

# Efficacy of Different Insecticides against Onion Thrip, *Thrips tabaci* in Awaran District

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**Abstract:** The research trail was conducted at a farmer field Awaran District to evaluate the efficacy of different insecticides for the management of onion thrips (*Thrips tabaci*) (Thysanoptera: Thripidae) on onion crop during Kharif season 2018. Six treatments (Five insecticides and control) were replicated four times in Randomized Complete Block Design (RCBD). Five insecticides Mospilan 20SP @ 125 gm/acre, Thiodan 35EC @ 600 ml/acre, Confidor 200SL @ 80 ml/acre, Curacron 500EC @ 500 ml/acre and Neem oil 10% @ 250 ml/acre were applied twice 15 days intervals at ETL. All the insecticides were significantly better than untreated check in reducing pest population after both applications. Thiodan 35EC proved best followed by Curacron 500EC and Mospilan 20SP.

**Keywords:** Efficacy; Different Insecticides, Onion thrip, Onion crop

## 1. INTRODUCTION

Onion is one of the major commercial crop in district Awaran, Balochistan Province of Pakistan. Like any other crop, onion is also subjected to the attack of many pests including insects, bacterial and fungal diseases (Arkhipove, 1984). Recently, *Thrips tabaci* Lind (Thysanoptera: Thripidae) has been reported to transmit Iris Yellow Spot Virus (family Bunyaviridae, genus Tospovirus) that has emerged as a devastating and widespread disease effecting bulb onion crop in Colorado, Utah, Idaho, Washington, California, Arizona, New Mexico and Nevada (Gent *et al.*, 2004). Adult and larval stages of *T. tabaci* feed on leaves and may reduce onion yield up to 50 % (Fournier *et al.*, 1995). Thrips puncture leaves and suck the exuding sap, leaving whitish area on leaves. Infestation is worse in very dry seasons and can often leads to destruction of entire crop. Though many control tactics are available for the management of this insect like cultural (i.e. host plant resistance, mix cropping, destruction of hibernating pupae) (Atwal, 1976; Uvah and Coake, 1984), biological (i.e. predators and parasitoids) (Atwal, 1976; Gandhale *et al.*, 1984); synthetic pesticides and chemicals along with their environmental and health hazards (Shah *et al.*, 2000) could not be avoided because of their quick knockdown action and epidemic condition. Kisha (1979) evaluated different insecticides and recommended methomyl (0.53 kg a.i ha<sup>-1</sup>) and phenthoate (1.08 kg ha<sup>-1</sup>) against onion thrips, if applied at 14 days interval. Anonymous (1999) reported that a good control of onion thrips could be achieved by application of various insecticides.

The development of insect resistance against insecticides has been reported from various parts of the world, so it is desirable to screen the new products and evaluate the existing insecticides for the efficacy and recording incidence of development of resistance. Keeping in this view, an experiment was designed to evaluate some insecticides for the management of onion thrips at Agriculture Research Field Experimental Station, (FES) Awaran District.

### 1.1 OBJECTIVES

1. To evaluate the efficacy of different insecticides for the management of onion thrips.
2. To find out most suitable insecticide for the control of onion thrip on onion crop.

## 2. MATERIALS AND METHODS

The experiment was conducted at a farmer field District Awaran. The variety of onion Phulkara was sown during Kharif season 2018 at one acre area in district Awaran. To evaluate the efficacy of different insecticides for the management of onion thrips (*Thrips tabaci*) in Randomized Complete Block Design (RCBD) and six treatments (blocks) were replicated four times. (Table 1) (i.e five insecticides and one control) were applied on a plot size of (4x3 m); and maintained all the recommended inter plant and inter row distances and followed standard agronomic practices. (Shakeel

et al., 2006) tested four onion varieties i.e Chiltan-98, Phulkara, Sariab Red and Swate-1 against onion thrips infestation at vegetable programme, National Agricultural Research Centre, Islamabad during 2004-2005 and found Swate-1 to be a tolerant variety, while Phulkara a resistant variety to *Thrips tabaci* infestation. Both these varieties were also found high yielding.

