



19

COCONUT VARIETIES OF KERALA

DEPT: OF
AGRICULTURE
KERALA

COCONUT VARIETIES OF KERALA

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INTRODUCTION

The Coconut palm is one of the most beautiful and useful trees in the world. Because of the promiscuous crossing occurring in coconut, several varieties or types widely differing from each other, exist in the different coconut growing countries. Coconut being a cross-fertilised heterozygote, the cropping power due to its genetic make-up very greatly differ from plant to plant, even among the same type or form

The introduction and trial of promising varieties from different parts of the world has been found to be one of the most profitable method of crop improvement. This method was explored for improvement of coconut too in Kerala. With this object in view, 22 varieties were introduced from different countries for trial and planted at the Central Coconut Research Station, Pilicode. From a detailed comparative study of these varieties with those of the local types, it is now possible to assess their merits and demerits and select some of them for extensive cultivation.



Central Coconut Research Station, Pilicode—Office

GENERAL CLASSIFICATION OF COCONUT PALMS

Coconut palms are broadly classified into two groups; the Tall and the Dwarf:

TALL VARIETY:— The tall varieties as the name indicates attain a height of about 15-18 metres. Their life span extends from 80 to 100 years. They normally come to bearing in about 8 to 10 years and attain steady bearing age by the 13th or 14th year. Normally they give economic yield upto 60 years. They are mostly regular bearers. Alternate bearers are also met with. The nuts of tall variety are medium to big in size with good kernel development inside. The quality of copra is good and oil-content fairly high.

Based on economic importance, size of the nut, and appearance of the tree the tall variety is grouped as follows:

- (1) Economic varieties grown on a plantation scale.
- (2) Tall varieties noted for the nut size and tender nuts.
- (3) Fancy varieties of tall group.
- (4) Tall varieties with ornamental value.

DWARF VARIETY:— As the varietal name indicates these are small in stature and slow growing. The trunk is lean and leaves are comparatively smaller. They yield prolifically; but are distinctly alternate bearers. The palm starts bearing very early by about $3\frac{1}{2}$ years and attains steady bearing by the 5th or 6th year. This character makes it a botanically important variety for taking up hybridisation work with tall varieties. The tree is short-lived and the life span is 45-55 years. The economic bearing period is upto 25-35 years. The nuts are small with a comparatively poor kernel development. Copra is of poor grade because it is soft, leathery and pliable and not appreciated in the market. Oil content is as low as 66.2%. Some varieties have nuts with attractive shape and colour.

Based on the appearance of the tree and academic interest the dwarf varieties are grouped into 2 viz., (1) Ornamental dwarf varieties, (2) Dwarf varieties of academic interest.

ECONOMIC TALL VARIETIES GROWN ON A PLANTATION SCALE

WEST COAST TALL:— As the name indicates this is the ordinary or common tall variety which is extensively cultivated in west coast. It is long lived, hardy, multipurpose palm which has a life span extending up to 80-100 years. They normally come to bearing in about 8 to 10 years and yield sizeable crop from the 13th to 60th year. The size of the nuts of this variety is medium to big. It has a copra content of 180.50 gms. Ordinarily 5540 nuts give one ton of copra. The oil percentage is 71.6% by chemical extraction on oven-dry basis. Average annual yield varies from 60 to 130 nuts depending upon the ecotypes with a maximum recorded yield of 191 nuts per tree per year.

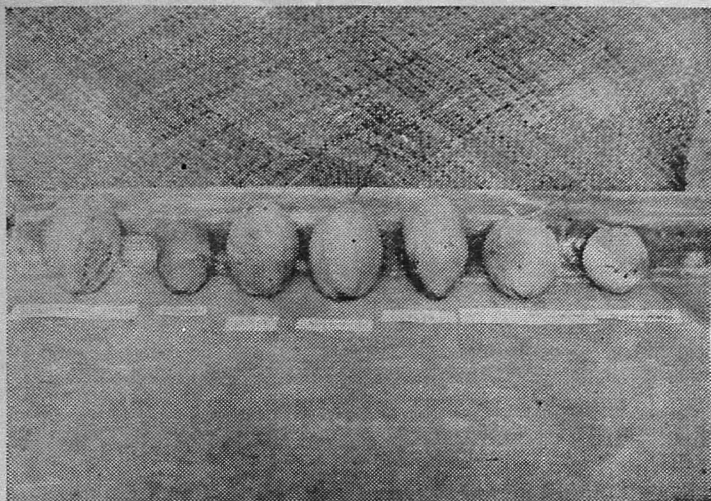
LACCADIVE ORDINARY:— This variety is introduced from Laccadive Islands. The palm is almost similar to West Coast Tall variety in growth habits and nut characters

