

Influence of Elanta Super (N-ATCA) and Ethrel on Yield and Quality of Cashew cv.Vengurla-4



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Abstract

An experiment was conducted to find out the effect of bio-efficacy of Elanta Super (N-ATCA) and Ethrel in relation to yield and quality of cashew cv.Vengurla-4. Among the different treatments, treatment T4 (four sprays of Elanta Super) recorded significantly maximum percent retention of nut (86.17), number of nuts harvested per plant (1700.33), early days for maturity (55.11days), yield of nuts per plant (11.18 kg), number of apple per tree (1700.33), yield of apple per tree (65.50 kg) followed by the treatment T3 (three sprays of Elanta Super) over rest of the treatments under study. The yield increment due to four sprays of elanta was 48% over control. However, the different elanta sprays did not improve the quality of cashew apple. The results are non-significant in terms of juice content (%), TSS and acidity (%). Treatment T4 (four sprays of Elanta Super) recorded highest average score 7.69 for sensory evaluation of cashew apple followed by T3 (three sprays of Elanta Super) 7.10, T2 (two sprays of Elanta Super) 7.02 and T1 (single spray of Elanta Super) 6.97

Keyword: Cashew, N-ATCA, Ethrel, Yield, Quality.

Introduction

Cashew (*Anacardium Occidentale L.*) belongs to Anacardiaceae family, is an evergreen tree and is extensively grown in Kerala, Karnataka, Goa, Tamil Nadu, Andhra Pradesh, Maharashtra, Orissa and West bengal states of India. Currently, the area under cashew is around 992000 ha. with a total production of 753000 tons. With 184000.20 ha with a total production of 224000.64 tons, Maharashtra accounts for 18.54% of the area and 29.74% of production, respectively (Anon, 2013) The highest productivity is observed in Kerala and Maharashtra with over one ton per ha. as compared to other states. But in addition to local production, India also imports a considerable quantity of raw nuts from several African and south-east Asian countries to satisfy the raw nut demand of cashew processing industry. Use of growth regulators like auxins, gibberellins and ethylene has resulted in improving the vegetative and reproductive parameters which are associated with high yield in many fruit crops (Lafer,2008). Thus by using different growth regulators for maximization of yield in cashew has wide scope now-a-days. Hence, the present study was undertaken to determine the effect of Elanta Super (N-ATCA) and Ethrel sprays on cashew cv. Vengurla-4 with respect to yield and quality.

Methodology

The present investigation was carried out at Soil Conservation Research Station, Awashi, Tal-Khed, Dist-Ratnagiri (Maharashtra) on 25 years old cashew trees during the period November 2013 to May, 2014. Disease free and uniform trees receiving uniform cultural practices were selected for experiment. The experiment was laid out in randomized block design with six treatments in four replication. The Number of inflorescences selected per treatment per replication were sixty for the observations under study. Spraying schedule of Elanta Super spray was followed as per experiment detail i.e. T1: At 50% flowering (1ml/litre), T2: At 50% flowering (1ml/litre) and 15 days after first spray (1.5 ml/litre), T3: At 50% flowering (1ml/litre), 15 days after first spray (1.5 ml/litre) and 15 days after 2nd spray(2 ml/litre), T4: At 50% flowering (1ml/litre), 15 days after first spray (1.5 ml/litre), 15 days after 2nd spray (2 ml/litre) and at turning of apple colour to red (2 ml/litre), T5: Ethrel spray at vegetative flush (10 ppm), at reproductive

flush (10 ppm) and at fruit set (10 ppm), T6:(water spray). The observations recorded were retention of nut (%), number of nuts per plant, days to maturity of nuts, average weight of nut (g), yield of nuts (kg), number of nuts per kg, number of apple per tree, average weight of apple (g), yield of apple per tree (kg), juice content(%), TSS⁰B) and acidity(%).The organoleptic evaluation of cashew apple was carried out by panel of 12 judges with 9 points hedonic scale score (Amerine et al.,1965) for the palatability.

