

EVALUATION OF SUPER MOTHER PALMS OF COCONUT BY PROGENY ANALYSIS*

It was Iyer *et al.* (1979) who first proposed the concept of super mother palms in coconut by defining them as those yielding more than 200 nuts annually and remaining unaffected by root (wilt) disease. In the present study seedling progeny analysis was conducted in super mother palms of coconut with annual yield of not less than 300 nuts per tree. These were compared with control mother palms (average mother palms with annual yield of not less than 80 nuts per tree). The objective was to evaluate these super palms for their prepotent ability to produce quality seedlings.

Ten super palms (Nos. 1 to 10) were selected from different locations in Trivandrum and Quilon districts of Kerala state. Five groups of control mother palms (Nos. 11 to 15) each consisting of five trees representing a location from where a super palm was selected were also included in the study. In addition to these five control groups, a general control (No. 16) comprising of random samples of 70 seednuts collected by the Department of Agriculture, Kerala state, from the seednut procurement belt in North Kerala (Badagara) was also included.

Seednuts were collected separately from each super palm and collected in bulk from each group of control mother palms. Thus there were altogether 16 lots of seednuts. Each lot comprised of 60 to 70 seednuts after rejecting malformed and barren nuts.

Random samples of five nuts were drawn from each seed lot and subjected to fruit component analysis. The rest of the seednuts were sown in the nursery in R B D with 16 treatments and three replications. There were 20 seedlings in each plot. Seednuts were sown in raised seed beds of 2.25 x 7.20 m giving a spacing of 45 x 45 cm. Nuts were vertically sown in furrows springled with sand and 5 per cent BHC dust.

Number of leaves, number of spadices, number of bunches and number of nuts per bunch were recorded for the mother palms. The component characters recorded for nuts were weight of unhusked nut, weight of husked nut, weight of meat, thickness of meat and diameter of eye. Germination per cent at sixth month of sowing, seedling height, girth at collar, number of leaves, leaf area and age at leaf splitting were recorded for the seedlings.

Data on the various mother palm characters observed on the ten super mother palms and six groups of control mother palms are given in Table 1. The results show that the super palms are really superior only in two characters namely number of bunches and number of nuts per bunch.

* Part of M. Sc. (Ag) thesis of the first author submitted to Kerala Agricultural University 1982

Table 1
Mean data on mother palm characters

Mother palms	No. of leaves	No. of spadices	No. of bunches	Nuts per bunch
Super palms (Data from single palm)				
T- 1	26	2	18	22
T- 2	38	3	20	28
T- 3	32	3	13	27
T- 4	52	3	22	26
T- 5	38	2	15	48
T- 6	33	3	17	25
t- 7	28	3	16	38
T- 8	67	7	19	26
T- 9	38	3	17	27
T-10	63	7	21	25
Control palms (Mean of five palms)				
T-11	33.20	2.80	15.60	10.00
T-12	29.40	2.80	12.80	10.60
T-13	19.50	2.75	16.50	8.75
T-14	40.00	3.80	14.20	16.20
T-15	30.10	3.00	11.20	10.20
T-16	33.60	4.60	8.20	10.10

The mean data for the various nut characters of ten super palms and six control mother palm groups are given in Table 2. The results show that the super palms T4 is significantly superior to all other palms in weight of unhusked nuts and weight of meat. In thickness of meat, no single palm or group of palms showed superiority over others. But in diameter of eye, super mother palm T8 showed significant superiority over all other palms.

Seedling progeny analysis

The mean data for the various seedling characters including germination percentage are presented in Table 3. The results show that super palm T4 is superior in percentage of seednut germination, closely followed by the control mother palm group T16. This shows the relative superiority of seednuts collected by the State Department of Agriculture from the selected gardens of Northern Kerala. Another fact observed from Table 3 is the low germination percentage of T2, T5, and T7 super palms which have high number of nuts per bunch (Table 1).

