
BIO-EFFICACY OF CYAZYPYR 10 OD W/V AGAINST THRIPS (*Scirtothrips dorsalis* HOOD) AND FRUIT BORER [*Helicoverpa armigera* (HUBNER) HARDWICK] INFESTING CHILLI

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ABSTRACT

A field experiment was conducted at Main Vegetable Research Station, Anand Agricultural University, Anand, Gujarat during *rabi* season of the year 2009-10 to assess the bio-efficacy of cyazypyr against *S. dorsalis* and *H. armigera* infesting chilli. Four different doses of cyazypyr (40, 50, 60 and 70 g a.i./ha) were evaluated along with methomyl 40 SP, Ethion + Cypermethrin 55 EC, spinosad 45 SC and control. Of the four doses, two higher doses (60 and 70 g a.i./ha) of cyazypyr 10 OD recorded significantly lowest thrips population than rest of the treatments after 3, 7 and 10 days of spray as well as in pooled of four sprays. These two higher doses (60 and 70 g a.i./ha) found most effective in reducing fruit damage and also registered significantly higher green chilli fruit yield of 137.12 and 125.28 q/ha, respectively.

Key words: Bio-efficacy, green chilli fruit, cyazypyr, fruit borer, thrips,

INTRODUCTION

Chilli (*Capsicum frutescens* Linnaeus) is an important spices vegetable grown all over India as a *kharif-rabi* season crop. It suffers severely by thrips, *Scirtothrips dorsalis* Hood and fruit borer, *Helicoverpa armigera* (Hubner) Hardwick. The infestation of thrips started from the nursery and remained till to the harvest of the crop. Thrips suck the cell sap from the lower surface of the leaves, as a result the leaves curled downward and plant growth remained stunted. The plants do not bear flowers and fruits in case of severe infestation. Fruit borer larvae bore into fruits and makes fruit unmarketable. The farmers spray insecticides frequently to control these pests which create problems of resistance, resurgence and residue in fruits and hence, the new molecules available in market is required to be tested for their bio-efficacy. With above view point, the field experiments were conducted at Main Vegetable Research Station, Anand Agricultural University, Anand during 2009-10 to study the bio-efficacy of cyazypyr against *S. dorsalis* and *H. armigera* infesting chilli.

MATERIALS AND METHODS

To study the bio-efficacy of cyazypyr 10 OD against *S. dorsalis* and *H. armigera* infesting chilli, a field experiment was conducted at Main Vegetable Research Station, Anand Agricultural University, Anand during *rabi* season of 2009-10. Four different doses (40, 50, 60 and 70 g a.i./ha) of cyazypyr were evaluated along with methomyl 40 SP (250 g a.i./ha), Ethion + Cypermethrin 55 EC (475 g a.i./ha), spinosad 45 SC (73 g a.i./ha) and control in a randomized block designed with three replications in a plot size of 3.0 x 3.0 m with a spacing of 60 x 60 cm. The first spray of respective treatments was given on appearance of the pest and subsequent four sprays were given at 10 days interval during the season. For recording observations, five plants were selected randomly from each net plot area. The observations on thrips were made from the three leaves of same selected plants from each treatment prior to 24 hours as well as 3, 7 and 10 days after each spray. The fruit damage due to fruit borer larvae was recorded by counting total and damaged fruits at each picking from each plot. Picking wise green chilli fruit yield was recorded from each plot. Thus, the data obtained for thrips population were analyzed by standard statistical procedure after adopting square root transformation, whereas the data on per cent fruit damage were analyzed by adopting arcsine transformation. The yield data were analyzed without any transformation. The data obtained were analyzed periodically, spray-wise as well as pooled over periods and sprays.

RESULTS AND DISCUSSION

The results on bio-efficacy of cyazypyr against *S. dorsalis* and *H. armigera* infesting chilli are presented in Table 1.

Evaluation based on thrips population

The results on bio-efficacy of cyazypyr against thrips population infesting chilli indicated that two higher doses (60 and 70 g a.i./ha) of cyazypyr recorded significantly lowest thrips population than rest of the treatments after 3 days of spray and both the doses were at par with each other. The remaining two doses of cyazypyr (40 and 50 g a.i./ha) were at par with each other but significantly superior to ethion + cypermethrin. After 7 days, the highest dose (70 g a.i./ha) of cyazypyr recorded significantly lower thrips population than rest of the treatments except its second higher dose (60 g a.i./ha). The second higher dose (60 g a.i./ha) were significantly effective as compared to its lowest dose (40 g a.i./ha), spinosad and ethion + cypermethrin, while it was at par with its second lower dose (50 g a.i./ha) as well as methomyl. The highest dose (70 g a.i./ha) of cyazypyr recorded significantly lowest thrips population than rest of the treatments after 10 days of spray. The second higher dose of cyazypyr (60 g a.i./ha) also found significantly effective than its two lower doses (40 and 50 g a.i./ha), methomyl, spinosad and ethion + cypermethrin in reducing thrips population.

