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Curative control of cashew stem and root borer, *Plocaederus ferrugineus* L.

AK Gupta**Abstract**

The cashew (*Anacardium occidentale* L.) is a member of the Anacardiaceae floral family. Cashew industry provides employment to more than 5 lakh people in farms and factories most of them in the rural areas. Among the various production constraints identified, the cashew stem and root borer, *Plocaederus ferrugineus* L is the most serious pest of cashew as its damage results in death of trees. Field experiment was conducted during 2015-16 to 2017-18 on old plantation of cashew variety, Vengurle-4 at farmer's field of village Bakawand, distt. Jagdalpur (Chhattisgarh) to evaluate the efficacy of different curative treatments using chemical against cashew stem and root borer (CSR). Treatments were applied after removal of the grubs in the stem and root zone. On the basis of mean percent trees without re-infestation of cashew stem and root borer during respective years revealed that Chlorpyrifos 20 EC @ 0.2% lead to maximum recovery of 69.75 percent tree without re- infestation followed by Fipronil @ 0.2%. So, Chlorpyrifos 20 EC @ 0.2% found better for the control of cashew stem and root borer.

Keywords: Cashew stem and root borer (CSR) and cashew**Introduction**

The cashew (*Anacardium occidentale* L.) is a member of the Anacardiaceae floral family. Cashew is grown in India, Brazil, Vietnam, Tanzania, Mozambique, Indonesia, Sri Lanka and other Tropical Asian and African countries. The area under cashew in the world is 30.62 lakh ha. The world production of cashew is estimated to be around 20.83 lakh tons. India's share in the world raw nut production accounts to about 25 per cent. In India it is grown in an area of 9.91 lakh ha with production of 6.92 lakh tones of raw nuts per annum [2]. Cashew grown in Kerala, Karnataka, Goa, and Maharashtra and along the west coast and Tamil Nadu, Andhra Pradesh, Orissa and West Bengal along the east coast. It is also grown to a limited extent in Chhattisgarh and Kolar (plains) region of Karnataka.

Chhattisgarh state has about 6 lakh ha wasteland area. Bastar plateau is southern part of Chhattisgarh and mainly covered with forest area and one of the biggest tribal districts to have around 40,000 ha. area suitable for cashew plantation (GIS Survey, GOI-2002-03). At present in Chhattisgarh, 28.42 thousand ha. under cashew cultivation in which production is 23.03 thousand metric tons and productivity is 800 kg per ha. [4]. In Baster district 8.00 thousand ha. under cashew cultivation in which production is 3.652 metric tons and productivity is 500 kg/ha [3].

Among the various production constraints identified, the insect pests form one of the major limiting factors causing a crops loss of 30 to 40 per cent [11]. Cashew is attacked by more than one species of insects, mites and vertebrates in India. Among which the cashew stem and root borer (CSR), tea mosquito bug (TMB) and foliage and flower insect (like thrips, leaf caterpillar and leaf miner) are important limiting factors [12]. The cashew stem and root borer, *Plocaederus ferrugineus* L is the most serious pest of cashew as its damage results in death of trees. It is an internal tissue borer and infestation was up to 40% in different periods and severely attacked trees die within a period of two years causing substantial tree loss. The extent of attack of the CSR assessed in different cashew plantation varying from 1.6 to 40.0 per cent in Kerala, Karnataka, Tamil Nadu, Maharashtra and Orissa [8, 1-7]. The incidence of CSR was found 2.5-30.0 per cent at the Baster Plateau Zone of Chhattisgarh, India during 1999 and 2000 [5].

In view of seriousness of infestation of cashew stem and root borer (CSR) in India, it is essential to evaluate the suitable management practice in all the potential cashew growing areas but in Chhattisgarh there was no systematic study of cashew insect pest and not any

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suitable management options are developed for cashew stem and root borer (CSRB) like destructive insect pest. Keeping this fact in view, studies on curative control of cashew stem and root borer were undertaken.

