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Original Research Article

Bio-efficacy of Newer Insecticides against Chilli Mite, *Polyphagotarsonemus latus*

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Keywords

Polyphagotarsonemus latus, Insecticides, chilli

A B S T R A C T

Field experiment entitled "Studies on bioefficacy of newer insecticides against mites of Chilli" was conducted during *kharif* season of 2011-12, at the farm of vegetable Research station, VNMKV, Parbhani. Experiment was laid out in Randomized block design with nine treatments replicated thrice. And results were obtained after first spraying indicated that the minimum mite population 2.93 mites per 3 leaves was recorded in the treatment sulphur 80 per centat 4g per lit water per ha which was at par with dicofol at 1.2ml per lit water. However in second spraying the minimum mite population was recorded in the treatment with sulphur 80 per centat 4g per lit water per ha 1.86 per 3 leaves the next best treatment was dicofol at 1.2ml per lit, these were followed by imidacloprid at125ml per ha.

Introduction

Chilli (*Capsicum annuum L*) belonging to the family Solanaceae is an important spice cum vegetable crop and grown throughout India as a cash crop. Its fruits are also rich source of Vit. C (Saimbhi, *et al.*, 1972) and also proteins, carbohydrates, minerals, salts and organic acids. Red dry fruits contain proteins and minerals (Kuar, *et al.*, 1980). In India, it is grown over an area of about 8.34 lakh hectares with annual production of 8.47 lakh metric tonnes of dry chillies (Anonymous, 2007). However, major states producing chilli are Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu and West Bengal is leading states in chilli cultivation. Maharashtra produces 67.5 thousand tons of chilli with average yield of 5.21 q per ha and average production of 12.7 thousand tones from an area of 129.4 thousand hectares (Anonymous, 1993). Thrips, *Scirtothripsdorsalis* Hood, whitefly, *Bemisiatabaci Genn.*, and mite, *Polyphagotarsonemus latus* are the important sucking pests contributing to decrease in the yield potentiality of the crop. Thrips and mites are responsible for causing chilli leaf curl. For managing the pest population of chilli different methods has been used but to keep the pest population below economic injury level. (ETL) use of insecticides seems to be only remedy. Keeping in view the importance of

management of chilli pests with different insecticides, the present studies were undertaken during 2011-12 with to study bio-efficacy of newer insecticides against mites and its natural enemies.

Materials and Methods

The experiment was conducted in *kharif*, 2011-12, at the farm of vegetable Research Station, Marathwada Krishi Vidyapeeth, Parbhani. Observations were recorded on number of mites at 2, 7, 14 and 21 days after sprayings on three leaves from top, middle and bottom canopy of five observation plants per plot. The experiment on bio-efficacy of newer insecticides was laid out in a randomized block design with nine treatments replicated three times with gross plot size 4.2 m x 2.7 m and the net plot size 3.0 m x 1.8 mwith spacing 45 cm x 60 cm on variety Parbhani Tejas.

Results and Discussion

The data presented in Table 1 indicated that pre count was non-significant showing even distribution of mite population before treatment application.

After first spraying

The data on mite population on second, seventh, fourteenth and twenty-first day after first spray are presented in Table 1. Second day after first spraying indicated that all the insecticidal treatments were significantly superior in reducing mite population than untreated check. Sulphur 80 per cent at 4g per lit water per ha was significantly superior than other treatments. It was followed by Dicofol at 1.2ml per lit. water/ha. Acetamiprid @ 50g/ha which was at par with Imidacloprid 17.8 SL @ 125ml. These were followed by Spinosad@ 135g/ha, Fipronil @ 40g/ha, the treatment Acephate 75% SP @ 585g/ha was least effective.

The data pertaining to mite population on seventh day after first spraying revealed that the treatment Sulphur 80% @ 4g/lit. water/ha recorded minimum mite population (0.80 mites per 3 leaves). The best next treatment was Dicofol @1.2ml/lit. water it was followed by Acetamiprid@50g/ha, Imidacloprid 17.8 SL @ 125ml/ha. The least effective treatment was Acephate 75% SP @ 585g/ha. The maximum mite population (5.53 mites per 3 leaves) was recorded in untreated check. It is evident from the data recorded on fourteenth day after first spraying that all the insecticidal treatments were significantly superior over untreated check. The minimum mite population was recorded in the treatment Sulphur 80% @ 4g/lit. water (1.53/3leaves). The next treatment was Dicofol @1.2ml/lit.water. It was followed by Acetamiprid @50g/ha, Imidacloprid 17.8 SP @ 125ml/ha.and Spinosad@135g/ha. The least effective treatment was Acephate 75% SP @ 585g/ha. The observations recorded on twenty first day after first spraying indicated that the minimum mite population (2.93 mites per 3 leaves) was recorded in the treatment Sulphur 80% @4g/lit. water/ha which was at par with Dicofol @ 1.2ml/lit. water these were followed by Spinosad @ 135g/ha and Fipronil @ 40g/ha which were at par with each other. Acephate 75% SP @ 585g/ha was least effective treatment. The maximum mite population was recorded in untreated check (5.86/3leaves).

After second spraying.

The observations was recorded on second day after second spraying indicated that all the insecticidal treatments were significantly superior in reducing mite population than untreated check.