The average annual yield recorded is 73 nuts per tree. The maximum yield so far recorded in the variety is 122 nuts per tree per year. It has a copra content of 180.5 gms. Only 5540 nuts are required to make one ton of copra. The oil percentage is 72.2 by chemical extraction on dry basis.

Besides, it yields just double the quantity of toddy obtained from West Coast Tall on tapping. This variety is fit for commercial plantation.

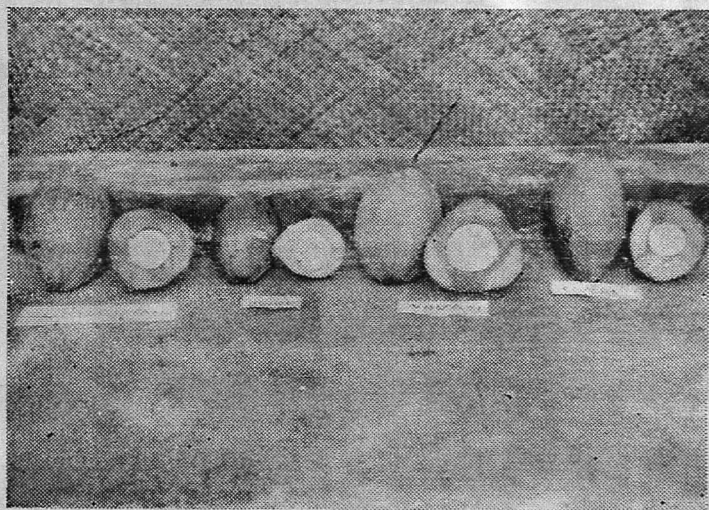
ANDAMAN ORDINARY:— This is an introduction from Andaman Islands. It appears to be a little more vigorous than the West Coast Tall. The annual average yield is 50 nuts per tree. The maximum yield recorded is 110 nuts per tree per year

The nuts are fairly big with thick kernel development inside. It has a copra content of 187.2 grams. Only 5340 nuts are required to make one ton of copra. The low oil percentage of 67.1 deprives it of its superiority with regard to other nut characters.



Nuts of varieties

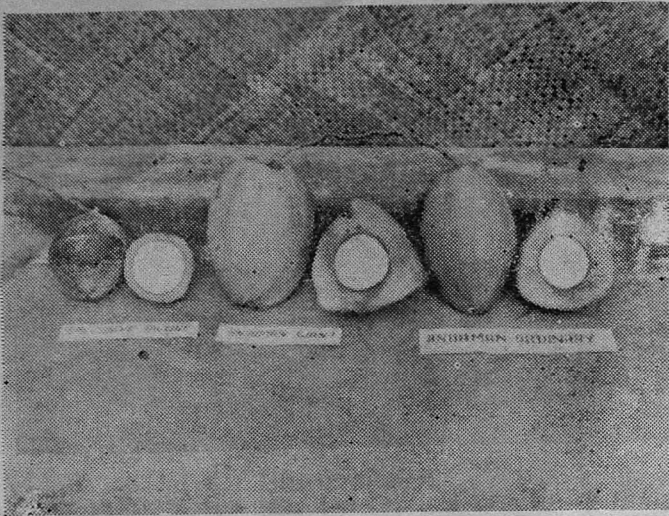
- (1) West Coast Tall (2) Dwarf (3) Fiji (4) Navasi
- (5) Ceylon (6) Strait Settlement (7) Nyirgrading



