

## Performance of six genotypes of cashew (*Anacardium occidentale* L.) under terai agro-climatic zone of West Bengal

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Accepted : April, 2010

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### ABSTRACT

An investigation was undertaken to assess the performance of six genotypes of cashew viz., VTH-30/4, Kanaka, H-2/15, Damodar, VTH-12 and Madakkathara -1. Among the genotypes studied, Madakkathara -1 and VTH-30/4 were found superior for growth character like plant height, girth at collar, number of leaders and laterals per branch and canopy spread. Maximum fruit-set per panicle, yield and shorter duration for fruit maturity was observed in hybrid Kanaka. Present investigation also reveals that hybrid H-2/15 and Damodar possess the bigger size nuts which are one of the most important quality parameters to be cited. However, considering the vegetative growth characters since the plants were only four years old, variety Madakkathara-1 and VTH-30/4 were found promising for this region.

**Key words :** Variety, Growth, Floral, Fruit-set, Nut characters

Cashew (*Anacardium occidentale* L.) is an important export oriented cash crop of India. It is grown in tropical and sub-tropical region of the globe.

At present, area under cashew in the country is 8.68 lakh hectares with a production of 6.65 lakh MT and productivity of 860 kg per hectare (Huballi, 2009). Though India is the largest producer, exporter and consumer of cashew in the world, the country still suffers due to deficit of raw nuts to sustain the developing industries. Therefore, there is an urgent need to enhance the domestic production. In West Bengal, area under cashew is 10,000 ha mainly concentrated in the Midnapore East and Midnapore West districts (Bhat *et al.*, 2007). However, there is a prospect of growing cashew in other nontraditional tract of the regions. As the crop has also wider adaptability to various agro-climatic condition and different type of soil, extension of cashew plantation in this zone will be a boon in boosting the rawnut production. Successful cashew cultivation, however, depends on the selection of the best varieties suited for the agro-climatic condition and the adoption of right package of practices recommended for the region. Varietals selection is the most critical decision in plantation management (Salam, 1999). Taking into account, an attempt was undertaken to study the performance of six genotypes of cashew under terai agro-climatic zone of West Bengal and to evolve varieties suitable for this region.

### MATERIALS AND METHODS

An experiment was conducted for two consecutive

years during 2005 and 2006 at the instructional farm of Uttar Banga Krishi Viswavidyalaya, Pundibari, Cooch Behar, West Bengal situated at 26°19'86" N latitude and 89° 23' 53" E longitude, at an elevation of 43 meters above MSL. The soil type of the experimental plot was sandy loam having soil pH-5.3. The climatic condition of terai zone is sub-tropical in nature with high rainfall, high humidity and prolonged winter. The experiment was laid out in Randomized Block Design (RBD) with 3 replications. For evaluating the performance on growth, floral, fruit-set, yield and nut characters, the four year old grafted plants viz., VTH-30/4, Kanaka, H-2/15, Dhana, VTH-12 and Madakkathara-1 planted at a spacing of 8m x 8m were used. The plants were allowed to grown following normal cultivation practices. Recommended dose of fertilizers @ 500g, 125g, 125g NPK per plant were applied as 1/3<sup>rd</sup> for first year, 2/3<sup>rd</sup> for second year and full dose for third year onwards in two equal splits during May- June and September-October by broadcasting over the entire tree basin, 10 cm deep within a radial distance of 1.0 meter. Regular weeding, mulching and plant protection practices were adopted.

### RESULTS AND DISCUSSION

The results obtained from the present investigation have been discussed under following heads:

#### Vegetative growth characters :

The varieties differed significantly for vegetative growth characters like plant height, girth at collar, canopy

spread and number of leaders and laterals per branch. Perusal of data presented in Table 1 indicated that Madakkathara-1 was the tallest (119.67cm) among the genotypes studied with maximum number of leaders (5.55) and laterals (51.25) per branch while maximum girth at collar (18.71cm) and canopy spread (2.70m) was recorded in variety VTH-30/4. Significantly Kanaka recorded the least canopy spread (0.98m). Variations among cashew clones might be attributed to varietal characters. Therefore, the present findings are in agreement with those reported by Reddy *et al.* (2002); Vishnuvardhana *et al.* (2003) and Dorajeerao *et al.* (2002). Longest leaf length was recorded in the variety

VTH-12 (12.24cm) followed by VTH-30/4 (11.40cm). However, as compared to other varieties maximum leaf breadth (7.69 cm) was observed in Madakkathara-1. Similar findings were reported by Johnson (1973) and Kumaran *et al.* (1976).

