Since its inception in 1984, the University of Illinois Insect Management and Insecticide Evaluation Program has provided the producers of Illinois complete and informative evaluations of registered insecticides and new chemical and transgenic tools for the management of insect pests in Illinois. It is our intention to provide scientifically sound efficacy data to aid the producers of Illinois in their insect pest management decision making.

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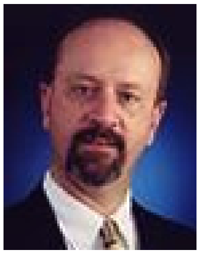

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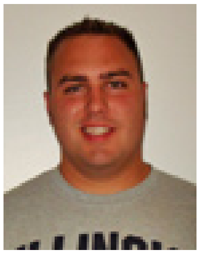

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CORN

SOYBEAN

APPENDICES

SECTION 1

Evaluation of products to control corn rootworm larvae (*Diabrotica spp.*) in Illinois, 2007

Ronald E. Estes, Kevin L. Steffey, and Michael E. Gray

Location

We established four trials on University of Illinois research and education centers near DeKalb (DeKalb County), Monmouth (Warren County), Perry (Pike County), and Urbana (Champaign County).

Experimental Design and Methods

The experimental design was a randomized complete block with four replications. The plot size for each treatment was 10 ft (four rows) x 30 ft at Monmouth and Perry and 10 ft (four rows) x 40 ft at DeKalb and Urbana. Five randomly selected root systems were extracted from the first row of each plot on 9 July at Urbana and Perry, and on 12 and 16 July at Monmouth and DeKalb, respectively. The root systems were washed and rated for corn rootworm larval injury using the 0 to 3 node-injury scale developed by Oleson et al. (2005) (Appendix I). Percentage consistency (percentage of roots with a node-injury rating less than 1.0) was determined for each product at each location. Five randomly selected root systems were extracted from a subset of treatments at Urbana, Monmouth, and DeKalb again on 6 and 7 August to assess late-season rootworm injury. The root systems were washed and rated (0 to 3 node-injury scale) for corn rootworm larval injury.

Yields were estimated by harvesting the center two rows of each plot on 1 October, 24 September, 18 September, and 27 September at DeKalb, Monmouth, Perry, and Urbana, respectively. Weights were converted to bushels per acre (bu/A) at 15% moisture.

Planting and Insecticide Application

Trials were planted on 1, 3, 8, and 10 May at Urbana, DeKalb, Perry, and Monmouth, respectively. All trials were planted using a four-row, Almaco constructed planter with John Deere 7300 row units with Precision Planting finger pick-up style metering units. Granular insecticides were applied through modified Noble metering units or through modified SmartBox metering units mounted to each row. Plastic tubes directed the insecticide granules to either a 5-inch, slope-compensating

TABLE 1.1 • Agronomic information for efficacy trials with products to control corn rootworm larvae, University of Illinois, 2007

	DeKalb	Monmouth	Perry	Urbana
Planting date	3 May	10 May	8 May	1 May
Root evaluation dates	16 July 7 August	12 July 6 August	9 July	9 July 7 August
Hybrids1	DKC61-73 DKC61-69 YGVT Pioneer 33T57 Pioneer 33T59 HxXTRA Mycogen 2T780 Mycogen 2T787 HxXTRA	DKC61-73 DKC61-69 YGVT Pioneer 33T57 Pioneer 33T59 HxXTRA Mycogen 2T780 Mycogen 2T787 HxXTRA	DKC61-73 DKC61-69 YGVT Pioneer 33T57 Pioneer 33T59 HxXTRA Mycogen 2T780 Mycogen 2T787 HxXTRA	DKC61-73 DKC61-69 YGVT Pioneer 33T57 Pioneer 33T59 HxXTRA Mycogen 2T780 Mycogen 2T787 HxXTRA
Row spacing	30 inches	30 inches	30 inches	30 inches
Seeding rate	33,000/acre	33,000/acre	33,000/acre	33,000/acre
Previous crop	Trap crop (late-planted corn and pumpkins)	Trap crop (late-planted corn and pumpkins)	Trap crop (late-planted corn and pumpkins)	Trap crop (late-planted corn and pumpkins)
Tillage	Fall—chisel plow Spring—field cultivator	Fall—chisel plow Spring—field cultivator	Fall—chisel plow Spring—field cultivator	Fall—chisel plow Spring—field cultivator

[1] All seed-applied insecticides and soil insecticides were applied to DKC61-73 (the non-rootworm trait isoline of DKC61-69 YGVT), unless otherwise listed.

bander or into the seed furrow. Liquid insecticides were applied at a spray volume of 5 gal per acre using a CO_2 system. All insecticides were applied in front of the firming wheels on the planter. Cable-mounted tines were attached behind each of the row units to improve insecticide incorporation.

Active ingredients for all chemical insecticides, except those with experimental numbers, are listed in Appendix II.

Agronomic Information

Agronomic information for all four trials is listed in Table 1.1.

Climatic Conditions

Temperature and precipitation data for all four locations are presented in Appendix III.

Statistical Analysis

Data were analyzed using ARM 7 (Agricultural Research Manager), revision 7.3.6. (Copyright© 1982–2007 Gylling Data Management, Inc., Brookings, SD).

Results and Discussion

DeKalb—Mean node-injury ratings and consistency percentages for rootworm injury evaluations on 25 July and the corresponding yields are presented in Table 1.2. The mean node-injury ratings in the untreated checks (UTCs) were 2.18 (Mycogen 2T780 + Cruiser 0.25), 1.89 (Pioneer 33T57 + Poncho 250) and 2.18 (DKC61-73), indicating that corn rootworm larval feeding was severe (two nodes of roots destroyed) in the trial. The mean node-injury ratings for all of the transgenic Bt rootworm hybrids were significantly lower than the mean node-injury ratings in all three UTCs. The mean node-injury ratings for all plots treated with an insecticide were significantly lower than the mean node-injury ratings of the DKC and Mycogen UTCs. The mean node-injury ratings for the plots treated with experimental seed treatments ('V' and 'NUP' treatments) did not differ significantly from the node-injury ratings for the Pioneer UTC. The mean node-injury ratings for most products was <1.0, except for Counter 15G and all of the insecticidal seed treatments, including Poncho 1250. YGVT + Counter 15G had the lowest mean node-injury rating of 0.07, although not significantly lower than the mean node-injury ratings for YGVT, HxXTRA (Mycogen and Pioneer hybrids), Defcon 2.1G (band and furrow), and Aztec 2.1G + EXP 4A.

The seed treatments (Poncho 1250 and the experimental treatments) offered the least consistent root protection with consistency percentages at 25% or less. The most consistent protection against rootworm injury (100% consistency) was provided by Force 2.25CS, YGVT + Counter 15G, YGVT, and HxXTRA (Mycogen and Pioneer hybrids).

