International Journal of Agriculture and Food Science 2025; 7(9): 739-743

ISSN Print: 2664-844X
ISSN Online: 2664-8458
NAAS Rating (2025): 4.97
IJAFS 2025; 7(9): 739-743
www.agriculturaljournals.com
Received: 11-07-2025
Accepted: 13-08-2025

Karthikeyan M
M.Sc. Scholar, Department of Agricultural Entomology, College of Agriculture, Dapoli, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri, Maharastra, India

BD Shinde
Professsor (CAS), Department of Agricultural Entomology, College of Agriculture, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri, Maharastra, India

PB Sanap
Professor, PG Institute of Post-Harvest Management, Roha, Dist-Raigad, Maharastra, India

HT Jadhav
Professor (CAS), Centre PI for AICRP-PEASEM, College of Agricultural Engineering and Technology, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri, Maharastra, India

Corresponding Author:
Karthikeyan M
M.Sc. Scholar, Department of Agricultural Entomology, College of Agriculture, Dapoli, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri, Maharastra, India

Efficacy of insecticides against thrips infesting capsicum under protected cultivation

Karthikeyan M, BD Shinde, PB Sanap and HT Jadhav

DOI: https://www.doi.org/10.33545/2664844X.2025.v7.i9j.820

Abstract
Capsicum (*Capsicum annuum* L.), commonly known as bell pepper or sweet pepper, is a high-value vegetable crop increasingly cultivated under protected structures due to its demand and profitability. However, its productivity is often constrained by insect pests, particularly thrips (*Scirtothrips dorsalis* Hood), which cause direct feeding damage and transmit viral diseases. The present study was conducted at the Research and Demonstration Centre, AICRP-PEASAM, DBSKKV, Dapoli, during the Rabi season of 2024-25 to evaluate the bio-efficacy of selected insecticides against thrips infesting capsicum. The experiment was laid out in a Randomized Block Design (RBD) with nine treatments and three replications, using the variety Indra. Two foliar sprays were applied, and thrips populations were recorded at regular intervals post-treatment counts. Results revealed that all insecticidal treatments significantly reduced thrips populations compared to the untreated control. Among them, Spinosad 45% SC @ 0.3 ml/lit was the most effective, achieving the lowest cumulative mean thrips population (1.99 per three leaves per plant) with 86.90% reduction over control. This was followed by Fipronil 5% SC @ 2 ml/lit (80.91% reduction), Diafenthiuron 50% WP @ 0.8 ml/lit (80.12% reduction), and Fenazaquin 10% EC @ 2 ml/lit (78.21% reduction). The findings demonstrate that Spinosad is highly effective in managing thrips under protected cultivation, offering a sustainable option for enhancing capsicum productivity. Integration of such effective insecticides with other IPM components can ensure long-term pest suppression and profitability for growers.

Keywords: Capsicum annuum, Thrips management, Protected cultivation, Spinosad efficacy, Insecticide bio-efficacy

Introduction
Capsicum (*Capsicum annuum* L.), commonly known as bell pepper or sweet pepper, is an economically important vegetable crop of the Solanaceae family (Pasquale and Sanjeet, 2019) [5]. Non-pungent types with larger fruits are referred to as sweet peppers, whereas smaller, pungent types are classified as chillies, differing primarily in fruit morphology and capsanthin content (Vishnu *et al*., 2016) [11]. The crop is cultivated worldwide, particularly in temperate regions of Central and South America, Europe, and Asia. In India, capsicum is extensively grown in Karnataka, Tamil Nadu, Maharashtra, Himachal Pradesh, Jammu & Kashmir, and West Bengal, with expanding adoption of protected cultivation for enhanced yield and profitability (Thamburaj and Narendra, 2001) [10]. These days, innovative farmers are embracing protected commercial cultivation of high-value vegetables and flowers (Maitra *et al*., 2020 and Sagar *et al.*, 2022) [4, 8]. Growing capsicum under protected structures benefits our farmers by providing them with higher income than open field cultivation (Ruli *et al.,* 2024) [7]. Providing a suitable microclimate and controlled environmental conditions for cultivation, enabling crop production to take place year-round or only during specific times of the year and producing a higher yield during the off-season under shade net conditions than open field conditions (Ghosal and Das, 2012) [1]. Insect pest issues are specific to polyhouse, greenhouse, and shade net production, in contrast to many other field issues. Under protected conditions, capsicum is seriously hampered by nematodes, *Meloidogyne incognita* (Chitwood), leafminers, *Liriomyzatrifolii*(Burgess), Thrips, *Scirtothrips dorsalis* (Hood); mite, *Polyphagotarsonemus latus* (Banks), aphid, *Myzuspersicae*(Sulz.) and whiteflies, *Bemisiatabaci* (Gennadius). In India, a significant insect pest of capsicum grown in net houses is the fruit borer (Singh and Peter, 2013) [9].

