



EVALUATION OF INSECTICIDES AGAINST THIRPS *SCIRTOTHRIPS DORSALIS* (HOOD) ON CHILLI

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ABSTRACT

This study evaluated the efficacy of selected insecticides against thrips *Scirtothrips dorsalis* (Hood) on chilli. All the insecticides significantly reduced the infestation, with imidacloprid 17.8%SL (0.68 thrips/ 3 leaves/ plant) giving maximum control; it was followed by spinosad 45%SC (0.89). The most economical treatment was imidacloprid 17.8% SL giving yield of 134.58 q/ ha (with benefit cost ratio 1:9.04) followed by spinosad 45%SC giving yield of 128.29 q/ ha (with benefit cost ratio 1:7.45).

Key words: Chilli, *Scirtothrips dorsalis*, insecticides, cost benefit ratio, economics, efficacy, infestation, significant reduction, imidacloprid, spinosad, yield

Chilli (*Capsicum annum* L.) is used throughout the world as a vegetable, spice, condiment, sauce, pickles, and medicine (Neelofor and Kumar, 2022); and it contains vitamins etc. (Kumar et al., 2020). India is the world's largest producer, consumer, and exporter of chilli, with a 7.43 lakh ha area under cultivation (Italiya et al., 2023). In Uttar Pradesh, it is estimated that the production during 2016-17 was 11.34 mt from 13.23 ha (Nagaraju and Kumar, 2022). *Scirtothrips dorsalis* (Hood) (Thripidae: Thysanoptera) is one of the most destructive pests of chilli (Sunitha et al., 2021). Several insecticides have been reported effective against chilli thrips; however, evidence of resistance and negative effects prompts IPM programs, with ecofriendly insecticides (Choudhary et al., 2022). Newer insecticide molecules offer environmentally friendly alternatives to conventional synthetic insecticides, reducing adverse environmental impacts. Ecofriendly methods also provide adequate pest control with fewer hazards to non-target organisms. Identifying the most effective insecticide for thrips control is essential for IPM. This study aims to evaluate selected insecticides for their comparative effectiveness against thrips in chilli.

MATERIALS AND METHODS

The experiment was conducted at Central Research Field, Sam Higginbottom University of Agriculture Technology And Sciences, Prayagraj, Uttar Pradesh during kharif 2023-24. The experiment was laid out in randomized block design with eight treatments and three replications, in plot divided into 24 subplots, each

measuring 2 x 1m, with 30 cm borders maintained as bunds. The treatments were assigned randomly and variety G4 was used with seedlings transplanted with spacing of 45 x 45 cm, and the recommended package of practices were followed. The treatments used were - Fipronil 5% SC @ 800ml/ ha; Diafenthiuron 50%WP @ 600 g/ ha; Spinosad 45%SC @ 160 ml/ ha; Imidacloprid 17.8%SL @ 120ml/ ha; Acetamiprid 20%SP @ 100 g/ ha; Neem oil 1500 ppm @ 750ml/ ha; *Metarhizium anisopliae* 1.15% WP @ 2.5 kg/ ha, and a control. Each insecticide was sprayed twice, and observations on the sucking pests were recorded visually using a magnifying lens, focusing on three leaves at the top, middle and bottom canopy from five randomly selected and tagged plants in each plot. Counts were made a day before the spray, and on the 3rd, 7th, and 14th days after the spray.

Two sprays were applied, and the overall expenses were calculated and cost benefit ratio calculated following standard procedures.

RESULTS AND DISCUSSION

The data from the first spray, as shown in Table 1, revealed that plots treated with imidacloprid 17.8%SL recorded the least incidence of thrips (0.84/ 3 leaves), followed by spinosad 45%SC (1.13). Neem Oil 1500 ppm (2.42) and *Metarhizium anisopliae* 1x10⁸ CFU/ml (2.64) were the less effective. With second spray, the least incidence was 0.51 thrips/ 3 leaves with imidacloprid 17.8%SL, followed by spinosad 45%SC, while neem oil 1500 ppm (2.02) and *Metarhizium*

