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Performance of Cashew Varieties in Coastal Zone of Karnataka

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Abstract Fifteen varieties were evaluated. Nuts per panicle ranged between 5.25 in Dharashri to 7.88 in Ullal-2. Priyanka had highest weight of the nuts (10.30 g) and lowest was found in Kanaka (5.19 g). UN-50 had bigger kernel size with higher grade of kernel (2.43 g and 187.16 kemels/pound) and smaller kernel size and lower grade was observed in Kanaka (1.88 g and 241.39 kernnels/pound). The shelling percentage of nuts was ranging from 22.65% in Amrutha to 36.43% in Kanaka. Nut yield was highest in Priyanka (21.88 kg/tree) and lowest was found in Amrutha (7.88 kg/tree).

Keywords Cashew nut, Varieties, Nut characters, Yield.

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Introduction

Cashew, a member of Anacardiaceae family, native of Brazil and introduced in India by Portuguese during sixteenth century. Initially, cashew plantations were done in high rainfall and degraded areas of coastal regions for resource conservation but realizing the importance, it has been commercialized as a major horticulture crop. Processing of cashew kernels generate better employment opportunities, especially for women folk and export of kernels is a good source of earning of foreign exchange. Cashew kernels are rich source of protein (21%), fat (47%), carbohydrates (22%), phosphorus, calcium, iron and other minerals. The most prominent vitamins in cashew are vitamins A, D and E, which are helpful in assimilation of fats and improving immunity in human body. About 82% of the total fat available in cashew is unsaturated fatty acid and helps in lowering the cholesterol level in blood.

Cashew is a hardy crop, drought resistant and comes up well in poor and marginal soils. It is a highly cross pollinated crop with high degree of heterogencity. Selection of suitable cultivar/variety for a particular area is of vital importance in improving the production. To meet the demand of better planting materials for large scale plantations, it is necessary to evaluate the growth and yield potential of various cashew cultivars. Considering the demand of the cashew growing community and the processing industries, there is a need to boost the nut yield (productivity) per unit area. The important areas of in-

creasing productivity are planting with high yielding clones or cultivars, use of recommended manures and fertilizers, adopting better management practices and timely planting. Among them, planting with high yielding clones is an important tool to get the higher productivity per unit area in a particular agro-climatic condition.

Materials and Methods

The experiment was carried out at Agricultural and Horticultural Research Station, Ullal during 2009-2010 and 2010-2011. It is located at 15m above mean sea level with a latitude of 13^0N and longitude of 75^0E. The Agricultural and Horticultural Research Station, Ullal being located in a cashew growing belt, has mainly typical laterite soils of west coast with patches of red sandy loam. The terrain is mostly undulating with a gradient of 4 to 15%. The soil is acidic in nature with pH ranging from of 5.4 to 5.8. The experiment was laid out in complete randomized block design with fifteen varieties and three replications.

The total number of nuts retained in the panicle till maturity was counted and expressed in number. Nut length, breadth and thickness were measured with the help of Vernier calipers and expressed in milli meter. Hundred nuts from the middle of harvest were weighed and mean weight was expreseed as test weight. One kilogram of nuts from middle harvest was weighed, counted and expressed as nuts/kg. Weight of 100 whole kernel was taken and the average was expressed kernel weight.

Half kilogram of nuts werte taken for hard shelling, and the testa was removed from kernel and the shelling percentage was calculated as follows:

$$\text{Shelling percentage} = \frac{\text{Kernel weight}}{\text{Nut weight}} \times 100$$

Kernels were weighed for a pound and the grade was expressed in number. The fallen nuts were collected from each tree and dried under sunlight, and the total nut weight was expressed as kilogram / tree.

Results and Discussion

Maximum number of nuts / panicle was observed in Ullal-2 (7.88), which was on par with Dhana (7.63), Ullal - 1 (7.25), UN-50 (6.88), Ullal -3 (6.75), vengurla-7 (6.75) and Ullal-4 (6.50). The minimum number of nuts per panicle was observed in Dharashri (5.25) (Table 1).

Table 1. Nut characters of cashew varieties. **=Highly significant.

Sl. No.	Variety	Nuts/ panicle	Nuts length (mm)	Nut breadth (mm)	Nut thick-ness (mm)	Teat weight (g)
1	Ullal-1	7.25	31.68	18.70	17.08	7.78
2	Ullal-2	7.88	27.88	16.81	16.68	6.52
3	Ullal-3	6.75	32.03	21.53	18.25	8.49
4	Ullal-4	6.50	30.90	18.06	16.98	7.47
5	Vengurla-1	5.75	29.64	16.84	16.40	6.20
6	Bhashara (11/6 Goa)	6.00	30.03	17.09	17.15	8.38
7	Kanaka	6.25	26.03	15.80	15.00	5.16
8	Dhana	7.63	28.81	17.85	16.53	6.88
9	Dharashree	5.25	29.91	17.11	17.06	6.48
10	Madakkathara-2 (NDR–2-1)	5.75	29.48	16.50	17.11	7.08
11	UN-50	6.88	35.88	19.95	16.54	8.84
12	Madakkathara-1 (BLA–39-4)	5.63	27.54	15.33	15.30	6.65
13	Vengurla-7	6.75	30.79	18.41	17.38	7.79
14	Priyanka	5.50	30.73	14.49	18.25	10.30
15	Amrutha	6.13	28.43	16.13	17.95	8.91
	F-test	**	**	**	**	**
	SEm	0.492	0.626	0.807	0.567	0.061
	CD at 5%	1.405	1.787	2.304	1.618	0.346
	CV	15.40	4.17	9.29	6.71	3.22

Several other workers also reported the variation for number of nuts/panicle. Poduval [1] showed that nuts/panicle ranging from 3.48 to 6.94. Hanumanthappa et al. [2] and Vikram et al. [3] also showed a variation for number of nuts/panicle. In cashew, all the hermoprodite flowers that get pollinated will not reach maturity and fruit drop occurs. The fruit drop is attributed to physiological reasons, insects attack also plays important role in immature fruit drop . Solanki et al. [4], opined that the fruit drop may be affected by weather and climate resulting in difference in performance of different cultivars at different climatic conditions. The nuts/panicle were found to be high in those varieties which had the maximum of hermaphrodite flowers in their inflorescence.

