



PERFORMANCE OF PRE-RELEASED CASHEW (*ANACARDIUM OCCIDENTALE* L.) GENOTYPES UNDER BHUBANESWAR CONDITION

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ARTICLE INFO	ABSTRACT
Received 8th, October, 2016, Received in revised form 14th, November, 2016, Accepted 27th, December, 2016, Published online 28th, January, 2017	A Field experiment was conducted at Cashew Research Station of All India Coordinated Research Project on Cashew (ICAR) under OUAT, Bhubaneswar, Odisha, India to study the performance of pre released cashew genotypes for vegetative growth parameters, yield attributing traits and nut yield. The experiment was laid out by adopting RBD replicated thrice having four plants per treatments. The treatment consisted of 11 entries such as BH 6 (Jagannatha), BH 85(Balabhardra), H 1597(Amrutha), H 662, H 675, H 32/4, K 22-1, H 11, H 14, and Goa 11/6(Bhaskara) including BPP 8(H 2/16) as local check. The clonal planting materials were planted at a spacing of 7.5m x 7.5 m during 2003 by adopting recommended package of practices uniformly to raise a good crop. The results on vegetative growth parameters revealed that the cashew types K-22-1 exhibited semi tall growth habits hence can be utilized for adopting high density planting in cashew with proper canopy management. The overall results revealed significant superiority of cashew genotypes such as BH-6, BH-85, H-1597, H-32/4, Goa-11/6 and BPP-8 for majority of the vegetative growth parameter such as plant height(m), trunk girth(cm), canopy spread(both in E-W and N-S direction) and canopy spread (m <sup>2</sup> ). Similarly, the cashew types such as BH 85, BH 6, and H 1597 recorded significantly better performances for mean nut weight(7.13 to 7.80 g), shelling %(28.70 to 31.10%) and mean annual nut yield(13.40 to 14.82kg ha <sup>-1</sup> ) than rest of the tested cashew types. It may be concluded that the cashew genotypes such as BH 85 (Balabhardra), BH 6 (Jagannatha) and H 1597 (Amrutha) may be recommended for commercial cultivation in the state of Odisha.
<b>Keywords:</b> cashew types, nut yield, kernel, evaluation, shelling %	
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INTRODUCTION

Cashew (*Anacardium occidentale* L.) treated as “Wonder nut of the world” is native to Brazil having about 75 genera and 700 species. Although cashew was introduced to India by Portuguese as a crop of afforestation and soil conservation purpose, but later on the crop was exploited commercially due to its versatile uses. Although, India rank 1<sup>st</sup> in production, processing and export of kernel in the world, but productivity of existing cashew plantation is very low, hardly 706 kg ha<sup>-1</sup> (Huballi et al., 2016) as compared to the other countries. The state Odisha covers about 1.58 lakh hectare with a production of 0.97 lakh MT with production share of 14%. Among the several factor influence the cashew productivity in the country as well as state, use of traditional varieties of low yield potential, lack of production and protection technologies etc. are the major causes. Therefore, the low production and productivity problems of cashew can be addressed by planting of superior cashew types with high yield potential under proper package of practices. The present study was under taken with

the objective to identify the suitable cashew types for commercial cultivation in the state of Odisha.

MATERIALS AND METHOD

The present investigation was carried out at the Cashew Research Station, Orissa University of Agriculture and Technology, Bhubaneswar, Odisha, India during the year 2014. Eleven clonally multiplied different cashew types from different Cashew Research Station of the country were collected and planted during 2003 by adopting Randomized Block Design with three replications. The cashew type such as BH-6(Jagannatha) and BH-85(Balabhdra) from CRS, Bhubaneswar, Odisha; H-11 and H-14 from CRS, Vridhachalam, Tamil Nadu; H-1597, K22-1 from CRS, Kerala; H-662 and H-675 from RFRS, Vengurla, Maharashtra; H-32/4 and Goa-11/6 from DCR, Puttur, Karnataka were planted for the study. In each replication four cashew plants of each type were planted observing the spacing of 7.5m x 7.5m. The soil type was loamy sand having pH5.2. These plants were fertilized with 500: 250:250g NPK plant<sup>-1</sup> as per recommendations of the

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state. All the recommended package of practices was adopted uniformly for all the treatments to raise a good crop. Observations on various vegetative, yield and yield attributing traits such as tree height(m), trunk girth(cm), canopy spread(m<sup>2</sup>), duration of flowering, sex ratio, average number of nuts panicle<sup>-1</sup>, average number of nuts m<sup>-2</sup>, nut weight (g), shelling % and mean annual nut yield(kg tree<sup>-1</sup>) etc. The recorded data were analyzed statistically by adopting the standard procedure of Panse and Sukhatme (1978).

