INSECTICIDE TRIALS FOR ONION THRIPS (*THRIPS TABACI*) CONTROL

Lynn Jensen
OSU Malheur County Extension Office
Ontario, Oregon, 1999

Introduction

There are approximately 20,000 acres of onions grown in the Treasure Valley production area of Eastern Oregon and Western Idaho. Growers apply two to four insecticide applications to control onion thrips. Previous tests have shown that most of the registered insecticides were ineffective and gave poor to moderate control of thrips. Therefore, the purposes of this research were to determine if 15 insecticide treatments are effective in controlling thrips, and to collect data for possible registration of the insecticides.

Materials and Methods

The trial was established on the edge of a commercial onion field near Ontario. The trial area was in an irregular part of the field that could be isolated from regular insecticide applications. Pretreatment thrips counts were made on June 22 by counting the total number of thrips on five plants in each plot. Post-treatment evaluations were made by counting the total population of thrips on 15 plants in each plot.

The initial treatments were applied on June 22. Evaluations were made at 3 and 7 days after treatment (DAT). The second treatments were made June 29 with evaluations at 7 and 14 days later. The third treatments were made on July 14. One evaluation was made five days later.

Applications were made using a backpack CO_2-pressurized sprayer set to deliver 37.9 gal/acre. The application data is included in Table 1.

Success, a relatively new biological insecticide, has been tested in California (verbal – Mike Lees, DowAgro Sciences) and is reported to have moderate activity on onion thrips when applied with 1% Agri-Dex, a crop oil concentrate (COC). Agri-Dex was not available at the time of this study, so an alternative crop oil concentrate was used.

Table 1. Application data for insecticide treatments to control onion thrips, Ontario, Oregon, 1999.

	1st Application	2nd Application	3rd Application
Date	6/22/99	6/29/99	7/14/99
Time	8:00–9:30 p.m.	3:30–5:00 p.m.	12:30–2:00 p.m.
Temperature	74°F	84°F	83°F
Wind	5–8 mph	3–10 mph	7–12 mph
Evaluation Date(s)	(3 DAT) 6/25/99 (7 DAT) 6/29/99	(7 DAT) 7/6/99 (14 DAT) 7/14/99	(5 DAT) 7/19/99

Individual plots were 6.67 ft wide (4 double rows) by 50 ft in length. Each treatment was replicated four times in a randomized complete block design. The treatments are listed in Table 2.

Table 2. Treatments and application rates for insecticides applied to control onion thrips. Ontario, Oregon, 1999.

Treatment	Adjuvant †	Formulation ‡	Rate	Rate/acre
			lb ai/acre	
Success	1% COC	2 SC	0.0625	4.0 oz
Success	2% COC	2 SC	0.125	8.0 oz
Success	1% COC	2 SC	0.1875	12.0 oz
Success +	1% COC	2 SC	0.0625	4.0 oz
Warrior T		1 CS	0.03	3.8 oz
Agenda	1% COC	1.67 SC	0.26	20.0 oz
Warrior	1% COC	1 EC	0.03	3.8 oz
Warrior T	1% COC	1 CS	0.03	3.8 oz
Warrior +	1% COC	1 EC	0.03	3.8 oz
Warrior T		1 CS	0.03	3.8 oz
Warrior +		1 EC	0.03	3.8 oz
Bioplus APF 401	1% COC			1.0 qt
Bioplus 10-20-20				1.0 qt
Warrior +	1% COC	1 EC	0.03	3.8 oz
Fulvic 6000+		8.5 SC	4.25	2.0 qt
Adage	1% COC	5 FS	1.25	1.0 qt
Lannate LV +	1% COC	2.4 WSL	0.9	3.0 qt
Fulvic 6000+		8.5 SC	4.25	2.0 qt
Orthene	1% COC	75 S	1.0	21.25 oz
Lannate LV	1% COC	2.4 WSL	0.9	3.0 pt
Untreated Check	--	--	--	--
Fulvic 6000+	1% COC	8.5 SC	4.25	2.0 qt.

† COC = Crop Oil Concentrate

‡ SC = Soluble Concentrate; CS = Capsule Suspension; EC = Emulsifiable Concentrate; FS = Flowable Suspension; WSL = Water Soluble Liquid; S = Solution;

All treatments were buffered with ZKP at 1.0 qt/37.9 gal except Warrior + Bioplus.

Results and Discussion

The results are listed in Table 3. The thrips counts represent the average number of thrips on each plant.

Table 3. Average number of thrips on each plant after application of an insecticide treatment, Ontario, Oregon, 1999.

