

Evaluation of insecticides against stemborers in maize

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ABSTRACT

In the field experiments conducted during *Kharif* 2012 and *Rabi* 2012-13 at Maize Research Centre, Rajendranagar to find out an alternative to endosulfan which was recommended against stem borer in maize, insecticides were sprayed at the recommended dosages at 12 DAG and observations were recorded at 45DAG and subjected to RBD analysis after angular transformation. Mean infestation was observed to be the lowest in the plot treated with chlorantriliniprole 18.5 SC (1.28%) followed by λ -cyhalothrin 5CS (2.33%). Mean per cent deadhearts was lowest *i.e.*, 0.41 in the λ -cyhalothrin treated plot followed by 0.61 in Indoxacarb treatment.

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INTRODUCTION

Maize is one of the important cereal crops in the world and cultivated for different purposes. In our country it is grown in 10.2 Mha with production of 26.26 Mt and yield 2.57t/ha (Anonymous, 2018). Among the biotic stresses in maize, yield losses due to *Chilo partellus* and *Sesamia inferens* in different regions of India range from 26.7-80.4 per cent and 25.7-78.9 per cent, respectively (Panwar, 2005). Annual loss of 11.05 crores in *Rabi* is due to the pink borer (Siddiqui and Marwaha, 1993). Endosulfan 35EC @0.07 was found to be more effective in reducing dead heart formation recording only 26.25 per cent as compared to 85 per cent in untreated control at 14 DAG (Pavani *et al.*, 2012). Once endosulfan was banned, there was necessity of changing the recommendation in maize crop.

MATERIAL AND METHODS

Field experiment was conducted at Maize Research Centre, Rajendranagar to find out an alternative to endosulfan for the control of stemborers in maize. Maize hybrid DHM117 was sown in ridge and furrow method at 75x20 cm spacing on 16.8.2012 and 30.12.2012 during *Kharif* 2012 and *Rabi* 2012-13, respectively. Experiment was designed in RBD with 14 treatments and 3 replications. Each plot comprised of 5 rows of 4m length. Insecticides were sprayed at the recommended dosages at 12 DAG and observations on leaf injury and deadhearts were recorded at 45DAG and subjected to RBD analysis after angular transformation.

RESULTS AND DISCUSSION

Among the treatments tested during *Kharif* 2012, λ -cyhalothrin, chlorantriliniprole, Thiodicarb, Indoxacarb,

Table 1 : Efficacy of insecticides on stem borer damage								
Sr. No.	Treatments	Dose ml/g/l	Kharif 2012		Rabi 2012-13		Pooled	
			Mean % infestation	Mean % dead hearts	Mean % infestation	Mean % dead hearts	Mean % infestation	Mean % dead hearts
1.	Acephate 75 SP	1.5	9.98(18.4)	7.38(15.7)	5.0(12.89)	3.22(10.31)	7.49(15.86)	5.3(13.26)
2.	Carbaryl 50 WP	3.0	9.59(17.74)	5.56(13.58)	7.79(16.18)	3.92(11.38)	8.69(17.01)	4.74(12.57)
3.	Thiodicarb 75 WP	1.5	5.66(13.64)	2.83 (9.59)	2.03(8.14)	0.31(2.26)	3.85(11.28)	1.57(7.18)
4.	Emamectin benzoate 1.9EC	0.45	8.86(17.31)	5.73 (13.77)	7.31(15.67)	1.12(4.29)	8.09(16.51)	3.43(10.51)
5.	Chlorpyrifos 25 EC	2.5	5.38(9.58)	2.31 (6.21)	8.55(16.98)	4.28(11.89)	6.97(15.11)	3.29(10.39)
6.	Monocrotophos 36SC	1.6	9.6(17.74)	1.89 (5.6)	7.71(16.07)	2.89(9.38)	8.66(17.08)	2.39(8.89)
7.	£-cyhalothrin 5 CS	2.0	1.57(7.18)	0 (0)	3.09(10.1)	0.81(3.64)	2.33(8.79)	0.41(2.97)
8.	Indoxacarb 15.8 EC	1.0	3.96(11.3)	0.9 (3.84)	3.6(10.91)	0.32(2.28)	3.78(11.12)	0.61(4.33)
9.	Novaluron 10 EC	1.0	2.36(8.64)	1.67 (5.26)	4.66(12.45)	0.74(3.48)	3.51(10.79)	1.21(6.18)
10.	Spinosad 45 SC	0.4	8.04(16.33)	1.47 (4.94)	3.71(10.91)	0.36(2.43)	5.88(14.02)	0.92(4.27)
11.	Flubendiamide 480 SC	0.1	3.61(10.95)	1.79 (5.45)	3.92(11.18)	0.62(3.18)	3.77(11.13)	1.21(6.1)
12.	Rynaxypyr 18.5 SC	0.4	1.32(4.67)	1.32 (4.67)	1.23(4.5)	0(0)	1.28(4.97)	0.66(3.68)
13.	Multineem 0.03%	5.0	9.29(17.6)	4.23 (11.81)	10.84(19.21)	3.98(11.49)	10.07(18.44)	4.11(11.65)
14.	Control	---	15.8(22.69)	12.54(20.37)	15.29(22.94)	6.58(14.83)	15.55(23.14)	9.56(17.92)
C.D. (P=0.05)			9.94	11.29	5.43	7.68	4.89	4.9

Novaluron and Flubendiamide were found to be at par with each other. Mean per cent infestation was only 1.32 in chlorantriliprole treated plot followed by 1.57 in £-cyhalothrin treated plot. Dead hearts were absent in £-cyhalothrin treatment whereas 0.9 per cent were observed in Indoxacarb treatment. Untreated plot showed 15.8 per cent infestation and 12.54 per cent dead hearts. Ramkumar and Alam (2017) reported 10.6 per cent mean infestation and 3.75 per cent mean deadhearts in chlorantriliprole 0.3ml/l treated plot.

During Rabi 2012-13, only chlorantriliprole and Thiodicarb were at par in reducing infestation to the tune of 1.23 and 2.03 per cent, respectively. All other novel insecticides £-cyhalothrin, Indoxacarb, Novaluron, spinosad and Flubendiamide were at par (3.09-4.66% infestation). No dead heart formation was observed in chlorantriliprole treated plot followed by thiodicarb (0.31%), Indoxacarb (0.32%), Spinosad (0.36%). Control plot showed 15.29 per cent infestation and 6.58 per cent dead hearts.

Two seasons pooled data reveals that £-cyhalothrin and chlorantriliprole were on par in reducing the borer infestation with 1.28 per cent and 2.33 per cent, respectively. Per cent dead heart formation was lowest in £-cyhalothrin treated plot *i.e.*, 0.41 followed by 0.61 in Indoxacarb and 0.66 in chlorantriliprole. Thiodicarb,

Novaluron, spinosad and Flubendiamide were also effective (0.92 to 1.57% dead hearts) in reducing the formation of dead hearts due to stem borer. Untreated plot had 15.55 per cent infestation and 9.56 per cent dead hearts. Chlorantriliprole @ 150 ml/ha was found at par with Carbofuran 3G@ 10kg/ha in reduction of leaf injury and dead hearts by maize stemborers with 68.36 and 73.3 per cent reduction over control at 7 and 14 DAT during Kharif 2017 (Sudha Rani *et al.*, 2018).

Chlorantriliprole, £-cyhalothrin and other novel insecticides were effective in reducing the stemborer damage.

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