

Evaluation of Foliar-Applied Insecticides in Soybean

Terry A. DeVries, University of Nebraska, South Central Ag Laboratory, Clay Center, NE 68933

Robert J. Wright, Dept. Of Entomology, University of Nebraska-Lincoln, Lincoln NE 68583-0816, rwright2@unl.edu

Background information pertaining to insecticide experiments conducted at Clay Center, NE during 2009.

AGRONOMIC:

Hybrid:	Pioneer 92M61
Row Spacing:	30 inches
Row Orientation:	North-South
Planting Date:	14 May 2009
Planter:	8-row 7300 JD Maximerge with vacuum seed metering units.
Planting Depth:	1-inch
Application Equipment:	<u>Liquid Insecticides:</u> Rear-mounted boom system on tractor. Liquid treatments were broadcast over the plant canopy in a 20.3 GPA water solution via 20-inch nozzle spacing (T-Jet 110002VS) @ 30 psi on 23 July 2009.
Previous Crop:	Sorghum
Soil Information:	Butler and Crete silt loam
Herbicides Applied:	Broadcasted: RoundUp WeatherMax @ 22 fl oz/acre and AMS @ 17 lbs/100 gal solution on 18 June 2009.
Cultivation Timing:	Soybeans were cultivated on 30 June 2009.

DATA COLLECTION:

- Plant Populations: The seeding rate was 144,000 seeds per acre.
- Insect Sampling: Insect populations were sampled prior to insecticide application on 23 July and 5 days, 1 week, 2 weeks, 3 weeks, and 4 weeks after treatment (28 July, 30 July, 06 August, 13 August, and 20 August). A sweep net (25 sweeps/plot) was used to sample insect populations. The total number of adult and nymphal brown stink bug, green stink bug, grasshopper and lady beetles and the number of adult *Dectes* stem borer and bean leaf beetle were recorded per plot for each sample date.
- Harvest Evaluations: Plots were machine harvested on 30 September 2009. Percent moisture and lbs of grain were recorded and converted to 60 lbs/bu @ 13% moisture to evaluate yield.

EXPERIMENTAL DESIGN:

- Design: Randomized complete block; replicated four times
- Plot Size: 16 rows x 420 feet
- Statistical Analyses: PROC MIXED, with mean separation using the differences of least square means (MIXED; $p|t|>0.05$).

ENVIRONMENTAL:

Conditions at time of treatment applications on 23 July (11:00am – 1:00pm):

- Wind direction and speed: SE < 10 mph
- Air Temperature: 85-90 °F
- Crop Stage: late R3

RECORD OF RAINFALL: (April 1 – September 30)

<u>Date</u>	<u>Amount (Inches)</u>	<u>Date</u>	<u>Amount (Inches)</u>
April 1	0.35	June 8	0.85
April 13	0.40	June 10	0.30
April 17	0.30	June 16	2.55
April 29	0.65	June 20	0.25
April 30	0.15	June 21	0.10
May 4	0.30	June 23	0.25
May 8	0.30	June 26	0.20
May 11	0.15	July 3	0.25
May 13	0.20	July 25	1.20
May 27	0.35	August 5	0.40
June 1	0.70	August 26	3.60
June 2	0.25	Sept. 13	1.15
		Sept. 14	<u>0.35</u>
		<i>Total</i>	<i>15.55</i>

<u>Month</u>	<u>Total (Inches)</u>	<u>Month</u>	<u>Total (Inches)</u>
April	1.85	July	1.45
May	1.30	August	4.00
June	5.45	September	<u>1.50</u>
		<i>Total</i>	<i>15.55</i>

SEASONAL RECORD OF IRRIGATION:

<u>Date</u>	<u>Amount (Inches)</u>
July 8	1.49
July 14	1.48
August 4	1.47
August 11	1.49
August 20	<u>1.47</u>
<i>Total</i>	7.40

<u>Month</u>	<u>Total (Inches)</u>
July	2.97
August	<u>4.43</u>
<i>Total</i>	7.40

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INSECT PRECOUNTS ON 23 JULY 2009

AVG. NO. PER 25 SWEEPS

Insecticide Product ¹	Brown Stink Bug		Green Stink Bug		Grasshopper		<i>Dectes</i>	Lady Beetle		Bean Leaf Beetle
	<u>Adult</u> ²	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Adult</u> ³	<u>Larva</u> ³	<u>Adult</u> ³
Baythroid XL	0.3 a	0	0.5	0	4.0	2.5	1.0	4.0	0	37.8
Leverage 2.7 SE	0.3 a	0	0.0	0	1.4	5.3	1.6	3.9	0	53.2
Untreated	3.5 b	0	0.0	0	3.3	4.3	0.5	5.0	0	44.5
<i>Treatment Probability</i>	<i>0.0351</i>	<i>1</i>	<i>0.1395</i>	<i>1</i>	<i>0.2474</i>	<i>0.2268</i>	<i>0.1093</i>	<i>0.6950</i>	<i>1</i>	<i>0.2143</i>

INSECT COUNTS 5 DAYS AFTER TREATMENT ON 28 JULY 2009

AVG. NO. PER 25 SWEEPS

Insecticide Product ¹	Brown Stink Bug		Green Stink Bug		Grasshopper		<i>Dectes</i>	Lady Beetle		Bean Leaf Beetle
	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Adult</u> ²	<u>Larva</u> ³	<u>Adult</u> ²
Baythroid XL	0.3	0	0	0	1.0	1.5	0	0.0 b	0	0.3 a
Leverage 2.7 SE	0.0	0	0	0	2.0	0.5	0	0.5 ab	0	1.5 a
Untreated	0.0	0	0	0	3.8	2.3	0	2.3 a	0	17.0 b
<i>Treatment Probability</i>	<i>0.4053</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>0.3624</i>	<i>0.3003</i>	<i>1</i>	<i>0.0495</i>	<i>1</i>	<i><.0001</i>

¹Baythroid XL applied at a rate of 2.8 fl oz/acre; Leverage 2.7 SE applied at a rate of 3.8 fl oz/acre on 23 July 2009.