Late-season rootworm injury in seven treatments was assessed on 7 August (Table 1.3). Overall, the mean node-injury ratings on 7 August were not noticeably different from the mean node-injury ratings on 16 July. The mean node-injury ratings for all treatments were significantly lower than the mean node-injury ratings for the DKC and Mycogen UTCs. The mean node-injury rating in the Poncho 1250 treated plots was not significantly lower than the mean node-injury rating for the Pioneer UTC. Mycogen's HxXTRA and the YGVT + Counter 15G treatments both provided 100% consistency on 7 August.

TABLE 1.2 • Evaluation of products to control corn rootworm larvae, DeKalb, University of Illinois, 2007

Product[1]	Rate[2,3]	Placement[2,3]	Mean node-injury rating[4,5,6,7] 16 July	% consistency[8]	Mean yield (bu/A)[6,9] 1 Oct
Aztec 2.1G + Poncho 250	6.7 0.25	Band Seed	0.81 e-h	60	225.03 abc
Aztec 2.1G[10] + Poncho 250	8 0.25	Band Seed	0.51 g-k	90	224.62 abc
Aztec 2.1G + EXP 4A	6.7 N/A	Band Seed	0.41 h-l	90	231.93 ab
Aztec 4.67G[11]	3	Furrow	0.66 f-i	70	203.25 c

Table 1.2 continued on page 6

TABLE 1.2 • continued

Product[1]	Rate[2,3]	Placement[2,3]	Mean node-injury rating[4,5,6,7] 16 July	% consistency[8]	Mean yield (bu/A)[6,9] 1 Oct
Counter 15G[11]	8	Band	1.00 def	40	236.88 a
Defcon 2.1G	6.7	Band	0.40 h-l	90	219.88 abc
Defcon 2.1G	6.7	Furrow	0.32 i-l	95	220.92 abc
Force 3G	4	Band	0.74 e-h	74	224.24 abc
Fortress 2.5G	8	Furrow	0.96 ef	45	210.48 bc
Lorsban 15G	8	Band	0.90 efg	45	216.50 abc
Saurus 15G	8	Band	0.87 efg	47	213.83 bc
Saurus 15G	8	Furrow	0.78 e-h	65	222.41 abc
Lorsban 4E	2.4	Band	0.55 f-j	90	215.22 abc
Force 2.25CS	0.46	Band	0.45 g-k	100	210.24 bc
Poncho 1250	1.25	Seed	1.18 cde	15	217.81 abc
EXP 4C	N/A	Seed	1.18 cde	25	213.42 bc
NUP 05071	1.34	Seed	1.51 bc	5	210.82 bc
NUP 07066	1.34	Seed	1.41 bcd	10	224.03 abc
V-10170 5SC	1.25	Seed	1.43 bcd	5	221.98 abc
HxXTRA (Mycogen 2T787) + Cruiser	— 0.25	— Seed	0.16 kl	100	228.12 ab
UTC[12] (Mycogen 2T780)[13] + Cruiser	— 0.25	— Seed	2.18 a	0	172.04 d
HxXTRA (Pioneer 33T59) + Poncho 250	— 0.25	— Seed	0.08 l	100	216.18 abc
Pioneer 33T57[14] + Force 3G + Poncho 250	— 4 0.25	— Band Seed	0.60 f-i	85	214.35 bc
UTC[12] (Pioneer 33T57)[14] + Poncho 250	— 0.25	— Seed	1.89 ab	5	177.09 d
YGVT (DKC61-69) + Poncho 250	— 0.25	— Seed	0.20 jkl	100	225.53 ab
YGVT (DKC61-69) + Counter 15G[11] + Poncho 250	— 6 0.25	— Band Seed	0.07 l	100	228.79 ab
UTC[12] (DKC61-73)	—	—	2.18 a	0	162.51 d

[1] All seed-applied insecticides and soil insecticides were applied to DKC61-73, the near-isoline of DKC61-69 YGVT, unless otherwise indicated.
[2] Rates of application for band and furrow placements are ounces (oz) of product per 1,000 ft of row.
[3] Rates of application for seed treatments are milligrams (mg) of active ingredient (a.i.) per seed.
[4] Mean node-injury ratings are based on the 0 to 3 node-injury scale (Oleson et al. 2005, Appendix I).
[5] Mean node-injury ratings were derived from five root systems per treatment in each of four replications.
[6] Data were transformed (square root transformation) for analysis; the actual means are shown.
[7] Means followed by the same letter do not differ significantly ($P = 0.05$, Duncan's New Multiple Range Test).
[8] Percentage of roots with a node-injury rating <1.0.
[9] Corn was harvested from the center two rows of each plot and converted to bushels per acre (bu/A) at 15% moisture.
[10] Aztec 2.1G was applied at 8 oz as experimental use only. *Aztec 2.1G is not labeled at this rate of application.* We do not condone the use of rates of application not indicated on the product label.
[11] Applied with modified SmartBox metering units.
[12] UTC = untreated check.
[13] Mycogen 2T780 is the near-isoline of Mycogen 2T787 HxXTRA.
[14] Pioneer 33T57 is the near-isoline of Pioneer 33T59 HxXTRA.

TABLE 1.3 • **Evaluation of products for late-season control of corn rootworm larvae, DeKalb, University of Illinois, 7 August, 2007**

Product[1]	Rate[2,3]	Placement[2,3]	Mean node-injury rating[4,5,6]	% consistency[7]
Aztec 4.67G[8]	3	Furrow	0.68 cd	75
Poncho 1250	1.25	Seed	1.21 bc	27
HxXTRA (Mycogen 2T787) + Cruiser	— 0.25	— Seed	0.15 de	100
UTC[9] (Mycogen 2T780)[10] + Cruiser	— 0.25	— Seed	2.16 a	5
HxXTRA (Pioneer 33T59) + Poncho 250	— 0.25	— Seed	0.49 de	75
UTC[9] (Pioneer 33T57)[11] + Poncho 250	— 0.25	— Seed	1.79 ab	10
YGVT (DKC61-69) + Poncho 250	— 0.25	— Seed	0.27 de	95
YGVT (DKC61-69) + Counter 15G[9] + Poncho 250	— 6 0.25	— Band Seed	0.04 e	100
UTC[9] (DKC61-73)	—	—	2.49 a	0

[1] All seed-applied insecticides and soil insecticides were applied to DKC61-73, the near-isoline of DKC61-69 YGVT, unless otherwise indicated.
[2] Rates of application for band and furrow placements are ounces (oz) of product per 1,000 ft of row.
[3] Rates of application for seed treatments are milligrams (mg) of active ingredient (a.i.) per seed.
[4] Mean node-injury ratings are based on the 0 to 3 node-injury scale (Oleson et al. 2005, Appendix I).
[5] Mean node-injury ratings were derived from five root systems per treatment in each of four replications.
[6] Data were transformed (square root transformation) for analysis; the actual means are shown. Means followed by the same letter do not differ significantly (P = 0.05, Duncan's New Multiple Range Test).
[7] Percentage of roots with a node-injury rating <1.0.
[8] Applied with modified SmartBox metering units.
[9] UTC = untreated check.
[10] Mycogen 2T780 is the near-isoline of Mycogen 2T787 HxXTRA.
[11] Pioneer 33T57 is the near-isoline of Pioneer 33T59 HxXTRA.

