. 32. Ujarulvaru. 33. Ichalampadi. 34. Edanadu. 35. Koipadi. 36. Mogral. 37. Kannuru. 38. Bela. 39. Madhuru. 40. Patla. 41. Shirivagilu. 42. Puthuru. 43. Kudlu. 44. Adkathbail. 45. Kasaragod. 46. Talankara. 47. Chengla. 48. Tekkil. 49. Parambale. 50. Chemnad. 51. Kalnad.

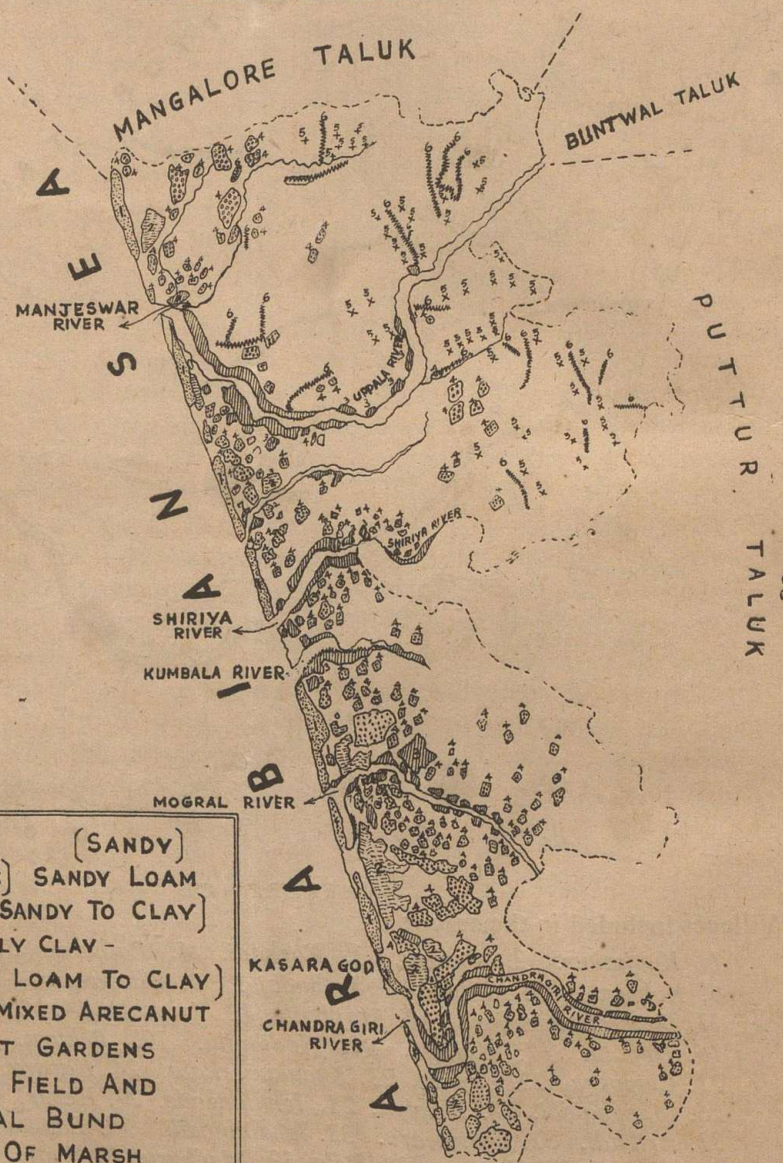
Total area of the villages surveyed = 167.13 sq. miles.

Total coconut area = 8000 acres.

No-2

SOIL MAP OF PRINCIPAL COCONUT AREA OF KASARAGOD TALUK CANNANORE DISTRICT KERALA STATE

SCALE 1 INCH = 4 MILES



LEGEND

- Costal Alluvium (Sandy)
- 2 Red Soil (Lateritic) Sandy Loam
- River Alluvium (Sandy To Clay)
- Laterite (Gravelly Clay - Loam To Clay)
- 5 Made Up Soil Of Mixed Arecanut And Coconut Gardens
- 6 Made Up Soil Of Field And Canal Bund
- 7 Reclaimed Soil Of Marsh Subject To Tidal Action

flowing westwards towards the Arabian Sea, joined in their course by a number of streams and canals. During the hot season the water of these rivers will be saline up to a considerable distance upstream and unsuitable for irrigation unless the rivers are bunded. They are in spate during the monsoon for short periods, submerging the neighbouring paddy fields and coconut groves.

Climate

The tract has a warm, humid tropical climate with annual precipitation ranging from 130 to 140 inches (3250 mm. to 3500 mm.), bulk of which is received during the two monsoons, the south-west and the north-east. The mean maximum and minimum temperatures range from 29°C to 34°C and 21°C to 25°C respectively.

Geology

Gniesses and granites form the principal parent rocks of the area, from the weathering of which the soils are mainly derived.

Natural vegetation

The natural vegetation consists of grasses, shrubs and forest trees. 'Muli' *(Apocopis wrighti)* forms an important fodder grass as well as thatching material growing wild in this area and nut grass *(Cyperus rotundus)* is a common but troublesome weed of the coconut gardens.

Agriculture

Paddy, pulses (black gram, horse gram, green gram), tobacco, sweet potato, plantain and vegetables form the principal cultivated aunual crops, while coconut, areca, pepper and cashew are the main plantation crops.

Local agronomic practices in coconut gardens

In this taluk, coconut cultivation is largely confined to the coastal belt, the flood plains of the rivers, the uplands, foot-hills and terraced slopes. On a small scale it is also raised in areca gardens along the borders and on field and canal bunds. *West Cast Tall* is the most common variety of coconut largely planted in this area, the seedlings of which are mostly raised locally by the growers themselves. The usual transplanting period is from June to September. The crop is invariably raised under rainfed conditions except in a very few places. According to the local practice the palms are manured and gardens intercultivated once in two years or at wider intervals, depending upon the financial resources of the growers. Green leaf, cattle manure, compost, wood ash and fish manure (raw or oil expelled) are some of the materials commonly used for manuring, either alone or in combination, according to their easy availability and cheapness. Application of common salt irrespective of soil type is also very popular with the cultivators. The usual tillage practice consists of either digging or ploughing the interspaces. Manures are invariably applied during July–August in circular trenches of two to three feet radius and twelve to eighteen inches depth. Intercrops in gardens are only seldom manured. Use of fertilisers and *in situ* application of leguminous green manures are rare practices. In general, it may be stated that manuring of coconut in this area is unsystematic, inadequate and

unbalanced, resulting in low average yield.

Pests and diseases

The major pest affecting the crop is the rhinoceros beetle. The damage caused by field rats is also not negligible in some of the gardens. Incidence of bud rot and stem bleeding is also noticed on a minor scale, the latter especially in shallow, gravelly soil with hard laterite substratum and in poorly drained soil with saline subsoil water.

Soils — general characteristics and distribution

In the area surveyed, the soils under coconut cultivation may broadly be classified into the following major groups or associations, the distribution of which is shown on map 2 (p. 354):—

1. Coastal alluvium, 2. Red soil (lateritic), 3. River alluvium, 4. Laterite, 5. Made-up soil of mixed areca and coconut gardens, 6. Made-up soil of field and canal bund cultivation, 7. Reclaimed soil of marsh and swamp subject to tidal action and seasonal floods. The sub-division of these into lower categories has not been dealt with in this article. The textural classes of each group with the ranges for organic matter, nitrogen, available phosphoric acid (P_2O_5) and potash contents (K_2O) and soil reaction (pH) are presented in Table II (p. 363).

Coastal alluvium

The soil is of a very coarse texture with more than 95 per cent sand fractions, very loose and porous, excessively drained, susceptible to drought, very poor in humus and major plant nutrients and slightly acid to neutral in reaction (pH).

It is found to occur in all the coastal villages of this taluk, as indicated on map 2.

Red soil (lateritic)

It is sandy loam in texture, easily friable, very deep with good root penetration, well drained and permeable. Though better than the first in organic matter and nutrient status it is not adequately supplied with the major plant food elements having only a low to a medium status of nitrogen, available phosphoric acid (P_2O_5) and potash (K_2O). The reaction (pH) is medium to slightly acid.

This is met with in parts of Udayavaram, Uppala, Mangalapadi, Arikadi, Koipadi, Mogral, Puthur, Kudlu, Adkathbailu, Chemnad and Kalnad villages.

River alluvium

Three soil types have been identified under this group (sandy, sandy loam and silty clay loam to clay) depending upon the materials deposited when the rivers are in spate. It has fairly high nitrogen and organic matter contents except in places where the soil is sandy. The amounts of potash and phosphoric acid in forms easily available to the plant are low. It is slightly acidic in reaction (pH). The subsoil and sub-soil water are saline in some parts adjacent to the river during the hot season due to the influx of sea water at high tides.

Portions in close proximity to the rivers at Udayavara, Bangramanjeswara, Uppala, Majibailu, Mulinja,

Shyriya, Ichalangode, Herur, Arikadi, Bombrana, Ujarulavaru, Koipadi, Mogral, Kannuru, Puthuru, Madhuru, Shirivagilu, Talankara, Chemnad, Thekkil and Kalnad villages, come under the above soil group.

Laterite

This is usually characterised by a clay loam to clay soil at the top underlain by a hard or soft bed of laterite. Presence of ferruginous gravel and concretions is a common feature. The soil is shallow to deep, well drained and moderately to severely eroded depending upon the gradient of slope. In valley lines it is fine in texture (clay), less gravelly, very deep but slowly drained. Though fairly high in nitrogen content, phosphate and potash in their available forms are present in very small amounts. It is more acidic than the soils described above.

This is found to occur in all the villages surveyed to a larger or smaller extent.

Made-up soil of the mixed areca and coconut gardens

With the rise in price of areca, a considerable area of paddy fields and hill slopes in this region with perennial source of water supply has been converted to areca gardens, on the borders of which coconut is also planted.

The soil over here is made up in the sense that the different top layers do not bear any sequence in characteristics between themselves or with the original soil at the substratum formed *in situ* since the materials used for levelling up the area to be planted are collected and transported from different places by human labour. Further it is also a common practice with the areca growers of this place, to apply earth or partially weathered laterite '*murum*' and level up the gardens at intervals of three to four years. The garden soils thus made up are likely to vary in their properties.

Typical soils examined in some of the areaca gardens having coconut on their borders, are found to have loamy to clayey texture, moderately good drainage and permeability with fairly high water table. Gardens in valleys are found to have poorly drained soil unlike at the foot-hills and slopes. The plant nutrient status is medium to high, for the practices of manuring, intercultivation and irrigation are more regular in areca plantations. Parts of important areca-growing villages like Paivalike, Bayaru, Chipparu, Kodlamogaru, Kayaru, Bekuru, Vorkadi, Pathuru, Kolyuru and Talekala are occupied by soil of the above nature.

