

## **Evaluate Insecticide Applications to Control Dectes Stem Borer in Soybeans**

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### **Objectives:**

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

### **Background and Review of Activities :**

Over the past few years, Dectes stem borer populations have been increasing statewide, causing as much as a 10 -30% yield loss due to lodging. A single foliar insecticide application had not been effective in reducing lodging losses caused by the Dectes stem borer larvae because of such a long (6 week) emergence window for the adults. In 2008, Hero insecticide (FMC Corporation) was labeled on soybeans and it is the only pyrethroid labeled on soybeans that has Dectes stem borer control on the label. It was also indicated that it might have extended residual control.

In 2009, research and demonstration plots were established at the University of Delaware's research farm near Georgetown and on cooperators farms (Milford, Bridgeville, Redden and Middletown) to evaluate Hero. Results indicated that applications did reduce the adult Dectes populations and the percent of infested stems. However, there were no differences between lodging loss and yield in the plots. This could have been related to the timing of the insecticide application and/or the need to make a second application to achieve satisfactory control.

In 2010, replicated research plots were established at the University of Delaware's research farm in Georgetown and on University of Delaware's Demonstration and Research Farm located near Middletown, DE to evaluate insecticide application timing and the need to make a second application to control the Dectes stem

borer. Implementing the application protocol developed by Kansas States Entomologists and reported in industry literature, three insecticide timing treatments were evaluated. Treatments consisted of (1) an application of Hero @ 10.3 oz/acre one week after the first adult was detected, (2) an application of Hero @ 10.3 oz/acre one week after the first adult was detected and an application of Tombstone Helios @ 2.8 oz/acre one week after the first application, and (3) an untreated check. Results indicate that there were no significant differences in adult beetle sweep net counts, percent infested stems, lodging loss or yield between treatments at either location.

In 2011, as a continuation of this project, demonstration plots were established in three grower fields to evaluate the effectiveness of timely insecticide applications to control the Dectes stem borer in soybeans. Due to drought conditions and Dectes field population levels, only one application was evaluated. Starting the end of June or beginning of July, two fields were sampled on a weekly basis by performing one hundred sweep net counts to monitor adult beetle emergence and to determine field populations. Approximately one week after adult beetle emergence, an insecticide application was made using commercial equipment on each of the grower demonstration plots. Hero EC was applied at a rate of 10.3 fl oz/acre in field #1 and at a rate of 5 oz/A in fields # 2 and 3. Grower Field 1 was split in half in a treated and untreated plot applied on July 19. Grower Field 2 and Grower Field 3 received a whole field insecticide application applied on July 20. Prior to harvest, one hundred stems were collected from each field and split to determine the percent of infested stems and the total number of larvae per one hundred stems. After harvest, fields were evaluated for lodging losses by collecting lodged plants in each of the demonstration plots. None of the demonstration plots experienced significant lodging losses in 2011 due to the ability to harvest on a timely manner.

**Results:**

**Grower Field 1: Adult Sweep Net Counts and Stem Infestation Data**

Trt	# of Adult Dectes per 100 Sweeps					% Infested Stems	# of Larvae per 100 Stems
	7/14 Pre-trt	7/21	7/29	8/4	8/16		
Treated	17	0	0	0	0	5	0
Untreated	14	5	0	0	1	6	2

### **Grower Field 2: Adult Sweep Net Counts and Stem Infestation Data**

<b># of Adult Dectes per 100 Sweeps</b>							<b>% of Infested Stems</b>	<b># of Larvae per 100 Stems</b>
7/1	7/8	7/12	7/22	7/29	8/5	8/17		
0	0	26	0	0	2	3	6	2

### **Grower Field 3: Stem Infestation Data (no adult counts)**

**% Infested Stems: 27**

**# Larvae per 100 stems: 1**

**Discussion:** The control of Dectes stem borer with insecticide applications continues to be variable. Early harvest continues to be the most viable and available management option. Although two applications appear to be necessary, we have not been able to document that two applications will result in an increase in yields as a result of reductions in lodging losses. It appears that the only true way to manage Dectes will be through host plant resistance. Although one variety has been identified in the national seed bank that exhibits true resistance to the Dectes stem borer, soybean breeders will need to incorporate this trait into commercially acceptable varieties.