

(E81)

**TOMATO:** *Lycopersicon esculentum* (Mill.), 'Tygress'

## CONTROL OF TOMATO PINWORM AND SOUTHERN ARMYWORM ON STAKED TOMATO, 2005

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Tomato pinworm (TPW): *Keiferia lycopersicella* (Walsingham)  
Southern armyworm (SAW): *Spodoptera eridania* (Cramer)

Tomato pinworm is an occasional pest of tomato, eggplant and potato in Florida, producing blotch mines in leaves and damaged fruit. The small larval entry holes are often hidden beneath the calyx and difficult to detect during commercial grading. Greenhouse-raised seedlings of the TYLCV resistant variety 'Tygress' were planted 22 Mar at 18-inch spacing on two sets of three beds. Beds were 32 inches wide, 250 ft long on 6-ft centers, covered with black polyethylene film. The outer two beds of each set of three was divided into eight plots, each 31 ft long and assigned to treatments in a RCB design with four replications. The middle row of each 3-bed set was left untreated to serve as a source of pinworms. Approximately 20% of the fertilizer was pre-plant soil incorporated and 80% applied through the drip tape. In addition to insecticide treatments, maintenance fungicides of Kocide and Maneb were applied weekly to control foliar diseases at rates of 2 lbs and 1 or 2 lbs per 100 gal respectively. A high-clearance sprayer was used operating at 180 psi and 2.3 mph with the spray delivered through two vertical booms using yellow Albuz hollow cone nozzles that applied 10 gpa each. When the plants were small, two nozzles on each boom were used, and then, as the plants grew taller, additional nozzles were added to maintain spray coverage. As nozzles were added, the gallons per acre increased, but the product rate per acre of insecticides was kept constant. Applications began at 40 gpa and ended at 100 gpa when the crop was mature. PSG (PureGreen Spray) oil was applied weekly starting the third week after transplant. The rest of the weekly treatments were begun six wks after transplant when daily captures in wing-type sticky traps baited with TPW pheromone (Scentry) placed along one edge of the field exceeded three TPW moths and larvae were observed feeding on foliage (Table 1). The standard treatment consisted of alternate treatments of first Asana XL 0.66EC at 8 fl oz/acre and then Avaunt 30 WG at 3.5 oz/acre. TPW larvae were sampled weekly starting 2 May by removing end trifoliate leaflets from leaves from the lower part of the plants. As the crop matured, the leaves had to be sampled farther up on the plant because of deterioration of the lower leaves from bacterial spot disease. A visual assessment of the disease severity rated as percentage of leaf tissue affected by symptoms of bacterial spot caused by *Xanthomonas campestris* pv. *vesicatoria* was conducted on 6, 10 and 28 May. One leaf from the lower canopy of 8 plants was collected on 2, 9, 16, and 23 May to evaluate whitefly parasitism. Leaves were held in 8 × 12-inch paper envelopes for emergence of whiteflies and parasitoids that were later counted. Vacuum samples were taken on 9 and 13 Jun and later inspected to separate and count all parasitic hymenoptera. Fifteen plants were harvested twice from each plot, and fruit was graded as marketable or culls. Marketable fruit was sorted by size according to USDA standards and damage determined to have been caused by damage by TPW or SAW. Data were subjected to ANOVA and means were separated using LSD ( $P \leq 0.05$ ).

Trap capture peaks of 11, 16, 15, and 10 were observed on 29 Apr, 9 and 19, May, and 8 Jun respectively with a daily average of 17.2 from 6 Apr to 14 Jun. TPW in leaf samples over five samples from 2 May through 1 Jun were fewer on all treated plants compared to the control, and fewest on plants treated with E2Y45 1.67SC at the high rate, though not significantly different from all other treatments except the standard and G1587 1SC at the lowest rate. Plants treated with PSG horticultural oil exhibited heightened incidence and severity of bacterial spot compared to other treatments including the control on the first two observations dates, but were not different from the control on the third observation date (Table 3). Treated plants yielded fewer TPW and SAW damaged culls than untreated

