



SOYBEANS

SECTION 5

Evaluation of seed- and foliar-applied insecticides to control foliar-feeding insect pests of soybean in Illinois, 2012

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Locations

We established one trial at the Adam Yoeckel Farm near Morrison (Whiteside County) and one trial at the University of Illinois Agricultural Engineering Farm near Urbana (Champaign County).

Experimental Design and Methods

The experimental design was a randomized complete block with four replications. The plot size for each treatment was 10 ft (four rows) x 20 ft. Densities of foliar-feeding insect pests were determined by taking 20 sweeps per plot with a 15-inch diameter sweep net at 0, 7, 14, and 21 days after treatment (DAT). Insect pest densities were assessed on 31 July and on 7, 14, and 21 August at Morrison. At Urbana, densities were assessed on 27 July and on 3, 10, and 17 August.

Planting, Insecticide Application, and Yield

The trial was planted on 10 May at Urbana and on 14 May at Morrison, using a four-row, ALMACO constructed planter with John Deere 7300 row units. Precision cone units were

used to meter the seeds. Seeds were planted in 30-inch rows at an approximate depth of 1 inch. Endigo ZC was applied on 27 July at Urbana and on 31 July at Morrison, using a CO₂ backpack sprayer and a four-row boom. TeeJet T^TJ60-11002 spray tips were calibrated to deliver a volume of 20 gallons per acre (gal/A). Active ingredients for all insecticides are listed in Appendix II.

Yields were estimated by harvesting the center two rows of each plot on 9 and 11 October at Urbana and Morrison, respectively. Weights were converted to bushels per acre (bu/A) at 13% moisture.

Agronomic Information

Agronomic information is listed in Table 5.1.

Climatic Conditions

Temperature and precipitation data are presented in Appendix III.

Statistical Analysis

Data were analyzed using ARM 8 (Agricultural Research Manager), revision 8.4.2 (Copyright[©] 1982–2012 Gylling Data Management, Inc., Brookings, SD).

Results and Discussion

Mean densities of foliar-feeding insect pests and yields are reported in Tables 5.2 and 5.3. Although a number of insect

TABLE 5.1 • Agronomic information for efficacy trials of seed- and foliar-applied insecticides to control foliar-feeding insect pests of soybean, University of Illinois, 2012

	Morrison	Urbana
Planting date	14 May	10 May
Harvest date	11 October	9 October
Variety	NK S31-L7	NK S34-N3
Row spacing	30 inches	30 inches
Seeding rate	140,000/acre	140,000/acre
Previous crop	Corn	Corn
Tillage	Fall—vertical tillage Spring—vertical tillage	Fall—chisel plow Spring—field cultivator



SOYBEANS

pests were recovered in sweep samples, only bean leaf beetle, corn rootworm beetle, and Japanese beetle averages are presented.

Morrison—Across all sampling dates, densities of bean leaf beetles and corn rootworm beetles were very low (Table 5.2). In fact, no bean leaf beetle adults were found. No significant differences in mean densities of corn rootworm beetles were observed. Densities of Japanese beetles were higher than densities of bean leaf beetles and corn rootworm beetles. The application of Endigo ZC significantly reduced Japanese beetle densities on the 7 August sampling date (7 DAT). Japanese beetle densities on the 14 and 21 August sampling dates (14 and 21 DAT) were statistically similar across all treatments.

Mean yields ranged from 60.7 to 64.0 bu/A. Only slight numerical differences in mean yield were observed; there were no statistically significant differences.

Urbana—Across all sampling dates, densities of Japanese beetle were very low (Table 5.3). No significant differences in mean densities of Japanese beetle were observed for any sampling date. Although densities of corn rootworm beetles were numerically higher, there also were no significant differences in mean densities across treatments for any of the sampling dates. Bean leaf beetle densities were significantly greater in the ApronMaxx treatment on 17 August (21 DAT); however, the differences were not biologically important.

Mean yields ranged from 60.1 to 62.8 bu/A. Only slight numerical differences in mean yield were observed; there were no statistically significant differences among the four treatments.

TABLE 5.2 • Evaluation of seed- and foliar-applied insecticides to control foliar-feeding insect pests of soybean, Morrison, University of Illinois, 2012

Product	Rate ¹	Mean no. corn rootworm beetles per 20 sweeps ^{2,3}				Mean no. Japanese beetles per 20 sweeps ^{2,3}				Mean yield (bu/A) ^{5,6} 11 Oct
		31 July (0 DAT ⁴)	7 Aug (7 DAT ⁴)	14 Aug (14 DAT ⁴)	21 Aug (21 DAT ⁴)	31 July (0 DAT ⁴)	7 Aug (7 DAT ⁴)	14 Aug (14 DAT ⁴)	21 Aug (21 DAT ⁴)	
ApronMaxx	0.0094	0.50 a	0.25 a	2.00 a	1.25 a	11.50 a	10.50 a	6.25 a	3.00 a	60.7 a
CruiserMaxx	0.0907	0.25 a	0.00 a	0.00 a	1.00 a	8.75 a	8.75 a	2.00 a	2.50 a	63.4 a
ApronMaxx + Endigo ZC	0.0094 3.5	0.50 a	0.00 a	0.00 a	0.75 a	5.25 a	0.50 b	1.75 a	2.00 a	63.9 a
CruiserMaxx + Endigo ZC	0.0907 3.5	0.50 a	0.00 a	0.05 a	0.75 a	7.50 a	1.50 b	2.33 a	2.25 a	64.0 a

¹ Rates of application for ApronMaxx and CruiserMaxx are milligrams (mg) active ingredient (a.i.) per seed; rates of application for Endigo ZC are ounces (oz) of product per acre.