This has led to a resultant reduction in size of nuts as evidenced from Table 2. These small sized nuts with less quantity of nut water, probably dried up during storage and might have led to their poor germination. This emphasises the importance of fixing the minimum nut size to 600 g in unhusked nuts for seed purpose in coconut.

In the seedling growth parameters like seedling height, girth at collar and number of leaves, the super palm T4 is ranked below control palms T14 and T15. The superior performance of the seedlings from these two control mother palms could be explained as the effect of the general vigour of the coconut garden from which these were selected. Cheyne (1952) has explained such effects in terms of 'block nut' selection.

The super palm T4 has shown superiority over the rest of the palms in respect of total leaf area, and age of leaf splitting (Table 3). Since leaf area is an important factor contributing to total vigour of a seedling (Ramadasan *et al.* 1980)

Table 2
Mean data on nut characters

Mother palms	Wt. of unhusked nuts (g)	Wt. of husked nuts (g)	Wt. of meat (g)	Thickness of meat (cm)	Diameter of eye (cm)
Super palms					
T- 1	666.40	476.40	260.80	0.92	0.70
T- 2	488.20	253.20	154.80	1.00	1.07
T- 3	770.80	391.60	221.60	0.95	0.82
T- 4	1149.20	776.60	551.20	0.99	1.10
T- 5	355.60	147.00	85.60	0.88	1.16
T- 6	629.20	383.60	248.20	0.93	1.03
T- 7	267.00	153.40	81.80	0.90	1.08
T- 8	573.60	295.20	155.00	0.94	1.46
T- 9	517.40	262.40	158.00	1.05	1.17
T-10	676.20	421.00	269.40	0.94	1.17
Control palms					
T-11	771.00	392.00	202.60	0.82	1.23
T-12	453.60	242.60	123.20	0.85	1.02
T-13	760.00	310.40	177.40	0.85	1.08
T-14	608.40	412.20	176.60	0.95	1.00
T-15	630.00	415.00	250.80	0.89	1.14
T-16	620.00	309.80	161.60	1.03	0.96
CD (0.05)	91.535	60.809	56.948	0.117	0.153

Table 3
Mean data on seedling characters

Mother palms	Germination (%)	Height (cm)	Girth at collar (cm)	Number of leaves	Leaf area (sq. cm)	Age at leaf splitting (months)
Super palms						
T-1	81.67 (64.55)	76.79	10.89	5.24	2384.90	9.00 (3.16)
T-2	18.33 (25.85)	61.00	8.29	4.04	866.43	0.00 (1.00)
T-3	73.89 (59.27)	88.57	10.93	4.93	2543.46	8.67 (3.11)
T-4	94.17 (76.00)	96.29	12.81	5.91	4349.54	8.30 (3.05)
T-5	15.00 (22.79)	56.20	9.20	4.24	972.21	0.00 (1.00)
T-6	70.93 (57.37)	87.56	10.63	5.56	2807.90	0.00 (1.00)
T-7	13.33 (21.41)	54.50	9.13	4.50	1338.95	0.00 (1.00)
T-8	61.67 (51.75)	74.94	10.35	4.83	2132.43	10.00 (3.32)
T-9	53.89 (47.23)	85.44	10.00	4.45	1749.29	0.00 (1.00)
T-10	85.00 (67.21)	77.16	11.69	5.54	2639.26	0.00 (1.00)
Control palms						
T-11	69.24 (56.31)	91.12	11.65	5.62	3130.12	10.00 (3.32)
T-12	82.23 (65.07)	83.26	11.04	5.32	2648.12	0.00 (1.00)
T-13	55.00 (47.87)	67.47	10.02	4.33	1683.21	0.00 (1.00)
T-14	78.33 (62.26)	97.04	13.17	6.09	4091.32	10.00 (3.32)
T-15	76.38 (60.93)	99.10	12.17	5.47	3585.87	0.00 (1.00)
T-16	90.00 (71.57)	75.05	10.54	4.88	1878.89	0.00 (1.00)
CD (0.05)	18.856	16.218	1.122	0.157	885.724	1.126

Figures in parenthesis are values after angular transformation.

the superiority of T4 in producing vigorous seedlings has become more evident. Leaf splitting occurs at the earliest by eight months after sowing in T4 which shows the quality of the seedlings obtainable from this tree, since early splitting of leaf is a sign of precocity (Menon and Pandalai, 1958).

