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ZUCCHINI SQUASH: *Cucurbita pepo* (L.) Var 'Black Beauty'

CONTROL OF PICKLEWORM , MELON WORM AND SOUTHERN ARMYWORM ON ZUCCHINI SQUASH, 2007

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Pickleworm: *Diaphania nitidalis* (Stoll)

Melonworm : *Diaphania hyalinata* Linnaeus

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

Pickleworm is a serious pest of squash, cucumber and cantaloupe in south Florida. Larvae are not subject to insecticidal control once in the fruit, so must be controlled either in the bloom or while in transit. Melonworm can seriously defoliate squash plants, destroy flowers and under high populations will damage fruit. SAW is an occasional pest of squash and can seriously defoliate the plants and destroy flowers before pollination occurs. For this trial, seeds were sown in 128 cell trays on 4 Sep 2007 and kept in a

screened greenhouse until transplanted into raised beds covered with polyethylene mulch on 13 Sep 2007. Water and fertilizer were provided by drip irrigation. Three beds 230 ft in length were spaced 6 ft apart with 12-inch plant spacing within the row. A randomized complete block (RCB) design was used with 4 treatments, 4 replications; each plot contained 17 plants with an additional three plants left as buffer between plots. The entire center row was left untreated. Each replicate consisted of a set of three beds with the center left untreated to serve as the untreated check. The treatments were applied 9-Oct, 16 – Oct, 23-Oct, and 30-Oct with 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 gallons per acre each. Two newly emerged male flower buds were sampled weekly from 5 Oct through Nov from each of four plants per plot. Leaf samples were taken weekly from 19- Oct to 1-Nov by randomly selecting two mid canopy level leaves from each of four plants per plot. Fruit was harvested 22-Oct by removing all fruit of marketable size from 10 plants in each plot. No plant yielded any fruit after this harvest date. Larvae from culled fruit were removed and identified
No lepidopteran larvae were found pre-spray in flowerbuds on 5 Oct nor were significant differences among treatments observed on 12 Oct with an average of 0.18 ± 0.24 larvae per flower. On 26- Oct and all subsequent sampling dates there were no flowers found in any of the control plots and the majority of the plant had been completely consumed by the three pests which varied in relative importance. Pickleworm went from a low of 18% on 26 Oct to a high of 60 % of 19 Oct while
melonworm ranged from a low of 9% on 12-Oct to a high of 48 % on 1- Nov. Southern armyworm contributed between 11% and 46 % of the total larval counts. However, no

significant differences were found in pest species ratios among treatments on any given date. On 19-Oct all treatments significantly reduced the number of larvae per flower when compared to the control plots as did the Spintor treatment on 26 Oct. On the 26-Oct and thereafter, all foliage had been completed consumed on untreated plants with no leaves to sample. Melonworm made up between 60 % and 90 % of the larvae in flower buds depending on sample date with the SAW making up the rest. No pickleworms were found leaves nor were population ratios on foliage different among treatments on any sample date. All treated plants had significantly fewer larvae per leaf than untreated plants and on 26-Oct and 1-Nov the Spintor treatment had resulted in fewer larvae per leaf than either of the Assail treatments. On 26-Oct, the higher rate of Assail (5.4 oz/acre) did yield significantly lower numbers of larvae when compared to the lower rate (4.0 oz/acre). Pickleworm and melonworm each made up approximately 50% of the population found in fruit with no SAW and no differences in population ratios among treatments. A significant increase in the number of fruit harvested was found with all insecticide treatments although fruit weight was only significantly improved only by Spintor. All insecticides significantly reduced the number of larvae found in the culled fruit but there were no differences among treatments.

Table 1:

Treatment	Rate	Number of larvae per leaf			Number of larvae per flower		
		19-Oct	26-Oct	1-Nov	19-Oct	26-Oct	1-Nov
Control		10.81 a	N/A	N/A	2.15 a	N/A	N/A
Assail 30 SG	4.0 oz/ac	1.31 b	4.19 a	0.84 a	0.28 b	0.88 a	0.58 a
Assail 30 SG	5.4 oz/ac	0.19 b	2.50 b	0.78 a	0.34 b	0.75 a	0.73 a
Spintor	4.0 oz/ac	0.00 b	0.63 c	0.25 b	0.41 b	0.28 b	0.28 a

Means within the same column followed by the same letter are not significantly different (LSD P<0.05)

Table 2:

		Harvest date 22-Oct (n=10 plants per plot)				
		Number of Fruit	Weight of Fruit (lbs)	Cull (No.)	Cull (wt)	Larvae in culls
Treatment	Rate					
Control		0 .0 b	0.0 b	4.3 a	9.2 a	14.0 a
Assail 30 SG	4.0 oz/ac	0.5 a	0.4 b	4.0 a	4.8 a	2.0 b
Assail 30 SG	5.4 oz/ac	1.3 a	2.7 ab	6.0 a	11.5 a	2.5 b
Spintor	4.0 oz/ac	3.8 a	6.9 a	3.5 a	6.1 a	0.0 b

Means within a column followed by the same letter are not significantly different (LSD 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
Acetamiprid	Assail	30 SG	(*E*)-N^1-[(6-chloro-3-pyridyl)methyl]-N^2-cyano-N^1-methylacetamidine	Cerexagri, Inc. 630 Freedom Bus. Center. Suite 402

				King of Prussia, PA 19406
Spinosad	Spintor	2 SC	Spinosad(a mixture of spinosyn A and spinosyn D)	Dow AgroSciences LLC 9330 Zionsville Road Indianapolis, IN 46268-1189