SEEDLING PROGENY ANALYSIS IN SELECTED CASHEW TYPES*

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Cashew (*Anacardium occidentale* L.) is one of the important nut crops grown in India. Research on genetic improvement of this crop is relatively recent and the progress so far achieved is by no means satisfactory. Large scale production of cashew seedlings in the nurseries of the Department of Agriculture is being done by using seednuts collected from mother trees selected purely on the basis of phenotypic expressions. The genetic superiority of the selected mother trees could be identified only through progeny testing. The present investigation was undertaken to study large number of cashew mother trees in relation to the characters of their seedling progenies to formulate an efficient method of evaluation of mother trees for large scale production of quality seedlings.

Materials and Methods

Seednuts collected from thirty mother trees from each of the two superior cashew types namely Kottarakara 1 and Kottarakara 27 formed the base material for the progeny study. The selected mother trees in two types were grouped under three yield groups namely low, medium and high based on their total yield. From each tree a sample of 100 nuts was used for the progeny study. The sample was drawn from the plumpy lot selected through the usual water immersion technique.

The seedlings were individually raised in polythene bags of 23 x 15cm filled with a mixture of 1:1 sand and top soil. A random sample of 20 seedlings was usedfor taking morphological observations.

Vigour index for each seedling under each type was determined as per the property of normal distribution based on five growth parameters viz., seedling height, total leaf area, length of internodes, girth at collar and length of tap root. Index scores of one, two and three were given for low, medium and high classes respectively for each character as suggested by Singh and Chaudhary (1979). Thus there was a minimum of five and maximum of 15 scores for each seedling. Seedlings having index scores higher to the middle score ie., 11 and above were considered vigorous ones.

On the basis of recovery percentage of vigorous seedlings the prepotency of each mother tree was determined. Those trees which register a higher recovery percentage over mean of the type was identified as prepotent.

Results and Discussion

The percentage of recovery of vigorous seedlings from the three yield groups of Kottarakara 1 and Kottarakara 27 is given in Table 1. The results indicate that the recovery of vigorous seedlings was more in the medium yielding group followed by the high yielding group in both types. The low yielding group registered the lowest recovery. The chi-square test of significance (Gupta and Kapoor, 1977) showed that there was no significant difference between the yield groups in the recovery of vigorous seedlings in Kottarakara 1 where as in Kottarakara 27 the yield groups differed significantly in this respect. There was significant difference between the types also. Kottarakara 27 was superior in the recovery of vigorous seedlings when compared to Kottarakara 1. These results indicate the superiority of certain types over others in the capacity to produce more vigorous seedlings.

Table 1

Percentage recovery of vigorous seedlings from the three yield groups of Kottarakara 1 and Kottarakara 27

Types	Low	medium	High	Total	Chi-square for yield groups	Chi-square for types
Kottarakara 1	—	—	—	—	1.09	11.28**
Vigorous seedlings obtained	42	119	40	201	—	—
Number of seedlings studied	140	340	120	600	—	—
Percentage of recovery	**30**	**35**	**33.33**	**33.5**	--	—
Kottarakara 27	—	—	—	—	11.98**	11.28**
Vigorous seedlings obtained	28	205	24	257	—	—
Number of seedlings studied	100	440	60	600	—	—
Percentage of recovery	28	46.59	40	42.83	—	—

For comparing yield groups
Chi-square 2 df at 5 per cent level = 5.99
Chi-square 2 df at 1 per cent level = 9.21
For comparing types
Chi-square 1 df at 5 per cent level — 3,84
Chi-square 1 df at 1 per cent level — 6.64
** Significant at 1 percent level

Table 2

Percentage recovery of prepotent trees from the three yield groups of Kottarakara 1 and Kottarakara 27

Types	Low	Medium	High	Total	Chi-square for yield groups	Chi-square for types
Kottarakara 1	—	—	—	—	2.01	0.04
Number of prepotent trees	2	9	4	15	—	—
Number of trees studied	7	17	6	30	—	—
Percentage of recovery	28.57	52.94	66.66	50	—	—
Kottarakara 27	—	—	—	–	2.97	0.04
Prepotent trees	1	14	1	16	—	—
Number of trees studied	5	22	3	30	—	—
Percentage of recovery	20	63.33	33.33	53.33	—	—

For comparing yield groups
Chi-square 2 df at 5 per cent level =5.99
Chi-square 2 df at 1 per cent level = 9.21
For comparing types
Chi-square 1 df at 5 per cent level = 3.84
Chi-square 1 df at 1 per cent level = 6.84

Recovery of prepotent trees

The percentage of recovery of prepotent trees from the three yield groups of Kottarakara 1 and Kottarakara 27 is given in Table 2, The recovery of prepotent trees in the three yield groups of the two types did not differ significantly in respect of recovery of prepotent trees in both types. Also, there was no significant differ- ence between the two types in respect of this character.