Cross Sections of varieties

- (1) West Coast Tall (2) Dwarf (3) Navasi (4) Ceylon

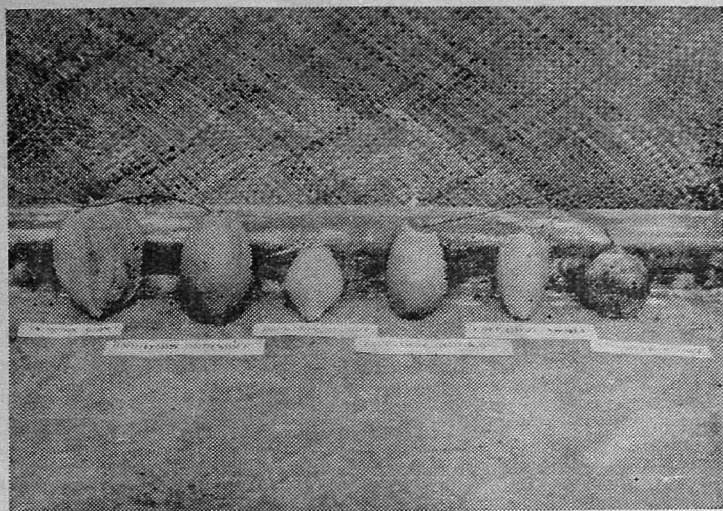
Nuts & Cross Sections of varieties



1 Laeodive Dwarf (2) Andaman Giant (3) Andaman Ordinary

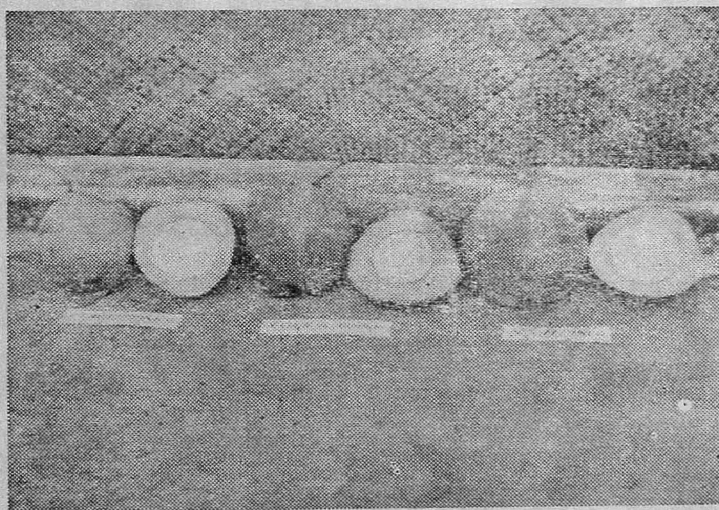


(1.) Fiji (2.) Strait Settlement (3.) Siam (4.) Java



Nuts of varieties

- | | | |
|------------------------|---------------------|----------------------|
| (1) Andaman Giant | (2) Andaman Dwarf | (3) Andaman Ordinary |
| (4) Laccadive Ordinary | (5) Laccadive Small | (6) Laccadive Dwarf |



Nuts & Cross Sections of varieties

- | | | |
|-----------------|------------------|----------------|
| (1) Philippines | (2) Cochin China | (3) New Guinea |
|-----------------|------------------|----------------|

This variety yields good toddy, nearly double the quantity obtained from West Coast Tall.

Fairly good yield coupled with good copra recovery makes it fit for commercial plantation.

JAVA:— This variety is indigenous to the Island of Java. Normally the tree is stout and vigorous.

The average yield of the palm is 54 nuts per tree per year.

The maximum annual yield so far recorded is 73 nuts per tree.

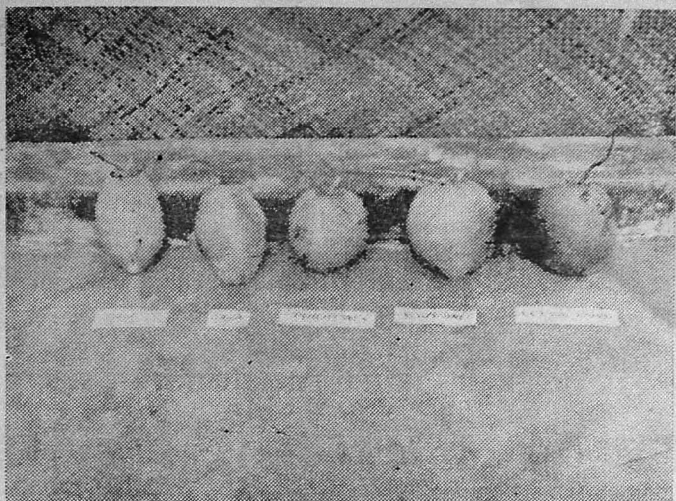
The nuts are appreciably big in size with a well-developed kernel growth inside. It has a copra content of 303.0 gms. Hence 3300 nuts are enough to make a ton of copra. The oil content is 70.2% which is comparable with that of the West Coast Tall. A tender nut gives 4 to 5 tumblers of sweet refreshing drink. Therefore it is specially suited to be used as tender nut.