plants with no differences among the former except in regard to TPW for plants treated with PSG (Table 2). Total yield and yield of extra-large fruit was greatest from plants sprayed with SpinTor, though not different compared to E2Y45 at the high rate or G1587 at the high rate (extra-large only). All treatments except PSG resulted in higher total yields than no treatment, but this was not true for G1587 at the two lowest rates or the standard in regard to extra-large fruit. Mean incidence of parasitism of silverleaf whitefly, *Bemisia tabaci*, from 138 samples taken on three sample dates was 37.1% SE = 2.3, with no significant differences between treatments ( $F = 0.6$ ,  $P = 0.8$ ,  $df = 8,24$ ) (Table 3). There was also no significant treatment effect in number of total parasitic hymenoptera sampled with the vacuum, but there was in the most abundant group, *Eretmocer* spp (whitefly parasitoids) that were most numerous on plants treated with the standard and least on plants treated with PSG oil.

Table 1.

Treatment/ formulation	Rate lbs(AI)/acre	Treatment dates							
		5 Apr	11 Apr	18 Apr	28 Apr	5 May	12 May	20 May	26 May
SpinTor 2SC	0.094				X	X	X	X	X
E2Y45 1.67SC	0.059				X	X	X	X	X
E2Y45 1.67SC	0.079				X	X	X	X	X
G1587 1SC	0.023				X	X	X	X	X
G1587 1SC	0.039				X	X	X	X	X
G1587 1SC	0.054				X	X	X	X	X
Avaunt 30WG	0.066					X		X	
Asana XL 0.66EC	0.041				X		X		X
PureGreen Spray	1% v/v	X	X	X	X	X	X	X	X
Untreated check	--								

Table 2.

Treatment/ formulation	Rate lbs(AI)/acre	Yield				
		Culls (lbs)		Marketable (lbs)		
		TPW/leaf	TPW	SAW	Total	Extra large
SpinTor 2SC	0.094	0.50cd	1.6c	2.2b	120.8a	76.9a
E2Y45 1.67SC	0.059	0.47cd	1.0c	1.6b	87.0bc	51.4bc
E2Y45 1.67SC	0.079	0.13d	1.3c	0.9b	99.4ab	63.4ab
G1587 1SC	0.023	1.16bc	2.9bc	2.6b	89.6bc	65.2ab
G1587 1SC	0.039	0.53cd	1.8c	2.1b	87.7bc	49.6bc
G1587 1SC	0.054	0.16cd	1.2c	0.8b	88.1bc	54.3bc
Avaunt 30 WG	0.066					
Asana XL 0.66EC	0.041	2.14b	2.7bc	1.7b	83.4bc	48.3bc
PureGreen Spray	1% v/v	0.56cd	4.7ab	2.0b	67.9cd	43.4c
Untreated check	--	7.72a	6.8a	13.5a	56.3d	37.3c

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

Table 3.

Treatment/ formulation	Rate lbs(AI)/acre	Bacterial spot rating			<i>Eretmocer</i> spp. (vacuum sample)
		6 May	10 May	28 ay	
SpinTor 2SC	0.094	6.5b	16.7b	25.0b	8.0cb
E2Y45 1.67SC	0.059	3.5b	10.0b	20.0b	7.5cb
E2Y45 1.67SC	0.079	3.0b	10.0b	16.3bc	3.5cb
G1587 1SC	0.023	7.0b	11.7b	20.0b	6.0cb
G1587 1SC	0.039	6.3b	18.3b	17.5bc	4.0cb
G1587 1SC	0.054	10.3b	17.5b	25.0b	4.0cb
Avaunt 30 WG	0.066				
Asana XL 0.66EC	0.041	3.8b	10.0b	9.0c	32.0a
PureGreen Spray	1% v/v	21.3a	35.0a	48.8a	3.0c
Untreated check	--	6.1b	21.0b	41.5a	15.0b

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