

CHEMICAL CONTROL OF ONION THRIPS IN MID-HILL CONDITIONS OF MINGORA (SWAT)

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(Received November 14, 1985; revised September 9, 1986)

Cypermethrin, deltamethrin + triazophos, methamidophos and methomyl were initially effective against onion thrips, *Thrips tabaci* Lind. However, from the 15th day after application methamidophos and methomyl showed a sharp decrease in effectiveness, while the others exhibited a gradual decrease in effectiveness. BPMC was moderately effective against thrips on both a short and long term basis.

Key words: *Thrips tabaci* Lind; Onion; Insecticides.

INTRODUCTION

Onion thrips, *Thrips tabaci* Lind. have been observed to be serious pests of onion in Swat. Thrips puncture the epidermal layer of the leaves from which the sap oozes out in the form of droplets. Loss of the sap causes separation of the epidermal layer from chlorophyll in the vicinity of the punctured area resulting in whitish streaks or spots on the leaves. Initially the young leaves are more affected, and show a yellowish green colour, especially at the basal portion. With the passage of time the leaves turn whitish yellow in colour due to excessive feeding. Curling of the leaves (especially the young leaves) has also been noted. Pathogens also gain entry through the feeding punctures. Dusts and fungal spores adhere to the sap droplets. These thrips have also been reported to inject toxins in the leaves [2]. It was, therefore, considered necessary to assess the effectiveness of some insecticide against this pest. Cypermethrin [12], methamidophos [6, 7, 11], methomyl [3, 4, 5, 7] and triazophos [1] have been reported to give effective control of *T. tabaci* as quoted in parenthesis. Deltamethrin alone [12] and in combination with other products [8, 9] has given good control of *T. tabaci*.

MATERIALS AND METHODS

A field experiment was carried out in randomised complete block design at the Agricultural Research Station, Mingora (Swat). Check and treatment plots measured 4.5 x 3.0 m and were replicated five times. Treatments and replicates were buffered with neutral spacings (ridges). Onion nursery (cv. Swat Local) was transplanted on February 2, 1985 in the experimental field at spacings of

0.075 and 0.3m between plants and rows (lines), respectively.

BPMC (10% EC (Bassa), cypermethrin 10% EC (Arrivo), cypermethrin 5% EC (Bestox), deltamethrin 0.025% EC + triazophos 14% EC (Decis H36), methamidophos 60% SL (Tamaron) and methomyl 90% SP (Methavin) were sprayed on May 27, 1985 at the rates given in Table 1 using a compressed air sprayer. Five leaves were plucked gently, using a small razor blade, from the plants selected randomly in each plot/replication and collected separately in plastic bags the day before and the day onward after application. The collected leaves were examined under the microscope and densities of the thrips were recorded. Plastic bags were jerked over a white paper for observing the thrips that have escaped the leaves if any. Data obtained were transformed into $\log x$ or $\log x + 1.5$ and subjected to analysis of variance. Means were compared through Duncan's multiple range test.

RESULTS AND DISCUSSION

Table 1 shows that thrips densities/leaf during four days after spraying were significantly reduced in plots of cypermethrin, deltamethrin + triazophos, methamidophos and methomyl in comparison to plots of BPMC and no treatment. Cypermethrin at both levels revealed a similar level of reduction in the thrip population. Reduced numbers of *T. tabaci* on foliage nine days after spraying is probably explained by its habit of pupating in the soil [10]. Fifteen days after spraying thrip numbers showed a tendency to increase in plots treated with BPMC, methamidophos and methomyl. Untreated plots showed a similar trend. On the other hand thrip numbers were relatively

Table 1. Population density of onion thrips, *Thrips tabaci* Lind., following insecticidal treatment

S.No.	Treatment	Rate (a.i)/ 100 l water	Pretreat- ment	Mean thrips densities/leaf						
				Days after treatment						
			1(ns)	1(**)	2(***)	3(**)	4(**)	9(**)	15(**)	19(**)
1.	BPMC 10% EC	44.44 ml	80.9	17.5b	32.2b	21.6b	26.8c	1.2bc	29.5b	31.1cd
2.	Cypermethrin 10% EC	13.33 ml	108.5	1.0a	0.2a	1.0a	0.9ab	0a	4.2a	11.6ab
3.	Cypermethrin 5% EC	6.67 ml	75.7	0.9a	0.6a	0.9a	2.1ab	0.1a	8.4a	6.0a
4.	Deltamethrin 0.025% EC + Triazophos 14% EC	24.93 ml	89.2	0a	0.2a	0.2a	0.4a	0a	1.8a	15.7bc
5.	Methamidophos 60% SL	133.33 ml	77.6	1.2a	0.6a	0.7a	4.0b	0.4ab	21.5b	74.7d
6.	Methomyl 90% SP	120 g	66.9	0.1a	0.8a	1.4a	0.9ab	0.2a	18.1b	71.2d
7.	Untreated	—	86.4	88.5c	151.3c	123.4c	101.8d	2.2c	13.4b	27.0c

ns = Not significant. (**) = Significant at 0.05 and 0.01 levels of probability. Means followed by the same letters are not significantly different.

lower in plots treated with cypermethrin and deltamethrin + triazophos. It has been therefore observed that the former three pesticides are less persistent in their effect against the thrips than the latter two.

On the afternoon of the 15th and 16th day after spraying it rained heavily (associated with slight hail) and the densities of the thrips were recorded on the 19th day — three days after rain. Table 1 shows that after 19 days there was a sharp increase in thrip population treated with methamidophos and methomyl when compared with the other insecticides in treated and untreated plots. On the other hand, there was a slight increase in populations in plots treated with cypermethrin and deltamethrin + triazophos and a moderate increase in plots treated with BPMC. Populations in the untreated plots also showed a moderate increase. Cypermethrin and deltamethrin + triazophos may have penetrated the leaf tissues through translaminar action or through feeding punctures and were thus probably not so greatly affected by rains. From these observations it may be concluded that simple washing of the onion foliage may lessen the chance of the ill effect of methamidophos and methomyl but in the case of cypermethrin and deltamethrin + triazophos such residual loss may not be expected.

Cypermethrin [12] and methamidophos [6, 7, 11] have been shown to be effective for up to two weeks while methomyl was effective for 1-2 weeks [3, 4, 5, 7]. The present results indicate a more or less similar trend. The effectiveness of BPMC and deltamethrin + triazophos against *T. tabaci* had not been previously reported. Deltamethrin alone [12] and in combination with polybutene [8, 9] has been shown to give good results against *T. tabaci*. Triazophos has also been shown to be effective

against *T. tabaci* [1].

Acknowledgement. The author is grateful to G.J. du Heasume and J.M. Palmer of the Commonwealth Institute of Entomology, London (England) for confirming the thrips.

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