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Cashew varietal screening for resistance against cashew stem and root borer, *Neoplocaederus ferrugineus* (L.)

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Abstract

The Cashew Stem and Root Borer which can cause 30-40 per cent reduction in the yield by damaging the vascular tissues and leads to the death of the trees. The varietal resistance will certainly reduce the complete dependency on the chemical control and it is an ideal method fit in the Integrated pest management practices. The experimental result revealed that, the cultivars Ullal-1, UN-50, Vengurla-4 were showing tolerance to cashew stem and root borer damage. The varieties 4/6 Madhuranthakam, 9/66 Chirala, Goa 11/6 recorded 10 per cent CSRB infestation while, the varieties 7/91 Kottarakara, 1/3 Ullal and Vengurla-7 were found the most susceptible to cashew stem and root borer (30%). It was closely followed by V.RI-3 and local Puttur shows 20 per cent damage.

Keywords: Cashew, stem and root borer, resistant, varietal screening

1. Introduction

Cashew (*Anacardium occidentale* L.) is an important commercial crop widely grown in tropical and coastal region of India. The area under cashew cultivation is around 10.62 lakh ha. which is the highest among cashew growing countries in the world and the annual average total production is 8.17 lakh tones during 2017-18^[2]. India is one of the largest producer, processor, consumer and exporter of cashew in the world. It ranks second in the cashew production after Vietnam. The states like Karnataka, Goa, Maharashtra, Kerala, Tamil Nadu, Andhra Pradesh and West Bengal are the mainly cashew cultivating areas in India. At present, it is also grown to a limited extent in non-traditional areas i.e. plain region of Karnataka. The commodity of commercial importance is the nut, which contains 47 per cent fat, 21 per cent protein and 22 per cent carbohydrate. It also contains vitamins, especially thiamine^[8]. Cashew nut proteins are complete, having all the essential amino acids and a kilogramme of the nut yields about 6000 calories compared to 3600 calories from cereals, 1800 calories from meat and 650 calories from fresh citrus fruit^[7].

Stem and root borers are major pests of cashew in all cashew growing tracts of India and a few other cashew growing countries^[1, 9] and pose a serious problem in realizing the maximum yield potential of cashew nut. It causes damage on vascular tissues resulting in gradual yellowing of the foliage of yielding trees and subsequently leads to death of trees. The 40 per cent extent of damage is observed in neglected plantations. The tiny grub of CSRB borers in to the fresh tissue and feeds on the phloem and xylem tissues of the trunk and root with making irregular tunnels, resulting in exudation of gum (gummosis) and extrusion of fibrous frass from damaged portion^[12].

Due to lack of knowledge about these pests, their incidence and proper management tactics, the growers come to know of the infestation only after the crop is lost or tree is dead. Use of resistant cashew cultivars or tolerant varieties to this insect pests is one of the alternatives which are environmentally friendly, secure and economically feasible way of controlling insect pests. The resistant cashew cultivars will have comparatively better crop yield as compared to susceptible cultivars. Keeping the above information in mind the present experiment was done with an objective to find out the most suitable cultivars resistance to the cashew stem borer insect pest infestation.

2. Materials and Methods

The experiment was conducted at Agricultural and Horticultural Research Station, Ullal, Mangalore, Karnataka.

The material for the present study comprised of 25 cashew genotypes selected from the core population of 64 germplasm accession. All the selected 25 varieties were screened to find out the resistance or tolerance variety/ cultivars in the 20 year old cashew orchard. The experiment was laid in Randomized Complete Block Design and same agronomic practices were given to all the varieties.

2.1 Observations recorded

The cashew stem and root borer damage at the root zone of each plant was inspected in every month by looking at the presence of entry holes and damaging symptoms. The observation on damage by stem and root borer was recorded and it was converted and represented in percentage basis. The temperature (18-34°C), Relative humidity (60-90%) and Rain fall (2800mm-3000mm) data also recorded in every year.

2.2 Statistical analysis

The data collected on different trees were statistically analyzed using the standard procedure and the result were tested at 5 per cent level of significance by using web agri stat package developed by ICAR Goa.

3. Results and Discussion

After twenty years of planting the varieties showed different level of tolerance to Cashew stem and Root borer. It was revealed from the table that, varieties/cultivars 7/91 Kottarakara, 1/3 Ullal and Vengurla-7 was found the most susceptible to cashew stem and root borer. 30 per cent trees were damaged by this pest. It was closely followed by Ullal-2(20), Ullal-4, 1/40, Palparamba (20%), Hy.40 Moz*1/63, C.R.S-1, 7/69 Ichapur, Brazil, V.R.I-3 and local puttur shows 20 per cent damage. Rest of the varieties/ cultivars like Ullal-1 were also infested by this pest whereas, showed lesser per cent damage (10%) compare to other cultivars and emerged as a tolerant/ resistant cultivars among the selected varieties (Table 1).

The results were supported by earlier findings [3, 10, 13], where it was reported CSR B as a serious pest of cashew trees in coastal Karnataka with pest incidence up to 12.5 per cent. These results are also supported by the findings of [5] who reported the lowest level mean infestation (2.78%) in the cultivars of Ullal-1 and V.R.I-2 and moderately (5.1-10%) in the cultivars UllaL-4, Hy.3/28 and vengurla-4. The highest infestation of *P. ferrugineus* in the coastal district, Ganjam (20.8%) and lowest infestation of 2.8 per cent in interior district, Koraput in Odisha [6].

