

(E64)

CORN (Sweet): *Zea mays* (L.), ‘Summer Sweet 8102R’**INSECTICIDAL CONTROL OF FALL ARMYWORM ON SWEET CORN, 2010****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 C. Kostyk

Email: bkostyk@ufl.edu

Fall armyworm (FAW): *Spodoptera frugiperda* (J.E. Smith)

FAW is the key pest of sweet corn in southern Florida with larvae feeding successively in whorls, tassels, silks, and ears. Broad-spectrum insecticides are sprayed frequently, especially after tassels have emerged, but more selective chemistries might provide as good or better control with less impact on non-target organisms. The trial was conducted at the Southwest Florida Research and Education Center in Immokalee Florida on 4 raised beds 32 inches wide and 400 ft long placed on 12 ft centers and covered with whiteface polyethylene mulch under which was placed a single drip tape irrigation line with 4 inch emitter spacing. Fertilizer (15-3-15) was mixed into the beds at 50 lbs N per acre and a 7-0-7 liquid fertilizer was applied through the drip tape using a Dosatron® during every irrigation cycle over the growing season for a total of 200 lbs N per crop. Corn was direct seeded 15-Sep at 10-inch spacing with three seeds per hole. Thirteen treatments were assigned in a RCB design across 4 replicates. Applications were made with a high clearance sprayer travelling at 2.3 mph equipped with ceramic Albuz® “yellow” hollow cone tips each delivering 10 gpa at 180 psi. On 7,11 -Oct, one nozzle was placed overhead and one nozzle was located on each of the two vertical drops (3 nozzles total). On 14,18,21,25,27 – Oct an additional nozzle was placed on each drop (5 nozzles total). All other applications were done with two nozzles on each of the two drops (4 nozzles total) (Table 1). A significant phytotoxic effect (Table 4) causing stunted plants and dwarfed ears, was observed with the MBI-206 + Induce treatments. Induce was discontinued from these treatments starting 1 Nov since we had previously observed similar effects with this product. Both MBI-206 treatments were not applied after 15-Nov (Table 1). Ten plants from each plot designated for either rate of the MBI-206 + Induce, the Lannate/Warrior rotation and the untreated check were measured on 17 Nov. from the tip of the tassel to the top of the bed to evaluate the phytotoxic effect of the MBI-206 plus induce treatments. Counts and damage assessments were made on 12 plants per plot noting the number of FAW larvae in the top of the whorl (12, 20 -Oct), in the tassel (27-Oct) and in the silk (3, 10, 17-Nov). Damage assessments were based on a rating of 0-5: 0 = no damage, 1 = <5%, 2 = 6-25%, 3 = 26-50%, 4 = 51-75%, 5 >76%. On 23-Nov (20 plants) and 1-Dec (15 plants) the dominant ear on each plant harvested was evaluated by removing the husks and grading to 3 categories; no damage, minor tip damage and significant ear damage. MBI-206 at both rates was not harvested on 1-Dec due to the lack of ears caused by the phytotoxicity. Data were subjected to ANOVA and means separated using LSD (P = 0.05).

