

# Effect of Different Insecticides Against Maize Stem Borer Infestation at Barani Agricultural Research Station, Kohat, KPK, Pakistan During Kharif 2012

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**Abstract:** Studies were initiated at Agriculture Research Station Jarma, Kohat on Maize Stem Borer infestation. Results revealed that there was significant difference between Granules and insecticides. Carbofuron 3G was recorded the most effective followed by Fipronil 4G. Average dead hearts count for Carbofuron 3G were 3.167 followed by 4.4 for Fipronil 4G.

**Keywords:** Maize Stem Borer, Rainfed conditions.

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## I. INTRODUCTION

Maize (*Zea mays* L.) is the third most important cereal crop of Pakistan after wheat and rice serving the purpose of food, feed and fodder in the country [6]. It is sown on an area of 9.39 million hectares with total annual production of 3.341 million tons and national average yield is 3.56 tons per hectare [3].

The use of Maize in Pakistan for direct human consumption is declining, but its utilization in the feed and wet milling industry is growing at a much faster pace than anticipated. Currently, sufficient Maize is grown in Pakistan for domestic needs and there is neither a surplus nor deficit in Maize grain supplies. After potato, Maize stands the most profitable stable and dependable crop in Pakistan [7].

Emboldened by a consistent growth in production, Pakistan has also been exporting some quantity of maize grains or corn. But since the country has been exporting just corn and not value-added maize or corn products the foreign exchange earnings have remained limited. And even the volumes of grains exports have never been large enough to be noticed as a potential export dollar earner.

Rain-fed cultivation of maize accounts for about one third of total output. There is a need to enhance per acre yield of the crop that depends on irrigation. One way of doing this could be to introduce genetically modified or GM corn in Pakistan. Two multinational companies have come up with plans to do this and their plans are awaiting approval from the Punjab and KP governments, according to an official of the Ministry of Food Security and Research.

Maize is planted on an estimated area of one million hectares with an annual production of about three million tonnes (last year the production was 3.5 million tonnes). The per hectare yield is above 3.5 tonnes which SUPARCO scientists believe can be doubled within years through better pre-planting management and by employing modern technology to reduce post-harvest losses.

Like in other crops, insect pests and weeds cause substantial losses to corn crop, including hybrid varieties. Maize stem borers and American bollworms are key crop destroyer. Agriculture departments of Punjab and Khyber Pakhtunkhwa have lately initiated moves to minimize the harm caused by these pests. Some agricultural scientists believe introduction

of GM can help growers get rid of these pests and thereby cut their input costs which at present remains high because they need to use lots of pesticides [1].

Larvae which attack all parts of the maize plants except roots injure the young leaves and later bore into the stem, tassels, stalks and ears of the maize plants [12].

Four granular insecticides, viz Carbofuran, Disulfoton (systemic), Diazimon and Fenthion (non-systemic) were evaluated for their efficacy and method of application against the maize stem borer, *Chilo partellus* (Swinhoe). All of them showed significantly less damage with increased yield of maize grain than the control. The furrow application of the systemic granules was economical and more effective than the foliar application of the non-systemic insecticides [15], while according to [5], seed dressers (Confidor® and Actara®) were found considerably more effective as compared to granules and foliar sprays. As a whole the insecticides treatments resulted in 50% reduction of MSB infestation as compared to control. Confidor® was the most effective among the treatments causing 97.30 % reduction in *C. partellus* infestation.

It has been reported to cause severe losses in maize crop throughout its geographical distribution including Pakistan. Yield losses of 24-75% have been reported by the attack of this pest alone (Kumar & [13]; [11]; [16]. [9] reported 10 – 50% damage by maize stem borer in Peshawar valley. Yield losses caused by stem borers in Africa could be as high as 80% for maize [8].

