



SOYBEANS

SECTION 5

Evaluation of foliar-applied insecticides and insecticide/fungicide combinations to control insect pests of soybean in Illinois, 2013

Ronald E. Estes, Nicholas A. Tinsley, and Michael E. Gray

Location

We established one trial at the Northern Illinois Agronomy Research Center near DeKalb (DeKalb 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 20 ft. Densities of foliar feeding insects were determined by taking 20 sweeps per plot with a 15-inch diameter sweep net. Densities of soybean aphids were determined by counting the total number of aphids on three plants in each plot. The mean number of corn rootworm beetles per 20 sweeps was assessed on 8, 15, 22, and 29 August (0, 7, 14, and 21 days after treatment [DAT], respectively). Populations of soybean aphids were not present until late August; because of this, aphid densities were not evaluated until 22 August (14 DAT).

Planting, Insecticide Application, and Yield

The trial was planted on 11 June using a four-row, John Deere 7300 planter. Seeds were planted in 30-inch rows at an approximate depth of 1 inch. Insecticides were applied on 8 August with a CO₂ backpack sprayer and a four-row boom. TeeJet TTJ60-11002 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 29 October. 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 8.5.0 (Copyright© 1982–2012 Gylling Data Management, Inc., Brookings, SD).

Results and Discussion

Very few insect pests were present in the trial area prior to the application of insecticides on 8 August. Detectable densities of soybean aphids appeared approximately 2 weeks after the application of insecticides. Mean densities of corn rootworm and soybean aphid following the application of insecticides are presented in Table 5.2.

Mean densities of corn rootworm beetles were very low at the 8, 15, and 22 August sampling dates (0, 7, and 14 DAT); although significant differences among treatments were observed, the low pest densities had no biological significance. On 29 August (21 DAT), Folicur, Stratego YLD, and Quilt Xcel had significantly more corn rootworm beetles per 20 sweeps than any of the insecticide treatments (with or without a fungicide/insecticide combination)—all insecticides had statistically similar densities of corn rootworm beetles. Mean densities of soybean aphid were virtually undetectable at the 8 and 15 August sampling dates (0 and 7 DAT). On 22 August (14 DAT), Folicur had significantly more soybean

TABLE 5.1 • Agronomic information for efficacy trial of foliar-applied insecticides and insecticide/fungicide combinations to control insect pests of soybean, DeKalb, University of Illinois, 2013

Planting date	11 June
Harvest date	29 October
Variety	NK S31-L7
Row spacing	30 inches
Seeding rate	150,000/acre
Previous crop	Corn
Tillage	Fall—disc ripper Spring—discovator



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aphids per plant than any other treatment. On 29 August (21 DAT), Quilt Xcel had significantly more soybean aphids per plant than any other treatment, including the untreated check (UTC), except the Folicur and Quilt Excel treatments. Although not documented formally, the increased densities of soybean aphids in plots treated with only fungicide could

be attributed to the elimination of entomopathogens by the fungicide applications.

Mean yields are presented in Table 5.2. No significant differences in mean yields were observed; none of the insecticide, fungicide, or combination treatments yielded significantly more than the UTC.

TABLE 5.2 • Evaluation of foliar-applied insecticides and insecticide/fungicide combinations to control insect pests of soybean, DeKalb, University of Illinois, 2013

Product	Rate ¹	Mean no. corn rootworm beetles per 20 sweeps ^{2,3}				Mean no. soybean aphids per plant ^{3,4}		Mean yield ^{6,7} (bu/A) 29 Oct
		8 Aug (0 DAT ⁵)	15 Aug (7 DAT ⁵)	22 Aug (14 DAT ⁵)	29 Aug (21 DAT ⁵)	22 Aug (14 DAT ⁵)	29 Aug (21 DAT ⁵)	
Baythroid XL	2.8	0.5 a	0.5 abc	2.0 a–d	19.8 d	33.7 b	4.3 b	61.8 a
Folicur	4	0.3 a	0.8 abc	5.0 abc	66.3 ab	329.8 a	171.3 ab	61.0 a
Baythroid XL + Folicur	2.8 4	0.5 a	0.0 c	2.0 a–d	30.3 cd	29.4 b	9.0 b	58.3 a
Leverage 360	2.8	0.0 a	0.3 bc	0.0 d	25.5 cd	34.3 b	3.4 b	59.0 a
Stratego YLD	4	1.0 a	1.8 abc	5.3 ab	77.5 a	134.9 b	141.8 ab	59.8 a
Leverage 360 + Stratego YLD	2.8 4	1.0 a	0.3 bc	2.5 a–d	29.5 cd	16.5 b	3.9 b	58.8 a
Mustang Maxx	4	0.8 a	0.3 bc	0.8 cd	26.0 cd	47.3 b	1.9 b	57.2 a
Headline	6	0.8 a	1.8 abc	4.3 a–d	47.3 bcd	93.3 b	15.9 b	59.0 a
Mustang Maxx + Headline	4 6	1.0 a	0.8 abc	2.0 a–d	22.0 d	54.8 b	18.9 b	62.6 a
Warrior II	1.6	1.8 a	0.3 bc	1.0 bcd	28.0 cd	6.9 b	0.1 b	54.8 a
Quilt Xcel	10.5	1.8 a	2.3 a	4.5 abc	62.7 ab	113.4 b	334.0 a	60.5 a
Warrior II + Quilt Xcel	1.6 10.5	1.3 a	0.5 abc	1.8 a–d	23.5 d	3.0 b	0.8 b	61.8 a
Untreated check	—	0.8 a	2.0 ab	5.8 a	54.3 abc	74.9 b	59.1 b	58.0 a

¹ Rates of application for foliar insecticide/fungicide are ounces (oz) of product per acre.

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

³ Means in the same column 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 soybean aphids on three plants in each plot of four replications.

⁵ DAT = days after treatment (with insecticide/fungicide).

⁶ Soybeans were harvested from the center two rows of each plot and converted to bushels per acre (bu/A) at 13% moisture.

⁷ Means followed by the same letter do not differ significantly ($P = 0.1$, Duncan's New Multiple Range Test).