Significantly less whorl damage compared to the untreated check was observed on 12 Oct for all treatments except for the Lannate/Warrior standard, Cobalt Advanced and MBI at 4qts. Damage on 20 Oct. was less on treated compared to untreated plants and least on plants sprayed weekly with Radiant and Entrust + MPede but not significantly so compared to Radiant sprayed every other week, Entrust alone, Rimon or Coragen. It is likely that some of this early damage occurred prior the applications beginning on 7-Oct. From 27-Oct to 17-Nov most damage was seen in the untreated check followed with few exceptions by MBI-206 + Induce, Voliam Xpress @ 7.0 oz, Cobalt and Lannate/Warrior, with least damage in the remaining treatments. All treatments resulted in significantly fewer larvae compared to the check on every sample date as the population moved from the whorl to the tassel to the silk and finally ear tips, except for the Lannate/Warrior treatment on 12-Oct (Table 2). However this treatment was not different than the two Entrust treatments or Radiant applied every other week. MBI – 206 applied at 4 qts/acre resulted in significantly more larvae than most of other insecticide treatments on 27-Oct, 3,10,17- Nov, but was not significantly different from Cobalt Advanced on 20, 27 – Oct and 10, 17 – Nov., Lannate/Warrior on 20-Oct and 10,17- Nov, Radiant sprayed every other week on 10-Nov and Rimon and Xpress 7.0 oz/acre applications on 17- Nov. The 8 qt rate of MBI resulted in significantly higher numbers than the other insecticide treatments on 20 and 27 –Oct, however the high rate of MBI-206 was better than the low rate only on 3-Nov. Significantly more marketable ears on both dates were harvested from plants receiving any of the insecticide treatments compared to the untreated check. Those receiving either rate of MBI-206 had fewer marketable ears than all other sprayed treatments. Plants treated with Cobalt Advanced and Lannate/Warrior rotation produced significantly fewer marketable ears than Rimon, Coragen, Voliam Flexi (7.0 and 9.0), Entrust with or without M-pede, and both Radiant treatments. The number of damaged ears observed were significantly reduced with all insecticide treatments compared to the check. Plants treated with MBI-206 + Induce were significantly shorter than either untreated or Lannate/Warrior treated plants, due to the phytotoxicity mentioned above, with no difference between rates of MBI-206.

Table 1

Treatment/ Formulation	Date GPA Rate Procut/Acre or % vol/vol	7-Oct 30	11-Oct 30	14-Oct 50	18-Oct 50	21-Oct 50	25-Oct 50	27-Oct 50	1-Nov 40	5-Nov 40	8-Nov 40	11-Nov 40	15-Nov 40	18/19-Nov 40	22-Nov 40	29-Nov 40
Untreated																
Lannate 2.4 LV	1.5 pts	x		x		x		x		x		x		x		x
Warrior 2.08 CS	1.92 oz		x		x		x		x		x		x		x	
Voliam Xpress	7.0 oz	x		x		x		x		x		x		X ¹		x
Voliam Xpress	9.0 oz	x		x		x		x		x		x		X ¹		x
Radiant 1 SC	5.0 oz	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Radiant 1 SC	5.0 oz	x		x		x		x		x		x		x		x
Entrust 80W	1.57 oz	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Entrust 80W	1.57 oz	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
M-pede 49%	2%	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Cobalt EC	19.0 oz	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Rimon 0.83 EC	12.0 oz	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Coragen 1.67 EC	3.5 oz	x		x		x		x		x		x		X ¹		x
MBI-206	4.0 qts	x	x	x	x	x	x	x	x	x	x	x	x			
Induce	0.50%	x	x	x	x	x	x	x								
MBI-206	8.0 qts	x	x	x	x	x	x	x	x	x	x	x	x			
Induce	0.50%	x	x	x	x	x	x	x								

