

(E)

**TOMATO:** *Lycopersicon esculentum* (Mill.) ‘Tygress’

## **CONTROL OF SILVERLEAF WHITEFLY ON STAKED TOMATO IN FLORIDA, 2008**

**Philip A. Stansly**

University of Florida/ IFAS

Southwest Florida Res. and Ed. Center

2686 State Road 29 North

Immokalee, FL 34142-9515

Phone: (239) 658-3427

Fax: (239) 658-3469

Email: [pstansly@ufl.edu](mailto:pstansly@ufl.edu)

**Barry Kostyk and Robert Riefer**

Silverleaf whitefly (SLW): *Bemisia tabaci* Gennadius

Silverleaf whitefly (SLW) *Bemisia tabaci* Biotype “B” also known as *B. argentifolii* remains the principal tomato pest in south Florida and elsewhere, primarily due to its role as vector of tomato yellow leaf curl virus (TYLCV). The disease and even the insect alone can cause dramatic losses in fruit yield. For this trial, seedlings of a TYLCV resistant variety ‘Tygress’ from a commercial greenhouse were transplanted 21 Feb at 18-inch spacing on 2 sets of 3 beds 235 ft in length and

covered with black polyethylene film mulch. A randomized complete block (RCB) design was used consisting of 9 treatments replicated 4 times. Each plot contained 24 plants with three left between plots as buffers. Approximately 20% of the fertilizer was preplant soil incorporated and 80% applied through the drip tape with 12-inch emitter spacing and drip rate of 0.36 gph per emitter.

Admire Pro was applied 28- Feb as a soil drench at 10.5 oz/acre to all plots except for those designated for untreated control, Grower Standard and Venom. Venom was applied at 6 oz/acre the same day in plots designated for that treatment and for the Grower Standard. Each plant was drenched with a 240 ml suspension delivered by an EZ-Dose® sprayer operating at a pressure of 45 PSI and a flow rate of 3.7 gallons per minute. Foliar sprays were applied with a single row high clearance sprayer operating at 200 psi and 2.3 mph with the spray delivered through two vertical booms fitted with yellow Albuz® hollow cone nozzles, each delivering 10 gpa. A single overhead nozzle was included on Apr -22 and all subsequent sprays. Total spray volume increased as nozzles were added to accommodate plant growth. The grower standard was included in one of the treatments receiving QRD416 at 2 qt/ac and the two treatments receiving Root and Flower Power (Tables). Root power and Como were applied weekly to appropriate plots by drenching with a 300 ml suspension applied with the EZ-Dose® sprayer operating as above. These drench solutions were applied into an open bottom plastic container buried in the ground approximately 4 inches on one side of the plant. Xentari (*bacillus thuringiensis*) was applied to control lepidopteron pests on 4-Apr, 17-Apr, 30-Apr, 13-May and 23 – May at a rate of 1.5 lbs/acre. Maintenance fungicides Kocide , Maneb and Pro-phyte were applied weekly to control foliar diseases at rates of 2 lb ,1 lb and 2.5 lb per acre, respectively.

Whitefly adults were evaluated every 7 days from 26- Mar to 21- May by counting all adults on five

leaflets from one mid-canopy level true leaf on 10 plants per plot. Immature stages were counted under a stereoscopic microscope from four 0.5 sq inch discs taken from each of three leaflets from one terminal trifoliolate taken from the 7th node of 4 centrally located plants in each plot on 9 – Apr, 23-Apr, 8-May and 21-May. Seven plants per plot were harvested on 30 -May and number, sizes, and weight of marketable fruit recorded.

Fewer adults were observed on all treated plants compared to the control on all sample dates except on 16 Apr for Venom alone or QRD416 alone following Admire Pro at either rate or for Admire Pro alone on 2, 9 16 Apr and 7, 14 May. Thus, more consistent control of adults was obtained with Venom alone than with Admire Pro alone and significant control was seen with QRD416 alone following Admire Pro on 8 out of 9 dates, surpassing the Grower Standard on 2 Apr. No other treatments improved adult control over the Grower Standard on any other date. The 4 qt/ac rate of QRD416 improved control over the 2 qt/ac rate on 3 of 9 dates. The Grower Standard began to outperform Venom alone by 23 Apr., indicating that the standard foliar applications were providing additional suppression at that time.

