

## EFFICACY OF FOLIAR INSECTICIDES FOR MANAGEMENT OF SILVERLEAF IN SQUASH

*Alton N. Sparks, Jr.  
University of Georgia  
Cooperative Extension Service  
Dept. of Entomology  
P.O. Box 1209  
Tifton, Georgia 31793*

### **Introduction**

Squash grown in south Georgia in the fall is attacked by a variety of insect pests. The silverleaf whitefly is one of several pests that can render a field unmarketable. Whitefly feeding on squash results in silverleaf symptoms (silver appearance of the foliage) and bleaching of the fruit even under relatively mild pest pressure. Many growers rely on preventative soil applications of neonicotinoid insecticides. Those not using this preventative approach are faced with limited options for foliar insecticides. These two studies were conducted to evaluate selected foliar insecticide treatments for management of silverleaf in squash.

### **Materials and Methods**

Two small plot rails were conducted simultaneously at the University of Georgia's Horticulture Farm in Tifton, Georgia. A virus resistant crookneck squash was direct seeded with two rows (36 inch row spacing) on 6 foot beds. Experimental plots in both tests were 2 rows (one bed) by 24 feet, with a fallow bed between adjacent plots. Plots were arranged in a randomized block design with four replications. Foliar treatments were applied to both tests on 27 Aug. and 2 and 9 Sept. with a CO<sub>2</sub> pressurized backpack sprayer (60 PSI) in 30 GPA with three hollow cone nozzles per row (one over-the-top, 2 on drops).

Treatments in Test 1 were: Mustang Max 0.8EC at 0.015, 0.02, and 0.025 lb AI/ac; Courier 70WP at 0.26 lb AI/ac; Knack 0.86EC at 0.054 lb AI/ac; and tank mixes of Mustang Max at 0.02 lb AI/ac + Courier at 0.26 lb AI/ac and Mustang Max at 0.02 lb AI/ac + Knack at 0.054 lb AI/ac. Treatments in Test 2 were: Oberon 2SC at 0.11 and 0.13 lb AI/ac (7 and 8.5 oz/ac); and tank mixes of Dibrom 8EC at 0.94 lb AI/ac with three different pyrethroids (Mustang Max 0.8EC at 0.025 lb AI/ac, Danitol 2.4EC at 0.2 lb AI/ac, and Warrior T 1SC at 0.03 lb AI/ac). Both tests included a non-treated control for comparison.

Visual foliage ratings were conducted on 10 Sept. Ratings were based on the amount of silverleaf in the plot as follows: 0 = no silverleaf, 1 = light or very spotty distribution, 2 = light and evenly distributed throughout plot, 3 = heavy spots within the plot, 4 = heavy and evenly distributed throughout the plot, 5 = all foliage silver. All fruit were harvested in each plot on 13 and 17 Sept. All fruit were categorized on a color scale with a 2 as near white, a 3 as cream colored, and a 5 as yellow (as expected for yellow squash). While a 3 may be acceptable for marketing, a 4 or higher would be preferred.

Data were analyzed with the PROC ANOVA procedure of PC-SAS. Where significant differences were detected ( $P < 0.05$ ), means were separated with LSD ( $P = 0.05$ ).

### **Results and Discussion**

**Test 1.** Silverleaf ratings of the foliage taken the day after the last application showed the least amount of silverleaf in both treatments containing Knack. Courier had the next best numerical rating, but was not significantly different from the check. Fruit harvested on 13 and 17 Sept. showed similar trends in color ratings. Typically, the treatments with Knack provided the fewest number of light colored fruit (2s and 3s) and the most darker fruit.

**Test 2.** Silverleaf ratings taken the day after the last application showed only the Oberon treatments with significantly less silverleaf. Fruit harvested on 13 and 17 Sept. also showed trends for improved fruit color with the Oberon treatments. Overall, Oberon provided the best control of silverleaf in this test, but the response was not strong.

Pyrethroid treatments in both tests provided poor results. It was assumed that the combination with Dibrom would provide synergism as occurs with most pyrethroid-organophosphate combinations, but this did not appear to occur. Addition of a pyrethroid to Courier and Knack also did not improve efficacy. Knack was the only treatment that provided a foliage rating below 2 and Oberon was the only other treatment with a rating below 3. Knack and Oberon were also the only treatments to provide an increase in fruit graded as a 4 or 5 color, although Oberon did this only in the last harvest. Both products appear to have a potential roll in management of silverleaf, however, their modes of action provide a delayed benefit and may require use in a more preventative, rather than rescue, approach.

**Table 1. Silverleaf ratings and harvested fruit color, squash efficacy test 1, Tifton, Georgia, 2004.**

Treatment	Silverleaf ratings (10 Sept.)	<u>No. of Fruit by Color</u> <u>Rating - 13 Sept.</u>			<u>No. of Fruit by Color</u> <u>Rating - 17 Sept.</u>		
		No. 2	No. 3	No. 4&5	No. 2	No. 3	No. 4&5
Check	3.38 ab	5.75 a	1.50 a	0.00 c	14.25 a	3.75 a	0.25 c
Mustang Max 0.015	3.50 ab	5.25 a	4.25 a	0.00 c	2.00 a	5.50 a	0.25 c
Mustang Max 0.02	4.00 a	5.75 a	2.00 a	0.00 c	7.75 a	4.25 a	0.00 c
Mustang Max 0.025	3.88 ab	3.75 ab	3.50 a	0.00 c	4.25 a	5.50 a	0.00 c
Courier	3.13 b	1.00 bc	0.75 a	0.00 c	2.50 a	6.50 a	1.25 c
Mustang Max + Courier	3.63 ab	3.25 ab	4.25 a	0.00 c	4.75 a	8.50 a	1.00 c
Knack	1.88 c	0.00 c	1.75 a	5.00 a	0.00 a	5.00 a	9.25 a
Mustang Max + Knack	1.38 c	0.00 c	1.75 a	2.50 b	1.50 a	5.50 a	5.50 b

Numbers within columns followed by the same letter are not significantly different (LSD; P=0.05).

**Table 2. Silverleaf ratings and harvested fruit color, squash efficacy test 2, Tifton, Georgia, 2004.**

Treatment	Silverleaf ratings (10 Sept.)	<u>No. of Fruit by Color</u> <u>Rating - 13 Sept.</u>			<u>No. of Fruit by Color</u> <u>Rating - 17 Sept.</u>		
		No. 2	No. 3*	No. 4	No. 2	No. 3	No. 4
Check	3.75 ab	2.25 a	3.25 a	0.00 a	0.50 a	8.25 a	0.25 c
Warrior + Dibrom	3.75 ab	2.75 a	2.50 a	0.00 a	1.50 a	5.00 a	0.00 c
Mustang Max + Dibrom	3.38 b	3.25 a	3.75 a	0.00 a	1.25 a	2.25 a	1.00 bc
Danitol + Dibrom	4.38 a	2.50 a	2.00 a	0.25 a	1.25 a	6.75 a	0.25 c
Oberon 7 oz	2.25 c	2.25 a	6.25 a	0.00 a	0.00 a	3.00 a	9.25 a
Oberon 8.5 oz	2.50 c	1.75 a	5.25 a	0.00 a	0.00 a	3.00 a	4.75 b

Numbers within columns followed by the same letter are not significantly different (LSD; P=0.05).

\* Differences did occur at P = 0.1.