#### Floral characters :

The data (Table 2) on floral characters reveals that Madakkathara-1 produces the longest panicle length (15.83 cm) and breadth (23.80 cm) with maximum number of primary, secondary and tertiary branch per panicle. Shortest panicle size and minimum floral branches was recorded in hybrid H-2/15. Variation in length and breadth

**Table 1 : Vegetative growth performance of six cashew genotypes**

Variety	Plant height (cm)	Girth at collar (cm)	Canopy spread (m)	No. of leaders /branch	No. of lateral/branch	Leaf length (cm)	Leaf breadth (cm)
VTH-30/4	118.00	18.71	2.70	5.25	48.98	11.40	6.32
Kanaka	81.33	14.65	0.98	2.55	18.00	10.67	6.56
H-2/15	73.57	13.02	1.00	2.81	16.11	9.92	6.26
Dhana	113.00	15.39	1.24	3.21	19.33	10.93	6.35
VTH-12	104.33	15.52	1.13	2.39	18.32	12.24	5.85
Madakkathara-1	119.67	17.20	1.63	5.55	51.25	11.22	7.69
S.E. $\pm$	1.74	0.28	0.34	0.27	1.45	0.12	0.07
C.D. (P=0.05)	5.51	0.91	0.53	0.86	4.59	0.38	0.24

**Table 2 : Floral characters and sex- ratio of six cashew genotypes**

Variety	No. of floral branch per panicle			Panicle length (cm)	Panicle breadth (cm)	Sex-ratio (perfect : staminate)
	Primary	Secondary	Tertiary			
VTH-30/4	6.93	24.00	66.33	11.36	15.16	0.97
Kanaka	6.93	22.76	68.60	12.51	15.63	1.34
H-2/15	6.00	20.26	59.90	10.83	11.86	0.23
Dhana	7.00	24.00	65.67	14.23	20.30	0.18
VTH-12	7.00	21.33	64.00	12.83	15.36	0.73
Madakkathara-1	10.66	47.66	189.00	15.83	23.80	0.07
S.E. $\pm$	0.15	1.00	2.70	0.86	0.78	0.03
C.D. (P=0.05)	0.49	3.15	8.51	2.17	2.47	0.10

**Table 3 : Fruit- set, yield and nut characters of six cashew genotypes**

Variety	No. of fruits per panicle	Duration of maturity of fruits (days)	Yield (kg/tree)	Length of nut (mm)	Breadth of nut (mm)	Weight of nut (g)
VTH-30/4	1.67	60.00	1.80	32.95	25.93	8.15
Kanaka	3.37	59.00	2.23	32.08	23.82	6.77
H-2/5	1.80	62.00	1.76	37.41	29.61	9.95
Dhana	1.67	61.00	1.70	38.60	26.81	9.26
VTH-12	2.67	60.00	2.06	33.82	27.90	7.26
Madakkathara-1	1.67	62.33	1.36	32.74	25.71	7.65
S.E. $\pm$	0.23	0.36	0.07	0.18	0.00	0.02
C.D. (P=0.05)	0.72	1.13	0.23	0.56	0.03	0.07

of panicles might be specific to varieties. Therefore, the findings strongly support with those reported by Sena *et al.* (1995). Though the panicle size were comparatively bigger in Madakkathara-1 compared to other varieties, hybrid Kanaka recorded the maximum sex-ratio (perfect: staminate) which is an important yield attributing characters.

#### **Fruit-set, yield and nut character :**

Data pertaining to fruit set, yield and nut characters among the genotypes have been presented in Table 3. Hybrid kanaka recorded the maximum fruit-set (3.37) and yield (2.23 kg) compared to other genotypes. Lowest fruit-set per panicle (1.67) and yield (1.36 kg) was observed in variety Madakkathara-1. Poor fruit- set in young plantation might be attributed to physiological reason. With respect to nut size hybrid Dhana and H-2/15 produce the maximum nut length (38.60 mm) and breadth (29.61 mm), respectively. The findings also depicts that all the nut weights recoded have shown to have high scoring (about 7 g) which is an important yield attributing characters.

From the foregoing study and discussion, though hybrid Kanaka was superior for sex-ratio, fruit-set and yield. However, taking into account the vegetative growth characters as the plant were only four years old. Variety Madakkathara-1 and VTH-30/4 were found suitable for the region.

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