Made-up soil of the field and canal bund cultivation

Planting coconut on broad field and canal bunds is also in vogue in the northern and eastern parts of this taluk, especially in the villages of Vorkadi, Kodlamogaru, Kolyuru, Badaje, Minja, Kolyuru, Paivalike, Bayaru and Kudalamerkala. Since the bunds are repaired and reinforced periodically the characteristics of these made-up soils are also likely to differ from place to place. Examination of some typical areas has shown that the soil texture ranges from sandy clay loam to clay and the drainage and permeability are moderately good. Nitrogen content is fairly high, but available phosphate and

potash status is low. The soil is also acidic in reaction (pH).

Reclaimed soil of marsh and swamp subject to tidal action

As there is very little scope for expansion of coconut area in arable lands, reclamation of lowlying marsh and swamp adjacent to rivers and backwater has now been taken up by a few growers here.

The soil upto about two feet is coarse (sandy to loamy sand) and further down it is fine (clay). The water table is very high and often fluctuating due to tidal action, resulting in impeded drainage of the subsoil. It has medium to high nitrogen and organic matter contents with low amounts of phosphate and potash in their available forms. The subsoil is strongly acidic.

Portions of Bangramanjeswar, Uppala, Shyriya, Arikadi, Puthuru and Kubanuru villages come under this soil class.

Of the afore-mentioned groups, the laterite has the largest area under coconut, followed in order by the river alluvium, coastal alluvium, red soil (lateritic), made-up soils and the reclaimed series.

Inferences and recommendations

Although fair status of particular plant food elements is indicated by some of these soil groups, it need not be over-emphasised that the same will not be kept up unless they are replenished regularly by a complete and balanced manurial schedule to compensate for the normal uptake by the crop and the natural loss of nutrients due to leaching and soil erosion. The proper schedules for each group consistent with the soil characteristics and availability of materials are suggested below. The manurial combinations have been prescribed on the basis that an adult palm requires about 0.25 to 0.50 kg. of nitrogen (N) 0.1 to 0.25 kg. of phosphoric acid ($P_2 0_5$), and 0.35 to 0.75 kg. of potash ($K_2 O$) per year over and above a basal dose of 25 to 50 kg. of green leaf, well rotted cattle manure or compost, which is common to all schedules.

Coastal alluvium

Being a very coarse soil deficient in humus and major NPK nutrients, it must respond to a complete schedule of manuring followed by irrigation. A combination of organic manures and chemical fertilisers will be more beneficial and application in split doses will be more suitable. Piling mounds and levelling the same at the proper time will be a better tillage practice for the soil.

1. Fish manure or prawn dust 10 kg.; Muriate of Potash 1 kg. — per tree / year

or

2. Groundnut cake (or any other nitrogen rich oil cake on equivalent nitrogen basis) 10kg.; Superphosphate or bonemeal 1 kg.; Muriate of potash 1 kg. — - do -

Red soil (lateritic)

In spite of the favourable physical condition of the soil, it has only low to

medium fertility status. High response to a complete and balanced fertilisation followed by suitable tillage operations can therefore be expected. *In situ* application of green manures of crotalaria species will be more economical and beneficial. Where this is not practicable, gliricidia may be grown on bunds and borders for green leaf.

1. Ammonium sulphate 1.5 to 2 kg.
   Superphosphate 1 kg.
   Muriate of potash 1 kg.
   } per tree/year

River alluvium

Low amounts of available potash and phosphate are indicated by the soil test results. Hence better response to the application of manures containing these can be expected. Wherever seasonal floods are likely to occur, manuring may be done after that period. Erosion on river banks and uprooting of trees may be checked by growing cover crops, soil binding grass or by erecting stone walls on the sides. Application of river silt will also help to enrich the soil.

1. Fish manure or prawn dust 10 kg.
   Muriate of potash 1 kg.
   } per tree/year

or

2. Calcium ammonium nitrate or Ammonium sulphate 1.5 to 2 kg.
   Bonemeal or superphosphate 1 kg.
   Muriate of potash 1 kg.
   } -do-

Laterite

Phosphate and potash in their available forms are very scarce and the crop is therefore expected to respond well to the application of manures carrying these constituents. Irrigation is bound to give better response in shallow gravelly soil, susceptible to drought. Soil conservation measures like terracing, bunding, etc., are quite essential in plantations on slopes to check erosion and deterioration of soil. Quick growing leguminous plants like *Gliricidia maculata* may be grown on the borders and bunds of the plots for green manuing.

1. Calcium ammonium nitrate 1.5 to 2 kg.
   Bonemeal or 1.0 kg.
   Muriate of potash 1.0 kg.
   } per tree/year

Made-up soil groups

1. Calcium ammonium nitrate 1.5 to 2 kg.
   Bonemeal 1.0 kg.
   Muriate of potash 1.0 kg.
   } per tree/year

or

2. Groundnut cake 10 kg.
   Bonemeal 10 kg.
   Wood ash 20 kg.
   } -do-

Reclaimed soil of marsh and swamp

1. Fish manure 10 kg.
   Muriate of potash 1 kg.
   } -do-

or

2. Calcium ammonium nitrate	1.5 to 2 kg.	
Bonemeal	1.0 kg.	–do–
Muriate of potash	1.0 kg.	

Drainage has to be improved and water stagnation to be prevented in depressions. Application of sea sand will be a beneficial practice to facilitate aeration and improve soil texture where it is of a clayey type. Manures may be applied after the flood season where it is likely to occur.

Conclusions

Based on the study of soil characteristics and the agronomic and field data collected during the survey, the following general recommendations are offered to improve the yield of coconut and step up production:—

1. Manuring should be more regular, adequate and balanced and it must be followed by suitable tillage practice.

2. Soil erosion and consequent loss of plant nutrients and the crop should be prevented on slopes and on the river side by adopting proper soil conservation measures.

3. Drainage has to be improved in lowlying areas with high water table, specially in reclaimed portions.

4. *In situ* application of green manure crops of crotalaria species may be done wherever possible and green manure plants like *Gliricidia maculata* may be grown on bunds and borders of the gardens to reduce the cost of manuring.

5. Inter-crops raised, if any, should be manured separately and adequately.

6. Manuring of transplanted seedlings may be taken from the second year onwards so as to promote vegetative growth and early bearing.

7. Irrigation must be provided wherever possible, especially in sandy and laterite areas subject to drought conditions.

8. Quality seedlings of high yielding strains with disease resistance, obtained from reliable sources may only be used as planting material.

9. Adequate spacing must be provided between transplanted seedlings and crowded planting should be avoided.

10. Square or triangular system of planting may be adopted wherever possible, in order to economise space and facilitate intercultivation, weeding and raising of green manure crops.

11. Damage to the tender functioning roots may be reduced to the minimum by opening the manure circle at a wider distance of about four to five feet in radius and at a depth of not more than nine to twelve inches.

12. Timely underplanting has to be taken up and unproductive, overaged and diseased palms should be cut and removed.

13. Deep-rooted, soil-exhausting tree crops like cashew, tamarind, etc., should not be grown in the midst of coconut palms lest there should be competition for moisture and nutrients.

14. Just as manuring, inter-cultivation should be very regular to prevent growth of weeds and facilitate aeration of soil, root penetration and retention of moisture, and gardens should be maintained under good hygeinic conditions

to check the breeding of pests like the rhinoceros beetle.

15. Effective control measures are necessary against beetle attack and stem bleeding prevalent in this area.

Apart from the scientific and technical aspects of the survey, it may be suggested that it will help to induce the growers to take to improved scientific methods of coconut cultivation provided demonstration plots (manurial cum cultural) are laid out in villages in cultivators' gardens. Depots supplying manures, fertilisers, etc., should be within easy reach of the cultivators in villages and these materials may be made available to them at subsidised rates and on credit basis, well ahead of the manuring season.

TABLE I

Showing the names of villages surveyed in Kasaragod Taluk with their total extent and the approximate area under coconut

Serial No.	Name of village	Total extent of village		* Approximate area of coconut gardens	
		Acres	Cents	Acres	Cents
1.	Kunjathur	2142	69	330	—
2.	Pavuru	2254	78	100	—
3.	Vorkadi	3343	41	122	50
4.	Pathuru	2579	29	40	—
5.	Kodlamogaru	3041	48	55	—
6.	Kolyuru	1196	57	98	—
7.	Kaliyuru	985	42	45	—
8.	Badaje	1575	94	22	—
9.	Udayavara	982	64	200	—
10.	Hosabettu	625	48	50	—
11.	Bangramanjeswara	703	02	120	—
12.	Majibailu	843	75	30	—
13.	Talekala	—	—	20	—
14.	Minja	2519	85	30	—
15.	Kuluru	—	—	28	—
16.	Uppala	1358	55	342	50
17.	Mulinja	547	51	32	—
18.	Kodibailu	638	54	32	—
19.	Bekuru	508	04	12	—
20.	Paivalike	5031	33	160	—
21.	Chipparu	1243	82	20	—
22.	Bayaru	6062	54	100	—

* Figures taken from the field measurement registers of the village office.

Serial No.	Name of Village	Total extent of village		*Approximate area of coconut gardens	
		Acres	Cents	Acres	Cents
23.	Kudalamerkala	3782	79	45	—
24.	Kayaru	1806	86	35	—
25.	Kubanuru	728	08	15	—
26.	Mangalpadi	2025	46	284	20
27.	Shyriya	900	—	137	50
28.	Ichalangode	983	57	32	50
29.	Herur	1280	83	32	—
30.	Bombrana	879	16	127	50
31.	Arikadi	1385	82	151	—
32.	Ujarulavaru	421	98	56	50
33.	Ichalampadi	—	—	41	—
34.	Ednadu	—	—	17	—
35.	Koipadi	3319	85	200	—
36.	Mogral	1035	56	227	20
37.	Kannuru	1696	22	72	30
38.	Bela	5630	94	71	—
39.	Madhuru	2671	54	174	—
40.	Patla	—	—	26	—
41.	Shirivagilu	1371	94	96	80
42.	Puthuru	2083	80	330	—
43.	Kudlu	2666	30	824	50
44.	Adkathbail	669	74	318	10
45.	Kasaragod	2210	17	531	60
46.	Talankara	1216	74	357	90
47.	Chengla	—	—	22	—
48.	Tekkil	3819	22	165	—
49.	Parambale	—	—	111	40
50.	Chemnad	2348	—	558	50
51.	Kalnad	2095	41	1022	60

* Figures taken from the field measurement registers of the village office.