## RESULTS AND DISCUSSION

Statistical analysis of important vegetative growth parameters such as tree height, trunk girth, and canopy spread (m<sup>2</sup>) indicated significant variations during the study(Table 1).

**Table 1** Mean values of different growth parameters in cashew

Genotypes	Plant height (m)	Trunk girth (cm)	Canopy spread (m) (E-W)	Canopy spread (m) (N-S)	Canopy spread m <sup>2</sup>
BH 6	5.11	81.42	8.39	8.41	53.71
BH 85	5.20	81.26	8.52	8.74	60.34
H 1593	5.20	84.64	8.10	8.53	54.53
K 22-1	3.61	42.57	4.35	5.81	20.97
H 662	4.53	52.10	5.92	6.10	28.63
H 675	4.11	57.71	5.22	4.70	18.60
H 11	5.20	79.35	8.01	8.44	52.93
H 14	5.05	69.49	8.18	8.28	51.81
H 32/4	5.87	86.23	8.41	8.57	57.17
Goa 11/6	5.29	82.18	8.18	8.34	55.72
H 2/16	5.43	84.32	8.63	8.82	63.60
<b>Grand mean</b>	4.96	72.84	7.45	7.70	47.09
<b>SEm (±)</b>	0.23	0.97	0.16	0.15	4.68
<b>CD%</b>	0.48	2.04	0.34	0.31	9.77

**Table 2** Mean values of flowering parameters in cashew

Genotypes	Flowering lateral	Flowering duration	Sex ratio
BH 6	22.42	94.00	0.37
BH 85	25.67	92.67	0.40
H 1593	32.75	63.33	0.76
K 22-1	16.92	73.00	0.31
H 662	17.80	73.67	0.28
H 675	17.33	95.67	0.88
H 11	27.08	87.33	0.59
H 14	19.33	121.33	0.55
H 32/4	15.17	62.33	0.42
Goa 11/6	22.92	77.67	0.30
H 2/16	17.50	81.67	0.18
<b>Grand mean</b>	21.35	8.87	0.45
<b>SEm (±)</b>	1.21	3.04	0.03
<b>CD%</b>	2.54	6.34	0.07

These traits can be considered as selection parameter for improvement of cashew by bringing change in different architectural features and screening of high yielding cashew genotypes. Maximum plant height was observed in H 32/4 (5.87cm) closely followed by H 2/16 (5.43cm) and minimum height was recorded in K-22-1 (3.61m) followed by H-675(4.11m). Therefore, it can be concluded that H 32/4 and H 2/16 were the tallest type cultivar whereas K-22-1 and H 675 were the dwarf stature in nature. Significant variations were also recorded in respect to trunk girth. Maximum trunk girth

was observed in H 32/4 (86.23cm) and minimum in K-22-1 (42.75cm). However, within the genotypes like Goa 11/6, BH 85 and BH 6 had no significant variation in respect to trunk girth. The present investigation illustrated that H 2/16 produce more extensive type of branching regarding total canopy (m<sup>2</sup>) as well as canopy spread in both direction i.e., E-W and N-S as compared to other genotypes whereas, K-22-1 showed minimum canopy coverage. Hence, it can be concluded that H genotype H 2/16 is spreading type where as genotype K 22-1 exhibited minimum plant height with compact canopy. Hence genotype K 22-1 will be suitable for closer planting in cashew. Masawe et al. (1999) and Sharma et al.(2011) observed similar type of variations among the cashew genotypes.

