

INDIANA

**CORN AND SOYBEAN
INSECTICIDE EVALUATIONS**

2008



Department of Entomology
Purdue University

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Introduction

Weather and Field Crop Pests during 2008

This weather narrative was summarized from personal observations (LWB) and Indiana State Climate Office Monthly Weather Reports (Joseph Mays).

The droughty conditions that prevailed through much of late 2007 abruptly ended with the appearance of much-needed rain and snow as the winter of 2007/2008 began. The early months of 2008 continued the wet and warm pattern. Damp conditions continued into February and, coupled with unusually cold temperatures, resulted in record snowfalls and many instances of freezing rain and sleet statewide. Below normal temperatures and very wet conditions continued into March with the southern and central counties receiving the bulk of record rain and snow. Despite repeated incursions of cold air, spring finally arrived in April with slightly warmer and drier conditions than normal, but the southern counties continued to lead the state in rainfall. The gains made in April to begin spring disappeared in May. Spring agricultural fieldwork was just beginning at the end of April when a prolonged period of abnormally cold temperatures and severe storms began with tornados and hail crossing the state at mid month. Soil temperatures remained below the level at which germination begins for many crops and weeds during the first three weeks of the month. This resulted in many fields being replanted statewide. Flooding was prevalent in 2008 in June with west central counties receiving up to 600% of normal rainfall. Many fields that had struggled to germinate in May were washed away, drowned, or had increased stress and disease injury. A series of storm fronts crossed the state the entire month. Like May, June experience a large number of violent storms with tornados and hail. Although there were several incursions of cold air, temperatures were slightly above normal statewide. The anticipation of warmer summer temperatures needed to accelerate crop growth was lost when July proved to be cooler than normal. The wet pattern present all year continued with moisture levels at or near normal. The cool trend continued until the end of August, but in contrast to most of the preceding year, this month marked the beginning of an extended period of dry weather for the central and southern counties. In September, the incursion of tropical storms brought extremely high levels of precipitation to northern counties, particularly in the northwest and damaging wind to southern counties. Temperatures were warmer than normal at this time. The dry conditions that begin in the previous month continued in the central counties. Statewide rain in early October eased the dry conditions in central counties somewhat but levels remain below normal. October began very warm but temperatures became more seasonal at mid month. Overall, 2008 was a markedly cooler and wetter year than in 2007.

The primary crop pest in 2008 was the western corn rootworm, *Diabrotica virgifera virgifera*, however, with the growing use of rootworm resistant corn the level of infestation tended to be less than that seen in previous years. Also, the extremely high levels of rainfall and subsequent areas of prolonged saturated soil in many counties in June likely resulted in substantial rootworm larval mortality. First stage larvae were first detected in Tippecanoe County on 4 June. This is four days later than the 27-year average. Adult rootworm beetles were first captured in emergence traps on 14 July. This was one to two weeks later than normal. Adults continued to emerge until about the first week of October, or about 3 weeks later than normal.

The near uniform use of highly resistant, transgenic corn hybrids has resulted in a substantial reduction of European corn borer, *Ostrinia nubilalis*, as a pest of corn. This insect continues to be found in home gardens and commercial vegetable production.

Soybean aphid, *Aphis glycines*, (SBA) continued the trend of alternating years of abundance in the great lake states area by being at very low levels statewide for most of the season. It appeared briefly at economically important levels in several north central counties late in the growing season. Late season attempts at classical biological control have yielded substantial levels of SBA mortality. Overwintering success of the introduced natural enemies is currently unknown.

As was the situation last year, Japanese beetle, *Popillia japonica*, adult and larval injury to field crops was very localized and the overall impact was minimal. Incidence of economically important populations in horticultural settings was highly variable and localized.

Corn earworm, *Helicoverpa zea*, (CEW) adults were present in very high numbers early in the season following the strong storms in June. Subsequent earworm larvae severely threatened early sweet corn. Later season CEW populations declined to normal levels. Only light infestations were reported in late season field corn.

Western bean cutworm *Striacosta albicosta*, (WBCW) is a relatively new pest in Indiana and appears to be expanding its range. Currently, greatest economic impact was confined to the northern one-third of the state

Alfalfa weevil, *Hypera postica*, injury to alfalfa was moderate to light in the spring. Excessive moisture is known to enhance pathogenic fungi which infects these insects.

The threat from the Asiatic garden beetle, *Maladera castanea*, appears to be increasing. Larvae were found to be damaging corn roots in very localized areas within fields primarily with sandy soils in across northern counties.

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EVALUATIONS OF INSECTICIDES USED TO CONTROL CORN ROOTWORM LARVAE

Introduction and Objective:

The western corn rootworm (WCR), *Diabrotica virgifera virgifera* is a very destructive corn pest in Indiana. The northern corn rootworm, *D. barberi*, and the southern corn rootworm, *D. undecimpunctata howardi* also occur in Indiana, but are not considered important pests there. Although rootworm adults can be damaging to above-ground portions of corn, larval damage to roots is most economically important. Test results included in this report compare efficacy of experimental and registered products and application technologies used to manage larvae. The overall goal of this report is to provide public information that would facilitate the most economically efficient, environmental safe, and practical options to manage WCR larval damage to corn.

Trial Locations:

- 1) Pinney-Purdue Agricultural Center, Wanatah, IN
- 2) Throckmorton-Purdue Agricultural Center, Lafayette, IN.

Test Design and Application Techniques:

The trial areas were late-planted to corn (relative to surrounding corn) as trap crops in 2007 to increase the probability of root damage by larvae in 2008. Each experiment was a randomized complete block design with four replications. The experimental unit or plot was a single row 100 feet in length. All trials were planted with a John Deere® MaxEmerge model 7000 planter at a speed of 3 mph. Corn was planted in 30-inch wide rows at 27,700 kernels/acre. DeKalb DKC61-73 treated with fungicides (fludioxonil+mefenoxam) and the seed-applied insecticide Poncho 250 was used as the base hybrid at all locations.

Granular insecticides were applied through specially modified, bench-calibrated Noble® metering units as T-band or as in-furrow treatments. Fortress 5G and Counter 15G were applied using an AMVAC SmartBox® applicator that had been modified to hold 1 pound of formulated product. Granular T-band applications were placed in front of the furrow-closure wheels using 4-inch skirted all terrain, plastic diffusers. The band coverage pattern was approximately five inches wide over an open furrow. In-furrow treatments were directed into the open furrow using 3/4-inch ID Tygon® tubing.

Liquid formulations were applied with CO2 propellant at 5 gpa using a TeeJet 80015 nozzle at 11 psi. Liquid T-band treatments had a coverage pattern of approximately five inches wide over an open furrow. Liquid formulations were agitated immediately prior to each application. Seed treatments and transgenic hybrids were planted using a modified seeder constructed from a standard John Deere finger pickup seed meter attached to a planter unit adapter frame and attached to a MaxEmerge 7000. The seeder was modified to contain and dispense about 4 ounces of seed.

All treatments were incorporated by a gang of five straight 5/16-inch diameter steel drag chains about eight inches long attached behind each furrow closure wheel.

Evaluation Procedures

Phytotoxicity:

Plant stand establishment was assessed to determine whether any of the insecticide treatments caused significant plant population reductions and to determine the occurrence and impact of additional insect pests. The number of healthy plants per 40 feet was recorded from each plot (4 replicates). In addition to stand counts, extended leaf heights of 10 randomly selected corn plants were measured and averaged for each replicate. This was an estimate of seedling vigor.

Larval Damage:

Five root systems were sampled and damage scores averaged from each plot (4 replicates). Each root system was washed and assigned a root damage rating.

Roots were rated using the node injury scale (Oleson et al. 2005. J. Econ. Entomol. 98:1) that had been slightly modified. The modification was that roots were declared pruned at 1.5 inches from the stalk instead of 2 inches.

Damage Rating

	<u>Description</u>
0.00	No feeding damage (lowest rating that can be given).
1.00	One node of roots, or the equivalent of an entire node, eaten back to within approximately 1.5 inches of the stalk (soil line on the 7th node).
2.00	Two nodes eaten.
3.00	Three or more nodes eaten. (highest rating)

Damage between complete nodes is the estimated percentage of the node missing, i.e. 1.50 = 1 1/2 nodes eaten, 0.25 = 1/4 of one node eaten, etc.

Plant Lodging:

Number of plants leaning greater than 45 degrees beginning below the ear (stalk lodging) per 20 consecutive plants were pooled for each plot. Lodged plants were caused by stalk breakage and by plants being uprooted by combinations of wet soil, compacted soil and wind. Each treatment mean was the average of 4 replications.

Consistency of Performance:

The proportion of roots (n=5) that were rated less than or equal to 0.25 on the node injury scale was calculated per replicate. The replicates (n=4) were averaged for each test entry to provide a measure of the frequency of root ratings at or below the conventional values of the economic injury level. The arcsine square root transformation was used to adjust the variances prior to mean separation. The means of the angles were back-transformed to the original units. The tables show raw and back-transformed percentages.

Analyses:

The Ryan, Einot, Gabriel, Welsch-Q multiple stage test ($\alpha=0.05$) was used to separate treatment means only where significant ANOVA F test occurred ($P\leq 0.05$) (SAS). The ANOVA and mean separations for the consistency data (proportion of roots at or below 0.25 rating) and percentage of lodged plants were performed on transformed data (arcsine square root) where indicated. Both raw means and back-transformed weighted means are shown when transformation was used. Data were segregated a-posteriori by hybrid family (DKC61-73/69, Mycogen 2J665/669, and Pioneer 32T84/85) and analyzed separately.

Weather Data

Weather data are from the Purdue Agricultural Automated Weather Station located at each test site (Appendix I). These data include precipitation, daily maximum and minimum air and soil temperatures from May-November. Growing Degree Days (GDD) base 50 are reported for each trial site.

Field Notes

1. Pinney PAC: Several plots (single rows) were accidentally not treated due to a Noble meter that was not engaged (worn out drive unit). Two Herculex Xtra plots were lost due to planting errors. Rootworm larval feeding "pressure" was moderate. There was drought stress from mid to late season. Soil at this site had a tendency toward compaction. The effects of "sidewall" compaction of the furrow were evident on the root masses during damage evaluation. Soil conditions at planting were dry surface with wet cold soil at 3 inches. An extended period of cold soil temperatures delayed germination by 3 weeks.

2. Throckmorton PAC: Several plots (single rows) were accidentally not treated due to a Noble meter that was not engaged (worn out drive unit). Soil conditions at planting were dry surface with wet cold soil at 3 inches. Germination and seedling growth were delayed by several weeks. Rootworm larval feeding "pressure" was moderate. Very wet soil conditions in June were associated with an atypical root damage pattern. Rootworm larvae and feeding damage had a tendency to be concentrated at the soil level and to destroy the root node closest to the surface. This allowed relative few larvae to cause more damage than would be expected by their abundance. There was drought stress at late season.

Test Information

Test name and Location: Experimental and Registered Products,
Pinney-Purdue Agricultural Center, Wanatah, IN.

Planting Date: 9 May 2008

Base Hybrid: DeKalb DKC61-73 with ApronMaxx and Poncho 250

Row width: 30"

Planter Population: 27,700 kernels per acre

Soil Type: Runnymede sandy loam

Soil Properties: Organic matter; 3.9%
pH; 6.2
CEC: 19.2
Texture: 56.4% sand, 27.6% silt, 16.0% clay

Tillage: 5/8/08 One pass tillage tool

Conditions at Planting: air temp; 53°F
2" soil temp; 60°F
wind dir and spd; S 10-12 mph

Previous Crop: corn (trap crop)

Previous Year Insecticide: none

Herbicides: Pre-emergence; 5/10/08, 3.5 qts. Degree Extra and 1.5 oz. Balance Pro.

Fertilizers: Starter, 5/9/08 12-12-12 113lbs; Post-emergence 6/13/08 28% UAN 50 gal/a

Observations: Plant stand and height, 11 June 2008
Root damage ratings, performance consistency , 16 July 2008
Lodging, 5 November 2008

Trial Design and Machinery Setup:

RCBD, 4 replications, single row plots, JD Max-emerge 7000 planter, granule applicator was modified Noble meter with plastic all terrain diffusers. AMVAC SmartBox® system was used where noted in tables. Liquid treatments were applied at 5 gpa using TeeJet 80015 nozzle at 11 psi. Corn seed changes were facilitated using John Deere seed meters modified to hold small quantities of seed. All applications were made at 3 mph.

