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

CONTROL OF SILVERLEAF WHITEFLY ON STAKED TOMATO IN FLORIDA, 2008

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Silverleaf whitefly (SLW): *Bemisia tabaci* Gennadius

Silverleaf whitefly (SLW) *Bemisia tabaci* Biotype “B” also known as *B. argentifolii* remains the most significant pest on tomatoes in south Florida, due primarily to its role as vector of tomato yellow leaf curl virus (TYLCV). Therefore, a TYLCV resistant variety ‘Tygress’ were used in order to assure a crop in case of heavy infestation. Commercially grown seedlings were transplanted 21 Feb at 18-inch spacing on 2 sets of 3 beds 235 ft in length and covered with black polyethylene film mulch. A randomized complete block (RCB) design was used consisting of 4

replicates and 9 treatments. Plots contained 24 plants with 3 plants were left between plots to serve as buffers. Approximately 20% of the fertilizer was preplant soil incorporated and 80% applied through the drip tape with 12-inch emitter spacing and drip rate of 0.36 gph per emitter.

Admire Pro was applied 28- Feb as a soil drench at 10.5 oz/acre to all plots except for those designated for untreated control and plots to be sprayed with a Leverage/Oberon. A 240 ml suspension was delivered to the base of each plant using an EZ-Dose® sprayer operating at a pressure of 45 PSI and a flow rate of 3.7 gallons per minute. Foliar sprays were applied with a single row high clearance self-propelled sprayer operating at 200 psi and 2.3 mph with the spray delivered through two vertical booms fitted with yellow Albuz® hollow cone nozzles, each delivering 10 gpa. A single overhead nozzle was included on 05-May application. Total spray volume increased as nozzles were added to accommodate plant growth (Table 1). Xentari (*Bacillus thuringiensis*) was applied to control lepidopteron pests on 4-Apr, 17-Apr, 30-Apr, and 13-May at a rate of 1.5 lbs/acre. Maintenance fungicides Kocide, Maneb and Pro-phyte were applied weekly to control foliar diseases at rates of 2 lb, 1 lb and 2.5 lb per acre, respectively. Coragen drenches (all three rates) were conducted on 25-Mar by delivering 120 ml of solution with an EZ-Dose® sprayer operating at a pressure of 45 PSI and a flow rate of 3.7 gallons per minute. The low rate of Coragen received a second application on 10-Apr.

Whitefly adults were evaluated every 7 days from 20-Mar to 21-May by counting all adults on five leaflets from one mid-canopy level true leaf on 10 plants per plot. Immature stages were counted under a stereoscopic microscope from four 0.5 sq inch discs taken from each of three leaflets from one terminal trifoliolate taken from the 7th node of 4 centrally located plants in each plot on 4-Apr, 16-Apr, 29-Apr and 15-May. Spidermite populations were also evaluated on the

samples collected for whitefly nymph counts on 15 May. Seven plants from the central area of each plot were harvested on 23 -May and 3-June. The number, sizes, and weight of marketable fruit were recorded.

No differences in numbers of adults were seen until 3 Apr when fewer were seen on plants receiving the grower standard and the Leverage + Oberon tank mix compared to the untreated check. By 10 Apr and thence forward all treatments resulted in fewer adults than the check with the exception of AdmirePro only on 16 Apr when lowest numbers were seen in response to the grower standard though not significantly different from the Leverage + Oberon tank mix. The Leverage Movento rotation resulted which resulted in fewest adults on 23 Apr and the tank mix on every subsequent date but 21 May, although differences between these two were never significant nor with the grower standard except on 23 Apr. Other treatments not significantly different from the best treatment included Leverage alone on 23 Apr and 1 May, two applications of Coragen at the low rate on 16,23 Apr and 1 May, and Coragen at the high rate on 23 Apr. All treatments resulted in fewer nymphs compared to the control on 2 and 16 Apr. except AdmirePro had apparently on 29 Apr.or 15 May. Fewest nymphs were seen with Leverage alone on 2 Apr. but differences were not significant except compared to the mid rate of Coragen. Fewest nymphs were seen 16 Apr on plants treated with the Leverage+Oberon tank mix but not significantly different from the Standard, Coragen low, Leverage alone or the Leverage Movento rotation. A similar situation was seen on 29 Apr except that Leverage alone was no longer in the lowest category. On 15 May the Leverage Movento combination had pulled ahead, presumably in response to late sprays of Movento, with Leverage+Oberon and the low rate of Coragen still in the running. Most spidermites were seen on plants treated with the grower standard, and fewest seen with the Leverage + Oberon tank mix although not different from the untreated check. Other treatments were intermediate. Number and weight of marketable fruit was highest with the high

rate of Coragen though not different from the mid rate or Leverage alone in regard to weight.