PHILIPPINES:—This palm from Philippine Island is stout and grows vigorously. The average annual yield of the palm is 52 nuts per tree. The highest annual yield so far recorded is 128 nuts per tree.

The nuts are big with beautiful round shape. It has a copra content of 224.2 gms per nut and its kernel is thick. 4460 nuts yield one ton of copra. The oil percentage is 60 which is slightly lower than that of West Coast Tall. Though the bunches carry a good number of nuts initially a fair percentage sheds, as they mature, due to cracking of shell at the basal end.

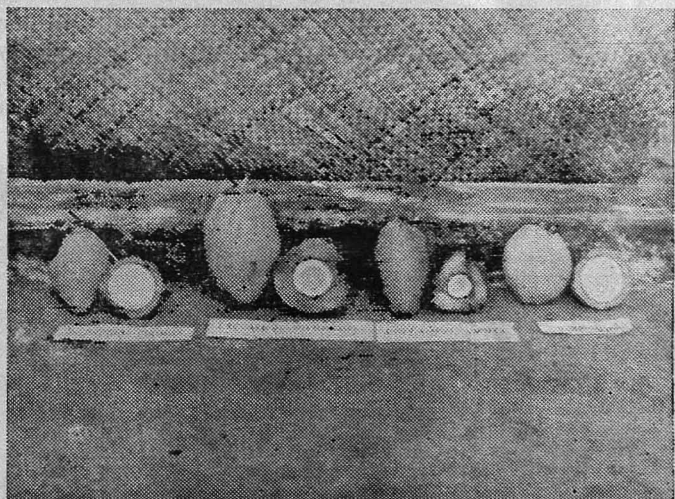
The tender nut of this variety is also delicious. The cocount milk, twice as much as that West Coast Tall has a characteristic flavour.

SIAM:—This Siamese introduction flourishes well as a tall growing robust palm.



Nuts of varieties

- (1) Siam (2) Java (3) Philippines
 (4) New Guinea (5) Cochin China



Nuts & Cross Sections of varieties

- (1) Andaman Dwarf (2) Laccadive Ordinary
 (3) Laccadive Small (4) Nyirgrading

The mean annual yield of the palm is 50 nuts and the maximum yield obtained in this variety is 82 nuts per tree per year.

The nuts are fairly big, well-filled with thick kernel inside. It has a copra content of 243.9 gms per nut. Therefore only 4100 nuts are required to make a ton of copra which fetches a premium in the market due to its high oil content of 74.3%.

A fairly good yield, good tonnage of copra and high oil content make it a commercially important variety.

TALL VARIETIES NOTED FOR THEIR NUT SIZE AND TENDER NUTS

NEW GUINEA:—The variety is from New Guinea. The palms are stout and grow vigorously.

The average yield of the palm is 41 nuts per tree per year with a maximum recorded yield of 90 nuts.

The nuts are comparatively big and round to spheroid in shape. The kernel is fairly thick but not corresponding to the size of the nut. It has a copra content of 231.4 gms and only 4,320 nuts are required to make one ton of copra. The oil content is 65.6% which is slightly less than that of the other varieties.

The big sized tender nuts give nearly 5 to 6 tumblers of sweet refreshing drink. The kernel too is equally sweet.

This quality coupled with economic yield, makes it a commercially important variety.

COCHIN CHINA:—This palm introduced from Cochin China is stout and grows vigorously. The average yield of this variety is 44 nuts per tree per annum. The maximum yield so far recorded is 74 nuts per tree per annum.