Thrips and mites are destructive pests of capsicum and are major constraints in its production which limits growth, yield and quality. Thrips pierce and collapse the plant cells resulting in the formation of deformed flowers, leaves, stems, shoots, and fruits, besides causing the greatest threat to many other crops, through the thrips vectored tomato spotted wilt virus (TSWV) (Kumari, 2024) [2]. Without the management of insect pests, reasonable fruit yield cannot be obtained. Recently, many new pesticides have been reported as an effective control measure for the insect pest management in capsicum. To overcome the thrips attack of capsicum and to increase the ultimate production of the capsicum, the research work was drawn in various ways.

Material and Methods

The field experiment was conducted at Research and Demonstration centre, AICRP-PEASAM, DBSKKV, Dapoli centre during *Rabi* season of 2024-25 to study the effectiveness of insecticides against pests infesting bell pepper using the variety Indra with the spacing of 45cm x 30 cm. The experiment was laid out in Randomized Block Design (RBD) with three replication and nine treatments. All the cultivation practices *viz.*, weeding, and fertilizer application was done as per the recommendations. Efficacy of eight insecticides viz**.,** Spinosad 45% SC @ 0.3 ml / lit, Emamectin benzoate 5%SG @ 0.4 ml / lit, Chlorantraniliprole 18.50 % SC @ 0.3 ml / lit, Fenazaquin 10% EC @ 2.0 ml / lit, Fipronil 5% SC @ 2.0 ml / lit, Diafenthiuron 50 % WP @ 0.8 ml / lit, Lamda cyhalothrin 5 %EC @ 1.0 ml / lit and Spiromesifen 45%SC @ 0.5 ml / lit was studied against thrips infesting capsicum under protected cultivation.

Observations recorded:

The observations of the population of thrips were recorded on randomly selected five plants from three leaves top, middle and bottom. The population of sucking pest was counted 1 day before spraying, 1 day after spraying, 3^{rd}, 5^{th}, 7^{th}, 10^{th} and 14^{th} days after spraying. The observations at 15 days after first spray were considered as pre-count observation of second spray. Then the average of pest population was carried out.

Results and Discussion

It was observed that a pre-treatment count was recorded one day prior to the first insecticide application. The pre-count indicated no significant differences in thrips population among the treatments, suggesting a uniform distribution of thrips infestation across the experimental plots. Prior to spraying, the thrips population ranged from 6.20 to 6.47 per three leaves per plant. Following the application of insecticides, the mean number of thrips recorded at 1^{st}, 3^{rd}, 7^{th}, 10^{th} and 14^{th} days after spraying (DAS) across various treatments showed statistically significant reductions compared to the untreated control.

First spray

After the first day of spraying of insecticides the mean number of thrips ranged from 3.60 to 6.47 per three leaves per plant. The treatment T_3 (Chlorantraniliprole 18.50 % SC @ 0.3 ml/lit) was significantly superior over the other treatments with the record of 3.60 mean number of thrips per three leaves per plant and was at par with theT_1 (Spinosad 45% SC @ 0.3 ml/lit) with the count of (4.60), T_4 (Fenazaquine 10 %EC @ 2 ml/lit) with the count of (4.40), T5 (Fipronil 5 %SC@ 2ml/lit) with count of (3.73) and the T_7 (Lamda cyhalothrin 5 %EC@ 1ml/lit) with the count of (4.33). While the observation of T_9 (Untreated control) counts maximum mean number of thrips (6.47) per three leaves per plant.

