

A note on the study of a few cultivars of coconut

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INTRODUCTION

Among the different methods of crop improvement, introduction of desirable and economic varieties from the different countries of the world occupies an important place. In many crop plants this method has helped to speed up improvement at relatively little cost. The importance of this method in the improvement of coconut and the limitations met with due to the peculiar nature of the crop have been well stressed by Satyabalan (1955). In spite of these limitations, the probable role which this method may play in the improvement of this crop has been under investigation in India since the early thirties. A few exotic cultivars from some of the coconut growing countries like New Guinea, Cochin China, Java, Siam, Philippines, Fiji, Straits Settlements, etc., were obtained and planted at the Agricultural Research Station, Pilicode and planting material (selfed and open pollinated progenies) of some of these and a few other straight introductions from F.M.S. etc., were subsequently planted at the Central Coconut Research Station, Kasaragod in the years 1940 and 1941. Since the taking over of the Agricultural Research Station, Kasaragod by the Indian Central Coconut Committee in 1948, this important aspect of research has been further intensified and seed material from almost all the coconut growing countries of the world has been obtained and introduced for an assessment of their performance under Indian conditions and evaluation of genetic stocks. The cultivars introduced earlier at this Station have been studied for their nut and copra characters. Ninan *et al* (1961) have made a detailed comparative study between the selfed and open pollinated progenies at Kasaragod with those of their parents at Pilicode. Seasonal variations in yield, nut characters and copra content in some of the exotic cultivars maintained at Kasaragod have been reported by Vasudevan Pillai and Satyabalan (1960). The

results presented in this paper pertain to the studies made on certain exotic cultivars at Central Coconut Research Station, Kasaragod.

MATERIALS STUDIED

As mentioned previously selfed and open pollinated progenies of some of the cultivars obtained from Agricultural Research Station, Pilicode were planted at Central Coconut Research Station, Kasaragod in the early forties. They are now in bearing stage and have been studied in detail for various characters like spathe production, female flower production, setting percentage, yield and also for their nut and copra characters like size, shape and weight of nuts, yield and quality of copra. A few of the cultivars are found to be promising under local conditions in respect of certain characters.

RESULTS

A comparative assessment of the performance of the cultivars and the *West Coast Tall* grown under similar conditions at the Central Coconut Research Station, Kasaragod has been made. Details of flowering and data on spathe production, female flower production, setting percentage and yield of the promising ones are given in Table I and nut and copra characters pertaining to these are given in Table II. Similar data for two *West Coast Tall* palms planted in the same field are also given in the tables for comparison. Brief description of the cultivars found to be promising under local conditions is given below.

Philippines

Selfed and open pollinated progenies of this cultivar resemble the ordinary tall form in stature. Both are regular in spathe production, the inbreds producing an average of 12.1 spathes and the open pollinated ones 14.4 spathes. But yield and copra content per nut is slightly higher in the open pollinated progenies than in the inbreds, the mean yields for the two groups being 87.9 nuts and 83.1 nuts respectively. Hence the annual out-turn of copra is higher in the open pollinated progenies than in the selfed ones, the average annual out-turn being 18.6 kg. for the former and 13.7 kg. for the latter. This cultivar has got the desirable characters of regular spathe production and high production of female flowers, but the setting percentage is poor. In all the palms of this cultivar studied, the number of female flowers produced by them is very high, the mean number being 346.5 and 455.6 in the case of inbreds and open pollinated progenies respectively. The setting percentage in the two groups varies between 19 and 24.

Cochin China

The palms of this cultivar also resemble the ordinary tall in tree characters. In this the selfed progeny is far superior to the open pollinated one in

respect of all characters. But in both, the copra content per nut is very high ranging from 246 to 283 gms. When compared to other cultivars, this has got the desirable character of high copra content per nut. The average annual yield for the inbreds is 68.6 nuts while it is 21.4 for the open pollinated progenies. The annual out-turn of copra for the former and the latter groups are 16.9 kg. and 6.1 kg. respectively.

New Guinea

The palms of this cultivar resemble in all respects those of *Cochin China*. In this also the performance of the selfed progeny is far superior to that of the open pollinated one. As in *Cochin China* the copra content per nut is fairly high in both, the mean data being 193.9 gm. for the inbreds and 273.9 gm. for open pollinated progenies. The mean yield for the inbred is 105.1 nuts while it is 55.1 for the open pollinated progeny, the annual out-turn of copra being 20.4 kg. and 15.1 kg. for the two groups respectively.

