

Final Report – 2010

Title: Evaluation of Insecticide Applications to Control Dectes Stem Borer in Soybeans

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Objectives:

1. Evaluate the use of foliar insecticide applications to control the Dectes Stem Borer
2. Determine the ideal timing for making a foliar application based on adult Dectes beetle emergence
3. Evaluate the effectiveness of making multiple foliar insecticide applications to control the Dectes Stem Borer

Procedures:

Group 4.4 soybean variety was planted on May 26 at the University of Delaware's Demonstration Farm located near Middletown, DE and on May 10 at the Carvel Research and Education Center located near Georgetown, DE. Plots drilled on 15 inch centers were 25 foot wide x 75 ft long at the Georgetown location and 25 ft wide x 36 ft long at the Middletown location, arranged in a randomized complete block design with four replications. The following treatments were applied: (1) One application of Hero @ 10.3 oz/A one week after the first adult was detected (July 1); (2) One application of Hero @ 10.3 oz/A one week after the first adult was detected (July 1) and an application of Tombstone Helios at 2.8 oz/A one week after the first application (July 8); and (3) untreated control.

Dectes adult beetle population levels were evaluated on a weekly basis from late June through early August by taking 20 sweeps per plot and counting the number of adult beetles. Before physiological maturity (August 17 at the Georgetown location and October 8 at the Middletown location), 20 stems were collected from each plot at both locations to determine the percentage of stems infested with Dectes larvae. At physiological maturity, soybeans were harvested on Oct 31 at the Middletown location and on Nov 10 at the Georgetown location. Either immediately before (Georgetown) or immediately after harvest (Middletown), all of the lodged stems were collected from each plot to calculate yield loss from Dectes stem borer. Data were analyzed using Proc GLM and means were separated by Tukey's mean separation test (P=0.05).

Results:

Table 1. Middletown Location

Treatment	Application Date	Rate/A	Number Dectes Adults per 20 sweeps				% Infested Stems Oct 8	# Larvae per 20 stems Oct 8	Yield (BU/A) Oct 31	Lodging Loss (BU/A) Oct 31	% Yield Loss
			Jun29	July 7	July 15	July 22					
Hero EC	July 1	10.3 oz/A	0.25a	0.00a	1.50a	0.50a	18.75a	3.50a	30.34a	0.14a	0.48a
Hero EC	July 1	10.3 oz/A									
Tombstone Helios	July 8	2.8 oz/A	0.00a	0.00a	0.75a	1.75a	27.50a	5.50a	27.20a	0.15a	0.61a
Untreated	---	---	0.00a	0.25a	0.50a	1.00a	16.25a	3.25a	31.58a	0.15a	0.44a

Means within a column followed by the same letter are not significantly different (Tukey's mean separation test; P=0.05).

Table 2. Georgetown Location

Treatment	Application Date	Rate/A	Number Dectes Adults per 20 sweeps				% Infested Stems Aug 17	# Larvae per 20 stems Aug 17	Yield (BU/A) Nov 10	Lodging Loss (BU/A) Nov 10	% Yield Loss
			Jun22	June 28	July 6	July 12					
Hero EC	July 1	10.3 oz/A	0.00a	0.25a	1.00a	0.75a	51.25a	6.25a	24.20a	6.51a	21.26a
Hero EC	July 1	10.3 oz/A									
Tombstone Helios	July 8	2.8 oz/A	0.00a	0.00a	1.25a	0.25a	45.00a	7.75a	24.67a	6.45a	20.76a
Untreated	---	---	0.00a	0.00a	1.50a	0.75a	53.75a	5.50a	25.83a	7.37a	22.24a

Means within a column followed by the same letter are not significantly different (Tukey's mean separation test; P=0.05).

Conclusions: Although treatments were applied according to protocols developed by Kansas State Entomologist's and reported in industry literature, no significant differences were observed between treatments. However, significant yield losses were observed at the Georgetown location and can be used to develop treatment thresholds for early harvest. If a new insecticide is identified in the future, it could also be used to support the submission of a Section 18 or full section 3 registration.