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(Received : December 97 Revised : February 99)

Madras Agric. J., 85(7-9): 425 - 427 July - September 1998
<https://doi.org/10.29321/MAJ.10.A00776>

EVALUATION OF CARBOSULFAN AGAINST CARMINE SPIDER MITE *Tetranychus cinnabarinus* (Boisd.) ON BHENDI

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ABSTRACT

A field study conducted on bhendi to evaluate the efficacy of carbosulfan (Marshal) 25 EC against the carmine spidermite *Tetranychus cinnabarinus* indicated that carbosulfan 0.075% is equally effective as that of proven acaricides viz., Ethion 50 EC and Fenprothrin 10 EC in reducing mite population when applied twice on 30th and 45th days after sowing.

KEY WORDS : Bhendi, Carbosulfan, Bioefficacy, Carmine spider mite.

Carmine mite *Teranychus cinnabarinus* (Boisd.) has been found to be a serious pests of lady's finger apart from cucumber, egg plant, bean, watermelon etc. The attack of this mite results in yellowing, crumbling curling and twisting of leaves. In addition the leaves are covered with heavy webs which adversely affects the photosynthetic activity of the plants. The leaves eventually dry up and fall off (Singh and Singh 1993). In severe cases growth, flowering and fruit formation also affected (Singh *et al.*, 1991). Even malformation of fruit leading to loss of its marketability has also been noticed in field condition. This spider mite is widely distributed in tropical regions of the globe causing heavy yield loss (Cherian, 1931). To control this pest dicofol, ethion and sulphur have been found to be very effective (Rai and Singh, 1996). Continued use of these acaricides over years may lead to development of resistance by the carmine spider mite. Hence to evaluate some alternate newer pesticide molecules like carbosulfan -a carbamate insecticide was tested in the present field study.

MATERIALS AND METHODS

The field study was conducted during kharif 1996 with red loam soil type with a plot size of 20 M² each replicated thrice with Indo- American hybrid as the cultivars. Seven chemicals were applied (Table 1-2) and compared with untreated check. The first application was given on 30th day after sowing and the same was repeated 15 days later. The observations were recorded on 1, 3, 7 & 15th day after each application. From each plot five plants were selected at random and from each plant 3 leaves were selected from top, middle and bottom. The number of mites cm sq⁻¹ area was counted using an one cm square card and the mean number of mite population cm sq⁻¹ was taken for statistical analysis. Corrected per cent mortality was worked out using Henderson and Tiltons formula (Henderson and Tilton, 1955).

RESULTS AND DISCUSSION

The results revealed that (Table 1 & 2) among the different treatments, the acaricides ethion 50 EC 0.05% and Fenprothrin 10 EC 0.05% are on

Table 1. Bioefficacy of carbosulfan 25 EC on population of *Tetranychus cinnabarinus* on bhendi. Number of mites/cm² of leaf (Mean of three replications)

Treatment	Corrected percent mortality (Days after application)				
	1	3	7	15	Mean
T ₁ Control (water spray)	0.0	0.0	0.0	0.0	
T ₂ Carbosulfan 25 EC 0.05% (Marshal 25 EC)	43.87 (41.45)b	62.98 (52.59)a	65.68 (64.40)a	35.69 (42.76)ab	
T ₃ Carbosulfan 25 EC 0.075% (Marshal 25 EC)	55.63 (48.27)a	68.54 (56.02)a	72.68 (58.10)a	46.13 (42.76)ab	
T ₄ FMC 54800 10 D 0.0015%	17.79 (24.78)c	11.81 (17.69)a	40.61 (39.57)b	9.03 (15.80)d	
T ₅ FMC 54800 10 D 0.015%	14.76 (22.30)c	41.46 (39.72)ab	41.69 (40.01)b	20.32 (25.72)bcd	
T ₆ Fenpropathrin 10 EC 0.05% (Danital 10 EC)	53.25 (46.88)ab	64.55 (53.51)a	73.34 (59.04)a	55.38 (48.21)a	
T ₇ Ethion (Tafethion) 50 EC 0.05%	54.19 (47.44)a	64.05 (53.24)a	76.49 (60.99)a	62.27 (52.13)a	
T ₈ Dimethoate (Rogor) 30 EC 0.06%	17.15 (23.64)c	11.80 (18.09)b	8.33 (13.92)c	18.12 (22.14)cd	

* Figures in parentheses are Arcsine (Sqr (x/100) transformed values)

* Means followed by common letter and not significantly different at the 5% level by DMRT.

par and highly effective in recording the maximum per cent mortality 89.5 and 85.3 on 15th day after second application.

