(E87)

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

IMPACT OF INSECTICIDES ON SILVERLEAF WHITEFLY AND SPREAD OF TOMATO YELLOW LEAFCURL VIRUS (TYLCV) ON STAKED TOMATO, 2002

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Silverleaf whitefly (SLWF): *Bemisia argentifolii* (Bellows & Perring)
Tomato pinworm (TPW): *Keifeira lycopersicella* (Walsingham)
Leafminer (LM): *Liriomyza trifolii* (Burgess)

Silverleaf whitefly (SLW) is the key pest of tomato in Florida, in large part because of its role as vector of TYLCV. Insecticidal control of the vector is the primary strategy used to reduce secondary spread of the disease within in the field. For this trial, greenhouse-raised seedlings were planted 25 Mar at 18-inch spacing on two sets of three drip irrigated beds, 240 ft long on 6 ft centers. The middle row of each three-bed set was left untreated to serve as a source of whiteflies while the outer two beds of each set were divided into 8 plots, each 30 ft long and assigned to treatments in an RCB design with four replications. Admire 2F and Platinum 2 SC each at two rates were applied as soil drenches on 27 Mar in 20 ml of water per plant. In the course of a pretreatment count made on 9 Apr by inverting the first fully expanded leaf of 25 per replication, 44% were observed to have whitefly adults present with a mean population of 0.65 adults per leaf. The remaining products were applied beginning 10 Apr in six weekly foliar applications a rate of 44 gpa using a high clearance sprayer driven by a hydraulic pump operating at 200 psi and delivering the spray through two drop booms each equipped with two yellow hollow cone ceramic Albuz nozzles. On 1 May, an additional nozzle was added to each drop for an output of 66 gpa for the remaining three applications. Five weekly evaluations of whitefly adults were made beginning 16 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 10 centrally located plants in each plot. All whitefly stages were counted that appeared in a 2.2 cm^2 ring placed four times on the terminal leaflet from each leaf collected. Live leaf miner and pinworm larva were also noted on the same leaflets on all but the first sample date. Plants were monitored weekly for symptoms of TYLCV until 13 May when 100% of the plants showed TYLCV symptoms. On 22 May, 12 plants per plot were harvested and the number and weights of insect, disease and marketable fruit were recorded.

Leafminer (LM) was most reduced on plants treated with DPX-002. Tomato pinworm (TPW) pressure was low. On 16 Apr fewest whitefly adults were observed on plants treated with a drench of Platinum at 0.172 lb AI/acre, but not significantly fewer than those treated with the other drenches. By 14 May there were fewest adults on plants sprayed five times with Oberon (total 0.67 lb AI/acre), but not significantly fewer than other treatments except the two Platinum drenches and DPX-002. Whitefly eggs and nymphs were fewest on 15 Apr in all the drench treatments. However, the trend was reversed by the last (14 May) evaluation, with fewest on plants sprayed repeatedly with Oberon or Assail. The same trends were seen for large nymphs and pupae. Fewest plants treated with drenches were infected with TYLCV in the interval 22-27 Apr, although differences were only significant in the comparison with Oberon. Fewest fruit were also harvested from plants treated with Oberon, though not all differences were significant. This trial demonstrated once again that, compared with regular foliar treatments, drenching with systemic neonicatinoid insecticides requires less active ingredient and provides better protection from virus spread during the critical early stages of the crop cycle that can translate into better yields.

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Table 1.

Treatment/ formulation	Rate lb (AI)/acre	No. SLW adults/4 plants					No. insects/10 leaflets (over four dates)	
		16 Apr	22 Apr	29 Apr	6 May	14 May	LM	TPW
Admire 2F	0.250	8.7cd	43.0b	31.5c	46.3bc	84.0bcd	6.9a	1.7a
Admire 2F	0.313	9.6cd	57.9ab	23.2c	38.9c	69.2cd	6.9a	0.9abc
Oberon 2 SC	0.133	19.1abc	73.7a	40.7bc	57.4abc	44.2d	6.7a	0.7bc
Assail 70 WP	0.075	28.0a	63.6ab	25.3c	38.3c	54.3cd	4.5b	0.1c
Platinum 2SC	0.125	10.6bcd	59.1ab	40.9bc	76.5a	136.9ab	4.1b	1.6ab
Platinum 2SC	0.172	8.1d	49.7ab	39.9bc	66.1ab	107.1abc	2.4b	0.9abc
DPX-002 1.67SC	0.089	20.4ab	69.2ab	55.4ab	72.9a	78.0cd	0.4c	0.1b
Untreated check	---	23.7a	66.4ab	68.1a	64.6ab	154.7a	7.1a	1.8a