The nuts are round and big containing 5 to 6 tumblers of sweet coconut water in tender nut stage. The kernel development is comparatively poor. It has a copra content of 172.4g;

5800 nuts are required to make a ton of copra. It has better toddy yield than West Coast Tall.

It is not much valued as a commercial variety.

FANCY VARIETIES OF TALL GROUP

LACCADIVE SMALL:— This is another introduction from Laccadive Islands. The palm is tall and healthy and resembles West Coast Tall.



A typical palm of Laccadive Small variety

As the name indicates the nuts are small. But the bunches are heavy and attractive with a good number of nuts closely packed. Bunches bearing 120-125 nuts have been recorded.

The average annual yield is 110 nuts per tree, while the maximum yield so far recorded for this variety is 337 nuts per tree per year. Even though the nuts are very small, the kernel is comparatively thick. Its copra content is 86.2 gms and 11,600 nuts make a ton of copra. The oil percentage is 70.5.

It is also a good variety for tapping. The toddy yield is more than that of West Coast Tall.

Due to its very small size, it is sold in the market as a special grade only, known locally as *Kottathengq*.

However the palm, being a profuse bearer, the nut size is compensated by the number.

LACCADIVE MICRO:—This also is a tall healthy palm introduced from Laccadive Islands.

The average annual yield of palm is 160 nuts per tree. The maximum yield recorded is 340 nuts. As the name suggests, the nuts are very small, but the full bunch with closely-set nuts makes the palm very attractive. The oil content is 75%. Because of the very small size of the nuts, it is not popular in the market.

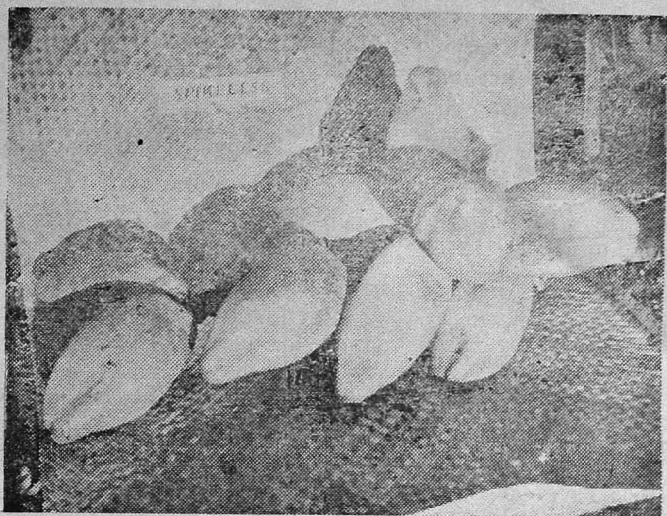
ANDAMAN GIANT:—The palm is introduced from Andaman Islands. The palm is gigantic in stature and habits. The whole nut is enormously big with attractive round shape.

Due to the giant big size of nuts, very few nuts set and develop in a bunch. The average annual yield is 36 nuts per tree. The maximum yield so far recorded is 62 nuts per tree per year.

The husked nuts are of medium size and the large size is due to the thick husk covering it. It has a copra content of 198.4 gms per nut and 5,040 nuts are required to produce one ton of copra. The oil content is only 67.1%. It is not a good variety for tapping. Due to its poor economic characters it is counted more as a fancy variety than as a commercial one.

SPIKELESS:—This is a tall growing healthy palm with all features and habits similar to those of the West Coast Tall but devoid of spikes on the main spadix and hence the name spikeless.

The inflorescence has the main spadix only and nearly 300 to 400 buttons are closely studded on it. At the special portion of the spadix, there will be male flowers 10 to 15 cms long. As



A bunch of spikeless variety

the spadices mature, a good number of buttons are shed, few rot and fall down, and finally there will be 8 or 10 nuts in the spadix. The nuts are medium to large and elliptical. The kernel is fairly thick.

The mean annual yield of the palm is 45 nuts. The maximum recorded is 112 nuts. It has a copra content of 155.5 gm and 6430 nuts are required to make a ton of copra. The oil percentage is 70.6. The variety is unfit for tapping.

TALL VARIETY WITH ORNAMENTAL VALUE

STRAIT SETTLEMENT APRICOT:—This is introduced from Malaya. The palm grows tall with yellow petiole and spadices.