Yields (Table 1.2) ranged from 162.51 to 236.88 bushels per acre, with no significant differences among any of the plots with rootworm control products. The yields for all rootworm control products were significantly higher than yields of the UTCs.

Monmouth—Mean node-injury ratings and consistency percentages for rootworm injury evaluations on 12 July and the corresponding yields are presented in Table 1.4. The mean node-injury ratings in the untreated checks (UTCs) were 1.58 (Mycogen 2T780 + Cruiser 0.25), 0.84 (Pioneer 33T57 + Poncho 250) and 1.14 (DKC61-73), indicating that corn rootworm larval feeding was moderate (one node of roots destroyed) in the trial. The mean node-injury ratings for all of the transgenic Bt rootworm hybrids were significantly lower than the mean node-injury ratings in the UTCs. The mean node-injury ratings for all plots treated with a soil insecticide were significantly lower than the mean node-injury ratings of the DKC and Mycogen UTCs. The mean node-injury ratings for the plots treated with seed treatments, including Poncho 1250, did not differ significantly from the node-injury ratings for the Pioneer and DKC UTCs. The mean node-injury ratings for all products was <1.0. With the exception of the seed treatments (Poncho 1250 and the experimental treatments), all products provided 90% or greater consistency.

Late-season rootworm injury in seven treatments was assessed on 7 August (Table 1.5). For the most part, the mean node-injury ratings on 7 August were not noticeably different from the mean node-injury ratings on 12 July, although the mean node-injury ratings increased over time in the Mycogen and Pioneer UTCs. The mean node-injury ratings for all rootworm control products were <1.0. The node-injury ratings for all treatments except Poncho 1250 were significantly lower than the node-injury rating for the DKC UTC. With the exception

TABLE 1.4 • **Evaluation of products to control corn rootworm larvae, Monmouth, University of Illinois, 2007**

Product[1]	Rate[2,3]	Placement[2,3]	Mean node-injury rating[4,5,6,7] 12 July	% consistency[8]	Mean yield (bu/A)[7,9,10] 24 Sep
Aztec 2.1G + Poncho 250	6.7 0.25	Band Seed	0.34 cde	90	232.82 a-d
Aztec 2.1G[11] + Poncho 250	8 0.25	Band Seed	0.15 de	100	232.95 a-d
Aztec 2.1G + EXP 4A	6.7 N/A	Band Seed	0.12 de	100	220.69 b-f
Aztec 4.67G[12]	3	Furrow	0.12 de	100	237.20 abc
Counter 15G[12]	8	Band	0.08 de	100	227.28 a-f
Force 3G	4	Band	0.22 de	100	229.26 a-f
Fortress 2.5G	8	Furrow	0.10 de	100	244.81 ab
Lorsban 15G	8	Band	0.20 de	100	231.13 a-e
Lorsban 4E	2.4	Band	0.25 de	100	229.31 a-f
Force 2.25CS	0.46	Band	0.23 de	100	236.81 abc
Poncho 1250	1.25	Seed	0.90 bc	55	227.89 a-f
EXP 4C	N/A	Seed	0.52 bcd	80	228.20 a-f
NUP 05071	1.34	Seed	0.88 bc	60	244.13 ab
NUP 07066	1.34	Seed	0.92 b	45	227.14 a-f
V-10170 5SC	1.25	Seed	0.93 b	70	236.90 abc
HxXTRA (Mycogen 2T787) + Cruiser	— 0.25	— Seed	0.12 de	100	219.03 c-f
UTC[13] (Mycogen 2T780)[14] + Cruiser	— 0.25	— Seed	1.58 a	35	206.37 f
HxXTRA (Pioneer 33T59) + Poncho 250	— 0.25	— Seed	0.05 de	100	206.80 ef
Pioneer 33T57[15] + Force 3G + Poncho 250	— 4 0.25	— Band Seed	0.32 cde	90	230.76 a-e
UTC[13] (Pioneer 33T57)[15] + Poncho 250	— 0.25	— Seed	0.84 bc	55	210.79 def
YGVT (DKC61-69) + Poncho 250	— 0.25	— Seed	0.03 de	100	237.47 abc
YGVT (DKC61-69) + Counter 15G[12] + Poncho 250	— 6 0.25	— Band Seed	0.01 e	100	249.76 a
UTC[14] (DKC61-73)	—	—	1.14 ab	45	210.04 def

[1] All seed-applied insecticides and soil insecticides were applied to DKC61-73, the near-isoline of DKC61-69 YGVT, unless otherwise indicated.
[2] Rates of application for band and furrow placements are ounces (oz) of product per 1,000 ft of row.
[3] Rates of application for seed treatments are milligrams (mg) of active ingredient (a.i.) per seed.
[4] Mean node-injury ratings are based on the 0 to 3 node-injury scale (Oleson et al. 2005, Appendix I).
[5] Mean node-injury ratings were derived from five root systems per treatment in each of four replications.
[6] Data were transformed (square root transformation) for analysis; the actual means are shown.
[7] Means followed by the same letter do not differ significantly ($P = 0.05$, Duncan's New Multiple Range Test).
[8] Percentage of roots with a node-injury rating <1.0.
[9] Corn was harvested from the center two rows of each plot and converted to bushels per acre (bu/A) at 15% moisture.
[10] Outliers have been removed due to unexplainable extremes in the data.
[11] Aztec 2.1G was applied at 8 oz as experimental use only. *Aztec 2.1G is not labeled at this rate of application.* We do not condone the use of rates of application not indicated on the product label.
[12] Applied with modified SmartBox metering units.
[13] UTC = untreated check.
[14] Mycogen 2T780 is the near-isoline of Mycogen 2T787 HxXTRA.
[15] Pioneer 33T57 is the near-isoline of Pioneer 33T59 HxXTRA.