TABLE II

Showing the percentage range of plant nutrients in the major soil groups under coconut cultivation in Kasaragod Taluk

No.	Soil group	Textural class (top class)	Percentage range of organic Carbon (C %)	Percentage range of total nitrogen (N %)	Percentage range of available Phosphoric acid (P_2O_5 %)	Percentage range of available Potash (K_2O %)	Range of pH
1.	Coastal alluvium	Sandy	0.01 to 0.10	0.005 to 0.01	0.001 to 0.003	Less than 0.001	6.5 to 6.7
2.	Red soil (lateritic)	Sandy loam	0.25 to 0.40	0. 04 to 0.05	0.001 to 0.004	Traces to 0.003	6.0 to 6.2
3.	River alluvium	Ranges from sandy to silty clay loam	0.10 to 1.1	0.008 to 0.15	0.002 to 0.004	Traces to 0.002	6.0 to 6.2
4.	Laterite	Sandy clay loam to clay	0.1 to 1.1	0.05 to 0.14	0.006 to 0.004	0.003 to 0.004	5.9 to 6.1
5.	Made-up soil (Mixed areca and coconut gardens)	Loam to clay	0.4 to 1.3	0.05 to 0.16	0.001 to 0.01	0.004 to 0.005	6.2 to 6.4
6.	Made-up soil of field bund cultivation	Sandy clay loam to clay	0.7 to 1.0	0.09 to 0.12	0.0007 to 0.002	0.003 to 0.005	5.9 to 6.0
7.	Reclaimed soil	Loamy sand to clay	0.2 to 0.9	0.03 to 0.1	Traces to 0.005	0.003 to 0.008	4.5 to 6.0

Better returns through marketing co-ops. will induce coconut growers to adopt scientific methods of cultivation and step up coconut production

Role of Credit and Marketing in Coconut Production

By M. S. VENKATARAMAN

Introduction

IN order to obtain the means of agricultural production and to bridge the expenditure gap between planting and harvest, farmers need credit. In the case of a perennial crop like coconut the time lag between planting and harvest is rather wide as coconut seedlings once planted take nearly 10 years to give economic yields. Even in the case of existing gardens scientific manuring and cultural operations will show up in increased yields only in about three years. Coconut growers, therefore, require not only short term credit but medium and long term credit also.

In the case of coconut growers it is also necessary for any credit institution which advances the credit to see

to it that repayment is made possible by an improvement of the economic position of the borrower resulting from the loan made. For, most of the coconut growers are small holders and they have no security to offer except the future yields in their meagre holdings. Unless, therefore, the surplus production of the coconut grower is taken off his hand immediately after harvesting he might incur a loss, and his interest in cultivation might also flag.

In view of the above it is now a well known fact that there is a direct connection between the marketing of goods on the one hand and productivity and standard of living on the other. It is proposed to discuss in this article to what extent the organisation of credit and marketing on proper lines can help in the development of the coconut industry in India. Before, however, we examine how credit and marketing should be organised to help in the development of the coconut industry it will be of interest to consider the present economy of the coconut industry and the marketing of coconut and also the basic conditions needed for marketing and credit to have proper effect in stepping up the production of coconuts.

Present conditions of coconut production & marketing

While the average annual income per capita in India at current prices for 1960-61 was estimated at Rs. 326.2, in most of the coconut-growing tracts of India it was much lower because of population pressure and low industrial development. In Kerala which contains over 70% of the coconut area in India, per capita income in 1960-61 at current prices was only Rs. 306.9. These variations reflect differences in productive capacity and consequently the ability of the peasants in the coconut tracts to invest in coconut culture.

Uneconomic holdings

The most common type of agriculture in the main coconut tracts of India is that of small holdings worked primarily to feed the farmer's family and providing small surpluses for sale to meet cash expenses and to buy a few things not produced at home.

Data on distribution of coconut holdings according to size are not available. But it is evident from available figures on land holdings that extreme population pressure on land has resulted in excessive sub-division and fragmentation of holdings into uneconomic units. The following distribution of holdings in Kerala illustrates this fact.

Size of holdings	Percentage of number of holdings
Less than 1.00 acre	55.6
1.00 acre to 2.50 acres	21.1
2.50 acres to 5.00 acres	11.3
5.00 acres to 7.50 acres	4.3
7.50 acres to 10.00 acres	2.2
10.00 acres to 12.50 acres	1.4
12.50 acres to 15.00 acres	0.9
15.00 acres to 17.50 acres	0.7
17.50 acres to 20.00 acres	0.5
20.00 acres to 25.00 acres	0.6
Over 25.00 acres	1.4
Total	100.00

Because of these conditions of subsistence farming, little attention is paid to manuring and cultural operations and this results in low production. This low productivity and low income result in a vicious circle of poverty, small savings and little possibility of investment to improve productivity.

Uncertain market

In many cases farmers lack the knowledge and method of improving productivity and some tend to resist adopting them when shown because of a preference for traditional ways and a reluctance to take risk. As already indicated earlier, another important factor is the time-lag of about ten years for a fresh plantation to start bearing and also about 3 years for results of scientific manuring and cultural practices to show up in increased yields. But prices of coconut products are subject to violent fluctuations over time. In view of this even cultivators of the better type are reluctant to invest large sums in coconut cultivation when the future market conditions are uncertain.

Yet another difficulty in getting the coconut cultivators to adopt scientific methods of cultivation and incur some expenditure for improved techniques is the fact that most of them are already indebted to some extent to village moneylenders or other indigenous bankers at high rates of interest and most of their produce is already hypothecated for a number of years at prices dictated by the creditors.

Lack of incentive

Naturally coconut growers lack the means and sometimes the interest to improve the quality of the nuts and even their quantity. The major portion of the produce is thus sold in the garden itself to the creditors of the growers. What little is left over is sold in the village market as the quantity left with most coconut growers is not worth the cost of transport and trouble in taking them to the important markets some distance away.

Pre-conditions for effective marketing and credit

Assurance of reasonable price

Scientific methods of farming in general use in the more advanced areas in this country itself, if properly applied to the conditions of those economically less developed coconut tracts, would certainly lead to immense increase in output. Better use of resources will, however, occur only when producers themselves make the extra effort and the additional cost outlay required, and this the growers are likely to do only if they expect to *benefit thereby*. The basic factor, therefore, needed for growers to co-operate in stepping up production is to be assured of conditions under which they will get a reasonable price for their produce. This hinges mainly on releasing the growers from the clutches of their creditors and enabling them to sell their produce through other channels, organising an agency to get together the small lots of the produce of these growers and arranging the collective sale of the produce in important markets for a better price, providing credit for productive activities in their farms and also advancing money for non-agricultural expenses

while the cultivators' produce is being sold.

Improved agrarian structure

Improvement of the agrarian structure is also necessary to induce the growers to make sustained efforts in stepping up production of coconuts. By improvement of the agrarian structure is meant the placing of the actual growers in possession of land by purchasing the rights of the absentee landlords. Organising growers into co-operative units so that the combined units will be of economic size and creditworthy, will also be an agrarian reform useful in production.

Prevention of price fluctuations

Preventing undue fluctuations in prices over time and keeping even the price parity of coconuts and of other products bought by the coconut growers will also be necessary. This, for the present, can be done by the regulation of imports. Subsidization of the factors of production needed by cultivators, such as fertilisers, seed materials, implements etc. will also go a long way in helping the coconut growers to obtain a better margin of profit despite uneven rise in the price of the factors of production.

When once the above conditions are satisfied, namely, an improved agrarian structure, stabilization of prices and subsidization of the factors of production, the development of credit and marketing is bound to have quick results in improving the productivity and income of coconut growers. Without these pre-conditions, however. improved marketing practices will benefit middlemen to a greater extent than the cultivators.

Linking credit with marketing

It is also necessary that the credit given is linked to the marketing of produce of growers and credit is given not only to liquidate existing liabilities but for improvement of coconut lands. Both long, medium and short-term loans are necessary and repayments should be staggered in such a way as to correspond to the productive period of the palm.

Credit and marketing co-operatives

It is now generally agreed that co-operatives form the most suitable agency for extending credit to the agriculturists. A scheme for linking rural credit with marketing co-operatives was designed by the Reserve Bank to co-ordinate and strengthen both credit and marketing co-operatives. The latter organisation is expected to sell the produce, recover co-operative production loans from the sale proceeds of the crop and pay only the balance to the cultivators. This process will help the credit society to recover its outstanding loans and the marketing society to get more business.

As a result, the credit and marketing co-operatives can build up a sound financial structure and compete successfully with private business. The credit societies may also be developed as service societies not only providing cash credit but also arranging

distribution of seed materials, fertilisers, implements etc. needed by the cultivators on credit and recovering the value of these at the time of harvests. Extension Officers associated with co-operatives can also educate members on scientific methods of cultivation, processing of the produce, storage of the products etc. In a sense the marketing co-operatives provide additional service to the cultivator in arranging the repayment of his loan to the credit society free of cost and it is therefore expected that the cultivator will on this account also be a gainer by linking credit to marketing.

Better gain from processing

Developing of co-operative processing of coconuts is essential not only for increasing the income of coconut growers and facilitating of credit for production but also for building up a co-operative rural economy. At present there are only very few co-operative processing units for coconuts in Kerala. There is therefore, scope for expanding the processing of coconuts on co-operative lines.

There is also a distinct advantage in co-operatives undertaking processing in that the copra or coconut oil finally produced by them can be processed to standards prescribed by the industrial consumers of these products in Bombay, Calcutta and other centres, and they canc ompete successfully and command the same price as imported copra or oil in those markets. The small holders by agreeing to have their small lots pooled for processing and grading by co-operative processing units, obtain the benefits of better prices at the main consuming centres.

How credit and marketing should be organised

The pattern of development of credit and marketing services for coconuts should, in view of the above facts, follow closely the arrangements for dispensing co-operative credit in the different States. Current trends in thinking are that, as far as possible, service co-operative societies at village level should provide essential short-term requirements of cash credit and also fertilisers and other requisites for cultivation, on loan. The extent of these aids should be based on production plans rather than on credit-worthiness. These short term loans in cash and kind are to be recovered from the sale of the surplus produce of coconut growers gathered by the society towards loan repayment.

Defined areas of operation

The area of operation of the service and marketing co-operatives should be clearly defined and owners of all coconut holdings of economic size in that area should be registered as members of the service society. The service society should issue loans and give other service facilities to these members on the basis of their production programmes. The service society should at harvest-time collect the surplus produce of members and transport it to the nearest processing unit or marketing society. There should be marketing-cum-processing

societies for coconuts at the main coconut markets. They should have godown facilities to store coconuts, copra processing kilns and also mills for crushing copra oil. Such of the copra as is of good quality and is needed for marketing as edible varieties may be despatched to centres consuming edible copra and the rest may be crushed for oil. The oil may be refined to "agmark" standards for sale locally or in the main consuming centres outside the producing States through consumer co-operatives.

The marketing societies will return to the service societies the value of produce which the latter deposit for sale with the former. The marketing societies at market centres may be linked to a State Apex Marketing Society. This apex society will attend to inter-State trade.

It may be necessary for the marketing societies to pay the value of produce deposited for sale by the service societies even before sale is effected. For this the marketing societies will have to be provided with funds by way of share capital contributions, loans or overdraft accounts. The State Governments and the District Co-operative Banks are expected to do so with the increased funds now being made available by the Reserve Bank of India.

Need for long term credit

The above suggestions relate to short term credit needed for manuring, culrural operations and irrigation in existing gardens and for marketing. But coconut growers need long term loans for replanting, for effecting permanent improvements such as bunding, levelling, reclamation of *kayal* lands etc.

Here resort will have to be made to Land Mortgage Banks. Debentures constitute the principal source of funds for loans advanced by Land Mortgage Banks. The Reserve Bank of India, State Bank of India and the Life Insurance Corporation have helped in a large measure by investing in these debentures. Special loan for reclamation of *kayal* lands are also now being given by the State Government through the Agricultural Department. It is desirable that these loans are also routed through the co-operative agencies. To strengthen the finances of Land Mortgage Banks an Agricultural Credit Re-Finance Corporation has recently been set up. This Re-Finance Corporation will advance funds at low rates of interest to scheduled banks to the extent of the latters' investment in rural debentures of the Land Mortgage Banks. It is hoped that this arrangement will help swell the finances of the Land Mortgage Banks and enable coconut cultivators to get adequate long term finance for replanting gardens having aged and disease affected palms.

