

MOTHER PALM AND SEEDLING SELECTION IN COCONUT

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Mother palm and seedling selection are practiced in most of the coconut growing countries for increasing productivity. High yielding mother palms are reported to produce high yielding progenies. However, Cheyne (1952) reported no significant difference in progenies of high and low yielding mother palms and from those selected at random. This led to the practice of seed nut selection on 'Block nut' basis with emphasis on seedling selection. Seedling selection is made based on the vigour of seedlings as judged by collar girth size, spread and colour of leaves, rapidity of growth and sturdiness of seedlings (Charles, 1959). Studies were undertaken to find out the influence of mother palm and seedling selection on the performance of the progenies.

Materials and Methods

Seednuts were collected from (1) palms giving an yield of 80 nuts and above (high yielders) (2) palms selected at random irrespective of yield (bulk mother palms) and (3) palms giving an yield below 20 nuts (poor yielders). Nuts were sown in the nursery and seedlings of each category of mother palm were grouped into vigorous, intermediate and poor based on collar girth, height and number of functioning leaves. Six seedlings in each of the treatments (Vide Table 3) were planted at the Coconut Research Station, Pilicode (laterite soil) under rainfed conditions. Preliminary results of the trial were reported earlier (Nambiar and Nair, 1963). Age at first flowering, number of female flowers, setting percentage, nut yield, weight of husked nut, copra content per nut and annual copra yield per palm were recorded during the subsequent years, and these are presented in this paper.

Results and Discussion

The characters of three categories of mother palms from which seed nuts were collected are furnished in table 1. The mean nut yield of progeny palms for 5 years from 1972 to 1976 are furnished in table 2. The yield difference between treatments was found to be significant. Progenies of poor yielding mother palms recorded the lowest yield irrespective of the vigour of seedlings. The yield of vigorous and intermediate seedlings of high yielding and bulk palms was found to be significantly better than the corresponding progenies of poor yielding mother palms.

Details of other characters of the progenies are furnished in table 3. Vigorous and intermediate seedlings of high yielding mother palms were sig-

nificantly superior to others in respect of age at first flowering with a mean number of 7.0 and 7.6 years respectively. Poor seedlings of all the three age groups required a longer period for flowering.

Table 1 Mother palm characters

Categories of mother palms	Age of palms (years)	Mean yield of nuts/annum	Mean No. of female flowers/tree/annum	Setting percentage	Weight of husked nut (g)	Copra content nut (g)	Annual yield of copra/tree (kg)	Mean No. of functioning leaves	Girth of stem 1m. above ground level (cm)
High yielding palms.	50	87.1	3261	27.0	623	189	16.46	29.6	75.7
Bulk palms	50	50.4	242.1	20.8	607	187	9.52	29.1	76.2
Poor yielding palms	50	18.8	109.7	17.0	664	200	3.70	22.1	74.8

Table 2 Mean annual yield of nuts per palm of progenies during 1972 to 1976

Parents/Seedlings	Vigorous	Intermediate	Poor	Mean
High yielding	76.1	79.1	55.8	71.63
Bulk	73.9	69.7	64.4	69.87
Poor yielding	44.6	31.8	47.6	39.40
Mean	64.3	58.4	57.2	60.30
C. D.	20.80

In respect of mean number of functioning leaves treatment (1) was significantly superior to all others except treatment (5) which was on par. Treatment (9) had the least number of functioning leaves.

Maximum number of female flowers were produced by intermediate seedlings of bulk mother palms closely followed by vigorous seedlings of high yielding mother palms. These two treatments were significantly superior to all other treatments. However the setting percentage was maximum in intermediate

seedlings of high yielding mother palms closely followed by poor seedlings of same yield group.

Table 3 Effect of seedlings on growth and yield characters of the progenies in coconut.