On the third day after the initial insecticide application, the mean thrips population per three leaves per plant ranged from 2.73 to 6.60. All treated plots demonstrated significant reductions in thrips population compared to the untreated control. Among the treatments, T_5 (Fipronil 5% SC @ 2 ml/lit) was found to be the most effective, recording the lowest mean thrips population of 2.73 per three leaves per plant. This treatment was statistically at par with T_1 (Spinosad 45% SC @ 0.3 ml/lit), T_3 (Chlorantraniliprole 18.50% SC @ 0.3 ml/lit) and T_6 (Diafenthiuron 50% WP @ 0.8 ml/lit)) which recorded 2.93, 3.53 and 3.67 thrips per three leaves per plant, respectively. The highest thrips population was observed in the untreated control (T_9), with a mean of 6.60 thrips per three leaves.

On the fifth day after spraying, the treatment T_1 (Spinosad 45% SC @ 0.3 ml/lit) was found to be the most effective, recording the lowest mean thrips population of 1.60 per three leaves per plant. This result was statistically at par with T_5 (Fipronil 5% SC @ 2 ml/lit) which recorded mean thrips populations of 2.27 per three leaves per plant. The highest thrips population at this interval was recorded in the untreated control (T_9), with a mean of 6.87 thrips per three leaves per plant.

On the seventh day after the initial insecticide application, the mean thrips population per three leaves per plant ranged from 1.60 to 9.20. All insecticide treatments continued to show significantly better control compared to the untreated control. Among the treatments, T_1 (Spinosad 45% SC @ 0.3 ml/lit) was the most effective, recording the lowest mean population of 1.60 thrips per three leaves per plan. The next most effective treatment was T_4 (Fenazaquin 10% EC @ 2 ml/lit) with a mean of 2.73 thrips per three leaves per plant, the highest mean thrips population was observed in the untreated control (T_9), with a count of 9.20 thrips per three leaves per plant.

On the tenth day after spraying, treatment T_1 (Spinosad 45% SC @ 0.3 ml/lit) continued to be the most effective, recording the lowest mean thrips population of 1.67 per three leaves per plant. This was statistically at par with T_6 (Diafenthiuron 50% WP @ 0.8ml/lit) with the count of 2.67 per three leaves per plant. The next most effective treatment was T_4 (Fenazaquin 10% EC @ 2 ml/lit), which recorded a mean population of 3.13 thrips per three leaves per plant, followed by T_5 (Fipronil 5% SC @ 2 ml/lit) with 3.47 thrips per three leaves per plant. The highest mean thrips population was noted in the untreated control (T_9), with 10.53 thrips per three leaves per plant.

On the fourteenth day after spraying, the highest mean thrips population was observed in the untreated control (T_9), recording 12.87 thrips per three leaves per plant. In contrast, the lowest thrips population was recorded in treatment T_1 (Spinosad 45% SC @ 0.3 ml/lit), with a mean of 3.40 thrips per three leaves per plant. This treatment was statistically at par withT_6 (Diafenthiuron 50% WP @ 0.8 ml/lit), T_4 (Fenazaquin 10% EC @ 2 ml/lit), T5 (Fipronil 5% SC @ 2 ml/lit) and T8 (Spiromesifen 45% SC @ 0.5 ml/lit) which were recorded 3.73, 4.60, 4.80 and 5.13 thrips per three leaves per plant, respectively.

Second spray

The data on mean number of thrips per three leaves per plant after second spray are given in the Table 2.

On the first day following the second insecticide spray, the highest mean thrips population was recorded in the untreated control (T_9), with 17.00 thrips per three leaves per plant. In contrast, the lowest population was observed in treatment T_1 (Spinosad 45% SC @ 0.3 ml/lit), which recorded 2.47 thrips per three leaves per plant and was found to be significantly superior to all other treatments and it was at par with T_6 (Diafenthiuron 50% WP @ 0.8 ml/lit) and T_5 (Fipronil 5% SC @ 2 ml/lit) with a mean of 3.20 and 3.80 thrips per three leaves per plant respectively. The next most effective treatment was T_4 (Fenazaquin 10% EC @ 2 ml/lit), which recorded a mean of 3.93 thrips per three leaves per plant respectively.