Materials and Methods

The trial was laid out in Randomized Block Design (RBD) with three replication including six treatments for three consecutive years 2015-16, 2016-17 and 2017-18. The

experiment was conducted on old plantation of cashew variety, Vengurle-4 at farmer's field of village Bakaw and, Jagdalpur (Chhattisgarh). For the curative control measure of CSRB, experiments were carried out on the basis of damaging symptoms produced like gummosis, extrusion of gummy frass or powder frass as reported by [4]. Following treatments were applied after removal of the grubs in the stem and root zone are as follows:

Table 1: Treatment details

S. No.	Treatment	Conc.
1	T1: Fipronil swabbing (2 ml/l)	1%
2	T2: Neem oil swabbing (5%)	5%
3	T3: Imidaclopride 17.8 SL swabbing (2ml/l)	0.03%
4	T4: Chlorpyriphos 20 EC swabbing (10 ml/l)	0.2%
5	T5: Treated check (only removal of CSRB grubs followed)	-
6	T6: Untreated check	-

Treatments were applied sequentially on infested trees. Sequential treatments were referred to T₁ on first infested tree, T₂ on second infested tree, T₃ on third infested tree, T₄ on fourth infested tree, T₅ on fifth infested tree, T₆ on sixth infested tree and again T₁ on seventh infested tree, T₂ on eighth and so on infested tree. Treatments were imposed sequentially as and when infested trees were available. Observations were recorded as per the procedure given by [9]. Percentage of re-infestation was recorded in each treatment and data was subjected to statistical analysis for critical differences.

Results and Discussion

The results of curative control measure were depicted in Table 2. Different insecticides were applied in CSRB infested trees after removal of CSRB grub or pupae. All the treatments were significantly superior over untreated control. Maximum recovery of 77.78 per cent tree without re-infestation recorded in treatment Fipronil swabbing @ 2ml/l followed by Chlorpyriphos 20 EC @ 0.2% and Imidaclopride 17.8 SL @ 2ml/l with 72.22 and 66.67 per cent recovery of CSRB infestation, respectively during 2015-16. However, treatment Chlorpyriphos 20 EC @ 0.2% gave maximum recovery of

72.22 per cent against CSRB infestation followed by Fipronil swabbing @ 2ml/l with 66.67 per cent recovery for CSRB infestation during 2016-17. During 2017-18, Chlorpyriphos 20 EC @ 0.2% was again superior treatment and provided maximum recovery of 66.67 per cent tree without re-infestation followed by Fipronil swabbing @ 2ml/l and Imidaclopride 17.8 SL @ 2ml/l with 61.11 and 55.55 per cent recovery, respectively. Among the three consecutive years, maximum recovery of CSRB infestation (77.78%) recorded during 2015-16 followed by 2016-17(72.22%) and 2017-18 (66.67). On the basis of mean per cent recovery of CSRB infestation revealed that Chlorpyriphos 20 EC @ 0.2% lead to maximum recovery of 69.75 per cent tree without re-infestation followed by Fipronil @ 2ml/l with 65.53 per cent tree without infestation. In accordance with present studies, [10] reported that in ten curative treatments applied against CSRB, the Chlorpyriphos (0.2%) was most suitable and gave lowest (12.96%) re-infestation. In contrary, [6] reported that Mud slurry+ Carbaryl (0.25%) swabbing gave the lowest mean cumulative percentage of infested tress (6.0) and highest recovery of infested tress after 4 treatments (38.4%).

Table 2: Efficacy of insecticides as post extraction prophylaxis (PEP) against cashew stem and root borer (CSRB) at Jagdalpur centre during 2015-16 to 2017-18.

Treatment	Percent recovery/ percent trees without reinfestation / persistent attack			Mean % trees without reinfestation/ persistent attack
	2015-16	2016-17	2017-18	
T1: Fipronil (2ml/l)	77.78	66.67	61.11	65.43
T2: Neem oil swabbing (5%)	55.56	38.89	33.33	38.27
T3: Imidaclopride 15.8SL (2ml/l)	66.67	44.44	55.55	51.85
T4: Chlorpyriphos 0.1%	72.22	72.22	66.67	69.75
T5: Treated check (only removal of CSRB grubs followed)	44.45	33.33	27.18	32.10
T6: Untreated check	33.34	22.22	22.22	23.46

Conclusion

From the curative control of cashew stem and root borer it was concluded that Chlorpyriphos (0.2%) was found best treatment to give the minimum re-infestation (25.00%).

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