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Control of Stem Borer by Different Insecticides in Corn Hybrid 4208

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Abstract

The performance of five granular insecticides i.e Furadon, Sunfuran, Agridan, Asocarbo and Rotap against maize borer (*Chilo partellus*) in corn hybrid 4208 was evaluated at Agronomic Research Area, Faculty of Agriculture, Gomal University, Dera Ismail Khan during the spring 1998. Among all the granules, Furadon 3G was the best in minimum dead hearts (7.50%), damaged cobs (3.50%) production, grain/cobs (527.8) production, maximum 1000-grain weight (245.5 g) and grain yield of 6.325 t ha⁻¹ respectively. Other granular insecticides were least effective than Furadon, however better than control.

Introduction

Maize occupies an important position in our cropping system. It is the staple food for a large population specially in hilly areas. Maize crop is grown throughout the country (Anonymous, 1985). Maize has great nutritive value as it contains about 72 percent starch, 10 percent proteins, 4.8 percent oil, 8.5 percent fibre, 3 percent sugar and 1.7 percent ash (Chaudhry, 1994). The green fodder contained 1.56 percent protein, 0.30 percent fat and 5.2 percent fibre. It is a short duration crop and is potentially capable of producing the largest quantity of grain per unit area. It can be planted twice in a year i.e during the spring and summer season. The maize crop is attacked by a number of insect pests, but maize stem borer, *Chilo partellus* (swinho) is the key pest, causing losses upto 75 percent. Its severe infestation at seedling stage may cause a total failure of this crop (Anonymous, 1986; Rahim *et al.*, 1992; Sekhon and Kanta, 1992; Ali *et al.*, 1992; Maniania, 1993; LaSalle, 1993). Considering the losses caused by maize stem borer, a study was carried out to evaluate different insecticides to control maize borer under the ecological conditions of Dera Ismail Khan.

Materials and Methods

The study was undertaken at the farm of Faculty of Agriculture, Gomal University, D.I. Khan during spring, 1998. The experiment was laid out in a Randomized Complete Block Design (RCBD) with six treatments using a net plot size of 3m x 5m. The approved corn hybrid 4208 of (Rather), company was planted in the 1st week of March 1998, on a well prepared seed bed by dibbling method. The plant to plant and row to row distance were kept 20 cm and 75 cm, respectively. All other cultural practices were kept normal and uniform for all treatments. The approved granular insecticides for the control of maize borers are Furadon of FMC, Sunfuran of Pak Agro, Agridan of Edgro, Rotap of ICI and Asocarbo of Rhone poulenc. These were used as treatments in this study;

T1	Check	
T2	Furadon	at 8 kg/acre
T3	Sunfuran	at 8 kg/acre
T4	Agridan	at 8 kg/acre

T5	Asocarbo	at 8 kg/acre
T6	Rotap	at 8 kg/acre

Nitrogen and phosphorus was applied at the rate of 70-46 kg/acre respectively. The seed was used at the rate of 10 kg/acre. The source of nitrogen and phosphorus was urea and triple super phosphate, respectively. The data so collected was analyzed statistically according to the appropriate statistical techniques for Randomized Complete Block Design. The analysis of variance and F-test were employed. Duncan's Multiple Range Test was used as a test of significance making a comparison among the treatment means.

Results and Discussion

Dead hearts (%): The data presented in Table 1 revealed that the dead hearts were significant less in all the treated plots as compared to the control plot. The data showed that among all the insecticides, Furadon was effective in the control of maize borer. These results also showed that all of the insecticides were significantly better than the check. The insecticides were found non significantly different from each other in case of dead hearts. Marwaha *et al.* (1984) reported that on the basis of percentage of dead hearts and leaf injury, the soil treatment with carbofuran granules at 1.0 kg a.i/ha and seed treatment with carbofuran at 30 g a.i/ha were superior to the other treatments.

Damaged cobs (%): It is clear from the data given in Table 1 that the total number of damaged cobs were 4.75, 4.50, 4.00, 83.75 and 3.50 percent in the sunfuran, Asocarbo, Rotap, Agridan and Furadon respectively as compared to 10.75 percent in the control plots. The data showed that Furadon was the most effective insecticide in the control of the pest. However, these results showed that all of the insecticides were significantly better than the check while the insecticides were found non significantly different from each other in the percent reduction of damaged cobs. Ahmad *et al.* (1973) stated that out of Ekalux, Furadon, Birlane, Azodrin and Diazinon, the insecticide Furadon was the most effective against the maize borer.

Grains per cob (No.): The data regarding the number of

Table 1: Control of stem borer by different insecticides in corn hybrid 4208

Insecticides	Dead hearts	Damaged cobs	Grains per cob	1000-grain wt	Grain yield
Control	27.50a*	1075.00a	462.0b	209.3b	3.592c
Furadon	07.50b	3.50b	527.8a	245.5a	6.325a
Sunfuran	8.75b	4.75b	520.5a	241.5a	5.552b
Agridan	10.00b	03.75b	508.0a	238.5a	5.030b
Asocarbo	8.75b	4.50b	516.5a	237.0a	5.432b
Rotap	12.50b	04.00b	522.5a	239.8a	5.463b

*Means sharing the same letter in a column are statistically non-significant.

grains per cob along with statistical analysis are presented in Table 1. The table showed that all of the insecticides were significantly different from the check. The insecticides were found non significantly different from each other. The data showed that the maximum number of grains/cob were obtained in Furadon treated plots while minimum No. of grains/cob were obtained in control plots.

1000-grain weight (g): The data given in Table 1 exhibited that there was statistically non significant difference in 1000-grain weight among the different insecticides while these insecticides were significantly different from the control plots. The 1000-grain weight in different treatments were 245.5, 241.5, 239.8, 238.5, 237.0, and 209.3 in Furadon, Sunfuran, Rotap, Agridan, Asocarbo and control plots respectively. Maximum 1000 grains weight (245.5 g) was found in furadon treated plots while the minimum (209.3 gms) was found in control plots. Ahmad (1987) concluded that the application of Furadon, Temik and Padan to "sunehri" maize had a positive influence on the physi-morphic characters of the crop.

Grain yield (t ha⁻¹): The data regarding grain yield showed that the insecticide Furadon differed significantly from sunfuran, Agridan, Asocarbo and Rotap treatments as well as from control plots. Sunfuran, Agridan, Asocarbo and Rotap were significantly different from control plot while they were non-significant from each other. Among sunfuran, Agridan, Asocarbo and Rotap, the grain yield of Sunfuran was higher (5.552 t ha⁻¹) followed by Rotap (5.463 t ha⁻¹), Asocarbo (5.432 t ha⁻¹) and Agridan (5.030 t ha⁻¹). These results were supported by the findings of Rahim *et al.* (1992) who tested fourteen insecticides in sprays, dust or granules against the Pyralid *Chita partellus* on Sada bahar in Pakistan and reported that in terms of yields, Furadon (carbofuran) among granular formulations gave good results. The data showed that the maximum grain yield of 6.325 t ha⁻¹ was obtained from the furadon treated plots as against minimum grain yield of 3.592 t ha⁻¹ from untreated plots. Hussain (1991) recorded grain yield of maize on per plot basis and reported that the yield was 48.14 kg by using the Furadon 3G insecticide, while the yield in control was 30 kg per plot measuring 8.61 x 7.61 m.

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