Notes: Several plots (single rows) were accidentally not treated due to a Noble meter that was not engaged (worn out drive unit). Two Herculex Xtra plots were lost due to planting errors. Rootworm larval feeding "pressure" was moderate. There was drought stress from mid to late season. Soil at this site had a tendency toward compaction. The effects of "sidewall" compaction of the furrow were evident on the root masses during damage evaluation. Soil conditions at planting were dry surface with wet cold soil at the 3 inch depth. An extended period of cold soil temperatures delayed germination by 3 weeks.

Table 1. **Stand counts** for experimental and registered insecticides for control of corn rootworm larvae at Pinney-Purdue Agricultural Center, Wanatah, IN, 2008¹.

No.	Treatment	Rate & Application ²		Plants per 40 ft	
				Mean ³	SEM
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	61.00 a	0.000
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	60.50 a	2.500
03	Force 3G/P250	0.12/0.25	TB/ST	62.75 a	1.652
04	Force 3G/P250	0.12/0.25	IF/ST	62.75 a	0.629
05	Lorsban 15G/P250	1.20/0.25	TB/ST	55.67 a	2.186
06	Lorsban 15G/P250	1.20/0.25	IF/ST	60.75 a	1.548
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	61.25 a	2.869
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	59.33 a	1.202
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	61.25 a	0.854
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	61.50 a	1.555
11	Counter 15G SB/P250	1.20/0.25	TB/ST	61.00 a	1.291
12	Counter 20G SB/P250	1.20/0.25	TB/ST	62.00 a	1.780
13	Force 1CS/P250	0.12/0.25	TB/ST	61.00 a	1.732
14	Force 1CS/P250	0.12/0.25	IF/ST	61.50 a	2.102
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	61.00 a	1.225
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	61.00 a	1.780
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	60.25 a	1.109
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	60.25 a	0.854
19	ST1			62.25 a	1.601
20	ST2+Aztec 2.1	0.14	IF	56.75 a	0.479
21	EXP5B			54.25 a	3.473
22	EXP7 (DKC61-69)		PIP	61.25 a	1.652
23	Poncho 1250	1.25	ST	61.75 a	1.436
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	62.50 a	1.708
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	58.25 a	2.869
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	61.33 a	1.202
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	59.25 a	0.750
38	Poncho 250 (DKC61-73) Control	0.25	ST	63.50 a	0.646
32	Poncho 250 (32T84)	0.25	ST	45.00 a	2.011
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	43.75 a	3.209
34	Poncho 250 (32T85)	0.25	ST/PIP	61.25 b	3.506
35	Cruiser 250 (2J665)	0.25	ST	47.50 a	3.708
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	54.75 a	1.250
37	Cruiser 250 (2T669)	0.25	ST/PIP	57.50 a	2.500

¹ Planted, 9 May 08; Sampled, 11 June 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ Means followed by a similar letter are not significantly different DKC61-69/73 (PR>F=0.0982), 32T84/85 (PR>F=0.0013), 2J665/669 (PR>F=0.1641).

Table 2. **Stand counts replication** for experimental and registered insecticides for control of corn rootworm larvae at Pinney-Purdue Agricultural Center, Wanatah, IN, 2008¹.

No.	Treatment	Rate & Application ²		Plants per 40 ft			
				Rep1	Rep2	Rep3	Rep4
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	61	61	nd	61
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	nd	58	nd	63
03	Force 3G/P250	0.12/0.25	TB/ST	59	63	67	62
04	Force 3G/P250	0.12/0.25	IF/ST	61	64	63	63
05	Lorsban 15G/P250	1.20/0.25	TB/ST	53	60	54	nd
06	Lorsban 15G/P250	1.20/0.25	IF/ST	61	65	59	58
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	57	56	64	68
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	60	61	nd	57
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	59	63	61	62
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	60	61	59	66
11	Counter 15G SB/P250	1.20/0.25	TB/ST	62	60	64	58
12	Counter 20G SB/P250	1.20/0.25	TB/ST	59	67	62	60
13	Force 1CS/P250	0.12/0.25	TB/ST	64	56	62	62
14	Force 1CS/P250	0.12/0.25	IF/ST	66	56	63	61
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	61	64	58	61
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	58	61	66	59
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	61	58	63	59
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	61	58	60	62
19	ST1			67	60	61	61
20	ST2+Aztec 2.1	0.14	IF	58	56	57	56
21	EXP5B			48	54	64	51
22	EXP7 (DKC61-69)		PIP	58	63	59	65
23	Poncho 1250	1.25	ST	66	60	61	60
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	64	62	58	66
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	63	50	59	61
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	nd	59	63	62
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	58	60	58	61
38	Poncho 250 (DKC61-73) Control	0.25	ST	64	63	62	65
32	Poncho 250 (32T84)	0.25	ST	40	47	46	47
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	45	46	46	38
34	Poncho 250 (32T85)	0.25	ST/PIP	62	62	57	64
35	Cruiser 250 (2J665)	0.25	ST	38	47	56	49
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	56	51	56	56
37	Cruiser 250 (2T669)	0.25	ST/PIP	60	nd	nd	55

¹ Planted, 9 May 08; Sampled, 11 June 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

nd=no data.

Table 3. **Plant height (vigor)** for experimental and registered insecticides for control of corn rootworm larvae at Pinney-Purdue Agricultural Center, Wanatah, IN, 2008¹.

No.	Treatment	Rate & Application ²		Extended Leaf Height(cm)	
				Mean ³	SEM
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	68.55 ab	3.219
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	70.55 ab	2.350
03	Force 3G/P250	0.12/0.25	TB/ST	69.99 ab	2.229
04	Force 3G/P250	0.12/0.25	IF/ST	68.64 ab	1.864
05	Lorsban 15G/P250	1.20/0.25	TB/ST	67.92 ab	2.444
06	Lorsban 15G/P250	1.20/0.25	IF/ST	68.29 ab	2.589
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	72.06 ab	2.090
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	67.93 ab	3.762
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	70.48 ab	2.133
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	69.14 ab	2.241
11	Counter 15G SB/P250	1.20/0.25	TB/ST	66.64 ab	3.293
12	Counter 20G SB/P250	1.20/0.25	TB/ST	65.60 ab	2.070
13	Force 1CS/P250	0.12/0.25	TB/ST	69.24 ab	2.617
14	Force 1CS/P250	0.12/0.25	IF/ST	69.94 ab	1.212
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	70.50 ab	2.081
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	66.69 ab	3.321
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	64.10 b	2.515
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	67.75 ab	2.886
19	ST1			69.24 ab	2.738
20	ST2+Aztec 2.1	0.14	IF	72.40 ab	1.889
21	EXP5B			70.35 ab	1.559
22	EXP7 (DKC61-69)		PIP	72.02 ab	1.591
23	Poncho 1250	1.25	ST	71.51 ab	1.681
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	70.95 ab	2.463
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	73.22 a	1.179
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	72.18 ab	3.363
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	69.64 ab	1.851
38	Poncho 250 (DKC61-73) Control	0.25	ST	69.36 ab	0.942
32	Poncho 250 (32T84)	0.25	ST	70.58 a	2.011
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	70.72 a	3.209
34	Poncho 250 (32T85)	0.25	ST/PIP	69.22 a	3.506
35	Cruiser 250 (2J665)	0.25	ST	66.36 a	3.186
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	66.98 a	1.953
37	Cruiser 250 (2T669)	0.25	ST/PIP	69.52 a	7.625

¹ Planted, 9 May 08; Sampled, 11 June 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ Means followed by a similar letter are not significantly different DKC61-69/73 (PR>F=0.0158), 32T84/85 (PR>F=0.6968), 2J665/669 (PR>F=0.4001).

Table 4. **Plant height (vigor) replication** for experimental and registered insecticides for control of corn rootworm larvae at Pinney-Purdue Agricultural Center, Wanatah, IN, 2008¹.

No.	Treatment	Rate & Application ²	Extended Leaf Height (cm) ³			
			Repl	Rep2	Rep3	Rep4
01	Aztec 2.1G/P250	0.14/0.25 TB/ST	63.95	66.95	nd	74.75
02	Aztec 2.1G/P250	0.14/0.25 IF/ST	nd	68.20	nd	72.90
03	Force 3G/P250	0.12/0.25 TB/ST	63.35	71.95	72.95	71.70
04	Force 3G/P250	0.12/0.25 IF/ST	65.95	65.15	70.45	73.00
05	Lorsban 15G/P250	1.20/0.25 TB/ST	63.10	71.05	69.60	nd
06	Lorsban 15G/P250	1.20/0.25 IF/ST	68.60	60.95	72.75	70.85
07	Fortress 5G SB/P250	0.15/0.25 TB/ST	70.20	67.60	73.10	77.35
08	Fortress 5G SB/P250	0.15/0.25 IF/ST	63.40	65.00	nd	75.40
09	Fortress5G Plus SB/P250	0.15/0.25 IF/ST	73.95	65.30	68.65	74.00
10	AMV 101 G SB/P250	3.0 oz prd/0.25 IF/ST	66.60	64.75	70.30	74.90
11	Counter 15G SB/P250	1.20/0.25 TB/ST	57.20	70.60	67.10	71.65
12	Counter 20G SB/P250	1.20/0.25 TB/ST	61.25	62.90	69.55	68.70
13	Force 1CS/P250	0.12/0.25 TB/ST	63.55	66.40	71.85	75.15
14	Force 1CS/P250	0.12/0.25 IF/ST	68.90	72.40	67.05	71.40
15	Capture LFR 1.5SC/P250	0.09/0.25 TB/ST	66.00	68.00	73.30	74.70
16	Capture LFR 1.5SC/P250	0.09/0.25 IF/ST	59.60	65.90	65.60	75.65
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25 TB/ST	65.20	58.35	62.50	70.35
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25 IF/ST	60.90	68.00	67.10	75.00
19	ST1		68.25	64.30	67.35	77.05
20	ST2+Aztec 2.1	0.14 IF	68.95	71.95	70.95	77.75
21	EXP5B		66.15	69.85	72.35	73.05
22	EXP7 (DKC61-69)	PIP	72.90	67.65	72.30	75.25
23	Poncho 1250	1.25 ST	69.10	68.15	74.15	74.65
24	Poncho 250 (DKC61-69)	0.25 ST/PIP	66.60	67.85	71.80	77.55
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25 IF/ST/PIP	73.00	70.05	74.30	75.55
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25 IF/ST/PIP	nd	73.70	65.75	77.10
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25 IF/ST/PIP	68.50	65.40	70.40	74.25
38	Poncho 250 (DKC61-73) Control	0.25 ST	69.50	67.10	69.15	71.70
32	Poncho 250 (32T84)	0.25 ST	64.65	72.40	71.70	73.55
33	Aztec 2.1G+P250 (32T84)	0.14/0.25 TB/ST	64.55	66.90	72.50	78.95
34	Poncho 250 (32T85)	0.25 ST/PIP	61.95	65.55	71.45	77.95
35	Cruiser 250 (2J665)	0.25 ST	57.15	67.30	69.55	71.45
36	Lorsban 15G+C250 (2J665)	1.20/0.25 TB/ST	63.35	65.05	67.15	72.35
37	Cruiser 250 (2T669)	0.25 ST/PIP	61.90	nd	nd	77.15

¹ Planted, 9 May 08; Sampled, 11 June 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ A replicate is the average of 10 observations.
nd=no data.

Table 5. **Root ratings** for experimental and registered insecticides for control of corn rootworm larvae at Pinney-Purdue Agricultural Center, Wanatah, IN, 2008¹.

No.	Treatment	Rate & Application ²		Node Injury Scale	
				Mean ³	SEM
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	0.263 a	0.018
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	0.475 ab	0.075
03	Force 3G/P250	0.12/0.25	TB/ST	0.258 a	0.052
04	Force 3G/P250	0.12/0.25	IF/ST	0.162 a	0.011
05	Lorsban 15G/P250	1.20/0.25	TB/ST	0.997 ab	0.307
06	Lorsban 15G/P250	1.20/0.25	IF/ST	0.472 ab	0.107
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	0.276 a	0.065
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	0.563 ab	0.120
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	0.712 ab	0.182
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	0.850 ab	0.273
11	Counter 15G SB/P250	1.20/0.25	TB/ST	0.138 a	0.006
12	Counter 20G SB/P250	1.20/0.25	TB/ST	0.180 a	0.038
13	Force 1CS/P250	0.12/0.25	TB/ST	0.798 ab	0.243
14	Force 1CS/P250	0.12/0.25	IF/ST	0.450 ab	0.150
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	0.975 ab	0.306
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	0.602 ab	0.259
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	0.300 a	0.105
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	0.368 ab	0.062
19	ST1			0.428 ab	0.128
20	ST2+Aztec 2.1	0.14	IF	0.578 ab	0.207
21	EXP5B			0.550 ab	0.187
22	EXP7 (DKC61-69)		PIP	0.122 a	0.040
23	Poncho 1250	1.25	ST	0.482 ab	0.085
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	0.233 a	0.055
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	0.092 a	0.018
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	0.090 a	0.036
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	0.098 a	0.018
38	Poncho 250 (DKC61-73) Control	0.25	ST	1.200 b	0.385
32	Poncho 250 (32T84)	0.25	ST	2.388 a	0.178
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	0.750 b	0.219
34	Poncho 250 (32T85)	0.25	ST/PIP	0.355 b	0.181
35	Cruiser 250 (2J665)	0.25	ST	2.975 a	0.025
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	0.710 b	0.293
37	Cruiser 250 (2T669)	0.25	ST/PIP	0.215 b	0.135

¹ Planted, 9 May 08; Sampled, 15 July 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ Means followed by a similar letter are not significantly different, P=0.05, Ryan-Einot-Gabriel-Welsch MRT; 61-73/69 (PR>F=0.0001), 32T84/85 (PR>F=0.0003), 2J665/669 (PR>F=0.0012).