The selection of seedlings bas3d on seedling characters has been reported by Nayar (1979) in cashew and Pankajakshan and George Minnie'(1961), Sahasra- naman (1962) and Kannan and Nambiar (1979) in coconut. The present study also indicates the possibility of utilising the large variability exhibited by seedling progenies from individual trees in cashew for screening them for vigour and to identify prepotent mother trees.

The results from the present investigation indicate that all high yielders are not prepotent and individual trees differ in their genetic superiority to transmit desirable characters to the progeny.   Similar reports have been made fay Harland

(1957) in coconut and Bavappa and Ramachander (1967) in arecanut. The existence of prepotency has been reported earlier by Gopikumar *et al.* (1979) in cashew, Ninan and Pankajakshan (1961), Satyabalan *et al.* (1975) and Iyer *et al.* (1981) in coconut and Bavappa and Ramachander (1967) in arecanut.

The major finding on which the present study is based is that the prepotency of a mother trea is expressed in the greater recovery of vigorous seedlings from it (Liyanage, 1953 and Satyabalan *et al.* 1975 in coconut). On that same principle, in cashew also, we could identify prepotent trees based on recovery of vigorous seedlings from individual trees under each type. In the present study 16 such prepotent trees were identified in Kottarakara 27 and 15 in Kottarakara 1. But ths superior performance of the progeny of such trees could be confirmed only through adult progeny analysis. Such an adult progeny analysis is recommended as future line of work in cashew.

Summary

Seedling progeny analysis of two different types of cashew namely Kottarakara 1 and Kottarakara 27 was done by raising nursery of seedlings collected from 30 mother trees each from the two types. The experiment was conducted at the College of Agriculture, Vellayani during 1981-82.

Analysis of seedling characters revealed that the two types differed significantly in the recovery of vigorous seedlings. Kottarakkara 27 was found to be significantly superiorto Kottarakkara 1 in this character. The recovery was more from the medium yielding group compared to low and high yielders in both types In the recovery of prepotent trees the three yield groups as wall as the two types were found to be not significantly different.

സംഗ്രഹം

കൊട്ടാരക്കര 1, കൊട്ടാരക്കര 27 എന്നീ **roane"** കശുമാവു' (പ്രാരൂപങ്ങളുടെ വി**OTTOI^**ക ളിൽ നിന്നും വള.ർത്തിയെടുത്ത സന്തതിതൈകളുടെ വളർച്ചയും പുഷ്'ടിയും പരിശോധിച്ച തിൽ കൊട്ടാരക്കര 27 എന്ന പ്രാരൂപത്തിനു പുഷ്'ടിയേറിയ കൂടുതൽ തൈകളെ ഉല്പാദി പ്പിക്കാനുള്ള ശേഷിയുണ്ടെന്നു കണ്ടു. ഇടത്തരം വിളവുല'പ്പാദനശേഷിയുള്ള മരങ്ങളിൽ നിന്നാണു കൂടുതൽ പുഷ്'ടിയുള്ള തൈകം ലഭിച്ചത്. മാതൃ മരങ്ങളുടെ പ്രാഗ്ശേഷി (Pre–potency—പരപരാഗണാവസ്ഥയിലും മാതൃമരത്തിന്റെ നല്ല ഗുണങ്ങാ സന്തതികളി ലേക്കു പകരാനുള്ള കഴിവു') പരിശോധിച്ചതിൽ വ്യത്യസ്ത വിളവ് ഗ്രൂപ്പുകളും രണ്ടു പ്രാരൂപങ്ങളും അത്തരം (പ്രാഗ്ശേഷിയുള്ള മരങ്ങളുടെ എണ്ണത്തി **raft** ഗണ്യമായ വ്യത്യാസം. പ്രകടിപ്പിക്കുന്നില്ലെന്നു കണ്ടു.

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