On the third day after the second insecticide application, treatment T_1 (Spinosad 45% SC @ 0.3 ml/lit) was found to be the most effective, recording the lowest mean thrips population of 1.73 per three leaves per plant. This treatment was statistically at par with T_5(Fipronil 5% SC @ 2 ml/lit) with (3.07), T_6(Diafenthiuron 50% WP @ 0.8 ml/lit) with (2.27), and T_8(Spiromesifen45% SC @ 0.5 ml/lit) with (2.27). The highest thrips population was recorded in the (untreated control) T_9 with a population of 17.83 per three leaves per plant. Observations recorded on the fifth day after the second spray revealed that treatment T_1 (Spinosad 45% SC @ 0.3 ml/lit) was the most effective, with a mean thrips population of1.27 per three leaves per plant. This treatment was statistically at par withT_6 (Diafenthiuron 50% WP @ 0.8 ml/lit) and T_5 (Fipronil 5% SC @ 2 ml/lit) and which were recorded 2.00 and 2.47 thrips perthree leaves per plant, respectively. The highest thrips infestation was observed in the untreated control (T_9), with a mean of 19.07 thrips per three leaves per plant. Observations recorded on the seventh day after spraying showed that treatment T_1 (Spinosad 45% SC @ 0.3 ml/lit) was the most effective, registering the lowest mean thrips population of 1.00 per three leaves per plant. The next most effective treatment was T_5 (Fipronil 0.5% SC @ 2 ml/lit), which recorded 2.07 thrips per three leaves per plant. The treatment T_6 (Diafenthiuron 50% WP @ 0.8 ml/lit) and T_4 (Fenazaquin 10% EC @ 2 ml/lit) was recorded 2.13 thrips per three leaves per plant. The highest thrips infestation was recorded in the untreated control (T_9), with 20.60 thrips per three leaves per plant.

Data recorded on the tenth day after spraying showed that the lowest mean thrips population, 0.73 per three leaves per plant was observed in treatment T_1 (Spinosad 45% SC @ 0.3 ml/lit), making it the most effective. The next most effective treatment was T_5 (Fipronil 5% SC @ 2 ml/lit), which recorded a mean of 1.73 thrips per three leaves per plant. In contrast, the highest thrips population was recorded in the untreated control (T_9), with a mean of 27.07 thrips per three leaves per plant.

Observations on the fourteenth day after spraying indicated that treatment T_1 (Spinosad 45% SC @ 0.3 ml/lit) remained the most effective, recording the lowest mean thrips population of 1.07 per three leaves per plant. The next most effective treatments wereT_5 (Fipronil 5% SC @ 2 ml/lit) followed by T_4 (Fenazaquin 10% EC @ 2 ml/lit) with mean thrips counts of 1.93 and 2.87 per three leaves per plant, respectively. The highest infestation was observed in the untreated control (T_9), with a mean of 27.33 thrips per three leaves per plant.

Cumulative mean of two spray

The data on the mean number of thrips per three leaves per plant after the two sprays are presented in Table 3 and graphically represented in Fig 1.

The overall mean thrips population per three leaves per plant, recorded after two insecticide sprays, showed that treatment T_1 (Spinosad 45% SC @ 0.3 ml/lit) was significantly more effective than all other treatments, with a mean thrips count of 1.99 per three leaves per plant and a percent reduction of 86.90% compared to the untreated control. The next most effective treatment was T_5 (Fipronil 5% SC @ 2 ml/lit), which recorded a mean of 2.90 thrips per three leaves per plant and an 80.91% reduction over control. This was followed by T_6 (Diafenthiuron 50% WP 0.8 ml/lit), with a mean population of 3.02 thrips per three leaves per plant and an 80.12 per cent reduction, and T_4 (Fenazaquin 10% EC 2 ml/lit), which recorded 3.31 thrips with a corresponding reduction of 78.21 per cent. These findings align with Mahalingappa *et al.* (2008), who reported that fipronil at 0.01% was among the most effective insecticides against chilli thrips, performing similarly to triazophos at 0.08%. Ravikumar *et al.* (2016) also demonstrated that Spinosad 45 SC (0.4 ml/l) provided the lowest thrips population (0.55 per plant), outperforming standard checks.

