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Tests of some insecticides against *Tetranychus telarius* LINNAEUS (Tetranychidae: Acarina) infesting brinjal in West Bengal

With 1 textfigure

The vegetable mite, *Tetranychus telarius* LINNAEUS, is a polyphagous species and is reported to be destructive to many economic crops in India and abroad. In the State of Behar in India this pest has been observed to infest lady's finger, brinjal, tomato, bean, potato, pumpkin, bottle gourd, cucumber and cotton by LALL & DUTTA, in 1959. Among these crops lady's finger recorded maximum infestation and this has also been observed by SINGH & SAINI in the Punjab in 1956. SRIVASTAVA & MATHUR in 1962 reported this species to be a major pest of Castor Plant in Rajasthan.

The species has been observed by the authors to gradually gain importance as a major pest of brinjal in West Bengal. Frequent reports of attack to this crop are often received by the State Entomologist from many parts of this State. During August 1963, brinjal plantations of over two acres, in the district of Hooghly, was so severely infested with this mite that chemical control operation had to be undertaken to bring it under control. The present paper reports for the first time the results of tests of three insecticides-Malathion, Thiodan and Trithion against the species under Indian condition.

Experimental details

The trial was conducted in the post-monsoon season on potted brinjal plants under natural infestation. Commercial formulations of three insecticides were used in the experiment. (1) Malathion 50 E.C. (containing 50% malathion) supplied by I.C.I (India) Ltd., Calcutta, (2) Thiodan 35 W.P. (Wettable Powder containing 35% active ingredient) supplied by Farbwerke Hoechst Ag., Germany, and (3) Trithion 20 E. (emulsifiable liquid containing 20% o,o-diethyl S-p-chlorophenyl thiomethyl phosphorodithioate) supplied by Mysore Insecticides Company, Madras.

The concentrations used in the experiment were as follows: (1) 0.05, 0.1 and 0.2 per cent of Malathion 50 E.C., (2) 0.1, 0.2 and 0.3 per cent of Thiodan 35 W.P., and (3) 0.1, 0.2 and 0.3 per cent of Trithion 20 E.C.

For spraying of the insecticides 'Ganesh' hand compressor sprayer was used. The assessment of effect was made on the living mite population before and after treatment over a circular area of 12 sq. cm. on the underside of each leaf by 'ring method'. The mite population referred to in table-I represent an average of three such 'ring count' on a plant. Post-treatment observations were taken at an interval

of one, three, seven and fifteen days after spraying and with reference to the same sample of leaves as selected for pre-treatment observation.

The per cent control due to treatment was obtained with the help of HENDERSON & TILTON (1955) formula $100 \left[1 - \frac{T_a \cdot C_b}{T_b \cdot C_a} \right]$, where T_b is the number of mites collected per sampling unit before treatment, T_a the number collected after treatment, C_b the number collected from the control plant before treatment and C_a the number collected from the control plant after treatment.

Results

The observations on the mite population before and after treatment are presented in the table. It is seen from the table and figure 1, Malathion, has given good initial control in comparison with Thiodan and Trithion as also observed by FRITZSCHE (1959). Upto three days after treatment, all the concentrations have given complete control after which the efficacy decreases. After 7 days of treatment .05, 0.1 and 0.2 per cent concentrations of Malathion 50 E.C. gave 70.8, 79.1 and 97 per cent control respectively and after 15 days the efficacy remained almost the same. The initial effect of Thiodan is somewhat lower comparative to Malathion and Trithion; 0.1, 0.2 and 0.3 per cent concentrations of Thiodan 35 W.P. gave 85.7, 88.5 and 97.8 per cent control respectively after one day of treatment but showed 100 per cent control after three days. The efficacy slightly decreased and remained almost the same after 7 and 15 days. The percentage control due to 0.2 per cent concentration was strikingly low (i.e. 31.8) but it seems to have no real bearing with the trend and is therefore left out of consideration.

Amongst the three insecticides Trithion has been found to be most effective in controlling mite population during the period of experiment. The initial control,

Table

Average mite population and per cent control of *Tetranychus telarius* in different treatments

Insecticide	Concentration percentage	Concentration percentage of active ingredient	Average mite population before treatment	Mite population after different period of treatment							
				1 day		3 days		7 days		15 days	
				A	P	A	P	A	P	A	P
Malathion 50 E.C.	0.05	0.025	30	0	100	0	100	12	70.8	8	75.0
	0.1	0.05	35	0	100	0	100	10	79.1	5	85.2
	0.2	0.1	49	0	100	0	100	2	97.0	5	88.8
Thiodan 35 W.P.	0.1	0.035	40	7	85.7	0	100	7	87.2	4	89.0
	0.2	0.07	57	8	88.5	0	100	19	31.8	7	96.4
	0.3	0.105	75	2	97.8	0	100	0	100	4	94.1
Trithion 20 E.C.	0.1	0.02	48	2	96.6	0	100	0	100	0	100
	0.2	0.04	39	1	97.9	0	100	0	100	3	91.5
	0.3	0.06	26	3	90.6	0	100	0	100	0	100
Untreated	—	—	35	43	—	52	—	48	—	32	—

A = Average mite population. — P = Per cent control.

