**(F)**

**SOYBEAN:** *Glycine max* (L.) 'Pioneer 92M61'

# EFFICACY OF FOLIAR INSECTICIDES AGAINST BEAN LEAF BEETLE, STINK BUG, GRASSHOPPER AND SOYBEAN STEM BORER IN SOYBEAN, 2009

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Bean Leaf Beetle (BLB): *Cerotoma trifurcata* (Förster)

Brown Stink Bug (BSB): *Euschistus servus* (Say)

Green Stink Bug (GSB): *Acrosternum hilare* (Say)

Grasshoppers (GHOP): *Melanoplus* spp.

Soybean stem borer (SSB): *Dectes texanus texanus* LeConte

Beneficial Lady Beetles (LB): Coleoptera: Coccinellidae

A field study was conducted at the University of Nebraska's South Central Ag Laboratory near Clay Center, NE to evaluate the effectiveness of foliar-applied insecticides against soybean insect pests during 2009. Experimental design was a RCB with 4 replicates. Plot size was 16 rows x 420 ft length (N-S orientation) in 30-inch row spacing. Soybean variety 'Pioneer 92M51' was planted at a seeding rate of 144,000 seeds per acre on 14 May. A sweep net (25 sweeps/plot) was used to sample insect populations. The number of BLB adults, BSB adults and nymphs, GSB adults and nymphs, GHOP adults and nymphs, SSB adults and beneficial LB adults and nymphs were recorded. Pre-treatment (PRE) insect populations were sampled on 23 Jul (0800-1000 CST). Foliar liquid insecticide treatments were applied on 23 Jul (1100-1300 CST). Treatments were broadcast over the plant canopy in a 20.3 gpa water solution via a 20-inch nozzle spacing @ 30 psi. Soybean growth stage was late R3. Post-treatment insect populations were sampled 5 DAT (28 Jul), and 1, 2, 3 and 4 WAT (30 Jul, 06 Aug, 13 Aug and 20 Aug). Plots were machine harvested on 30 Sept. Percent moisture and lbs of grain were recorded and corrected to 60 lbs/bu @ 13% moisture. Data were analyzed by ANOVA with mean separation using differences of least square means (P = 0.05).

With the exception of BLB adult populations, insect pest populations were present at low levels. Baythroid XL and Leverage 2.7 SE significantly reduced BLB populations 5 DAT and 1 WAT compared to the untreated check (Table 2 and 3). Yield levels were NS influenced by the application of a foliar-applied insecticide to late R3 growth stage soybeans (Table 7).

**Table 1.**

| No./25 sweeps PRE | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment/ Formulation[1] | Rate-amt form/acre | BSB | | GSB | | GHOP | | SSB | LB | | BLB |
| | | Adult[2] | Nymph[3] | Adult[3] | Nymph[3] | Adult[3] | Nymph[3] | Adult[3] | Adult[3] | Larva[3] | Adult[3] |
| Baythroid XL | 2.8 fl oz | 0.3a | 0 | 0.5 | 0 | 4.0 | 2.5 | 1.0 | 4.0 | 0 | 37.8 |
| Leverage 2.7 SE | 3.8 fl oz | 0.3a | 0 | 0.0 | 0 | 1.4 | 5.3 | 1.6 | 3.9 | 0 | 53.2 |
| Untreated check | ---------- | 3.5b | 0 | 0.0 | 0 | 3.3 | 4.3 | 0.5 | 5.0 | 0 | 44.5 |
| | P | 0.0351 | 1 | 0.1395 | 1 | 0.2474 | 0.2268 | 0.1093 | 0.6950 | 1 | 0.2143 |

**Table 2.**

| No./25 sweeps 5 DAT | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment/ Formulation[1] | Rate-amt form/acre | BSB | | GSB | | GHOP | | SSB | LB | | BLB |
| | | Adult[3] | Nymph[3] | Adult[3] | Nymph[3] | Adult[3] | Nymph[3] | Adult[3] | Adult[2] | Larva[3] | Adult[2] |
| Baythroid XL | 2.8 fl oz | 0.3 | 0 | 0 | 0 | 1.0 | 1.5 | 0 | 0.0b | 0 | 0.3a |
| Leverage 2.7 SE | 3.8 fl oz | 0.0 | 0 | 0 | 0 | 2.0 | 0.5 | 0 | 0.5ab | 0 | 1.5a |
| Untreated check | ---------- | 0.0 | 0 | 0 | 0 | 3.8 | 2.3 | 0 | 2.3a | 0 | 17.0b |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | 0.4053 | 1 | 1 | 1 | 0.3624 | 0.3003 | 1 | 0.0495 | 1 | <.0001 |

**Table 3.**

| No./25 sweeps 1 WAT | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment/ Formulation[1] | Rate-amt form/acre | BSB | | GSB | | GHOP | | SSB | LB | | BLB |
| | | Adult[3] | Nymph[3] | Adult[3] | Nymph[3] | Adult[3] | Nymph[3] | Adult[3] | Adult[3] | Larva[3] | Adult[2] |
| Baythroid XL | 2.8 fl oz | 0.0 | 0 | 0 | 0 | 1.3 | 1.0 | 0 | 0.0 | 0 | 2.0a |
| Leverage 2.7 SE | 3.8 fl oz | 0.3 | 0 | 0 | 0 | 0.0 | 2.5 | 0 | 0.0 | 0 | 0.8a |
| Untreated check | ---------- | 0.0 | 0 | 0 | 0 | 1.0 | 2.8 | 0 | 0.5 | 0 | 8.3b |
| | P | 0.4053 | 1 | 1 | 1 | 0.0834 | 0.3910 | 1 | 0.1004 | 1 | 0.0027 |