Table 1: Effect of insecticide on thrips infesting capsicum after first spray

Tr. No.	Treatment Details	Dose (ml or g / lit)	Mean no. of thrips/three leaves/plant							
			Pre count	1 DAS**	3 DAS	5 DAS	7 DAS	10 DAS	14 DAS	Overall Mean
T1	Spinosad 45 % SC	0.3	6.20 (2.59) *	4.60 (2.26)	2.93 (1.85)	1.60 (1.45)	1.60 (1.45)	1.67 (1.47)	3.40 (1.97)	3.14
T2	Emamectin benzoate 5 % SG	0.4	6.27 (2.60)	4.93 (2.33)	4.47 (2.23)	3.93 (2.10)	4.27 (2.18)	4.87 (2.32)	6.13 (2.57)	4.98
T3	Chlorantraniliprole 18.50 % SC	0.3	6.20 (2.59)	3.60 (2.02)	3.53 (2.01)	3.33 (1.96)	3.47 (1.99)	3.93 (2.10)	5.60 (2.47)	4.24
T4	Fenazaquin 10% EC	2.0	6.13 (2.57)	4.40 (2.21)	3.80 (2.07)	3.33 (1.96)	2.73 (1.80)	3.13 (1.91)	4.80 (2.30)	4.05
T5	Fipronil 5% SC	2.0	6.33 (2.61)	3.73 (2.06)	2.73 (1.80)	2.27 (1.66)	2.87 (1.84)	3.47 (1.99)	4.60 (2.26)	3.71
T6	Diafenthiuron 50 % WP	0.8	6.33 (2.61)	4.87 (2.32)	3.67 (2.04)	3.07 (1.89)	2.93 (1.85)	2.67 (1.78)	3.73 (2.00)	3.90
T7	Lamda cyhalothrin 5 %EC	1.0	6.33 (2.61)	4.33 (2.20)	4.20 (2.17)	3.93 (2.10)	4.33 (2.20)	4.87 (2.32)	6.60 (2.66)	4.94
T8	Spiromesifen 45 % SC	0.5	6.47	4.80	4.00	3.27	3.40	3.60	5.13	4.38

			(2.64)	(2.30)	(2.12)	(1.94)	(1.97)	(2.02)	(2.37)	
T9	Untreated Control	-	6.40 (2.63)	6.47 (2.64)	6.60 (2.66)	6.87 (2.71)	9.20 (3.11)	10.53 (3.32)	12.87 (3.66)	8.42
	S.E. ±	-	0.02	0.07	0.08	0.09	0.11	0.12	0.15	-
	C.D.at 5%	-	NS	0.21	0.25	0.28	0.33	0.35	0.45	-

* Figures in parenthesis are $\sqrt{X + 0.5}$ values
(DAS**- Days After Spraying)

Table 2: Effect of insecticide on thrips infesting capsicum after second spray

Tr. No.	Treatment Details	Dose (ml or g / lit)	Mean no. of thrips/three leaves/plant						
			1 DAS**	3 DAS	5 DAS	7 DAS	10 DAS	14 DAS	Overall mean
T_1	Spinosad 45 % SC	0.3	2.47 (1.72) *	1.73 (1.49)	1.27 (1.33)	1.00 (1.22)	0.73 (1.11)	1.07 (1.25)	1.38
T_2	Emamectin benzoate 5 % SG	0.4	5.67 (2.47)	4.93 (2.33)	5.00 (2.34)	5.27 (2.39)	5.33 (2.41)	5.53 (2.45)	5.29
T_3	Chlorantraniliprole 18.50 % SC	0.3	4.60 (2.26)	4.00 (2.12)	4.33 (2.20)	3.80 (2.07)	4.07 (2.14)	4.27 (2.18)	4.18
T_4	Fenazaquin 10% EC	2.0	3.93 (2.09)	3.27 (1.93)	2.67 (1.78)	2.13 (1.61)	2.60 (1.75)	2.87 (1.83)	2.91
T_5	Fipronil 5% SC	2.0	3.80 (2.07)	3.07 (1.89)	2.47 (1.72)	2.07 (1.60)	1.73 (1.49)	1.93 (1.56)	2.51
T_6	Diafenthiuron 50 % WP	0.8	3.20 (1.91)	2.27 (1.65)	2.00 (1.57)	2.13 (1.61)	2.87 (1.83)	3.13 (1.90)	2.60
T_7	Lamda cyhalothrin 5 %EC	1.0	6.27 (2.60)	5.47 (2.44)	5.40 (2.43)	5.30 (2.41)	5.60 (2.46)	5.87 (2.52)	5.65
T_8	Spiromesifen 45 % SC	0.5	4.00 (2.12)	2.27 (1.65)	2.93 (1.85)	3.83 (2.08)	4.47 (2.23)	5.20 (2.39)	3.78
T_9	Untreated Control	-	17.00 (4.18)	17.53 (4.24)	19.07 (4.42)	20.60 (4.59)	27.07 (5.25)	27.33 (5.28)	21.43
	S.E. ±	-	0.12	0.13	0.13	0.12	0.10	0.09	-
	C.D.at 5%	-	0.35	0.40	0.40	0.37	0.29	0.28	-