Conclusion

It is hoped that in the Fourth Plan there will be enough funds for providing short, medium and long term loans and for starting in each market centre in the coconut producing areas a marketing co-operative society with godown facilities and a copra processing unit. Effective linking up of these marketing

societies with service societies on the one hand and apex marketing societies on the other will ensure orderly marketing of coconuts collected from the coconut growers and a better return to the coconut growers for their labours. This incentive of a better return will in the final analysis be the most effective means of inducing the grower to adopt scientific methods of cultivation and help increase the production of coconuts.

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 **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.**

Fertiliser Trials in Growers' Gardens Show Balanced Manuring Pays

Demonstration in 180 fields dotted over 350 miles from Tellicherry to Kanyakumari for 8 years has proved beyond doubt to coconut cultivators that balanced NPK manuring is the key to increased coconut production

BY M. S. LAKSHMANACHAR

THE main objective of agronomic experiments is to study the immediate and long term effects of various factors such as manuring, cultivation, irrigation, pest and disease control, etc., on crops and soils and their inter-relation. Based on the scientific inference drawn, optimum farming practices are recommended to the farmers.

Demonstration Plots

Generally, detailed agronomic experiments are confined to the research stations and experimental farms which are necessarily limited in number. The

stations or farms may not be fully representative of all the soils and climatic conditions under which the crop is usually grown. Moreover, in an underdeveloped country like India, the standard of farm management at the research stations or farms is generally higher than that on the cultivators' fields. So, the conclusions drawn from the experiments in the research stations may not hold good in their entirety under ordinary farming conditions. The main purpose of laying out fertiliser trials in cultivators' gardens is to find out whether results achieved under controlled conditions will hold good under conditions prevalent in the farmers' gardens. It is this awareness that has made the running of demonstration plots a necessary preliminary to large scale popularisation of improved practices. To be really useful the demonstration plots selected should be representative of the area and conditions under which the crop is being raised.

Manuring Coconuts

Among crop improvements that are of immediate utility in enhancing production in coconuts, are scientific methods of cultivation and manuring. The coconut gardens in general are not given the attention they deserve. The native soil fertility is itself poor and if to this is added a low level of management also one cannot be surprised at the prevailing low level of production. Adequate manuring should aim at providing the crop with necessary nutrients in sufficient quantities and in proper balance in accordance with its special requirements.

Unlike the other fruit-bearing trees there is continuity of production in coconuts. According to estimates worked out, the annual loss of plant nutrients from a garden having about 60 bearing palms and yielding 3,000 nuts per annum amounts to 66 lb. of nitrogen, 27 lb. of phosphoric acid and 123 lb. of potash. Hence to maintain the soil fertility it is essential to make good this loss by the adoption of a proper manurial schedule. The usefulness and profitableness of manuring have been clearly demonstrated from the results of experiments carried out in Government farms.

Coconut Fertiliser Demonstrations

It should be said to the credit of Potascheme and M/s. Parry & Company that they were the first to recognise the importance of large scale fertiliser demonstration trials on coconut and to take steps to run a network of demonstration plots throughout Kerala, with the technical guidance of the Indian Central Coconut Committee. A brief survey of the scheme and results achieved under it are given below.

Under the scheme, fertiliser demonstrations were run in 180 fields distributed over the coconut area extending from Tellicherry in Malabar to Cape Comorin in the south covering a distance of about 350 miles. The fertiliser dose adopted for demonstration was a mixture of 45 lb. of nitrogen 45 lb. of phosphoric acid and 90 lb. of potash for 60 trees and this was given in the form of Parry's coconut fertiliser mixture analysing 8-8-16. Green manuring was also done.

Indications

The trials were run from 1952 to 1959 and yield data gathered from the

demonstration plots were subjected to detailed scrutiny with reference to the main soil types and climatic conditions. The indications obtained are the following :-

Sandy loam

This is the major soil type covered under the scheme. Fifty fields out of a total of 154 fields distributed over all the centres come under this soil type. The rainfall in all these centres is almost the same ranging from 100 to 120 inches per year except for Nagercoil (30 inches per year), Quilon (80 inches per year), Mavelikara (90 inches per year) and Kanjirappally (heavy rainfall of 150 to 200 inches per year). The increase in the yield of nuts averaged over all centres due to NPK manuring was 7.4 nuts. Response was particularly satisfactory at Badagara and Ponnani centres.

Sandy

A total of 36 demonstration plots were under this soil type. The average response to fertilizer was 6.9 nuts, and was particularly good at Ponnani centre (11.7 nuts).

Laterite

There were 27 fields on the whole distributed in the centres Badagara, Changanacherry, Kanjirappally, Quilon and Nagercoil. The average increase in this soil type was 6.8 nuts per tree.

Red loam soil

There were 12 fields under this soil type, all except one being located in Nagercoil area. The response was uniformly high and amounted to 14.7 nuts per tree.

It may thus be seen that balanced NPK manuring has helped to increase the yield appreciably. A detailed analysis of the data has shown that "it is possible to increase the production of coconuts by nearly 35 per cent and copra out-turn by 44 per cent by regular manuring and interculturing of coconuts ..... Such manuring results in a net profit of Rs. 88 per acre based on nut yields and Rs. 130 per acre based on quantity of copra".

Conclusions

The Coconut Fertiliser Demonstration Scheme on the South-West Coast launched by the Potascheme and M/s. Parry & Company, has revealed beyond any shadow of doubt that balanced NPK manuring has both productive as well as economic advantages. It is now the duty of all those interested in increasing coconut production to disseminate this information widely among the coconut growers and to provide them with all facilities and incentive and encouragement to take to improved agricultural practices.

SPEAKING OF COCONUT.....

Did you know

That the weight of evidence is in favour of the original home of the coconut being located somewhere in South-East Asia and that one writer has traced it to Indonesia, another to Siam, Malaya and Java, a third to the north-west portion of New Guinea and a fourth to Melanesia ?

* * *

That the Spaniards introduced the coconut into the West Indies and the southern shores of the Caribbean sea, the Portuguese introduced it into Bahia and other parts of Brazil, Polynesian seafarers spread it to the different islands of the Pacific, the Arabs took it to the African Coast and the maritime Tamils together with the mariners of the Bengal coast distributed it into the lands of the Indian Oeean ?

* * *

That 17 varieties of the dwarf coconut palm and 78 varieties of the tall coconut have been reported from the various coconut-growing countries of the world ?

* * *

That in coconuts indigenous to New Caledonia there are some curiosities such as palms bearing white nuts *(Nu Kaume Cocotier)*, palms bearing nuts with stripes of green and white and palms bearing nuts whose husk is sweet and could be chewed like sugarcane *(Cocos Sucre)* ?

* * *

That the annual production of coconuts in India is estimated at 4164 million nuts of which about 84 per cent are utilised within the country for edible purposes in such forms as tender nuts, fresh mature nuts, edible copra and coconut oil ?

* * *

That India imported during 1962-63 coconuts and coconut products, in terms of copra, of the order of 101,492 tonnes valued at Rs. 10.5 crores ?

* * *

That, if the consumption of coconuts for edible purposes were so regulated by a self-denying ordinance by the consumers by which where 5 coconuts are now consumed only 4 will be consumed hereafter, imports of coconut products could be reduced to a mere trickle and foreign exchange of the value of about Rs. 10 crores saved per annum?

KERALA

April

If there are ample facilities for irrigation plant coconut seedlings now. They will strike roots before the heavy monsoon rains and derive the full benefit of the rains.

May

With the first pre-monsoon showers, plough up the loamy soils and sow a green manure crop like sunnhemp, wild sunnhemp or sesbania. The seed rate for the above mentioned three crops is 30–40 lb., 20–25 lb., and 25 lb. respectively. If the soil is laterite, plough and sow a green manure crop in terraced fields and a cover crop in slopy or uneven land.

MYSORE

April

Cart in jungle earth and heap it up in different parts of the garden. You can also fold sheep and incorporate the sheep manure into the soil.

May

Just before the pre-monsoon rains, spread out the carted earth (one to two carts per palm) and also cattle manure at the rate of 100 lb. per palm. Plough these in.

After one or two showers, work a cultivator to bring the soil to a fine tilth. If there is sufficient moisture in the soil, sow a green manure crop and cover.

MADRAS

April-May

Plough the garden once to get it ready to receive summer showers.

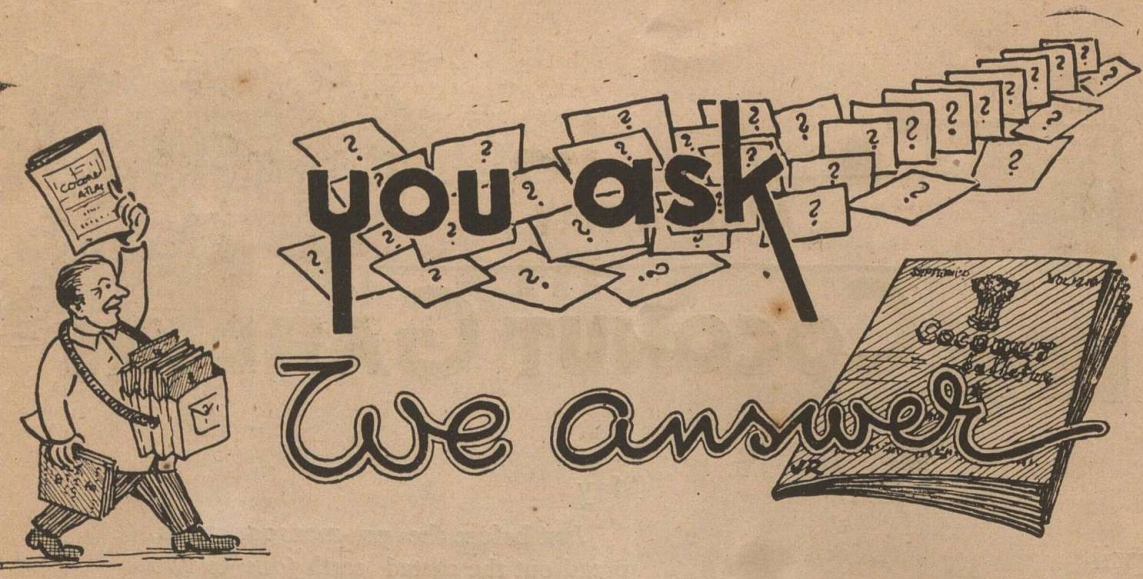
ORISSA

April

Continue cleaning and deepening of channels and tanks. Strengthen the bunds. Prepare for planting monsoon vegetables.

May

Sow your green manure crop with the pre-monsoon showers. Cart in clay



Button-Shedding

Question:- I have a few young coconut palms in my garden. I observe that they bear very few nuts as nearly all the buttons are shed. Please tell me what I should do to get a fair yield from my palms.