**Table 4.**

| No./25 sweeps 2 WAT | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment/ Formulation[1] | Rate-amt form/acre | BSB | | GSB | | GHOP | | SSB | LB | | BLB |
| | | Adult[3] | Nymph[3] | Adult[3] | Nymph[3] | Adult[3] | Nymph[3] | Adult[3] | Adult[3] | Larva[3] | Adult[3] |
| Baythroid XL | 2.8 fl oz | 0.3 | 0 | 0 | 0 | 4.3 | 2.3 | 0 | 0.5 | 0 | 6.8 |
| Leverage 2.7 SE | 3.8 fl oz | 0.3 | 0 | 0 | 0 | 5.8 | 4.5 | 0 | 1.0 | 0 | 11.0 |
| Untreated check | ---------- | 0.3 | 0 | 0 | 0 | 1.3 | 2.0 | 0 | 0.8 | 0 | 11.5 |
| | P | 1.0000 | 1 | 1 | 1 | 0.0613 | 0.1780 | 1 | 0.7985 | 1 | 0.3072 |

**Table 5.**

| No./25 sweeps 3 WAT | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment/ Formulation[1] | Rate-amt form/acre | BSB | | GSB | | GHOP | | SSB | LB | | BLB |
| | | Adult[3] | Nymph[3] | Adult[3] | Nymph[3] | Adult[3] | Nymph[2] | Adult[3] | Adult[3] | Larva[3] | Adult[3] |
| Baythroid XL | 2.8 fl oz | 0.3 | 0 | 0.0 | 0 | 3.8 | 4.8c | 0 | 0.3 | 0 | 9.3 |
| Leverage 2.7 SE | 3.8 fl oz | 0.3 | 0 | 0.8 | 0 | 3.0 | 3.5b | 0 | 0.3 | 0 | 13.3 |
| Untreated check | ---------- | 0.0 | 0 | 0.0 | 0 | 1.5 | 2.5a | 0 | 1.0 | 0 | 9.3 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | 0.6224 | 1 | 0.1410 | 1 | 0.1699 | 0.0011 | 1 | 0.4219 | 1 | 0.2346 |

**Table 6.**

| No./25 sweeps 4 WAT | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment/ Formulation[1] | Rate-amt form/acre | BSB | | GSB | | GHOP | | SSB | LB | | BLB |
| | | Adult[3] | Nymph[3] | Adult[3] | Nymph[3] | Adult[3] | Nymph[3] | Adult[3] | Adult[3] | Larva[3] | Adult[3] |
| Baythroid XL | 2.8 fl oz | 0.5 | 0.0 | 0.0 | 0 | 6.0 | 2.8 | 0 | 0 | 0 | 0.3 |
| Leverage 2.7 SE | 3.8 fl oz | 0.3 | 0.5 | 0.3 | 0 | 6.8 | 4.0 | 0 | 0 | 0 | 0.8 |
| Untreated check | ---------- | 0.5 | 2.0 | 0.3 | 0 | 4.5 | 2.3 | 0 | 0 | 0 | 3.5 |
| | P | 0.7674 | 0.1843 | 0.6224 | 1 | 0.2441 | 0.4527 | 1 | 1 | 1 | 0.0536 |

**Table 7.**

| Treatment/ Formulation[1] | Rate-amt form/acre | Yield bu/acre[3] |
|---|---|---|
| Baythroid XL | 2.8 fl oz | 73.7 |
| Leverage 2.7 SE | 3.8 fl oz | 73.8 |
| Untreated check | ---------- | 73.1 |
| | P | 0.3181 |

[1]Treatments were broadcast over the plant canopy in a 20.3 GPA water solution via a 20-inch nozzle spacing @ 30 psi on 23 Jul.

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

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

**Part II. Materials Tested for Arthropod Management**

**(F)**

**SOYBEAN:** *Glycine max* (L.) 'Pioneer 92M61'

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| **Trade Name** | **Formulation** | **Common Name** | **Composition** | **Manufacturer** |
|---|---|---|---|---|
| Baythroid | XL | beta- | reaction mixture comprising the enantiomeric pair (*R*)- | Bayer AG |

| | | | | |
|---|---|---|---|---|
| | | cyfluthrin | α-cyano-4-fluoro-3-phenoxybenzyl (1*S*,3*S*)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate and (*S*)-α-cyano-4-fluoro-3-phenoxybenzyl (1*R*,3*R*)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate in ratio 1:2 with the enantiomeric pair (*R*)-α-cyano-4-fluoro-3-phenoxybenzyl (1*S*,3*R*)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate and (*S*)-α-cyano-4-fluoro-3-phenoxybenzyl (1*R*,3*S*)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate | Agriculture Division<br>P.O. Box 4913,<br>Hawthorn Road<br>Kansas City, MO 64120 |
| Leverage | 2.7 SE | imidacloprid and cyfluthrin | (*E*)-1-(6-chloro-3-pyridylmethyl)-*N*-nitroimidazolidin-2-ylideneamine<br>AND<br>(*RS*)-α-cyano-4-fluoro-3-phenoxybenzyl (1*RS*,3*RS*;1*RS*,3*SR*)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate | Bayer AG<br>Agriculture Division<br>P.O. Box 4913,<br>Hawthorn Road<br>Kansas City, MO 64120 |