The average annual yield is 48 nuts per tree and the maximum yield recorded is 122 nuts.

The nuts are apricot-shaped and hence the name. They have an attractive bright yellowish-orange colour and is thus

an ornamental variety. The copra content is 180.5 gms per nut and 5540 nuts are required to produce a ton of copra. Oil content is 68.1%.

Generally ornamental varieties are poor in nut characters, but Strait Settlement Apricot is an exception.

OTHER EXOTIC TALL VARIETIES

The following varieties though do not possess any remarkable characters have acclimated themselves to local conditions.

STRAIT SETTLEMENT GREEN:— This is an introduction from Malaya. In stature and habit, the palm is similar to Apricot variety. The nuts are elliptical or ovoid and are green. The nuts are not very attractive.

The mean yield per tree is 50 nuts per annum, while the maximum recorded is 120 nuts. The size of nut is medium and the kernel development is normal. It has a copra content of 175.1 gms and 5710 nuts are required to make a ton of copra. The oil percentage is 68.2.

FII:— This tall variety has been brought from Fiji Islands.

The average annual yield is 40 nuts per tree while the maximum recorded is 115 nuts per tree per year. The bunch often buckles down due to its long drooping spadix. So the bunches are to be protected by tying it with petioles. The nuts are medium-sized but the kernel development is very good. It has a copra content of 198.4 gms; so 5040 nuts are enough to make a ton of copra. The oil content is 68.8%.

CEYLON:— This tall variety from Ceylon is almost like the West Coast Tall. The palm yields 46 nuts annually on an average. The maximum yield so far recorded for this variety is 118. Nuts are medium-sized with average development of kernel inside. It has a copra content of 161.3 gms; 6,200 nuts are required to produce one ton of copra. The oil percentage is 69.4.

YELLOW DWARF

This indigenous variety is widely grown in Chowghat area of Trichur District and is known as Chowghat Yellow Dwarf. The nuts, spadices and leaf petioles have attractive yellow colour. This palm is also called Gourigatham which indicates the complexion of Goddess Parvathy

The average annual yield of the palm is 34 nuts, while the highest yield recorded is 67 nuts.

The nuts are ovoid to spherical in shape and fairly big in size than 'Green dwarf'. It has a copra content of 121.8 gms; 8210 nuts make a ton of copra. Oil percentage is 67.2. Because of the poor market grade it is not a variety fit for commercial plantations. Both cross and self pollination occur in this variety.

ANDAMAN DWARF:—This is introduced from Andaman Islands. The tree has more vigorous growth and it is taller than yellow dwarf. The bunches are closely set with bright orange coloured nuts. Even the leaf petiole and mid-rib of leaflets get the orange shade and make the tree all the more attractive.

The average annual yield is 29 nuts per tree and the maximum yield recorded is 63 nuts.

The nuts are round and medium sized with thick husk. The kernel development is poor and the copra quality is also low. It has a copra content of 140.0 gms; 7140 nuts are required to make a ton of a copra. Oil content is 62%.

The tender nut has very sweet coconut water inside, believed to have medicinal value, and is used as remedy for measles, chicken pox and small pox.

LACCADIVE DWARF:—This is another introduction from Laccadive Islands. The tree is short in stature. The bunches are heavy with spherical nuts having reddish orange colour. Leaf petiole also has the same colour. The colour is not so attractive as in the case of Andaman Dwarf.

The average annual yield of the palm is 41 nuts. The maximum yield recorded is 104.

The size of nut and kernel development are better than Andaman Dwarf. It has a copra content of 143.6 gms; 6960 nuts give a ton of copra. Oil content is 68.5%. Its copra is not much appreciated in market.

GON-THEMBILI:—This is introduced from Ceylon. In growth habit it is a little more vigorous than Andaman Dwarf.

The bunches are full with medium small nuts. The nuts and bunches are bright coloured with mixed shades of yellow and orange. The leaf petiole and midrib of leaflets also get this colour and the tree is very attractive in appearance.

The average annual yield of the palm is 61 nuts while the maximum is 63 nuts. It has a copra content of 138.6 gms. Nearly 7230 nuts are required to make a ton of copra. The oil content is 68.4%.

The peculiar shape and bright colour add to the charm of the tree.