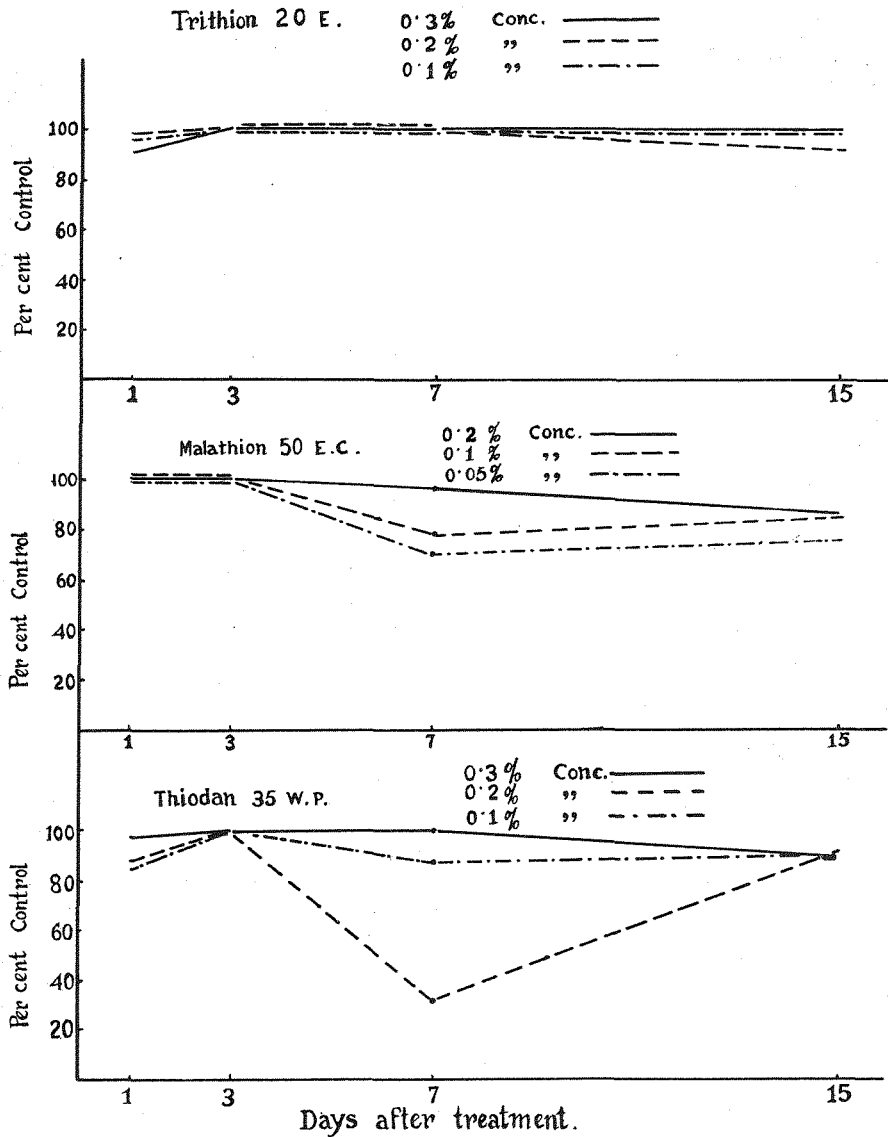


Fig. 1. The mite population and percentage control of *Tetranychus telarius* LINNÆUS after different periods of treatment

after one day of treatment, was over 90 per cent in case of all concentration tried i.e. 0.1, 0.2 and 0.3 per cent. The lowest concentration, 0.1 per cent controlled the population to the extent of 100 per cent after 3, 7 and 15 days of treatment. The results of Trithion suggest to carry out a further investigation with a lower concentrations of this insecticide. The results corroborate the findings of CANT (1960) who

confirmed the superiority of Trithion to the extent that a single application was effective against *Tetranychus telarius* in a full schedule. He also found Malathion as fairly effective.

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Summary

The vegetable mite, *Tetranychus telarius* LINNAEUS, is gradually assuming importance as a major pest of brinjal plant in West Bengal. — Three insecticides — Malathion, Thiodan and Trithion in different doses were tested for their efficacy in controlling the mite. — In general, all the chemicals, in doses tried, gave good results in the reduction of mite population by showing quick knock down activity and residual persistence for the period of test. — Trithion was found to be the most effective material and needs further investigation to find out an economic dose. The other insecticides were also fairly effective and gave adequate control.

Zusammenfassung

Die Gemüsemilbe *Tetranychus telarius* LINNAEUS gewinnt allmählich an Bedeutung als ein gefährlicher Schädling der Aubergine (Eierfrucht) in Westbengalen. — Die drei Insektizide Malathion, Thiodan und Trithion wurden in verschiedener Dosierung auf ihre Wirksamkeit zur Bekämpfung dieser Milbe getestet. — Im allgemeinen erzielten alle drei Chemikalien in den erprobten Dosierungen gute Ergebnisse bei der Verringerung der Milbenpopulation. Sie zeigten schnelle tödliche Wirkung und Beständigkeit über die ganze Versuchszeit. — Als wirksamstes Mittel erwies sich Trithion, dessen wirtschaftliche Dosis noch durch weitere Untersuchungen ermittelt werden mußte. Die anderen Insektizide waren auch leidlich wirksam und gestatteten eine hinreichende Bekämpfung.

Резюме

Обыкновенный паутиный клещ *Tetranychus telarius* LINNAEUS постепенно приобретает все большее значение как опасный вредитель баклажанов в западной Бенгалии. Исследовалась действенность различных дозировок трех инсектицидов — малатион, тиодан и тритион — для борьбы с этим клещом. В целом можно сказать, что все три средства в испытанных дозировках показали хорошие результаты в сокращении популяции клещей. Они быстро убивают вредителей и отличаются постоянством действия в течение всего испытания. Наиболее действенным средством оказался тритион, экономичная доза применения которого должна быть проверена в дальнейших исследованиях. Другие средства были тоже довольно действенны и удовлетворительно уничтожали клещей.

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