Carbosulfan 25 EC (Marshal, 25 EC) at 0.05% and 0.075% concentration has recorded the maximum per cent mortality of 84.6 and 86.2 on 15th day after second application. It is on par and equally effective as that of the standard acaricides tested. Carbosulfan can also be recommended for effective control of carmine spider mite on Bhendi. FMC 54800 10 D at 0.0015 and 0.015%

concentration recorded less than 57% mortality and ranks third in the order. Dimethoate 30 EC 0.06% has recorded only 43.2% mortality and not effective against *T. cinnabarinus*. The present results is in line with the study conducted elsewhere (Suchitra and Khokhar, 1966) which proved that carbosulfan as 25 EC and 25 STD is very effective against *T. cinnabarinus* and *Amrasca biguttula biguttula* on Bhendi. Hence carbosulfan 25 EC at 0.05% and 0.075% concentration is equally effective against carmine spider mite as that of the proven acaricides tested like ethion and fenpropathrin, carbosulfan

Table 2. Bioefficacy of carbosulfan 25 EC on population of *Tetranychus cinnabarinus* on bhendi. Number of mites/cm² of leaf (Mean of three replications)

Treatment	Corrected percent mortality (Days after application)				
	1	3	7	15	Mean
T ₁ Control (water spray)	0.0	0.0	0.0	0.0	
T ₂ Carbosulfan 25 EC 0.05% (Marshal 25 EC)	43.87 (41.45)b	62.98 (52.59)a	80.84 (64.05)a	84.65 (67.13)a	
T ₃ Carbosulfan 25 EC 0.075% (Marshal 25 EC)	55.63 (48.27)a	68.54 (56.02)a	82.36 (65.55)a	86.29 (68.37)a	
T ₄ FMC 54800 10 D 0.0015% (20.38)b	13.10 (21.69)b	14.46 (24.65)b	18.58 (39.75)b	41.47	
T ₅ FMC 54800 10 D 0.015% (24.78)b	17.79 (17.69)b	11.81 (27.40)b	21.52 (52.17)b	57.68	
T ₆ Fenpropathrin 10 EC 0.05% (Danital 10 EC)	53.25 (46.88)ab	64.55 (53.51)a	84.05 (66.82)a	85.31 (67.62)a	
T ₇ Ethion (Tafethion) 50 EC 0.05% (47.44)a	54.19 (53.25)a	64.05 (69.23)a	87.22 (71.59)	89.50	
T ₈ Dimethoate (Rogor) 30 EC 0.06% (23.64)c	17.15 (18.40)b	11.80 (23.19)c	19.13 (41.10)b	43.25	

* Figures in parentheses are Arcsine (Sqr (x/100) transformed values)

* Means followed by common letter and not significantly different at the 5% level by DMRT.

can also be recommended for the effective management of carmine spider mite on Bhendi.

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(Received : November 97 Revised : February 99)

Madras Agric. J., 85(7-9): 427 - 429 July - September 1998

PREY POTENTIAL AND PREFERENCE OF THREE RICE DWELLING SPIDERS

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ABSTRACT

Laboratory experiments conducted at Soil and Water Management Research Institute, (TNAU), Thanjavur to assess the prey potential and preference of three common rice dwelling spiders on rice pests showed that *Pardosa* sp was the most efficient predator and it had the highest predatory potential with BPH (14.31) followed by WBPH (10.96). *Tetragnatha* and *Oxyopes* sp consumed more of GLH 5.69 and 7.29 and their potential against WBPH and BPH was almost equal. *Pardosa* preferred plant hoppers (BPH and WBPH) to leaf hopper (GLH). *Tetragnatha* and *Oxyopes* preferred more of GLH than WBPH and BPH. The three spiders behaved differently on the preference of moths of leaf folder, stem borer and caseworm.

KEY WORDS : RICE-SPIDERS-PREY-POTENTIAL-PREFERENCE

Agricultural entomologists have acknowledged the importance of spider species as a major factor in regulating pest populations of crops. Spiders as obligate suctorial carnivores often constitute a large part of the predatory arthropod fauna of rice agro ecosystem and prey on many insect pests (Barrion and Litsinger, 1980). Because of their ability to build up high populations densities and their insectivorous feeding behaviour, it is suspected that under favourable habitats spiders may play a significant role as mortality agents of insect populations (Kiritani, 1972). Preliminary estimates of prey biomass consumed by wolf spiders vary substantially between 0.5 kg/ha/yr fresh weight in cereal crops (Nyffeler 1982 a), to 50 kg/ha/yr in undisturbed grassland (Van Hook, 1971), with an intermediate value of 3-9 kg/ha/yr found in forests (Nyffeler, 1982 b). Despite their importance highlighted by several workers, the role they play in regulation of pest populations has received scant attention in India and few workers have attempted

on prey predator relationship and faunistic survey (Nirmala, 1990 and Ganesh kumar, 1994). Hence to assess the prey potential and preference of three importance rice dwelling spiders viz., *Pardosa*, *Oxyopes* and *Tetragnatha* on rice insect pests, studies were conducted and results presented.

MATERIALS AND METHODS

1. Predatory potential : The predatory potential of *Pardosa* sp., *Oxyopes* sp and *Tetragnatha* sp adults was studied in the laboratory. The adult spiders were collected from pesticide unsprayed rice fields, sorted to uniform size and starved for 24 hours. Spiders were caged in tube pots containing 30 day old rice seedlings separately with adults of ten numbers of green leafhopper (GLH = *Nephotettix virescens* Distant), brown plant hopper (BPH = *Nilaparvata lugens* Stal. and white backed plant hopper (WBPH = *Sogatella furcifera* Horvath.). Observations were taken