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. SLW immatures/9.1 cm^2 leaf area																	
		15 Apr (18 DAT)[1a]			22 Apr (25 DAT)			29 Apr (32 DAT)			7 May (40 DAT)			14 May (47 DAT)			Means Over Dates		
		Eggs	Small Nymphs	Large Nymphs & pupa	Eggs	Small	Large Nymphs & pupa	Eggs	Small Nymphs	Large Nymphs & pupa	Eggs	Small Nymphs	Large Nymphs & pupa	Eggs	Small Nymphs	Large Nymphs & pupa	Eggs	Small Nymphs	Large Nymphs & pupa
Admire 2F	0.250	0.5c	0.2c	0.1bc	2.3bc	1.0c	0.2b	11.7a	8.1ab	1.4bc	3.9ab	5.6cde	3.5bc	6.0bc	15.5ab	16.8b	4.9c	6.0bc	4.3b
Admire 2F	0.313	0.4c	0.1c	0.1bc	2.3bc	1.1c	0.2b	5.7b	5.3bcd	0.5bcd	6.3a	7.7abc	3.8bcd	5.2bc	15.8ab	19.1b	4.0cd	5.6bcd	4.7b
Oberon 2SC	0.133	1.4bc	1.9b	1.1a	0.3d	0.5c	0.3b	6.8b	3.0d	0.1d	2.5b	2.6e	0.5c	4.0c	4.9c	0.8c	3.0d	2.7e	0.5c
Assail 70WP	0.075	1.8b	1.2bc	0.2bc	1.1cd	0.7c	0.2b	7.0b	3.7d	0.3cd	1.5b	3.4de	0.7c	6.2bc	10.6b	3.3c	3.5cd	4.0ed	0.9c
Platinum 2SC	0.125	0.5c	0.3c	0.1bc	0.9cd	2.7b	0.6b	4.1b	5.4bcd	1.6b	2.8b	6.5bcd	4.7bc	7.9bc	11.7b	16.4b	3.2d	5.3cd	4.6b
Platinum 2SC	0.172	0.3c	0.2c	0.0c	1.0cd	1.3c	0.1b	3.3b	4.8cd	0.9bcd	2.6b	6.1bcd	2.8bc	7.6bc	15.8ab	14.5b	2.9d	5.6bc	3.6b
DPX-002 1.67SC	0.089	3.7a	3.6a	0.5ab	3.4b	3.3b	1.9a	12.7a	7.2abc	1.3bc	4.0ab	9.4ab	6.7b	9.1ab	12.0ab	17.2b	6.6b	7.1b	5.5b
Untreated check	---	3.6a	2.3b	0.8a	6.6a	5.9a	2.2a	13.1a	9.8a	6.1a	5.9a	10.4a	20.2a	12.2a	17.3a	48.3a	8.3a	9.1a	15.5a

Means in a column followed by the same letter are not significantly different (LSD, $P < 0.05$).
[a]Days after soil drenches applied.

Table 3.

Treatment/ formulation	Rate lb (AI)/acre	Cumulative % plants showing TYLCV symptoms				Marketable fruit/12 plants			
						Large + X-large		Total	
		16 Apr	22 Apr	27 Apr	6 May[a]	No	Wt (lb)	No	Wt (lb)
Admire 2F	0.250	1.3a	1.3a	3.8bc	35.0abc	56ab	22.1ab	140a	39.3a
Admire 2F	0.313	0.0a	0.0b	5.0bc	38.8abc	51ab	19.9ab	125ab	35.9a
Oberon 2SC	0.133	3.8a	7.5a	16.3a	56.3a	27c	10.1c	97b	24.4b
Assail 70WP	0.075	0.0a	7.5a	10.0ab	35.0abc	62a	24.4a	135a	39.8a
Platinum 2SC	0.125	0.0a	0.0b	1.3c	25.0c	59ab	23.2ab	143a	41.1a
Platinum 2SC	0.172	0.0a	1.3ab	3.8bc	30.0bc	51ab	20.4ab	136a	37.8a
DPX-002	0.089	2.5a	5.0ab	8.8abc	52.5ab	56ab	21.8ab	144a	39.7a
Untreated check	---	0.0a	2.5ab	7.5bc	48.8ab	46b	18.6b	117ab	33.9a

Means in a column followed by the same letter are not significantly different (LSD, $P < 0.05$).
[a] On 13 May 100 per cent of the plants in the field showed TYLVC symptoms.