Table 6. **Root rating replication** for experimental and registered insecticides for control of corn rootworm larvae at Pinney-Purdue Agricultural Center, Wanatah, IN, 2008¹.

No.	Treatment	Rate & Application ²		Node Injury Scale ³			
				Rep1	Rep2	Rep3	Rep4
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	0.23	0.27	nd	0.29
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	nd	0.40	nd	0.55
03	Force 3G/P250	0.12/0.25	TB/ST	0.23	0.25	0.40	0.15
04	Force 3G/P250	0.12/0.25	IF/ST	0.15	0.17	0.19	0.14
05	Lorsban 15G/P250	1.20/0.25	TB/ST	0.60	1.60	0.79	nd
06	Lorsban 15G/P250	1.20/0.25	IF/ST	0.32	0.74	0.55	0.28
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	0.45	0.30	0.19	0.16
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	0.75	0.60	nd	0.34
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	0.85	1.00	0.18	0.82
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	0.60	1.25	1.35	0.20
11	Counter 15G SB/P250	1.20/0.25	TB/ST	0.14	0.14	0.12	0.15
12	Counter 20G SB/P250	1.20/0.25	TB/ST	0.26	0.22	0.09	0.15
13	Force 1CS/P250	0.12/0.25	TB/ST	1.35	1.00	0.62	0.22
14	Force 1CS/P250	0.12/0.25	IF/ST	0.29	0.31	0.90	0.30
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	0.70	0.45	0.90	1.85
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	0.55	0.21	1.35	0.30
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	0.29	0.60	0.17	0.14
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	0.55	0.29	0.29	0.34
19	ST1			0.79	0.40	0.32	0.20
20	ST2+Aztec 2.1	0.14	IF	0.22	0.24	1.05	0.80
21	EXP5B			1.05	0.45	0.55	0.15
22	EXP7 (DKC61-69)		PIP	0.18	0.20	0.03	0.08
23	Poncho 1250	1.25	ST	0.70	0.44	0.50	0.29
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	0.34	0.31	0.17	0.11
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	0.10	0.11	0.12	0.04
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	nd	0.14	0.11	0.02
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	0.08	0.15	0.07	0.09
38	Poncho 250 (DKC61-73) Control	0.25	ST	2.30	1.15	0.75	0.60
32	Poncho 250 (32T84)	0.25/0.25	ST	2.75	2.40	2.50	1.90
33	Aztec 2.1G+P250 (32T84)	0.14	TB/ST	0.47	0.80	1.35	0.38
34	Poncho 250 (32T85)	0.25	ST/PIP	0.37	0.85	0.19	0.01
35	Cruiser 250 (2J665)	0.25	ST	3.00	3.00	3.00	2.90
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	1.55	0.45	0.21	0.63
37	Cruiser 250 (2T669)	0.25	ST/PIP	0.35	nd	nd	0.08

¹ Planted, 9 May 08; Sampled, 15 July 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ A replicate is the average of 5 observations.
nd=no data.

Table 7. **Root ratings consistency of performance** for experimental and registered insecticides for control of corn rootworm larvae at Pinney-Purdue Agricultural Center, Wanatah, IN, 2008¹.

No.	Treatment	Rate & Application ²		Percent Rating \leq 0.25	
				Raw Mean	Transformed Mean ³
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	86.7	90.746 abc
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	50.0	50.000 abc
03	Force 3G/P250	0.12/0.25	TB/ST	85.0	91.982 abc
04	Force 3G/P250	0.12/0.25	IF/ST	100.0	100.000 a
05	Lorsban 15G/P250	1.20/0.25	TB/ST	6.7	2.370 c
06	Lorsban 15G/P250	1.20/0.25	IF/ST	60.0	60.482 abc
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	85.0	91.982 abc
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	33.3	25.000 abc
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	40.0	33.214 abc
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	30.0	23.713 abc
11	Counter 15G SB/P250	1.20/0.25	TB/ST	100.0	100.000 a
12	Counter 20G SB/P250	1.20/0.25	TB/ST	95.0	98.662 ab
13	Force 1CS/P250	0.12/0.25	TB/ST	40.0	39.518 abc
14	Force 1CS/P250	0.12/0.25	IF/ST	55.0	48.970 abc
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	15.0	8.018 bc
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	55.0	55.516 abc
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	75.0	85.355 abc
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	70.0	70.499 abc
19	ST1			65.0	71.434 abc
20	ST2+Aztec 2.1	0.14	IF	60.0	66.786 abc
21	EXP5B			50.0	50.000 abc
22	EXP7 (DKC61-69)		PIP	100.0	100.000 a
23	Poncho 1250	1.25	ST	40.0	33.214 abc
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	85.0	91.982 abc
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	100.0	100.000 a
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	100.0	100.000 a
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	95.0	98.662 ab
38	Poncho 250 (DKC61-73) Control	0.25	ST	20.0	15.381 abc
32	Poncho 250 (32T84)	0.25	ST	0.0	0.000 a
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	45.0	38.512 ab
34	Poncho 250 (32T85)	0.25	ST/PIP	70.0	81.240 b
35	Cruiser 250 (2J665)	0.25	ST	0.0	0.000 a
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	55.0	55.025 ab
37	Cruiser 250 (2T669)	0.25	ST/PIP	90.0	94.721 b

¹ Planted, 9 May 08; Sampled, 15 July 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ Means followed by a similar letter are not significantly different, P=0.05, Ryan-Einot-Gabriel-Welsch MRT; Arcsine square root transformation. 61-73/69 (PR>F=0.0001), 32T84/85 (PR>F=0.0341), 2J665/669 (PR>F=0.0285).

Table 8. **Root rating consistency replication** for experimental and registered insecticides for control of corn rootworm larvae at Pinney-Purdue Agricultural Center, Wanatah, IN, 2008¹.

No.	Treatment	Rate & Application ²		Percentage Rating ≤ 0.25 ³			
				Repl	Rep2	Rep3	Rep4
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	100	80	nd	80
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	nd	60	nd	40
03	Force 3G/P250	0.12/0.25	TB/ST	80	100	60	100
04	Force 3G/P250	0.12/0.25	IF/ST	100	100	100	100
05	Lorsban 15G/P250	1.20/0.25	TB/ST	0	0	20	nd
06	Lorsban 15G/P250	1.20/0.25	IF/ST	80	60	20	80
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	60	80	100	100
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	20	0	nd	80
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	0	0	100	60
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	20	0	0	100
11	Counter 15G SB/P250	1.20/0.25	TB/ST	100	100	100	100
12	Counter 20G SB/P250	1.20/0.25	TB/ST	80	100	100	100
13	Force 1CS/P250	0.12/0.25	TB/ST	20	0	40	100
14	Force 1CS/P250	0.12/0.25	IF/ST	80	60	0	80
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	20	40	0	0
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	40	100	0	80
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	80	20	100	100
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	60	0	80	60
19	ST1			40	60	60	100
20	ST2+Aztec 2.1	0.14	IF	100	100	0	40
21	EXP5B			0	60	40	100
22	EXP7 (DKC61-69)		PIP	100	100	100	100
23	Poncho 1250	1.25	ST	0	20	60	80
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	60	80	100	100
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	100	100	100	100
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	nd	100	100	100
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	100	80	100	100
38	Poncho 250 (DKC61-73) Control	0.25	ST	0	20	40	20
32	Poncho 250 (32T84)	0.25	ST	0	0	0	0
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	80	20	0	80
34	Poncho 250 (32T85)	0.25	ST/PIP	60	20	100	100
35	Cruiser 250 (2J665)	0.25	ST	0	0	0	0
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	0	60	100	60
37	Cruiser 250 (2T669)	0.25	ST/PIP	80	nd	nd	100

¹ Planted, 9 May 08; Sampled, 15 July 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ A replicate is the average of 5 observations.
nd=no data.

Table 9. **Plant lodging percentage** (plants lodged/20 plants) for experimental and registered insecticides for control of corn rootworm larvae at Pinney-Purdue Agricultural Center, Wanatah, IN, 2008¹.

No.	Treatment	Rate & Application ²		Percentage Lodged Plants	
				Raw Mean ³	Transformed Mean
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	5.00	1.75 ab
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	31.67	11.41 ab
03	Force 3G/P250	0.12/0.25	TB/ST	0.00	0.00 b
04	Force 3G/P250	0.12/0.25	IF/ST	0.00	0.00 b
05	Lorsban 15G/P250	1.20/0.25	TB/ST	7.50	2.09 ab
06	Lorsban 15G/P250	1.20/0.25	IF/ST	5.00	2.41 ab
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	13.75	6.25 ab
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	43.33	34.79 a
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	23.75	13.67 ab
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	24.00	17.25 ab
11	Counter 15G SB/P250	1.20/0.25	TB/ST	0.00	0.00 b
12	Counter 20G SB/P250	1.20/0.25	TB/ST	1.25	0.32 ab
13	Force 1CS/P250	0.12/0.25	TB/ST	22.50	12.91 ab
14	Force 1CS/P250	0.12/0.25	IF/ST	1.25	0.32 ab
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	1.25	0.32 ab
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	2.50	0.65 ab
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	5.00	1.34 ab
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	15.00	6.87 ab
19	ST1			15.00	7.47 ab
20	ST2+Aztec 2.1	0.14	IF	1.25	0.32 ab
21	EXP5B			3.75	1.86 ab
22	EXP7 (DKC61-69)		PIP	10.00	2.90 ab
23	Poncho 1250	1.25	ST	3.75	1.86 ab
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	37.50	29.92 ab
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	0.00	0.00 b
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	0.00	0.00 b
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	1.25	0.32 ab
38	Poncho 250 (DKC61-73) Control	0.25	ST	27.50	20.15 ab
32	Poncho 250 (32T84)	0.25	ST	47.5	42.49 a
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	0.0	0.00 a
34	Poncho 250 (32T85)	0.25	ST/PIP	15.0	7.47 a
35	Cruiser 250 (2J665)	0.25	ST	45.00	40.19 a
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	6.25	6.10 a
37	Cruiser 250 (2T669)	0.25	ST/PIP	10.00	9.40 a

¹ Planted, 9 May 08; Sampled, 5 November 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ Means followed by a similar letter are not significantly different, P=0.05, Ryan-Einot-Gabriel-Welsch MRT; Arcsine square root transformation. 61-73/69 (PR>F=0.0007), 32T84/85 (PR>F=0.0656), 2J665/669 (PR>F=0.3693).

Table 10. **Plant percentage lodging replication** (raw data) for experimental and registered insecticides for control of corn rootworm larvae at Pinney-Purdue Agricultural Center, Wanatah, IN, 2008¹.

No.	Treatment	Rate & Application ²		Percentage Lodged Plants ³			
				Rep1	Rep2	Rep3	Rep4
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	0	15	nd	0
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	nd	20	nd	5
03	Force 3G/P250	0.12/0.25	TB/ST	0	0	0	0
04	Force 3G/P250	0.12/0.25	IF/ST	0	0	0	0
05	Lorsban 15G/P250	1.20/0.25	TB/ST	0	30	0	0
06	Lorsban 15G/P250	1.20/0.25	IF/ST	5	15	0	0
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	0	50	0	5
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	50	80	nd	0
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	25	70	0	0
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	6	60	30	0
11	Counter 15G SB/P250	1.20/0.25	TB/ST	0	0	0	0
12	Counter 20G SB/P250	1.20/0.25	TB/ST	0	5	0	0
13	Force 1CS/P250	0.12/0.25	TB/ST	50	40	0	0
14	Force 1CS/P250	0.12/0.25	IF/ST	0	5	0	0
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	0	5	0	0
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	10	0	0	0
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	0	20	0	0
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	5	55	0	0
19	ST1			10	50	0	0
20	ST2+Aztec 2.1	0.14	IF	0	5	0	0
21	EXP5B			0	10	5	0
22	EXP7 (DKC61-69)		PIP	0	40	0	0
23	Poncho 1250	1.25	ST	10	5	0	0
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	80	60	0	10
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	0	0	0	0
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	nd	0	0	0
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	0	5	0	0
38	Poncho 250 (DKC61-73) Control	0.25	ST	20	85	5	0
32	Poncho 250 (32T84)	0.25	ST	85	95	0	10
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	0	0	0	0
34	Poncho 250 (32T85)	0.25	ST/PIP	10	50	0	0
35	Cruiser 250 (2J665)	0.25	ST	65	95	20	0
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	5	5	5	0
37	Cruiser 250 (2T669)	0.25	ST/PIP	15	nd	nd	5

¹ Planted, 9 May 08; Sampled, 5 November 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ A replicate is the average of 5 observations.
nd=no data.

