

**E89**

**TOMATO:** *Lycopersicon esculentum* Mill., ‘Tygress’ and ‘BHN-602’

**CONTROL OF SILVERLEAF WHITEFLY WITH FOLIAR AND SOIL APPLIED INSECTICIDES ON TYLCV RESISTANT AND SUSCEPTIBLE STAKED TOMATOES, 2010**

**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

**Barry C. Kostyk**

Email: bkostyk@ufl.edu

**Robert Riefer**

Email: reriefer@ufl.edu

Sweetpotato whitefly: *Bemisia tabaci* (Gennadius) – biotype B

SWF biotype B also known as *B. argentifolii* is the key tomato pest in Florida due to its role as vector of tomato yellow leaf curl virus (TYLCV), as well as the cause of the physiological disorder, tomato irregular ripening. These conditions can cause dramatic loss of fruit yield and quality respectively. Seedlings of a TYLCV resistant variety ‘Tygress’ and a susceptible variety BHN-602 obtained from a commercial greenhouse were transplanted at the Southwest Florida Research and Education Center in Immokalee Florida on 23 Mar. Plants were spaced 18-inches apart on 2 sets of 3 beds 235 ft in length covered with black polyethylene film mulch after incorporating approximately 25% of the fertilizer (13-2-13 NPK) with the rest later injected as liquid 8-0-8 through drip tape with 4 inch emitter spacing. The center row was left untreated throughout the trial with 8 treatments arranged on the other 4 beds in a RCB design. Plots in the four treated rows contained 19 plants, with a single plant left between plots as buffer. Plots were split into two subplots of 9 TYLCV susceptible (‘BHN-602’) and 9 resistant (‘Tygress’) plants separated by a TYLCV symptomatic plant in the middle from a local farm to provide virus inoculum. Soil drenches of Scorpion, Coragen and Admire were made 24 Mar by delivering a 120 ml suspension using an EZ-Dose® sprayer operating at a pressure of 45 psi and a flow rate of 3.7 gpm. Foliar sprays (Table 1) were applied with a single row high clearance sprayer operating at 180 psi and 2.3 mph. The sprayer was fitted with two vertical booms equipped with yellow Albuz® hollow cone nozzles, each delivering 10 gpa. Total spray volume increased as nozzles were added to accommodate plant growth and are reported in Table 1. A standard used for 4 of the treatments consisted of 2.75 oz of Fulfill on 4 May, tankmix of of Courier (9 oz) and Thionex (21 oz) on 18 May, and 9 oz of Courier on 3 Jun. Xentari (*Bacillus thuringiensis*) was applied to control lepidopteron pests on 19, 24 May and 3,9,13 Jun. Maintenance fungicides Kocide, Maneb and Pro-phyte were applied weekly starting on 29 May to control foliar diseases at rates of 2 lb, 1 lb and 2.5 lb per acre, respectively. Whitefly adults were evaluated weekly from 8 Apr to 9 Jun on five leaflets from one mid-canopy level true leaf on 4 plants per subplot. Immature stages from 3 plants in each subplot were counted on 4,17, 31 May under a stereoscope microscope from eight 0.5 sq inch discs cut from each of three leaflets of one terminal 7th node trifoliolate. Samples on 9 Jun (adults) and 9 and 14 Jun (nymphs) were only obtained from ‘Tygress’ plants due to severe leaf distortion on TYLCV infected ‘BHN-602’ plants. All plants were inspected weekly and the date of symptom appearance recorded. Fruit of marketable size was harvested from 6 plants in each sub-plot on 2 and 16 Jun. Fruit was culled for defects due to stink bug damage, bacterial spot and surface deformities such as shoulder cracking and zippering and number, size, and weight of marketable fruit recorded. Data were subjected to ANOVA and means separated using LSD (P = 0.05) are presented.

Whitefly infestation was initially light due to cold weather including freezes. Fewer adults than the control were seen with all treatments on 8 Apr except for Coragen drenches and AdmirePro + Movento whereas only AdmirePro + Movento, Oberon or Rimon provided significant control on 5 May (Table 2). All products provided significant control of adults for the next 5 weeks although drenches of Scorpion and the low rate of Coragen followed by standard sprays failed to do so on 9 Jun. Over all dates, fewest whiteflies were seen with AdmirePro drenched followed by either sprays of Movento or Oberon although not significantly different from AdmirePro drenched followed by either standard sprays or Rimon. Nymphs were most reduced on 4 May by Scorpion, followed by the high rate of Coragen which was not different from one of the 7 oz AdmirePro drench treatments, the sprays having not yet been applied (Table 3). On 17 May, only applications of Scorpion followed by the standard or AdmirePro followed by Movento, Oberon or Rimon sprays gave control. These first 3 again gave best control of whitefly nymphs on 31 May followed by AdmirePro + Rimon or standard sprays or the high rate of Coragen drench + standard sprays, with all treatments significantly better than the control. AdmirePro + Rimon gave best control of nymphs on 8 Jun, though not different from any of the treatments including AdmirePro or Scorpion. However, this latter, along with treatments including Coragen were not different from the control. Treatment effects on the percentage of ‘BHN-602’ plants showing symptoms of TYLCV were significant only on 27 May, when fewest were seen from the

treatment with Scorpion + the standard though not different from AdmirePro with either Movento or Rimon or Oberon. However, this latter along with the remaining treatments was not different from the control. Surprisingly, higher yields of marketable fruit were seen from the susceptible ‘BHN-602’ plants due to excessive cracking and zippering of ‘Tygress’ fruit (Table 4). Greater yields were seen from all treated plants compared to the control, with no differences among treatments regardless of variety. No phytotoxicity was observed for any of the treatments.