²Means in column followed by the same lowercase letter are not statistically different using the differences of least square means (MIXED; p|t|>0.05).

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INSECT COUNTS 1 WEEK AFTER TREATMENT ON 30 JULY 2009

AVG. NO. PER 25 SWEEPS

Insecticide Product ¹	Brown Stink Bug		Green Stink Bug		Grasshopper		<i>Dectes</i>	Lady Beetle		Bean Leaf Beetle
	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Adult</u> ³	<u>Larva</u> ³	<u>Adult</u> ²
Baythroid XL	0.0	0	0	0	1.3	1.0	0	0.0	0	2.0 a
Leverage 2.7 SE	0.3	0	0	0	0.0	2.5	0	0.0	0	0.8 a
Untreated	0.0	0	0	0	1.0	2.8	0	0.5	0	8.3 b
<i>Treatment Probability</i>	<i>0.4053</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>0.0834</i>	<i>0.3910</i>	<i>1</i>	<i>0.1004</i>	<i>1</i>	<i>0.0027</i>

INSECT COUNTS 2 WEEKS AFTER TREATMENT ON 06 AUGUST 2009

AVG. NO. PER 25 SWEEPS

Insecticide Product ¹	Brown Stink Bug		Green Stink Bug		Grasshopper		<i>Dectes</i>	Lady Beetle		Bean Leaf Beetle
	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Adult</u> ³	<u>Larva</u> ³	<u>Adult</u> ³
Baythroid XL	0.3	0	0	0	4.3	2.3	0	0.5	0	6.8
Leverage 2.7 SE	0.3	0	0	0	5.8	4.5	0	1.0	0	11.0
Untreated	0.3	0	0	0	1.3	2.0	0	0.8	0	11.5
<i>Treatment Probability</i>	<i>1.0000</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>0.0613</i>	<i>0.1780</i>	<i>1</i>	<i>0.7985</i>	<i>1</i>	<i>0.3072</i>

¹Baythroid XL applied at a rate of 2.8 fl oz/acre; Leverage 2.7 SE applied at a rate of 3.8 fl oz/acre on 23 July 2009.

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INSECT COUNTS 3 WEEKS AFTER TREATMENT ON 13 AUGUST 2009

AVG. NO. PER 25 SWEEPS

Insecticide Product ¹	Brown Stink Bug		Green Stink Bug		Grasshopper		<i>Dectes</i>	Lady Beetle		Bean Leaf Beetle
	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Nymph</u> ²	<u>Adult</u> ³	<u>Adult</u> ³	<u>Larva</u> ³	<u>Adult</u> ³
Baythroid XL	0.3	0	0.0	0	3.8	4.8 c	0	0.3	0	9.3
Leverage 2.7 SE	0.3	0	0.8	0	3.0	3.5 b	0	0.3	0	13.3
Untreated	0.0	0	0.0	0	1.5	2.5 a	0	1.0	0	9.3
<i>Treatment Probability</i>	<i>0.6224</i>	<i>1</i>	<i>0.1410</i>	<i>1</i>	<i>0.1699</i>	<i>0.0011</i>	<i>1</i>	<i>0.4219</i>	<i>1</i>	<i>0.2346</i>

INSECT COUNTS 4 WEEKS AFTER TREATMENT ON 20 AUGUST 2009

AVG. NO. PER 25 SWEEPS

Insecticide Product ¹	Brown Stink Bug		Green Stink Bug		Grasshopper		<i>Dectes</i>	Lady Beetle		Bean Leaf Beetle
	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Nymph</u> ³	<u>Adult</u> ³	<u>Adult</u> ³	<u>Larva</u> ³	<u>Adult</u> ³
Baythroid XL	0.5	0.0	0.0	0	6.0	2.8	0	0	0	0.3
Leverage 2.7 SE	0.3	0.5	0.3	0	6.8	4.0	0	0	0	0.8
Untreated	0.5	2.0	0.3	0	4.5	2.3	0	0	0	3.5
<i>Treatment Probability</i>	<i>0.7674</i>	<i>0.1843</i>	<i>0.6224</i>	<i>1</i>	<i>0.2441</i>	<i>0.4527</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>0.0536</i>

¹Baythroid XL applied at a rate of 2.8 fl oz/acre; Leverage 2.7 SE applied at a rate of 3.8 fl oz/acre on 23 July 2009.

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HARVEST DATA ON 30 SEPTEMBER

Insecticide Product ¹	Yield ³ (bu/acre)	% Moisture ²
Baythroid XL	73.7	11.2 b
Leverage 2.7 SE	73.8	11.2 b
Untreated	73.1	11.1 a
<i>Treatment Probability</i>	<i>0.3181</i>	<i>0.0221</i>

¹Baythroid XL applied at a rate of 2.8 fl oz/acre; Leverage 2.7 SE applied at a rate of 3.8 fl oz/acre on 23 July 2009.

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³Means in column are not statistically different using the differences of least square means (MIXED; p|t|>0.05).