DWARF VARIETIES OF ACADEMIC INTEREST

GREEN DWARF:—This is an indigenous variety commonly seen in Chowghat area of Trichur district. This is also popularly known as Chowghat green dwarf.

The tree is very slow growing compared to the coloured varieties, but it starts bearing early by the 3rd year itself and yields very prolifically. Alternate bearing habit is distinct and more pronounced. The heavy bunch of tender nut in the tree is a beautiful sight to see. The nuts, leaves and petioles are dark green. The nuts assume a wrinkled and distorted shape as they mature and present a very bad appearance. The mean yield is 43 nuts per tree per year. The maximum yield recorded is 76 nuts per tree per year. The

size of nut is very small and kernel development also is poor. The copra is leathery and finds no market. Copra content is 105.6 gms; 9470 nuts are required to make a ton of copra. Oil percentage is 66.2.

This is much valued as a pollen parent for T x D hybridisation by research workers because it is self-pollinated and maintains high purity and hence the importance of this variety.

GANGABONDOM:—This is a semi-dwarf variety from Andhra. The palm grows faster and attains greater height than the ordinary dwarf and hence termed as medium dwarf type.

The tree yields prolifically by the 4th year and is an alternate bearer. The bunches are full with medium-sized oblong nuts. The bunches, leaves and petioles are dark green. The mean yield of the palm is 65 nuts per tree per year. The maximum yield recorded is 181 nuts.

The nut is medium-sized and the kernel development is fairly good. It has a copra content of 167.2 gms. Nearly 5980 nuts produce a ton of copra. Oil content is 72%.

This is also a promising pollen parent for hybridisation work.

HYBRIDS

Hybrids are synthetic varieties, combining the desirable characters of two distinctly different types of palms. The maximum hybrid vigour in coconuts was recorded when the tall variety was used as the female and the Dwarf Green as the male parent.

Only one hybrid variety has been released so far, for large scale cultivations and it is a cross between West Coast Tall and Dwarf.

TALL x DWARF:—This is a hand-pollinated variety with West Coast Tall as female parent and Green Dwarf as male parent.

The palm exhibits extra vigour right from the nursery. It grows vigorously. It comes to bearing within 4½ years and attains steady bearing by the 6th or 7th year. It yields prolifically but alternate bearing nature, characteristic of its male parent, is not so distinct here. The bunches are full and the size of nut is medium to large, with good kernel growth inside. But characters are most inherited from its mother parent West Coast Tall.

The average annual yield of the palm is 72 nuts per tree. The maximum yield recorded is 151 nuts. It has copra content of 171.5 gms. per nut. Nearly 5230 nuts are required to make one ton of copra. Oil content recorded is 70%.

This is a variety suitable for commercial plantation. Seednuts from this hybrid should not be used for further propagation as the progenies will not breed true to parent.

The information given are based on the observations made during the last 30 to 40 years on the varietal collection available at Central Coconut Research Station, Pilicode.

The performance of recently introduced exotic varieties- Nyrgrading, San Raman, Navasi, Gon-Thembili, Philippine leguna, Seychellus is also under observation and study.

Newly evolved hybrids of tall varieties x Gangabondom are being studied for their performance.

APPENDIX I

Varieties at a glance

Variety	1	2	3	4	5	6	7
	Life period (Year)	Age at first flowering (Year)	Age of attainment of steady bearing (Year)	Normal age of economic bearing (till year)	Average annual yield per tree (nuts)	Maximum yield per tree per year (nuts)	
1. West Coast	80-100	6-8	12-14	60-65	52	191	
2. Laccadive Ordinary	80-100	6-8	12-14	60-65	73	122	
3. Andaman Ordinary	100-120	6-8	12-14	65-70	50	110	
4. Java	80-100	6-8	12-14	60-65	54	73	
5. Philippines	100-120	6-8	12-14	65-70	52	128	
6. Siam	80-100	6-8	12-14	60-65	50	82	
7. New Guinea	100-200	7-9	12-14	65-70	41	90	
8. Cochin-China	100-120	7-9	12-14	65-70	44	74	
9. Laccadive small	80-100	6-8	12-14	60-65	110	337	
10. Laccadive Micro	80-100	6-8	12-14	60-65	160	340	
11. Andaman giant	100-120	8-10	13-15	65-70	36	62	
12. Spikeless	80-100	6-8	12-14	60-65	45	112	
13. Strait Settlement Apricot	80-90	6-7	10-12	55-60	40	128	
14. Strait Settlement Green	80-90	6-7	10-12	55-60	0	120	
15. Fiji	80-100	6-8	12-14	60-65	40	115	
16. Ceylon	80-100	6-8	12-14	60-65	46	188	

APPENDIX I (Contd.)