Test Information

Test name and location: Experimental and Registered Products,
Throckmorton-Purdue Agricultural Center, Lafayette, IN.

Planting date (s): 28 May 2008

Base Hybrid: DeKalb DKC61-73 with ApronMaxx and Poncho 250

Row width: 30"

Planter Population: 27,700 kernels per acre

Soil Type: Chalmers silt loam

Soil Properties: Organic matter; 2.5%
pH; 6.4%
CEC: 14.1
Texture: 24.4% sand, 54.0% silt, 21.6% clay

Tillage: Chisel/disk

Conditions at Planting air temp; 65°F
2" soil temp; 79°F
wind dir and spd; NE 10-15 mph

Previous Crop: corn (trap crop)

Previous Year Insecticide: none

Herbicides: 29 April 08, 3qt Degree Xtra + 1.5pt Aatrex 4L

Fertilizers: 20 April 08, 47 gpa 28% UAN; 28 May 08. 113lbs 12-12-12

Trial Design and Machinery Setup:

Observations: Plant stand and height, 12 June 2008
Root damage ratings, performance consistency, 15 July 2008
Lodging, 6 November 2008

RCBD, 4 reps, single row plots, JD Max-emerge 7000 planter, granule applicator was modified Noble meter with plastic all terrain diffusers. AMVAC SmartBox® system was used where noted in tables. Liquid treatments were applied at 5 gpa using TeeJet 80015 nozzle at 11 psi. All applications were made at 3 mph.

Notes: Several plots (single rows) were accidentally not treated due to a Noble meter that was not engaged (worn out drive unit). Soil conditions at planting were dry surface with wet cold soil at 3 inches. Germination and seedling growth were delayed by several weeks. Rootworm larval feeding "pressure" was moderate. Very wet soil conditions in June were associated with an atypical root damage pattern. Rootworm larvae and feeding damage had a tendency to be concentrated at the soil level and to destroy the root node closest to the surface. This allowed relative few larvae to cause more damage than would be expected by their abundance. There was drought stress at late season.

Table 11. **Stand counts** for experimental and registered insecticides for control of corn rootworm larvae at Throckmorton-Purdue Agricultural Center, Lafayette, IN, 2008¹.

No.	Treatment	Rate & Application ²		Plants per 40 ft	
				Mean ³	SEM
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	65.00 a	1.683
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	64.75 a	1.109
03	Force 3G/P250	0.12/0.25	TB/ST	59.50 a	0.500
04	Force 3G/P250	0.12/0.25	IF/ST	62.00 a	2.082
05	Lorsban 15G/P250	1.20/0.25	TB/ST	64.25 a	1.250
06	Lorsban 15G/P250	1.20/0.25	IF/ST	60.25 a	2.562
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	62.25 a	0.750
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	61.00 a	0.408
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	64.00 a	1.080
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	63.50 a	0.500
11	Counter 15G SB/P250	1.20/0.25	TB/ST	62.67 a	0.667
12	Counter 20G SB/P250	1.20/0.25	TB/ST	62.00 a	1.155
13	Force 1CS/P250	0.12/0.25	TB/ST	62.00 a	0.913
14	Force 1CS/P250	0.12/0.25	IF/ST	62.25 a	1.493
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	58.75 a	0.750
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	61.33 a	0.667
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	62.00 a	0.913
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	58.50 a	1.258
19	ST1			59.75 a	1.250
20	ST2+Aztec 2.1	0.14	IF	58.00 a	3.937
21	EXP5B			62.00 a	3.082
22	EXP7 (DKC61-69)		PIP	60.75 a	3.591
23	Poncho 1250	1.25	ST	62.25 a	0.629
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	62.00 a	1.155
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	62.75 a	2.097
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	65.00 a	0.707
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	61.25 a	0.750
38	Poncho 250 (DKC61-73) Control	0.25	ST	62.25 a	1.031
32	Poncho 250 (32T84)	0.25	ST	42.50 c	1.190
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	48.33 b	3.497
34	Poncho 250 (32T85)	0.25	ST/PIP	62.75 a	1.109
35	Cruiser 250 (2J665)	0.25	ST	58.00 b	0.707
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	nd	nd
37	Cruiser 250 (2T669)	0.25	ST/PIP	50.25 a	2.056

¹ Planted, 28 May 08; Sampled, 12 June 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ Means followed by a similar letter are not significantly different DKC61-69/73 (PR>F=0.1739), 32T84/85 (PR>F=0.0015), 2J665/669 (PR>F=0.0005).

Table 12. **Stand counts replication** for experimental and registered insecticides for control of corn rootworm larvae at Throckmorton-Purdue Agricultural Center, Lafayette, IN, 2008¹.

No.	Treatment	Rate & Application ²		Plants per 40 ft			
				Rep1	Rep2	Rep3	Rep4
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	63	63	70	64
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	66	64	67	62
03	Force 3G/P250	0.12/0.25	TB/ST	60	60	58	60
04	Force 3G/P250	0.12/0.25	IF/ST	57	67	61	63
05	Lorsban 15G/P250	1.20/0.25	TB/ST	61	65	67	64
06	Lorsban 15G/P250	1.20/0.25	IF/ST	65	62	61	53
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	63	63	63	60
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	60	61	61	62
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	65	64	66	61
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	63	63	63	65
11	Counter 15G SB/P250	1.20/0.25	TB/ST	nd	62	62	64
12	Counter 20G SB/P250	1.20/0.25	TB/ST	64	64	60	60
13	Force 1CS/P250	0.12/0.25	TB/ST	61	63	64	60
14	Force 1CS/P250	0.12/0.25	IF/ST	59	61	66	63
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	58	58	61	58
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	64	60	nd	62
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	63	61	64	60
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	59	61	55	59
19	ST1			63	59	57	60
20	ST2+Aztec 2.1	0.14	IF	54	69	51	58
21	EXP5B			63	69	62	54
22	EXP7 (DKC61-69)		PIP	64	64	50	65
23	Poncho 1250	1.25	ST	62	61	62	64
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	64	64	60	60
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	64	63	67	57
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	64	67	64	65
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	60	62	60	63
38	Poncho 250 (DKC61-73) Control	0.25	ST	65	60	62	62
32	Poncho 250 (32T84)	0.25	ST	40	45	41	44
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	49	52	nd	44
34	Poncho 250 (32T85)	0.25	ST/PIP	64	62	65	60
35	Cruiser 250 (2J665)	0.25	ST	58	59	59	56
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	nd	nd	nd	nd
37	Cruiser 250 (2T669)	0.25	ST/PIP	51	55	45	50

¹ Planted, 28 May 08; Sampled, 12 June 08.

² Rates for granules and liquids are oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

nd=no data.

Table 13. **Plant height (vigor)** for experimental and registered insecticides for control of corn rootworm larvae at Throckmorton-Purdue Agricultural Center, Lafayette, IN, 2008¹.

No.	Treatment	Rate & Application ²		Extended Leaf Height(cm)	
				Mean ³	SEM
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	47.70 a	2.676
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	49.41 a	1.577
03	Force 3G/P250	0.12/0.25	TB/ST	47.18 a	2.019
04	Force 3G/P250	0.12/0.25	IF/ST	47.80 a	2.530
05	Lorsban 15G/P250	1.20/0.25	TB/ST	46.04 a	3.457
06	Lorsban 15G/P250	1.20/0.25	IF/ST	47.36 a	2.289
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	47.12 a	2.721
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	47.11 a	1.901
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	50.12 a	1.610
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	47.31 a	2.102
11	Counter 15G SB/P250	1.20/0.25	TB/ST	46.73 a	4.594
12	Counter 20G SB/P250	1.20/0.25	TB/ST	44.02 a	3.657
13	Force 1CS/P250	0.12/0.25	TB/ST	47.28 a	1.247
14	Force 1CS/P250	0.12/0.25	IF/ST	47.09 a	2.653
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	47.01 a	1.913
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	45.03 a	5.712
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	46.10 a	1.710
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	43.09 a	2.607
19	ST1			47.20 a	2.901
20	ST2+Aztec 2.1	0.14	IF	49.96 a	2.322
21	EXP5B			47.44 a	3.543
22	EXP7 (DKC61-69)		PIP	46.61 a	2.723
23	Poncho 1250	1.25	ST	49.48 a	1.695
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	49.52 a	2.005
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	50.70 a	1.931
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	48.90 a	3.074
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	46.45 a	3.583
38	Poncho 250 (DKC61-73) Control	0.25	ST	45.12 a	3.151
32	Poncho 250 (32T84)	0.25	ST	49.28 a	2.330
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	45.77 a	3.181
34	Poncho 250 (32T85)	0.25	ST/PIP	50.99 a	2.188
35	Cruiser 250 (2J665)	0.25	ST	47.40 a	1.382
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	nd	nd
37	Cruiser 250 (2T669)	0.25	ST/PIP	48.11 a	1.750

¹ Planted, 28 May 08; Sampled, 12 June 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ Means followed by a similar letter are not significantly different DKC61-69/73 (PR>F=0.8526), 32T84/85 (PR>F=0.1736), 2J665/669 (PR>F=0.7110).

Table 14. **Plant height (vigor) replication** for experimental and registered insecticides for control of corn rootworm larvae at Throckmorton-Purdue Agricultural Center, Lafayette, IN, 2008¹.

No.	Treatment	Rate & Application ²		Extended Leaf Height(cm) ³			
				Repl	Rep2	Rep3	Rep4
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	49.35	52.40	49.05	40.00
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	51.15	50.60	44.70	51.20
03	Force 3G/P250	0.12/0.25	TB/ST	46.20	49.75	50.85	41.90
04	Force 3G/P250	0.12/0.25	IF/ST	48.65	52.90	40.80	48.85
05	Lorsban 15G/P250	1.20/0.25	TB/ST	49.25	54.25	39.90	40.75
06	Lorsban 15G/P250	1.20/0.25	IF/ST	51.20	46.05	50.75	41.45
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	51.35	52.30	42.60	42.25
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	49.50	50.45	42.00	46.50
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	52.60	48.20	46.60	53.10
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	51.60	49.25	41.80	46.60
11	Counter 15G SB/P250	1.20/0.25	TB/ST	47.55	nd	54.25	38.40
12	Counter 20G SB/P250	1.20/0.25	TB/ST	51.70	47.80	41.60	35.00
13	Force 1CS/P250	0.12/0.25	TB/ST	50.00	47.50	47.65	43.95
14	Force 1CS/P250	0.12/0.25	IF/ST	46.00	49.65	52.50	40.20
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	46.50	50.10	49.65	41.80
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	nd	55.75	43.10	36.25
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	46.45	46.20	41.70	50.05
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	46.55	48.05	41.05	36.70
19	ST1			53.20	50.70	40.50	44.40
20	ST2+Aztec 2.1	0.14	IF	53.25	49.30	43.65	53.65
21	EXP5B			47.50	52.20	52.65	37.40
22	EXP7 (DKC61-69)		PIP	52.20	50.25	43.00	41.00
23	Poncho 1250	1.25	ST	49.75	48.90	45.50	53.75
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	53.35	51.10	49.70	43.95
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	51.40	49.95	55.40	46.05
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	52.45	53.20	50.05	39.90
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	51.55	52.55	44.60	37.10
38	Poncho 250 (DKC61-73) Control	0.25	ST	48.30	48.85	47.65	35.70
32	Poncho 250 (32T84)	0.25	ST	52.10	51.05	51.65	42.30
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	49.85	47.95	nd	39.50
34	Poncho 250 (32T85)	0.25	ST/PIP	54.35	54.55	45.35	49.70
35	Cruiser 250 (2J665)	0.25	ST	50.25	48.25	43.65	47.45
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	nd	nd	nd	nd
37	Cruiser 250 (2T669)	0.25	ST/PIP	49.10	52.40	46.75	44.20

¹ Planted, 28 May 08; Sampled, 12 June 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ A replicate is the average of 10 observations.
nd=no data.