¹ application conducted following day, 19-Nov

Table 2

Treatment/ formulation	Rate (Product/acre or % vol/vol)	Damage Rating						Larvae Per Plant					
		Whorl 12-Oct	Whorl 20-Oct	Tassel 27-Oct	Silk 3-Nov	Silk 10-Nov	Silk 17-Nov	Whorl 12-Oct	Whorl 20-Oct	Tassel 27-Oct	Silk 3-Nov	Silk 10-Nov	Silk 17-Nov
Untreated		0.85a	1.40a	1.29a	1.31a	1.25a	1.06a	0.10a	0.25a	0.79a	0.44a	0.54a	0.40a
Lannate2.4 LV / Warrior 2.08 SC		0.63abc	0.38cd	0.04d	0.13cd	0.08c	0.15c	0.06ab	0.04bc	0.00c	0.04c	0.04bc	0.10b
Voliain Xpress	7 oz	0.54bcd	0.56c	0.31c	0.19c	0.08c	0.10cd	0.02bc	0.02c	0.04bc	0.02c	0.00c	0.06bc
Voliain Xpress	9 oz	0.28def	0.33cd	0.06d	0.00d	0.00c	0.00d	0.00c	0.02c	0.00c	0.02c	0.00c	0.00c
Radiant 1 SC X 15	5 oz	0.06f	0.02e	0.00d	0.00d	0.00c	0.00d	0.00c	0.00c	0.00c	0.00c	0.00c	0.00c
Radiant 1 SC X 8	5 oz	0.44cde	0.23de	0.00d	0.04d	0.04c	0.00d	0.04bc	0.02c	0.00c	0.00c	0.02bc	0.00c
Entrust 80W	1.57 oz	0.17ef	0.10de	0.00d	0.00d	0.00c	0.00d	0.02bc	0.00c	0.00c	0.00c	0.00c	0.00c
Entrust 80W + M-Pede	1.57 oz 2%	0.10 f	0.00e	0.00d	0.00d	0.00c	0.00d	0.02bc	0.00c	0.00c	0.00c	0.00c	0.00c
Cobalt EC	19 oz	0.77ab	0.56c	0.29c	0.10cd	0.15c	0.19c	0.00c	0.04bc	0.04bc	0.06c	0.08bc	0.13b
Rimon 0.83 SC	12 oz	0.13f	0.17de	0.02d	0.00d	0.00c	0.02d	0.00c	0.00c	0.00c	0.00c	0.00c	0.04bc
Coragen 20SC	3.5 oz	0.17ef	0.27de	0.08d	0.00d	0.02c	0.00d	0.00c	0.02c	0.00c	0.00c	0.00c	0.00c
MBI-206	4 qt	0.60abc	0.88b	0.64b	0.43b	0.42b	0.41b	0.00c	0.06bc	0.13b	0.17b	0.10b	0.13b
+ Induce	0.5%												
MBI-206	4 qt	0.44cde	0.98b	0.50b	0.55b	0.46b	0.40b	0.00c	0.13b	0.10b	0.00c	0.04bc	0.06bc
+ Induce	0.5%												

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

Table 3

Treatment/ formulation	Rate (Product/acre or % vol/vol)	Marketable ears (No.)		Tip Damage (No.)		Ear Damage (No.)	
		23-Nov	1-Dec	23-Nov	1-Dec	23-Nov	1-Dec
		Untreated	3.25e	2.75c	4.50abc	4.00ab	12.25a
Lannate2.4 LV / Warrior 2.08 SC	15.75bc	10.25b	4.00abcd	4.50a	0.25d	0.25b	
Voliain Xpress	7 oz	19.25a	14.75a	0.75ef	0.25c	0.00d	0.00b
Voliain Xpress	9 oz	19.50a	14.75a	0.50ef	0.25c	0.00d	0.00b
Radiant 1 SC X 15	5 oz	20.00a	15.00a	0.00f	0.00c	0.00d	0.00b
Radiant 1 SC X 8	5 oz	19.25a	14.75a	0.75ef	0.25c	0.00d	0.00b
Entrust 80W	5 oz	19.50a	14.75a	0.50ef	0.25c	0.00d	0.00b
Entrust 80W + M-Pede	1.57 oz 2%	19.50a	14.75a	0.50ef	0.25c	0.00d	0.00b
Cobalt EC	19 oz	14.75c	10.00b	3.25bcde	4.25ab	2.00cd	0.75b
Rimon 0.83 SC	12 oz	18.25ab	13.75a	1.75cdef	1.00c	0.00d	0.25b
Coragen 20SC	3.5 oz	18.50ab	13.25a	1.50def	1.75bc	0.00d	0.00b
MBI-206	4 qt	9.00d	NA	6.00a	NA	5.00b	NA
+ Induce	0.5%						
MBI-206	4 qt	10.25d	NA	5.25ab	NA	4.50bc	NA
+ Induce	0.5%						

Table 4

Treatment/ Formulation	Rate (Product/acre)	Plant Height on 17-Nov (Inches)
Untreated		68.64b
Lannate 2.4 LV Warrior 2.08 SC		71.35a
MBI-206	4 qt	
Induce	0.5%	50.67c
MBI- 206	8 qt	
Induce	0.5%	50.24c

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