TABLE 1.5 • **Evaluation of products for late-season control of corn rootworm larvae, Monmouth, University of Illinois, 7 August, 2007**

Product[1]	Rate[2,3]	Placement[2,3]	Mean node-injury rating[4,5,6]	% consistency[7]
Aztec 4.67G[8]	3	Furrow	0.32 c	95
Poncho 1250	1.25	Seed	0.55 bc	70
HxXTRA (Mycogen 2T787) + Cruiser	— 0.25	— Seed	0.21 c	95
UTC[9] (Mycogen 2T780)[10] + Cruiser	— 0.25	— Seed	1.92 a	25
HxXTRA (Pioneer 33T59) + Poncho 250	— 0.25	— Seed	0.15 c	100
UTC[9] (Pioneer 33T57)[11] + Poncho 250	— 0.25	— Seed	1.59 a	30
YGVT (DKC61-69) + Poncho 250	— 0.25	— Seed	0.02 c	100
YGVT (DKC61-69) + Counter 15G[8] + Poncho 250	— 6 0.25	— Band Seed	0.06 c	100
UTC[9] (DKC61-73)	—	—	1.20 ab	50

[1] All seed-applied insecticides and soil insecticides were applied to DKC61-73, the near-isoline of DKC61-69 YGVT, unless otherwise indicated.
[2] Rates of application for band and furrow placements are ounces (oz) of product per 1,000 ft of row.
[3] Rates of application for seed treatments are milligrams (mg) of active ingredient (a.i.) per seed.
[4] Mean node-injury ratings are based on the 0 to 3 node-injury scale (Oleson et al. 2005, Appendix I).
[5] Mean node-injury ratings were derived from five root systems per treatment in each of four replications.
[6] Data were transformed (square root transformation) for analysis; the actual means are shown. Means followed by the same letter do not differ significantly (P = 0.05, Duncan's New Multiple Range Test).
[7] Percentage of roots with a node-injury rating <1.0.
[8] Applied with modified SmartBox metering units.
[9] UTC = untreated check.
[10] Mycogen 2T780 is the near-isoline of Mycogen 2T787 HxXTRA.
[11] Pioneer 33T57 is the near-isoline of Pioneer 33T59 HxXTRA.

of Poncho 1250, all treatments had consistency ratings of 95% or greater.

Overall yields were high, with averages ranging from 206.37 to 249.76 bushels per acre. The plots with Aztec 4.67G, Force 2.25CS, Fortress 2.5G, NUP 05071, V-10170, YGVT + Counter 15G, and YGVT alone all had significantly higher yields than the yields of the UTCs. Additionally, the plots with Fortress 2.5G, NUP 05071, and YGVT + Counter 15G had significantly higher yields than the plots with HxXTRA (Pioneer and Mycogen hybrids).

Perry—Mean node-injury ratings and consistency percentages for rootworm injury evaluations on 9 July and the corresponding yields are presented in Table 1.6. The mean node-injury ratings in the untreated checks (UTCs) were 0.15 (Mycogen 2T780 + Cruiser 0.25), 0.25 (Pioneer 33T57 + Poncho 250), and 0.84 and 1.09 (DKC61-73), indicating that rootworm larval densities were low. However, the mean node-injury ratings for the DKC UTCs were significantly higher than the mean node-injury ratings for all other treatments, including the Mycogen and Pioneer UTCs. The low level of corn rootworm injury did not allow for an adequate appraisal of product performance; there were no significant differences in node-injury ratings among any of the rootworm control products. Percentage consistencies for all rootworm control products were all 95% or greater. Because of the low level of rootworm injury on 9 July, we did not dig roots in this trial a second time.

Yields ranged from 89.29 to 176.15 bushels per acre. The yield of YGVT was significantly higher than the yields from plots treated with Aztec 2.1G + EXP 4A, Lorsban 4E, Force 2.25CS, and Poncho 1250, and from the yields of the Mycogen and Pioneer UTCs. Based upon the low level of rootworm

TABLE 1.6 • **Evaluation of products to control corn rootworm larvae, Perry, University of Illinois, 2007**

Product[1]	Rate[2,3]	Placement[2,3]	Mean node-injury rating[4,5,6] 9 July	% consistency[7]	Mean yield (bu/A)[6,8] 18 Sep
Aztec 2.1G + Poncho 250	6.7 0.25	Band Seed	0.04 b	100	140.11 ab
Aztec 2.1G[9] + Poncho 250	8 0.25	Band Seed	0.03 b	100	151.31 ab
Aztec 2.1G + EXP 4A	6.7 N/A	Band Seed	0.05 b	100	137.68 b
Force 3G	4	Band	0.10 b	100	149.76 ab
Lorsban 15G	8	Band	0.10 b	100	152.91 ab
Lorsban 4E	2.4	Band	0.08 b	100	137.66 b
Force 2.25CS	0.46	Band	0.12 b	100	138.59 b
Poncho 1250	1.25	Seed	0.15 b	100	135.33 b
EXP 4C	N/A	Seed	0.04 b	100	159.02 ab
NUP 05071	1.34	Seed	0.11 b	100	147.48 ab
NUP 07066	1.34	Seed	0.22 b	95	140.17 ab
V-10170 5SC	1.25	Seed	0.17 b	95	143.73 ab
HxXTRA (Mycogen 2T787) + Cruiser	— 0.25	— Seed	0.06 b	100	157.31 ab
UTC[10] (Mycogen 2T780)[11] + Cruiser	— 0.25	— Seed	0.15 b	95	137.31 b
HxXTRA (Pioneer 33T59) + Poncho 250	— 0.25	— Seed	0.06 b	100	155.94 ab
Pioneer 33T57[12] + Force 3G + Poncho 250	— 4 0.25	— Band Seed	0.09 b	100	149.63 ab
UTC[10] (Pioneer 33T57)[12] + Poncho 250	— 0.25	— Seed	0.25 b	90	132.78 b
YGVT (DKC61-69) + Poncho 250	— 0.25	— Seed	0.01 b	100	176.15 a
UTC[10] (DKC61-73)	—	—	1.09 a	60	100.98 c
UTC[10] (DKC61-73)	—	—	0.84 a	60	89.29 c

[1] All seed-applied insecticides and soil insecticides were applied to DKC61-73, the near-isoline of DKC61-69 YGVT, unless otherwise indicated.
[2] Rates of application for band and furrow placements are ounces (oz) of product per 1,000 ft of row.
[3] Rates of application for seed treatments are milligrams (mg) of active ingredient (a.i.) per seed.
[4] Mean node-injury ratings are based on the 0 to 3 node-injury scale (Oleson et al. 2005, Appendix I).
[5] Mean node-injury ratings were derived from five root systems per treatment in each of four replications.
[6] Means followed by the same letter do not differ significantly (P = 0.05, Duncan's New Multiple Range Test).
[7] Percentage of roots with a node-injury rating <1.0.
[8] Corn was harvested from the center two rows of each plot and converted to bushels per acre (bu/A) at 15% moisture.
[9] Aztec 2.1G was applied at 8 oz as experimental use only. *Aztec 2.1G is not labeled at this rate of application.* We do not condone the use of rates of application not indicated on the product label.
[10] UTC = untreated check.
[11] Mycogen 2T780 is the near-isoline of Mycogen 2T787 HxXTRA.
[12] Pioneer 33T57 is the near-isoline of Pioneer 33T59 HxXTRA.