Table 15. **Root ratings** for experimental and registered insecticides for control of corn rootworm larvae at Throckmorton-Purdue Agricultural Center, Lafayette, IN, 2008¹.

No.	Treatment	Rate & Application ²		Node Injury Scale	
				Mean ³	SEM
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	0.778 abc	0.2223
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	0.812 abc	0.3665
03	Force 3G/P250	0.12/0.25	TB/ST	0.458 abc	0.1440
04	Force 3G/P250	0.12/0.25	IF/ST	0.435 abc	0.1728
05	Lorsban 15G/P250	1.20/0.25	TB/ST	1.112 abc	0.2313
06	Lorsban 15G/P250	1.20/0.25	IF/ST	0.558 abc	0.2252
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	0.742 abc	0.1744
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	0.630 abc	0.1368
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	0.798 abc	0.0563
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	0.610 abc	0.0941
11	Counter 15G SB/P250	1.20/0.25	TB/ST	0.190 ab	0.0153
12	Counter 20G SB/P250	1.20/0.25	TB/ST	0.300 abc	0.1053
13	Force 1CS/P250	0.12/0.25	TB/ST	0.405 abc	0.0369
14	Force 1CS/P250	0.12/0.25	IF/ST	0.520 abc	0.1502
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	0.782 abc	0.2549
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	0.988 abc	0.5080
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	0.490 abc	0.1993
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	0.342 abc	0.1213
19	ST1			0.418 abc	0.0890
20	ST2+Aztec 2.1	0.14	IF	0.685 abc	0.3730
21	EXP5B			0.675 abc	0.1738
22	EXP7 (DKC61-69)		PIP	0.107 a	0.0649
23	Poncho 1250	1.25	ST	1.362 c	0.2569
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	0.125 ab	0.0429
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	0.050 a	0.0234
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	0.102 a	0.0338
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	0.120 ab	0.0286
38	Poncho 250 (DKC61-73) Control	0.25	ST	1.188 bc	0.2968
32	Poncho 250 (32T84)	0.25	ST	1.952 b	0.5427
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	0.453 a	0.1992
34	Poncho 250 (32T85)	0.25	ST/PIP	0.078 a	0.0239
35	Cruiser 250 (2J665)	0.25	ST	2.950 b	0.0500
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	nd	nd
37	Cruiser 250 (2T669)	0.25	ST/PIP	0.135 a	0.0435

¹ Planted, 28 May 08; Sampled, 15 July 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ Means followed by a similar letter are not significantly different, P=0.05, Ryan-Einot-Gabriel-Welsch MRT; 61-73/69 (PR>F=0.0003), 32T84/85 (PR>F=0.0534), 2J665/669 (PR>F=0.0187).

nd=no data (equipment failure)

Table 16. **Root rating replication** for experimental and registered insecticides for control of corn rootworm larvae at Throckmorton-Purdue Agricultural Center, Lafayette, IN, 2008¹.

No.	Treatment	Rate & Application ²		Node Injury Scale ³			
				Rep1	Rep2	Rep3	Rep4
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	0.50	1.25	1.05	0.31
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	1.90	0.55	0.30	0.50
03	Force 3G/P250	0.12/0.25	TB/ST	0.65	0.75	0.28	0.15
04	Force 3G/P250	0.12/0.25	IF/ST	0.21	0.95	0.28	0.30
05	Lorsban 15G/P250	1.20/0.25	TB/ST	0.60	1.70	0.95	1.20
06	Lorsban 15G/P250	1.20/0.25	IF/ST	0.65	1.15	0.30	0.13
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	0.69	0.49	0.54	1.25
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	0.48	1.04	0.50	0.50
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	0.70	0.89	0.70	0.90
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	0.39	0.85	0.60	0.60
11	Counter 15G SB/P250	1.20/0.25	TB/ST	0.21	nd	0.16	0.20
12	Counter 20G SB/P250	1.20/0.25	TB/ST	0.11	0.58	0.17	0.34
13	Force 1CS/P250	0.12/0.25	TB/ST	0.40	0.40	0.50	0.32
14	Force 1CS/P250	0.12/0.25	IF/ST	0.29	0.95	0.50	0.34
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	0.33	1.40	1.00	0.40
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	nd	0.65	0.45	0.35
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	0.19	1.05	0.50	0.22
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	0.17	0.70	0.28	0.22
19	ST1			0.59	0.29	0.55	0.24
20	ST2+Aztec 2.1	0.14	IF	0.25	0.40	0.29	1.80
21	EXP5B			0.65	1.00	0.85	0.20
22	EXP7 (DKC61-69)		PIP	nd	0.01	0.08	0.23
23	Poncho 1250	1.25	ST	1.35	1.95	0.70	1.45
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	0.06	0.23	0.16	0.05
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	0.03	0.03	0.12	0.02
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	0.04	0.19	0.12	0.06
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	0.12	0.20	0.09	0.07
38	Poncho 250 (DKC61-73) Control	0.25	ST	2.05	0.95	0.95	0.49
32	Poncho 250 (32T84)	0.25	ST	2.45	2.90	2.05	0.41
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	0.45	0.80	nd	0.11
34	Poncho 250 (32T85)	0.25	ST/PIP	0.02	0.13	0.06	0.10
35	Cruiser 250 (2J665)	0.25	ST	3.00	3.00	3.00	2.80
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	nd	nd	nd	nd
37	Cruiser 250 (2T669)	0.25	ST/PIP	0.02	0.22	0.12	0.18

¹ Planted, 28 May 08; Sampled, 15 July 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, and in-furrow=IF, plant incorporated protectant=PIP.

³ A replicate is the average of 5 observations.
nd=no data.

Table 17. **Root ratings consistency of performance** for experimental and registered insecticides for control of corn rootworm larvae at Throckmorton-Purdue Agricultural Center, Lafayette, IN, 2008¹.

No.	Treatment	Rate & Application ²		Percent Rating \leq 0.25	
				Raw Mean ³	Transformed Mean
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	35.0	34.20 a-e
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	40.0	33.68 a-e
03	Force 3G/P250	0.12/0.25	TB/ST	50.0	50.00 a-e
04	Force 3G/P250	0.12/0.25	IF/ST	70.0	76.29 a-e
05	Lorsban 15G/P250	1.20/0.25	TB/ST	5.0	1.34 e
06	Lorsban 15G/P250	1.20/0.25	IF/ST	50.0	50.00 a-e
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	20.0	15.38 c-e
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	40.0	39.52 a-e
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	20.0	20.00 b-e
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	35.0	28.57 a-e
11	Counter 15G SB/P250	1.20/0.25	TB/ST	100.0	100.00 a
12	Counter 20G SB/P250	1.20/0.25	TB/ST	80.0	88.73 a-d
13	Force 1CS/P250	0.12/0.25	TB/ST	65.0	65.34 a-e
14	Force 1CS/P250	0.12/0.25	IF/ST	55.0	48.97 a-e
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	35.0	22.84 c-e
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	40.0	33.68 a-e
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	60.0	66.79 a-e
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	70.0	76.29 a-e
19	ST1			55.0	55.52 a-e
20	ST2+Aztec 2.1	0.14	IF	55.0	48.97 a-e
21	EXP5B			35.0	34.19 a-e
22	EXP7 (DKC61-69)		PIP	93.3	97.63 a-c
23	Poncho 1250	1.25	ST	10.0	5.28 de
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	95.0	98.66 ab
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	100.0	100.00 a
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	100.0	100.00 a
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	100.0	100.00 a
38	Poncho 250 (DKC61-73) Control	0.25	ST	10.0	5.28 de
32	Poncho 250 (32T84)	0.25	ST	10.0	2.90 a
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	53.0	61.98 b
34	Poncho 250 (32T85)	0.25	ST/PIP	100.0	100.00 c
35	Cruiser 250 (2J665)	0.25	ST	0.0	0.00 a
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	nd	nd
37	Cruiser 250 (2T669)	0.25	ST/PIP	95.0	98.66 b

¹ Planted, 28 May 08; Sampled, 15 July 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ Means followed by a similar letter are not significantly different, P=0.05, Ryan-Einot-Gabriel-Welsch MRT; Arcsine square root transformation. 61-73/69 (PR>F=0.0001), 32T84/85 (PR>F=0.0024), 2J665/669 (PR>F=0.0011).

Table 18. **Root rating consistency replication** (raw data) for experimental and registered insecticides for control of corn rootworm larvae at Throckmorton-Purdue Agricultural Center, Lafayette, IN, 2008¹.

No.	Treatment	Rate & Application ²		Percentage Rating ≤ 0.25 ³			
				Repl	Rep2	Rep3	Rep4
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	20	20	20	80
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	0	40	80	40
03	Force 3G/P250	0.12/0.25	TB/ST	20	0	80	100
04	Force 3G/P250	0.12/0.25	IF/ST	100	20	80	80
05	Lorsban 15G/P250	1.20/0.25	TB/ST	20	0	0	0
06	Lorsban 15G/P250	1.20/0.25	IF/ST	20	0	80	100
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	20	20	40	0
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	40	20	40	60
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	20	20	20	20
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	80	0	20	40
11	Counter 15G SB/P250	1.20/0.25	TB/ST	100	nd	100	100
12	Counter 20G SB/P250	1.20/0.25	TB/ST	100	60	100	60
13	Force 1CS/P250	0.12/0.25	TB/ST	60	60	80	60
14	Force 1CS/P250	0.12/0.25	IF/ST	80	0	60	80
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	80	0	0	60
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	nd	40	40	80
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	100	0	40	100
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	100	20	80	80
19	ST1			40	80	20	80
20	ST2+Aztec 2.1	0.14	IF	80	60	80	0
21	EXP5B			20	0	20	100
22	EXP7 (DKC61-69)		PIP	nd	100	100	80
23	Poncho 1250	1.25	ST	20	0	20	0
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	100	80	100	100
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	100	100	100	100
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	100	100	100	100
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	100	100	100	100
38	Poncho 250 (DKC61-73) Control	0.25	ST	0	0	20	20
32	Poncho 250 (32T84)	0.25	ST	0	0	0	40
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	40	20	nd	100
34	Poncho 250 (32T85)	0.25	ST/PIP	100	100	100	100
35	Cruiser 250 (2J665)	0.25	ST	0	0	0	0
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	nd	nd	nd	nd
37	Cruiser 250 (2T669)	0.25	ST/PIP	100	100	100	80

¹ Planted, 28 May 08; Sampled, 15 July 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ A replicate is the average of 5 observations.
nd=no data.

Table 19. **Plant Lodging** (plants lodged/20 plants) for experimental and registered insecticides for control of corn rootworm larvae at Throckmorton-Purdue Agricultural Center, Lafayette, IN, 2008¹.

No.	Treatment	Rate & Application ²		Percentage Lodged Plants	
				Raw Mean ³	Transformed Mean
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	5.00	1.338 ab
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	8.75	5.820 ab
03	Force 3G/P250	0.12/0.25	TB/ST	0.00	0.000 b
04	Force 3G/P250	0.12/0.25	IF/ST	1.25	0.318 ab
05	Lorsban 15G/P250	1.20/0.25	TB/ST	28.75	26.080 ab
06	Lorsban 15G/P250	1.20/0.25	IF/ST	17.50	12.155 ab
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	42.50	41.191 a
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	22.50	20.865 ab
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	16.25	7.526 ab
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	16.25	14.996 ab
11	Counter 15G SB/P250	1.20/0.25	TB/ST	8.33	8.159 ab
12	Counter 20G SB/P250	1.20/0.25	TB/ST	23.75	16.449 ab
13	Force 1CS/P250	0.12/0.25	TB/ST	2.50	0.646 ab
14	Force 1CS/P250	0.12/0.25	IF/ST	7.50	3.806 ab
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	7.50	5.478 ab
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	5.00	3.291 ab
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	11.25	5.590 ab
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	1.25	0.318 ab
19	ST1			13.75	12.381 ab
20	ST2+Aztec 2.1	0.14	IF	17.50	6.015 ab
21	EXP5B			28.75	26.007 ab
22	EXP7 (DKC61-69)		PIP	0.00	0.000 b
23	Poncho 1250	1.25	ST	26.25	24.787 ab
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	1.25	0.318 ab
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	0.00	0.000 b
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	8.75	4.400 ab
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	1.25	0.318 ab
38	Poncho 250 (DKC61-73) Control	0.25	ST	33.75	32.259 ab
32	Poncho 250 (32T84)	0.25	ST	3.75	0.9853 a
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	1.67	0.5640 a
34	Poncho 250 (32T85)	0.25	ST/PIP	1.25	0.3175 a
35	Cruiser 250 (2J665)	0.25	ST	75.00	76.765 a
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	nd	nd
37	Cruiser 250 (2T669)	0.25	ST/PIP	5.00	2.408 b

¹ Planted, 28 May 08; Sampled, 6 November 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ Means followed by a similar letter are not significantly different, P=0.05, Ryan-Einot-Gabriel-Welsch MRT; Arcsine square root transformation. 61-73/69 (PR>F=0.0004), 32T84/85 (PR>F=0.9245), 2J665/669 (PR>F=0.0043).

