EVALUATION OF Bt & SYNTHETIC INSECTICIDE TREATMENTS IN CABBAGE

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Introduction

Cabbage, *Brassica oleracea* (L.) Capitata group (in this test 'Platinum Dynasty'), is a key Brassica crop in Georgia. It is faced with multiple pests that attack the leaves, namely, diamondback moth (DBM); *Plutella xyllostella,* cabbage looper (CL); *Trichoplusia ni,* and imported cabbage worm (ICW); *Pieris rapae*. This test evaluated new numbered Bt insecticide compounds from Valent BioSciences, compared with new materials from Bayer, Syngenta and Dupont used in this crop. The use of new chemistries and product rotations are critical for managing insecticide resistance in DBM.

Materials and Methods

Cabbage was transplanted into 2 rows per 6-ft beds on 6 March 2007 and maintained with standard cultural practices at the Lang Farm, Georgia Coastal Plain Experiment Station at Tifton. A total of 500 lbs of 10-10-10 and 300 lbs of 34-0-0 were applied to Tift pebbly clay loam field plots. Plots were irrigated regularly with an overhead sprinkler system. Scouting was conducted weekly from 3 April using two samples of 6 plants per plot. Foliar applications of insecticides were made approximately weekly from 30 March to 22 May. Plant tops were harvested from 10 ft of the center of the plot row on 4 June and heads with wrapper leaves were weighed and categorized as 0=not damaged, 1=slightly damage, 2=moderately damaged, 3=severely damaged by worms. Damage ratings >1 were not marketable cabbage heads. Data was analyzed using GLM and LSD tests for separation of means (SAS Institute 1990).

Results and Discussion

All of the treatments were effective compared to the check and provided similar levels of control of Lepidoptera larvae based on season long averages. The most significant results in terms of separating out efficacy between treatments were in the ratings of damage to wrapper leaves and the head. As a group, Spintor, Synapse and E2Y45 performed better than most of the Bt insecticides relative to damage to the head, with the exception of 60125. In terms of significant increases in marketable yield, the Synapse treatment performed best, followed by Spintor, E2Y45, and 60125 and 60126. The results were consistent with the synthetic compounds having quicker knockdown activity than the Bt compounds, with all treatments providing good levels of control of Lepidoptera larvae.

Treatment - rate per acre	Diamond-back moth larvae 4/24/07	Cabbage looper larvae 4/27/07	Diamond-back moth larvae 5/4/07	Cabbage looper larvae 5/4/07	Imported cabbage worms 5/4/07	Total Lepidoptera larvae 5/4/07	Imported cabbage worms 5/15/07
1. Untreated Check	4.5 a	0.5 a	8.5 a	1.5 a	2.75 a	12.8 a	5.5 a
2. VBC-60125 1 lb/a	2.3 bc	0.0 b	3.8 bc	0.3 b	1.0 b	5.0 bcd	0.5 b
3. VBC-60126 1 lb/a	0.8 cd	0.0 b	5.0 bc	0.0 b	0.0 b	5.0 bcd	0.5 b
4. VBC-60127 1 lb/a	2.5 abc	0.0 b	5.8 ab	0.0 b	0.8 b	6.5 bc	2.0 b
5. VBC-60128 1 lb/a	3.0 ab	0.0 b	4.8 bc	0.0 b	1.0 b	5.8 bc	0.8 b
6. VBC-60129 1 lb/a	0.5 cd	0.0 b	6.3 ab	0.8 ab	0.0 b	7.0 b	0.8 b
7. ABG-6405 1 lb/a	2.3 bc	0.0 b	2.3 c	0.0 b	0.0 b	2.3 d	0.5 b
8. Spintor 6 oz prod/a	1.0 bcd	0.0 b	3.8 bc	0.0 b	0.0 b	3.8 cd	0.5 b
9. Synapse 24WG 3 oz prod/a	0.0 d	0.0 b	4.0 bc	0.0 b	0.5 b	4.5 bcd	0.3 b
10. E2Y45 0.066 lbs ai/a	1.8 bcd	0.0 b	5.3 b	0.0 b	0.3 b	5.5 bc	1.0 b

* Means within columns followed by the same letter are not significantly different (LSD, P<0.05).

Treatment - rate per acre	Overall Cabbage looper	Overall Diamond-back moth	Imported cabbage worm	Leps total Overall		Wrapper Damage rating	Head Damage rating	Marketable Weight of Cabbage
1. Untreated Check	1.1 a	5.0 a	2.0 a	8.1 a		2.72 a	2.50 a	12 e
2. VBC-60125 1 lb/a	0.1 b	2.2 b	0.4 bc	2.7 b		0.95 d	0.58 de	43 bc
3. VBC-60126 1 lb/a	0.1 b	2.8 b	0.3 bc	3.1 b		1.35 c	0.78 cd	43 bc
4. VBC-60127 1 lb/a	0.1 b	2.9 b	0.8 b	3.8 b		1.70 b	1.40 b	24 de
5. VBC-60128 1 lb/a	0.1 b	2.6 b	0.5 bc	3.1 b		1.45 bc	1.10 bc	36 cd
6. VBC-60129 1 lb/a	0.3 b	2.6 b	0.3 bc	3.2 b		1.51 bc	1.00 c	38 c
7. ABG-6405 1 lb/a	0.2 b	2.5 b	0.1 c	2.8 b		1.60 bc	1.08 bc	35 cd
8. Spintor 6 oz prod/a	0.2 b	1.8 b	0.3 bc	2.2 b		0.66 e	0.41 ef	54 ab
9. Synapse 24WG 3 oz prod/a	0.1 b	2.3 b	0.3 bc	2.8 b		0.30 f	0.10 f	56 a
10. E2Y45 0.066 lbs ai/a	0.1 b	2.7 b	0.3 bc	3.1 b		0.30 f	0.08 f	47 abc

* Seasonal means within columns followed by the same letter are not significantly different (LSD, P<0.05).