Answer:- Button-shedding in the coconut palm may be due to one of the four following reasons:-

1) Lack of soil fertility.
2) Drought
3) Diseases like *Mahali*, root wilt etc.
4) Poor genetic quality.

Button-shedding also occurs both when the palms commence bearing and for two or three years thereafter. If your palms have only just started bearing, the phenomenon of button-shedding may disappear in course ef time.

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or sand, depending on whether the soil is clayey or sandy. Start sowing winter crops like ginger or colocasia.

MAHARASHTRA

April

Apply silt, if available, from tanks and channels, between the palms.

May

Plough the land twice or thrice and remove all weeds and grass. Sow a green manure crop such as wild sunnhemp, *dhaincha*, *sesbania* or *kolinji*. Use 25 to 30 lb. of seeds per acre for sowing.

WEST BENGAL

April

Carry out intercultural operations around the coconut palms and irrigate them.

May

Sow *Crotalaria striata* seeds broadcast at the rate of 20 to 25 lb. per acre. Cover with a light plough.

But little or inadequate manuring or drought also may cause button-shedding. If you feel that your palms are affected in these ways, then apply to them adequate quantities of potassic manures like ash and muriate of potash and water them during the hot season.

If, however, you notice any symptoms of disease on your palms you should adopt the appropriate control measures, after consulting the nearest Agricultural Officer.

Prevention of Soil Erosion

Question:- My fields which are situated on the banks of a river are flooded every year and much soil is washed away. Can I prevent or check erosion by raising a coconut garden on the river bank up to some depth?

Answer: Groups of coconut palms with well-developed root systems can prevent erosion to some extent but seedlings may not be able to withstand the force of water or stand submersion in muddy water for long periods at a stretch. Therefore, raising a coconut garden on the river bank will not serve your purpose. But if you can establish a suitable grass cover in areas subject to erosion you may be able to reduce the damage due to erosion. Water grass may be suitable for this purpose.

Wild Sunnhemp
(Crotalaria Striata)

Question:- I have a coconut plantation on one of the islands of Greater Bombay. Last year I tried to raise a crop of Crotalaria juncea *for green manure. In spite of uniform sowing of the seeds I found that the growth of the crop was uneven-quite thick in some places, almost uneven in others. This year I want to try* Crotalaria striata. *In Bombay we don't have showers in April and May. Now will you please clear the following points?*

1. *What is the cause of the uneven growth of* Crotalaria juncea *?*
2. *Is growing* Crotalaria striata *advisable on the sandy soil of Bombay?*
3. *When should I sow the seeds of* Crotalaria striata.
4. *Are the seeds to be sown before or after ploughing.*

Answer:- Uneven growth is a very common occurrence in crops raised on dry lands and may be due to a variety of causes such as difference in soil depth, fertility, presence of moisture, presence of shade etc., etc. Unless conditions are made as uniform as possible differences in the stand and productivity of crops have to be expected.

Reports regarding the performance of *Crotalaria striata* in the sandy soils of Bombay are not available, but generally speaking its performance in soils of poor fertility may not be satisfactory. Moreover, for leguminous crops like *Crotalaria striata* to grow satisfactorily, certain specific bacteria must be present in the soils.

You will be well-advised not to grow *Crotalaria striata* in large areas at a stretch. Try it on a small scale and if the results are satisfactory extend the area.

Seeds of *Crotalaria striata* can be sown in March-April even if no rains are received. They should be sown in well-ploughed land. The seeds may be lightly covered with leafy branches cut from nearby trees.

Root Pruning

Question:- Is it good to dig basins round coconut palms every year and apply manure in them? Will not the roots be damaged by digging under the palms every year and will this not obstruct the absorption of plant nutrients through the roots? Is it not better to dig round the palms and apply manures once in two years rather than annually?

Answer:- Where the soil is deep and the palms are healthy root pruning has no deleterious effect. In fact such root pruning gives rise to fresh new roots to go deep into the soil. If, however, the water table is high or the trees diseased, annual root pruning may prove harmful. In such cases basins may be dug only on one half side of the trees in alternate years for applying manures. Annual manuring is necessary and manuring in alternate years may not be enough.

Intensive Agricultural District Programme

The Intensive Agricultural District Programme (IADP) – which takes into consideration all the recommendations of the Royal Commission on Agriculture, the Fiscal Commission, and the Grow More Food Enquiry Committee — is a new experiment in increasing our agricultural output. It fundamentally differs from all other agricultural programmes in that it studies the problems of individual farmers on the spot and provides them all the necessary assistance in one package. Hence it is popularly known as the "Package Programme".

The Programme provides our farmers all the supplies and services at the right time and in adequate quantities. The supplies, which are the accepted factors of improved production, comprise (i) improved seeds, (ii) fertilisers, (iii) implements, (iv) measures for the control of weeds, pests and diseases, (v) godown facilities, (vi) credit based on sound farm-production plans, and (vii) marketing facilities. The services provide an intensive co-ordinated effort by many specialists and extension workers, who communicate technical know-how through information aids and organize field demonstrations.

The Package Programme was launched in 1960-61 by the Government of India in collaboration with the Ford Foundation. It was initially confined to seven districts, but was later extended to cover one district in each of the States in India. In Kerala two districts are under this programme. It will last for 5 years.

The Programme, which is an integrated approach to an overall improvement of the lot of the farmer, also takes up side-lines of agriculture, such as growing fruits and vegetables, improvement of livestock and poultry, beekeeping and raising fish. But the main work taken up, of course, concerns the chief food crops grown in the district.

The success of the Package Programme depends upon two important factors — men and material resources. Material resources being assured, its success depends primarily on the co-ordinated efforts of our men — the farmers and the workers in the field. As the Grow More Food Enquiry Committee pointed out, no plan can have any chance of success unless the millions of small farmers accept its objectives, share in its making, regard it as their own, and are prepared to implement it.

— *Rice News Teller*

Production and Use of Milk in Kerala

The annual milk yield per cow in Kerala as per 1956 livestock census data is only about 350 lb. which compares very unfavourably with most other States in India. According to the 1961 livestock census, the average milk yield of a cow (over 3 years of age) in Kerala is 459 lb. per annum. The average annual milk yield per she-buffalo (over 3 years of age) in 1956 was 619 lb. in the State as against 970 lb. in India as a whole; the corresponding figure for the State in 1961 is 964 lb.

The *per capita* availability of milk in the State in 1956 was only 1.3 oz. per day which was the lowest for any State in India excepting Assam. The daily *per capita* availability of milk for the whole of India was about 4.8 oz. in 1956. Kerala's annual requirements of milk on the basis of a minimum standard of 10 oz. per head per day is 468 lakh mds. Milk production in the State in 1961 is estimated as follows :-

	(lakh litres)
Cow's milk	2349.72
Buffalo's milk	572.97
Goat's milk	272.31
	3195.00

(89.36 lakh Mds.)

The estimated production of milk in the State, *viz.*, 89 lakh Mds. works out to a *per capita* availability of about 1.88 oz. per day. Even to reach the present all-India level of consumption almost a threefold increase in production is necessary.

— Shri C. Viswanathan Pillai
in *The Southern Economist*

Tourism is Big Business

According to the National Geographic Society, tourism has replaced wheat as the world's biggest business. It already earns more than any single export of Australia, Italy, Mexico, Spain and Nepal.

Americans are now spending some $30,000 million (Rs. 15,000 crores) a year for tourism at home and abroad, the National Geographic Society says. Some one million of them crossed the Atlantic Ocean last year in one of the "largest mass movements in history."

Although Americans have become the most numerous international tourists the Japanese, Germans and French are also travelling in increased numbers.

— *The American Reporter*

First Watch Factory

The pioneering task of setting up India's first watch factory was entrusted

to HMT, and was made possible by the availability of technical manpower and skilled personnel. Built in collaboration with the Citizen Watch Company Ltd. of Japan, the factory, was completed in 13 months, in October 1962 with an initial capacity of about 360,000 watches per annum, when in full production. During 1962-'63, 51,562 watches were assembled out of imported components. In January, 1963, indigenous manufacture of components was commenced and by April, 1963, 54 per cent of the components were being made. The present production is 500-600 watches per day of two types of watches for men and one type for ladies. At present, this factory employs 600 workers, 170 of whom are women. An HMT-made watch costs only Rs. 100 against Rs. 150 for an imported watch of equivalent quality.

— Research & Industry

Soap and Cooking Oil from Rice Bran

Bran forms about 13 per cent of the milled rice. The inner layers of bran contain vitamins of the Vitamin B complex. In addition, bran contains 40-50 per cent soluble carbohydrates, 5-8 per cent fibre, and is therefore an excellent cattle-and poultry-feed. But immediately after its separation from rice, bran begins to decompose owing to the presence of an enzyme called lipase. The free fatty acids are below 3 per cent to begin with, but increase at the rate of 1 per cent per hour during the first few hours, and at a slower rate thereafter, when stored under humid conditions and at normal daily temperature. Because of its high content of fatty acids, 15-20 per cent 'soft' oil and 0.4-1.05 per cent crude oil, it tends to cause diarrhoea in cattle. Removal of oil enhances the nutritive value of bran by proportionately increasing the carbohydrate and protein contents. Indeed it has been found that rice bran from which oil is removed is more acceptable to cattle and has better keeping quality.

Mechanical and solvent methods of oil extraction from bran has been practised for many years, especially in Japan, where the annual production is 17,000 tons a year. Nearly 90 per cent of the de-oiled bran is used in Japan as cattle-feed and the rest as fertiliser, especially for tobacco and onion plantings.

The refined bran oil is clear, light-coloured, odourless, of low acidity, and is exceptionally stable after hydrogenation. As it is a superior cooking oil, it is made into salad oil in the United States. It is also being used as a 'carrier' for insecticides, and as sulphonated oil in textile and leather treatment. But possibly its greatest value is as an anti-corrosion and rust-resistant oil. Hence it is of immense use in lubricating

wrist watches and delicate scientific instruments.

The possibility of extracting oil from rice bran was first explored in India by the Central Food Technological Research Institute, Mysore, which has set up a pilot plant. In our country rice bran has a higher content of free fatty acid. It is, therefore, more suitable for industry than for cooking purposes. Experiments carried out so far show that rice-bran oil produces a harder soap than groundnut oil. With further investigation, the oil could possibly be rendered suitable for making quality soap.

An important factor which affects the quality of rice bran is the method of dehusking paddy. When a sheller is used, the bran and husk come off separately, while with a huller they get mixed up. In order to conserve and economically utilize rice bran, it is proposed to promote location of plants within a radius of 50 miles from places where rice mills are concentrated, so that no difficulties arise in regard to transport. Also, since shellers are better than hullers, rice mills will be persuaded to switch over to shellers without increasing the total capacity. Technological laboratories will also be called upon to pursue further research on the refining, bleaching, deodorization and hydrogenation of rice-bran oil.