The results were also in accordance with the earlier study [4] where, varieties like H-255, H-303, T.No. 30/1, T.No.3/33, T.No. 10/19, T.No. 3/28, H-367, M-15/4, NRCC-2 were tolerant to cashew stem and root borer attack. The variety M-15/4 and NRCC -2 were recorded 100 per cent free from CSR B infestation after twelve years of planting while NRCC-1 was found the most susceptible to cashew stem and root borer (100% infestation).

The survey study revealed that, Ullal-1, UN-50, Vengurla-4 and other eight cultivars shows less stem borer damage among the 25 varieties. These results are in line with the findings of previous author [9], who recorded the lowest CSR B infestation (2%) in Ullal-3, Priyanka and Vengurla-4.

4. Conclusion

Present study revealed that, by Comparing the per cent stem borer damage among the selected 25 varieties in the 20 year

old orchard, the experiment it could be concluded that the varieties Ullal-1, UN-50, Vengurla-4 are the most resistance against stem and root borer. 7/91 Kottarakara, 1/3 Ullal and Vengurla-7 was found to be highly susceptible and Ullal-2,Ullal-4(20%), 1/40 Palparamba(20%), Hy.40 Moz×1/63, C.R.S-1, 7/69 Ichapur, Brazil, VRI-3 and local Puttur and other eight cultivars shows a little tolerance against cashew stem and root borer.

Table 1: Cashew Stem and Borer damage on indigenous/exotic types of cashew varieties

Sl. No.	Variety\cultivars	Per cent stem borer damage
1	Ullal-1	10.00(12.14) ^c
2	Ullal-2	19.8(22.79) ^b
3	Ullal-3	10(12.14) ^c
4	Ullal-4	20(23.01) ^b
5	UN-50	10(11.10) ^c
6	1/40 Palparamba	20(23.00) ^b
7	4/6 Madhuranthakam	10(11.20) ^c
8	9/66 Chirala	10(12.10) ^c
9	3/111 Gubbi	10(11.10) ^c
10	7/91 Kottarakara	30(28.08) ^a
11	Nairobi	10(11.21) ^c
12	8/103 Gubbi	10(12.14) ^c
13	Goa 11/6	10(11.20) ^c
14	Hy.40 MOZ ×1/63	20(23.01) ^b
15	1/3 Ullal	30(28.08) ^a
16	C.R.S.1	20(23.01) ^b
17	7/69 Ichapur	20(23.05) ^b
18	Brazil	20(23.01) ^b
19	9/10 Permannur	10(11.10) ^c
20	B.P.P-8	20(23.01) ^b
21	Vengurla -7	30(28.08) ^a
22	V.R.I-3	20(23.01) ^b
23	Priyanka	10(11.10) ^c
24	Local (Puttur)	20(23.01) ^b
25	Vengurla -4	10(11.10) ^c
	S. Em(±)	0.685
	CD(P=0.05)	2.06

5. References

1. Abraham EV. Pests of cashew (*Anacardium occidentale* L). Indian Journal of Agricultural Sciences. 1958; 28(4):531-543.
2. Anonymous. Insect pests of cashew and their management. Technical Bulletin 27. ICAR - Directorate of Cashew Research. Puttur. Karnataka. 2017, 1.
3. Bhat MG, Nagaraja KV, Rupa TR. Cashew research in India Journal of Horticultural Sciences. 2010; 5(1):1-16.
4. Kar A, Poduva M. Varietal screening of cashew against different insect pests at Red and Lateritic Zone of West Bengal. Green Farming. 2018; 9(1):161-164.
5. Mohapatra RN, Jena, BC, Lenkha PC. Studies on the level of cashew stem and root borer infestation on different cultivars. Journal of Plantation crop. 2006; 34(3):417-419.
6. Mohapatra LN, Mohapatra RN. Distribution, intensity and damage of cashew stem and root borer *P. ferrugineus* in Orissa. Indian Journal of Entomology. 2004; 66(1):4-7.
7. Nambiar MC, Rao B, Thankamma EVV, Pillai PK. Cashew. In: Bose TK, Mitra SK (Eds) Fruits: Tropical and Subtropical, Naya Prakash, Calcutta. 1990; 386-419.
8. Ohler JG. Cashew. (Koninklijk Instituut Voo de Tropen: Amsterdam, Netherlands). 1979, 260.

9. Pillai GB, Dubey OP, Singh V. Pests of cashew and their control in India : A review of current status. *Journal of plantation crops*. 1976; 4:37-50.
10. Rao, BEVV. Integrated production practices of cashew in India. RAP FAO Corporate Document Repository. www.fao.org/docrep/005/ac451e/ac451e04.htm. 1998;12pp
11. Sahu KR. Survey of insect pests of cashew (*Anacardium occidentale* L.) and management of key pest *Plocaederus ferrugineus* L. (Cashew stem and root borer). Ph.D Thesis, IGKV, Raipur, 2009.
12. Sathiamma B. Nature and extent of damage by *Helopeltis antoni* S., the T- mosquito bug non cashew. *Journal of plantation crops*. 1997; 5:58-62.
13. Sundararaju D, Bakthavatsalam N. Cashew pest management for coastal Karnataka. *The Cashew*. 1990; 4:3-6.