Table 1.

Product/ formulation	Rate amt product/ acre	Application Dates			
		24 Mar (120 ml/plant)	4 May (60 GPA)	18 May (60 GPA)	3 Jun (80 GPA)
Untreated					
Admire Pro 4.6 SC	7.0 oz	x			
Fulfill 50 WG	2.75 oz		x		
Courier 1.67 SC	9.0 oz			x	x
Thionex 3 EC	21.0 oz			x	
Coragen 1.67 SC	5.0 oz	x			
Fulfill 50 WG	2.75 oz		x		
Courier 1.67 SC	9.0 oz			x	x
Thionex 3 EC	21.0 oz			x	
Coragen 1.67 SC	7.0 oz	x			
Fulfill 50 WG	2.75 oz		x		
Courier 1.67 SC	9.0 oz			x	x
Thionex 3 EC	21.0 oz			x	
Scorpion 35 SL	10.3 oz	x			
Fulfill 50 WG	2.75 oz		x		
Courier 1.67 SC	9.0 oz			x	x
Thionex 3 EC	21.0 oz			x	
Admire Pro 4.6 SC	7.0 oz	x			
Movento 2 SC	5.0 oz		x	x	
Admire Pro 4.6 SC	7.0 oz	x			
Oberon 2SC	8.5 oz		x	x	
Admire Pro 4.6 SC	7.0 oz	x			
Rimon 0.83 EC	12.0 oz		x	x	x

Table 2.

Treatment	Adult whitefly per 5 leaflets							
	8-Apr	5-May	12-May	19-May	25-May	1-Jun	9-Jun	ALL DATES
Untreated	0.63a	2.09a	2.63a	1.84a	3.44a	4.66a	3.28a	1.99a
Admire Pro + Std	0.09c	1.56abc	1.81b	0.59c	1.75bc	1.31cde	1.21bc	0.96bc
Coragen 5.0 oz + Std	0.41ab	1.47abc	1.78b	0.88bc	2.25b	1.75bcd	2.38ab	1.19b
Coragen 7.0 oz + Std	0.50ab	1.66abc	1.72b	0.56c	2.34b	2.28b	1.81bc	1.21b
Scorpion + Std	0.03c	1.94ab	1.53b	0.69c	1.47c	1.78bc	2.38ab	1.10b
Admire Pro + Movento	0.41ab	1.13c	1.19b	1.03bc	1.38c	0.81e	1.06c	0.78c
Admire Pro + Oberon	0.28bc	1.28bc	1.72b	0.53c	1.38c	0.90de	0.78c	0.81c
Admire Pro + Rimon	0.22bc	1.09c	1.60b	1.38ab	1.41c	1.66 bcde	0.84c	0.95bc

Means followed by the same letter within a column are not statistically different (LSD P>0.05).

Table 3.

Treatment	Total Number of Nymphs/4 square inches				% of BHN-602 with TYLCV symptoms
	4 May	17 May	31 May	14 Jun	27 May
Untreated	9.30ab	33.58a	51.4a	50.33a	86.11ab
Admire Pro + std	9.08abc	23.38ab	24.68c	23.17bcd	83.33ab
Coragen 5.0 oz + std	7.17abc	26.71ab	37.00b	36.58abc	91.32ab
Coragen 7.0 oz + std	6.00c	25.83ab	27.79c	37.50ab	91.67a
Scorpion + std	2.42d	11.46c	12.54d	34.50abcd	51.39c
Admire Pro + Movento	6.63bc	12.17c	5.67d	16.33cd	63.89bc
Admire Pro + Oberon	10.04a	11.67c	9.50d	17.33bcd	75.00abc
Admire Pro + Rimon	8.71abc	18.79bc	21.29c	14.58d	63.89bc

Means followed by the same letter within a column are not statistically different (LSD  $P > 0.05$ )

Table 4.

Treatment	Marketable Fruit both harvests (No.)	
	BHN-602	Tygress
Untreated	50.8a	31.0a
Admire Pro + std	88.5b	49.5b
Coragen 5.0 oz + std	87.3b	45.2b
Coragen 7.0 oz + std	71.8b	43.5b
Scorpion + std	78.0b	45.7b
Admire Pro + Movento	72.3b	45.0b
Admire Pro + Oberon	80.8b	46.5b
Admire Pro + Rimon	76.0b	50.75b

Means followed by the same letter are not significantly different (LSD  $P < 0.05$ ).