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Jagadeesha SK
Department of PSM & AC,
University of Horticultural
Sciences, Bagalkot, Karnataka,
India

Venkatesha J
Department of PSM & AC,
University of Horticultural
Sciences, Bagalkot, Karnataka,
India

Performance of different cashew (*Anacardium occidentale* L.) varieties for southern dry zone of Karnataka

Jagadeesha SK and Venkatesha J

Abstract

The present investigation was carried out to evaluate the performance of different cashew varieties for Southern Dry Zone of Karnataka. The experiment was conducted at College of Horticulture, Mysore, Karnataka during 2012-13. Cashew varieties were evaluated for growth, yield and quality parameters. All the 13 varieties showed significant differences in respect of all the attributes evaluated. The maximum mean plant height was observed in variety UN-50 (5.71 m). However highest canopy spread was recorded in variety V-4 (6.41 m). While girth of the collar region was more in UN-50 (17.19 cm). Significantly highest nut yield per plant was recorded in variety V-4 (3.74 kg). Whereas maximum nut weight was recorded in variety V-7 (9.68 g) with good quality of nuts.

Keywords: Cashew varieties, performance, southern dry zone

Introduction

Cashew (*Anacardium occidentale* L.) is a tropical plant belongs to the family Anacardiaceae found within the region between 23° N and 23° S of the equator. It gained popularity in hills and plains because of its drought tolerance and wide adoptability to various agro-climatic conditions (Singh *et al.*, 2010) [1] is a drought resistant tree, crop can be grown successfully in areas with annual rainfall of 50-350 cm. Being an ever green tree of tropics this is cultivated in more than 28 countries in tropical region for its delightful nutritious kernels, apple and cashew nut shell liquid (CNSL). The Portuguese traders introduced the cashew tree in to India and Africa to prevent soil erosion. India is the largest producer, processor, consumer and exporter of cashew in the world (Anon., 2009) [1]. It is the first country in the world to exploit the international trade in cashew kernels in the early part of 20th century (Chavan and Raut, 2013) [2]. Value added products such as juice, fenni, wine, dried cashew apple, syrup and jam can be prepared from cashew apple (Suganya and Dharshini, 2011) [12]. Cashew nut shell liquid a by-product of nut is also treated as valuable raw material for paints and varnish industries (Sethi *et al.*, 2015) [10]. India has exported 11,422 metric tonnes of cashew nut shell liquid in the year 2016-17 (Mahantesh Nayak *et al.*, 2018) [5]. The current Cashew nut production in India accounts for 45 per cent of the global production. It is grown in Kerala, Karnataka, Goa, and Maharashtra along the West coast and Tamil Nadu, Andhra Pradesh, Odissa and West Bengal along the East-coast, occupies an area of 10.30 lakh hectares in the country with a production of 9.98 lakh metric tonnes (Elakkiya *et al.*, 2017) [3]. Karnataka is a prominent state in cashew production occupying 5th position in area (1, 18, 000 ha) ranking 6th in production (53,000 t) with an average productivity of 461 kg/ha which is much less than the national average. Dakshina Kannada district has the highest area of cashew in Karnataka, followed by Udipi, Belgaum, Chickballapur, Uttara Kannada, Kodagu and Kolar (Maruthi Prasad *et al.*, 2015) [7]. Selection of varieties is most important and critical decision in plantation management (Salam 1999) [9]. Hence, the present investigation was undertaken to assess the performance of thirteen cashew varieties under Southern Dry Zone of Karnataka.

Materials and Methods

The field experiment was laid out at College of Horticulture, Mysore, Karnataka during 2012-13. The plantation was raised during 2012 (October) following randomized block design consisting of thirteen cashew varieties *viz.*, Ullal-1, Ullal-2, Ullal-3, Ullal-4, UN-50, V-4, V-7, Dhana, Bhaskara, VRI-3, NDR-2-1, K-22-1 and Bapatla-8. Planted at a spacing of 7.5 m × 7.5 m. Replicated three times. Recommended package of practices were followed for all the

Corresponding Author:
Jagadeesha SK
Department of PSM & AC,
University of Horticultural
Sciences, Bagalkot, Karnataka,
India

varieties. The statistical analysis of data obtained from field experiment for all the characters was done by analysis of variance methods for randomised block design (Panse and Sukhatme, 1967) [8]. For evaluating the performance of cashew varieties, plant growth characters like plant height (m), canopy spread (m) and girth of the collar region (cm) were recorded. With respect to plant yield characters yield per plant (kg/plant) and nut weight (g) were recorded for quality attributes from 2012 to 2020.

Results and Discussion

Plant growth

The observation with respect to growth parameters like plant height, Canopy spread, Girth of the collar region are presented in Table 1. There was a significant difference observed with respect to plant height (Mahesha *et al.*, 2005) [6] (Singh *et al.*, 2010) [11]. The maximum mean plant height (5.71 m) was observed in UN-50 followed by Bhaskara (5.17 m), while the minimum plant height was recorded in VRI-3 (3.40 m). However varieties differed significantly on observations pertaining to the canopy spread. The highest mean canopy spread was recorded in variety V-4 (6.41 m) and the lowest was recorded in variety K-22-1 (4.01 m). With respect to girth of the collar region the varieties differed

significantly and the maximum mean girth of the collar region was observed in UN-50 (17.19 cm) whereas the minimum girth of the collar region was recorded in NDR-2-1 (13.26 cm).