The data pooled over periods over sprays revealed that two higher doses (60 and 70 g a.i./ha) of cyazypyr recorded significantly lower thrips population than its two lower doses (40 and 50 g a.i./ha), methomyl, spinosad and ethion + cypermethrin. The lowest dose (40 g a.i./ha) recorded

significantly lower thrips population as compared to ethion + cypermethrin whereas, it was at par with spinosad.

Evaluation based on per cent fruit damage by fruit borer

The data on per cent fruit damage (Table 1) revealed significant effectiveness of all the treatments when compared with control. The highest dose (70 g a.i./ha) of cyazypyr found significantly effective in preventing the per cent fruit damage by fruit borer than rest of the treatments except its second higher dose (60 g a.i./ha) with which it was at par. The second higher dose of cyazypyr (60 g a.i./ha) were also significantly effective than ethion + cypermethrin, its lowest dose (40 g a.i./ha) and spinosad, whereas it was at par with methomyl and its second lower dose (50 g a.i./ha).

Evaluation based on green chilli fruit yield

The data on green chilli fruit yield (q/ha) during first year (Table 1) revealed that two higher doses (60 and 70 g a.i./ha) recorded significantly higher green chilli fruit yield of 137.12 and 125.28 q/ha, respectively than rest of the treatments. The second lower dose of cyazypyr (50 g a.i./ha) gave significantly higher green chilli fruit yield (97.94 q/ha) than its lowest dose (40 g a.i./ha) and spinosad, while it was at par with methomyl and ethion + cypermethrin.

The tested insecticides cyazypyr is new molecules and no work has been done in chilli. Hence, the results are not compared with work done elsewhere. However, Prasad and Khalid (2009) reported spinosad as effective against thrips and fruit borer in chilli. Satpathy *et al.* (2006) reported that methomyl @ 300 g ai/ha was most effective against thrips in chilli. Mallapur *et al.* (2001) and Misra (2003) reported the effectiveness of ethion and Kumar *et al.* (2001) reported cypermethrin as effective insecticide against pod borer in chilli.

CONCLUSION

Among the four doses of cyazypyr 10 OD evaluated for their bio-efficacy against *S. dorsalis* and *H. armigera* infesting chilli, two higher doses (60 and 70 g a.i./ha) of cyazypyr were found most effective by recording significantly lowest thrips population as well as lower per cent fruit damage and registered significantly higher green chilli fruit yield.

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Table 1: Effectiveness of cyazypyr 10 OD against thrips and fruit borer infesting chilli and its impact on green chilli fruit yield

Treatments (g a.i./ha)	Number of Thrips per Leaf*					Per Cent Fruit Damage **	Green Chilli Fruit Yield (q/ha)
	Before Spray	Days After Spray			Pooled Over Periods and Sprays		
		3	7	10			
Cyazypyr (40)	1.90 (3.13)	1.68 (2.33)	1.54 (1.91)	1.76 (2.62)	1.66 (2.29)	17.09 (08.67)	78.01
Cyazypyr (50)	2.00 (3.49)	1.61 (2.16)	1.45 (1.63)	1.63 (2.18)	1.56 (1.99)	16.10 (07.83)	97.94
Cyazypyr (60)	2.03 (3.64)	1.31 (1.28)	1.23 (1.06)	1.42 (1.53)	1.32 (1.29)	13.97 (05.83)	125.28
Cyazypyr (70)	1.92 (3.20)	1.26 (1.15)	1.09 (0.72)	1.28 (1.17)	1.21 (1.01)	13.11 (05.17)	137.12
Methomyl 40 SP (250)	2.04 (3.67)	1.59 (2.07)	1.44 (1.61)	1.54 (1.89)	1.52 (1.86)	16.39 (08.00)	108.76
Ethion + Cyper. 55 EC (475)	2.01 (3.53)	2.02 (3.59)	1.82 (2.84)	1.89 (3.12)	1.91 (3.18)	16.59 (08.17)	91.45
Spinosad 45 SC (73)	1.94 (3.27)	1.74 (2.55)	1.61 (2.12)	1.68 (2.34)	1.68 (2.34)	18.71 (10.33)	74.40
Control	1.93 (3.22)	2.57 (6.15)	2.42 (5.43)	2.51 (5.84)	2.50 (5.81)	24.05 (16.67)	36.90
S. Em. + T	0.06	0.08	0.08	0.04	0.04	0.85	4.49
T x S	-	0.09	0.07	0.07	0.08	-	-
C.D. at 5% T	NS	0.24	0.22	0.11	0.11	2.57	13.61
T x S	-	0.25	0.19	NS	0.21	-	-
C.V. (%)	5.56	8.76	7.25	7.05	7.76	8.63	8.29

* $\sqrt{X} + 0.5$ transformed values, ** Arcsine transformed values while those in parenthesis are original values

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