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Comparative Efficacy of Some Insecticides Against Insect Pest Complex of Maize

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Abstract: The impact of various insecticides viz., Promet 400CS (Seed treatment), Confidor 70WS, Furadan 3G, Basudin 60EC against pest insect complex of maize and on various yield components has been tested in this research. Confidor gave best results in reducing population of maize stem borer and maize shoot fly i.e., 1.708 and 2.375 per 20 plants respectively followed by Furadan i.e., 1.75 and 4.083 respectively. Basudin resulted in mean pest population as 2.33 (maize borer) and 5.375 (shoot fly). All the insecticidal treatments tested, significantly improved the plant characters over check. The highest plant height (241.82 cm) was observed in plots, which received seed treatment with Confidor.

Key words: Insecticides, Insect pest, Maize

Introduction

Maize (*Zea mays* L.) is the world's third ranking food and fodder crop of Pakistan. It is used as flour in the diet of human beings. It has got a valuable place in the cattle fodder and poultry feed (Chaudhary, 1983). Corn oil is one of the most important product of this crop and demand for corn oil has been increasing in recent years as it is very useful for human consumption, especially for heart patients due to its cholesterol free nature (Kent, 1984).

In the past few years, insect pests outbreaks have resulted in a catastrophe (Chiang, 1978). Almost 75 percent damage of the crop occurs due to the attack of maize stem borer (Latif *et al*., 1960). The total loss due to shoot fly is sometimes as high as 60 percent (Atwal, 1991). In order to reduce heavy losses due to these serious pests and to maximize production, the use of insecticides remains the most effective method. Epperlein *et al*. (1995) concluded that colonization of maize by aphid was diminished in plots with seed treatments. Singh and Chaudhary (1995) compared the efficacy of cypermethrin (Cyperkil 25EC), Biobit (B.T.) and endosulfon (Thiodon 35EC) against *Chilo partellus* on forage sorghum and found that all were effective at 200 ml/hac., 1250 gm/hac. and 1250 ml/hac., respectively. Sadakathulla (1981) found that 3 spray application of phosalon, diazinon and demeton S-methyl (Metasystox), all at 0.05 percent were as effective as 3% granules of carbofuran applied in the soil. Halimie *et al*. (1989) reported, reduced infestation of *Chilo partellus* to 6.77 percent. Moallim (1990) compared the efficacy of 3 insecticides viz., Furadon, Basudin and Sevin against *Chilo partellus* in Somalia in sorghum. Two applications of carbofuran gave good control of the pest and were as effective as sprays of all 3 insecticides.

The present study was planned with a view to test the efficacy of different insecticides, viz, seed treatments, whorl and spray application against insect pests of Kharif sown "Sultan" variety of maize to ascertain the most effective and economical one.

Materials and Methods

The experiment was carried out at farmer's field in Randomized Complete Block Design with four replications and there was following five treatments including a check.

Promet 400SC (Seed Treatment) at 1 lit /100kg
Confidor 70WS (Seed Treatment) at 7 gm / kg (30 ml water /7 gm poison)
Furadan 3G at 8 kg/acre
Basudin 60EC (Spray) at 400 ml/acre
Check

Seed treatment was carried out by taking seed in a plastic container by Promet and Confidor. Furadan granules were used as whorl application 2 weeks after sowing. First spray was done with Basudin 2 weeks after sowing and subsequent application of Basudin was done at 4 weeks intreval.

In case of seed treatments and granular application, pest insect population was recorded weekly after germination of crop from 3 central rows, in 20 randomly selected plants. In case of spray application, pest population data was recorded 24 hours before and 24, 48, 72 and 168 hours (7 days) after each application, then followed weekly.

At maturity of crop, the yield components, viz., plant height in cm, no. of cobs per plant taken from 20 plants selected at random, no. of grains per cob, weight of grains per cob taken from 20 cobs selected at random and cob weight per plot taken from the measured plot were recorded. Then the data was subjected to statistical analysis.