TABLE 1.7 • Evaluation of products to control corn rootworm larvae, Urbana, University of Illinois, 2007

Product[1]	Rate[2,3]	Placement[2,3]	Mean node-injury rating[4,5,6] 9 July	% consistency[7]	Mean yield (bu/A)[8,9] 27 Sep
Aztec 2.1G + Poncho 250	6.7 0.25	Band Seed	0.31 gh	100	175.17 a-e
Aztec 2.1G[10] + Poncho 250	8 0.25	Band Seed	0.34 gh	95	187.23 a-d
Aztec 2.1G + EXP 4A	6.7 N/A	Band Seed	0.25 gh	100	192.21 abc
Aztec 4.67G[11]	3	Furrow	0.21 gh	100	161.50 b-e
Counter 15G[11]	8	Band	0.13 gh	100	168.95 b-e
Defcon 2.1G	6.7	Band	0.31 gh	100	179.65 a-e
Defcon 2.1G	6.7	Furrow	0.23 gh	100	188.12 a-d
Force 3G	4	Band	0.41 gh	95	176.40 a-e
Fortress 2.5G	8	Furrow	0.15 gh	100	187.60 a-d
Lorsban 15G	8	Band	0.40 gh	100	179.02 a-e
Saurus 15G	8	Band	0.26 gh	95	156.88 cde
Saurus 15G	8	Furrow	0.31 gh	100	171.01 b-e
Lorsban 4E	2.4	Band	0.34 gh	100	176.65 a-e
Force 2.25CS	0.46	Band	0.36 gh	95	168.64 b-e
Poncho 1250	1.25	Seed	1.49 de	20	177.64 a-e
EXP 4C	N/A	Seed	1.66 cd	15	170.38 b-e
NUP 05071	1.34	Seed	1.29 def	35	159.69 cde
NUP 07066	1.34	Seed	1.99 bc	10	145.58 e
V-10170 5SC	1.25	Seed	1.39 de	40	151.75 de
HxXTRA (Mycogen 2T787) + Cruiser	— 0.25	— Seed	1.04 ef	45	154.72 cde
UTC[12] (Mycogen 2T780)[13] + Cruiser	— 0.25	— Seed	2.86 a	0	107.36 f
HxXTRA (Pioneer 33T59) + Poncho 250	— 0.25	— Seed	0.49 g	89	153.79 de
Pioneer 33T57[14] + Force 3G + Poncho 250	— 4 0.25	— Band Seed	0.21 gh	100	155.73 cde
UTC[12] (Pioneer 33T57)[14] + Poncho 250	— 0.25	— Seed	2.36 ab	5	85.70 f
YGVT (DKC61-69) + Poncho 250	— 0.25	— Seed	0.84 f	50	205.17 ab
YGVT (DKC61-69) + Counter 15G[11] + Poncho 250	— 6 0.25	— Band Seed	0.07 h	100	219.92 a
UTC[12] (DKC61-73)	—	—	2.74 a	0	56.56 g

Footnotes on next page

Table 1.7 Footnotes

[1] All seed-applied insecticides and soil insecticides were applied to DKC61-73, the near-isoline of DKC61-69 YGVT, unless otherwise indicated.
[2] Rates of application for band and furrow placements are ounces (oz) of product per 1,000 ft of row.
[3] Rates of application for seed treatments are milligrams (mg) of active ingredient (a.i.) per seed.
[4] Mean node-injury ratings are based on the 0 to 3 node-injury scale (Oleson et al. 2005, Appendix I).
[5] Mean node-injury ratings were derived from five root systems per treatment in each of four replications.
[6] Data were transformed (square root transformation) for analysis; the actual means are shown. Means followed by the same letter do not differ significantly (P = 0.05, Duncan's New Multiple Range Test).
[7] Percentage of roots with a node-injury rating <1.0.
[8] Corn was harvested from the center two rows of each plot and converted to bushels per acre (bu/A) at 15% moisture.
[9] Data were transformed (log transformation) for analysis; the actual means are shown. Means followed by the same letter do not differ significantly (P = 0.05, Duncan's New Multiple Range Test).
[10] Aztec 2.1G was applied at 8 oz as experimental use only. *Aztec 2.1G is not labeled at this rate of application*. We do not condone the use of rates of application not indicated on the product label.
[11] Applied with modified SmartBox metering units.
[12] UTC = untreated check.
[13] Mycogen 2T780 is the near-isoline of Mycogen 2T787 HxXTRA.
[14] Pioneer 33T57 is the near-isoline of Pioneer 33T59 HxXTRA.

TABLE 1.8 • Evaluation of products for late-season control of corn rootworm larvae, Urbana, University of Illinois, 7 August, 2007

Product[1]	Rate[2,3]	Placement[2,3]	Mean node-injury rating[4,5,6]	% consistency[7]
Aztec 4.67G[8]	3	Furrow	0.18 c	100
Poncho 1250	1.25	Seed	1.21 b	45
HxXTRA (Mycogen 2T787) + Cruiser	— 0.25	— Seed	0.82 b	68
UTC[9] (Mycogen 2T780)[10] + Cruiser	— 0.25	— Seed	2.65 a	5
HxXTRA (Pioneer 33T59) + Poncho 250	— 0.25	— Seed	0.28 c	90
UTC[9] (Pioneer 33T57)[11] + Poncho 250	— 0.25	— Seed	2.06 a	15
YGVT (DKC61-69) + Poncho 250	— 0.25	— Seed	0.97 b	40
YGVT (DKC61-69) + Counter 15G[8] + Poncho 250	— 6 0.25	— Band Seed	0.06 c	100
UTC[9] (DKC61-73)	—	—	2.66 a	10

[1] All seed-applied insecticides and soil insecticides were applied to DKC61-73, the near-isoline of DKC61-69 YGVT, unless otherwise indicated.
[2] Rates of application for band and furrow placements are ounces (oz) of product per 1,000 ft of row.
[3] Rates of application for seed treatments are milligrams (mg) of active ingredient (a.i.) per seed.
[4] Mean node-injury ratings are based on the 0 to 3 node-injury scale (Oleson et al. 2005, Appendix I).
[5] Mean node-injury ratings were derived from five root systems per treatment in each of four replications.
[6] Data were transformed (log transformation) for analysis; the actual means are shown. Means followed by the same letter do not differ significantly (P = 0.05, Duncan's New Multiple Range Test).
[7] Percentage of roots with a node-injury rating <1.0.
[8] Applied with modified SmartBox metering units.
[9] UTC = untreated check.
[10] Mycogen 2T780 is the near-isoline of Mycogen 2T787 HxXTRA.
[11] Pioneer 33T57 is the near-isoline of Pioneer 33T59 HxXTRA.

larval injury in most of the treatments, these differences in yield cannot be ascribed to differences in rootworm larval injury. Yields from all of the treated plots and the Pioneer and Mycogen UTCs were significantly higher than yields from the DKC UTCs.