Yield

Performances of different cashew varieties with respect to mean nuts yield and mean nut weight are presented in Table 2. There was significant difference noticed with respect to mean nuts yield and nut weight among different varieties of cashew (Hanumashetti *et al.*, 2002) [4]. The variety V-4 has recorded the highest mean nuts yield per plant (3.47 kg) followed by variety Dhana (2.82 kg) whereas the lowest mean nut yield was recorded in variety NDR-2-1 (1.41 kg). The highest nut yield recorded might be attributed to the wide canopy spread, inherent capacity of the variety and agro-climatic conditions of the region. These results are in consonance with the findings of Vikram *et al.*, 2013 [13]. However with respect to the mean nut weight varieties differed significantly. The maximum mean nut weight was recorded in variety V-7 (9.68 g) followed by Dhana (9.38 g) and UN-50 (9.13 g) respectively. The lowest nut weight was recorded in variety K-22-1 (6.03 g).

Table 1: Cashew observations with respect to growth performance like plant height, canopy spread, girth of the collar region

Treatments	Plant height (m)				Canopy spread (m)			
	2018-19	2019-20	2020-21	Mean	2018-19	2019-20	2020-21	Mean
Ullal-1	3.17	3.18	4.02	3.46	5.17	5.20	4.76	5.04
Ullal-2	3.67	4.63	3.62	3.97	4.52	4.36	4.66	4.51
Ullal-3	4.49	4.52	4.71	4.57	5.17	5.38	5.24	5.26
Ullal-4	4.18	4.37	3.98	4.18	5.39	5.30	5.39	5.36
UN-50	5.10	6.35	5.68	5.71	6.20	6.10	6.50	6.27
V-4	3.87	4.13	3.40	3.80	6.66	6.70	5.86	6.41
V-7	4.62	4.98	4.85	4.82	6.09	6.60	5.98	6.22
Dhana	4.38	4.88	4.76	4.68	5.79	5.63	6.08	5.83
Bhaskara	4.83	5.50	5.17	5.17	5.77	5.70	5.79	5.75
VRI-3	3.90	2.73	3.58	3.40	4.77	5.30	4.89	4.99
NDR-2-1	3.47	4.78	4.30	4.18	4.56	4.80	4.33	4.57
K-22-1	3.43	3.40	3.87	3.57	4.10	4.23	3.70	4.01
Bapatla-8	3.73	3.90	3.88	3.84	4.93	5.27	4.77	4.99
S.Em ±	0.314	0.296	0.255	0.225	0.226	0.191	0.210	0.136
CD at 5%	0.918	0.866	0.745	0.658	0.660	0.559	0.614	0.397

Treatments	Girth of the Collar region (cm)			
	2018-19	2019-20	2020-21	Mean
Ullal-1	12.81	13.84	13.66	13.43
Ullal-2	14.23	14.41	15.56	14.73
Ullal-3	14.71	15.20	15.52	15.14
Ullal-4	14.08	14.36	15.03	14.49
UN-50	16.62	17.30	17.64	17.19
V-4	14.85	12.96	13.40	13.74
V-7	14.20	13.53	13.43	13.72
Dhana	13.57	15.02	16.27	14.95
Bhaskara	14.85	13.20	14.42	14.16
VRI-3	13.60	14.49	15.07	14.39
NDR-2-1	13.31	13.39	13.07	13.26
K-22-1	17.05	15.40	14.85	15.77
Bapatla-8	14.88	17.24	15.93	16.02
S.Em ±	0.746	0.462	0.480	0.470
CD at 5%	2.179	1.350	1.403	1.372

Table 2: Cashew observations with respect to yield and quality performance (Nut weight)

Treatments	Yield/plant (kg)				Nut weight (g)			
	2018-19	2019-20	2020-21	Mean	2018-19	2019-20	2020-21	Mean
Ullal-1	1.65	1.81	1.91	1.79	6.24	7.07	7.15	6.82
Ullal-2	1.57	2.13	1.79	1.83	6.53	6.20	6.73	6.49
Ullal-3	1.83	1.72	2.08	1.88	7.14	7.03	7.53	7.24
Ullal-4	2.33	2.47	2.18	2.33	6.67	6.63	7.60	6.97
UN-50	2.17	2.18	2.10	2.15	9.10	9.70	8.60	9.13
V-4	3.08	3.76	3.55	3.47	7.47	7.23	7.73	7.48
V-7	2.20	2.47	2.54	2.40	9.20	9.77	10.07	9.68
Dhana	2.30	2.77	3.41	2.82	9.40	9.43	9.30	9.38
Bhaskara	2.17	2.10	2.30	2.19	7.33	7.13	7.13	7.20
VRI-3	1.83	1.87	2.39	2.03	6.97	7.27	6.90	7.04
NDR 2-1	1.47	1.50	1.27	1.41	7.17	7.30	6.90	7.12
K-22-1	2.00	2.13	2.07	2.07	6.10	6.20	5.80	6.03
Bapatla-8	1.97	2.17	2.07	2.07	8.10	8.03	8.40	8.18
S. Em ±	0.182	0.132	0.178	0.123	0.402	0.305	0.260	0.191
CD at 5%	0.533	0.386	0.521	0.359	1.175	0.891	0.760	0.558

Conclusion

All the cashew varieties showed significant differences in respect of all the attributes evaluated. Plant height and girth of collar region was more in UN-50, canopy spread and yield per plant was maximum in V-4. Similarly the observations on Nut weight was more in V-7. Based on the evaluation of performance of cashew varieties at eight year after planting, it can be concluded that variety V-4 and Dhana performed better in Southern Dry Zone of Karnataka.

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