Table 20. **Plant lodging replication** (raw data) for experimental and registered insecticides for control of corn rootworm larvae at Throckmorton-Purdue Agricultural Center, Lafayette, IN, 2008¹.

No.	Treatment	Rate & Application ²		Percentage Lodged Plants ³			
				Rep1	Rep2	Rep3	Rep4
01	Aztec 2.1G/P250	0.14/0.25	TB/ST	20	0	0	0
02	Aztec 2.1G/P250	0.14/0.25	IF/ST	25	5	5	0
03	Force 3G/P250	0.12/0.25	TB/ST	0	0	0	0
04	Force 3G/P250	0.12/0.25	IF/ST	5	0	0	0
05	Lorsban 15G/P250	1.20/0.25	TB/ST	5	45	15	50
06	Lorsban 15G/P250	1.20/0.25	IF/ST	45	0	5	20
07	Fortress 5G SB/P250	0.15/0.25	TB/ST	35	10	50	75
08	Fortress 5G SB/P250	0.15/0.25	IF/ST	25	20	40	5
09	Fortress5G Plus SB/P250	0.15/0.25	IF/ST	60	0	5	0
10	AMV 101 G SB/P250	3.0 oz prd/0.25	IF/ST	30	20	10	5
11	Counter 15G SB/P250	1.20/0.25	TB/ST	10	nd	5	10
12	Counter 20G SB/P250	1.20/0.25	TB/ST	75	5	0	15
13	Force 1CS/P250	0.12/0.25	TB/ST	0	10	0	0
14	Force 1CS/P250	0.12/0.25	IF/ST	0	0	20	10
15	Capture LFR 1.5SC/P250	0.09/0.25	TB/ST	15	0	5	10
16	Capture LFR 1.5SC/P250	0.09/0.25	IF/ST	nd	0	10	5
17	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	TB/ST	10	0	35	0
18	Cobalt 2.5/0.45EC/P250	3.0 oz prd/0.25	IF/ST	0	0	0	5
19	ST1			25	5	20	5
20	ST2+Aztec 2.1	0.14	IF	0	0	0	70
21	EXP5B			65	15	30	5
22	EXP7 (DKC61-69)		PIP	nd	0	0	0
23	Poncho 1250	1.25	ST	20	55	10	20
24	Poncho 250 (DKC61-69)	0.25	ST/PIP	0	5	0	0
25	CaptureLFR 1.5SC(DKC61-69/P250)	0.037/0.25	IF/ST/PIP	0	0	0	0
26	Fortress 5G SB(DKC61-69/P250)	0.15/0.25	IF/ST/PIP	0	25	0	10
27	Counter 15G SB(DKC61-69/P250)	0.60/0.25	IF/ST/PIP	0	5	0	0
38	Poncho 250 (DKC61-73) Control	0.25	ST	50	10	50	25
32	Poncho 250 (32T84)	0.25	ST	0	0	0	15
33	Aztec 2.1G+P250 (32T84)	0.14/0.25	TB/ST	5	5	nd	0
34	Poncho 250 (32T85)	0.25	ST/PIP	0	0	0	0
35	Cruiser 250 (2J665)	0.25	ST	90	65	90	55
36	Lorsban 15G+C250 (2J665)	1.20/0.25	TB/ST	nd	nd	nd	nd
37	Cruiser 250 (2T669)	0.25	ST/PIP	15	5	0	0

¹ Planted, 28 May 08; Sampled, 6 November 08.

² Rates for granules and liquids = oz ai/1000 ft and for seed treatment = mg/seed; applications are T-band=TB, SmartBox=SB, seed treatment=ST, in-furrow=IF, and plant incorporated protectant=PIP.

³ A replicate is the average of 5 observations.
nd=no data.

**Effect of Selected Foliar Insecticides on Soybean Yield
in the Absence of Insect Pests**

Planting Date: 18 June 2008

Trial Location: Throckmorton-Purdue Ag Center, 8343 US 231 South, Lafayette, IN

Hybrid: Beck's 342

Fertilizers: none

Herbicides: 7/16/07 Cornerstone 48 oz + Poast 16 oz.

Soil: Chalmers loam, CEC 13.1. OM 2.3, pH 6.3, Sand 36.8%, Silt 41.6%, Clay 21.6%

Previous Crop: corn

Experimental Design: Randomized Complete Blocks with 4 replications. Plots were four rows 25 ft long.

Conditions at Planting: Wind; NE 0 to 3 mph.
 Temp; 79°F,
 Sky: Partly cloudy

Weather: See Appendix I.

Methods:

Soybean aphid numbers were assessed on 24 July (-25 DAT) and 18 August (0 DAT). Aphids on leaves and stems of five entire plants per replicate (20 plants per treatment) were recorded. Sprays were applied on 18 August 2008 to all rows of the four-row plots at 20 gpa using a boom with 2 Teejet 8004 E nozzles at 24 psi and 3 mph. Actavator90 was used as non-ionic surfactant for Leverage 2.7SE. Soybean leaf percentage chlorosis was visually assessed on 22 August (4 DAT). Yields were estimated on 23 October using a Kencaid 8-XP plot combine to sample two center rows 20 ft long (40ft total). Moisture was adjusted to 13 percent before calculating bushels per acre.

Results:

An unusually cold and wet month of May delayed planting regionally. This may have contributed to a regional reduction of SBA numbers. Soybean aphid (SBA) and other pests were below detection levels through 24 July (Table 1). By 18 August (Table 2; Growth stage R2-3), SBA was at the detection level (1.45 SBA per plant (n=180 plants) with many plants not having any SBA and only an occasional natural enemy (primarily the multicolored Asian lady beetle). The SBA white dwarf form was rare. Only informal SBA observations were made following treatment. SBA numbers never rose above detection level following treatment in the trial area and in surrounding soybean areas.

Foliar products were applied on 18 August to assess potential plant regulatory affects (yield) of products, or the possibility that an undetected economically important pest might be present.

No detrimental gross effects of chemical treatments on soybean leaves were discernable at 4 DAT. (Table 3).

Overall yield for the trial averaged 50.12 bushels per acre (Table 4). Yield did not differ among treatments (P=0.05, LSD=4.25).

Table 1. Soybean aphids per plant (n=5 plants) on 24 July 2008 (-24 DAT).
Throckmorton-Purdue Ag Center, Lafayette, IN.

No. Treatment	Rate oz prod/a	Aphids per Plant					Avg.
		R1	R2	R3	R4		
01. UTC							
02. Lorsban 4E	16.0	0.0	0.0	0.0	0.0	0.0	
03. Warrior 1CS	2.56	0.0	0.0	0.0	0.0	0.0	
04. BaythroidXL	2.4	0.0	0.0	0.0	0.0	0.0	
05. BaythroidXL+Lorsban 4E	2.0+8.0	0.0	0.0	0.0	0.0	0.0	
06. Leverage 2.7SE+NIS 0.125%	3.8	0.0	0.0	0.0	0.0	0.0	
07. Dimethoate 4EC	8.0	0.0	0.0	0.0	0.0	0.0	
08. Dimethoate 4E+Nufos 4E	8.0+8.0	0.0	0.0	0.0	0.0	0.0	
09. Cobalt 2.5+	13.0	0.0	0.0	0.0	0.0	0.0	

Table 2. Soybean aphids per plant (n=5 plants) on 18 August 2008 (0 DAT).
Throckmorton-Purdue Ag Center, Lafayette, IN.

No. Treatment	Rate oz prod/a	Aphids per Plant					Avg.
		R1	R2	R3	R4		
01. UTC		0.2	0.0	0.0	1.0	0.30	
02. Lorsban 4E	16.0	0.0	0.0	2.4	5.4	1.95	
03. Warrior 1CS	2.56	0.6	2.0	0.0	0.0	0.65	
04. BaythroidXL	2.4	6.8	2.6	0.0	0.4	2.45	
05. BaythroidXL+Lorsban 4E	2.0+8.0	4.2	0.8	0.0	0.2	1.30	
06. Leverage 2.7SE+NIS 0.125%	3.8	0.8	0.0	0.4	0.4	0.40	
07. Dimethoate 4EC	8.0	0.2	0.0	0.4	1.4	0.50	
08. Dimethoate 4E+Nufos 4E	8.0+8.0	5.2	0.0	1.0	3.2	4.70	
09. Cobalt 2.5+0.045EC	13.0	0.6	0.0	0.8	1.8	0.80	

Test average=1.45

Table 3. Percentage of plants showing leaf chlorosis, Throckmorton-Purdue Ag Center, Lafayette, IN. 2008

Treatment Forml	Percentage Leaf Chlorosis, 4 DAT (7/22)	
	Rate oz Prod/a	Avg
01. UTC		
02. Lorsban 4E	16.0	0
03. Warrior 1CS	2.56	0
04. BaythroidXL	2.4	0
05. BaythroidXL+Lorsban 4E	2.0+8.0	0
06. Leverage 2.7SE+NIS 0.125%	3.8	0
07. Dimethoate 4EC	8.0	0
08. Dimethoate 4E+Nufos 4E	8.0+8.0	0
09. Cobalt 2.5+0.045EC	13.0	0

Table 4. Soybean yield (bu/ac). Throckmorton-Purdue Ag Center, Lafayette, IN. 2008

Treatment Forml	Rate oz Prd/a	Yield (bu/ac)				Ave
		Rep1	Rep2	Rep3	Rep4	
01. UTC		47.67	51.15	51.34	50.88	50.26 a
02. Lorsban 4E	16.0	47.11	51.06	48.37	52.40	49.73 a
03. Warrior 1CS	2.56	48.99	48.73	53.42	54.49	51.41 a
04. BaythroidXL	2.4	54.94	52.76	53.62	53.10	53.60 a
05. BaythroidXL+Lorsban 4E	2+8	49.30	53.18	48.76	46.44	49.42 a
06. Leverage 2.7SE+NIS0.125%	3.8	52.44	54.41	49.33	47.49	50.92 a
07. Dimethoate 4EC	8.0	50.81	53.08	53.16	43.51	50.14 a
08. Dimethoate 4E+Nufos 4E	8+8	48.77	49.41	47.35	49.10	48.66 a
09. Cobalt 2.5+0.045E	13.0	42.18	45.07	51.72	49.02	47.00 a

ANOVA Pr>F=0.1819. LSD=4.23. Test average=50.12

**Effect of Gaucho and Cruiser Seed Treatments on Soybean Yield
in the Absence of Foliar Pest Insects.**

Objective: Obtain yield comparisons of commercial rates of Gaucho vs. Cruiser seed treatments.

Trial Site: Throckmorton-Purdue Agricultural Center. Lafayette, IN.

Planting Date: 18 June 08.

Variety: Asgrow AG3202 RR

Planting Rate: about 8 seeds/ft

Design: RCB with 4 replications, Plots were 4 30-inch wide rows by 40 ft long. Plot dimensions were 10 ft X 40 ft.

Treatments:

1. Gaucho 600 62.5 gai + Apron XL 3.75 gai + Maxim 2.5 gai /100 kg
2. Cruiser 83 mg + Apron XL 3.75 gai + Maxim 2.5 gai /100 kg
3. Apron XL 3.75 gai + Maxim 2.5 gai /100 kg
4. Untreated seed

Herbicide: 7/16/07 Cornerstone 48 oz + Poast 16 oz.

Soil:

Chalmers loam, CEC 13.1. OM 2.3, pH 6.3, Sand 36.8%, Silt 41.6%, Clay 21.6%

Plant vigor (population and height): Plants in 10 ft per row in each of the center two rows (total = 20 ft) were counted. Height of the apical meristem from the ground surface was measured for 10 random plants in each of the two center rows and pooled (n=20 plants)

Insect sampling: Soybean aphid presence was assessed on 24 July (36 DAP) and 15 August (58 DAP) by counting the aphids on five entire random plants anywhere within the middle of the center two rows.

Harvest: Yield estimates were determined by harvesting the center two rows on 23 October 08 using a small-plot combine. Harvested row length was 40 ft Sample weights were converted to bushels per acre at 13 percent moisture.

