

CHEMICAL CONTROL OF RED SPIDER MITE, *TETRANYCHUS CINNABARINUS* (BOISDUVAL) ON OKRA

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Abstract : Seven acaricides were tried for their efficacy in controlling the red spider mite on okra, *Tetranychus cinnabarinus* during kharif seasons of 1990 and 1991. Results revealed fluvalinate (0.005 per cent) and tedion (0.1 per cent) to be superior to other chemicals up to fourteen days after treatment.

Key words: Okra, red spider mite, relative efficacy, *Tetranychus cinnabarinus*.

INTRODUCTION

Tetranychus cinnabarinus (Boisduval) is a serious pest of okra. Initially it feeds harbouring the ventral surface of leaves. Under conditions of severe infestations, these mites are seen on dorsal leaf surface, fruits and tender shoots webbing all these together. Investigations on the susceptibility of red spider mite to pesticides have been reported by Reghupathy and Palaniswamy (1992), Yadav *et al.* (1989), David and Kumaraswamy (1989) and Singh *et al.* (1990). The present investigations were aimed at evaluating the bioefficacy of a few acaricides along with some synthetic pyrethroids against the spider mite under field conditions.

MATERIALS AND METHODS

Field trials were conducted with okra variety Pusa Sawani in randomised block design with three replications during kharif seasons of 1990 and 1991 at the farm of IARI, New Delhi. Eight treatments including an untreated check were included in the trial. Healthy seeds were sown in 3 x 3 m size plots maintaining a spacing of 60 x 40 cm. To estimate mite population counts, five plants were selected at random from each plot and pegged. Three leaves per plant, one each from lower, middle and upper stratum were selected for observation. Population counts were made from 1 cm² area of the lower surface of each leaf with the help of a hand lens (x 10) and a square window of 1 cm² prepared on a card board. Pre-treatment observation and post-treatment counts at twenty four hours, three days, seven days and fourteen days were recorded. The

percentage efficacy of different treatments was worked out using the formula by Takeda *et al.* (1986).

$$\text{Percentage efficacy} = 1 - \left\{ \frac{(\text{Cb} \times \text{Ta})}{(\text{Tb} \times \text{Ca})} \right\} \times 100$$

Where Cb = No. of mites on untreated check before treatment

Ca = No. of mites on untreated check after treatment

Tb = No. of mites on treated plot before treatment

Ta = No. of mites on treated plot after treatment

The data thus obtained on percentage efficacy were transformed to angular values and subjected to analysis of variance technique.

RESULTS AND DISCUSSION

Pooled analysis of the data of the trials conducted in 1990 and 1991 (Table 1) showed fluvalinate (0.005 per cent) being superior to all other treatments showing an efficacy of 84.98 per cent up to fourteenth day after treatment and the mean number of mites / cm² in this treatment was 20.67. This was followed by tedion (0.1 per cent) which was on par with fluvalinate (0.005 per cent) on first day after treatment and subsequently came next in order up to fourteenth day. Patel *et al.* (1985) had reported fluvalinate (0.025 per cent) to be very effective in controlling *Tetranychus cinnabarinus* on brinjal. Studies conducted by Goyal and Bath (1967) showed tedion to be less effective than ethion and methyl demeton to adults of *Tetranychus cinnabarinus* on

Table 1. Mean number of mites per cm^2 of *Tetranychus cinnabarinus* and percentage efficacy following spray application of different acaricides

Treatment	Pre-treatment ; population	Mean No. of mites / cm^2				Percentage efficacy			
		Days after treatment				Days after treatment			
		1	3	7	14	i	3	7	14
Tedion (0.1%)	92.00	18.67	24.00	29.00	25.33	79.48 (63.15)	80.37 (63.87)	70.43 (57.23)	71.61 (58.05)
Dicofol (0.075%)	84.33	50.33	68.00	64.33	77.33	50.04 (45.15)	58.28 (49.94)	56.02 (48.49)	51.88 (46.01)
Ethion (0.01%)	71.33	21.33	33.00	44.33	50.67	61.11 (51.73)	55.69 (48.35)	39.08 (38.11)	41.59 (39.49)
Quinalphos (0.04%)	100.33	33.00	71.33	85.67	109.67	53.02 (46.77)	49.16 (44.83)	39.96 (38.91)	33.13 (34.79)
Cypermethrin (0.015%)	105.67	42.67	47.00	58.00	121.67	76.76 (61.43)	75.61 (60.53)	65.19 (53.94)	41.16 (39.53)
Fluvalinate (0.005%)	85.00	10.00	13.00	14.00	20.67	89.82 (72.26)	91.19 (73.05)	88.68 (70.59)	84.98 (67.44)
Pyraclafos (0.03%)	75.33	25.33	41.00	58.33	71.33	67.58 (57.10)	62.65 (52.44)	39.59 (38.28)	38.33 (37.59)
Control	81.67	102.67	127.67	145.33	163.67	-	-	-	-
CD (0.05)						11.00	7.05	8.43	8.57

Figures in parentheses are angular transformed values

limabeans even though it was highly toxic to eggs. The present investigations however showed tedion to be effective under field conditions and on par with fluvalinate on first day after treatment as the population comprised of adults as well as immature stages of mites.

Cypermethrin (0.015 per cent) was found to be effective up to seven days and after that there was substantial increase of mite population levels from 42.67 mites cm^2 on first day to 121.67 mites cm^2 on fourteenth day after treatment. This may be due to the resurgence of mite population as a result of Cypermethrin treatment. The enhancement of brinjal mite population with the use of Cypermethrin has also been reported by Natekar *et al.* (1988) and that of *Tetranychus cinnabarinus* on okra by David and Kumaraswamy (1989).

Dicofol (0.075 per cent) even though found inferior to fluvalinate, tedion and Cypermethrin during the initial days after treatment maintained its persistence and was on par with tedion on fourteenth day after treatment. This may be due to its relatively low order of toxicity to adult mites and effectiveness to immature stages. Ethion, quinalphos and pyraclafos did not give any promising results.

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