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

CONTROL OF SOUTHERN ARMYWORM ON STAKED TOMATO, 2007

Philip A. Stansly

University of Florida/ IFAS

Southwest Florida Res. and Ed. Center

2686 State Road 29 North

Immokalee, FL 34142-9515

Phone: (239) 658-3427

Fax: (239) 658-3469

Email: pstansly@ufl.edu

Barry Kostyk and Robert Riefer

Southern Armyworm (SAW): *Spodoptera eridania* (Cramer)

Southern armyworm is the principal early-season pest of fall tomatoes in southwest Florida, capable of destroying a crop if left uncontrolled. This trial evaluated a wide range products alone, in rotations and in combinations with non ionic surfactants with the goal of providing more options for controlling these pests. Greenhouse-raised seedlings were planted 17 Sep at 18-

inch spacing on east-west oriented raised beds on 6-ft centers, each covered with whiteface polyethylene film. A complete randomized block design was used with 4 replications and 9 treatments. Each treated plot contained 23 plants with 3 plants were left untreated between plots to provide a buffer between treated plots. A 5-0-15 granular fertilizer at a rate of 800 lb/ac (?) was applied preplant and soil incorporated accounting for 25% of the seasonal application. The remaining fertilizer as an 8 - 0- 8 solution was applied 5 times a week through Netafim® drip tape with 12-inch spacing between emitters. Kocide 3lbs/acre, Manzate 75 DF 1.5lbs/acre and Pro-phyte 4 pints/acre were applied as needed for disease control. Fulfill 2.75 oz/acre and Oberon 8.5 oz/acre were applied on 8-Oct and 19 – Oct respectively for early season whitefly control.

Traditional insecticide treatments were conducted with a high clearance sprayer with two vertical booms operating at 180 psi. Each boom was fitted with horizontally directed ATR 80 ® hollow cone nozzles emitting 10 gallons of solution per acre. Additional nozzles were added as plant size increased. The Root Power and Root Feed products were applied with an EZ-Dose® sprayer at a pressure of 45 PSI and a flow rate of 3.7 gallons per minute with 360 mls of solution be added to each plant.

Fifteen plants per plot were inspected from 1- Nov to 30 -Nov and the number of plants showing visible evidence of SAW damage was recorded. The number of SAW larvae observed on the North and South face of each plant were counted and larvae were classified as small – 1st and 2nd instars; medium 3rd and 4th instars; large 5th instars . Eight plants from each plot were harvested on 13 –Dec 07 and 02-Jan 08. The total number of fruit collected and weight in pounds per plot

were recorded. Fruit were separated according to USDA standards by size and fruit damaged by SAW was culled. Total number and weight of culls per plot was also recorded.

Following the initial 1-Nov reading when no significant treatment effect was observed, all insecticides significantly reduced the number of all stages of larvae with no significant differences among these treatments. The plant fertilizer products Root Feed II and Root Power had no effect on SAW. All insecticidal treatments significantly increased the number and weight of marketable fruit harvested per plot and significantly reduced the number and weight of culls caused by SAW, again with no significant differences among these treatments. Plants treated with Root Feed II and Root Power did not yield greater weight or number of fruit compared to the control but did produce significantly fewer culls caused by SAW.

Table 1

Treatment	Rate	Application #1		Application #2		Application #3		Application #4		Application #5	
		Date	Gal/Acre	Date	Gal/Acre	Date	Gal/Acre	Date	Gal/Acre	Date	Gal/Acre
Avaunt	3.5 oz/acre	25-Oct	40	5-Nov	60	19-Nov	80	3-Dec	100	17-Dec	100
Coragen	5.066 fl oz/acre	25-Oct	40	5-Nov	60	19-Nov	80	3-Dec	100	17-Dec	100
NIS Induce	0.50%v/v	25-Oct	40	5-Nov	60	19-Nov	80	3-Dec	100	17-Dec	100
Synapse	3 oz/acre	25-Oct	40	5-Nov	60	19-Nov	80	3-Dec	100	17-Dec	100
Synapse	3 oz/acre	25-Oct	40	5-Nov	60	19-Nov	80	3-Dec	100	17-Dec	100
NIS Induce	0.25%v/v	25-Oct	40	5-Nov	60	19-Nov	80	3-Dec	100	17-Dec	100
Radiant	6.04 fl oz/acre	25-Oct	40	5-Nov	60	19-Nov	80	3-Dec	100	17-Dec	100
Radiant	6.04 fl oz/acre	25-Oct	40			19-Nov	80			17-Dec	100
Intrepid	8 fl oz/acre			5-Nov	60			3-Dec	100		
Root Feed II	5 gal/acre	weekly									
Root Power	1 pt/acre	weekly									

