

(E96)

**TOMATO:** *Lycopersicon esculentum* Mill., 'Neptune'

**IMPACT OF INSECTICIDES ON SILVERLEAF WHITEFLY  
AND TOMATO YELLOW LEAF CURL VIRUS (TYLCV)  
ON STAKED TOMATO, 2000**

**P. A. Stansly, J. M. Conner, and D.R. Peach**

University of Florida/IFAS

Southwest Florida Research and Education Center

2686 State Road 29 North

Immokalee, FL 34142-951

Phone: (941) 658-3427

Fax: (941) 658-3470

E-mail: [pas@icon.imok.ufl.edu](mailto:pas@icon.imok.ufl.edu)

Silverleaf whitefly: *Bemisia argentifolii* Bellows & Perring

TYLCV is a devastating whitefly-vectored disease of tomato that has spread from the Mediterranean to the Caribbean region including Florida. Along with cultural control, such as host free periods, insecticidal control of the vector is the key to present-day management of TYLCV. Greenhouse-raised seedlings were planted 9 Mar at 18-inch spacing on two sets of three drip irrigated beds, 240 ft long on 6-ft centers. The outer two beds of each set were divided into seven plots, each 34 ft long, and assigned to treatments in a CRB design with four replications. The middle row of each three-bed set was left untreated to serve as a source of whiteflies. On 16 Mar, two tomato plants that had been exposed to TYLCV infected whiteflies were transplanted in the center of each plot to provide a source of virus inoculum. Admire 2F and Platinum 2 SC were applied as soil drenches on 13 Mar in 10 ml water per plant. Two treatments, one with the half rate of Admire and one with no Admire, received weekly applications, 11 in total, of Neemix beginning 1 Mar when the plants were still in the transplant trays. Actara 25 WG was applied as a foliar spray on 21 Mar, 11 Apr, and 2 May. Applaud 70 WP was applied 11 Apr and the same plots sprayed with Knack 0.86 EC on 2 May. Foliar applications were made using a high clearance sprayer driven by a hydraulic pump operating at 200 psi and delivering the spray through two drop booms equipped with two yellow hollow cone ceramic Albus nozzles each at a rate of 44 gpa until 11 Apr when another nozzle was added to each drop for an output of 66 gpa for the remaining applications. Seven weekly evaluations of whitefly adults were made beginning 10 Apr by beating one side of four plants at four locations per plot with a 9 x 13-inch pie pan painted black and coated with a 9:1 mixture of vegetable oil and liquid detergent. Immature stages were monitored from one leaf removed from the 6th node of four centrally located plants in each plot. All whitefly stages were counted that appeared in a 2-cm<sup>2</sup> ring placed four times on each leaflet using three leaflets from each leaf collected. Plants were monitored every 3 or 4 days for symptoms of TYLCV. On 26 May, 15 plants per plot were harvested and the number and weights of insect, disease, and marketable fruit were recorded.

Whitefly populations were sufficient to move virus rapidly from inoculum plants into treated plants. Soil drenches of Admire or Platinum provide the most rapid response in whitefly numbers, with significant differences from the untreated check throughout the study period. Significant differences were seen in plants treated with Actara by the second week, and with Knack rotated with Applaud by the third week. Significantly fewer adults than in the untreated check were seen on plants sprayed with Neemix on 10 Apr, 15 May, and over all dates. Fewest whitefly adults over all dates were seen on plants treated with Admire at the full rate, significantly less than on plants treated with Platinum or the Knack and Applaud rotation. All treatments were significantly different from the untreated check. Fewer eggs were seen over all dates on plants treated with Platinum, although not significantly less than those treated with Admire at the full rate, Neemix, or Actara. Fewest nymphs were seen on plants treated with Platinum, and were significantly less on all treatments than on the untreated check, except Knack + Applaud, which had no overall effect. Best overall control of nymphs + pupae was obtained with Platinum, with no significant difference between the full and half rates of Admire + Neem. All treatments were significantly different from the untreated check. Incidence of TYLCV at 25 and 32 days was significantly reduced by all treatments except by Knack + Applaud. Fewest symptomatic plants were seen from 32 through 60 days in plots drenched with Admire or Platinum. Only plants treated with Platinum produced significantly greater numbers of fruit than the untreated check, although fruit weight was significantly greater from plants treated with Admire at the full rate as well. This trial demonstrated that only soil drenches of choricotinoid insecticides were able to protect plants from an early and heavy attack of viruliferous whiteflies. Nevertheless, significant whitefly control was also observed from Actara, Knack + Applaud and Neemix.

TABLE 1.