All the flowering traits like flowering lateral, flowering duration as well as sex ratio showed significant variations among all the selected cashew genotypes(Table 2). Genotype H 1593 recorded maximum flowering laterals (32.75) m<sup>-2</sup> while duration of flowering was recorded maximum in genotype H 14(121.33days). Similarly significantly highest sex ratio was recorded in genotype H 675(0.88) while lowest sex ratio was recorded in local check BPP-8(0.18).

**Table 3** Mean values of different yield attributing traits and nut yield of in cashew

Genotypes	Number of Nuts/panicle	Nut weight (g)	Number of nuts/m <sup>2</sup>	Apple weight (g)	Shelling %	Yield/plant (kg)	Harvesting duration
BH 6	6.33	7.57	27.13	61.94	31.10	13.40	22.33
BH 85	6.22	7.13	31.17	60.20	28.70	14.68	24.00
H 1593	6.78	7.80	33.00	63.24	31.00	14.82	26.00
K 22-1	5.11	5.64	24.23	46.46	29.70	5.87	29.67
H 662	4.78	7.57	21.93	88.84	29.23	6.33	22.33
H 675	7.11	4.66	23.58	35.48	30.40	5.47	30.33
H 11	6.67	5.31	25.67	46.73	28.93	11.48	26.33
H 14	5.78	5.40	24.45	45.42	29.43	7.20	33.00
H 32/4	6.11	6.45	22.10	61.94	28.07	6.99	25.67
Goa 11/6	6.00	6.58	25.17	55.47	28.70	8.81	23.33
H 2/16	5.44	6.73	30.33	58.57	28.33	9.74	20.67
<b>Grand mean</b>	6.03	6.44	26.25	56.75	32.84	9.52	25.78
<b>SEm (±)</b>	0.28	0.19	1.74	4.29	0.36	0.39	1.72
<b>CD%</b>	0.59	0.41	3.64	8.94	0.75	0.81	3.60

Mean number of panicles m<sup>-2</sup> ranged from maximum 33.00(H-1597) to minimum 21.93(H-622) while mean number of nuts m<sup>-2</sup> ranged from 33.00 (H 1593) to 21.93 (H 662) Similarly mean number of nuts panicle<sup>-1</sup> recorded maximum in genotype H-675(7.11) and minimum in H-662(4.78). Significantly maximum nut weight was recorded in genotype H-1597(7.80 g) followed by BH-6(7.57 g) and H-662(7.57 g) which were statistically at par. The minimum nut weight was recorded in genotype H-675(4.66g). Mean apple weight (g) ranged from maximum 88.84g (H-662) to minimum 38.81g (H-675) among the tested genotypes. Significantly maximum shelling was recorded in genotype BH-6(31.10%) followed by H-1597(31.00%) and H-675(30.40%) where statistical parity was observed. The lowest shelling was recorded in genotype H-32/4(28.07%). The genotype H-1593 recorded significantly maximum mean annual nut yield (14.82kg tree<sup>-1</sup>) then rest of the tested genotypes except BH-85(14.68 kg tree<sup>-1</sup>) which were statistically at par. Overall results revealed that genotype H-1597, BH-85, and BH-6 recorded promising performance with

respect to mean annual nut yield (kg tree<sup>-1</sup>) during the fruiting season (Table 3). Duration harvest ranged from minimum 20.67(H 2/16) days to maximum 33.00(H-14) days. Similar variations among cashew types were also observed by Sena *et al.* (1985), Reddy *et al.* (2002) and Sethi *et al.* (2015) under Bhubaneswar, condition.

The present investigation revealed that there is significant difference among the cashew types taken for study with respect to vegetative, yield attributing traits and nut yield. Nut weight(g), shelling % and mean annual yield per plant was recorded highest in genotype H 1593 closely followed by BH 85 and BH 6. Therefore, these three genotypes can be chosen in the hybridization programme to retrieve high yielding cultivar and can be recommended for cultivation in Odisha condition.

#### Acknowledgement

The authors highly acknowledge the financial support received from the Directorate of Cashew Research, Puttur, Karnataka and Orissa University of Agriculture & Technology, Odisha, India for the research facilities provided to carry out the study under AICRP on Cashew.

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