Urbana—Mean node-injury ratings and consistency percentages for rootworm injury evaluations on 9 July and the corresponding yields are presented in Table 1.7. The mean node-injury ratings in the untreated checks (UTCs) were 2.86 (Mycogen 2T780 + Cruiser 0.25), 2.36 (Pioneer 33T57 + Poncho 250) and 2.74 (DKC61-73), indicating that corn rootworm larval feeding was severe (two nodes of roots destroyed) in the trial. The mean node-injury ratings for all plots treated with an insecticide were significantly lower than the mean node-injury ratings of the DKC and Mycogen UTCs. All plots treated with a granular or liquid insecticide had significantly less rootworm larval damage than plots with insecticidal seed treatments. However, there were no significant differences in mean node-injury ratings among any of the plots treated with granular or liquid insecticides (both in combination with other products and with or without insecticidal seed treatments). All of the plots treated with granular or liquid insecticides had significantly lower node-injury ratings than the YGVT and Mycogen HxXTRA plots. The mean node-injury ratings for all of the transgenic Bt rootworm hybrids were significantly lower than the mean node-injury ratings in the UTCs. The mean node-injury rating for Pioneer's HxXRTA was significantly lower than the mean node-injury ratings for Mycogen's HxXTRA and YGVT.

The liquid and granular insecticide treatments offered the most consistent protection against rootworm larval injury (95% or greater consistency). All insecticidal seed treatments had consistency ratings less than 50%, indicating that more than one half of the roots evaluated had node-injury ratings greater than or equal to 1.0. At least 50% or more of the Mycogen HxXTRA and YGVT roots had node-injury ratings greater than or equal to 1.0. The percentage consistency of the combination of YGVT + Counter 15G (100%) was double the percentage consistency of YGVT alone (50%) in this trial with extensive rootworm injury.

Late-season rootworm injury in seven treatments was assessed on 7 August (Table 1.8). Overall, the mean node-injury ratings on 7 August were not noticeably different from the mean node-injury ratings on 9 July. The mean node-injury ratings for all treatments were significantly lower than the mean node-injury ratings in the UTCs. The mean node-injury ratings for Aztec 4.67G, Pioneer's HxXTRA, and YGVT + Counter 15G were significantly lower than the mean node-injury ratings for Poncho 1250, Mycogen's HxXTRA, and YGVT. The granular insecticides and Pioneer's HxXTRA provided the most consistent protection (90% or greater) against late-season rootworm larval injury.

Yields (Table 1.7) ranged from 56.56 to 219.92 bushels per acre. All of the plots with rootworm control products had significantly higher yields than the UTCs. The yields from the YGVT, YGVT +Counter 15G, and Aztec 2.1G + EXP 4A plots were significantly higher than the yields from the NUP 07066, V10170, Pioneer HxXTRA, and UTC plots.

Summary of 2007 Results

Rootworm larval injury was moderate to heavy at three (DeKalb, Monmouth, and Urbana) of the four locations in 2007. At these three sites, most of the liquid and granular soil insecticides and the transgenic Bt rootworm hybrids provided adequate to excellent protection against injury caused by corn rootworm larvae. Insecticidal seed treatments did not provide adequate protection against injury caused by rootworm larvae, consistent with data we have generated in the past. The combination of YGVT + Counter 15G provided significantly better protection than YGVT by itself in Urbana where rootworm larval feeding injury was severe.

SECTION 2

Comparison of Herculex Rootworm (HxRW) hybrids to control corn rootworm larvae (*Diabrotica spp.*) in Illinois, 2007

Ronald E. Estes, Kevin L. Steffey, and Michael E. Gray

Location

We established one trial at the University of Illinois Agricultural Engineering Farm near Urbana (Champaign County).

Experimental Design and Methods

With the cooperation of Pioneer Hi-Bred International, Inc., we evaluated the efficacy of five Herculex Rootworm (HxRW) hybrids and two check (non-rootworm Bt) hybrids against corn rootworm larvae. All hybrids were selected by Pioneer personnel; we were not informed about the genetic backgrounds nor provided with the names of the hybrids. Treatments were labeled only with letters of the alphabet—A through G for the hybrids provided.

The experimental design was a randomized complete block with four replications. The plot size for each hybrid was 10 ft (four rows) x 30 ft. Five randomly selected root systems were extracted from the first row of each four-row plot on 10 July. The root systems were washed and rated for corn rootworm larval injury using the 0 to 3 node-injury scale developed by Oleson et al. (2005) (Appendix I). Percentage consistency (percentage of roots with a rating less than 1.0) also was determined for each hybrid.

Planting Information

The trial was planted on 2 May using a four-row, Almaco constructed planter with John Deere 7300 row units with Precision Planting finger pick-up style metering units.

Agronomic Information

Agronomic information is listed in Table 2.1.

Climatic Conditions

Temperature and precipitation data are presented in Appendix III.

Statistical Analysis

Data were analyzed using ARM 7 (Agricultural Research Manager), revision 7.3.6. (Copyright© 1982–2007 Gylling Data Management, Inc., Brookings, SD).

Results and Discussion

The level of rootworm injury to the check (non-rootworm Bt) hybrids was moderate to high, with mean node-injury ratings of 1.41 and 1.98 for hybrids A and F, respectively. (We were not made aware that hybrids A and F were non-rootworm Bt checks until after evaluations had been completed.) The mean node-injury ratings for all of the HxRW hybrids were very low, ranging from 0.04 to 0.13, indicating excellent protection against rootworm larval injury. Percentage consistency values for all HxRW hybrids was 100% (all node injury ratings <1.0). Based on the data we have gathered from two years of testing various Pioneer HxRW hybrids, the hybrids we have evaluated seem to provide excellent protection against corn rootworm larval injury, with little variation in rootworm larval injury among different hybrids.

TABLE 2.1 • Agronomic information for efficacy trial of Herculex Rootworm (HxRW) hybrids to control corn rootworm larvae, Urbana, University of Illinois, 2007

Planting date	2 May
Root evaluation date	10 July
Row spacing	30 inches
Seeding rate	33,000/acre
Previous crop	Trap crop (late-planted corn and pumpkins)
Tillage	Fall—chisel plow Spring—field cultivator

TABLE 2.2 • **Evaluation of Herculex RW (HxRW) hybrids for control of corn rootworm larvae, Urbana, University of Illinois, 10 July, 2007**

Hybrid	Mean node-injury rating[1,2,3]	% consistency[4]
Hybrid A (non-rootworm Bt check)	1.41 a	55
Hybrid B	0.06 b	100
Hybrid C	0.06 b	100
Hybrid D	0.12 b	100
Hybrid E	0.04 b	100
Hybrid F (non-rootworm Bt check)	1.98 a	25
Hybrid G	0.13 b	100

[1] Mean node-injury ratings are based on the 0 to 3 node-injury scale (Oleson et al. 2005, Appendix I).
[2] Mean node-injury ratings were derived from five root systems per treatment in each of four replications.
[3] Means followed by the same letter do not differ significantly (P = 0.05, Duncan's New Multiple Range Test).
[4] Percentage of roots with a node-injury rating <1.0.