Results and Discussion

Figure 1 shows that the overall minimum population of maize stem borer and maize shoot fly was recorded as 1.708 and 2.375 per 20 plants in plots which received seed dressing by Confidor. These results are in comparison with Sadakathullah (1981) who reported that the seed treatments with carbofuran 5 percent at the rate of 8 or 10 kg/hac., 2-5 gm a.i./100 gm seed against *Chilo partellus* and *Atherigona soccata* obtained significant results.

In present investigations, Furadan 3G granules were applied in whorls and significant results were achieved in controlling the pest population of maize stem borer and maize shoot fly as 1.75 and 4.083 insects respectively. Almost comparable findings were reported by Halimie *et al*. (1989) who used carbofuran as a whorl application at 0.75 kg a.i./hac. at 25 and 45 days after sowing. They were able to reduce the infestation of maize borer to 6.7 percent and obtained higher yields.

Basudin 60EC was sprayed twice during the crop duration, which resulted in the mean pest population 2.33 and 5.375 of maize stem borer and shoot fly respectively (Fig. 1). Low population density of above two pests indicates the effectiveness of the poison and ranked third among all the treatments. These results are in partial confirmation with Moallim (1990). He compared the efficacy of three insecticides viz., Furadan, Basudin and Sevin against *Chilo partellus* on sorghum. Two applications of carbofuran gave good control of the pest and were as effective as sprays of all three insecticides.

Table 1 shows that all the treatments tested significantly improved the plant characters over check. On an overall basis seed treatments with Confidor 70WS proved to be the best and granules Furadan 3G ranked second. The highest plant height was observed in plots, which received seed treatment with Confidor as

Table 1: Average Plant Height (Cm), Number of Cobs per Plant, Number of Grains per Cob, Weight of Grain per Cob (Mg) and Cob Yield per Plot (Kg) under Different Treatments

Treatments	Plant Height (cm)	No. of cobs per plant	No. of grains per cob	Wt. of grains per cob (gm)	Cob yield per plot (kg
T_1	203.08	2.05	731.00	180.30	48.97
T_2	241.82	2.27	824.25	202.05	62.48
T_3	215.45	2.15	797.25	196.87	52.62
T_4	204.55	2.10	757.50	177.15	50.38
T_5	191.07	1.81	648.75	139.55	42.9

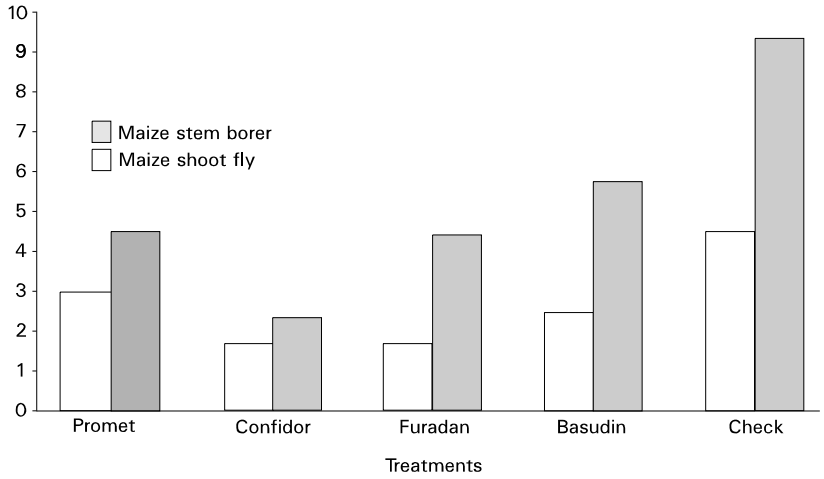

Fig. 1: Over all mean population of maize stem borer (*Cilo partellluls*) and maize shoot fly (*Atherigona soccata*) per 20 plant

compared to the lowest in check.

Out of all the insecticidal treatments, Confidor was found the best, followed by Furadan, Basudin and Promet. The yield of all the treated plots also showed a similar pattern as discussed above.

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