## II. MATERIAL AND METHODS

To study the efficacy of different insecticides as granules and foliar formulations against *Chilo partellus* in maize crop, an experiment was conducted at Barani Agricultural Research Station, Kohat of Khyber Pakhtunkhwa, Pakistan. The chemicals were obtained from local authorized dealers. The insecticides used in the experiment included two granular insecticides Carbofuran 3G @ 8 kg acre-1, Fipronil 4G @ 12 kg/ha and two foliar insecticides; Abamectin @ 10mls/20l, Profenofos 40% EC @ 500 g/l.

### *Procedure:*

A local, open pollinated maize variety “Azam” was sown on 26-07-2012 in a randomized complete block design (RCBD), with three replications. The crop was sown on a well-prepared seedbed, using a single row hand drill planter. Total plot size was 41.5×29 m<sup>2</sup>, having 7.5×9 m<sup>2</sup> sub plots. The row-to-row distance was 75 cm. A buffer zone of 1 meter wide was kept between the plots to isolate them from each other. A basal dose of fertilizers @ one bag DAP and urea per acre (N: P2O5 @ 80:58 kg ha<sup>-1</sup>) were applied at the time of sowing. Insecticides (both granules and foliar sprays) were applied 20 days after emergence.

Data collection and Analysis For the extent of infestation dead heart were used as criteria for infested plants which were then converted into total percent infestation and mean percent infestation for the season. Data was analyzed statistically at 0.05% probability.

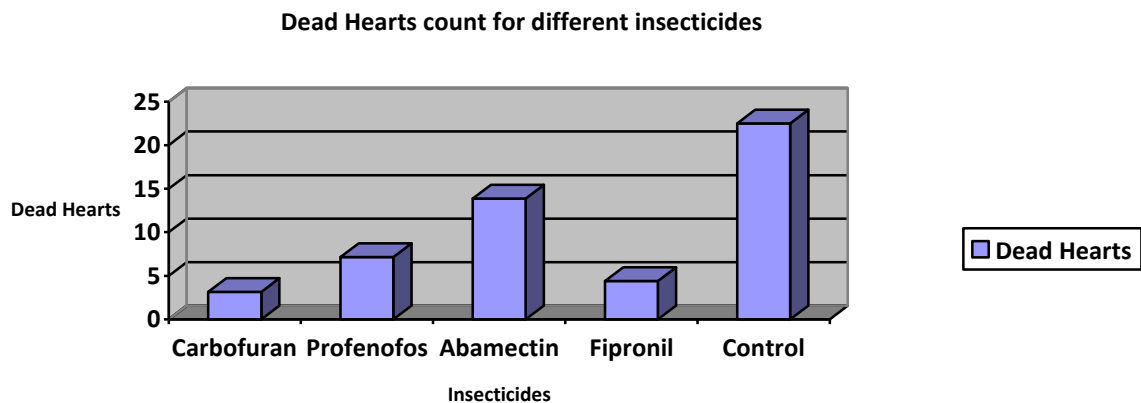
T1:	Carbofuron 3G (Granules)
T2:	Profenofos
T3:	Abamectin
T4:	Fipronil 4G (Granules)
T5:	Control

## III. Results & Discussion

Table 1 revealed that there was significant difference between Granules and insecticides. Carbofuran 3G was recorded the most effective followed by Fipronil 4G. Average dead hearts count for Carbofuran 3G were 3.167 followed by 4.4 for Fipronil 4G. Similar result was reported by [10]; Granular formulations of chlorpyrifos and carbofuran were effective

against the pest and in 1992 by [14]. that granular application of insecticides showed better control of maize stem borer as compared to the emulsifiable concentrates (EC) as a foliar application at Peshawar Pakistan. According to [4] in 2011, Fipronil 0.3G and Thiocyclam hydrogen oxalate 0.4G can be recommended in addition to the present recommendation of Diazinon 5G for the control of stem borer in maize.

**Table 1: Showing average dead hearts count for different insecticides**



#### IV. Acknowledgment

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#### V. Conclusion

Carbofuran 3G was recorded the most effective followed by Fipronil 4G. Average dead hearts count for Carbofuran 3G were 3.167 followed by 4.4 for Fipronil 4G.

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