SECTION 3

Evaluation of Force 2.25CS to control corn rootworm larvae (*Diabrotica spp.*) in Illinois, 2007

Ronald E. Estes, Kevin L. Steffey, and Michael E. Gray

Location

We established one trial at the University of Illinois Agricultural Engineering Farm near Urbana (Champaign County).

Experimental Design and Methods

The experimental design was a randomized complete block with four replications. The plot size for each treatment was 10 ft (four rows) x 30 ft. Five randomly selected root systems were extracted from the first row of each plot on 9 July. The root systems were washed and rated for corn rootworm larval injury using the 0 to 3 node-injury scale developed by Oleson et al. (2005) (Appendix I). Percentage consistency (percentage of roots with a rating less than 1.0) was determined for each product.

Yields were estimated by harvesting the center two rows of each plot on 9 October. Weights were converted to bushels per acre (bu/A) at 15% moisture.

Planting and Insecticide Application

The trial was planted on 7 May using a four-row, Almaco constructed planter with John Deere 7300 row units with Precision Planting finger pick-up style metering units. Granular insecticides were applied through modified Noble metering units mounted to each row of the planter. Plastic tubes directed the insecticide granules to either a 5-inch, slope-compensating bander or into the seed furrow. Capture 2EC and Force 2.25CS were applied at a spray volume of 5 gal per acre using a CO_2 system with TeeJet 8001VS spray tips attached to stainless steel drop tubes. Regent 4SC was applied though microtubes at a spray volume of 5 gal per acre using a CO_2 system. All insecticides were applied in front of the planter's firming wheels. Cable-mounted tines were attached behind each of the planter row units to improve insecticide incorporation.

Active ingredients for all chemical insecticides, except those with experimental numbers, are listed in Appendix II.

Agronomic Information

Agronomic information is listed in Table 3.1.

Climatic Conditions

Temperature and precipitation data are presented in Appendix III.

Statistical Analysis

Data were analyzed using ARM 7 (Agricultural Research Manager), revision 7.3.6. (Copyright© 1982–2007 Gylling Data Management, Inc., Brookings, SD).

Results and Discussion

The mean node-injury rating, percentage consistency, and yield for each treatment are provided in Table 3.2. The mean node-injury rating in the untreated check (UTC) was 1.38, indicating that corn rootworm larval feeding injury was moderate to heavy in the trial.

The mean node-injury ratings for all insecticide treatments were significantly lower than the mean node-injury rating for the UTC. Regardless of placement (band or furrow), Aztec 2.1G, Capture 2EC, Force 3G, and Force 2.25CS all provided essentially the same level of protection against corn rootworm larval injury, with node-injury ratings that ranged from 0.04 to 0.19. The mean node-injury rating for Regent 4SC was significantly higher than the mean node-injury ratings for all other insecticide treatments. Percentage consistency was 90% or greater for all insecticide treatments, with the exception of Regent 4SC with a consistency rating of 55%.

TABLE 3.1 • Agronomic information for efficacy trial of Force 2.25CS to control corn rootworm larvae, Urbana, University of Illinois, 2007

Planting date	7 May
Root evaluation date	9 July
Row spacing	30 inches
Seeding rate	33,000/acre
Hybrid	DKC61-73
Previous crop	Trap crop (late-planted corn and pumpkins)
Tillage	Fall—chisel plow Spring—field cultivator

Based upon these and previous years' data, the liquid formulation of tefluthrin (Force 2.25CS) seems to provide an equivalent level of protection against corn rootworm larval injury as its granular counterpart, Force 3G.

All of the insecticide treated plots had significantly higher yields than the UTC. The Aztec 2.1G (furrow) and Capture 2EC (furrow) treated plots, both had significantly higher average yields than the plots treated with Regent 4SC.

TABLE 3.2 • **Evaluation of Force 2.25CS for control of corn rootworm larvae, Urbana, University of Illinois, 2007**

Product	Rate[1,2,3]	Placement	Mean node-injury rating[4,5,6] 9 July	% consistency[7]	Mean yield (bu/A),[6,8] 9 Oct
Aztec 2.1G	6.7	Band	0.04 c	100	208.353 ab
Aztec 2.1G	6.7	Furrow	0.04 c	100	214.280 a
Capture 2EC	0.075	Band	0.17 c	100	206.375 ab
Capture 2EC	0.075	Furrow	0.19 c	95	214.330 a
Force 3G	4	Band	0.16 c	90	202.428 ab
Force 3G	4	Furrow	0.08 c	100	208.223 ab
Force 2.25CS	0.12	Band	0.14 c	100	199.265 ab
Force 2.25CS	0.12	Furrow	0.13 c	100	197.470 ab
Regent 4SC	0.24	Furrow	0.68 b	55	184.910 b
UTC[9] (DKC61-73)	—	—	1.38 a	35	149.085 c

[1] Rates of application for granular insecticides are ounces (oz) of product per 1,000 ft of row.
[2] Rates of application for Capture 2EC and Force 2.25CS are ounces of active ingredient (oz a.i.) per 1,000 ft of row.
[3] The rate of application for Regent4SC is fluid ounces (fl oz) of product per 1,000 ft of row.
[4] Mean node-injury ratings are based on the 0 to 3 node-injury scale (Oleson et al. 2005, Appendix I).
[5] Mean node-injury ratings were derived from five root systems per treatment in each of four replications.
[6] Means followed by the same letter do not differ significantly (P = 0.05, Duncan's New Multiple Range Test).
[7] Percentage of roots with a node-injury rating <1.0.
[8] Corn was harvested from the center two rows of each plot and converted to bushels per acre (bu/A) at 15% moisture.
[9] UTC = untreated check.

SECTION 4

Evaluation of Herculex XTRA (HxXTRA) for control of black cutworm larvae (*Agrotis ipsilon*) in Illinois, 2007

Ronald E. Estes, Kevin L. Steffey, and Michael E. Gray

Location

We established two trials on 8 June and 14 September at the University of Illinois Agricultural Engineering Farm near Urbana (Champaign County).

Experimental Design and Methods

The experimental design was a randomized complete block with four replications. The plot size for each treatment was 1 row x 10 plants.

In the trial planted on 8 June, each plant (stage V2–V3) was infested with two second- to third-instar black cutworms on 19 June. A 6-in section of 4-in diameter PVC pipe was placed over each plant as a barrier to contain black cutworm larvae. The number of plants that were fed upon or cut by the larvae was recorded on 22, 26, and 29 June and on 3 July (3, 7, 10, and 14 days after infestation).

For the trial planted on 14 September, each plant (stage V2–V3) was infested with two second-instar black cutworms on 25 September. A 6-in section of 4-in diameter PVC pipe was placed over each plant as a barrier to contain black cutworm larvae. The number of plants that were fed upon or cut by the larvae was recorded on 2, 9, and 16 October (7, 14, and 21 days after infestation).