Weather: Climate data appear in Appendix I, Table 2.

Results:

Insecticide type (Gaucho vs Cruiser) did not affect ($P=0.05$) the number of plants per 10 ft at soybean growth stage R1 (24 July). However, there was approximately 12 more plants per 10ft (21,135 plants per acre) where the insecticide seed coatings plus a fungicide were used when compared to fungicide or naked seed only treatments (Table 1).

At no time did soybean aphid approach the 250 aphids/plant treatment threshold (Tables 2 and 3). Aphids did not appear in the trial until 15 August and numbers were exceptionally low.

Yields for the two insecticides were almost identical (Table 4). There was a non-significant ($P=0.05$) trend for the insecticide treatments to yield approximately two bushels per acre more than the fungicide and naked seed treatments. The greater number of plants in the insecticide treatments may be associated with the yield trend. There were no consistent data trends that suggested that any of the treatments affected soybean aphid. During informal field observations, no other foliar pests were present in economically important numbers at any time during the

season. As in the previous three seasons, these overall results and observations do not support anecdotal conjecture that soybean seed insecticide+fungicide treatments are associated with consistently increased yields in the absence of foliar pests.

Table 1. Plants per 10 ft (30 inch row spacing) on 24 July 2008 (36 DAT), Throckmorton-Purdue Ag Center, Lafayette, IN.

No. Treatment	Plants per 10 ft					
	R1	R2	R3	R4	Avg.	SEM
1. Gaucho+ApronMaxx	84	85	80	80	82.25 a	1.315
2. Cruiser+ApronMaxx	80	79	81	77	79.25 a	0.854
3. ApronMaxx	77	71	64	74	71.50 b	2.784
4. Untreated	73	71	58	61	65.75 b	3.683

Pr>F=0.0009. LSD (SAS) P=0.05.

Table 2. Soybean aphids per plant on 24 July 2008 (36 DAT), Throckmorton-Purdue Ag Center, Lafayette, IN.

No. Treatment	Soybean Aphids per Plant ¹				
	R1	R2	R3	R4	Avg.
1. Gaucho+ApronMaxx	0.0	0.0	0.0	0.0	0.0
2. Cruiser+ApronMaxx	0.0	0.0	0.0	0.0	0.0
3. ApronMaxx	0.0	0.0	0.0	0.0	0.0
4. Untreated	0.0	0.0	0.0	0.0	0.0

¹Replicate means are the average of 5 plants.

Table 3. Soybean aphids per plant on 15 August 2008 (58 DAT), Throckmorton-Purdue Ag Center, Lafayette, IN.

No. Treatment	Soybean Aphids per Plant ¹					
	R1	R2	R3	R4	Avg.	SEM
1. Gaucho+ApronMaxx	0.2	0.0	0.2	0.0	0.10 a	0.058
2. Cruiser+ApronMaxx	9.2	0.0	1.4	0.0	2.65 a	2.208
3. ApronMaxx	0.2	0.0	0.0	0.0	0.05 a	0.050
4. Untreated	0.0	0.0	0.0	0.0	0.00 a	0.000

Pr>F=0.2985.

¹Replicate means are the average of 5 plants.

Table 4. Yield, Throckmorton-Purdue Ag Center, Lafayette, IN. 23 October_2008.

No. Treatment	Bushels/Acre					
	R1	R2	R3	R4	Avg.	SEM
1. Gaucho+ApronMaxx	66.06	53.08	56.57	53.44	57.29 a	3.027
2. Cruiser+ApronMaxx	50.98	53.08	62.80	62.10	57.24 a	3.040
3. ApronMaxx	53.18	58.58	51.61	57.18	55.14 a	1.639
4. Untreated	53.55	51.42	60.71	56.13	55.45 a	2.000

Pr>F=0.9095.

Appendix I. Weather Observations 2008

Table 1. Pinney-Purdue Agricultural Center, Wanatah, IN

Date	Precip (inch)	Air (degF)	Max Air (degF)	Min Air (degF)	Soil Bare°F	Soil GrassF°
05/01	0.00	47	61	29	50	51
05/02	0.00	61	74	46	55	54
05/03	0.18	65	74	56	60	57
05/04	0.01	51	58	42	53	55
05/05	0.00	53	67	37	54	54
05/06	0.00	59	75	44	57	56
05/07	0.00	65	82	42	62	58
05/08	0.23	61	67	52	60	59
05/09	0.02	51	57	47	53	56
05/10	0.00	49	61	38	54	55
05/11	0.00	54	66	37	55	56
05/12	0.70	50	58	44	52	55
05/13	0.00	46	55	39	54	55
05/14	0.18	58	72	41	56	56
05/15	0.05	53	60	40	56	57
05/16	0.00	49	59	39	51	54
05/17	0.00	58	70	39	58	57
05/18	0.12	63	73	49	62	60
05/19	0.09	49	55	43	57	59
05/20	0.03	51	62	38	56	58
05/21	0.00	52	64	43	55	58
05/22	0.00	52	65	43	58	58
05/23	0.00	50	57	42	60	59
05/24	0.00	51	62	44	57	58
05/25	0.00	58	71	44	61	59
05/26	0.00	64	79	43	64	60
05/27	0.00	72	82	60	70	64
05/28	0.06	47	70	42	59	61
05/29	0.00	51	66	42	61	60
05/30	0.00	59	74	38	63	61
05/31	0.49	67	79	60	65	62

Pinney-Purdue Agricultural Center, Wanatah, IN

Date	Precip (inch)	Air (degF)	Max Air (degF)	Min Air (degF)	Soil Bare°F	Soil GrassF°
06/01	0.11	71	80	63	68	65
06/02	0.00	66	76	54	68	67
06/03	0.00	72	86	53	71	68
06/04	0.11	68	74	62	68	68
06/05	0.34	73	82	66	71	69
06/06	0.16	77	86	65	73	71
06/07	0.28	78	86	69	73	72
06/08	0.07	75	81	70	72	71
06/09	0.08	79	89	67	75	73
06/10	0.01	71	80	65	73	73
06/11	0.05	70	80	61	72	73
06/12	0.00	75	85	60	74	73
06/13	0.00	79	89	69	76	73
06/14	0.13	73	83	67	75	73
06/15	0.00	72	83	57	74	73
06/16	0.04	69	84	61	72	72

06/17	0.00	64	76	56	72	71
06/18	0.00	63	76	51	71	70
06/19	0.00	63	74	51	74	71
06/20	0.00	65	79	48	74	72
06/21	0.00	69	83	50	73	71
06/22	0.04	69	80	60	74	72
06/23	0.25	64	78	53	70	70
06/24	0.01	62	71	52	69	70
06/25	0.00	66	80	47	71	71
06/26	0.26	70	78	64	71	71
06/27	0.00	74	82	66	73	72
06/28	0.04	73	80	65	74	73
06/29	0.03	73	82	60	77	74
06/30	0.07	65	77	59	72	72

Pinney-Purdue Agricultural Center, Wanatah, IN

Date	Precip (inch)	Air (degF)	Max Air (degF)	Min Air (degF)	Soil Bare°F	Soil GrassF°
07/01	0.00	65	76	49	73	72
07/02	0.00	68	82	47	76	72
07/03	0.00	75	87	60	78	74
07/04	0.05	64	71	56	76	75
07/05	0.00	65	78	51	76	73
07/06	0.00	67	82	49	78	74
07/07	0.00	72	86	54	80	76
07/08	0.00	76	85	69	80	76
07/09	0.30	75	85	67	80	77
07/10	0.00	71	80	62	77	77
07/11	0.13	71	84	60	77	76
07/12	0.59	73	87	62	76	76
07/13	0.29	74	83	65	76	77
07/14	0.00	69	77	59	73	76
07/15	0.00	70	82	56	75	76
07/16	0.00	75	88	60	80	77
07/17	0.00	77	88	67	83	79
07/18	0.00	78	88	65	84	80
07/19	0.00	77	89	67	84	80
07/20	0.47	73	81	66	78	78
07/21	0.21	74	85	65	79	78
07/22	0.05	72	80	66	77	78
07/23	0.00	68	75	59	78	78
07/24	0.00	66	76	52	78	77
07/25	0.00	67	83	51	78	76
07/26	0.00	69	83	53	79	77
07/27	0.00	72	82	57	83	79
07/28	0.00	69	83	51	80	77
07/29	0.00	73	86	63	83	79
07/30	0.00	74	90	55	83	80
07/31	0.01	75	87	68	84	81

Pinney-Purdue Agricultural Center, Wanatah, IN

Date	Precip (inch)	Air (degF)	Max Air (degF)	Min Air (degF)	Soil Bare°F	Soil GrassF°
08/01	0.00	74	89	66	83	80
08/02	0.01	75	88	67	82	80
08/03	0.01	70	78	54	82	79
08/04	0.00	71	86	51	82	79

08/05	1.22	72	86	66	77	78
08/06	3.11	74	83	66	76	75
08/07	0.00	72	82	62	77	77
08/08	0.00	67	75	58	75	76
08/09	0.00	65	74	54	73	75
08/10	0.00	65	77	52	71	73
08/11	0.00	62	70	47	71	72
08/12	0.00	63	75	50	72	72
08/13	0.00	64	80	49	72	72
08/14	0.01	66	77	58	72	73
08/15	0.01	66	78	57	73	74
08/16	0.00	64	76	53	74	73
08/17	0.00	66	82	49	75	74
08/18	0.00	69	80	55	77	74
08/19	0.00	71	82	60	78	75
08/20	0.00	70	86	54	79	75
08/21	0.00	69	82	58	79	76
08/22	0.00	70	80	58	76	75
08/23	0.41	74	80	69	76	76
08/24	0.00	77	87	68	78	77
08/25	0.00	67	76	56	76	76
08/26	0.00	64	76	51	73	74
08/27	0.00	64	79	51	73	73
08/28	0.00	66	81	50	76	74
08/29	0.00	70	80	56	75	74
08/30	0.01	72	80	55	80	76
08/31	0.00	67	86	49	78	75

Pinney-Purdue Agricultural Center, Wanatah, IN

Date	Precip (inch)	Air (degF)	Max Air (degF)	Min Air (degF)	Soil Bare°F	Soil Grass°F°
09/01	0.00	69	87	50	78	75
09/02	0.00	70	87	54	78	75
09/03	0.00	74	94	53	80	76
09/04	0.00	69	75	64	77	75
09/05	2.11	66	70	62	70	72
09/06	0.11	63	69	51	69	70
09/07	0.01	62	75	49	68	70
09/08	0.15	63	72	55	69	71
09/09	0.74	59	70	54	65	69
09/10	0.03	57	67	44	65	67
09/11	0.00	56	72	39	63	66
09/12	0.02	64	77	50	65	67
09/13	0.41	70	72	68	70	69
09/14	3.37	73	82	67	72	71
09/15	3.76	64	71	56	68	69
09/16	0.02	60	66	54	64	67
09/17	0.00	61	71	52	67	68
09/18	0.00	64	80	50	66	68
09/19	0.00	63	76	54	66	68
09/20	0.00	63	78	47	66	68
09/21	0.00	65	83	51	68	69
09/22	0.00	66	82	50	69	70
09/23	0.00	67	82	56	70	70
09/24	0.00	67	82	52	70	70
09/25	0.00	67	86	52	70	70
09/26	0.00	68	83	56	71	70
09/27	0.00	63	80	47	69	69

09/28	0.00	61	79	44	67	67
09/29	0.00	61	75	49	67	67
09/30	0.00	57	70	48	64	65

Pinney-Purdue Agricultural Center, Wanatah, IN

Date	Precip (inch)	Air (degF)	Max Air (degF)	Min Air (degF)	Soil Bare°F	Soil GrassF°
10/01	0.01	55	62	49	61	64
10/02	0.41	51	57	45	58	61
10/03	0.02	52	62	42	57	60
10/04	0.02	51	59	41	57	60
10/05	0.00	47	60	32	54	58
10/06	0.00	49	62	33	52	56
10/07	0.00	59	69	52	56	58
10/08	1.12	58	67	50	57	58
10/09	0.10	56	61	44	59	60
10/10	0.01	54	70	42	56	58
10/11	0.00	55	74	36	55	57
10/12	0.00	62	82	45	59	59
10/13	0.00	68	85	53	62	62
10/14	0.00	69	83	56	63	63
10/15	0.03	60	70	52	64	64
10/16	1.02	57	66	52	60	62
10/17	0.00	51	57	43	56	59
10/18	0.01	48	58	35	54	57
10/19	0.01	50	62	40	54	57
10/20	0.00	49	62	37	51	55
10/21	0.11	50	65	40	52	54
10/22	0.03	44	54	33	50	54
10/23	0.00	42	54	31	46	51
10/24	0.00	47	60	32	46	49
10/25	0.36	49	55	43	50	51
10/26	0.00	45	52	41	47	50
10/27	0.00	47	57	34	47	50
10/28	0.16	38	48	33	42	47
10/29	0.02	37	44	33	42	46
10/30	0.00	37	49	27	41	44
10/31	0.00	43	61	24	42	44