— *Rice News Teller*

WEATHER REVIEW

JANUARY 1964

	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	34.1°C	32.7°C	16.4°C	20.5°C	3.8	—6.7	1	316.4
Central Coconut Research Station, Kasaragod	34.6°C	31.7°C	16.9°C	19.7°C	0.0	—2.2	0.0	298.7

FEBRUARY 1964

Central Coconut Research Station, Kayangulam	35.3°C	33.6°C	18.8°C	21.9°C	17.8	—14.0	1	295.4
Central Coconut Research Station, Kasaragod	34.4°C	32.2°C	19.7°C	21.6°C	0.0	—.26	0.0	288.4

Market Surveys

Foreign Markets

General Trend

The "Oil World", Hamburg in its issue dated 28th February 1964 observes that a change of trend occurred in the world markets for copra and coconut oil during the week ending January 26th with a pronounced recovery for coconut oil. Apart from the general prospects for food fats and oils the change of trend is primarily a result of the smaller Philippine exports in January when the shipments of coconut oil declined by 8,300 to 10,500 tons and those of copra by 1,200 tons to 6,940 tons compared to January 1963. For both copra and coconut oil the decline is even more pronounced if compared with December 1963. Expectations now are for a further decline in exports as a considerable drought apparently was experienced during the period from October 1962 to July 1963. If the decline in Philippine supplies continues prices are likely to be advanced further. At the beginning of this year the West European stocks of copra and coconut oil were by far not as large as two years ago when the previous major decline in Philippine supplies was under way. In 1962 the large European stocks prevented a noteworthy advance of prices until the autumn, but this is unlikely to be repeated this year. Depending on the extent of any decline in supplies prices will rise correspondingly.

According to the F. A. O. the consumption of coconut oil in Europe and the U.S.A. increased sizeably from 1959 to 1962 although it remained substantially behind the record level of 1957 in West Europe. In the past few years there had been quite a noteworthy increase in consumption for non-food purposes, which in 1962 was sharply above the 1957 level in the U. S. A. and moderately above it in Europe.

SINGAPORE

16th January to 31st January 1964

COPRA

During the second half of January 1964 in the Singapore market as most of the mills were adequately provided with copra and refused further stock accumulation at current price level, activity in loose copra was limited while both buyers and sellers were cautions. The F.O.B. prices of copra were not quoted throughout.

COCONUT OIL

In the second half of January 1964 the bulk oil market remained idle, but some activity in drum oil was recorded earlier when resellers secured business at a discount of 50 cents per picul. Since then more sellers appeared soliciting bids. Towards month-end the market closed on an extremely easy note under selling pressure.

Price quoted for a picul (133 1/3 lb.) of drum oil was M$. 53.00 on the 24th and M$. 51.00 on the 31st January 1964.

COLOMBO
February, 1964

COPRA

The Colombo copra market displayed a weak trend during the month of February 1964. On the 1st February a candy (560 lbs.) of copra Estate No. 1 quality was quoted at Rs. 166.00 which gradually declined to Rs. 165.50 on the 8th, Rs. 165.20 on the 15th and Rs. 164.50 on the 22nd. But the market closed on the 29th at Rs. 165.50.

A similar trend in prices was witnessed in the case of milling copra also which was quoted at Rs. 163.50, Rs. 163.00, Rs, 162.70, Rs. 162.00 and Rs. 163.00 per candy on the 1st, 8th, 15th, 22nd and 29th respectively.

COCONUT OIL

During the month of February, 1964 the Colombo coconut oil market presented a declining trend till the 3rd week in sympathy with the copra market, but towards month-end the price slightly improved.

On the 1st February, a ton of coconut oil was quoted at Rs. 1015.00 which slightly declined to Rs. 1010.00 on the 8th and 15th and Rs. 1000.00 on the 22nd and the market closed on the 29th at Rs. 1045.00 per ton.

Indian Markets
COCHIN
February, 1964

When the Cochin coconut oil market opened on the 1st of February, 1964, a quintal of ready coconut oil was quoted at Rs. 265.50, On account of the export incentive scheme, Bombay merchants were getting licences for the import of a good lot of copra and thus affecting adversely the Bombay demand for Cochin coconut oil. The Cochin market displayed a declining trend in prices during the first week of February, 1964. On the 3rd a quintal of oil was priced at Rs. 263.50 which declined to Rs. 261.50 on the 4th and the market closed for the week-end on the 8th at Rs. 264.00.

In the second week the market opened on the 10th at Rs. 269.00. As rumour was current in the market to the effect that new duties would be levied on vegetable non-essential oils in the new Budget and as there was considerable demand for oil from Calcutta market, a bullish trend prevailed in the market and the prices went up during the second week. On the 12th a quintal of oil was quoted at Rs. 270.00 which further improved and the market closed on the 14th at Rs. 271.00.

When the market opened on the 17th a quintal of oil was quoted at Rs. 267.50. The market during the week kept up more or less a steady trend as supply position exceeded that of demand. The market closed on the 22nd at the opening level. But in the last week of the month as transactions in both ready and forward sectors were limited in volume and as there was not much demand for oil due to uncertainties of the Budget provisions for 1964-65 regarding the imposition of excise duty on coconut oil the price slightly declined from the previous week's level and fluctuated slightly around

Rs. 263.00 and the closing quotation on the 29th February was Rs. 264.00 per quintal.

ALLEPPEY

When the Alleppey coconut oil market opened on the 1st February, 1964, a quintal of ready oil was quoted at Rs. 265.00. During the 1st week the market presented a slightly declining trend in prices as demand for coconut oil from North Indian markets was less in comparison with the seasonal arrivals of copra in the market. On the 3rd a quintal of oil was quoted at Rs. 261.00 which went down to Rs. 259.00 on the next day. But towards week-end the price slightly improved and was quoted at Rs. 264.00 on the 7th. The market opened on the 10th at Rs.263.00. During the second week due to good demand for ready oil from Calcutta and other North Indian markets the prices improved and on the 12th a quintal of oil was quoted at Rs. 268.00 and the market closed for the week-end at Rs. 264.00.

During the third week the prices slightly declined due to selling pressure from millers and lack of steady demand for oil from North Indian markets. The opening quotation on the 17th was Rs. 262.00 and from the 18th to the 22nd the prices fluctuated around Rs. 263.00 and 264.00 per quintal.

When the market opened on the 24th a quintal of oil was quoted at Rs. 262.00. In the last week of the month trading activities of both sectors *viz.*, ready and forward were limited due to uncertainties that prevailed in the market on account of the impending Central Budget announcement regarding excise duty on coconut oil and copra. On the 26th a quintal of oil was priced at Rs. 261.00 which slightly declined to Rs. 258.00 in the next two days and the market closed on the 29th at Rs. 256.00

TO SUBSCRIBERS

COCONUT BULLETIN is generally published during the first week of the month subsequent to the month to which the issue relates. Complaints regarding non-receipt of copies should be sent during the third week of the publishing month. Subscribers should allow at least two weeks for change of their address to be incorporated in our books. The subscription number (printed on the top left of Subscriber's address) should always be quoted when renewing the subscription or intimating change of address.

MARKET REPORTS

I. Cochin, Alleppey & Calicut

The daily prices of coconuts, copra, coconut oil and coconut oil cake at Cochin, Alleppey and Calicut from 1st February, 1964 to 29th February, 1964 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.
1 - 2 - 64	255 00	305 00	240 00	182 55	183 00	176 50	265 50	265 00	270 50	57 00	55 00	56 00
2 - 2 - 64	S	U	N	D	A	Y	S	U	N	D	A	Y
3 - 2 - 64	255 00	N.R.	240 00	181 28	180 00	173 25	263 50	261 00	271 00	57 00	55 00	54 50
4 - 2 - 64	255 00	N.R.	240 00	180 00	178 00	173 25	261 50	259 00	271 00	57 00	53 50	54 50
5 - 2 - 64	255 00	275 00	240 00	180 30	178 00	173 25	262 50	260 00	271 00	56 00	53 00	54 50
6 - 2 - 64	225 00	N.R.	240 00	181 52	180 00	175 00	263 75	262 00	266 00	56 00	52 50	54 50
7 - 2 - 64	255 00	N.R.	240 00	179 72	180 00	175 00	263 25	264 00	266 00	53 00	52 50	54 50
8 - 2 - 64	255 00	275 00	240 00	179 84	N.R.	175 00	264 00	N.R.	266 00	52 00	N.R.	54 50
9 - 2 - 64	S	U	N	D	A	Y	S	U	N	D	A	Y
10 - 2 - 64	245 00	N.R.	240 00	182 34	178 00	175 50	269 00	263 00	266 00	52 00	51 00	54 50
11 - 2 - 64		Holi	day			Siva	rathri			Holi	day	
12 - 2 - 64	245 00	270 00	240 00	182 89	182 00	179 50	270 00	268 00	275 50	50 00	51 50	54 50

13 - 2 - 63	245 00	N.R.	247 50	183 83	182 00	178 25	271 50	266 00	275 50	50 00	51 00	54 50
14 - 2 - 63	245 00	N.R.	247 50	183 17	182 00	178 50	271 00	264 00	275 50	49 00	51 00	54 50
15 - 2 - 63		Ramzan		Holiday				Ramzan		Holiday		
16 - 2 - 63	S	U	N	D	A	Y	S	U	N	D	A	Y
17 - 2 - 64	245 00	N.R.	258 00	179 59	178 00	178 00	267 50	262 00	275 50	45 00	50 00	54 50
18 - 2 - 64	245 00	N.R.	258 00	178 95	177 00	173 00	266 50	263 00	270 00	45 00	48 00	54 50
19 - 2 - 64	245 00	260 00	258 00	178 17	178 00	172 00	265 25	264 00	275 00	45 00	48 00	53 50
20 - 2 - 64	245 00	N.R.	250 50	179 53	180 00	171 00	267 50	264 00	270 00	45 00	49 00	54 50
21 - 2 - 64	245 00	N.R.	250 50	179 41	180 00	171 00	267 25	264 00	270 00	45 00	49 00	54 50
22 - 2 - 64	245 00	260 00	250 50	179 30	178 00	173 00	266 50	263 00	270 00	46 00	49 00	54 50
23 - 2 - 64	S	U	N	D	A	Y	S	U	N	D	A	Y
24 - 2 - 64	245 00	N.R.	245 00	178 68	178 00	173 00	265 50	262 00	265 00	46 00	49 00	54 50
25 - 2 - 64	245 00	N.R.	245 00	177 47	178 00	175 00	263 00	260 00	265 00	47 00	49 00	54 50
26 - 2 - 64	245 00	260 00	247 50	178 13	177 00	175 00	263 50	261 00	265 00	48 00	48 00	54 50
27 - 2 - 64	245 00	N.R.	247 50	179 00	177 00	174 12	265 00	258 00	271 00	48 00	49 00	55 00
28 - 2 - 64	245 00	N.R.	N.R.	177 43	177 00	N.R.	263 50	258 00	N.R.	46 00	49 00	N.R.
29 - 2 - 64	245 00	260 00	245 00	177 43	177 00	173 62	264 00	256 00	270 00	46 50	48 00	54 50

Source: (1) **Cochin**: Indian Chamber of Commerce, Cochin. (2) **Alleppey**: The Malayala 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 February, 1964

Commodity - Markets	Carry over	Arrivals	Sales	Balance
Coconuts (in thousands)				
Kozhikode	420	3,400	3,300	520
Badagara	500	725	960	265
Ponnani	15	257	253	19
Tellicherry and Dharmadam	58	800	780	78
Tirur	199	662	724	137
Cannanore	15	72	58	29
Copra (in quintals)				
Kozhikode	4,365	13,700	13,550	4,515
Badagara	1,230	9,310	9,150	1,390
Cannanore	50	425	450	25

Weekly prices of coconuts and copra in some of the Malabar markets during the month of February, 1964

Commodity - Markets	1st week Rs. nP.	2nd week Rs. nP.	3rd week Rs. nP.	4th week Rs. nP.
Coconuts (husked for 1000)				
Badagara	240.00	243.00	243.00	243.00
Ponnani	230.00	225.00	230.00	225.00
Tellicherry and Dharmadam	200.00	190.00	205.00	200.00
Tirur	240.00	240.00	235.00	245.00
Cannanore	253.00	260.00	235.00	240.00
Copra at Badagara market (per quintal)				
Office pass	168.00	170.00	165.00	166.00
Edible Copra				
Madras	Nil	Nil	Nil	Nil
Dilpas	183.00	188.00	183.00	188.00
Rajpur	218.00	223.00	218.00	220.00

General **1. Coconuts :** Arrivals and despatches decreased considerably when compared to the previous month. Prices were more or less steady.

