

LEPIDOPTERA CONTROL ON CABBAGE, FALL 2004

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Introduction

Lepidopterous insects are among the most damaging pests of cole crops. Common caterpillar species encountered in south Georgia include the diamondback moth (DBM), cabbage looper (CL) and imported cabbageworm (ICW). The diamondback moth typically presents the greatest control problems as it has a long history of resistance to insecticides. This test was conducted to evaluate the efficacy of selected insecticides against caterpillar pests of cole crops. Products tested included those most recently registered for caterpillar control and three products in development and near registration.

Materials and Methods

The experiment was conducted at the 'Showcase plots' near the Rural Development Center, Tifton, Ga. Cabbage, var. 'Rio Verde', was transplanted on plastic mulch with two rows (16 inch centers) on 3 foot beds. Experimental plots were 2 rows wide by 24 feet. Insecticide applications were made with a CO₂ pressurized backpack sprayer (60 PSI) in 30 GPA with 2 hollow-cone nozzles over the row. Applications were applied on 1, 8, 16 and 28 Oct., and 6 Nov. GF 968 was not applied on the last two dates because of limited supply.

Treatments evaluated were: Rimon 0.83EC (novaluron) at 12 oz/ac; GF 968 0.1 g AI/ml at 21.26 g AI/ac; Pyridalyl 4EC at 4.8 and 6.4 oz/ac; SpinTor 2SC at 4 oz/ac; Avaunt 30WDG at 3.5 oz/ac; and Proclaim 5SG at 3.2 oz/ac. A non-treated control was included for comparison.

Caterpillar densities were monitored periodically from 4 Oct. through 16 Nov. Five plants were randomly selected from each plot on each sample date and visually inspected. Larvae were classified by species, or as small if they were too small to be reasonably identified in the field, and counted. Plant damage ratings were made on 27 Oct. and 2 Nov. Plots were visually examined and the number of plants with caterpillar damage on the 'new' growth were counted. Damaged plants were categorized as light to moderate (any obvious damage) or heavy (large holes or portions of leaves eaten). A final damage rating was made on 22 Nov. (16 days after the last application). Plots were rated for damage on the following scale: 0 = no damage, 1 = minor damage in spots, 2 = a few plants with heavy damage (most plants 'clean'), 3 = minor damage throughout plot with some heavy damage, 4 = heavy damage through most of plot, 5 = heavy damage throughout plot. All data were analyzed with the PROC ANOVA procedure of PC-SAS. Where significant differences were detected ($P < 0.05$) means were separated with LSD ($P = 0.05$).

Results and Discussion

Insect counts are presented in Tables 1 - 4. While all species were monitored on each date, only data for dates in which the species of interest exceeded 1 larvae per 5 plants in at least one treatment are presented.

GF 968. Cabbage webworm was the only species present in significant numbers during the early portion of this test when GF 968 was being applied. Other species appeared well after the last application of GF 968; therefore, this product is not included in most of the discussion below.

Diamondback moth. DBM pressure was generally low and significant differences occurred only on two dates. On 27 Oct., only the Pyridalyl (both rates) and Rimon treatments were significantly different from the check. These three treatments were also the only treatments in which DBM populations never exceeded 0.25 larvae per 5 plants and were the only treatments with less than 1 larva per 5 plants collected during the entire test.

Cabbage looper. Looper densities increased in late October and remained at moderate pressure for the remainder of the test. In general, most treatments provided significant reductions in looper densities except for Proclaim (Pyridalyl also appeared a little weak on loopers but was usually among the best statistical grouping). [Field observations also supported a weakness on loopers for Proclaim and pyridalyl].

Imported cabbageworm. ICW populations increased rapidly near the end of this test. All products tested gave good control of ICW.

Cabbage webworm. Cabbage webworm were present in the early portion of this test. All products tested (including GF 968) gave excellent control of this pest.

Damage ratings. Significant differences were detected in damage ratings on 2 and 22 Nov. (Table 5). On 2 Nov., all treatments reduced the number of plants damaged as compared to the check. Pyridalyl, Avaunt and Rimon had less than one heavily damaged plant per plot on 2 Nov. On the final damage rating (22 Nov.; 16 days after the last application) all treatments (except GF 968) were rated less than 3, compared to a 5 in the check. Only Avaunt and Diamond had average damage ratings less than 2 (likely resulting from longer residual control).

Table 1. Diamondback moth larvae infestation levels, Lepidoptera control test in cabbage, Tifton, Georgia, 2004.