Results and Discussion

The data on the effect of Elanta Super (N-Acetyl Thiazolidine-4-Carbozyllic Acid) and Ethrel sprays on cashew crop is presented in Table 1. It is revealed that treatment T4 (four sprays of Elanta Super) has recorded highest percent retention of nut (86.17%) which was significantly maximum over rest of the treatments followed by treatment T3 (three sprays of Elanta Super) which registered 84.87 percent retention of nut. Konhar and Mech (1988) also reported highest fruit retention in cashew with Ethrel spray (50 ppm). Similarly, reduced fruit drop in cashew due to application of growth regulators was reported by Kumar et al.(1994). Lakshmipathi et al.(2014) also reported increase in fruit set and fruit retention due to application of Ethrel and other growth regulators. The treatment T6 (control) has recorded lowest 78.42 percent retention of nut which was significantly minimum. The treatment T4 (four sprays of Elanta Super) 1700.33 was recorded maximum number of nuts per plant which was significantly maximum over rest of the treatments followed by T3 (three sprays of Elanta Super) 1574.83.The treatment T2 (two sprays of Elanta Super) and T5 (three sprays of Ethrel) recorded 1295.74 and 1263.83 number of nuts per plant respectively which were at par with each other. Veeraraghavathatham and Palaniswamy (1983) also noted increase in nut yield with application of growth regulators could be attributed to increase total number of nuts per tree. The treatment T6 (water spray) recorded significantly minimum number of nuts per plant (1039.00).

The treatment T4 (four sprays of Elanta Super) recorded minimum maturity compared with control (T6). The maturity of treatment T3 (three sprays of Elanta Super) and T4 (four sprays of Elanta Super) was 55.11 days each which was at par with each other. Olawale et al.(2011) demonstrated foliar application of the exogenous plant hormones at pre- blooming stage will enhance the flowering precocity, shorten the flowering duration, increase production of hermaphrodite flowers and fruit set significantly. The treatment T6 (no spray) has registered 60.16 days which was statistically more days than T3 (three sprays of Elanta Super) and T4 (four sprays of Elanta Super).

Reduction in the weight of nut was observed with elanta spray.. The treatment T4 (four sprays of Elanta Super) registered minimum nut weight (6.58 g) which was significantly minimum. The treatment T5 (three sprays of Ethrel) 7.19 g, T6 (water spray) 7.21 g and T1 (single spray of Elanta Super) 7.20 g were at par with each other. Treatment T4 (four sprays of Elanta Super) recorded highest yield of nut (11.18 kg) which was significantly maximum over rest of the treatments. It was followed by T3 (four sprays of Elanta Super) 10.91 kg .Gajbhiye et al.(2007) , Mohan and Rao (1995) and

Gawankar et al. (2010) also reported highest nut yield with ethrel spray. However, the mean nut weight was not significantly influenced by spray treatments.The treatment T6 (no spray) (7.55 kg) recorded lowest yield of nuts. Treatment T5 (three sprays of Ethrel) has recorded lowest number of nuts per kg (143.49) which were at par with T1 (143.99) and T6 (no spray) 143.50. However, the maximum number of nuts per kg were recorded in T4 (four sprays of Elanta Super) 158.08 followed by T3 (three sprays of Elanta Super) 155.66. Number of nuts in 1 kg were recorded in the range of 143.49 (T5) to 158.08 (T4).

Treatment T4 (four sprays of Elanta Super) (1700.33) recorded maximum number of apples followed by T3 (three sprays of Elanta Super) 1574.83.Treatment T2 (two sprays of Elanta Super) (1295.74) and T5 (three sprays of Ethrel) (1263.83) were at par with each other and significantly maximum over control (T6). Laxmipathi et al.(2014) observed that application of Ethrel (50 ppm) and NAA (25 ppm) were found to be beneficial for increasing the nut yield through improvement in sex ratio, fruit set and fruit retention in cashew var.Bhaskara. Lowest numbers of apples per tree were recorded in control (T6) (1039). The average weight of apple was decreased with increase in the sprays of elanta. It was maximum (45.20 g) in T1 (single spray of Elanta Super) which was significantly superior followed by the treatment T6 (control) 43.83 g. The treatment T4 (four sprays of Elanta Super) was recorded minimum average weight of apple (38.52 g). The treatment T4 (four spray of Elanta super) recorded maximum (60.50 kg) yield of apple followed by 62.19 kg recorded in T3 (three sprays of Elanta Super). The control treatment (T6) recorded 45.54 kg apples per tree. The yield of apple recorded by T1 (single sprays of Elanta Super) 50.35 kg, T2 (two sprays of Elanta Super) 50.40 kg and T5 (three sprays of Ethrel) 52.99 kg were at par to each other.

The different sprays of elanta super and Ethrel did not improve the juice content %, TSS and acidity %. However, the maximum (78.74%) juice content (%) was recorded by T1 (single spray of Elanta Super) and minimum (77.83%) juice content was recorded in T3 (three sprays of Elanta Super). The highest TSS of juice (13.80⁰Brix) was recorded by T4 (four sprays of Elanta Super). The acidity of juice ranged from 0.19 to 0.20 %.