2. Copra : Arrivals decreased during the month. Despatches were more or less steady. Slight increase in price was noticed.

III. Colombo

The weekly average prices of coconuts and coconut products at Colombo during the month of January, 1964 are given below :-

Commodity	Unit	Week ending 4-1-64 Rs. cts.	Week ending 11-1-64 Rs. cts.	Week ending 18-1-64 Rs. cts.	Week ending 25-1-64 Rs. cts.
Coconuts (Husked) for export at Buyers' Stores	per 1000 nuts	152.50 to 155.00	152.50 to 155.00	152.50 to 155.00	152.50 to 155.00
Fresh Coconuts - (Husked) used for copra making and local consumption	,,	150.00 to 155.00	150.00 to 155.00	150.00 to 155.00	150.00 to 155.00
Copra - Estate No. 1 quality at Buyers' Stores	per candy of 560 lb.	171.75	168.00	166.50	168.75
Milling copra	,,	169.25	165.50	164.00	166.25
Desiccated Coconut - Wharf delivery or Buyers' Stores Medium and fine 50%	per lb.	0.41	0.39½	0.39½	0.39
Coconut oil - White, naked wharf delivery	per ton	1070.00	1005.00	1050.00	1030.00

The weekly prices of coconuts and coconut products at Colombo during the month of February 1964 are given below :-

Commodity	Unit	Week ending 1-2-64 Rs. cts.	Week ending 8-2-64 Rs. cts.	Week ending 15-2-64 Rs. cts.	Week ending 22-2-64 Rs. cts.	Week ending 29-2-64 Rs. cts.
Coconuts (Husked) for export at Buyers' Stores	per 1000 nuts	152.50 to 155.00	152.50 to 155.00	152.50 to 155.00	152.50 to 155.00	152.50 to 155.00
Fresh Coconuts - (Husked) used for copra making and local consumption	,,	150.00 to 155.00	150.00 to 155.00	150.00 to 155.00	150.00 to 155.00	150.00 to 155.00
Copra - Estate No. 1 quality at Buyers' Stores	per candy of 560 lb.	166.00	165.50	165.20	164.50	165.50
Milling copra	,,	163.50	163.00	162.70	162.00	163.00
Desiccated Coconut - Wharf delivery or Buyers' Stores Medium and fine 50%	per lb.	0.39½	0.39½	0.39½	0.40	0.41
Coconut oil - White, naked wharf delivery	per ton	1015.00	1010.00	1010.00	1000.00	1045.00

IV. Malaysia

SINGAPORE

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

Date	Copra $	Coconut Oil $
1st Week	No Quotation	No quotation
2nd Week	do	do
3rd Week	do	53.75
4th Week	do	53.50

PENANG

January 1964	Not quoted	52.25

NOTE : The prices quoted above are per picul F. O. B. Singapore/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.

Imports of copra into India

Sources	November 1963		Seven months ended Nov. 1963	
	Qty. in M. tons	Value in (000) Rs.	Qty. in M. tons	Value in (000) Rs.
Ceylon	3,762	3,693	16,665	17,008
Kenya	...	...	29	28
Malaya	838	776	19,726	20,506
Maldives	10	13	71	100
Seychelles	707	699	4,334	4,700
Singapore	...	...	1,780	1,621
Tanganyika	664	641	4,006	3,706
Zanzibar	688	678	8,592	8,024
Others	...	...	2	3
Total	6,669	6,500	55,205	55,696

Imports of coconut oil into India

Source	November 1963		Seven months ended Nov. 1963	
	Qty. in M. tons	Value in (000) Rs.	Qty. in M. tons	Value in (000) Rs.
Ceylon	64	96	1,286	1,898

Exports of copra cake from India

Destinations	November 1963		Seven months ended Nov. 1963	
	Qty. in M. tons	Value in (000) Rs.	Qty. in M. tons	Value in (000) Rs.
Belgium	...	...	979	321
Bulgaria	100	41	200	81
Denmark	100	28	773	195
France	300	85	2,147	581
Germany W.	550	157	4,341	1,219
Italy	...	...	200	56
Malaya	166	48	166	48
Netherlands	127	34	3,909	1,020
Pakistan W.	...	...	165	42
Singapore	125	44	248	78
Spain	...	...	250	74
U. K.	103	32	153	51
Total	1,571	469	13,531	3,766

Wind of Change in the Nicobars

"The pigs eat coconuts, each one five to six a day! We eat both coconuts and the pigs that eat coconuts!" said big and burly Captain Martin of Cchukchcuke Village of the Nicobar Islands and having said so burst into hilarious laughter.

Group photo taken on the occasion of the visit of the Nicobarese party to the office of the Indian Central Coconut Committee, Ernakulam. Seated in the centre is Dr. P. J. Gregory, Secretary of the Committee. To his right is Shri Jaswant Singh and to his left Captain Martin. To the Captain's left is Shri P. S. Ponratnam, Asstt. Secretary of the Committee.

"I own one thousand pigs and about six thousand nuts go to feed them daily," added Captain Martin as though to drive home the point he had earlier made.

In the Nicobar Islands a man's social status is gauged by the number of pigs he owns. And as land is owned in common, coconut grows wild and no limit is laid on the use of nuts by members of the community either for their own consumption or to feed their pigs, one can easily imagine that breeding pigs is not a costly occupation in the Nicobars.

Captain Martin, proud owner of a thousand pigs was a leading member of a party of Nicobarese who were visiting the office of the Indian Central Coconut Committee on the 23rd February, 1964 as part of their study tour of the coconut

research stations on the West Coast belonging to the Indian Central Coconut Committee and the Kerala Department of Agriculture and coconut gardens in this part of the country.

Staple food

The Nicobarese have lived amidst coconut plantations from time immemorial and in fact coconut constitutes their staple food. An easily contented, happy-go-lucky race they have hardly ever bothered to consider how they can better their present day conditions. But the wind of change blowing over India is taking the Nicobars also in its sweep and the islanders are being roused to a new awakening. They are beginning to realize what immense wealth their coconut palms, properly exploited, can provide and are gradually opening their minds to receive ideas of scientific coconut cultivation. It is in order to hasten this process and to show them at first hand how these ideas have been put into practice that batches of Nicobarese are sent annually to the West Coast of the mainland to see for themselves and learn modern methods of coconut culture.

Parts of the coconut palm which are considered useful in the mainland are practically wasted in the Nicobars. For example, the leaves are not plaited and used as thatching material in the Islands. Instead they use for thatching a sort of grass that lasts for several years and therefore does not need renewing every year as do the plaited coconut leaves.

What coconut oil the islanders want is usually produced by desiccating the coconut kernel and later heating and pressing it. But the Wardha ghani is being introduced to crush copra and a few of these ghanis are already in operation.

At the Office of the Indian Central Coconut Committee the Nicobarese watched with great interest the films on growing coconuts and on controlling coconut pests and diseases. They unanimously requested that a set of the films should be sent to the Nicobars for frequent screening there.

Where cows run wild

Believe it or not, cows run wild in the Nicobars and are seldom milked. Quite recently, however, a dairy with five tame cows has been started.

The Nicobarese party led by Shri Jaswant Singh, Horticultural Supervisor landed in India on the 17th February and arrived on the 18th at the Central Coconut Research Station, Kayangulam where they were given training in methods of pest and disease control. They were taken round private coconut gardens, coir and cashewnut factories nearby.

From Kayangulam they went to Ernakulam and after a day's stay there proceeded to Nileshwar and Kasaragod where they were given facilities for studying the agronomical and breeding aspects of coconut cultivation.

It is hoped that the lessons successive batches of Nicobarese are learning from the mainland will help to spread in the Islands better and modern ideas of cultivating coconuts, leading to fuller and more economic utilization of this perennial wealth of the islanders.

Agricultural Development Board

With a view to ensure an integrated approach in matters of agricultural policies and programmes the Government of India have set up an Agricultural Production Board consisting of the Union Ministers of Food and Agriculture, Food, Agriculture, Community Development and Co-operation, Irrigation and Power, and Planning and the Member for Agriculture in the Planning Commission.

The main function of the Board will be to bring about expeditious implementation of the programmes for the development of agriculture including animal husbandry, forestry and fisheries and with this end in view will secure effective and continuous co-ordination between the concerned Ministries and Departments at the Centre and between the Centre and the States in matters relating to the formulation and execution of development programmes, review the progress of development programmes, ensure efficient arrangements for supplies and services, locate difficulties, if any, and endeavour to remove them.

Participation in Exhibitions

The Indian Central Coconut Committee participated in the Khadi and Village Industries Exhibition held on the Alwaye sands from the 10th to the 17th February in connection with the Mahasivaratri festival.

The Committee also participated in the Agricultural and Industrial Exhibition held at Lalam (Kottayam District, Kerala) from the 13th to the 19th March, 1964 in connection with the opening of the Headquarters Office of the local National Extension Service Block.

The Committee is presently participating in the Seventh National Agricultural and Industrial Exhibition which began at Kottayam (Kerala) on the 15th March, 1964. The exhibition is expected to continue upto the middle of April, 1960.