Treatments	Age at first flowering (years)	No. of functioning leaves/plant	No. of female flowers/plant	Setting percentage	Weight of husked nut (g)	Copra content/nut (g)	Annual copra yield/palm (kg)	Oil content (percentage)
1 Vigorous seedlings from high yielding mother palms	7.0	36.0	204.5	29.2	756	230	17.50	64.0
2 Intermediate seedlings from high yielding mother palms	7.6	33.0	182.1	33.1	753	234	18.40	63.8
3 Poor seedlings from high yielding mother palms	9.2	31.0	129.8	32.4	712	207	11.55	63.9
4 Vigorous seedlings from bulk mother palms	8.1	33.9	191.5	30.3	730	221	16.33	62.8
5 Intermediate seedlings from bulk mother palms	8.1	34.5	215.1	24.6	711	225	15.68	63.7
6 poor seedlings from bulk mother palms	8.4	32.8	195.6	24.3	654	221	14.23	63.4
7 Vigorous seedlings from poor yielding motherpalms	9.0	31.6	125.4	18.5	674	212	9.45	64.8
8 intermediate seedlings from poor yielding motherpalms	8.2	31.9	172.0	27.4	671	211	6.70	62.2
9 Poor seedlings from poor yielding mother palms	9.6	29.0	142.3	20.6	510	166	7.79	63.7
C. D. at 5% (between treatments)	0.81	1.54	13.56	3.39	35.32	9.32	N. S.	N. S.

N. S. data not significant.

Treatments (1), (2) and (4) were superior to others in respect of husked nut weight but among themselves there was no significant difference. Copra content per nut was higher in the nuts of intermediate and vigorous seedlings of high yielding mother palms and intermediate seedlings of bulk mother palms and were significantly superior to all other treatments. The annual production of copra per palm was also highest in treatment (2) closely followed by treatment (1). The former yielded 18.40 kg and the latter 17.50 kg of copra per palm per annum. The intermediate and poor seedlings of poor mother palms were poor in copra yield.

Table 4 Measurable vegetative characters of coconut seedlings

Treatments	At the time of planting in 1956			on 31 December, 1959		
	Mean girth (cm)	Mean height (cm)	Mean No. of leaves	Mean girth (cm)	Mean height (cm)	Mean No. of leaves
1 Vigorous seedlings from high yielding mother palms	14.9	146.3	6.5	57.0	293.5	8.8
2 Intermediate seedlings from high yielding mother palms	13.2	110.7	6.2	63.4	305.4	7.2
3 Poor seedlings from high yielding mother palms	10.9	83.5	5.0	26.3	179.6	5.2
4 Vigorous seedlings from bulk mother palms	14.9	132.8	6.2	64.0	299.8	8.6
5 Intermediate seedlings from bulk mother palms	13.4	123.9	5.7	62.8	297.6	8.5
6 Poor seedlings from bulk mother palms	10.9	92.8	4.5	45.0	269.3	7.0
7 Vigorous seedlings from poor yielding mother palms	12.9	119.3	3.6	43.6	255.8	6.6
8 Intermediate seedlings from poor yielding mother palms	12.1	112.5	3.8	52.2	261.3	7.0
9 Poor seedlings from poor yielding mother palms	7.8	71.8	2.6	33.0	186.0	6.0

The most important economic characters of a coconut palm are precocity, high yield of nuts and copra out turn. The intermediate and vigorous seedlings of high yielding mother palms clearly established their superiority in

all these three characters followed by vigorous and intermediate seedlings of bulk mother palms. The progenies of poor mother palms proved to be inferior in all these respects.

However, very wide variations in nut yield were noticed among individual progenies of same yield groups and same type of seedlings. Mean yield of individual palms ranged from 53.0 to 100.6, 59.2 to 117.8 and 21.2 to 79.0 nuts in vigorous, intermediate and poor seedlings of high yielding palms, 62.4 to 100.4, 28.2 to 96.2 and 38.0 to 81.2 nuts in bulk palms and 25.6 to 44.4, 32.6 to 83.6 and 3.6 to 69.2 nuts in low yielding palms. This shows lack of any definite pattern of inheritance of yield contributory factors.

Correlations between various parental characters such as girth, weight of husked nut, copra per nut, number of functioning leaves annual yield of copra per palm, setting percentage, seedling girth, seedling height and progeny yield were worked out. None of the parental characters had significant correlation with the yield of progeny.