Variety	Mean weight of copra in gm. per nut	Kernel Development	approximate no. of nuts required to make one ton of copra	Oil content in copra	Chemical Analysis)	Other remarkable features
1. West Coast	180.5	Good	5540	71.6	Fib for tapping. A good commercial variety.	
2. Laccadive Ordinary	180.5	Good	5540	72.2	Good toddy doner. Good commercial variety.	
3. Andaman Ordinary	187.2	Thick	5340	71.1	Good commercial variety.	
4. Java	303.0	Thick	3300	70.2	Good commercial variety.	
5. Philippines	224.2	Thick	4460	69.0	Tender nut water with a nice flavour, good commercial variety.	
6. Siam	243.9	Thick	4100	74.3	High oil percentage, copra of good market grade.	
7. New Guinea	231.4	Good	4320	65.6	Big sized nut with plenty of nut water in tender nut stage. Sweet kernel.	
8. Cochín-China	172.4	Fair	5800	66.2	Big size. Good tendernut.	
9. Laccadive small	86.2	Good	11600	70.5	Fancy variety, small nut, good toddy yielder.	
10. Laccadive Micro	81.1	Fair	12320	75.0	Fancy variety. Very small nut.	
11. Andaman giant	198.4	Fair	5040	67.1	Biggest sized nut, fancy variety.	
12. Spikeless	155.5	Fair	6430	70.6	Fancy variety with no spikes in the bunch.	
13. Strait Settlement Apricot	180.5	Fairly Good	5540	68.1	Ornamental, attractive shape and colour of nut.	
14. Strait Settlement Green	175.1	Fairly Good	5710	68.2	do.	
15. Fiji	198.4	Thick	5040	68.8	do.	
16. Ceylon	161.3	Fair	6200	69.4	do.	

APPENDIX I (Contd.)

Variety	Life period (Year)	Age at first flowering (Year)	Age of attainment of steady bearing (Year)	Normal age of economic bearing (till year)	Average annual yield per tree (nuts)	Maximum yield per tree per year (nuts)
	2	3	4	5	6	7

DWARF VARIETIES

17. Yellow Dwarf	35-45	3½-4	5-6	25-30	34	67
18. Andaman Dwarf	35-45	3½-4	5-6	30-35	29	63
19. Laccadive Dwarf	40-50	4-5	6-7	30-35	41	140
20. Gon-Tembili	40-50	4-5	6-7	30-35	61	63
21. Green Dwarf	35-45	3-3½	4-5	25-30	43	76
22. Gangabondom	50-60	4-4½	5-6	35-45	65	181

HYBRIDS

23. Tall x Dwarf	Observe till 33 years	4½-5	6-8	Observed till 33 years	72	151
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APPENDIX I (Contd.)

Variety	Mean weight of copra in gm per nut	Kernel Development	Approximate no of nuts required to make one ton of copra	Oil content in copra	Chemical Analysis	Other remarkable features
	8	9	10	11	12	

DWARF VARIETIES

17. Yellow Dwarf	121.8	Subnormal	8210	67.0	Ornamental, copra poor.	
18. Andaman Dwarf	140.0	Subnormal	7140	62.0	Ornamental, copra poor.	
19. Laccadive Dwarf	143.6	Subnormal	6960	62.50	Ornamental, copra poor.	
20. Gon-Tembili	138.6	Subnormal	7230	68.4	Ornamental, copra poor.	
21. Green Dwarf	105.6	Poor	9470	66.2	Prolific yielder. Alternate pollen parent for hybridisation work.	
22. Gangabondom	167.2	Fair	5980	72.0	Prolific yielder. Pollen parent for hybridisation.	

HYBRIDS

23. Tall x Dwarf	171.5	Good	5830	70.0	Prolific early bearing; long life and bearing period is predicted.	
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