

Final Report – 2010

Title: Evaluate Soybean Varieties for Management of Dectes Stem Borer in Soybeans

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Objectives: To further evaluate varieties that were identified in the 2009 University of Delaware's Variety trial that appeared to exhibit reduced amounts of lodging from Dectes stem borer.

Procedures:

Replicated research plots were 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 20 foot wide x 18 foot long at the Georgetown location and 12.5 x 18 ft long at the Middletown location. Plots were arranged in a randomized complete block design with 6 replications. Four varieties in similar maturity groups (4.7- 4.8) were selected and evaluated for Dectes infestations and lodging losses.

Dectes adult beetle population levels were evaluated on a weekly basis from mid June through early August by taking 20 sweeps per plot at each location. Before physiological maturity (Aug 17), 10 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 harvest (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**

Variety # (Maturity Group)	Number Dectes Adults per 20 sweeps				% Infested Stems Aug 17	# Larvae per 10 stems Aug 17	Yield (BU/A) Oct 31	Lodging Loss (BU/A) Oct 31	Percent Lodging Loss Oct 31
	June 29	July 8	July 15	July 22					
Variety #1 (4.8)	1.50a	0.17a	4.00a	1.67a	50.00a	5.83a	20.03b	0.46a	2.37a
Variety #2 (4.8)	0.67a	0.67a	5.00a	1.00a	35.00a	4.67a	24.44ab	0.55a	2.24a
Variety #3 (4.7)	1.67a	0.50a	4.33a	2.67a	40.00a	3.83a	26.33a	0.20a	0.76a
Variety #4 (4.8)	1.50a	0.33a	4.50a	2.33a	38.33a	4.00a	24.91a	0.16a	0.67a

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

Variety # (Maturity Group)	Number Dectes Adults per 20 sweeps				% Infested Stems Aug 17	# Larvae per 10 stems Aug 17	Yield (BU/A) Nov 10	Lodging Loss (BU/A) Nov 10	Percent Lodging Loss Nov 10
	June 22	June 28	July 6	July 12					
Variety #1 (4.8)	0.00a	0.33a	1.67a	1.50a	85.00a	10.17a	30.60a	3.16b	9.05b
Variety #2 (4.8)	0.17a	0.67a	1.50a	0.67a	53.33b	6.17b	30.88a	7.68a	18.66a
Variety #3 (4.7)	0.17a	0.50a	0.83a	1.67a	65.00ab	6.33b	27.59a	0.79b	2.77c
Variety #4 (4.8)	0.33a	0.50a	1.33a	1.50a	70.00ab	7.17ab	30.78a	0.78b	2.25c

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

Conclusions: At the Middletown location, no significant difference was observed between the four varieties in all categories evaluated. At the Georgetown location, Variety #2 had significantly higher lodging losses and percent lodging loss compared to the other 3 varieties. The percent lodging loss for Variety #1 and Variety #2 was also significantly greater compared to Variety #3 and Variety #4. However, there was no significant difference between the varieties regarding final yield. 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.