SECTION 8

Evaluation of foliar- and seed-applied insecticides to control soybean aphids *(Aphis glycines)* in Illinois, 2008

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Location

We established one trial at the David and Carol Cook Farm near Morrison (Whiteside 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 30 ft. Insecticides were applied to designated plots on 18 August. At intervals before and after the insecticide application, densities of soybean aphids were estimated by counting the total number of aphids on three plants in each plot. Densities of soybean aphids after foliar insecticides were applied were assessed on 25 August (7 days after treatment, DAT), 1 September (14 DAT), and 8 September (21 DAT). Two rows from each plot were mechanically harvested on 10 October, and the weights were adjusted to bushels per acre at 13% moisture.

Planting and Insecticide Application

The trial was planted on 20 May using a four-row, Almaco constructed planter with John Deere 7300 row units. Precision cone units were used to plant the seeds. Insecticides were applied on 18 August with a CO_2 backpack sprayer and a four-row hand boom. TeeJet 80015VS spray tips were calibrated to deliver a volume of 20 gal per acre.

Active ingredients for all chemical insecticides, except those with experimental numbers, are listed in Appendix II.

Agronomic Information

Agronomic information is listed in Table 8.1.

Climatic Conditions

Temperature and precipitation data are presented in Appendix III.

Statistical Analysis

Data were analyzed using ARM 7 (Agricultural Research Manager), revision 7.4.2. (Copyright© 1982–2008 Gylling Data Management, Inc., Brookings, SD).

Results and Discussion

Densities of soybean aphids throughout the season are presented in Table 8.2. Soybean aphids on three plants in each plot were counted weekly from 18 August to 8 September. Although there were some differences in densities of soybean aphids before foliar insecticides were applied on 18 August, the focus of this discussion will be on densities of soybean aphids on the dates following the foliar applications.

The overall mean for all plots (including those with seed-applied insecticides) was 249.5 soybean aphids per plant (the economic threshold is 250 aphids per plant) prior to treating designated plots with foliar-applied insecticides. On 25 August (7 DAT), there was nearly a 75% overall reduction in densities of soybean aphids in plots treated with foliar-applied insecticides.

Mean densities of soybean aphids ranged from 0.00 to 297.67 aphids per plant on 25 August. Eight of the 17 plots treated with a foliar-applied insecticide had significantly fewer aphids than plots treated with Flonicamid 0.85, V-10226, V-10170, and the untreated check (UTC).

On 1 September, mean densities of soybean aphids ranged from 0.33 to 394.67 aphids per plant. Eight of the 17 plots treated with a foliar-applied insecticide had significantly fewer aphids than plots treated with Flonicamid 0.85, V-10226, and V-10170.

TABLE 8.1 • Agronomic information for the efficacy trial of foliar- and seed-applied insecticides to control soybean aphids, Morrison, University of Illinois, 2008

Planting date	20 May
Row spacing	30 inches
Seeding rate	140,000/acre
Variety	Midwest Seed Genetics GR-2332
Previous crop	Corn
Tillage	Spring—disk

By 8 September, densities of soybean aphids had declined. Mean densities of soybean aphids in the UTC were not significantly different from the densities of soybean aphids in many of the plots treated with foliar-applied insecticides.

Mean yields among treatments in the trial ranged from 59.89 to 69.79 bushels per acre. The mean yields for plots treated with Warrior 1CS and Discipline were significantly larger than the mean yield for plots treated with Flonicamid 0.85. There were no other significant differences in yields among any other treatments.

TABLE 8.2 • Evaluation of foliar- and seed-applied insecticides to control soybean aphids, Morrison, University of Illinois, 2008

Product	Rate[2,3]	Mean no. soybean aphids per plant[1]			Mean yield (bu/A)[4,7] 10 October
		25 August[4,5] (7 DAT)[6]	1 September[4,5] (14 DAT)[6]	8 September[4,5] (21 DAT)[6]	
Asana XL + Lorsban 4E	6.4 4	4.67 ef	4.58 d	0.92 c	62.23 ab
Baythroid XL	2.4	70.42 b-f	84.00 a-d	20.67 bc	65.63 ab
Baythroid XL + Lorsban 4E	2 8	6.17 def	0.58 d	11.50 bc	63.30 ab
Cobalt 2.55 EC	13	2.25 ef	3.92 d	3.92 bc	65.34 ab
Cruiser 5FS[8]	50	153.67 a-d	338.17 a-d	117.92 abc	63.53 ab
Dimethoate 4EC	8	34.08 c-f	28.75 bcd	21.42 bc	61.91 ab
Dimethoate 4EC + Nufos 4EC	8 8	10.33 def	6.83 d	6.33 bc	66.51 ab
Discipline	5.12	0.00 f	0.33 d	0.44 c	69.67 a
Flonicamid	2	68.58 a-f	109.75 a-d	49.00 abc	65.33 ab
Flonicamid	0.85	297.67 a	346.17 ab	199.67 abc	59.89 b
Flonicamid	1.4	65.08 a-f	49.08 bcd	25.58 bc	65.27 ab
Flonicamid	1.1	88.75 a-f	25.17 bcd	63.50 abc	66.17 ab
Gaucho 600[8]	62.5	171.25 a-f	183.00 a-d	46.08 abc	61.72 ab
Hero	5	0.75 f	0.50 d	2.92 bc	65.14 ab
Leverage 2.7 + NIS[9]	3.8 0.125	16.17 def	16.50 bcd	11.33 bc	65.65 ab
Lorsban 4E	16	6.50 def	15.33 cd	12.08 bc	64.91 ab
V-10170[8] V-10226[10]	50 3.5	127.50 a-e	181.75 a-d	66.50 bc	62.74 ab
V-10170[8]	50	240.92 ab	394.67 a	123.42 ab	63.28 ab
V-10226[10]	3.5	192.17 abc	329.50 abc	227.83 a	65.45 ab
Warrior 1CS	3.2	64.00 c-f	3.00 d	10.75 bc	69.79 a
UTC[11]		215.83 abc	219.58 a-d	41.25 bc	61.68 ab

[1] Mean densities of soybean aphids were derived from the total number of aphids on three plants per treatment in each of four replications.
[2] Rates of application of foliar-applied insecticides are ounces (oz) of product per acre.
[3] Rates of application of NIS (non-ionic surfactant) are percentage volume of product per volume of spray solution (% v/v).
[4] Means followed by the same letter do not differ significantly (P= 0.05, Duncan's New Multiple Range Test).
[5] Data were transformed (log transformation) for analysis; the actual means are shown.
[6] DAT = days after treatment (with foliar-applied insecticides).
[7] Soybeans were harvested from 30 ft of the center two rows of each plot, and weights were converted to bushels per acre (bu/A) at 13% moisture.
[8] Rates of application for these seed treatments are grams (g) of active ingredient (a.i.) per 100 kg of seed.
[9] NIS = non-ionic surfactant.
[10] Rates of application for these seed treatments are ounces (oz) of product per hundredweight (cwt) of seed.
[11] UTC = untreated check.