The crop was carefully observed at weekly interval to monitor the thrips population and insecticides were administered as it reached to the economic threshold level (ETL). The application of insecticides was repeated after 15 days of 1<sup>st</sup>

spray when any of the insecticides plot showed ETL. Anonymous (2002) recorded more than 70 thrips per plant during March on onion seed crop at Swate and also reported maximum 15 thrips per plant at Bajna-1 and 4 thrips per plant during April at Abbottabad. (Shakeel et al., 2006) recorded number of *T. tabaci* on Swate-1 and Sariab Red (both are red varieties) with 6.35 and 5.57 individual per plant. After 2<sup>nd</sup> application, crop reached to physiological maturity, so the experiment was terminated. Percent mortality was corrected using Abbott's formula (Abbott, 1925). Collected data were analyzed statistically for analysis of variance to determine the significant difference among the treatments.

**3. RESULTS AND DISCUSSION**

**Table 3.1 Insecticides, active ingredient with recommended doses**

Treatments	Insecticides	Active ingredient	Dose /acre
T <sup>1</sup>	Mospilan 20SP	Acetamiprid	125gm/acre
T <sup>2</sup>	Thiodan 35EC	Endosulfan	600ml/acre
T <sup>3</sup>	Confidor 200SL	Imidacloprid	80ml/acre
T <sup>4</sup>	Curacron 500EC	Profenophos	500ml/acre
T <sup>5</sup>	Neem oil 10%	Azadirachtin	250ml/acre
T <sup>6</sup>	Control (Untreated)	-----	-----

**Table 3.2 Mean number of onion thrips per plant and percent mortality after first spray at various intervals**

Insecticides	Mean No. of Thrip Per Plant				% mortality after 1 day	% mortality after 4 days	% mortality after 7 days	% mortality after 10 days
	After 1 day	After 4 days	After 7 days	After 10 days				
Mospilan 20SP	8.45 a	5.90 b	6.00 b	7.95 a	50.0	82.00	80.68	45.5
Thiodan 35EC	5.00 a	4.15 b	5.75 b	7.15 a	70.4	86.63	81.48	51.0
Confidor 200SL	6.75 a	6.35 b	6.95 b	11.90 a	60.1	79.55	77.62	18.5
Curacron 500EC	10.65 a	6.15 b	6.25 b	9.90 a	37.0	80.19	79.87	32.2
Neem oil 10%	11.50 a	5.45 b	5.95 b	10.50 a	32.0	81.45	80.84	28.1
Control	16.90 a	31.05 a	31.05 a	14.60 a	0	0	0	0
LSD value at 5 %	12.85	10.98	10.98	8.605				

The results (Table 3.2) show mean number of onion thrips per plant and their respective percent mortality caused by insecticides after 1 day, 4 days, 7 days and 10 days intervals. All the insecticides evaluated against thrips on onion crop were significantly better than the control plots. After 1 day of spray, Thiodan 35EC caused 70.4 % mortality followed by Confidor 200SL (60.1 %), Mospilan 20SP (50.0 %), Curacron 500EC (37.0 %) and Neem oil (32.0 %). After 4 days of spray, highest percent mortality was recorded for Thiodan 35EC rose to (86.63 %) followed by Mospilan 20SP (82.00

%), Neem oil 10% (81.45) while the lowest percent mortality was recorded for Confidor 200SL (79.55 %) followed by Curacron 500EC (80.19 %). After 7 days of spray, percent mortality maintained almost the same range for all insecticides which was recorded after 4 days but very much fluctuation was recorded after 10 days of spray among the treatments but again it was significantly better than control. After 10 days of spray highest percent mortality was also recorded for Thiodan 35EC (51.0 %) while lowest percent mortality was observed again for Confidor 200SL (18.5%).

