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Research Paper

EFFECT OF PESTICIDES AGAINST *CHILO PARTELLUS* (SWINHOE) DAMAGING STEM OF MAIZE

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The maize stem borer *Chilo partellus* (Swinhoe) is one of the most destructive pests. This species is the most important at altitudes below 1500 meters above sea level. It's magnitude of damage ranges from 26 to 80. In young plants and shoot can be killed, causing a "dead heart". In older plants the upper part of the stem usually dies as a result of the boring of the caterpillars. Several contact and systematic pesticides are being used for its management. Therefore, it necessitated evaluating the relative persistence of pesticides commonly used against this stem borer pest for devising its economically effective management programme.

Keywords: Pesticides, Carbofuran and furaden, Stem borer on maize

INTRODUCTION

In India, maize is emerging as third most important crop after rice and wheat. Maize has its significance as a source of a large number of industrial products besides its uses as human food and animal feed. To meet the growing demand, per hectare yield of maize is estimated to rise to 2.36 tonnes as against 1.7 tonnes. In order to increase the production and productivity of maize, the new approach for area expansion are to be adopted in view of serious competition from food and cereal crops (De Groote H et al., 2003). It can only be done through transfer of improved technology through demonstration on improved crop production technology and integrated Pest Management (Khan N. A et al., 1999) training programs, seed production programs, insecticides, pesticides (Chinwada P and Overholt W A 2001), weedicides and other inputs, etc. besides introduction of high yielding hybrids. Maize requires fine field preparation for the raising good crop. The field should be free from previous crop stubble in order to avoid carrying of previous crop pathogens and pests (Ampofo J K O and Saxena K N 1989). Diseases of maize are strongly influenced by weather conditions and are very difficult to predict. They are best controlled by the use of resistant or tolerant hybrids and varieties and a balanced fertility program. Most of the disease causing

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agents / pathogens has the capacity to overcome the winter. Chemical control should only be aimed at small caterpillars (up to 5mm). Thrips may damage crops that are stressed and not growing well. They are very small, brown/black insects measuring 1-2 mm in size.

MATERIALS AND METHODS

Two pesticides namely furaden and carbofuran and leaf whole were evaluated under both laboratory and field conditions for their relative persistency against maize stemborer (Chinwada P and Overholt W A 2001). Pure culture of *Chilo partellus* (Swinhoe) was used for experimental purpose.

Under Laboratory Condition

Maize variety "NAVIN" was sown in plastic pots for each treatment. The experiment was conducted in randomized block designed by replicating each treatment thrice. The plants were sprayed after 15 days of germination and after 24 hours of spraying, the whorl were cut from each treatment and placed in plastic vials.10 freshly hatched larvae (Caterpillars) of *C. partellus* were then released in each vials containing plant role with the help of '0' size camel hairbrush. The mortality counts were taken 24 hours of their release. Exactly the same procedure was followed 3, 5, 7, 9, 11, 13 and 15 days after application of pesticides until the larval survival reaches equal to that of untreated control. Percent mortality of *C. partellus* larvae obtained both in the treated and untreated samples were corrected following to ABBOTS formula (Abbot W S 1925) based on the period for which toxicity (T), the "PT" values were computed.

Under Field Condition

For each treatment sowing in farmer field at Etah District of Western Uttar Pradesh in October 2010 was done in 3 rows/plot of 2 meter row length, in field. After 15 days of germination all plants were sprayed with Carbofuran and Furaden pesticides. Rest of the procedure followed was the same as described under laboratory condition (Koch R L et al., 2006; Kfir R et al., 2002; Abate T et al., 2000; Sarup P et al., 1987; Halimie M A et al., 1998; Kumar H 1997; Ilah K et al., 1992).

Table 1: The Rate Of Mortality of Larvae on Maize on Applying Carbofuran/Furaden With Periodic Intervals of 15 Days at Etah District in September-October 2010

MEAN OF 100 OBSERVATION					
Name of Pesticides	Treatment (%)	Number of Replications	Percentage of Mortality		
			45 days 04-09-2010	60 days 20-09-2010	75 days 04-10-2010
Carbofuran / Furaden	0.05	3	3	7	17
	0.05	3	3	8	24
	1.5	3	8	25	41
	2.0	3	11	46	90
Rate of Infestation in Untreated Plants (Control)			42	76	96

RESULTS AND DISCUSSION

Persistent toxicity data based on PT under laboratory and field condition (Table 1) indicates that maximum PT values were obtained in case of Carbofuran and Furaden in October (2010) under laboratory conditions. On the basis of Relative Persistence Toxicity (RPT), it can be concluded the Carbofuran is most persistent, while Furaden was the least amongst all the pesticides. Likewise under field condition, the maximum PT value was obtained in the case of Carbofuran followed by Furaden.

Percent Reduction in Mortality

Based on the larval mortality data in subsequent days was found that maximum reduction in mortality during the subsequent days after treatment. On the other hand least reduction in mortality was recorded in case of Carbofuran the toxicity in case of Carbofuran was persisted upto 15 days, followed by Furaden (11 days each).

CONCLUSION

It can be concluded that synthetic pesticides in comparison to Carbofuran was the best amongst all tested pesticides with highest PT value, minimum % reduction in mortality in subsequent days and maximum LT value.

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