The above results indicate that the phenotypic superiority of palms based on total nut yield per palm per year is not reflected on the seedling progeny performance. Among the ten super palms studied, only one namely T 4 was found to be capable of transmitting its superiority to the progeny in the form of superior seedling characters. The seednuts from this palm showed the largest scores for weight of unhusked nuts, husked nuts, and meat. This indicates the importance of striking a balance between number of nuts per bunch and nut size in selecting superior mother palms in coconut.

സംഗ്രഹം

വർഷത്തിൽ 300 roi അധികം തേങ്ങതരുന്ന 10 മേത്തരം മാതൃവൃക്ഷങ്ങളെ അവയുടെ സന്തതി വിശ്ലേഷണം മുഖേന മറ്റു സാധാരണ മാതൃവൃക്ഷങ്ങളുമായി താരതമ്യപ്പെടുത്തി പഠിച്ചതിൽ താഴെപ്പറയുന്ന വിവരങ്ങൾ ലഭിച്ചു.

കൂലകളുടെ എണ്ണം, ഒരു കൂലയിലെ തേങ്ങകളുടെ എണ്ണം എന്നീ രണ്ടു മാതൃവൃക്ഷ സ്വഭാവങ്ങളിൽ fo?t<v>ff>ii മേത്തരം മാതൃവൃക്ഷങ്ങൾ മറ്റുള്ളവയേക്കാൾ മുന്നിട്ടു നിന്നിരുന്നുള്ളൂ. എന്നാൽ സന്തതി പരീക്ഷണത്തിൽ T4 എന്ന മേത്തരം മാതൃവൃക്ഷം വിത്തു തേങ്ങയുടെ വലിപ്പത്തിലും പരിപ്പിന്റെ തൂക്കത്തിലും കിളുക്കൽ ശതമാനത്തിലും തൈകളുടെ പത്ര വിസ്താരത്തിലും ഏറ്റവും ആദ്യം ഓലക്കാൽ വിരിയുന്ന സ്വഭാവത്തിലും മറ്റു മാതൃവൃക്ഷങ്ങളേക്കാൾ മുന്നിലാണെന്നു കണ്ടു. നല്ല മാതൃവൃക്ഷങ്ങളുടെ സ്വഭാവത്തിൽ തേങ്ങകളുടെ എണ്ണംത്തൊടൊപ്പം അവയുടെ വലിപ്പത്തിലും തുല്യ പ്രാധാന്യം നൽകണം എന്ന കാര്യത്തിന്റെ പ്രാധാന്യം ഈ പരീക്ഷണത്തിൽ വെളിവാചി.

College of Agriculture
Vellayani 695 522
Trivandrum, Kerala

Thomas Mathew
Ft. Gopimony
P. Gangadharan

References

Cheyne, O.B.M. 1952. Seed coconuts: Block nuts vs mother palm nuts. *Ceylon Cocon.* 0. 3: 73-74
Iyer, R. D., Rao, B. R. V. V. and Govindankutty, M. P. 1979. Super yielders of coconuts. *Indian Fmg.* 28 (20): 3-5
Menon, K. P. V. and Pandalai, K. M. 1958. *The Coconut Palm -A Monograph.* Indian Central Coconut Committee, Ernakulam, India: 46
Ramadasan, A., Satheesan, K. V. and Balakrishnan, R. 1980. Leaf area and shoot dry weight in coconut seedling selection. *Indian J. agrt'c. Sci.* 50 (7): 553-554.