Indian Banana in the Soviet Union

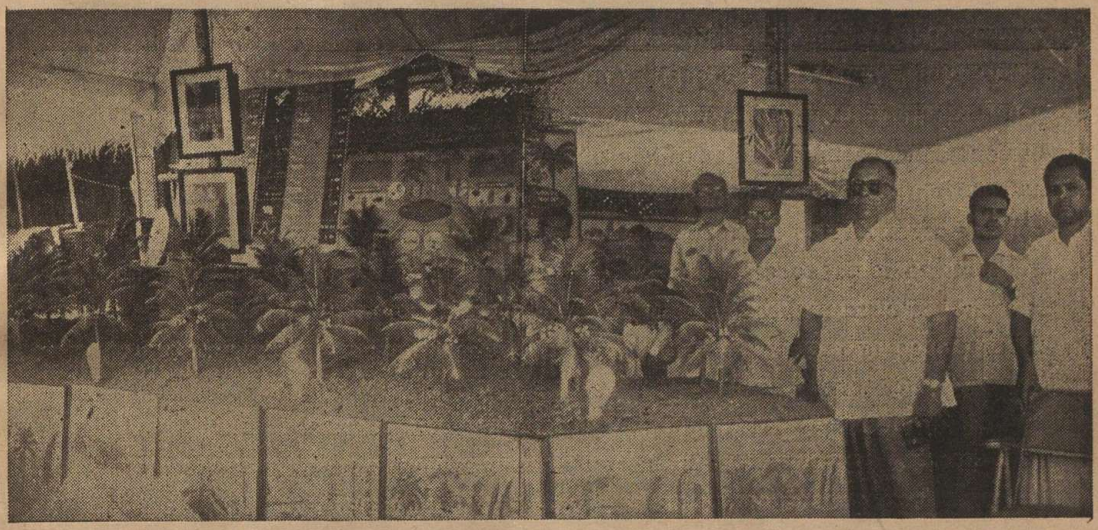
Indian bananas made their first appearance in the Soviet Union in November, 1963. Out of the 11,000 tons shipped to Odessa, 300 tons went to Moscow. The Indian bananas were

highly appreciated by the Russians who, it is reported, are looking forward to increased supplies from India in the near future. The Soviet Union, it is understood, has also placed orders for canned pineapple, canned mango and mango and pineapple juices from India during the current year.

Forestry Co-operatives

A novel experiment in farm forestry is in progress in the Kangra District of the Punjab. Farmers in this region have banded together in Co-operative Forest Societies for protection, improvement and regeneration of the forests in their area. The scheme is in operation in about 70 villages, covering 60,000 acres. The members of these societies with the assistance of the Forest Department have prepared suitable working plans for their forests. These plans include rotational closure for grazing and fodder cutting, planting of fodder trees, and anti-erosion measures. The sowing and planting of trees is done by the members themselves, but the engineering works for check dams, trenches and training of torrents are paid for by the Government. A subsidy of Rs. 50,000/- is granted for this purpose.

In addition to planting trees in their fields and homesteads the Punjab farmers are getting the full benefit of a tree cover by raising such farm forests.



A view of the Indian Central Coconut Committee's stall at the National Agricultural and Industrial Exhibition, Kottayam.

Praise for Kerala's Educational Level

"I have been all over Africa and over Latin America and all over Asia and you (the people of Kerala) have, I think, the highest percentage of children going to school of any State except Japan," observed Mr. Chester Bowles, U. S. Ambassador to India at a press conference at Trivandrum on the 5th March, 1964. The Ambassador

added, "Now it is very impressive to ride along these roads and see streams of young children and then to see them coming out of schools. Now this is creating problems, because educated people ask for answers to their problems. They want to see progress made. The whole basis of Japan's great success was education. The Japanese are the most literate people in Asia and based on this very solid basis of education was the extraordinary development of the Japanese economy which has occurred. So I have suggested your education was creating difficulties for the moment in the sense that people want change, they want improvement, they want betterment. But it also gives you the ingredient over the years out of which these changes and betterment can be produced."

Seminar on Irrigation Practices

Thc Union Minister for Food and Agriculture inaugurated in New Delhi on he 2nd March, 1964 the Fifth Irrigation Practices Seminar for the Near East and South Asia. India was host for the 2-week seminar which had been convened by the U. S. Agency for International Development. The objectives of the seminar were to pool information regarding irrigation.

Talk to Marketing Trainees

A talk on the various research and development activities of the Indian Central Coconut Committee, with special reference to the statistical and marketing aspects was given by Shri A. S. Pankajakshan, Statistician in the office of the Committee at Ernakulam, to 21 trainees in agricultural marketing drawn from different States of the Indian Union, when they visited the Committee's office on the 4th March, 1964 under the leadership of Dr. J. N. Chaturvedi, Marketing Officer, Directorate of Marketing and Inspection. The party watched with great interest the Committee's films on coconut cultivation specially screened on the occasion.

Study Team Discusses Co-operative Marketing of Coconuts

A Study Team set up by the National Co-operative Development Corporation to study problems relating to the co-operative marketing of selected plantation crops visited the office of the Indian Central Coconut Committee on the 5th March, 1964 to discuss with the officials of the Committee problems concerning the co-operative marketing of coconuts and coconut products. The team which consisted of Shri N. P. Chatterjee, Joint Secretary to the Government of India in the Ministry of Community Development and Co-operation (Chairman), Shri M. L. Batra, Chief Officer, Rural Credit, State Bank of India, Shri K. Shamanna, Co-operative Marketing Officer, Indian Central Arecanut Committee, Shri A. C. Bandyopadhyaya, Secretary, National Co-operative Development Corporation and Shri S. T. Khushalani, Deputy Director, National Co-operative Development Corporation, was welcomed by Shri P. S. Ponratnam, Assistant Secretary of the Committee in the absence of Dr. P. J. Gregory, Secretary, who was on tour. The discussion between the study team on the one hand and the Committee's Assistant Secretary, Statistician and other officers on the other centred round the organisation of multi-crop marketing co-operatives to handle commodities like coconut, arecanut, etc., the processing of coconuts into copra and coconut oil by the co-operatives, and the grading of coconuts so that better quality nuts might fetch a premium.

would be no water within reach of the roots of the palms. It is, therefore, essential to water the palms, and irrigation which has been listed above as last in the *panch sheel* of coconut culture, assumes first importance these days.

THIS IS ALSO THE TIME WHEN THE LEAF-EATING CATERPILLAR, ENEMY Number Two of coconut palms indulges in its nefarious activity of eating away the green leaves of the palms, leaving them weak with a burnt or scorched up appearance. The cultivator has to be ever on the look-out for this pest and the moment its presence is noticed should adopt either the biological or the pesticidal measure of controlling it. The former consists in liberating parasites of the pest on the crowns of the affected and the neighbouring trees and the latter in spraying 0.2 per cent D.D.T. on to the leaves of the palms particularly their underside where the pest has its habitation. A precaution to be taken in this connection is that in places where parasites have been released, pesticides should not be sprayed, for the beneficial parasites would be destroyed thereby.

WELL BEFORE THE ONSET OF THE MONSOON IT IS ALSO NECESSARY TO SPRAY the trees with Bordeaux mixture or a copper fungicide in areas where fungal diseases are prevalent. In Kerala in twenty-two taluks in the southern part of the State where the leaf-rot and root (wilt) diseases are widely prevalent, the Government of the State are running a big scheme to spray the crowns of coconut palms twice a year as a control and prophylactic measure and it is up to the coconut growers in this area to take the fullest advantage of this scheme.

THE COCONUT RESPONDS KINDLY TO CULTURAL OPERATIONS. EVEN if manuring is not done, cultivation enables the palms to yield better. But, of course, cultivation plus manuring is the ideal. In low-lying areas where coconut is grown on bunds, now is the time to clean the canals between the bunds and earth up the sides of the latter. May-June is the busiest period of cultural operations. Basins must be dug round the base

of the palms for the application of manures and contour bunds constructed to prevent soil erosion. At the commencement of the south-west monsoon rains green leaves at the rate of 25-50 kgs. per tree should be spread in the basins and over it compost or farmyard manure at the rate of 50 kgs. per tree. The manure should then be covered with a 3-inch layer of earth. During the rains the green leaves and the compost or farmyard manure rot in the basins and the plant nutrients contained in them are made available for assimilation by the palms. In August-September the coconut fertiliser mixture, prepared by fertiliser firms officially approved in this behalf, should be applied in the prescribed dosage and the basin fully filled with earth.

SEVERAL STATES HAVE SCHEMES IN HAND FOR THE SUPPLY OF FERTILISERS on loan basis and growers should take full advantage of these schemes.

AS FAR AS GREEN MANURE IS CONCERNED, GROWERS MUST PRODUCE IT themselves. Green manure crops like sunn-hemp *(Crotalaria juncea)*, wild sunn-hemp *(Crotalaria striata)* and sesbania may be raised in coconut gardens and incorporated in the soil when the crops are about three months old. To raise one of these green manure crops the coconut garden is ploughed once or twice with the first pre-monsoon showers in April-May, the seeds sown broadcast and covered with a light plough. The crops are cut and incorporated into the soil in August-September. Perennial green manure bushes like *Gliricidia maculata* also can be grown on the borders of coconut gardens. An adequate supply of green manure will be assured if two gliricidia bushes are grown for every coconut palm. The advantages of growing green manure crops and incorporating them in the soil, although axiomatic, will bear repetition.

THEY PROMOTE CRUMB STRUCTURE IN HEAVY CLAYS AND MAKE LIGHT soils cohesive and retentive.

THEY ADD 18 TO 45 KGS. OF NITROGEN PER ACRE TO THE SOIL.

THEY SERVE AS FOOD FOR SOIL ORGANISMS AND STIMULATE BENEFICIAL biological changes in it.

THEY PREVENT LEACHING OF NUTRIENTS AND BRING UP NUTRIENTS from lower layers.

THEY CHECK SOIL EROSION AND WEED GROWTH.

THEY OPEN UP AND IMPROVE THE SUB-SOIL.

AN ALL-OUT CAMPAIGN TO IMPLEMENT THE *panch sheel* OF COCONUT culture is the need of the hour.

BEHIND IT MUST BE RANGED ALL WHO HAVE ANYTHING TO DO WITH coconut cultivation—individual growers, village level workers, agricultural demonstrators, extension officers, service co-operatives, panchayats, farmers' clubs etc., etc., — and if they pool their energy, enthusiasm, knowledge, experience and willingness to serve there is no reason why the campaign should not be crowned with success.

Ourselves

Readers will observe that this issue of the "Coconut Bulletin" has been brought out as an enlarged double number to cover the months of February and March, 1964. Owing to circumstances beyond our control, it had not been possible for us, for some time past, to publish this periodical in time, that is, bring out the issue pertaining to a particular month in the first week of the month following. We hope to be able to adhere to this schedule from the present number.

With this issue the "Coconut Bulletin" completes 17 years of its publication and with the next number will enter upon the 18th. With the new volume new numbers are proposed to be allotted to the subscribers who are requested to note them and quote them whenever writing to us on matters relating to their subscription.

Publications of the Indian Central Coconut Committee

BOOKS

		Price per copy including cost, postage, registration etc. Rs.	nP.
1.	The Coconut Palm — A Monograph — de luxe edition Sh. 90/ $ 13.00	43	00
2.	The Coconut Palm — A Monograph — cheaper edition	21	00
3.	The First Conference of Coconut Research Workers in India	15	00
4.	Coconut Cultivation — A Hand Book English edition Rs. 2.90, Malayalam edition Rs. 2.00 and Tamil, Telugu, Kannada, Oriya, Assamese and Marathi editions Rs. 1.38 each.		
5.	Reports on the Marketing of Coconut and Coconut Products (Malayalam)	1	38

PERIODICALS

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