Straits Settlements (Green)

The open pollinated progeny of this breed is a robust one and produces large sized nuts. It is regular in spathe production. It produces large number of female flowers and the yield is also very high. Another open pollinated progeny of the same cultivar which was planted later also shows certain desirable characters as high production of spathes and female flowers, exhibited by the former. The mean number of spathes and female flowers produced by the palms studied are 14.3 and 375.1 respectively. The mean yield is 92.6 nuts and the mean annual out-turn of copra is 18.5 kg. for the two palms studied.

Fiji

This resembles the ordinary *West Coast Tall* in palm and nut characters. The open pollinated progenies of this cultivar studied indicate that the setting percentage in this is very high, the average for the palms studied being 44.4. The mean copra content per nut of the palms studied is 196.5 gm. and this also is fairly higher than that of the *West Coast Tall*. The mean yield and annual out-turn of copra for the three palms studied are 115.2 nuts and 22.5 kg. respectively.

F. M. S.

The open pollinated palms directly introduced from Malaya possess two desirable characters, namely, high setting percentage and high copra content per nut. The yield is not very high in these palms. The mean yield for the two palms studied is 75.6 nuts. The mean setting percentage and the mean copra content per nut of the palms are 40.6 and 209.7 gm. respectively. An annual out-turn of 15.8 kg. of copra has been obtained.

DISCUSSION

Though the number of palms in each of the exotic cultivars under study is admittedly few to permit general conclusions to be drawn, yet it is seen from the data furnished that some of them appear promising under conditions prevailing at Kasaragod. Not only is the yield generally better in some of the cultivars studied than the common run of the West Coast breed, most of them appear to be considerably better than it in some specific characters. Thus *New Guinea* and *Cochin China* have a uniformly high copra content per nut while *Philippines* and *S. S. Green* produce large number of female flowers. High setting percentage and high copra content per nut are exhibited by *Fiji* and *F. M. S.* These characters appear to be specific to these cultivars because both the inbreds and open pollinated ones exhibit them. These cultivars may, therefore, be used as parents for hybridisation involving these characters. There is some indication that setting percentage can also be considered as a character of classificatory value in the coconut. Narayana and John (1949) do not appear to have taken this into consideration.

That the palm characters are susceptible to changes due to environmental conditions and that the changes need not necessarily be in the same direction are apparent when the data obtained at Kasaragod are compared with the data obtained for their mother palms at Pilicode (Table III). The climatic conditions are almost the same at both the Stations, the difference being mostly in the soil type. The soil of the Agricultural Research Station, Pilicode is gravelly laterite of hill top while that of Kasaragod is deep red loam. According to Ninan *et al* (*loc. cit.*), a knowledge of paternity is also necessary to draw a sure conclusion because of the varying nature of the first generation progenies of various introductions. However, the results obtained here do stress the need to study all the cultivars under the same conditions to obtain comparable data for classification purposes.

SUMMARY

The inbred and open pollinated progenies of certain exotic cultivars obtained from Agricultural Research Station, Pilicode and planted at Central Coconut Research Station, Kasaragod in the years 1940 and 1941 which are now in full bearing stage were studied for their different characters. The characters and performance of a few promising cultivars were compared with those of the *West Coast Tall* grown under similar conditions and with those of the parent palms at Pilicode. A few of the cultivars are found to be promising under local conditions in respect of certain characters. Some cultivars are found to be specific in certain characters though they are found to be variable due to environment. Therefore the need to grow the cultivars for comparative purposes under the same environmental conditions is indicated.

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TABLE I.
Statement showing date of planting and flowering and performance of promising cultivars
at Central Coconut Research Station, Kasaragod.