Table 1. Effect of insecticides against thrips on chilli

Sr. No.	Treatment	Number of <i>S. dorsalis</i> / 3 leaves/ plant										Overall Mean	Yield (q/ha)	Cost benefit ratio
		First spray					Second spray							
		DBS	3DAS	7DAS	14DAS	3DAS	7DAS	14DAS	3DAS	7DAS	14DAS			
T ₀	Control	8.73	9.87 ^a	11.60 ^a	12.67 ^a	13.40 ^a	14.20 ^a	15.80 ^a	12.93 ^a	28.87	1:2.12			
T ₁	Fipronil 5% SC@1.6lit./ha	8.47	1.87 ^d	1.00 ^{de}	1.40 ^d	1.33 ^d	0.67 ^{cd}	1.00 ^d	1.21 ^b	116.31	1:7.28			
T ₂	Diafenthiuron 50% WP@1.2kg/ha	8.80	2.40 ^c	1.60 ^{de}	2.20 ^c	2.00 ^c	1.53 ^b	1.67 ^{bc}	1.90 ^b	83.72	1:5.26			
T ₃	Spinosad 45% SC@320ml/ha	9.27	1.40 ^{de}	0.87 ^{de}	1.13 ^{de}	0.80 ^d	0.40 ^{cd}	0.73 ^{de}	0.89 ^b	128.29	1:7.45			
T ₄	Imidacloprid 17.8 % SL@500ml/ha	9.13	1.07 ^c	0.60 ^e	0.87 ^e	0.73 ^c	0.33 ^d	0.47 ^e	0.68 ^b	134.58	1:9.04			
T ₅	Acetamiprid 20% SP@200gm/ha	9.20	1.73 ^d	1.20 ^{cd}	1.53 ^d	1.47 ^d	0.80 ^c	1.20 ^{cd}	1.33 ^b	106.95	1:7.06			
T ₆	Neem oil 1500 ppm@1.5lit/ha	9.00	2.87 ^{bc}	1.80 ^b	2.60 ^{bc}	2.40 ^{bc}	1.67 ^b	2.00 ^b	2.22 ^b	56.68	1:3.94			
T ₇	<i>Metarhizium anisopliae</i> 1x10 ⁸ CFU/m @5 kg/ha	8.47	3.27 ^b	1.87 ^b	2.80 ^b	2.53 ^d	1.87 ^b	2.13 ^b	2.41 ^b	51.75	1:3.38			
	F – test	NS	S	S	S	S	S	S	S	-	-			
	S.Ed. (±)	--	0.499	0.433	0.437	0.476	0.456	0.538	0.87	-	-			
	C.D. at 0.05%	0.344	0.231	0.200	0.202	0.220	0.210	0.248	2.06	-	-			

DBS – Day Before Spray, DAS – Day After Spray, NS – Non significant, S – Significant, Cost of yield/q = ₹2500

anisopliae 1x10⁸ CFU/ ml (2.18) were less effective. Yield varied significantly among the treatments, with the highest yield being with imidacloprid 17.8%SL (134.58 q/ ha), followed by spinosad 45%SC (128.29 q/ ha), fipronil 5%SC (116.31 q/ ha), and acetamiprid 20%SP (106.95 q/ ha); comparatively lower yields were observed with diafenthiuron 50%WP (83.72 q/ ha), neem oil 1500 ppm (56.68 q/ ha), and *Metarhizium anisopliae* 1x10⁸ CFU/ ml (51.75 q/ ha). Imidacloprid 17.8% SL was identified as the most economical treatment (1: 9.04), followed by spinosad 45%SC (1: 7.45). The statistical analysis revealed that all treatments demonstrated significant superiority over control. Imidacloprid 17.8%SL proved to be most effective. These results are supported by those of Kondalkar and Tayde (2023), Yadav et al. (2022), Gupta et al. (2023), Babu et al. (2021), and Sangle et al. (2017). Imidacloprid 17.8% SL recorded the maximum cost-benefit ratio (1:9.04), similar results were reported by Sangle et al. (2017), Samota et al. (2017), Sathua et al. (2017), and Babu et al. (2021). Thus, application of imidacloprid 17.8% SL can be suggested as the best for IPM in chilli.

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No conflict of interest.

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