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MANAGEMENT OF STEM BORER, *COELOSTERNA SCRABRATOR* FABR. IN GRAPEVINE

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Abstract

A field experiment was conducted at Grape Research Station, Rajendranagar for a period of two years (2011-13) on six year old grape garden (Thompson seedless variety) in a completely randomized block design with ten treatments. The treatments include injection of aluminium phosphide tablet @1g/live hole, dichlorvos injection 76%EC @ 80ml/ live hole, petrol injection @ 5ml/ live hole, methyl bromide @ 2ml/ live hole, carbon disulphide @ 2ml/ live hole, chloroform injection @ 2ml/ live hole, monocrotophos root application @ 5ml/ live hole, imidacloprid 17.8% soil drenching @ 1.5ml/l, soil drenching of thiamethoxam @ 2g/live hole and untreated control. The results clearly indicated that dichlorvos injection 76% EC @ 80ml/ live hole and aluminium phosphide tablet @ 1g/live hole has recorded hundred per cent reduction in live tunnels while chloroform injection @ 2ml/ live hole, carbon disulphide @ 2ml/ live hole, methyl bromide @ 2ml/ live hole and petrol injection @ 5ml/ live hole has recorded 91.67, 75.00, 66.67 and 47.83 per cent reduction in live tunnels, respectively.

Key words : Grape, stem borer, management, *Coelosterna scrabrator*.

Introduction

Grape is an important fruit crop of Telanagana State. It is attacked by nearly 100 insect pests, which inflict different types of injuries to the host. Among these, the stem borer of grape *Coelosterna Scrabrator* is a serious pest and becoming one of the limiting factor in grape cultivation and attaining a major pest status in the recent past in grape growing areas of Rangareddy, Nalgonda and Medak districts.

The grubs of *C. scabrator* Fabr. (Coleoptera : Cerambycidae) are the commonly occurring stem borer in grapes (Rao *et al*., 1979). Adults of *C. scabrator* are 2.0-4.0 cm long with mottled grey elytra and a small projecting spine on metathorax. Nair (2007) reported *C. scabrator* infesting the live wood of *Acacia nilotica* and the management strategies for the same were outlined by Jagginavar *et al*. (2008). Adults of *C. scrabrator* are 20-28 mm in size, have mottled gray elytra, met thorax on each of its sides and has a small projection pointing forward. Female adults lay eggs below loose bark of stem and inside the old tunnels. Both adults and grubs cause damage to grape. Adult beetles gnaw the shoots of girth size between 1.4 to 2cm leading to drying from the injury point whereas, shoots with girth size more than 2 cm tolerated the injury and recouped (Jagginavar *et al*., 2008). *C. scabrator* commonly known as the babul root borer was also found to infest forest trees belonging to various families, *viz*., Casuarinaceae, Dipterocarpaceae, Leguminosae, Rhamnaceae, Verbenaceae, Myrtaceae etc. (Choudhuri, 1963).

Presence of saw dust like substance under the vine indicates the damage done by the grub. Damaged vines get weakened and growth gets affected. The maturity of berries is also delayed which ultimately affects the grape production in terms of both yield and quality. This also attacks pomegranate where in detailed management strategies have been studied (Birader *et al*., 2005). In addition to *C. scrabrator*, *S. barbatum* infests live green vines of grapes in addition to the dead vine parts. The insects usually feed on the dried bamboos, which may be one of the possible routes of entry of this pest into the grapevine ecosystem because bamboo poles are used in grapevine orchards as one of the supporting structures to vines especially during the initial years of its establishment (Salini and Yadav, 2011). Earlier, this pest was considered to be a problem only in old and neglected vineyards. However, in recent years, severe incidence of this pest has been observed in even on one year old

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gardens. Owing to the serious magnitude of the damage and limited work done on this pest the present study was taken up.

Materials and Methods

A field experiment was conducted for two years during 2011-12 and 2012-13 at Grape Research Station, Rajendranagar, Telanagana on seven year old grape garden (Thompson seedless variety). The treatments $\mathbf{T_2}$ to $\mathbf{T_6}$ include stem injection with squeeze bottle with different chemicals having various degrees of fumigant activity.