Treatment/ formulation	Rate lb (AI)/acre	No. whitefly adults/4 plants (one side only)							Means overall dates
		10 Apr	17 Apr	24 Apr	1 May	8 May	15 May	22 May	
Admire 2F	0.250	1.07 c	4.44 b	2.32 c	4.25 b	13.4 bc	37.8 e	51.5 cd	16.39 e
Admire 2F + Neemix 4.5%	0.125 0.012	2.69 c	7.9 c	3.07 c	7.19 b	17.3 b	54.0 bcd	59.1 bcd	21.59 cd
Neemix 4.5%	0.012	6.00 b	14.6 a	6.13 ab	21.3 a	44.5 a	61.8 b	66.2 abc	31.49 b
Knack .86 EC rotated with Applaud 70 WP	0.055 0.350	7.50 ab	17.1 a	5.38 b	8.32 b	15.5 bc	40.2 de	48.0 d	20.26 cde
Platinum 2SC	0.172	2.00 c	5.75 b	2.50 c	5.63 b	8.94 c	43.0 cde	65.0 abc	18.94 de
Actara 25 WG	0.0625	8.63 a	7.38 b	4.25 bc	8.13 b	12.2 bc	56.2 bc	71.2 ab	23.97 c
Untreated check	----	7.82 ab	17.2 a	8.00 a	22.2 a	44.4 a	81.8 a	77.9 a	37.03 a

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

TABLE 2.

Treatment/ formulation	Rate lb (AI)/acre	No. whitefly immatures/8 cm <sup>2</sup> leaf area							
		Eggs		Nymphs +Pupae		Eggs		Nymphs +Pupae	
		10 Apr		17 Apr		24 Apr		1 May	
Admire 2F	0.250	0.11 b	0.11 c	0.38 c	0.38 b	0.15 bc	0.173 c	0.09 b	1.63 bc
Admire 2F + Neemix 4.5%	0.125 0.012	0.02 b	0.11 c	0.48 bc	0.70 b	0.42 a	1.04 c	0.20 ab	2.28 b
Neemix 4.5%	0.012	0.09 b	0.65 bc	0.59 abc	2.25 a	0.21 abc	4.10 a	0.48 a	5.04 a
Knack .86 EC rotated with Applaud 70 WP	0.055 0.350	0.59 a	1.33 a	1.19 a	2.00 a	0.34 ab	2.21 b	0.34 ab	1.67 bc
Platinum 2SC	0.172	0.20 b	0.06 c	0.09 c	0.38 b	0.02 c	0.44 c	0.00 b	0.52 c
Actara 25 WG	0.063	0.36 ab	0.48 c	0.63 abc	0.83 b	0.04 c	1.06 c	0.09 b	1.06 bc
Untreated check	----	0.56 b	1.12 ab	1.04 ab	2.50 a	0.14 bc	4.56 a	0.46 a	5.52 a
		8 May		15 May		22 May		Means over all dates	
Admire 2F	0.250	0.13 bc	1.67 cd	0.84 ab	2.13 b	0.15 bc	2.15 bcd	0.26 cd	1.18 cd
Admire 2F + Neemix 4.5%	0.125 0.012	0.65 a	1.54 bc	0.81 ab	1.98 b	0.61 ab	3.48 b	0.46 bc	1.59 c
Neemix 4.5%	0.012	0.07 bc	2.33 b	0.25 b	4.33 a	0.00 c	3.08 bc	0.24 cd	3.11 b
Knack .86 EC rotated with Applaud 70 WP	0.055 0.350	0.19 bc	2.20 b	1.23 ab	1.48 b	1.09 a	0.42 d	0.71 a	1.61 c
Platinum 2SC	0.172	0.15 bc	0.46 d	0.19 b	0.77 b	0.32 bc	1.50 cd	0.11 d	0.58 e
Actara 25 WG	0.063	0.00 c	0.27 d	0.61 ab	1.56 b	0.07 c	0.63 d	0.26 cd	0.84 cd
Untreated check	----	0.38 ab	4.84 a	1.80 a	3.86 a	0.30 bc	5.32 a	0.67 ab	3.96 a

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

TABLE 3.

Treatment/ formulation	Rate lb (AI)/acre	% TYLCV incidence <sup>a</sup>						Total marketable fruit <sup>b</sup>	
		25 d <sup>c</sup>	32 d	39 d	46 d	53 d	60 d	No.	Wt (lb)
Admire 2F	0.250	1 b	14 d	29 c	37 d	48 d	66 e	28.8 ab	8.2 a
Admire 2F + Neemix 4.5%	0.055 0.350	5 b	33 c	52 b	62 bc	69 c	78 cd	26.3 abc	7.5 ab
Neemix 4.5%	0.012	2 b	35 bc	79 a	93 a	97 ab	98 ab	25.4 bc	7.0 ab
Knack .86 EC rotated with Applaud 70 WP	0.055 0.350	14 a	54 a	74 a	86 a	95 ab	98 ab	21.5 c	6.1 b
Platinum 2SC	0.172	1 b	13 d	32 c	50 c	65 c	75 de	30.9 a	8.4 a
Actara 25 WG	0.063	3 b	33 c	60 ab	72 b	85 b	88 bc	24.6 bc	6.4 b
Untreated check	----	11 a	51 ab	73 a	88 a	100 a	100 a	23.8 bc	6.4 b

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

<sup>a</sup> Percentage of total plants showing symptoms of TYLCV, (harvest at 71 days was same as 60 days).

<sup>b</sup> Harvested 15 plants per plot.

<sup>c</sup> Days after inoculum plants introduced in field.