



SOYBEANS

SECTION 9

Evaluation of experimental and commercially available foliar-applied insecticides to control Japanese beetles (*Popillia japonica*) in soybean in Illinois, 2013

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

Location

We established one trial at the Adam Yoeckel 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 20 ft. Densities of Japanese beetles were determined by taking 20 sweeps per plot with a 15-inch diameter sweep net. Densities of Japanese beetles were assessed on 25 July and on 1, 8, and 15 August (0, 7, 14, and 21 days after treatment [DAT], respectively). Defoliation was determined by estimating the percentage defoliation for five randomly selected leaflets per plot on 15 August (21 DAT).

Planting and Insecticide Application

The trial was planted on 20 May using a 16-row Case IH Model 1250 planter. Seeds were planted in 30-inch rows at an approximate depth of 1 inch. Insecticides were applied on 25 July 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, except those with experimental designations, are listed in Appendix II.

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 8.5.0 (Copyright© 1982–2012 Gylling Data Management, Inc., Brookings, SD).

Results and Discussion

Mean densities of Japanese beetles are presented in Table 9.2. On 25 July (0 DAT), mean beetle densities were substantial (18.9 Japanese beetles per 20 sweeps when averaged across all treatments). On 1 August (7 DAT), all insecticide treatments had significantly fewer Japanese beetles per 20 sweeps than both the untreated check (UTC) and Quilt Xcel fungicide treatment. On 8 August (14 DAT), Besiege, Cobalt Advanced, Cobalt Advanced + Headline SC, and Warrior II + Quilt Xcel had significantly fewer Japanese beetles per 20 sweeps than Quilt Xcel. On 15 August (21 DAT), Besiege, Cobalt Advanced, Quilt Xcel, and Warrior II + Quilt Xcel had significantly fewer Japanese beetles per 20 sweeps than the UTC. It is unclear why the Quilt Xcel fungicide treatment had such a low mean density of Japanese beetles on 15 August.

Mean defoliation percentages are presented in Table 9.2. No significant differences in mean defoliation percentages were observed.

TABLE 9.1 • Agronomic information for efficacy trial of experimental and commercially available foliar-applied insecticides to control Japanese beetles in soybean, Morrison, University of Illinois, 2013

Planting date	20 May
Variety	Pioneer 92Y51
Row spacing	30 inches
Seeding rate	150,000/acre
Previous crop	Corn
Tillage	Fall—vertical tillage Spring—vertical tillage



SOYBEANS

TABLE 9.2 • Evaluation of experimental and commercially available foliar-applied insecticides to control Japanese beetles in soybean, Morrison, University of Illinois, 2013

Product ¹	Rate ²	Mean no. Japanese beetles per 20 sweeps ^{3,4}				Mean % defoliation ^{4,6} 15 Aug (21 DAT ⁵)
		25 July (0 DAT ⁵)	1 Aug (7 DAT ⁵)	8 Aug (14 DAT ⁵)	15 Aug (21 DAT ⁵)	
Besiege	9	18.5 a	2.3 b	1.8 b	4.8 c	5.5 a
Cobalt Advanced	26	18.0 a	1.5 b	3.5 b	11.8 bc	7.5 a
Cobalt Advanced + Headline SC	26 12	15.8 a	1.3 b	3.0 b	7.0 abc	4.1 a
Endigo ZCX ⁷	4.5	17.5 a	3.0 b	10.3 ab	14.5 ab	5.7 a
EXP1	14	17.3 a	1.3 b	10.3 ab	11.3 abc	5.4 a
Quilt Xcel	14	19.3 a	15.0 a	20.8 a	5.5 c	5.3 a
Warrior II	1.92	19.3 a	2.0 b	10.3 ab	10.8 abc	8.2 a
Warrior II + Quilt Xcel	1.92 14	20.5 a	1.5 b	5.0 b	6.0 c	5.7 a
Untreated check	—	23.8 a	20.0 a	11.8 ab	16.5 a	9.4 a

¹ Crop oil concentrate was added to the spray solution for each product (excluding the stand-alone Cobalt Advanced treatment) at a rate of 1%.

² Rates of application for foliar insecticide/fungicide are ounces (oz) of product per acre.

³ Means were derived from the numbers of insects in 20 sweeps per plot in each of four replications.

⁴ Means in the same column and followed by the same letter do not differ significantly ($P = 0.05$, Duncan's New Multiple Range Test).

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

⁶ Means were estimated by determining the percentage defoliation for five randomly selected leaflets per plot in each of four replications.

⁷ Endigo ZCX is not currently labeled for commercial use.