All treated plants had significantly lower densities of nymphs than untreated plants on all 4 sample dates, regardless of treatment. Fewer nymphs were seen on plants treated with Venom alone than Admire Pro alone on 23 Apr and 8 May. Fewer nymphs than the Grower Standard were seen 9 Apr on plants treated with QRD416 alone at 2 qt/ac following Admire Pro and the treatments including Root and Flower Power. The 4 qt/ac rate of QRD416 improved control over the 2 qt/ac rate only on 21 May.

Plants treated with the Root Power/Flower Power/Como combination yielded a significantly more fruit than all other treatments. Fruit weight from plants treated with the Grower Standard was also significantly greater than from plants treated with Admire Pro alone. Otherwise, there were no other

significant treatment effects on yield.

		Foliar applications by date and application volume (gal/ac)							
		24-Mar (40 )	31-Mar (40)	7-Apr (40)	15-Apr (60)	22-Apr (70)	28-Apr (90)	5-May (90)	13-May (90)
<u>Standard Spray Protocol*</u>									
Fulfill	50 WG	X							
Thionex	3EC		X			X			X
Knack	11 WG			X			X		
Oberon	2 SC				X			X	
QRD416**		X	X	X	X	X	X	X	X
Flower Power		X	X	X	X	X	X	X	X
Como		X	X	X	X	X	X	X	X

\*Standard spray protocol included in Grower Standard, Root power/Flower Power and Root Power/Flower Power/Como and QRD with standard treatments

\*\* Both 2 qt/acre and 4 qt/acre treatments.

Table 2:

Treatment	Rate/acre	Drench*	Standard Spray Protocol	Adults per leaf								
				26-Mar	2-Apr	9-Apr	16-Apr	23-Apr	30-Apr	7-May	14-May	21-May
Control	N/A	No	No	1.75 a	1.63 a	1.48 a	2.48 ab	3.40 a	7.78 a	3.45 a	2.76 a	2.02 a
Admire	10.5 fl oz	A	No	0.88 b	1.33 a	1.03 ab	2.80 a	1.80 b	5.08 b	3.13 a	2.45 a	1.53 b
Venom	6.0 oz	V	No	0.35 c	0.80 b	0.63 bcd	1.73 bcd	1.18 bc	2.53 cd	1.88 b	1.90 b	1.30 bc
Grower Std	Variable	V	Yes	0.55 bc	0.65 b	0.40 d	1.1 d	0.25 e	1.05 e	0.98 c	0.38 cd	0.30 ef
QRD416	2 qts	A	No	0.43 c	0.55 b	0.98 b	2.43 abc	1.78 b	3.35 c	1.65 b	1.90 b	1.05 cd
QRD416	4 qts	A	No	0.30 c	0.43 bc	0.48 cd	2.60 ab	0.98 bc	1.90 de	0.88 c	0.83 c	0.68 de
QRD416	2 qts	A	Yes	0.38 c	0.13 c	0.55 bcd	1.30 d	0.38 de	0.93 e	0.90 c	0.38 cd	0.20 f
Root Power	1 pt	A	Yes	0.98 b	0.45 bc	0.58 bcd	1.50 d	0.33 de	0.83 e	0.68 c	0.18 d	0.23 f
Flower Power	1 pt											
Root Power	1 pt	A										
Flower Power	1 pt		Yes	0.56 bc	0.43 bc	0.93 bc	1.55 cd	0.38 de	1.40 e	0.95 c	0.23 d	0.50 ef
Como	1 pt											

\* A = AdmirePro @ 10.5 oz/ac; V = Venom at 6 oz/ac.

Table 3:

Nymphs per 2 sq inches

Treatment	Rate/acre	Drench*	Standard Spray Protocol	Nymphs per 2 sq inches			
				9-Apr	23-Apr	8-May	21-May
Control	N/A	No	No	10.17 a	9.75 a	12.23 a	24.67 a
Admire	10.5 fl oz	A	No	3.13 bc	6.63 b	9.96 b	16.02 b
Venom	6.0 oz	V	No	2.67 bc	2.29 cde	5.83 d	15.89 b
Grower Std	Variable	V	Yes	3.83 b	0.98 e	1.48 e	0.69 d
QRD416	2 qts	A	No	2.23 c	3.81 c	7.92 c	16.35 b
QRD416	4 qts	A	No	3.00 bc	3.23 cd	6.44 cd	11.77 c
QRD416	2 qts	A	Yes	2.50 bc	1.04 e	0.71 e	0.33 d
Root Power	1 pt	A	Yes	1.96 c	2.13 de	1.79 e	0.98 d
Flower Power	1 pt						
Root Power	1 pt	A	Yes	2.25 c	1.31 e	1.35 e	1.13 d
Flower Power	1 pt						
Como	1 pt						

