Mycopath (2012) 10(2)**:** 97-99 **Research Article**

Relative efficacy of granule insecticides for the management of *Chilo infuscatellus* (Lepidoptera: Pyralidae) in Pakistan

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Abstract

The study was planned to find out the relative efficacy of granule insecticides against the sugarcane stem borer, *Chilo infuscatellus* Snellen. The experiment was laid out in a randomized complete block design and replicated thrice with a plot size of 5×10 m^2 with five treatments. Four insecticides viz., Furadan (2,2-dimethyl-2,3-dihydro-1-benzofuran-7-yl methylcarbamate), 3G Carbofuran @ 12 kg ha^{-1}, Padan (S'-2-dimethylaminopropane- 1,3-diyl) 4G Cartap @ 10 kg ha^{-1}, Thimet (O,O diethyl S ethylthiomethyl phosphorodithioate) 5G Phorate @ 10 kg ha^{-1} and Monomehypo (Dimethyl- hydro-2-(1,3 monosodium disolfonat thio prpopya l0 ammomonium) @ 8 kg ha^{-1} were applied. Minimum infestation of sugar cane stem borer was observed after the treatments with Furadan (10.22%) followed by Thimet (11.35%), Padan (12.45%) and Monomehypo (13.84%) when compared with the control (26.13%). Findings of the present study could be helpful in the chemical based management of sugarcane stem borer using Furadan.
Keywords: *Chilo infuscatellus,* granule insecticides, sugarcane

Introduction

Sugarcane (*Saccharum officinarum* L.) is an important cash crop of Pakistan. This crop is grown mostly in the three province of Pakistan namely Punjab, Khyber Pakhtunkhwa and Sind. The average yield of sugarcane crop per hectare is 53.3 million tons that is 12% higher than that of the previous years (Anonymous, 2011). There are 12 reported species of insect pests that attack on sugarcane crop (Chaudhry and Ansari, 1988; Ahmad *et al*., 2011). The most important species causing damage to the sugarcane crop are the sugarcane borers, particularly the sugarcane stem borer (Gul *et al.,* 2008). This species is scattered in Punjab and other provinces of Pakistan (Hashmi, 1994; Cheng *et al.,* 1997). The insect pests of sugarcane crop cause about 20% loss in its yield every year (Dhaliwal *et al.*, 2004). In some studies it was find out that losses caused by sugarcane stem borers are up to 36.51% (Ahmad *et al*., 2011).

Presently, a lot of problems have been created in Pakistan because of the unwise and inappropriate use of chemical pesticides to manage insect pests of agricultural (Ahmad, 2011) and veterinary importance (Khan *et al.,* 2012, 2013). This necessitates the need to explore wise chemical use, and at appropriate stages of insect pests. Gupta and Singh (1997) reported that the 3rd and 4th broods of sugarcane borers reduce more than 25% decrease in weight. In previous studies, Rana *et al*. (1992), Khan and Jan (1994) and Mishra *et al*. (1998) revealed that granular insecticides viz., Furadan and Basudin are very effective in reducing the stem borer infestation and helpful to increase the sugarcane yield. Keeping in view the importance of the crop and decrease in the yield by borers attack, there is a need to explore appropriate insecticides at appropriate doses for the effective management of the stem borers. In the present study, we were interested to find the relative efficacy of commercially available granule insecticides for the management of the sugarcane stem borer.

Materials and Methods

To find out the relative efficacy of granule insecticides against the sugarcane stem borer, an experiment was conducted at the District Rahim Yar Khan, Pakistan, using a sugarcane variety US-718. The experiment was conducted by following the methodology of Ahmad *et al.* (2011). Briefly, a standard commercial sugarcane variety US-718 was planted in rows 2.5 feet R × R and 1 foot P × P distance between the sets and plot (5 × 10 m^2) with five treatments in each block. The experiment was designed in a randomized complete block design and replicated three times. Four insecticides viz., Furadan 3G Carbofuran @ 12 kg ha^{-1}, Thimet 5G Phorate @ 10 kg ha^{-1}, Padan 4G Cartap @ 10 kg ha^{-1} and Monomehypo @ 8 kg ha^{-1} were

applied with a check for comparison. Observations were recorded on the percentage of each damage 15 shoot were selected randomly from each treatment in each replication.

Damaged canes were separated; holes were counted and the whole damage percentage was calculated according to the following formula:

$$\text{Infestation (\%)} = \frac{\text{No. of damaged cane}}{\text{No. of total cane}} \times 100$$

The pre-treatment observations were recorded one day before each application of insecticide, while the post treatment observations were recorded 10, 20 and 30 days after each dressing of the insecticide. All the data were analysed by following analysis of variance (ANOVA) and means were compared by the Tukey HSD test (P≤5%) by using the software Statistix 8.1.

Results and Discussion

All the treatments showed significant differences with respect to the infestation caused by sugarcane stem borer (F = 1129; df = 4.28; P≤0.01). The results showed a significant difference among the treatments. The minimum infestation 10.22% was recorded in the plots treated with Furadan. The percentage infestation increase up to 11.35%, 12.45% and 13.84% in the plots treated with Thimet, Padan and Monomehypo, respectively, as compared to control (26.13%). The infestation was almost the same with three intervals (Table 1). The present findings are comparable with those of Halimie *et al*. (1994), Marwat and Khalid (1985), Rana *et al*. (1992), Mishra *et al.* (1998) and Ahmad (2011), who reported that Furadan is very effective against sugarcane stem borer. The present findings are comparable with those of Talpur and Qureshi (2002) suggested that Furadan 3G, Padan 4G and Thimet 5G are very effective against the sugarcane borer. Furadan showed very effective results to control the stem borer as compared to the other insecticides tested. The present findings are also comparable with those of Madan *et al*. (1998), Halimie *et al*. (1989) who reported that the use of insecticides at initial stages gave the best results and reduced the infestation from 4.48% to 3.63%. However, the results are in contrast with those of Yunus and Hussain (1973), who tested seven insecticides including Furadan and Thiodan and diazinin etc, when applied at different time intervals. Different environmental conditions and the sugarcane variety might be the probable reasons for these differences from previous studies.

Conclusion

It is concluded from the above discussion that Furadan is relatively more effective than the rest of the insecticides in reducing borer infestation

Table 1: Relative efficacy of different insecticide on percent infestation of sugarcane stem borer

Treatment	Interval (days)			Mean
	10	15	20	
T_1	9.76±0.41	10.33±0.27	10.57±0.21	10.22±0.20 A
T_2	11.45±0.04	11.31±0.06	11.30±0.07	11.35±0.04 B
T_3	12.01±0.38	12.95±0.07	12.38±0.06	12.45±0.18 C
T_4	13.78±0.38	13.79±0.34	13.96±0.34	13.84±0.18 D
T_5	25.76±0.22	26.57±0.79	26.05±0.35	26.13±0.28 E
Mean	14.55±1.54 A	14.99±1.59 A	14.85±1.53 A	

Means with different letters in a row or in a column are significantly different at P≤0.05.

T_1 = Control
T_2 = Furadan 3G carbofuran @ 12 kg ha^{-1}
T_3 = Thimet 5G Phorate @ 10 kg ha^{-1}
T_4 = Padan 4G Cartap @ 10 kg ha^{-1}
T_5 = Monomehypo @ 8 kg ha^{-1}

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