In conclusion, the split application of Coragen seemed to provide better whitefly control than the mid rate or even the high rate applied once. Leverage tank mixed with Oberon or rotated with Movento provided best control of whiteflies although not often more so than the grower standard.

Perhaps an earlier application of Movento in the rotation would have improved control, and substituting Oberon for Movento in the last spray would probably have provided better suppression of the late spidermite infestation. However, production was most favored by a single early application of Coragen at the high rate indicating populations of the pests monitored in this trial were not deciding factors in determining yield.

Treatment	Rate fl. oz/acre	Total Nymphs per 2 square inches				Spidermites	Yield 7 plants	
		2-Apr	16-Apr	29-Apr	15-May	15-May	Number	Weight (lbs)
Untreated		2.78 a	8.33 a	11.10 a	21.67 a	8.64 cde	163.8 b	63.5 bc
Standard		0.36 bc	2.06 cde	2.71 c	8.60 cd	18.58 a	125.8 c	49.1 d
AdmirePro	10.5	0.97 bc	5.25 b	11.17 a	21.56 a	6.79 de	153.0 bc	57.2 cd
Coragen	5.0	0.78 c	2.29 cde	3.60 c	7.75 cde	15.69 abc	160.5 b	63.1 bc
Coragen	6.7	1.06 b	3.56 c	5.69 b	11.31 bcd	11.10 bcd	180.8 ab	76.2 ab
Coragen	7.6	0.72 bc	3.33 cd	3.36 c	11.79 bc	17.90 ab	204.5 a	81.5 a
Leverage	5.1	0.28 c	1.85 de	6.08 b	14.19 b	8.90 cde	156.3 bc	68.5 abc
Leverage	5.1	0.75 bc	1.23 e	1.88 c	7.50 de	2.98 e	161.3 b	64.6 bc
Oberon	8.5							
Leverage	5.1	0.64 bc	1.86 de	1.89 c	3.77 e	5.81 de	155.3 bc	60.9 cd
Movento	5.0							

Part II: Materials Tested for Arthropod Management

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Common name	Trade name	Concentration/ Formulation	Chemical name	Manufacture/source
imidacloprid	Admire Pro	4.6 SC	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
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

spirotetramat	Movento	240 SC	<i>cis</i> -4-(ethoxycarbonyloxy)-8-methoxy-3-(2,5-xylyl)-1-azaspiro[4.5]dec-3-en-2-one	Bayer CropScience LP P.O. Box 12014 1 T.W. Alexander Drive Research Triangle Park, North Carolina 27709
Imidacloprid	Leverage	2.7 SE	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
Cyfluthrin			Cyano(4-fluoro – 3phenoxyphenol) methyl -3 (2,2 – dichloroethenyl) 2,2 dimethylcyclopropanecarboxylate	
Rynaxypyr	Coragen	20 SC	3-bromo- <i>N</i> -[4-chloro-2-methyl-6-[(methylamino)carbonyl]phenyl]-1-(3-chloro-2-pyridinyl)-1H-pyrazole-5-carboxamide	DuPont Company Stine-Haskell Research Center Dupont Crop Protection Newark, DE 19711
Pymetrozine	Fulfill	50 WG	Pymetrozine	Syngenta Crop Protection P.O. Box 18300 Greensboro, NC 27419
Buprofezin	Courier	40 SC	2-tert-Butylimino-3-isopropyl-5-phenylperhydro-1,3,5-thiadiazin-4-one	Nichino America Inc. 4550 New Linden Hill Rd. Suite 501 Wilmington DE 19808
Endosulfan	Thionex	3 EC	Hexachlorohexahydromethan o -2,4,3 –benzodioxathaepin-3-oxide	Makhteshim Agan of North America Inc. 4515 Falls of Neuse Rd. Suite 300 Raleigh NC 27609