Agri. Res. J. Kerala, 1976 14 (/) 48—52

STUDIES ON THE OPEN POLLINATED PROGENIES OF TALL x DWARF COCONUT HYBRIDS

K. KANNAN

College of Horticulture, Mannuthy, Kerala

Manifestation of hybrid vigour in Tall x Dwarf hybrids has been well established (Patel, 1938; John and Narayana, 1943; Rao and Koyamu, 1952; Anon, 1961). The hybrids are reported to combine the desirable early flowering nature of the dwarf parent with the economic nut characters of the tall parent. Therefore, they have become very popular with the coconut growers and large scale production and distribution of hybrid seedlings are in progress. But one of the problems faced by the cultivators of T x D palms is as to whether they could select open pollinated seednuts of T X D palms for further propagation. It is presumed that the F2 seedlings raised from the seednuts of these hybrids will show segregation for parental characters and may prove undersirable for planting. It is also thought that the F2 progenies may not perpetuate the hybrid vigour of the F1 parents. However no scientific studies of T X D hybrids seem to have been made. These aspects were therefore studied in a trial laid out at the Coconut Research Station, Pilicode, the results of which are presented in this paper.

Materials and Methods

One hundred and forty seedlings raised from open pollinated seednuts collected from 10 T x D palms grown at the Coconut Research Station, Nileshwar were planted in Block I of Coconut Research Station, Pilicode in 1950. Out of these, 29 seedlings died subsequently. Details of the existing plants are furnished in Table IV.

The seedlings were subjected to rigorous selection at the nursery stage discarding the dwarf segregates on the basis of their early germination and delicate thin leaflets and the tall segregates by their late germination and general low vigour. Cultural operations, manuring etc. were done uniformly to all palms. The age at first flowering, height and girth of the trunk, annual leaf production and nut yield were recorded. The copra yield per tree per annum was computed from the copra content per nut.

Results and Discussion

Years to first flowering of the progenies of T x D parents are furnished in Table 1.

Table 1

Years to first flowering of the progenies of T x !) palms

Parent tree No.	Range (years)	Mean (years)
VI1I/26	5-11	8.50
VII1/32	5-14	8.20
VIII/33	6-8	7.50
VI1I/40	4-10	7.80
VII1/48	5-8	6.60
VIII/54	5-10	7.20
VI1/109	5-10	8.00
VI I/I 11	5-12	7.50
V1I/114	5-9	6.50
VII/115	5-9	7.00

The progenies exhibited wide variations among themselves and also comparison with the parents in the age at first flowering. Only one out of 111 plams flowered in 4 years, 12 in 5 years, 15 in 6 years and 8 in 7 years. The rest of the palms (67.5 per cent) took 8 years and more to start flowering. It is observed at the Coconut Research Station, Nileshwar that T x D palms flower in 4 to 5 years and sometimes even earlier as against more than 8 years required for the West Coast Tall palms. Precocity is one of the important characteristics of T x D and it is evident that this has not been inherited by their progenies. However variations were noticed among the parents in their ability to transmit the early flowering character. While the mean number of years for first flowering in the progenies of VII/114 parent was 6.50 years it was 8.50 years in VIII, 26,

The mean height, girth and rate of leaf production of the progeny palms of 22 years old are furnished in Table 2.

The height of a 35 year old T x D palm was reported to be (Anon, 1975) 618 cm (17.66 cm/year) while it ranged from 523 cm (24.00 cm/year) to 717 cm (32.60 cm/year) in 22 year old progenies. So also the girth of T x D palm was 66 cm (1.9 cm/year) (Ibid) and that of the progenies ranged from 72 cm (3.27 cm/year) to 79 cm (3.60 cm/year). T x D palms are generally semi-tall in stature and this characteristic has not been perpetuated in their progenies. Production of leaves and inflorescences at shorter intervals was noticed in F1 progenies due to hybrid vigour. While annual rate of leaf production in the

T x D palms under study recorded at C. R. S., Nileshwar was 13.5 it was only 11.5 to 12.8 in the progenies of T x D. The progenies did not inherit the extra vigour exhibited by T x D palms in the production of larger number of leaves.

Table 2

Mean height, girth and leaf production of the progenies

Parent tree No.	Height (cm)	Girth (cm)	Rate of leaf production per year
VIII/26	581	79	12.1
VIII/32	682	73	11.6
VIII/33	621	72	11.8
VIII/40	582	77	12 2
VII1/48	523	70	11.5
VIII/54	692	74	12.5
VII/109	717	77	12.5
VII/111	714	79	12.8
VI1/114	583	72	11.9
VII/115	625	73	11.8

The mean nut and copra yeild of the parent trees and their progenies over *a* period of 10 years are presented in Table 3.

