PLD 57 – a Promising Dwarf Cashew

Meera Manjusha and B. Jayaprakash Naik
Regional Agricultural Research Station
Kerala Agricultural University
Pilicode, Kerala

Keywords: cashew, dwarfness, hybrid, recessive, panicle shape, cashew apple

Abstract

Cashew (*Anacardium occidentale* L.) is grown in lateritic waste lands at a spacing of 8×8 m^2 in northern Kerala. The grafts take 7 to 8 years to cover the interspaces and to give economic returns. Since no intercrops can be raised in cashew plantations grown in this type of soil, high density planting is recommended. Dwarf plants suitable for high density planting in these wastelands are the only solution to economic return from unit area. Also, for cashew apple processing, freshly plucked apples are required. Dwarf and compact plants offer potential for easy picking as well as for mechanical harvesting. Accordingly, a dwarf 'PLD57' identified and selected in the northern Kerala was evaluated along with the semi tall types, 'Anakkayam 1' (ANK 1) and 'Madakkathara 1' (MDK 1). The dwarf 'PLD 57' is precocious with spreading/crawling canopy but with low setting percentage and nut yield. This dwarf was crossed with the semi tall ANK 1 and MDK 1 and progenies were evaluated. The seedlings with open pollinated seeds expressed the dwarf characters. The hybrids of ANK 1 × PLD 57 started flowering early from second year onwards. But the hybrids failed to show the dwarf character. Further evaluation of the performance of the hybrids for economic yield and productivity in high density plantation (HDP) and regarding the transfer of the dwarf character are warranted.

INTRODUCTION

Cashew (*Anacardium occidentale* L.), the dollar crop of India is earning an exchequer to the tune of Rs. 3000 crores per annum. India has been the largest producer, processor and exporter of cashew until recently. The global consumption of cashew kernel is 2 lakh MT, About 50% of this was (i.e., 1.08 lakh MT) supplied from India alone (Anonymous, 2011). In Kerala it is grown mostly in wastelands and the spacing recommended is 8×8 m^2 for commercial cultivation. Since no other inter crops can be raised in between and the plants take 10 to 12 years to cover the interspaces, the income from this unit area of land is low. The crop yield is obtained only from 3rd year and the economic yield is from the 7th year onwards. So there is a considerably long waiting period for economic returns from this plantation. In order to get a marginal income, raising of intercrops like pineapple and vegetables are recommended during the initial years of establishment of the orchard. When the land is not suitable for any other crops and waste land suitable for cashew only, we can hardly raise any intercrops. In this situation high density planting is recommended wherein 625 grafts are grown in the initial years instead of 160 plants per hectare. In the former case, the plant density is regulated by removing the plants in between the rows from 7th year onwards. In order to reduce the canopy pressure a good population should be maintained at different stages of canopy development to harvest the maximum sunlight and to avoid overlapping of branches and yield loss. It is understood that the farmers are reluctant to cut the trees to regulate the plant population when the trees reach yielding stage. This leads to uneconomical cashew plantations with low yield. Nowadays cashew apple is being utilized for preparation of various products like syrup, jam, ready to serve beverages, etc. For preparation of such products freshly picked apples without cuts and bruises are required. For easy harvesting and for obtaining quality apples dwarf and compact types are highly desirable. With this

Nayak, M.G., Swamy, K.R.M. and Palaniswamy, K. 1995. Studies on scree cashew types for dwarfing character. The Cashew 9(4):18-24.

Tables

Table 1. Comparison of the dwarf and semi tall/tall types of cashew.

Sl. no.	Characters	Dwarf (PLD 57)	ANK1	MDK1
1	Plant habit	Bushy	Semi erect	Semi spreading
2	Branching habit	Intensive	Extensive	Extensive
3	Internodal length (cm)	0.3	0.8	1.5
4	Lamina length (cm) (mean of 3rd and 6th leaves)	10.2	13.0	14.0
5	Lamina breadth (cm) (average of 3rd and 6th leaves)	5.7	8.25	7.75
6	No. of veins/leaf lamina	11/11	11/10	13/12
7	Petiole length (cm)	0.95	1.35	1.45
8	New flush shoot length (cm)	11.0	14.5	18.2
9	No. leaves/flush	23	14	12
10	No. of laterals per leader (m^2)	8	2	3
11	No. of terminals/m^2	42	18	14
12	Date of first flowering	October 2nd week	November 1st week	December 1st week
13	Date of last flowering	4th week of April	December 2nd week	February 1st week
14	Panicle shape	Pyramidal	Pyramidal	Pyramidal
15	Panicle length (mean of 10 panicles) (cm)	20	24	30
16	Panicle breadth (mean of 10 panicles) (cm)	18	16	30
17	No. of fruits per panicles (10 panicles)	1-2	8-10	4-6
18	Coherence of nut to apple	Tight	Tight	Tight
19	Apple colour	Yellow	Pink	Yellow
20	Apple shape	Pear	Pear	Round
21.	Apple weight (g) (10 nos.)	200 g	650 g	920 g
22	Juice (ml) (10 fruits)	52 ml	200 ml	320 ml
23	100 nut weight (g)	550 g	567 g	580 g
24	Shelling percentage	29.2%	33.1%	32.9%
24	Tea mosquito tolerance	Susceptible	Susceptible	Susceptible
25	Yield (kg/tree)	2.0 kg	10.0 kg	12.0 kg

Table 2. Pollination and fruit set in dwarf cashew cross combinations.

Cross combinations	No. of flowers pollinated	Fruit set		Hybrid nuts obtained (nos.)
		Numbers	Percentage	
PLD57×PLD57	610	10	1.63	2
PLD 57×MDK 1	141	4	2.84	2
PLD57×ANK1	145	8	5.52	2
MDK1×PLD57	229	18	7.86	17
ANK1×PLD57	322	32	9.94	24
PRINKA×PLD57	146	6	4.11	3

Table 3. Biometrical characters of dwarf ('PLD 57'), MDK 1, ANK 1 and their crosses.

No.	Accession no./ cultivar	Plant height (m)	Collar girth (cm)	Canopy spread (m)		Panicle per m^2	Male to bisexual ratio	Nut yield (kg/tree)	Shelling (%)
				E-W	N-S				
1	PLD57 (op)	1.33	28.0	3.50	3.25	5.56	1.490	0.470	29.0
2	PLD57graft	3.00	43.1	4.46	4.11	13.1	2.410	0.500	29.2
3	MDK1	4.60	48.0	6.50	5.50	6.00	1.240	2.500	32.9
4	ANK1	4.90	66.0	6.25	7.00	10.75	2.280	2.340	33.1
5	MDK1×PLD 57	5.40	66.0	7.50	7.50	10.00	1.900	0.250	30.1
6	ANK1×PLD 57	4.90	64.0	6.63	5.75	3.50	3.075	0.300	30.8
CD 0.05		1.24	NS	NS	NS	3.57	2.3	0.85	NS