SECTION 9

Evaluation of experimental and commercially available foliar-applied insecticides to control soybean aphids (*Aphis glycines*) and other insect pests of soybean in Illinois, 2011

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Location

We established one trial at the Adam Yoeckel Farm near Morrison (Whiteside County). Funding for this experiment was provided by the Illinois Soybean Association.

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 30 ft. Insecticides were applied to designated plots on 19 August. Prior to insecticide application, densities of soybean aphids were estimated by counting the total number of aphids on 20 randomly selected plants in the trial area; densities of other insect pests were determined by taking 20 sweeps in 8 randomly selected plots using a 15-inch diameter sweep net. After the application of insecticides, densities of soybean aphids were estimated by counting the total number of aphids on three plants in each plot. Soybean aphid densities were assessed on 27 August, and on 3 and 10 September (7, 14, and 21 days after treatment [DAT], respectively). Densities of other insect pests were assessed on 27 August (7 DAT) by taking 20 sweeps in each plot with a 15-inch diameter sweep net.

Planting, Insecticide Application, and Yield

The trial was planted on 10 May using a four-row, vacuum style planter constructed by Seed Research Equipment Solutions (SRES). Seeds were planted in 30-inch rows at an approximate depth of 1 inch. Insecticides were applied on 20 August with a CO_2 backpack sprayer and a four-row boom. TeeJet TTJ60-1102VP spray tips were calibrated to deliver a volume of 20 gallons per acre (gal/A). Active ingredients for all insecticides, except those with experimental designations, are listed in Appendix II.

Yields were estimated by harvesting the center two rows of each plot on 6 October. Weights were converted to bushels per acre (bu/A) at 13% moisture.

Agronomic Information

Agronomic information is listed in Table 9.1.

Climatic Conditions

Temperature and precipitation data are presented in Appendix III.

Statistical Analysis

Data were analyzed using ARM 8 (Agricultural Research Manager), revision 8.3.4 (Copyright© 1982–2011 Gylling Data Management, Inc., Brookings, SD).

Results and Discussion

Mean densities of soybean aphids, corn rootworm beetles, grasshoppers, green stink bugs, Japanese beetles and yields are reported in Table 9.2. Densities of all insects were very small across all sampling dates and never exceeded their economic thresholds. Prior to insecticide application, mean insect pest densities were:

- Soybean aphids—1.5 per plant
- Corn rootworm beetles—0.6 per plot
- Grasshoppers—0.1 per plot
- Green stink bugs—0.3 per plot
- Japanese beetles—6.0 per plot

TABLE 9.1 • Agronomic information for efficacy trial of experimental and commercially available foliar-applied insecticides to control soybean aphids and other insect pests of soybean, Morrison, University of Illinois, 2011

Planting date	10 May
Harvest date	6 October
Soybean variety	Pioneer 92Y80
Row spacing	30 inches
Seeding rate	140,000/acre
Previous crop	Corn
Tillage	Spring—vertical tillage

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No significant differences in the mean number of soybean aphids were observed through 3 September (14 DAT). On 10 September (21 DAT), all but one of the insecticide treatments, Declare + Nufos, had significantly smaller numbers of soybean aphids per plant than the untreated check (UTC).

There were no significant differences observed in mean densities of all other pests.

Due to the low number of pests found in the study, no significant differences in yield were observed among any of the treatments. This observation further justifies the value of scouting and using economic thresholds and demonstrates that there is no guarantee of a benefit from "insurance applications" of insecticides.

TABLE 9.2 • Evaluation of experimental and commercially available foliar-applied insecticides to control soybean aphids and other insect pests of soybean, Morrison, University of Illinois, 2011

Product	Rate[1]	Mean no. soybean aphids per plant[2,3]			Mean no. corn rootworm beetles per plot[3,4]	Mean no. grass-hoppers per plot[3,4]	Mean no. green stink bugs per plot[3,4]	Mean no. Japanese beetles per plot[3,4]	Mean yield (bu/acre)[6,7] 6 Oct
		27 Aug (7 DAT[5])	3 Sep (14 DAT[5])	10 Sep (21 DAT[5])	27 Aug (7 DAT[5])	27 Aug (7 DAT[5])	27 Aug (7 DAT[5])	27 Aug (7 DAT[5])	
Baythroid XL	2.4	0.5 a	2.6 a	3.2 b	0.0 a	0.0 a	0.0 a	1.3 a	41 a
Baythroid XL + Lorsban 4E	2 4	0.1 a	1.5 a	0.3 b	0.0 a	0.3 a	0.0 a	1.5 a	38 a
Declare	1.02	1.2 a	1.9 a	1.9 b	0.0 a	0.0 a	0.0 a	0.5 a	41 a
Declare	1.28	0.2 a	0.2 a	0.3 b	0.3 a	0.0 a	0.0 a	1.3 a	36 a
Declare + Nufos 4E	1.02 4	0.1 a	0.3 a	5.6 ab	0.0 a	0.0 a	0.3 a	0.0 a	43 a
F-9210	4	0.7 a	3.8 a	1.8 b	0.0 a	0.0 a	0.0 a	0.5 a	38 a
F-9210	4.8	0.4 a	5.2 a	1.0 b	0.0 a	0.0 a	0.0 a	0.5 a	37 a
Hero	10.3	0.3 a	0.8 a	0.2 b	0.0 a	0.0 a	0.0 a	0.3 a	40 a
Leverage 360	2.8	0.2 a	1.5 a	1.3 b	0.0 a	0.8 a	0.0 a	0.0 a	42 a
Warrior II	1.54	0.5 a	2.3 a	1.0 b	0.0 a	0.5 a	0.3 a	1.3 a	37 a
UTC[8]	—	2.0 a	7.0 a	9.7 a	0.0 a	0.0 a	0.3 a	1.8 a	39 a

[1] Rates of application for foliar insecticide are ounces (oz) of product per acre.
[2] Means were derived from the numbers of soybean aphids on three plants 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] Means were derived from the numbers of insects per 20 sweeps in each plot in each of four replications.
[5] DAT = days after treatment (with insecticide).
[6] Soybeans were harvested from the center two rows of each subplot and converted to bushels per acre (bu/A) at 13% moisture.
[7] Means followed by the same letter do not differ significantly ($P = 0.10$, Duncan's New Multiple Range Test).
[8] UTC = untreated check.