ONION THRIPS CONTROL TRIALS

Lynn Jensen
Malheur County Extension Service
Oregon State University
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Objectives

The purpose of this project was to compare the efficacy of new insecticides on onion thrips control and to determine if rotating different classes of insecticides would result in better thrips control. There is a continuing need to screen new insecticides or new formulations of registered insecticides to determine if they are effective in controlling thrips. Because of the number of generations per year, thrips rapidly build up resistance to insecticides. Rotating between different classes of insecticides is one method of reducing resistance.

Materials and Methods

The trial was conducted on the Hasebe Farms on the southern edge of Ontario. The two-acre field was split between the variety Tango and a yellow variety. The trial was in the Tango onions. The plots were four double rows, 25 feet in length, and each treatment was replicated four times. The first part of the trial consisted of two applications of 16 treatments, the second treatments being made 14 days after the first. The exception was the ES 9601 compounds, which were sprayed every 7 days for three applications. Thrips counts were made just prior to spraying and at 3, 7, and 14 days after the first application, and at 7 days after the second application.

The treatments were made with a CO_2 pressurized plot sprayer set to deliver 27.4 gal/ac of water. The center two rows of each plot were used for evaluation. The number of thrips on 15 onion plants in each plot were counted to determine control.

The different products and their application rates for the efficacy trial are listed in Table 1. A new formulation of Warrior was tested alone and with a non-ionic surfactant, a silicone surfactant and a crop oil concentrate. ES 9601 is a fungal biopesticide of Mycotech's *Beauveria bassiana.*

The second part of the trial consisted of applications of Warrior, Guthion, Fipronil, Mustang, Diazinon, and Lannate in various sequences to determine which would give the best season-long control. Insecticide applications were made at two week intervals and thrips counts were made just prior to each application. Three applications were made during the growing season. The sequence trial was initiated on June 12 with subsequent applications on June 27 and July 16. The following products were used.

Lannate, Diazinon and Guthion were buffered with 3.5 oz/ac Leffingwell ZKP as a buffering agent.

The sequential applications were made according to the schedule in Table 3.

Thrips samples were collected from the red and yellow varieties in the field along with a sample from one other field near Nyssa to identify species makeup of the population and for comparison.

Results and Discussion

The results of the efficacy trial are shown in Table 4 and the sequence trial in Table 5.

Except for the 3 days after treatment counts in the efficacy trial, none of the data were significantly different. Even though there were differences in the three day trial, it is hard to draw conclusions based solely on one count date.

The bigger question is why were there no differences among treatments in either of the efficacy on sequence trials when significant differences have been shown in other years. A major pesticide company also had a thrips trial in the same field with similar results. Samples of thrips were taken from the field in the Tango portion and from the yellow variety portion. A field in Nyssa was also sampled to give an idea of which species of thrips were present. The thrips were identified by Nancy Matteson, an entomologist with the University of Idaho in Twin falls. She found the following.

Ontario Tango field: Mostly Western Flower Thrips (*Frankliniella occidentalis*) and a few Onion Thrips (*Thrips tabaci*).

Ontario Yellow: a 50:50 mix of Western Flower Thrips and Onion Thrips.

Nyssa Field (yellow onions): Mostly Western Flower Thrips and a few Onion Thrips.

No positive conclusions can be drawn from this year's study but there are indications that a species shift towards a higher population of Western Flower Thrips may have occurred in the trial area. If this is the case, thrips populations need to be examined throughout the region since Western Flower Thrips are resistant to most of the registered insecticides. If a species shift is taking place, alternative strategies such as variety selection and biological control may be necessary.

Table 1. Insecticides and rates used in the efficacy trial for onion thrips. Ontario, OR. 1996.

Treatment		Application Rates	
Product	Formulation	Active Ingredient/ac	Product volume/ac
Warrior 11	1.0 CSO	0.03 lb	3.84 oz
Fipronil	1.67 SC	0.022 lb	1.7 oz
Fipronil	1.67 SC	0.044 lb	3.4 oz
Fipronil	1.67 SC	0.06 lb	4.6 oz
Mustang	1.5 EC	0.03 lb	2.6 oz
Mustang	1.5 EC	0.0375 lb	3.2 oz
ES 9601	ES	-	1.0 pint
ES 9601	ES	-	2.0 pint
ES 9601	WP	-	0.5 lb
ES 9601	WP	-	1.0 lb
Orthene	75 WP	-	21.25 oz
Warrior	1.0 EC	0.03 lb	3.84 oz

Table 2. Insecticides and rates used in the sequential application evaluation for onion thrips control. Ontario, OR. 1996.

