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

CONTROL OF SOUTHERN ARMYWORM ON STAKED TOMATO, 2009

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Southern armyworm (SAW): *Spodoptera eridania* (Stoll)

SAW can be a devastating pest of tomatoes in southwest Florida causing fruit damage and subsequent yield reductions if left uncontrolled. This trial evaluated a wide range of products alone and in rotations with the goal of providing growers with greater options for managing this pest. Greenhouse-raised seedlings were transplanted 15 Sep at 18-inch spacing in raised beds on 6-ft centers, each covered with whitefaced polyethylene film at the Southwest Florida Research and Education Center in Immokalee FL. A RCB design was used with 4 replications and 8 treatments. The center row of each three-row section was planted with 'Tygress' TYLCV resistant plants and left untreated throughout the experiment as a source of pest inoculum. Each plot contained 15 'Phoenix' tomato plants with three plants left between plots as an untreated buffer. A 12-3-12 granular fertilizer at a rate of 50 lb N/acre was applied preplant and soil incorporated, accounting for 25% of the seasonal application. The rest was applied as an 8 - 0- 8 liquid fertilizer solution 5 times a week through Netafim® drip tape with 4-inch spacing between emitters. Kocide (3 lb/acre), Manzate 75 DF (1.5 lb/acre), Pro-phyte (4 pt/acre) and Oxidate (45 oz/acre) were applied as needed for disease control, principally bacterial spot. All plants were treated on 23 Sep with a 90 ml suspension of AdmirePro at 10.5 oz/acre by drench using an EZ-Dose® sprayer at a pressure of 45 psi and a flow rate of 3.7 gpm. Durivo was applied in 120 ml suspension per plant 23 Sep using the same equipment. Foliar insecticide treatments were applied using a high clearance sprayer with two vertical booms operating at 180 psi. Each boom was fitted with horizontally directed ATR 80 ® hollow cone nozzles delivering 10 gpa. Additional nozzles were added as plant size increased so that 40 gpa were applied on 27 Oct, 60 gpa on 12 Nov and 80 gpa on 7 Dec. Coragen was not applied 7 Dec and the Radiant/Intrepid rotation began with a Radiant application. Synapse applications included the adjuvant Induce at a rate of 0.5% vol/vol on all dates. Ten plants per plot were inspected from 2 Nov to 7 Dec 2009 and the number of SAW larvae observed on the North and South face of each plant was counted. Defoliation was rated as: 0 = no damage; 1=<5% damaged, 2 = between 5 and 33% damaged; 3 = between 33 and 67% damaged; and 4 = >67% damaged. Just prior to harvest in early Dec the crop was damaged by feral hogs and much of the fruit was lost. Nonetheless, on 16 Dec all remaining fruit from 8 plants per plot were collected and fruit was sorted and graded for damage by SAW. Data were subjected to ANOVA and means separated using LSD (P = 0.05) are presented.

All treatments significantly reduced the number of larvae per plant observed on all sample dates with no significant differences among sprayed treatments except on 7 Dec when no larvae were seen on Coragen and Durivo treated plants which was significantly less than on plants treated with Synapse (Table 1). Severity of defoliation was less than the control for all treatments on all dates with no differences among treatments on 2, 16, and 23 Nov (Table 2). On 9 Nov more defoliation was seen on Radiant-Intrepid rotation treated plants than all other treatments except for Voliam Flexi whereas the Voliam Flexi treatment proved less effective than Coragen and Voliam Express treatments on 30 Nov. Radiant - Intrepid rotation and Leverage added to the best treatment list on 7 Dec. All treatments resulted in fewer damaged fruit at harvest with no significant differences among them. No phytotoxicity was observed in any of the treatments.

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Table 1.

Treatment/formulation	Rate amt product/acre	Number of larvae per plant 2 Nov	9 Nov	16 Nov	23 Nov	30 Nov	7 Dec
Untreated		6.73a	12.13a	7.75a	8.95a	7.93a	5.08a
Coragen 20 SC	5.0 oz	0.00b	0.00b	0.00b	0.00b	0.00b	0.00c
Radiant 1 SC /	6.0 oz	0.05b	0.28b	0.00b	0.00b	0.00b	0.05bc
Intrepid 2F (rotate)	8.0 oz						
Durivo	10 oz	0.25b	0.00b	0.03b	0.00b	0.00b	0.00c
Voliam Flexi	5.0 oz	0.25b	1.05b	0.63b	0.08b	1.50b	1.40bc
Voliam Express	10.0 oz	0.03b	0.00b	0.00b	0.00b	0.00b	0.83bc
Synapse 24 WG	3.0 oz	0.20b	0.13b	0.08b	0.00b	0.00b	2.28b
Leverage 2.7 SE	4.0 oz	0.00b	0.00b	0.00b	0.00b	0.00b	0.78bc

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

Table 2.

Treatment/formulation	Rate amt product/acre	Average defoliation rating 2 Nov	9 Nov	16 Nov	23 Nov	30 Nov	7 Dec	Percentage of fruit with damage
Untreated		0.85a	1.00a	1.40a	1.58a	1.93a	1.75a	44.1a
Coragen 20 SC	5.0 oz	0.02b	0.02c	0.02b	0.02b	0.00c	0.00c	0.0b
Radiant 1 SC /	6.0 oz	0.10b	0.25b	0.00b	0.05b	0.05bc	0.03c	1.2b
Intrepid 2F (rotate)	8.0 oz							
Durivo	10 oz	0.08b	0.03c	0.08b	0.03b	0.03bc	0.00c	0.7b
Voliam Flexi	5.0 oz	0.10b	0.08bc	0.20b	0.10b	0.15b	0.23b	0.9b
Voliam Express	10.0 oz	0.03b	0.03c	0.00b	0.00b	0.00c	0.08bc	0.9b
Synapse 24 WG	3.0 oz	0.18b	0.05c	0.13b	0.05b	0.05bc	0.15bc	3.2b
Leverage 2.7 SE	4.0 oz	0.05b	0.05c	0.05b	0.00b	0.03bc	0.05c	0.7b

Means followed by same letter are not significantly different (LSD, P<0.05)