*Figures in parenthesis are $\sqrt{X + 0.5}$ values
(DAS**- Days After Spraying)

Table 3: Effect of insecticides on thrips infesting capsicum (cumulative mean of two spray)

Tr. No.	Treatment details	Dose (ml or g / lit)	Mean no. of thrips/three leaves/plant							Overall mean	Percent reduction over untreated control
			Pre-count	1 DAS**	3 DAS	5 DAS	7 DAS	10 DAS	14 DAS		
T_1	Spinosad 45 % SC	0.3	6.20 (2.59) *	3.53 (2.01)	2.25 (1.66)	1.43 (1.39)	1.32 (1.35)	1.20 (1.29)	2.23 (1.65)	1.99	86.90
T_2	Emamectin benzoate 5 % SG	0.4	6.27 (2.60)	5.30 (2.41)	4.85 (2.31)	4.47 (2.23)	4.77 (2.29)	5.10 (2.36)	5.83 (2.51)	5.05	66.75
T_3	Chlorantraniliprole 18.50 % SC	0.3	6.20 (2.59)	4.10 (2.13)	3.90 (2.10)	3.35 (1.95)	3.63 (2.03)	4.00 (2.12)	4.93 (2.33)	3.99	73.73
T_4	Fenazaquin 10% EC	2.0	6.13 (2.57)	4.17 (2.16)	3.55 (2.01)	3.00 (1.86)	2.43 (1.71)	2.87 (1.83)	3.83 (2.07)	3.31	78.21
T_5	Fipronil 5% SC	2.0	6.33 (2.61)	3.77 (2.06)	2.90 (1.84)	2.37 (1.69)	2.47 (1.72)	2.60 (1.74)	3.27 (1.93)	2.90	80.91
T_6	Diafenthiuron 50 % WP	0.8	6.33 (2.61)	4.03 (2.12)	2.80 (1.82)	2.53 (1.74)	2.53 (1.74)	2.77 (1.80)	3.43 (1.97)	3.02	80.12
T_7	Lamda cyhalothrin 5 %EC	1.0	6.33 (2.61)	5.30 (2.41)	4.80 (2.30)	4.67 (2.27)	4.82 (2.30)	5.23 (2.39)	6.23 (2.59)	5.16	66.03
T_8	Spiromesifen 45 % SC	0.5	6.47 (2.64)	4.40 (2.21)	3.10 (1.90)	3.10 (1.90)	3.62 (2.03)	4.03 (2.12)	5.16 (2.38)	3.90	74.32
T_9	Untreated Control	-	6.40 (2.62)	11.73 (3.50)	12.65 (3.62)	12.97 (3.67)	14.90 (3.92)	18.80 (4.39)	20.10 (4.54)	15.19	0.00
	S.E. ±	-	0.02	0.08	0.08	0.08	0.08	0.09	0.10	-	-
	C.D.at 5%	-	NS	0.24	0.24	0.23	0.24	0.28	0.31	-	-

*Figures in parenthesis are $\sqrt{X + 0.5}$ values
DAS**- Days After Spraying)