Treatment	Number of Diamondback larvae per 5 plants				
	10/7	10/13	10/27	11/2	Total
Check	1.00	1.25	2.50 a	1.75 a	7.25 a
GF 968*	0.00	2.25	1.25 ab	0.25 b	4.00 abc
Pyridalyl 4.8	0.00	0.00	0.00 b	0.00 b	0.50 c
Pyridalyl 6.4	0.00	0.00	0.00 b	0.00 b	0.00 c
Proclaim	0.00	0.75	1.25 ab	0.75 ab	3.25 abc
Avaunt	0.00	0.75	1.00 ab	0.00 b	2.50 bc
SpinTor	0.00	3.25	1.00 ab	0.50 b	5.50 ab
Rimon	0.25	0.00	0.00 b	0.00 b	0.50 c

Numbers within columns followed by the same letter are not significantly different (LSD, P = 0.05).

* last application on 16 Oct.

Table 2. Cabbage looper larvae infestation levels, Lepidoptera control test in cabbage, Tifton, Georgia, 2004.

Treatment	Number of Cabbage Looper larvae per 5 plants				
	10/27	11/2	11/10	11/16*	Total
Check	2.50 ab	7.25 a	7.50 a	8.00 a	26.75 a
GF 968**	1.25 bc	2.25 bc	5.75 ab	4.50 ab	14.00 bc
Pyridalyl 4.8	2.50 ab	2.25 bc	2.25 cde	2.50 b	9.50 bc
Pyridalyl 6.4	1.50 bc	1.50 c	3.75 bcd	4.00 ab	11.75 bc
Proclaim	4.00 a	5.75 ab	4.50 abc	2.25 b	16.75 ab
Avaunt	0.75 bc	1.25 c	1.50 cde	0.00 b	3.50 c
SpinTor	1.75 bc	2.00 c	0.00 e	0.50 b	5.25 c
Rimon	0.25 c	1.75 c	1.25 de	1.25 b	5.00 c

Numbers within columns followed by the same letter are not significantly different (LSD, P = 0.05).

*Differences were detected at P=0.1 (LSD at P=0.05)

** last application on 16 Oct.

Table 3. Imported cabbageworm and cabbage webworm larvae infestation levels, Lepidoptera control test in cabbage, Tifton, Georgia, 2004.

Treatment	Number of larvae per 5 plants				
	Imported Cabbageworm				Cabbage Webworm
	11/2	11/10	11/16	Total	10/04
Check	10.75 a	9.25 a	9.25 a	30.25 a	1.50 a
GF 968*	7.50 a	9.00 a	10.50 a	27.25 a	0.00 b
Pyridalyl 4.8	0.25 b	0.75 b	0.50 b	1.75 b	0.00 b
Pyridalyl 6.4	0.50 b	0.25 b	0.00 b	0.75 b	0.00 b
Proclaim	1.50 b	0.25 b	0.00 b	1.75 b	0.00 b
Avaunt	0.25 b	0.00 b	0.00 b	0.50 b	0.00 b
SpinTor	1.00 b	0.25 b	0.25 b	1.50 b	0.00 b
Rimon	0.25 b	0.50 b	0.00 b	0.75 b	0.00 b

Numbers within columns followed by the same letter are not significantly different (LSD, P = 0.05). * last application on 16 Oct.

Table 4. Plant damage ratings, Lepidoptera control test in cabbage, Tifton, Georgia, 2004.

Treatment	No. of plants damaged per plot (Oct. 27)		No. of plants damaged per plot (Nov. 2)		Damage rating (Nov. 22)
	Any damage*	Heavy damage*	Any damage	Heavy damage	
	Check	10.75 a	4.75 a	20.75 a	
GF 968**	6.00 a	2.75 a	14.50 b	6.25 b	5.00 a
Pyridalyl 4.8	3.25 a	0.00 a	5.50 cd	0.75 c	2.50 b
Pyridalyl 6.4	3.75 a	0.75 a	5.50 cd	0.75 c	2.25 bc
Proclaim	6.25 a	1.50 a	8.75 cd	3.25 bc	2.75 b
Avaunt	4.75 a	1.50 a	4.00 d	0.75 c	1.75 cd
SpinTor	7.25 a	2.00 a	9.25 c	2.25 c	2.50 b
Rimon	2.75 a	0.75 a	4.75 cd	0.25 c	1.50 d

Numbers within columns followed by the same letter are not significantly different (LSD, P = 0.05). * Differences were detected at P = 0.1. ** last application on 16 Oct.