Treatments : 10

1. Aluminium phosphide @ 1 gm/livehole
2. Dichlorvos 76 EC injection @ 2 ml/live hole
3. Petrol @ 5ml / livehole
4. Methyl bromide @ 2ml / livehole
5. Carbon disulphide @ 2ml / livehole
6. Chloroform @ 2ml / livehole
7. Root application of Monocrotophos @ 5 ml / vine
8. Soil drenching of Imidacloprid 17.8 SL @ 1.5 ml/l/vine.
9. Soil drenching of Thiamethoxam @ 2g/l/vines.
10. Control.

For imposing each treatment, five stem borer infested vines (with live holes) were selected and replicated thrice in randomized block design. Before injecting the chemicals, the tunnels were cleaned or loosened with the help of hard metal wire. For injecting the chemicals, 250 ml sized squeeze bottle was used. After injecting into the tunnels, the bored holes were plugged with clay. Pre-treatment observation on live tunnels and post treatment observations on live and dead tunnels were taken at one, two, three and four weeks after treatment. Finally, percent reduction in live holes was calculated after four weeks. The data was subjected to statistical analysis.

Results and Discussion

During 2011-12, all the treatments were superior over control in the management of stem borer. Injection of Dichlorovos @ 80ml/lit and Aluminium phosphide @ 1g/lit were found effective to control grubs of stem borer. The mean mortality of stem borer was hundred per cent in treatment with Dichlorovos @ 80ml/lit and Aluminium phosphide @ 1g/lit followed by chloroform injection (91.13), Carbon disulphide (50.1) and Methyl bromide (50.1) and significantly superior to the rest of the treatments.

During 2012-13, all the treatments were superior over control in the management of stem borer. Injection of Dichlorovos @ 80ml/lit and Aluminium phosphide @ 1g/lit were found effective to control grubs of stem borer. The mean mortality of stem borer was hundred per cent in treatment with Dichlorovos @ 80ml/lit and Aluminium phosphide @ 1g/lit followed by chloroform injection (91.66), Carbon disulphide (75.00) and Methyl bromide (66.67) (table 1).

Table:1 Efficacy of insecticides against grubs of grapevine stem borer, *C. scabrator* during 2011-13

S. no.	Name of the treatment	Dose	Mean mortality of grubs (%)		Mean (2011-13)
			(2011-12)	(2012-13)	
1.	Aluminium phosphide	1g/live hole	100 (90.00)a	100 (90.00)a	100 (90.00)
2.	Dichlorvas injection 76 EC	80 ml/Lit	100 (90.00)a	100 (90.00)a	100 (90.00)
3.	Petrol injection	5ml/ live hole	44.46 (39.11)b	47.83 (43.73)c	46.14(41.42)
4.	Methyl Bromide	2 ml/live hole	50.01(44.99)b	66.67(59.99)b	58.31(52.49)
5.	Carbon disulphide	2ml/live hole	50.01(44.99)b	75.00(64.98)b	62.50(54.98)
6.	Chloroform injection	2ml / live hole	91.13(51.48)a	91.66(82.49)a	76.39(67.14)
7.	Monocrotophos-Root application	5ml /vine	44.46(36.48)b	38.55(38.30)c	41.50(37.39)
8.	Imidacloprid – 17.8 SL Soil drenching	1.5 ml / l /vine	44.45(36.48)b	13.88(13.37)d	29.16(19.18)
9.	Soil drenching of Thiamethoxam	2g/vine	33.33(27.35)c	19.44(19.24)d	26.38(23.29)
10.	Control-	5.55(5.87)d	0.07(1.20)e	2.81(3.53)	
CD			19.948	20.25	
SEm			6.98	7.089	
CV			31.6	34.499	

- Figures inside the parenthesis are angular transformed values

The efficacy of the above treatments may be due to good fumigant action. The differential action of the chemicals may be due to the difference in the fumigant action of the insecticides. Root application of Monocrotophos @ 5 ml/vine, soil drenching of Imidacloprid 17.8 SL @ 1.5 ml/l/vine, Soil drenching of thiamethoxam @ 2g/l/vines were very less effective and slow in action in the management of the stem borer.

Conclusion

Stem borer is a serious problem in grapevine and causes serious damage. Hence, stem injection of Dichlorovos @ 80ml/lit was found effective to control grubs of stem borer in grapevine.

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