Table 2

	SAW Larvae Per Plant (N=15)				Damaged plants (out of 15)	Production from 8 Plants 13 Dec 07 and 02 Jan 08			
Products	1-Nov	8-Nov	15-Nov	30-Nov	30-Nov	Marketable Fruit (No.)	Marketable Fruit (lbs)	Culls (No.)	Culls (lbs)
Control	2.91 a	8.24 a	13.15 a	13.63 a	**10.5 a**	71.0 c	39.6 b	74.8 a	32.5 a
Avaunt	0.00 a	0.00 c	0.00 c	0.00 b	**2.8 b**	172.0 ab	98.2 a	4.3 c	2.4 c
Coregan	2.00 a	0.00 c	0.00 c	0.02 b	**3.3 b**	179.5 ab	96.7 a	3.8 c	2.2 c
Synapse	0.63 a	0.87 bc	2.27 bc	0.40 b	3.5 b	151.3 b	85.6 a	4.3 c	2.4 c
Synapse with Induce	0.00 a	0.02 bc	0.00 c	0.00 b	3.0 b	177.0 ab	95.1 a	2.3 c	1.0 c
Radiant	0.00 a	0.00 c	1.02 bc	1.10 b	3.3 b	191.0 a	101.3 a	6.5 c	3.3 c
Radiant and Intrepid	2.02 a	0.03 bc	0.00 c	0.05 b	4.8 b	178.5 ab	99.0 a	3.5 c	1.9 c
Root Power	6.33 a	8.32 a	7.02 ab	13.27 a	11.8 a	74.0 c	43.9 b	52.3 b	24.1 b
Root Feed	2.07 a	6.23 ab	11.00 a	14.00 a	12.0 a	75.5 c	42.9 b	44.8 b	21.5 b

Means within a column followed by the same letter are not significantly different $P<0.05$

Part II: Materials Tested for Arthropod Management

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Common name	Trade name/ Cultivar	Concentration/ Formulation	Chemical name	Manufacture/source
Flubendiamide:	Synapse	24 WG	*N*2-[1,1-dimethyl-2-(methylsulfonyl)ethyl]-3-iodo-*N*1-[2-methyl-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]phenyl]-1,2-benzenedicarboxamide	Bayer CropScience LP P.O. Box 12014 1 T.W. Alexander Drive Research Triangle Park, North Carolina 27709
indoxacarb	Avaunt	30WG	(S)-methyl 7-chloro-2,5-dihydro-2-((methoxycarbonyl)(4-(trifuoromethoxy)phenyl)amino)-carbonyl)indeno(1,2-e)(1,3,4)oxadiazine-4a(3H)-carboxylate	DuPont Company Stine-Haskell Research Center Dupont Crop Protection Newark, DE 19711

Spinetoram	Radiant	1 SC	1-H-as-Indaceno[3,2-d]o oxacyclododecin-7,15-dione, 2-[(6-deoxy-3-O-ethyl-2,4-di-O-methyl-a-Lmannopyranosyl)oxy]-13-[[(2R,5S,6R)-5-(dimethylamino) tetrahydro-6-methyl-2H-pyran-2-yl]oxy]-9-ethyl-2,3,3a,4,5,5a,5b,6,9, 10,11,12,13,14,16a,16b-hexadecahydro1 14-methyl-, (2R,3aR,5aR,5bS,9S,13S,14R,16aS,16bR) and 1H-as-Indaceno[3,2-d]oxacyclododecin-7,15-dione, 2-[(6-deoxy-3-O-ethyl-2,4-di-O-methyl-a-Lmannopyranosyl)oxy]-13-[[(2R,5S,6R)-5-(dimethylamino)tetrahydro-6-methyl-2H-pyran-2-yl]oxy]-9-ethyl-2,3,3a,5a,5b,6,9,10,11,12,13,14,16a,16btetradecahydro-4,14-dimethyl-, (2S,3aR,5aS,5bS,9S,13S,14R,16aS,16b	Dow Agrosciences LLC Indianapolis IN 46288
Rynaxypyr	Coragen	20 SC	3-bromo-*N*-[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
methoxyfenozide	Intrepid	2 F	Benzoic acid, 3-menthoxy-2methyl-, 2-(3,5-dimethylbenzoyl)-2-(1,1-dimethylethly)hydrazide	Dow AgroSciences LLC 9330 Zionsville Road Indianapolis, IN 46268-1189
Plant Fertilizer	Root Power		Boron (B) 1.0% Zinc (Zn).4.0% 4.0% chelated Zinc (Zn)	Stoller Enterprises, Inc. 4001 W. Sam Houston Parkway North, Suite 100 Houston Texas 77043 USA
Plant Fertilizer	Root Feed		Nitrogen (N) 9.0%	Stoller Enterprises,

	II		9% Urea Nitrogen Calcium (Ca) 7.0% Magnesium (Mg) 1.5% 1.5% water soluble magnesium (Mg) Boron (B) 0.1%	Inc. 4001 W. Sam Houston Parkway North, Suite 100 Houston Texas 77043 USA