Sl. No.	Cultivars	Selfed or open pollinated	Date of planting	Date of first flowering	Mean No. of spathes produced	Mean No. of female flowers (1953 - 1962)	Mean setting percent- age (1953 - 1962)	Mean yield of nuts
1.	<i>Philippines</i>	S	16-7-1941	Jan. 1948	11.7	370.8	16.2	66.8
2.	"	O. P.	26-6-1940	Jan. 1945	16.3	266.4	38.7	103.0
3.	"	S	16-7-1941	Jan. 1948	11.5	295.1	32.2	95.0
4.	"	O. P.	26-6-1940	Feb. 1946	12.7	412.7	16.9	69.7
5.	"	S	16-7-1941	Feb. 1945	13.2	373.5	23.5	87.6
6.	"	O. P.	26-6-1940	Aug. 1944	14.3	687.6	13.2	90.9
7.	<i>Cochin China</i>	S	16-7-1941	March 1946	14.3	259.9	26.4	68.6
8.	"	O. P.	26-6-1940	March 1946	6.6	101.3	21.1	21.4
9.	<i>New Guinea</i>	S	16-7-1941	Feb. 1947	12.2	353.2	29.8	105.1
10.	"	O. P.	21-8-1940	Feb. 1945	9.6	122.2	45.1	55.1
11.	<i>S. S. Green</i>	O. P.	15-7-1947	Feb. 1950	12.1	321.7	12.5	40.3
12.	"	O. P.	26-6-1940	Dec. 1944	16.0	417.7	34.6	144.9
13.	<i>Fiji</i>	O. P.	26-6-1940	Feb. 1947	14.2	251.4	38.9	98.0
14.	"	O. P.	26-6-1940	Jan. 1944	12.1	276.0	51.9	143.4
15.	"	O. P.	26-6-1940	Jan. 1944	8.4	251.1	41.4	104.1
16.	<i>F. M. S.</i>	O. P.	26-6-1940	March 1947	7.8	199.7	40.4	80.8
17.	"	O. P.	26-6-1940	Jan. 1947	12.2	164.0	37.3	61.2
18.	"	O. P.	26-6-1940	Jan. 1946	9.5	191.6	44.2	84.7
19.	<i>W. C. Tall (for comparison)</i>	O. P.	26-6-1940	Feb. 1945	13.7	212.5	36.8	78.3
20.	"	O. P.	26-6-1940	March 1945	11.1	100.4	40.2	40.4

TABLE II.

Statement showing the details of nut and copra characters of some promising cultivars.

Sl. No.	Cultivars	Selfed or open pollinated	Weight of unhusked nut (gm)	Weight of husked nut (gm)	Thickness of kernel (mm)	Weight of copra per nut (gm)	Annual out-turn of copra (kg)
1.	Philippines	S	1025.4	470.3	12.0	148.3	9.90
2.	"	O. P.	1209.2	540.5	11.9	165.3	17.03
3.	"	S	1060.1	566.96	10.8	168.3	15.99
4.	"	O. P.	1588.4	1014.7	13.2	253.3	17.66
5.	"	S	1128.3	664.0	12.2	173.8	15.22
6.	"	O. P.	1489.9	847.3	12.0	233.1	21.19
7.	Cochin China	S	1718.7	961.3	11.1	246.4	16.9
8.	"	O. P.	2211.8	1250.0	12.4	283.1	6.06
9.	New Guinea	S	1295.4	664.4	10.2	193.9	20.38
10.	"	O. P.	2064.5	1186.2	10.1	273.9	15.09
11.	S. S. Green	O. P.	971.2	580.7	11.1	154.2	6.21
12.	"	O. P.	1478.6	744.8	12.7	212.98	130.86
13.	Fiji	O. P.	1408.4	673.9	11.8	200.9	19.69
14.	"	O. P.	1240.5	650.5	11.0	193.2	127.70
15.	"	O. P.	1011.7	633.9	11.8	191.7	19.96
16.	F. M. S.	O. P.	1076.8	664.9	11.0	202.0	16.32
17.	"	O. P.	1444.4	996.1	12.0	226.3	13.85
18.	"	O. P.	1540.0	739.7	12.2	203.2	17.21
19.	W. C. Tall (for comparison)	O. P.	1134.8	475.3	12.6	156.9	12.29
20.	"	O. P.	910.3	456.6	11.8	133.6	5.38

TABLE III

*Performance of exotic cultivars of coconuts at Agricultural Research Station,
Nileskwar (Pilicode), (1943-1951).*

Sl. No.	Cultivars	Mean No. of female flowers produced	Mean bolting percentage	Mean yield	Mean copra content per nut (gm)	Average annual out-put of copra (kg.)
1.	Philippines	176.1	24.5	43.3	268.3	11.62
2.	Cochin China	221.8	24.2	53.7	279.3	14.99
3.	New Guinea	334.7	12.9	43.2	253.4	10.95
4.	S. S. Green	161.3	29.5	47.6	144.8	6.89
5.	Fiji	336.5	8.1	27.4	204.9	5.61
						31.10
						12.55
						13.00
						12.00
						13.07
						6.00