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SOYBEAN: *Glycine max* (L.) 'Channel 2500R2 Brand'

**EFFICACY OF FOLIAR INSECTICIDES AGAINST BEAN LEAF BEETLES,
SOUTHERN CORN ROOTWORMS, STINK BUGS, GRASSHOPPERS, LEPIDOPTERAN
LARVAE AND SOYBEAN STEM BORERS IN SOYBEAN, 2011**

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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.

Southern Corn Rootworm (SCR): *Diabrotica undecimpunctata howardi* Barber

Soybean Stem Borer (SSB): *Dectes texanus texanus* LeConte

Lepidoptera (LEP): Arctiidae, Noctuidae

Beneficial Lady Beetles (LB): Coleoptera: Coccinellidae

A field study was conducted at the University of Nebraska's South Central Agricultural Laboratory near Clay Center, NE to evaluate the effectiveness of foliar-applied insecticides against soybean insect pests during 2011. Experimental design was a RCB with 4 replicates. Plot size was 8 rows x 47 ft length (N-S orientation) in 30-inch row spacing. Soybean variety 'Channel 2500R2 Brand' was planted at a seeding rate of 150,000 seeds per acre on 10 May. A sweep net (25 sweeps/plot) was used to sample insect populations. The number of BLB adults, SCR adults, BSB adults and nymphs, GSB adults and nymphs, GHOP adults and nymphs, SSB adults, LEP larvae and beneficial LB adults and larvae were recorded per sample date. Pre-treatment (PRE) insect populations were sampled on 25 Jul. Foliar insecticide treatments were subsequently applied on 25 Jul. Treatments were broadcast over the plant canopy in a 10 gpa water solution via a 20-inch nozzle spacing @ 30 psi. Post-treatment insect populations were sampled 1 DAT (26 Jul), 3 DAT (29 Jul), 7 DAT (02 Aug), 14 DAT (09 Aug) and 21 DAT (16

Aug). Soybean plots were machine harvested on 27 Sept. Percent moisture and lbs of grain were recorded and corrected to 60 lbs/bu @ 13% moisture. Data were analyzed by PROC MIXED with mean separation using differences of least square means ($P = 0.05$).

With the exception of BLB, insect pest populations were present at low levels throughout the duration of the field study. All foliar-applied insecticides significantly reduced BLB populations 1 DAT and 3 DAT compared to the untreated check (Table 2 and 3). Soybean yield levels were NS influenced by the application of a foliar-applied insecticide (Table 7). This research was supported by industry gifts of pesticides and research funding.

Table 1.

No./25 sweeps PRE													
Treatment/ Formulation ^a	Rate-amt form/acre	BLB	SCR	BSB		GSB		GHOP		SSB	LEP	LB	
		Adult ^c	Adult ^c	Adult ^c	Nymph ^c	Adult ^c	Nymph ^c	Adult ^c	Nymph ^c	Adult ^c	Larva ^c	Adult ^c	Larva ^c
Leverage 360	2.8 fl oz	42.0	0.0	0.8	0	0	0	0	0.3	0.0	1.0	1.0	0
Lorsban 480EC	16 fl oz	34.8	0.0	1.8	0	0	0	0	0.0	0.5	0.5	0.5	0
Warrior	2.56 fl oz	33.8	0.5	1.0	0	0	0	0	0.3	0.3	0.8	1.3	0
Baythroid XL + Lorsban 480EC	2 fl oz + 8 fl oz	31.8	0.5	0.8	0	0	0	0	0.5	0.0	1.3	1.3	0
Untreated Check	-----	28.8	0.0	1.5	0	0	0	0	0.5	0.0	1.0	2.0	0

P 0.3943 0.1243 0.5302 1 1 1 1 0.5258 0.1991 0.6575 0.7481 1

Table 2.

No./25 sweeps 1 DAT													
Treatment/ Formulation ^a	Rate-amt form/acre	BLB	SCR	BSB		GSB		GHOP		SSB	LEP	LB	
		Adult ^b	Adult ^c	Adult ^c	Nymph ^c	Adult ^c	Nymph ^c	Adult ^c	Nymph ^c	Adult ^c	Larva ^c	Adult ^c	Larva ^c
Leverage 360	2.8 fl oz	0.8 a	0	0.0	0	0.0	0	0	0	0	0.3	0.3	0
Lorsban 480EC	16 fl oz	3.5 a	0	0.5	0	0.0	0	0	0	0	0.3	0.5	0
Warrior	2.56 fl oz	0.8 a	0	0.3	0	0.3	0	0	0	0	0.3	0.0	0
Baythroid XL + Lorsban 480EC	2 fl oz + 8 fl oz	0.0 a	0	0.0	0	0.0	0	0	0	0	0.0	0.3	0
Untreated Check	-----	21.0 b	0	0.3	0	0.0	0	0	0	0.3	0.0	0.8	0

P <.0001 1 0.6795 1 0.4449 1 1 1 0.4449 0.7166 0.4735 1

Table 3.