The data on sensory evaluation of cashew apple presented in Table 2 revealed that treatment T4 (four sprays of Elanta Super) has recorded maximum score (7.66) for colour of cashew apple followed by T1 (single spray of Elanta Super) 7.33 and T2 (two sprays of Elanta Super) 6.83. Treatment T3 (three sprays of Elanta Super) recorded maximum score (8.20) for flavor followed by T4 (four sprays of Elanta Super) 8.00, T5 (three sprays of Ethrel) 6.33 and T6 (control) 6.33. Treatment T2 (two sprays of Elanta Super) recorded maximum score 8.08 for texture followed by T4(four sprays of Elanta Super) 7.41,T1 (single spray of Elanta Super) 7.33 and T5 (three sprays of Ethrel) 7.33 Among the treatments, treatment T4 (four sprays of Elanta Super) recorded highest average score 7.69 for sensory evaluation of cashew apple followed by T3 (three sprays of Elanta Super) 7.10, T2 (two sprays of Elanta Super)7.02 and T1 (Single spray of Elanta Super) 6.97.

It was concluded that the treatment T4 (Four sprays of Elanta Super) was found to be very effective for improvement of percent retention of nut (86.17), number of nuts harvested per plant (1700.33), early days for maturity from flowering (55.11), yield of nuts per plant (11.18 kg), number of apple per tree (1700.33),

yield of apple per tree (65.50 kg) followed by the treatment T3 (three sprays of Elanta Super) over rest of the treatments under study. The yield increment due to

four sprays of Elanta Super (N-ATCA) was 48% over control. The different spray of elanta did not improve the apple quality of cashew.

Table-1: Effect of Elanta Superin Relation to Yield and Quality of Cashew CV. Vengurla-4

Treatment.No.	Retention of nut (%)	No. of nuts/plant	Days to maturity of nuts from flowering	Av. wt. of nut (g)	Yield of nut tree ⁻¹	No. of nuts kg ⁻¹	No. of apples tree ⁻¹	Av. wt. of apple (g)	Yield of apple tree ⁻¹ (kg)	Juice content of apple (%)	TSS of apple juice (°B)	Acidity of apple juice (%)
T ₁	81.07	1113.77	58.87	7.20	8.19	143.99	1113.77	45.20	50.35	78.74	13.60	0.19
T ₂	84.11	1295.74	57.11	6.98	9.44	148.49	1295.74	38.89	50.40	78.72	13.27	0.19
T ₃	84.87	1574.83	55.11	6.66	10.91	155.66	1574.83	39.48	62.19	78.37	13.10	0.20
T ₄	86.17	1700.33	55.11	6.58	11.18	158.08	1700.33	38.52	65.50	77.83	13.80	0.20
T ₅	81.30	1263.83	58.56	7.19	9.86	143.49	1263.83	41.92	52.99	78.21	13.25	0.20
T ₆	78.42	1039.00	60.16	7.21	7.55	143.50	1039	43.83	45.54	78.71	13.40	0.19
S.E _±	0.2325	12.1921	0.2111	0.0097	0.0764	0.406	12.1921	0.4082	0.9264	0.0094	0.2945	0.0032
C.D. at 5%	0.6787	35.588	0.6162	0.0283	0.223	1.1851	35.58	1.1915	2.7041	NS	NS	NS
CV %	0.57	1.83	1.04	0.29	1.71	0.55	1.83	1.78	3.4	0.05	4.41	3.3

Table-2: Sensory Evaluation of Cashew Apple.

Parameter	Treatments					
	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆
Colour	7.33	6.83	6.34	7.66	5.58	6.66
Flavor	6.25	6.16	8.20	8.00	6.33	6.33
Texture	7.33	8.08	6.77	7.41	7.33	6.00
Average score	6.97	7.02	7.10	7.69	6.41	6.33

Sensory Score Rating-

- 9- Like extremely
- 8- Like very much
- 7- Like moderately
- 6- Like slightly
- 5- Neither like nor dislike
- 4- Dislike slightly
- 3- Dislike moderately
- 2- Dislike very much
- 1- Dislike extremely

The overall rating was obtained by averaging score of evaluation. The fruits with score of 5.5 and above were rated as acceptable (Amerine et. al. 1965).



Harvested cashew nuts from treatment T1, T2, T3, T4, T5 and T6



Harvested cashew apple from treatment T1, T2, T3, T4, T5 and T6

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