Table 4

Harvested May 30 2008

Treatment	Rate/acre	Drench*	Standard Spray Protocol	Harvested May 30 2008	
				Fruit (No.)	Fruit (Wt - lbs)
Control	N/A	No	No	146.3 b	61.7 bc
Admire	10.5 fl oz	A	No	120.8 b	50.8 c
Venom	6.0 oz	V	No	147.5 b	68.3 ab
Grower Std	Variable	V	Yes	138.3 b	57.8 bc
QRD416	2 qts	A	No	130.3 b	52.0 c
QRD416	4qts	A	No	129.5 b	55.5 bc
QRD416	2 qts	A	Yes	134.0 b	56.4 bc
Root Power	1 pt	A	Yes	128.5 b	53.8 bc
Flower Power	1 pt				
Root Power	1 pt	A	Yes	184.8 a	76.7 a
Flower Power	1 pt				
Como	1 pt				

**Part II: Materials Tested for Arthropod Management**

**TOMATO:** *Lycopersicon esculentum* Mill. ‘Tygress’

**CONTROL OF SILVERLEAF WHITEFLY ON STAKED TOMATO WITH INSECTICIDES,  
2008**

**Philip A. Stansly**

University of Florida/ IFAS

Southwest Florida Res. and Ed. Center

2686 State Road 29 North

Immokalee, FL 34142-9515

Phone: (239) 658-3427

Fax: (239) 658-3469

Email: pstansly@ufl.edu

Common name	Trade name	Concentration/ Formulation	Chemical name	Manufacture/source
imidacloprid	Admire Pro	4.6 SC	1_((6-Chloro-3-pyridinyl)methyl)-N-nitro-2-imidazolidinimine	Bayer CropScience LP P.O. Box 12014 1 T.W. Alexander Drive Research Triangle Park, North Carolina 27709
spiromesifen	Oberon	2SC	2-oxo-3-(2,4,6-trimethylphenyl)-1-oxaspiro(4,4)non-3-en-4-yl 3,3-dimethylbutanoate	Bayer CropScience LP P.O. Box 12014 1 T.W. Alexander Drive Research Triangle Park, North Carolina 27709

Pyriproxyfen	Knack	11 WG	2-(1-Methyl-2(4 – phenoxyphenoxy)ethoxy)pyridine	Valent Biosciences Corporation 870 Technology Way Suite 100 Libertyville IL 60048
Pymetrozine	Fulfill	50 WG	Pymetrozine	Syngenta Crop Protection P.O. Box 18300 Greensboro, NC 27419
Experimental	QRD 416		Experimental	AgraQuest 1540 Drew Avenue Davis, CA 95618
Dinotefuran	Venom	70 SG	N-methyl n-nitro n((tetrahydro-3-furanyl)methyl)guanidine	Valent Biosciences Corporation 870 Technology Way Suite 100 Libertyville IL 60048
Endosulfan	Thionex	3 EC	Hexachlorohexahydromethano-2,4,3 –benzodioxathiaepin-3-oxide	Makhteshim Agan of North America Inc. 4515 Falls of Neuse Rd. Suite 300 Raleigh NC 27609
Plant Fertilizer	Root Power		Boron (B) 1.0% Zinc (Zn).4.0% 4.0% chelated Zinc (Zn)	Stoller Enterprises, Inc. 4001 W. Sam Houston Parkway North, Suite 100 Houston Texas 77043 USA
Plant Fertilizer	Flower Power		Boron (B) 3.0% Copper (Cu) 0.1% 0.1% Chelated Copper Molybdenum (Mo) 0.02% Zinc (Zn) 4.0% 4.0% Chelated Zinc Derived from Boric Acid, Copper Chloride, Sodium Molybdate and Zinc Oxide chelated with Ethanol, 2-amino-2-hydroxy-1,2,3-propanetricarboxylate. MAXIMUM Chloride (Cl) content is less than 0.1%	Stoller Enterprises, Inc. 4001 W. Sam Houston Parkway North, Suite 100 Houston Texas 77043 USA
Cobalt Molybdenum Enhancer	Como Classic		Cobalt (Co). 2.0% Molybdenum (Mo) 3.0%	Stoller Enterprises, Inc. 4001 W. Sam Houston Parkway North, Suite 100 Houston Texas 77043 USA