Pinney-Purdue Agricultural Center, Wanatah, IN

Date	Precip (inch)	Air (degF)	Max Air (degF)	Min Air (degF)	Soil Bare°F	Soil GrassF°
11/01	0.00	55	72	42	49	48
11/02	0.00	49	59	38	49	50
11/03	0.05	56	69	46	53	51
11/04	0.00	62	73	51	55	54
11/05	0.00	58	73	48	53	53
11/06	0.00	58	72	46	52	53
11/07	0.48	58	70	49	53	53
11/08	0.01	45	55	39	49	52
11/09	0.00	37	40	34	42	47
11/10	0.01	34	37	30	40	44
11/11	0.00	31	41	25	38	42
11/12	0.14	31	37	20	36	40
11/13	0.17	43	49	36	42	42

11/14	0.00	48	53	43	47	46
11/15	0.24	48	52	42	47	47
11/16	0.17	39	43	35	42	45
11/17	0.00	33	36	29	38	42
11/18	0.01	31	34	27	35	40
11/19	0.05	25	30	16	34	39
11/20	0.01	33	42	23	36	39
11/21	0.00	32	37	24	35	38
11/22	0.00	24	29	17	33	36
11/23	0.00	22	31	15	31	35
11/24	0.00	28	42	14	31	34
11/25	0.06	34	37	31	31	34
11/26	0.00	32	39	26	33	35
11/27	0.00	31	42	22	34	35
11/28	0.00	32	44	19	33	34
11/29	0.00	33	45	24	34	35
11/30	0.00	31	46	19	32	34

Appendix I. Weather Observations 2008.

Table 2. Throckmorton-Purdue Agricultural Center, Lafayette, IN.

Date	Precip (inch)	Air (degF)	Max Air (degF)	Min Air (degF)	Soil Bare°F	Soil GrassF°
05/01	0.00	51	67	34	56	52
05/02	0.00	64	74	52	61	56
05/03	0.13	67	74	60	63	59
05/04	0.00	53	60	41	57	56
05/05	0.00	53	68	37	59	55
05/06	0.01	61	76	43	63	57
05/07	0.00	68	82	50	66	60
05/08	0.17	64	67	60	63	60
05/09	0.28	52	62	50	58	57
05/10	0.02	53	59	46	57	56
05/11	0.00	56	68	39	59	56
05/12	0.46	52	58	48	56	56
05/13	0.00	52	63	41	58	57
05/14	0.07	60	73	46	61	58
05/15	0.28	57	61	50	60	58
05/16	0.57	51	58	45	55	56
05/17	0.00	56	67	47	59	58
05/18	0.03	63	76	52	61	60
05/19	0.00	54	63	46	60	59
05/20	0.04	51	61	40	56	62
05/21	0.00	53	61	44	56	63
05/22	0.00	55	66	45	61	73
05/23	0.00	58	72	43	64	77
05/24	0.36	52	58	47	58	62
05/25	0.00	59	70	47	61	73
05/26	0.00	65	77	48	62	71
05/27	0.01	70	76	64	67	72

Throckmorton-Purdue Agricultural Center, Lafayette, IN

Date	Precip (inch)	Air (degF)	Max Air (degF)	Min Air (degF)	Soil Bare°F	Soil GrassF°
06/01	0.00	72	81	64	72	69
06/02	0.24	71	83	59	73	69
06/03	0.00	73	85	61	73	70

06/04	0.53	71	77	67	71	69
06/05	0.38	73	83	65	73	71
06/06	0.00	80	87	73	76	73
06/07	0.20	78	90	68	76	73
06/08	0.92	74	81	67	72	71
06/09	0.00	82	89	74	77	74
06/10	0.30	77	85	66	77	74
06/11	0.12	71	81	62	75	73
06/12	0.00	75	84	64	75	73
06/13	0.00	79	90	68	78	73
06/14	0.33	73	80	65	74	72
06/15	0.00	73	84	62	75	74
06/16	0.04	72	86	62	75	73
06/17	0.00	69	79	56	73	72
06/18	0.00	65	76	53	72	70
06/19	0.00	67	80	54	74	69
06/20	0.00	69	84	52	76	70
06/21	0.00	73	87	57	79	72
06/22	0.04	71	81	61	75	71
06/23	0.01	68	81	59	73	70
06/24	0.02	68	79	57	75	70
06/25	0.00	69	82	52	77	70
06/26	0.10	76	87	66	76	72
06/27	ND	74	86	65	76	72
06/28	0.40	73	83	67	74	72
06/29	0.03	74	82	64	74	73
06/30	0.00	68	77	62	72	71

Throckmorton-Purdue Agricultural Center, Lafayette, IN

Date	Precip (inch)	Air (degF)	Max Air (degF)	Min Air (degF)	Soil Bare°F	Soil Grass°F°
07/01	0.00	68	80	57	74	70
07/02	0.00	69	83	52	77	70
07/03	0.20	76	87	62	79	72
07/04	0.36	69	75	63	74	72
07/05	0.37	67	74	61	71	71
07/06	0.00	69	80	58	74	72
07/07	0.00	74	85	61	79	74
07/08	0.37	74	80	68	76	73
07/09	0.20	77	86	70	78	75
07/10	0.02	74	81	66	78	76
07/11	0.19	74	85	61	79	74
07/12	0.02	76	87	63	78	75
07/13	0.99	75	86	69	78	76
07/14	0.00	70	79	60	75	74
07/15	0.00	72	83	60	77	74
07/16	0.00	76	88	62	82	75
07/17	0.00	78	88	68	84	77
07/18	0.00	79	88	68	85	77
07/19	0.00	78	88	65	85	77
07/20	0.00	77	85	71	82	76
07/21	0.00	78	88	71	82	77
07/22	0.18	76	87	68	81	76
07/23	0.34	72	81	63	78	75
07/24	0.01	69	80	58	75	74
07/25	0.00	67	80	53	75	72
07/26	0.00	71	83	58	79	73
07/27	0.00	75	86	65	82	75

07/28	0.00	71	83	56	80	74
07/29	0.52	73	84	65	78	73
07/30	0.22	76	87	64	79	75
07/31	0.00	73	81	69	77	75

Throckmorton-Purdue Agricultural Center, Lafayette, IN

Date	Precip (inch)	Air (degF)	Max Air (degF)	Min Air (degF)	Soil Bare°F	Soil GrassF°
08/01	0.00	76	86	68	79	76
08/02	0.00	77	86	69	81	76
08/03	0.00	74	82	64	81	76
08/04	0.00	72	84	57	79	74
08/05	0.00	76	87	66	79	75
08/06	0.00	74	82	69	77	74
08/07	0.00	76	85	65	79	76
08/08	0.00	70	79	60	75	74
08/09	0.00	67	78	57	73	72
08/10	0.00	67	77	57	72	71
08/11	0.00	65	75	58	72	71
08/12	0.00	64	78	51	72	70
08/13	0.27	67	81	54	73	70
08/14	0.00	69	82	60	75	71
08/15	0.00	69	78	60	74	72
08/16	0.00	67	78	55	73	71
08/17	0.00	67	80	53	73	70
08/18	0.00	67	80	54	74	70
08/19	0.00	69	83	57	75	71
08/20	0.00	72	85	57	75	71
08/21	0.00	72	84	61	76	72
08/22	0.00	72	83	62	75	72
08/23	0.31	74	82	69	75	73
08/24	0.00	78	89	67	77	75
08/25	0.00	73	82	61	77	75
08/26	0.00	66	78	56	73	71
08/27	0.01	66	79	53	72	70
08/28	0.00	70	83	58	74	71
08/29	0.00	72	82	60	74	71
08/30	0.00	74	84	61	76	73
08/31	0.00	70	86	53	76	71

Throckmorton-Purdue Agricultural Center, Lafayette, IN

Date	Precip (inch)	Air (degF)	Max Air (degF)	Min Air (degF)	Soil Bare°F	Soil GrassF°
09/01	0.00	72	87	56	77	71
09/02	0.00	72	88	57	77	71
09/03	0.00	75	90	58	79	72
09/04	0.02	75	92	66	80	74
09/05	1.46	69	75	64	74	72
09/06	0.09	64	71	61	71	71
09/07	0.21	65	75	54	71	69
09/08	0.44	64	74	55	72	70
09/09	0.22	65	76	55	70	69

09/10	0.19	60	71	52	69	68
09/11	0.00	60	74	47	68	66
09/12	0.06	66	81	53	68	67
09/13	0.27	71	76	67	71	70
09/14	0.01	78	88	71	74	72
09/15	0.44	69	77	60	71	71
09/16	0.00	62	70	57	67	68
09/17	0.00	61	75	52	68	67
09/18	0.01	63	79	49	68	67
09/19	0.00	66	79	54	69	67
09/20	0.00	66	82	52	68	67
09/21	0.00	66	82	55	68	67
09/22	0.00	67	82	58	69	68
09/23	0.00	70	85	58	70	68
09/24	0.00	70	85	56	71	68
09/25	0.00	70	88	58	71	68
09/26	0.00	69	85	55	71	67
09/27	0.00	65	80	50	69	65
09/28	0.00	66	81	52	69	65
09/29	0.00	64	82	48	69	65
09/30	0.00	63	79	52	68	65

Throckmorton-Purdue Agricultural Center, Lafayette, IN

Date	Precip (inch)	Air (degF)	Max Air (degF)	Min Air (degF)	Soil Bare°F	Soil GrassF°
10/01	0.00	56	66	49	66	63
10/02	0.00	52	63	42	63	60
10/03	0.00	51	65	36	61	58
10/04	0.00	56	70	43	62	59
10/05	0.00	53	67	39	62	59
10/06	0.00	57	78	37	62	58
10/07	0.00	64	80	50	64	60
10/08	0.00	62	73	56	63	60
10/09	0.00	60	69	47	62	61
10/10	0.00	57	75	44	60	59
10/11	0.01	61	80	43	59	58
10/12	0.00	68	85	54	63	61
10/13	0.00	70	86	57	65	63
10/14	0.00	70	81	59	65	63
10/15	0.00	65	74	59	66	64
10/16	0.02	66	82	53	66	65
10/17	0.00	53	61	48	61	61
10/18	0.00	51	60	39	57	58
10/19	0.00	51	61	41	58	58
10/20	0.01	50	63	39	54	55
10/21	0.00	54	69	41	54	55
10/22	0.01	47	57	37	53	54
10/23	0.00	45	57	34	49	51
10/24	0.00	51	66	35	50	50
10/25	0.39	51	58	45	52	53
10/26	0.00	45	53	38	48	51
10/27	0.00	49	60	37	49	50
10/28	0.00	39	45	33	44	47
10/29	0.00	36	45	26	42	45
10/30	0.00	41	54	31	43	44
10/31	0.00	46	64	29	44	45

Throckmorton-Purdue Agricultural Center, Lafayette, IN

Date	Precip (inch)	Air (degF)	Max Air (degF)	Min Air (degF)	Soil Bare°F	Soil GrassF°
11/01	0.00	57	73	47	49	48
11/02	0.00	58	73	46	53	51
11/03	0.00	60	73	51	56	54
11/04	0.00	61	74	51	56	54
11/05	0.00	59	73	47	55	53
11/06	0.00	60	73	48	55	53
11/07	0.06	59	72	50	55	54
11/08	0.00	48	56	40	52	53
11/09	0.00	39	43	36	46	48
11/10	0.00	35	36	31	43	45
11/11	0.00	31	40	24	41	43
11/12	0.04	35	40	24	40	42
11/13	0.47	46	51	40	44	44
11/14	0.02	51	55	46	49	48
11/15	0.42	51	55	45	50	49
11/16	0.06	40	45	34	45	47
11/17	0.00	34	37	30	40	43
11/18	0.00	32	36	27	38	41
11/19	0.00	27	36	20	37	38
11/20	0.00	34	44	24	36	38
11/21	0.00	32	36	24	36	38
11/22	0.00	23	31	16	33	35
11/23	0.00	24	33	15	32	34
11/24	0.00	31	44	20	32	33
11/25	0.11	37	41	31	35	36
11/26	0.00	32	40	26	35	36
11/27	0.00	31	43	22	34	35
11/28	0.00	35	48	21	35	35
11/29	0.00	33	43	26	35	36
11/30	0.00	34	47	21	35	35