Treatment		Application Rates	
Product	Formulation	Active Ingredient/ac	Product volume/ac
Warrior	1.0 EC	0.03 lb	3.8 oz
Mustang	1.5 EC	0.03 lb	2.6 oz
Guthion	2.0 EC	0.5 lb	1.0 pt
Diazinon	4.0 EC	0.5 lb	1.0 pt
Fipronil	1.67 SC	0.06 lb	4.6 oz
Lannate	2.4 WSL	0.9 lb	3.0 pt

Table 3. Date of application and materials used in the sequential application trial for onion thrips control. Ontario, OR. 1996

1st Treatment 6/12/96	2nd Treatment 6/27/96	3rd Treatment 7/16/96
Warrior	Fipronil	Lannate
Warrior	Warrior	Warrior
Warrior	Lannate	Lannate
Warrior	Fipronil	Warrior
Warrior	Warrior	Lannate
Warrior	Diazinon	Lannate
Warrior	Warrior	Fipronil
Fipronil	Warrior	Lannate
Warrior	Guthion	Lannate
Guthion	Diazinon	Lannate
Guthion	Diazinon	Warrior
Fipronil	Guthion	Diazinon
Mustang	Mustang	Mustang
Mustang	Fipronil	Lannate
Mustang	Mustang	Lannate
Mustang	Guthion	Lannate

Table 4. Onion thrips control results from the insecticide efficacy trial. Ontario, OR. 1996.

Treatment		Thrips Counts			
	ai/ac	1st application			2nd appl.
		3 DAT	7 DAT	14 DAT	7 DAT
Warrior 11	0.03	2.5	8.3	19.6	11.8
Warrior 11 + NIS*	0.03	2.5	10.5	17.3	13.3
Warrior 11 + COC**	0.03	3.6	11	19.5	13
Warrior 11 + SIS***	0.03	5.1	11.1	20.1	18.2
Fipronil	0.02	3.9	10.3	20.1	14
Fipronil	0.04	12.1	11.2	21.3	14.2
Fipronil	0.06	4.7	9.5	18.1	15.6
Mustang	0.03	3.4	10.2	19.5	12.4
Mustang	0.04	3.6	10	19	11
Check	-	10.1	9.6	22.9	16.8
ES 97-1	1.0 pt	7.6	10.1	21.8	14.7
ES 9601	2.0 pt	8.3	10.7	21.8	14.3
ES 9601	0.5 lb	4.6	9.9	21.1	11.9
ES 9601	0.5 lb	6.8	11.2	19.2	14.2
Orthene	1.3 lb	3.1	10.3	21	15
Warrior	0.03	3.7	9.3	21.3	12.5
LSD		4	N.S.	N.S.	N.S.

* non-ionic surfactant; ** crop oil concentrate; *** silicone surfactant

Table 5. Average onion thrips counts after sequential insecticide applications. Ontario, OR. 1996

Treatment 1	Ave Thrips Count	Treatment 2	Ave Thrips Count	Treatment 3	Ave Thrips Count	Average
Warrior	13.2	Fipronil	22.9	Lannate	69	35
Warrior	10.9	Warrior	20.8	Warrior	70.5	34.1
Warrior	12.1	Lannate	21.2	Lannate	57	30.1
Warrior	8.2	Fipronil	23.1	Warrior	75	35.4
Warrior	11.4	Warrior	20.7	Lannate	79.5	37.2
Warrior	12.4	Diazinon	20.8	Lannate	67.5	33.6
Warrior	10.7	Warrior	20.2	Fipronil	84	38.3
Fipronil	11.7	Warrior	19.4	Lannate	79.5	36.9
Warrior	11.7	Guthion	25.2	Lannate	66	34.3
Guthion	16	Diazinon	22	Lannate	76.5	38.2
Guthion	13.7	Diazinon	25	Warrior	72	36.9
Fipronil	13.1	Guthion	24.6	Diazinon	72	36.6
Mustang	12.2	Mustang	21.7	Mustang	82.5	38.8
Mustang	10.8	Fipronil	21.3	Lannate	75	35.7
Mustang	14	Mustang	21.2	Lannate	76.5	37.2
Mustang	12.5	Guthion	22.3	Lannate	75	36.6