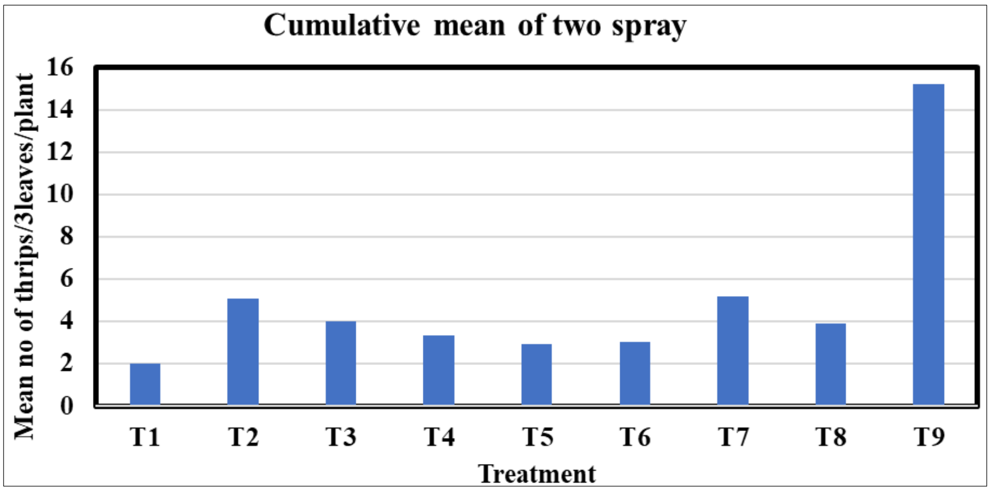

Fig 1: Effect of insecticide on thrips infesting capsicum (cumulative mean of two spray)

Conclusion

The study evaluated the efficacy of various insecticides against thrips in capsicum under protected cultivation. Two rounds of spraying were applied, and the thrips population was monitored at regular intervals post-treatment. Prior to the first spray, thrips populations were uniformly distributed across plots, ranging from 6.20 to 6.40 per three leaves per plant. After both sprays, a significant reduction in thrips was observed in treated plots compared to the untreated control. Spinosad 45% SC @ 0.3 ml/lit (T_1) consistently outperformed all other treatments, recording the lowest cumulative thrips population of 1.99 per three leaves per plant and achieving the highest percent reduction (86.90%). It was followed by Fipronil 5% SC @ 2 ml/lit (80.91% reduction) and Diafenthiuron 50% WP @ 0.8 ml/lit (80.12%).

Acknowledgement

The researchers extend their heartfelt gratitude to the Research and Demonstration Centre, AICRP -PEASAM, DBSKKV, Dapoli Centre for providing the necessary facilities. Special thanks are also extended to the staff, students of the Department of Entomology and my friends for their valuable support throughout the the research work.

References

1. Ghosal S, Das S. Effects of shading and high temperature amplitude in greenhouse on growth, photosynthesis, yield and phenolic contents of tomato (Lycopersicum esculentum Mill.). Sci Rep. 2012;2(1):829.
2. Kumari H. Management of thrips and mites in chilli crop. Int J Res Agron. 2024;6(3):210-214.
3. Mahalingappa PB, Dharma Reddy K, Narasimha Reddy K, Subbaratnam GV. Bioefficacy of certain insecticides against thrips. J Res ANGRAU. 2008;36(1):11-15.
4. Maitra S, Gaikwad DJ, Shankar T, editors. Protected cultivation and smart agriculture. New Delhi: New Delhi Publishers; 2020.
5. Pasquale T, Sanjeet K. The Capsicum crop: An introduction. In: Barchenger DW, Naresh P, Kumar S, editors. Genetic resources of Capsicum. Cham: Springer; 2019. p. 1-8.
6. Ravikumar A, Manisegaran S, Chinniah C, Irulandi S, Parthiban P. Evaluation of eco-friendly management modules against major pests of chilli (Capsicum annuum L.). Ann Plant Prot Sci. 2016;24(2):223-227.
7. Ruli SS, Patil GI, Veeresh K, Goudappa SB. Economics of Capsicum and tomato crops production under protected cultivation in the regions of Kalyana Karnataka, India. J Sci Res Rep. 2024;30(6):53-58.
8. Sagar A, Tiwari V, Kumar R. Protected cultivation of horticultural crops as a livelihood opportunity in western India: an economic assessment. Sustainability. 2022;14(12):7430.
9. Singh DK, Peter KV. Protected cultivation of horticultural crops. New Delhi: New India Publishing Agency; 2013.
10. Thamburaj S, Singh N. Textbook of vegetables, tuber crops and spices. 7th reprint. New Delhi: Indian Council of Agricultural Research; 2018.
11. Vishnu S, Francis PA, Shenoi SSC, Ramakrishna SSVS. On the decreasing trend of the number of monsoon depressions in the Bay of Bengal. Environ Res Lett. 2016;11(1):014011.