Table 3

Mean annual nut and copra production per tree

Parent tree No.	Parent trees			Progenies		
	Nut yield (No)	Copra/nut (gr)	Copra/tree (Kg)	Nut yield (No)	Copra/nut (gr)	Copra/tree (Kg)
VIII/26	50.9	168	8.55	50.7	148	7.50
VIII/32	65.9	181	11.92	56.5	161	9.09
VIII/33	51 8	164	8.49	76.6	152	11 64
VIII/40	47.7	182	8.68	69.2	1 SO	12.45
VI1I/48	49.3	164	8.08	74.5	198	14,75
VIII/54	60.9	182	11.08	84.6	165	1395
Vll/109	46.0	193	8.87	73.4	197	14.45
VII/111	76.6	167	13.02	82.8	175	14.49
VII/114	63.3	202	12.78	62.8	161	10.11
VII/115	70.0	130	9.10	92.1	154	14.18

Seven out of 10 parents produced progenies giving mean yield higher than the parents while the yield of the progenies of the remaining three parents were lower. The mean annual production of copra per tree increased from 8.08 kg. in parent tree VIII/48 to 14.75 kg. in its progeny and from 13.0.2 kg. in parent tree VII/111 to 14.49 kg. in its progeny.

Some of the parent trees produced more number of high yielding progenies while some others produced fewer number of high yielders (Table 4).

table 4

Details of high yielding progenies

Parent tree number at C. R. S., Nileshwar	Number of progenies planted at C R. S. Pilicode	Number of high yielders	Percentage of high yielders
VIII/26	11	3	27 30
VIII/32	28	6	21.40
VIII/33	9	5	55.50
VIII/40	11	;0	90.90
VIII/48	3	3	100.00
VIII/54	12	8	66.60
VII/109	9	7	77 70
VII/111	19	8	42.10
VII/114	4	2	50.00
VII/115	5	4	80.00

Out of a total number of 111 progenies under trial 56 palms (50.45 per cent) were higher yielders while the remaining 55 palms (49.55 per cent) gave lower yields. The heritability of high yielding character was more in certain parents than in others. The percentage of high yielders ranged from 21.4 in the progenies of parent tree number VIII/32 to 100 in VIII/48. Considering the fact that rigorous selection was resorted to in the nursery and only the best seedlings were used for planting, the performances of the open pollinated progenies of T x D palms under trial in respect of vegetative growth, precocity and nut yield were not satisfactory.

Summary

A study of the performance of the open pollinated progenies of T x D palms was conducted at the Coconut Research Station, Pilicode. Considerable

reduction in the expression of hybrid vigour was observed from the first generation T x D to the second generation open pollinated progenies. In respect of age at first flowering growth rate and leaf production they were more equal to the West Coast Tall than to T x D. About half the population gave higher yield of nut and copra than the parents while the other half was low yielders. A few of the parent palms produced high percentage of high yielders which may be due to prepotency.

Acknowledgement

The author thanks Sri. K. P. Padmanabhan Nambiar, Coconut Specialist for the valuable help and guidance given in the preparation of this paper.

സംഗ്രഹം

ടി x ഡി സങ്കരഇനം തെങ്ങുകളിൽ സ്വാഭാവികമായുണ്ടാകുന്ന വിത്തു് തേങ്ങകളും പാവി മുളപ്പിച്ചുണ്ടാക്കിയ തൈകളുടെ സ്വഭാവ ഗുണങ്ങളെപ്പറ്റി പഠിക്കാനുള്ള ഒരു പരീക്ഷണം 1950 മുതൽ പിലിക്കോടു് നാളികേര ഗവേഷണകേന്ദ്രത്തിൽ നടത്തുകയുണ്ടായി. ടി x ഡിയിൽ കാണുന്ന സങ്കരവീര്യം അവയുടെ സന്തതികളിൽ വേണ്ടത്ര പ്രകടമാകയുണ്ടായില്ല. വളർച്ച, ഇല വിരിയൽ, തേങ്ങയുടെ എണ്ണം, കൊപ്രയുടെ വാർഷികോൽപ്പാദനം എന്നിവയിലും സാധാരണ നാടൻ തെങ്ങുകളോടു്, തത്തുല്യമായ ഗുണവിശേഷങ്ങളെ ടി x ഡിയുടെ സന്തതികളിൽ കണ്ടുള്ളൂ. ടി x ഡിയുടെ സ്വഭാവ ഗുണങ്ങളും ലഭ്യമാകുമെന്ന ഉദ്ദേശത്തോടെ raroajco'lraii നിന്നുള്ള വിത്തു് തേങ്ങ പാവി മുളപ്പിച്ച തൈകളും നട്ടുന്നതു് അഭികാമ്യമല്ലെന്നാണു് പരീക്ഷണ ഫലങ്ങളും തെളിയിക്കുന്നതു്.

REFERENCES

Anonymous 1961 Coconut Administration Report of the Agricultural Department, Kerala for the year 1?59-60

Anonymous 1975 Technical report presented to the Coconut convention held on 9th and 10th October, 1975 at. the Kerala Agricultural Universiiy.

John, C. M. and Venketanarayana G. 1943 Note on the improvement of the coconut by cross-breeding. *Madras Agri. J.* **31**: 75-77

Patel, J. S. 1938 *The Coconut—A monograph.* Govt. Press, Madras.

Rao, M B. S. and Koyamu K. 1952 Hybrid vigour in coconut seedlings. *Indian Coconut J 6* 41-44

(M. S. *received: 14-8-1976)*