No./25 sweeps 3 DAT													
Treatment/ Formulation ^a	Rate-amt form/acre	BLB	SCR	BSB		GSB		GHOP		SSB	LEP	LB	
		Adult ^b	Adult ^c	Adult ^c	Nymph ^c	Adult ^c	Nymph ^c	Adult ^c	Nymph ^c	Adult ^c	Larva ^c	Adult ^b	Larva ^c
Leverage 360	2.8 fl oz	1.8 a	0.0	1.0	0	0.0	0	0.0	0.5	0.0	0	0.3 cd	0
Lorsban 480EC	16 fl oz	5.3 a	0.5	0.8	0	0.3	0	0.0	0.3	0.0	0	1.8 ab	0
Warrior	2.56 fl oz	1.0 a	0.0	0.3	0	0.0	0	0.3	0.5	0.3	0	0.0 d	0
Baythroid XL + Lorsban 480EC	2 fl oz + 8 fl oz	5.3 a	0.0	1.3	0	0.0	0	0.0	0.3	0.3	0	1.0 bc	0
Untreated Check	-----	17.5 b	0.3	1.3	0	0.0	0	0.3	0.3	0.3	0	2.0 a	0

P 0.0003 0.1586 0.6911 1 0.4449 1 0.5732 0.9424 0.7166 1 0.0022 1

Table 4.

No./25 sweeps 7 DAT													
Treatment/ Formulation ^a	Rate-amt form/acre	BLB	SCR	BSB		GSB		GHOP		SSB	LEP	LB	
		Adult ^c	Adult ^c	Adult ^c	Nymph ^c	Adult ^c	Nymph ^c	Adult ^c	Nymph ^c	Adult ^c	Larva ^c	Adult ^c	Larva ^c
Leverage 360	2.8 fl oz	3.0	0.0	0.5	0	0	0	0.0	0.0	0.3	0	0.0	0
Lorsban 480EC	16 fl oz	5.5	0.5	0.3	0	0	0	0.0	0.3	0.0	0	0.0	0
Warrior	2.56 fl oz	10.5	0.3	0.8	0	0	0	0.3	0.5	0.0	0	0.8	0
Baythroid XL + Lorsban 480EC	2 fl oz + 8 fl oz	8.5	0.0	0.3	0	0	0	0.0	0.5	0.0	0	0.0	0
Untreated Check	-----	8.0	1.0	0.0	0	0	0	0.3	0.3	0.0	0	0.0	0

P 0.0901 0.0642 0.6213 1 1 1 0.4449 0.6911 0.4449 1 0.4449 1

Table 5.

No./25 sweeps 14 DAT													
Treatment/ Formulation ^a	Rate-amt form/acre	BLB	SCR	BSB		GSB		GHOP		SSB	LEP	LB	
		Adult ^b	Adult ^c	Adult ^c	Nymph ^c	Adult ^c	Nymph ^c	Adult ^c	Nymph ^c	Adult ^c	Larva ^c	Adult ^c	Larva ^c
Leverage 360	2.8 fl oz	12.3 a	0.8	0.5	0.0	0.0	0	0	0.3	0.3	0	0.8	0
Lorsban 480EC	16 fl oz	17.0 ab	0.3	1.0	0.0	0.0	0	0	0.0	0.0	0	0.5	0
Warrior	2.56 fl oz	25.0 b	0.5	0.5	0.0	0.3	0	0	0.3	0.0	0	1.8	0
Baythroid XL + Lorsban 480EC	2 fl oz + 8 fl oz	10.8 a	0.8	0.3	0.3	0.0	0	0	0.0	0.0	0	0.0	0
Untreated Check	-----	12.0 a	0.5	0.0	0.0	0.0	0	0	0.3	0.0	0	0.0	0

P 0.0406 0.7854 0.2065 0.4449 0.4449 1 1 0.7166 0.4449 1 0.2062 1

Table 6.