² Means were derived from the numbers of insects per 20 sweeps in each plot in each of four replications.

³ Means for the same date and followed by the same letter do not differ significantly ($P = 0.05$, Duncan's New Multiple Range Test).

⁴ DAT = days after treatment (with insecticide).

⁵ Soybeans were harvested from the center two rows of each plot and converted to bushels per acre (bu/A) at 13% moisture.

⁶ Means followed by the same letter do not differ significantly ($P = 0.1$, Duncan's New Multiple Range Test).



SOYBEANS

TABLE 5.3 • Evaluation of seed- and foliar-applied insecticides to control foliar-feeding insect pests of soybean, Urbana, University of Illinois, 2012

Product	Rate ¹	Mean no. bean leaf beetles per 20 sweeps ^{2,3}				Mean no. corn rootworm beetles per 20 sweeps ^{2,3}			
		27 July (0 DAT ⁴)	3 Aug (7 DAT ⁴)	10 Aug (14 DAT ⁴)	17 Aug (21 DAT ⁴)	27 July (0 DAT ⁴)	3 Aug (7 DAT ⁴)	10 Aug (14 DAT ⁴)	17 Aug (21 DAT ⁴)
ApronMaxx	0.0094	3.50 a	1.75 a	1.00 a	1.25 a	5.75 a	5.00 a	4.50 a	10.75 a
CruiserMaxx	0.0907	2.75 a	1.50 a	1.00 a	0.25 b	6.25 a	3.00 a	2.50 a	8.75 a
ApronMaxx + Endigo ZC	0.0094 3.50	1.00 a	0.25 a	0.00 a	0.00 b	5.00 a	1.00 a	1.25 a	1.50 a
CruiserMaxx + Endigo ZC	0.0907 3.50	2.00 a	0.00 a	0.25 a	0.00 b	7.50 a	1.25 a	1.00 a	3.50 a

¹ Rates of application for ApronMaxx and CruiserMaxx are milligrams (mg) active ingredient (a.i.) per seed; rates of application for Endigo ZC are ounces (oz) of product per acre.

² Means were derived from the numbers of insects per 20 sweeps in each plot in each of four replications.

³ Means for the same date and followed by the same letter do not differ significantly ($P = 0.05$, Duncan's New Multiple Range Test).

⁴ DAT = days after treatment (with insecticide).

⁵ Soybeans were harvested from the center two rows of each plot and converted to bushels per acre (bu/A) at 13% moisture.

⁶ Means followed by the same letter do not differ significantly ($P = 0.1$, Duncan's New Multiple Range Test).

TABLE 5.3 (CONTINUED) • Evaluation of seed- and foliar-applied insecticides to control foliar-feeding insect pests of soybean, Urbana, University of Illinois, 2012

Product	Rate ¹	Mean no. Japanese beetles per 20 sweeps ^{2,3}				Mean yield (bu/A) ^{5,6} 9 Oct
		27 July (0 DAT ⁴)	3 Aug (7 DAT ⁴)	10 Aug (14 DAT ⁴)	17 Aug (21 DAT ⁴)	
ApronMaxx	0.0094	0.50 a	0.00 a	0.00 a	0.25 a	62.8 a
CruiserMaxx	0.0907	0.50 a	0.00 a	0.00 a	0.25 a	60.1 a
ApronMaxx + Endigo ZC	0.0094 3.5	0.50 a	0.00 a	0.00 a	0.25 a	62.4 a
CruiserMaxx + Endigo ZC	0.0907 3.5	0.00 a	0.00 a	0.00 a	0.50 a	60.1 a

¹ Rates of application for ApronMaxx and CruiserMaxx are milligrams (mg) active ingredient (a.i.) per seed; rates of application for Endigo ZC are ounces (oz) of product per acre.

² Means were derived from the numbers of insects per 20 sweeps in each plot in each of four replications.

³ Means for the same date and followed by the same letter do not differ significantly ($P = 0.05$, Duncan's New Multiple Range Test).

⁴ DAT = days after treatment (with insecticide).

⁵ Soybeans were harvested from the center two rows of each plot and converted to bushels per acre (bu/A) at 13% moisture.

⁶ Means followed by the same letter do not differ significantly ($P = 0.1$, Duncan's New Multiple Range Test).