Results of the present study thus showed that the performance of the selected seedling progenies of high yielding and bulk parents were superior even from the early stages. Mortality of seedlings was less in these progenies compared to the progenies of poor mother palms as well as poor seedlings of high yielding and bulk palms. They had also made vigorous growth and came to flower earlier and gave highest mean yield of nut and copra.

Variations noticed within progenies of same yield groups might be attributed to the genetic nature of palms. Coconut palm being a highly heterozygous and cross pollinated plant, the capacity of palms to produce high yielding progenies varies considerably and even the progenies of the same palm may behave differently. However, as Menon and Pandalai (1960) observed there is greater chance of obtaining a high yielding progeny by selection than otherwise.

Another finding of interest was that the performance of the progenies of palms selected at random irrespective of their yield (bulk mother palms) was as good as the progenies of high yielding palms. This shows that the method of 'Block nut' selection advocated by Cheyne (1952) is sound and can be adopted without any adverse effect. In as much as seedling selection was carried out both in the progenies of high yielding and bulk palms the points raised against block nut selection by Thampan (1975) do not seem to be sustainable. Progenies of palm yielding less than 20 nuts per annum are definitely unsuitable for selection of seed nuts.

Seedling selection is necessary but it need not be as stringent as is advocated at present. The vigorous and intermediate seedlings of both high

yielding and bulk palms had made up the difference in initial growth within three years after planting (Table 4). In respect of nut and copra yield also they were on par. Poor seedlings however, had taken longer time to flower and yielded less number of nuts and copra. Therefore, only seedlings which show very poor growth need be rejected and all others can be selected for planting.

Summary

Studies were undertaken at the Coconut Research Station, Pilicode to find out influence of mother palm and seedling selection on the performance of the progenies. Palms yielding more than 80 nuts per annum and palms selected at random (bulk mother palms) are found to produce high yielding progenies. Palms giving an yield of less than 20 nuts are definitely unsuitable for seednut selection. Seedling selection though necessary need not be as stringent as is advocated at present since the yield difference between vigorous and intermediate seedlings is not significant. However, for ensuring better establishment, early flowering and higher yield, poor seedlings should be rejected.

സംഗ്രഹം

തെങ്ങിൽ മാതൃവൃക്ഷങ്ങളും, തൈകളും തിരഞ്ഞെടുക്കുമ്പോൾ സുപ്രകാശിതമാണെന്നു മാത്രമല്ല അതിൽ 80 നു് കൂടുതൽ വർഷം പഴക്കമുള്ള പാമ്പൻ പീലിക്കോട് നാളികേര ഗവേഷണകേന്ദ്രത്തിൽ 1956 മുതൽ 1976 വരെ നടത്തുകയുണ്ടായി. മൂന്നു് തരത്തിലുള്ള മാതൃവൃക്ഷങ്ങളും അവയുടെ കാരോന്നിന്റെയും മൂന്നു് തരത്തിലുള്ള തൈകളുമാണു് പഠനവിധേയമാക്കിയതു്. ആദ്യദശയിൽ, ചുരുങ്ങിയ വിളവു് തരുന്ന മാതൃവൃക്ഷങ്ങളുടെ സന്തതികൾ കൂടുതൽ എണ്ണം ഉണ്ടാക്കിപ്പോകുകയുണ്ടായി. കൂടുതൽ വിളവുതരുന്നതും 'ബ്ലോക്ക്' സിസ്റ്റത്തിൽ തിരഞ്ഞെടുത്തതുമായ മാതൃവൃക്ഷങ്ങളുടെ കരുത്തുറവയും മധ്യകരുത്തുള്ളവയുമായ സന്തതികൾ നാളികേരവിളവിലും, കൊപ്രയുടെ ഉൽപ്പാദനത്തിലും മുന്നിട്ടു് നിൽക്കുകയുണ്ടായി. കുറഞ്ഞ വിളവുകൾ തരുന്ന മാതൃവൃക്ഷങ്ങളും കരുത്തു് വളരെ കുറഞ്ഞ തൈകളും പ്രവർദ്ധനത്തിനുപയോഗിക്കുന്നതു് ഒഴിവാക്കേണ്ടതാണു്.

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