

EFFICACY OF FOLIAR INSECTICIDES FOR MANAGEMENT OF SILVERLEAF ON SQUASH - TEST I

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Introduction

The silverleaf whitefly (SLWF), Bemisia argentifolii, also known as the B strain of the sweetpotato whitefly, B. tabaci, is a key pest of numerous vegetable crops grown in Georgia. In squash, this pest causes a plant disorder known as silverleaf, from which it obtains the common name. This disorder results in a distinct 'silvering' or whitish coloring of the foliage. Severe silverleaf also results in a 'bleaching' or loss of color in the fruit of affected plants. A small plot trial was conducted at the University of Georgia's Lang Farm in Tifton, Georgia, to evaluate the efficacy of selected foliar insecticides for control of silverleaf whitefly and resulting effects on plant and fruit color.

Materials and Methods

A virus resistant yellow squash, Destiny III, was direct seeded for this test with two rows planted on 6 foot beds. Because of stand establishment problems, plants were transplanted to establish good stands on single rows of each bed (plants moved from the row with the thinnest stand to fill in thin spots in the row used for the test). Experimental plots were one row wide and 24 feet long. Treatments were arranged in a randomized complete block design with 4 replications.

Treatments evaluated were:

- Assail 70 WP at 0.048 lb AI/ac and 0.074 lb AI/ac
- V-10112 20SGat 0.088 lb AI/ac and 0.13 lb AI/ac
- Danitol 2.4 EC at 0.3 lb AI/ac + Endosulfan 3EC at 0.75 lb AI/ac
- Provado 1.6F at 0.0468 lb AI/ac
- Actara 25WDG at 0.0468 lb AI/ac
- Non-treated check

All insecticide treatments were tank mixed with DyneAmic at 0.5% v/v. Applications were made on August 13, 18 and 25 and September 1. Treatments were applied with a CO₂ pressurized (50 PSI) backpack sprayer calibrated to deliver 30 GPA. Treatments were made with 3 ceramic hollow-cone nozzles per row (one over-the-top, one on drops on each side of the row).

Plots were visually rated for severity of silverleaf symptoms on foliage. A 1 to 5 scale was used as follows:

- 1 = little or no silverleaf (except on older leaves)
- 2 = silverleaf symptoms minor but apparent (good control)
- 3 = silverleaf symptoms obvious through most of plot
- 4 = silverleaf symptoms moderate to heavy throughout plot
- 5 = All or nearly all leaves with severe silverleaf symptoms

On each harvest date, all fruit of harvestable size were collected from each plot. Number of fruit with virus symptoms (green spots or solid green) were counted. All fruit, except solid green fruit, were categorized by color based on a scale developed with PowerPoint graphics and number of fruit in each category was recorded. Fruit were rated from 1 (white) to 11 (dark orange), with most in the 2 to 6 range. A 2 on this scale is near white, a 3 is cream colored and a 5 is the 'normal' bright yellow of a yellow squash. Data were analyzed with the PROC ANOVA procedure of PC-SAS. Where significant differences were detected ($P < 0.05$), means were separated with LSD ($P = 0.05$). Harvest data were not analyzed because of poor yields which resulted in missing data for many plots.

Results and Discussion

Significant differences were detected among treatments in the silverleaf ratings (Table 1). In general, Assail and V-10112 provided the greatest suppression of silverleaf symptoms followed by Actara.

Yields were poor in this test and inconsistent across dates. The data presented in Table 2 represent all fruit harvested in the test across three harvest dates (addition of all fruit across four replications and three dates). Although conclusions from these data are weak, the fact that only the Assail and V-10112 treatments provided average ratings of 3 or higher support the silverleaf ratings showing the best control with these products. The distribution of fruit across color categories also showed a distinct shift toward the darker fruit in the Assail and V-10012 treatments.

Also of interest in this test are the significant differences among treatments in the number of plants per plot damaged by caterpillars (primarily the melonworm)(Table 1). The Danitol+Endosulfan treatment, which should be broad spectrum, provided significant reductions in caterpillar damage. Of particular interest, the Assail and V-10112 treatments also suppressed caterpillar damage. These treatments generally are not considered broad spectrum and additional studies are needed to specifically evaluate their potential for suppression of caterpillar pests.

Table 1. Silverleaf severity ratings and caterpillar damage incidence, SLWF efficacy test, Tifton, Georgia, 2003.

Treatment	Silverleaf ratings			No of caterpillar damaged plants per plot	
	8/22	8/26	8/29	8/26	8/29
Check	4.75 a	5.00 a	4.75 a	4.75 ab	9.25 a
Danitol+Endosulfan	4.75 a	4.25 b	4.50 a	0.75 c	0.75 cd
Provado	4.50 ab	4.25 b	4.25 a	8.00 a	8.00 ab
Actara	3.75 b	3.25 c	3.25 b	3.25 bc	5.00 abc
Assail 1.1 oz.	2.25 c	2.25 d	2.50 b	0.25 c	1.00 cd
Assail 1.7 oz.	2.25 c	2.25 d	3.00 b	0.00 c	0.00 d
V-10112 40 g.	2.75 c	2.50 d	2.75 b	1.00 c	3.75 bcd
V-10112 60 g.	2.75 c	2.75 cd	3.00 b	0.50 c	0.50 cd

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

Table 2. Fruit color ratings, SLWF efficacy test, Tifton, Georgia, 2003.

Treatment	Total number of fruit by color category				Avg. color rating of all fruit
	2	3	4	5	
Check	4	5	3	0	2.92
Dan. + Endo.	5	8	0	0	2.62
Provado	4	2	2	0	2.75
Actara	3	7	0	0	2.70
Assail 1.1 oz.	2	12	4	2	3.30
Assail 1.7 oz.	2	11	5	1	3.44
V-10112 40 g.	0	6	6	0	3.50
V-10112 60 g.	0	5	1	0	3.17

No statistics were conducted on these data. Data represent the total harvest across three dates.