No./25 sweeps 21 DAT													
Treatment/ Formulation ^a	Rate-amt form/acre	BLB	SCR	BSB		GSB		GHOP		SSB	LEP	LB	
		Adult ^b	Adult ^c	Adult ^c	Nymph ^c	Adult ^c	Nymph ^c	Adult ^c	Nymph ^c	Adult ^c	Larva ^c	Adult ^c	Larva ^c
Leverage 360	2.8 fl oz	16.0 a	0.3	0.5	0.3	0.0	0	0.0	0.3	0.0	0.3	0	0
Lorsban 480EC	16 fl oz	29.3 b	0.3	0.8	1.8	0.3	0	0.5	0.0	0.0	0.0	0	0
Warrior	2.56 fl oz	35.8 b	0.5	0.0	0.5	0.3	0	0.0	0.0	0.3	0.0	0	0
Baythroid XL + Lorsban 480EC	2 fl oz + 8 fl oz	33.5 b	0.5	0.3	1.3	0.0	0	0.3	0.0	0.0	0.0	0	0
Untreated Check	-----	25.0 ab	0.3	0.3	2.0	0.0	0	0.0	0.3	0.0	0.3	0	0

P 0.0363 0.8960 0.2520 0.1136 0.5732 1 0.1991 0.4449 0.4449 0.5732 1 1

Table 7.

Treatment/ Formulation ^a	Rate-amt form/acre	% Grain Moisture ^c	Yield (bu/acre) ^c
Leverage 360	2.8 fl oz	9.5	78.7
Lorsban 480EC	16 fl oz	9.6	74.9
Warrior	2.56 fl oz	9.5	77.7
Baythroid XL + Lorsban 480EC	2 fl oz + 8 fl oz	9.5	77.6
Untreated Check	-----	9.6	76.4

P 0.5271 0.2572

^aTreatments were broadcast over the plant canopy in a 10 gpa water solution via a 20-inch nozzle spacing @ 30 psi on 25 Jul.

^bMeans in column followed by the same lowercase letter are NS different using the differences of least square means (MIXED; p|t|>0.05).

^cMeans in column are NS different using the differences of least square means (MIXED; p|t|>0.05).

Part II. Materials Tested for Arthropod Management

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Trade Name	Formulation	Common Name	Composition	Manufacturer
Baythroid	XL	beta-	reaction mixture comprising the enantiomeric pair	Bayer AG

		cyfluthrin	(<i>R</i>)-α-cyano-4-fluoro-3-phenoxybenzyl (1<i>S</i>,3<i>S</i>)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate and (<i>S</i>)-α-cyano-4-fluoro-3-phenoxybenzyl (1<i>R</i>,3<i>R</i>)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate in ratio 1:2 with the enantiomeric pair (<i>R</i>)-α-cyano-4-fluoro-3-phenoxybenzyl (1<i>S</i>,3<i>R</i>)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate and (<i>S</i>)-α-cyano-4-fluoro-3-phenoxybenzyl (1<i>R</i>,3<i>S</i>)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate	Agriculture Division P.O. Box 4913, Hawthorn Road Kansas City, MO 64120
Leverage	360	imidacloprid and beta-cyfluthrin	(<i>E</i>)-1-(6-chloro-3-pyridylmethyl)-<i>N</i>-nitroimidazolidin-2-ylideneamine AND reaction mixture comprising the enantiomeric pair	Bayer AG Agriculture Division P.O. Box 4913, Hawthorn Road

			(<i>R</i>)-α-cyano-4-fluoro-3-phenoxybenzyl (1<i>S</i>,3<i>S</i>)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate and (<i>S</i>)-α-cyano-4-fluoro-3-phenoxybenzyl (1<i>R</i>,3<i>R</i>)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate in ratio 1:2 with the enantiomeric pair (<i>R</i>)-α-cyano-4-fluoro-3-phenoxybenzyl (1<i>S</i>,3<i>R</i>)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate and (<i>S</i>)-α-cyano-4-fluoro-3-phenoxybenzyl (1<i>R</i>,3<i>S</i>)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate	Kansas City, MO 64120
Warrior w/Zeon Technology		Lambda- cyhalothrin	reaction product comprising equal quantities of (<i>R</i>)-α-cyano-3-phenoxybenzyl (1<i>S</i>,3<i>S</i>)-3-[(<i>Z</i>)-2-chloro-3,3,3-trifluoropropenyl]-2,2-dimethylcyclopropanecarboxylate and (<i>S</i>)-α-cyano-	Syngenta Crop Protection, Inc. P. O. Box 18300 Greensboro, NC 27409

			3-phenoxybenzyl (1R,3R)-3-[(Z)-2-chloro-3,3,3-trifluoropropenyl]-2,2-dimethylcyclopropanecarboxylate or of (R)-α-cyano-3-phenoxybenzyl (1S)-cis-3-[(Z)-2-chloro-3,3,3-trifluoropropenyl]-2,2-dimethylcyclopropanecarboxylate and (S)-α-cyano-3-phenoxybenzyl (1R)-cis-3-[(Z)-2-chloro-3,3,3-trifluoropropenyl]-2,2-dimethylcyclopropanecarboxylate	
Lorsban	480EC	chlorpyrifos	O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate	Dow AgroSciences LLC 9330 Zionsville Road Indianapolis, IN 46268