Table 2. Nut and kernel characters of cashew varieties. ** =Highly significant.

Sl. No.	Variety	Nuts/ kg	Kernel weight	Shelling %	Grades of kernel	Nut yield/ tree
1	Ullal-1	128.66	2.23	28.69	203.44	15.50
2	Ullal-2	153.52	2.04	31.23	222.97	12.88
3	Ullal-3	117.87	2.33	27.47	194.76	14.28
4	Ullal-4	133.95	2.04	27.26	222.96	13.39
5	Vengurla-1	161.33	2.03	32.75	223.49	14.91
6	Bhaskara (11/6 Goa)	119.33	2.16	25.78	210.12	11.63
7	Kanaka	193.81	1.88	36.43	241.39	11.13
8	Dhana	145.28	2.03	29.49	223.48	14.50
9	Dharashree	154.45	2.12	32.66	214.51	9.00
10	Madakkathara -2 (NDR-2-1)	141.20	2.09	29.51	217.10	21.38
11	UN-50	113.14	2.43	27.44	187.16	10.50
12	Madakka-thara-1 (BLA–39-4)	150.40	2.05	30.82	221.30	19.13
13	Vengurla–7	128.50	2.20	28.22	206.76	12.63
14	Priyanka	97.37	2.36	22.92	192.70	21.88
15	Amrutha	112.40	2.02	22.65	225.15	7.88
	F-test	**	**	**	**	**
	SEm	0.943	0.008	0.233	0.916	0.357
	CD at 5%	5.381	0.053	1.328	5.227	1.020
	CV	2.76	1.75	3.22	1.71	5.09

Highest nut length was recorded in UN-50 (35.88 mm) (Table 2). The lowest nut length was recorded in Kanaka (26.03). Significantly highest on par nut breadth was observed in Ullal-3 (21.53 mm) and UN-50 (19.95 mm). The lowest nut breadth was observed in Priyanka (14.49). The results were in confirmation with Srinivas [5]. Nut thickness was maximum in Ullal-3 and Priyanka (18.25 mm), on par with Amrutha (17.95 mm), Vengurla-7 (17.38 mm), Bhaskara (17.15 mm), Madakathara-2 (17.11 mm), Ullal-1 (17.08 mm), Dharashri (17.06 mm), Ullal-4 (16.98 mm) and Ullal-2 (16.68 mm). The lowest nut thickness was recorded in Kanaka (15.00).

The test weight ranged between 5.16 g to 10.29 g. Significantly highest test weight was observed in Priyanka (10.33) followed by amrutha (8.91) and UN-50 (8.62) and lowest test weight was found in Kanaka (5.02). Priyanka with higher test weight had lowest number of nuts per kilogram (97.37) followed by Amrutha (112.40) and UN-50 (113.14). Whereas, highest number of nuts/kilogram was observed in kanaka (193.81) which had lowest test weight. Significantly higher kernel weight was observed in UN-50 (2.42 g), which was followed by Priyanka (2.35 g) and Ullal-3 (2.33 g). Whereas, lowest kernel weight was observed in kanaka (1.88 g). The results were in confirmity with earlier findings of Kabitha et al. [6] who showed that a maximum kernel weight of 3g in F-28, which was on par with C-30 and B-27 (2.9 g). The lowest was found in J-13 (1.6 g). Zachariah et al. [7] and Hanumanthappa et al. [2] also showed that the variation for kernel weight.

The shelling percentage was found non significant among the entries. However, highest shelling percentage was recorded in UN-50 (32.45) and lowest was recorded in Amrutha (21.75). Venkataramana et al. [8] showed that highest shelling percentage in T. No. 4/3 (36.16) followed by T. No-228 (35.36) and lowest shelling percentage was noticed in T. No. 6/14 (25.25 g). Zachariah et al. [7], Meera and Jayaprakash [9], Poduval [1], Rajanna et al. [10] and Reddy et al. [11] showed that variation in shelling percentage among the genotypes. Rajanna et al. [10] opined that the higher shelling percentage in some of the genotypes may be due to better absorption of nutrients and translocation by these genotypes. The number of kernels in a pound was significantly highest in Kanaka (285.92) followed by Dharashri (232.66) indicating the low grade of kernels. Significantly lowest number of kernels per pound was observed in Priyanka (139.11). Zachariah et al. [7] and Desai [12] observed variation for number of kernels in a pound.

Highest yield of nuts/tree was observed in Priyanka (21.88 kg/tree) followed by madakkathara-2 (NDR-2-1) (21.38 kg/tree). Whereas lowest nut yield/ tree was observed in Amrutha (7.88). Zachariah et al. [7], Meera and Jayaprakash [9], Poduval [1], Rajanna et al. [10], Reddy et al. [11], Solanki et al. [4] and Venkataramana et al. [8], showed a variation in nut yield/tree.

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