**Table 3.3 Mean number of onion thrips per plant and percent mortality after second spray at various intervals**

Insecticides	Mean No. of Thrip Per Plant				% mortality after 1 day	% mortality after 4 days	% mortality after 7 days	% mortality after 10 days
	After 1 day	After 4 days	After 7 days	After 10 days				
Mospilan 20SP	10.00 b	9.50 bc	11.05 bc	11.95 bc	62.8	67.3	61.6	49.5
Thiodan 35EC	2.25 c	0.95 c	3.85 bc	5.25 c	91.6	96.7	86.6	77.8
Confidor 200SL	7.20 bc	15.05 b	14.05 b	18.85 ab	73.2	48.2	51.2	20.3
Curacron 500EC	1.60 c	2.45 c	0.70 c	9.10 c	94.1	91.6	97.6	61.5
Neem oil 10%	11.40 b	14.45 b	11.00 bc	9.30 c	57.6	50.3	61.8	60.7
Control	26.90 a	29.05 a	28.80 a	23.65 a	0	0	0	0
LSD value at 5 %	6.718	9.607	12.88	8.261				

The results (Table 3.3) indicated that the mean number of onion thrips per plant and percent mortality caused by insecticides after 1 day, 4 days, 7 days and 10 days intervals respectively of second spray were quite effective. All the insecticides evaluated against thrips on onion crop were significantly better than the control plots. After 1 day of spray, Curacron 500EC (94.1%), followed by Thiodan 35EC (91.6 %), Confidor 200SL (73.2 %), Mospilan 20SP (62.8 %) and Neem oil 10% (57.6 %). After 4 days of spray, highest percent mortality was recorded for Thiodan 35EC which is (96.7 %) followed by Curacron 500EC (91.6 %) while the lowest percent mortality was recorded for Confidor 200SL (48.2 %) followed by Neem oil 10% (50.3 %) and Mospilan 20SP (67.3). After 7 days of spray, highest percent mortality was recorded for Curacron 500 EC (97.6 %) followed by Thiodan 35EC (86.6 %), Neem oil 10% (61.8%), Mospilan 20SP (61.6 %) and lowest value of (51.2 %) was shown by Confidor 200SL. After 10 days of spray, highest percent mortality was also recorded for Thiodan 35EC (77.8%) followed by Curacron 500EC (61.5%), Neem oil 10% (60.7%), Mospilan

20SP (49.5%) and Confidor 200SL (20.3%).

The results obtained in this study are quite in conformity with the findings of previous workers who used synthetic insecticides for the management of onion thrips in different parts of the world and got a considerable knockdown effect (Gandhale *et al.*, 1984; Kisha, 1979; Hussain *et al.*, 1997). Kisha (1979) tested different insecticides and reported that onion thrips can be controlled by methomyl (0.53 a.i. kg ha<sup>-1</sup>), malathion (1.0 kg ha<sup>-1</sup>) and phenthoate (1.08kg ha<sup>-1</sup>), if applied at 14 days interval. It showed that the residue lasted for 14 days, which confirm the finding of present studies, although different insecticides were used in different agro- ecological zones. Gandhale *et al.* (1984), also reported a good control of onion thrips and the residues could last for a period of one week or so. Since all the insecticides used lost their effect after 15 days, it is assumed that pre harvest period supposed to be somewhat longer than over twenty days. However, instrumental residual analysis studies are needed for definite and safe pre-harvest period. Hussain *et al.* (1997) tested

different insecticides against *Thrips tabaci* and found that Methamidophos was the most effective insecticides for the

#### 4. CONCLUSION AND RECOMMENDATIONS

Thiodan 35EC, Curacron 500EC and Mospilan 20SP gave best results among all the insecticides and control, therefore Thiodan 35EC, Curacron 500EC and Moapilan 20SP is recommended against onion thrips in district Awaran province of Balochistan, Pakistan. The onion should be regularly

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control followed by Dicrotophos and Endosulfan. Cypermethrin and Monocrotophos were the least effective.

monitored for thrips attack and if the number increased 15 thrips per plant the crop should be sprayed with recommended insecticide on recommended dose. The spray can be repeated 15 days intervals if thrips population exceeds this number.

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