

(E)

TOMATO: *Lycopersicon esculentum* (Mill.) ‘Florida 47’ ‘Tygress’

**CONTROL OF SILVERLEAF WHITEFLY AND INCIDENCE OF TOMATO YELLOW
LEAF CURL VIRUS ON STAKED TOMATO WITH INSECTICIDES AND RESISTANT
VARIETIES, 2006**

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

Robert E. Riefer

Silverleaf whitefly (SLW): *Bemisia argentifolii* Bellows & Perring

Reduced yield due to whitefly-borne tomato yellow leafcurl virus (TYLCV) is a major constraint to tomato production in southwest Florida. Integration of insecticidal control and disease resistant

varieties would provide benefits of both management tactics to avoid yield loss. On 22 Feb, tomato seedlings from a commercial greenhouse were transplanted at 18-inch spacing on 2 sets of 3 beds 240 ft in length and covered with polyethylene film mulch, black side up. The center bed in each set of 3 was planted in the TYLCV-susceptible 'Florida 47' and left untreated to serve as the untreated check and as source of whiteflies and virus. The remaining 8 treatments (Table 1) were randomized among 31 ft. plots in a complete block design replicated 4 times. Liquid formulations of Platinum and Admire Pro were applied as soil drenches in 50 ml of solution 2 days later. Approximately 20% of the fertilizer was preplant soil incorporated with the remaining 80% applied through drip irrigation. Foliar sprays were applied with a single row high clearance sprayer operating at 200 psi and 2.4 mph with the spray delivered through two vertical booms fitted with yellow Albuz® hollow cone nozzles, each delivering 10 gpa. Two nozzles per boom were used to apply 40 gallons per acre when plants were small, additional nozzles being added later to maintain spray coverage to a maximum of 4 nozzles per boom to deliver 80 gpa. As nozzles were added, concentration was adjusted to maintain a constant product rate per acre. Fungicides Kocide and Manzate 75 DF were applied weekly to control foliar diseases at rates of 3 lbs and 1.5 lbs per 100 gallons, respectively. Eleven weekly evaluations of whitefly adults were made beginning 15 Mar. by beating 1 side of 8 plants per plot with a 9 x 13 inch pie pan painted black and coated with spray-on oil. Immature stages were monitored 10 times weekly beginning 30 Mar by counting all whitefly stages appearing in a 2 cm area ring placed on each leaflet of the 3 terminal leaflets collected using 1 trifoliate leaf removed from the 6th node of 4 centrally located plants in each plot. Plants were evaluated weekly for the presence of TYLCV symptoms. Fruit was harvested weekly for 5 weeks from the 8 plants per plot beginning 4 May. Number and weight of marketable fruit and culls were recorded.

Average numbers of whitefly adults during the first six weeks of the trial were low, although numbers

increased dramatically during the subsequent five weeks. Most adult whiteflies were observed on untreated 'Tygress' plants, although not significantly more than on untreated 'Florida 47' (Table 2). Numbers of adults on plants treated with the low (8 oz) rate of Platinum followed by the standard spray combination were not different from either untreated check. Fewest whiteflies were observed on plants treated with Admire at planting, followed by the low rate of NNI-0101, though not less than plants receiving the same treatments except with the higher rate of NNI-0101. These in turn were not significantly different from plants sprayed with the standard combination or with oil following the Admire drench. Fewest whitefly eggs were seen on plants sprayed following the Admire drench with the high rate of NNI-0101 twice and Courier once or weekly with JMS Stylet oil. There were no differences compared to the untreated controls exhibited by the other treatments. More small nymphs were seen over all sample dates on untreated 'Florida-47' than all treated plants, with no differences between untreated varieties. Fewest small nymphs were seen on plants drenched with Admire and receiving the standard sprays or the high rate of NNI-0101, although not significantly so compared to all other treatments except JMS oil. More large nymphs were seen on unsprayed 'Florida 47' than unsprayed 'Tygress', with no differences between this latter control and all remaining treatments except the high (11 oz) rate of Platinum. No virus symptoms were seen on the 'Tygress' plants except for one possible case in an unsprayed plot. However, few plants were observed with symptoms of TYLCV until the end of the trial, and the distribution of symptomatic plants did not seem to correlate well with whitefly populations on the susceptible variety. For instance, plants treated with 11 oz of Platinum exhibited significantly higher incidence of diseased plants than the untreated susceptible control. All treated plants yielded more marketable fruit than untreated plants, with most harvested from 'Tygress' receiving the standard treatment, although not significantly more than all other treatments except plants oil, Platinum and the control. Similarly, fewest culls were taken from plants

receiving the standard treatment regardless of variety, though not significantly less than plants receiving either rate of Platinum, NNI-0101 or oil. In conclusion, resistant varieties showed little or no virus symptoms, although yields were not significantly different from susceptible plants, probably because of low virus incidence. NNI-0101, a feeding inhibitor, provided control of whiteflies comparable to the standard treatment of adults. Weekly oil treatment after the Admire drench also provided good whitefly control although the yield suffered somewhat, comparable to plants treated with Platinum at the low rate followed by the standard spray regimen. The trial did not demonstrate a clear advantage to using the resistant variety under conditions of low virus pressure, but there was certainly no disadvantage in utilizing this form of insurance against the worst consequences of whitefly and TYLCV.

