

(E77)

TOMATO: *Lycopersicon esculentum* (Mill.), 'Florida 47'

CONTROL OF SILVERLEAF WHITEFLY AND INCIDENCE OF TOMATO YELLOW LEAF CURL VIRUS ON STAKED TOMATO WITH NEONICOTINOID AND OTHER INSECTICIDES, 2005

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

Silverleaf whitefly (SLW) and whitefly-borne tomato yellow leaf curl virus (TYLCV) are major constraints to tomato production in southwest Florida. Development of more effective formulations of soil applied products and new modes of action for foliar materials are necessary to maintain control of this pest. For this trial, seedlings from a commercial greenhouse were transplanted 22 Mar at 18-inch spacing on two sets of three beds 250 ft in length and covered with polyethylene film mulch. The center bed in each set of three was left untreated to serve as a source of whiteflies and untreated check. A RCB design was used consisting of nine treatments replicated four times with plots of 31 ft each (Table 1). Water and fertilizer were provided through drip tape. Approximately 20% of the fertilizer was preplant soil incorporated and 80% applied through the drip tape. On 24 Mar, two days after transplanting, liquid formulations of Admire, Platinum, and Admire Pro were applied as soil drenches in 10 ml of solution, and the dry formulation of V10112 at a rate of 1 g per plant. Foliar sprays were applied with a single row high clearance sprayer operating at 180 psi and 2.3 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 gpa when plants were small, additional nozzles being added later to maintain spray coverage to a maximum of four nozzles per boom to deliver 80 gpa. As nozzles were added, concentration was adjusted to maintain a constant product rate per acre. Avaunt 30WG at 3.5 oz product/acre was applied two times to control tomato pinworm larvae and maintenance fungicides of Kocide and Maneb were applied weekly to control foliar diseases at rates of 2 lb and 1 to 2 lb per 100 gallons, respectively. Seven weekly evaluations of whitefly adults were made beginning 6 Apr by beating one side of eight plants per plot with a 9 × 13 inch pie pan painted black and coated with a 9:1 mixture of vegetable oil and liquid detergent. Immature stages were monitored 25 Apr, 4, 9 and 18 May using one trifoliate leaf removed from the sixth node of four centrally located plants in each plot. All whitefly stages were counted that appeared in a 2 cm area ring placed on each leaflet of the three terminal leaflets collected. Plants were evaluated seven times from 6 Apr to 20 May for the presence of TYLCV symptoms. Fruit was harvested from the 10 plants per plot on 26 May and 6 Jun and the number, sizes, and weights of marketable fruit were recorded. Data were subjected to ANOVA and means were separated using LSD ($P = 0.05$).

Whitefly pressure was heavy from the beginning of the trial and movement of TYLCV through the plots was rapid. Area under the disease progression curve (AUDPC) was lowest where plants were treated with dinotefuran at planting, though not significantly less than those treated with Admire (Table 2). Significant differences in numbers of adults were seen on 6, 13 Apr between the control and all other treatments, and again on 25 May when most whiteflies were seen on untreated plants, although not fewer than on plants treated at planting with Platinum (Treatment 2). Fewest adults over all dates were seen on plants receiving Admire at planting and 2 sprays of NNI-2302 (Treatment 7), though not significantly different from treatments 3, 4, 5 and 8. Significant differences were seen on 25 Apr in large nymphs and all nymphs that were highest in the check and fewest on plants receiving AdmirePro at planting, although differences with other treatments except No. 2 were not significant. On 9 May, fewer large nymphs were seen on plants receiving treatments 1 and 7 though differences with all other treatments other than the control and treatment 2 were not significant, a similar pattern over all dates when treatment 2 grouped with the control against all other treatments. Plants drenched with 2% V10112 (treatment 1) expressed lowest incidence of TYLCV incidence, though not different from

plants drenched with 16 fl oz Admire (treatment 8). All other treatments were not significantly different from the check. There were no significant treatment effects on yield with an average 67.7 marketable fruit (17.7lb) and 25.4 (5.0 lb) culls picked per 10 plants in each plot over two harvests. Lack of treatment effects was attributable to heavy whitefly and virus pressure over all treatments.

Table 1.

Treatment	Products/ formulation	Rate lb (AI)/acre	Spray dates								
			24 Mar	4 Apr	11 Apr	18 Apr	28 Apr	5 May	12 May	20 May	26 May
1	V10112 2G	0.213	X								
2	Platinum 2SC	0.123	X								
	Fulfill 50WG + Kinetic ^a	0.086 + 0.1% v/v		X	X	X	X				
3	Knack 0.86EC Admire 2F	0.054 0.250	X					X		X	
	Oberon 2SC + Induce	0.133 + 0.1% v/v					X		X		X
4	Admire Pro 4.6F Oberon 2SC	0.252 0.133	X								
	+ Induce	+ 0.1% v/v					X		X		X
5	Admire 2F	0.250	X								
	Courier 40SC	0.253					X				X
6	Admire 2F	0.250	X								
	Courier 40SC	0.380					X				X
7	Admire 2F	0.250	X								
	NNI-2302 EC	0.137					X				X
8	Admire 2F	0.250	X								
9	Untreated check	--									

^aKinetic not included on 4 Apr.

Table 2.

Treatment	TYLCV incidence AUDPC ^a	6 Apr	13 Apr	25 Apr		9 May	25 May	Over all dates	
		Adults (per beat)	Adults (per beat)	Large nymphs	All nymphs	Large nymphs	Adults (per beat)	Large nymphs	Adults (per beat)
1	0.45d	0.17b	0.28b	0.25b	3.75bc	4.75c	6.78c	1.67b	5.17bc
2	0.73abc	0.19b	0.63b	0.50b	9.00b	18.25a	12.34ab	6.42a	6.01ab
3	0.73abc	0.16b	0.72b	0.25b	5.5bc	6.00bc	5.81c	2.08b	4.01bcd
4	0.73abc	0.16b	0.28b	0.25b	2.00c	2.00c	5.41c	0.90b	4.14bcd
5	0.65bcd	0.09b	0.25b	0.25b	3.75bc	6.25bc	7.94bc	2.17b	3.44cd
6	0.84ab	0.08b	0.75b	0.50b	3.75bc	5.75bc	8.75bc	2.08b	4.22bcd
7	0.75ab	0.14b	0.53b	0.50b	5.25bc	3.00c	7.44c	1.17b	3.04d
8	0.53cd	0.03b	0.56b	0.50b	5.25bc	5.00bc	7.91bc	1.83b	3.44cd
9	0.88a	0.67a	1.75a	6.25a	17.0a	15.5ab	14.13a	7.75a	7.36a

Means in columns followed by the same letter are not significantly different (LSD, $P > 0.05$).

^aArea under the disease progression curve.