Table.1 Boiefficacy of newer insecticides against mites, *H. latus* on chilli

Sr. No.	Treatments	Dose/ha (g or ml)	Number of mites per three leaves							
			Precount	Days after first spraying				Days after second spraying			
				2	7	14	21	2	7	14	21
T_1	Imidacloprid 17.8 SL	125	5.00	1.00 (1.22)	1.46 (1.39)	2.20 (1.64)	3.33 (1.95)	1.06 (1.24)	1.20 (1.30)	1.80 (1.51)	2.60 (1.76)
T_2	Acephate 75 % SP	585	5.66	1.93 (1.55)	2.06 (1.59)	3.13 (1.90)	4.06 (2.13)	1.93 (1.55)	2.06 (1.59)	2.66 (1.77)	3.93 (2.10)
T_3	Acetamiprid 20 SP	50	5.53	0.93 (1.19)	1.20 (1.30)	2.06 (1.59)	3.13 (1.90)	0.80 (1.13)	1.06 (1.24)	1.66 (1.46)	2.40 (1.70)
T_4	Monocrotophos 36 EC	200	5.70	1.46 (1.39)	2.06 (1.59)	2.80 (1.81)	3.99 (2.11)	1.456 (1.39)	1.93 (1.55)	2.40 (1.70)	3.60 (2.02)
T_5	Fipronil 5 SC	40	5.13	1.20 (1.30)	1.93 (1.55)	2.66 (1.77)	3.93 (2.10)	1.20 (1.30)	1.86 (1.53)	2.20 (1.64)	3.33 (1.95)
T_6	Spinosad 45 SC	135	5.66	1.06 (1.24)	1.73 (1.49)	2.40 (1.70)	3.60 (2.02)	1.00 (1.22)	1.53 (1.42)	1.93 (1.55)	2.80 (1.81)
T_7	Dicofol	1.2 ml/l	5.60	0.66 (1.07)	1.06 (1.24)	1.86 (1.53)	3.00 (1.87)	0.53 (1.01)	1.00 (1.22)	1.20 (1.30)	2.13 (1.62)
T_8	Sulphur 80 %	4 g/l	5.46	0.13 (0.79)	0.80 (1.13)	1.53 (1.42)	2.93 (1.85)	0.00 (0.70)	0.60 (1.04)	1.06 (1.24)	1.86 (1.53)
T_9	Untreated control	-	5.60	5.60 (2.46)	5.53 (2.45)	5.66 (2.48)	5.86 (2.52)	5.93 (2.53)	6.00 (2.54)	6.06 (2.56)	6.13 (2.58)
	SE±	-	-	0.014	0.011	0.011	0.009	0.019	0.018	0.014	0.010
	CD at 5 %	-	-	0.042	0.034	0.034	0.027	0.057	0.054	0.044	0.032

(Figures in parentheses indicate $\sqrt{x + 0.5}$ values)

Treatment details

Tr. No.	Treatments	Dose/ha (g or ml)
T_1	Imidacloprid 17.8 SL	125
T_2	Acephate 75 % SP	585
T_3	Acetamiprid 20 SP	50
T_4	Monocrotophos 36 EC	200
T_5	Fipronil 5 SC	40
T_6	Spinosad 45 SC	135
T_7	Dicofol or Avermectin	1.2 ml/lit. water
T_8	Sulfur 80 %	4 g/lit. water
T_9	Untreated control	-

The treatment Sulphur 80%@4g/lit.water/ha was significantly superior than other treatments. It was followed by Dicofol @ 1.2ml/lit. water/ha, Acetamiprid @ 50g/ha. Spinosad@ 135g/ha was at par with Imidacloprid 17.8 SL @ 125ml. These were followed by Fipronil @ 40g/ha. The treatment Acephate 75% SP @ 585g/ha was least effective. The data pertaining to mite population on seventh day after second spraying revealed that the treatment Sulphur 80% @ 4g/lit. water/ha recorded minimum mite population and Dicofol @1.2ml/lit. water which was at par with Acetamiprid@50g/ha. These were followed by Imidacloprid 17.8 SP @ 125ml/ha, Fipronil @ 40g/ha, Monocrotophos 36 EC @ 200g/ha. The least effective treatment was Acephate 75% SP @ 585g/ha. The maximum mite population was recorded in untreated check (6.00/3leaves).

It is evident from the data recorded on fourteenth day after second spraying that all the insecticidal treatments were significantly superior over untreated check. The minimum mite population (1.06 mite per 3 leaves) was recorded in the treatment Sulphur 80% @ 4g/lit. water The next treatment was Dicofol at @1.2ml/lit. water it was followed by Acetamiprid @50g/ha. Imidacloprid 17.8 SL @ 125ml/ha which was at par with Spinosad@135g/ha. The least effective treatment was Acephate 75% SP @ 585g/ha. The untreated check recorded maximum mite population (6.06 mites per 3 leaves). The observations recorded on twenty first day after second spraying indicated that the minimum mite population was recorded in the treatment Sulphur 80% @ 4g/lit. water/ha. (1.86/3leaves). The best next treatment was Dicofol @ 1.2ml/lit, Acetamiprid @50g/ha These were followed by Imidacloprid @125ml/ha. These were followed by Spinosad @ 135g/ha and Fipronil @ 40g/ha. Acephate 75% SP @ 585g/ha was least effective treatment. The maximum mite population was recorded in untreated check (6.13/3leaves).

These finding of first and second spray are closely related to Tomar and Singh (2011) reported Dicofol @ 125 ml/ha were found effective in reducing mites population and remained effective till 15 days after sprays. However Targe and Kurtadikar (2003) reported that imidacloprid 17.8 SL @ 112 ml/ha protected the crop upto 15 days against mites in first spray. The treatment Sulphur 80% @ 4g/lit. water /ha was superior in reducing mite population. The other effective treatments in descending order were Dicofol @ 1.2ml/lit. water/ha, Acetamiprid 20 SP@50g/ha, Spinosad 45 SC @ 135g/ha.

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