Treatment	Rate	Thrips number Pre-count	1st Application 3 DAT	1st Application 7 DAT	2nd Application 7 DAT	2nd Application 14 DAT	3rd Application 5 DAT	Average
	lb ai/acre	----------average number thrips per plant----------						
Success	4.0 oz.	5.7	4.0	7.9	8.8	7.6	5.8	6.8
Success	8.0 oz.	5.4	4.2	12.1	8.5	10.0	8.2	8.6
Success	12.0 oz.	4.7	2.9	8.1	6.9	6.5	6.7	6.2
Success + Warrior T	4.0 oz. 3.8 oz.	6.4	1.3	2.6	1.7	6.7	4.0	3.3
Agenda	20.0 oz.	8.4	3.2	6.4	2.2	2.2	2.5	3.3
Warrior	3.8 oz.	5.9	2.7	2.4	2.3	3.9	3.7	3.0
Warrior T	3.8 oz.	4.5	2.4	2.6	1.1	4.7	3.6	2.9
Warrior + Warrior T	3.8 oz. 3.8 oz.	3.1	1.0	2.2	1.9	2.5	3.3	2.2
Warrior + Bioplus APF 401+ Bioplus 10-20-20	3.8 oz. 1.0 qt. 1.0 lb.	5.9	1.6	2.1	1.5	2.4	3.0	2.1
Warrior + Fulvic 6000+	3.8 oz. 2.0 qt.	11.4	2.5	3.2	2.8	8.7	4.6	4.4
Adage	1.0 qt	3.8	1.8	4.5	2.2	6.6	---	3.2
Lannate + Fulvic 6000+	3.0 pt. 2.0 qt.	3.5	2.4	6.5	1.4	3.6	4.9	3.8
Orthene	21.25 oz.	5.8	2.8	9.5	2.5	5.1	4.4	4.9
Lannate	3.0 pt.	5.4	2.1	7.5	1.9	4.0	2.5	3.6
Untreated Check	---	3.8	4.8	11.9	9.8	9.2	5.1	8.2
Fulvic 6000+	2.0 qt.	5.4	3.6	7.6	7.0	9.8	10.7	7.7
LSD (0.05)		n.s.	2.4	4.8	6.1	6.5	5.3	
LSD (0.01)				6.8				

None of the Success treatments adequately controlled thrips (Table 4). This material was tested in 1997 in this area with similar results; however, crop oil concentrate was not applied at that time. Since Success has some activity against onion thrips in California when used with Agri-Dex, there is a possibility that some COC materials may be more effective than others, or that the thrips population in California is more susceptible to Success.

When Warrior T was combined with Success, there was no additional activity as compared to the Warrior T treatment. Warrior T is an encapsulated formulation of lambda cyhalothrin. This formulation was compared to the emulsifiable concentrate formulation (Warrior). There was no significant difference between the formulations.

Other compounds added to Warrior were: (1) Fulvic 6000+, a garlic oil based adjuvant – biological insecticide, and (2) a foliar fertilizer, Bioplus APF 401 and Bioplus 10-20-20.

Fulvic 6000+ did not provide any additional benefits to Warrior. Bioplus AFP 401 plus 10-20-20 was significantly better than Warrior plus Fulvic 6000+ at 14 DAT after the second application. The Warrior plus Bioplus treatment had the overall best control of any treatment including the Warrior plus Warrior T treatment.

Both Lannate and Orthene had significantly less control than Warrior T 7 days after the first treatment. All of the other evaluations were not significantly different when compared to Warrior T. Fulvic 6000+ was added to Lannate to see if it would enhance control (Table 9). It did not enhance control and by itself was not significantly different from the untreated check.

Two new insecticides (Agenda and Adage) not yet registered on onions were tested for efficacy against thrips. Adage provided good control except at the 14 DAT evaluation. Adage did not receive a third application. Agenda performed well after the second application.

Conclusions

The biological insecticide Success did not give satisfactory thrips control.

Warrior T and Warrior both gave adequate control through two applications.

Fulvic 6000+, a garlic based biological adjuvant/insecticide, did not enhance the effectiveness of either Warrior or Lannate, nor did it give thrips control when applied alone.

Bioplus AFP 401 and the foliar fertilizer 10-20-20 enhanced the effectiveness of Warrior. It is not known whether other fertilizer products have similar activity. These materials were as effective as the 2X rate of Warrior plus Warrior T.

Lannate and Orthene were only moderately effective after the first application, but their effects were better after the second application.

Adage and Agenda were very effective after the second application, although the residual activity of Adage was less at the 14-day evaluation.

Overall, there appeared to be good activity of most of the insecticides when a second application was made 7 days after the first application.

Table 4. Percent control of onion thrips with insecticide treatments as compared to the untreated check, Ontario, Oregon, 1999.

Treatment	Rate	Thrips control 1st Application 3 DAT	1st Application 7 DAT	2nd Application 7 DAT	2nd Application 14 DAT	3rd Application 5 DAT	Average
	lb ai/acre				%		
Success	4.0 oz.	16.7	33.6	10.2	17.4	0	17.1
Success	8.0 oz.	12.5	0	13.3	0	0	0
Success	12.0 oz.	39.6	31.9	29.6	29.3	0	22.4
Success + Warrior T	4.0 oz. 3.8 oz.	72.9	78.2	82.7	27.2	21.6	59.5
Agenda	20.0 oz.	33.3	46.2	77.6	76.1	51.0	59.8
Warrior	3.8 oz.	43.8	79.8	76.5	57.6	27.5	63.4
Warrior T	3.8 oz.	50.0	78.2	88.8	48.9	29.4	64.7
Warrior + Warrior T	3.8 oz. 3.8 oz.	79.2	81.5	80.6	72.8	35.3	73.2
Warrior + Bioplus APF 401+ Bioplus 10-20-20	3.8 oz. 1.0 qt. 1.0 lb.	66.7	82.4	84.7	73.9	41.2	74.4
Warrior + Fulvic 6000+	3.8 oz. 2.0 qt.	47.9	73.1	71.4	5.4	9.8	46.6
Adage	1.0 qt	62.5	62.2	77.6	28.2	---	57.6
Lannate + Fulvic 6000+	3.0 pt. 2.0 qt.	50.0	45.4	85.7	60.9	3.9	53.7
Orthene	21.25 oz.	41.7	20.2	74.5	44.6	13.7	40.2
Lannate	3.0 pt.	56.3	37.0	80.6	56.5	51.0	56.1
Untreated Check		0	0	0	0	0	0
Fulvic 6000+	2.0 qt.	25.0	36.1	28.6	0	0	6.1