Table 1

Treatment				Week Insecticide Applied													
no	Cultivar	Product	Rate	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Tygress	untreated	--														
2	Florida 47	untreated	--														
3	Tygress	Admire Pro 4.6L	7 fl oz per acre		x												
		Oberon 2SC	8 fl oz per acre								x		x				
		Knack .86L	9 fl oz per acre											x	x		
4	Florida 47	Admire Pro 4.6L	7 fl oz per acre		x												
		Oberon 2SC	8 fl oz per acre								x		x				
		Knack .86L	9 fl oz per acre											x	x		
5	Florida 47	Platinum 2SC	8 fl oz per acre		x												
		Oberon 2SC	8 fl oz per acre								x		x				
		Knack .86L	9 fl oz per acre											x	x		
6	Florida 47	Platinum 2SC	11 fl oz per acre		x												
		Oberon 2SC	8 fl oz per acre								x		x				
		Knack .86L	9 fl oz per acre											x	x		

7	Florida 47	Admire Pro 4.6L	7 fl oz per acre		x													
		JMS Stylet Oil	1 % v/v				x		x	x	x	x	x	x	x	x	x	x
8	Florida 47	Admire Pro 4.6L	7 fl oz per acre		x													
		Courier 40SC	12 fl oz per acre													x		
		NNI-0101	0.2 lb per acre a.i.								x		x				x	
9	Florida 47	Admire Pro 4.6L	7 fl oz per acre		x													
		Courier 40SC	12 fl oz per acre													x		
		NNI-0101	0.3 lb per acre a.i.								x		x				x	

Table 2

Treatment	Adults (no./8 beats)	Eggs (no./6 cm ²)	Small Nymphs (no./6 cm ²)	Large Nymphs (no./6 cm ²)	TYCLV (%)	Marketable (lbs/8 plants)	Unmarketable (lbs/8 plants)
1	21.3 a	1.6 abc	4.13 ab	0.68 b	1.3 bc	20.3 c	58.0 ab
2	18.6 ab	2.5 ab	5.70 a	1.55 a	6.3 bc	19.8 c	62.9 a
3	10.4 cde	1.55 abc	1.2 cd	0.38 bc	0.0 c	40.8 a	35.6 d
4	12.1 cd	0.75 c	1.03 d	0.3 bc	10.5 ab	35.2 ab	36.8 c
5	15.9 abc	2.6 a	1.30 cd	0.23 bc	5.3 bc	28.9 b	49.8 bc
6	14.0 bc	2.5 ab	1.63 cd	0.05 c	28.3 a	34.7 ab	45.0 cd
7	10.4 cde	1 bc	3.13 bc	0.58 b	2.3 bc	32.4 b	44.7 cd
8	6.1 e	1.25 abc	1.48 cd	0.38 bc	2.3 bc	35.5 ab	48.3 bc
9	7.1 de	1.13 abc	0.78 d	0.33 bc	7.8 abc	34.2 ab	49.3 bc

Means within each column not followed by the same letter are significantly different (LSD, P<0.05)

Part II: Materials Tested for Arthropod Management

TOMATO: *Lycopersicon esculentum* Mill. 'Florida 47'

CONTROL OF SILVERLEAF WHITEFLY AND INCIDENCE OF TOMATO YELLOW LEAF CURL VIRUS (TYLCV) ON STAKED TOMATO WITH NEONICATINOID AND OTHER INSECTICIDES, 2006

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/ Cultivar	Concentration/ Formulation	Chemical name	Manufacture/source
buprofezin	Courier	40SC	(2-tert-butylimino-3-isopropyl-5-phenylperthydro-1,3,5-thiadiazin-4-one)	Nichino America, Inc. 4550 New Linden Hill Road, Suite 501 Wilmington, DE 19808
horticultural oil	JMS Stylet Oil	97.1 % E	parafinic distillate, non-ionic emulsified	JMS Flower Farms, Inc. 4423 5 th Place, SW Vero Beach, FL. 32968
imidacloprid	Admire Pro	4.6FL	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
pyriproxyfen	Knack	.86EC	(2-(1-methyl-2-(4- phenoxyphenoxy)ethoxy)pyridine)	Valent U.S.A. Corporation 1333 N. California Blvd., Suite 600 Walnut Creek, CA 94596

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
thiamethoxam	Platinum	2SC	4H-1,3,5-Oxadiazin-4-imine,3-((2-chloro-5-thiazolyl)methyl)tetrahydro-5-methyl-N-nitro-	Syngenta Crop Protection P.O. Box 18300 Greensboro, NC 27419
Not given	NNI-0101	L	Not Given	Nichino America, Inc. 4550 New Linden Hill Road, Suite 501 Wilmington, DE 19808