Planting Information

The trials were planted on 8 June and 14 September using a four-row, Almaco constructed planter with John Deere 7300 row units. Precision cone units were used to plant the seeds.

Agronomic Information

Agronomic information is listed in Table 4.1.

Climatic Conditions

Temperature and precipitation data are presented in Appendix III.

Statistical Analysis

Data were analyzed using ARM 7 (Agricultural Research Manager), revision 7.3.6. (Copyright © 1982–2007 Gylling Data Management, Inc., Brookings, SD).

Results and Discussion

The mean number of plants that were cut or fed upon by black cutworm larvae are presented in Tables 4.2 and 4.3 for the 8 June and 14 September plantings, respectively. Due to the relatively low level of injury, there were no significant differences in the amount of injury caused by black cutworm larvae between the plots with HxXTRA (Mycogen 2T787) and the UTC (Mycogen 2T777). Although each plant was infested with black cutworm larvae to increase the probability for injury, apparently there was a high level of larval mortality due to environmental conditions or other unknown factors.

TABLE 4.1 • Agronomic information for evaluation of Herculex XTRA (HxXTRA) to control black cutworm larvae, Urbana, University of Illinois, 2007

Planting dates	8 June 14 September
Row spacing	30 inches
Seeding rate	~1 seed/foot
Hybrids	Mycogen 2T787 HxXTRA Mycogen 2T777 RR2

TABLE 4.2 • **Evaluation of Herculex transgenic corn hybrids (HxXTRA) to control black cutworm larvae, 8 June planting, Urbana, University of Illinois, 2007**

Product	22 June, 3 DAI[1]		26 June, 7 DAI[1]		29 June, 10 DAI[1]		3 July, 14 DAI[1]	
	Mean no. of cut plants[2]	Mean no. of plants with feeding injury[2]	Mean no. of cut plants[2]	Mean no. of plants with feeding injury[2]	Mean no. of cut plants[2]	Mean no. of plants with feeding injury[2]	Mean no. of cut plants[2]	Mean no. of plants with feeding injury[2]
HxXtra (Mycogen 2T787)	0.00 a	6.25 a	0.00 a	9.00 a	0.00 a	9.25 a	0.00 a	9.25 a
UTC[3] (Mycogen 2T777)	0.00 a	6.25 a	0.75 a	8.25 a	1.25 a	8.25 a	1.25 a	8.25 a

[1] DAI = days after infestation by second- and third-instar black cutworms.
[2] Means followed by the same letter do not differ significantly (P = 0.05, Duncan's New Multiple Range Test).
[3] UTC = untreated check.

TABLE 4.3 • **Evaluation of Herculex transgenic corn hybrids to control black cutworm larvae, 14 September planting, Urbana, University of Illinois, 2007**

Product	2 October, 7 DAI[1]		9 October, 14 DAI[1]		17 October, 21 DAI[1]	
	Mean no. of cut plants[2]	Mean no. of plants with feeding injury[2]	Mean no. of cut plants[2]	Mean no. of plants with feeding injury[2]	Mean no. of cut plants[2]	Mean no. of plants with feeding injury[2]
HxXtra (Mycogen 2T787)	0.00 a	7.50 a	0.00 a	8.75 a	0.00 a	9.00 a
UTC[2] (Mycogen 2T777)	0.00 a	5.25 a	0.00 a	7.00 a	0.00 a	7.75 a

[1] DAI = days after infestation by second- and third-instar black cutworms.
[2] Means followed by the same letter do not differ significantly (P = 0.05, Duncan's New Multiple Range Test).
[3] UTC = untreated check.

SECTION 5

Evaluation of experimental and commercially available insecticidal seed treatments for control of black cutworm larvae (*Agrotis ipsilon*) in Illinois, 2007

Ronald E. Estes, Kevin L. Steffey, and Michael E. Gray

Location

We established one trial at the University of Illinois Agricultural Engineering Farm near Urbana (Champaign County).

Experimental Design and Methods

The experimental design was a randomized complete block with four replications. The plot size for each treatment was 10 ft (four rows) x 17.5 ft. Steel barriers (5.5 ft x 5.5 ft, 5 in tall) were place around approximately 20 plants in each plot. Each plant within the barrier was infested with two second- to third-instar black cutworms on 19 June. The number of plants that were fed upon or cut by the larvae was recorded on 24 and 29 June and on 3 July (5, 10, and 15 days after infestation).

Planting Information

The trial was planted on 8 June using a four-row, Almaco constructed planter with John Deere 7300 row units. Precision cone units were used to plant the seeds.

Active ingredients for all chemical insecticides, except those with experimental numbers, are listed in Appendix II.

Agronomic Information

Agronomic information is listed in Table 5.1.

Climatic Conditions

Temperature and precipitation data are presented in Appendix III.

Statistical Analysis

Data were analyzed using ARM 7 (Agricultural Research Manager), revision 7.3.6. (Copyright © 1982–2007 Gylling Data Management, Inc., Brookings, SD).

Results and Discussion

The mean number of plants that were cut or fed upon by black cutworm larvae are presented in Table 5.2. Due to the relatively low level of injury, there were no significant differences in the amount of injury caused by black cutworm larvae among any of the plots. Although each plant was infested with black cutworm larvae to increase the probability for injury, apparently there was a high level of larval mortality due to environmental conditions or other unknown factors.

TABLE 5.1 • Agronomic information for evaluation of experimental and commercially available insecticidal seed treatments to control black cutworm larvae, Urbana, University of Illinois, 2007

Planting date	8 June
Row spacing	30 inches
Seeding rate	30,000
Hybrid	Unknown

TABLE 5.2 • Evaluation of experimental and commercially available insecticidal seed treatments to control black cutworm larvae, Urbana, University of Illinois, 2007

Product	Rate[2]	24 June, 5 DAI[1]		29 June, 10 DAI[1]		3 July, 15 DAI[1]	
		Mean no. of cut plants[3]	Mean no. of plants with feeding injury[3]	Mean no. of cut plants[3]	Mean no. of plants with feeding injury[3]	Mean no. of cut plants[3]	Mean no. of plants with feeding injury[3]
DPX-E2Y45	0.25	0.00 a	10.50 a	0.25 a	13.00 a	0.25 a	13.75 a
DPX-E2Y45	0.75	0.00 a	9.75 a	0.25 a	10.00 a	0.25 a	11.25 a
DPX-E2Y45 + Gaucho	0.25 0.25	0.00 a	10.50 a	0.50 a	10.75 a	0.50 a	11.50 a
DPX-E2Y45 + Gaucho	0.75 0.25	0.00 a	8.00 a	0.25 a	8.75 a	0.25 a	9.75 a
Gaucho	0.25	0.00 a	14.00 a	0.25 a	14.50 a	0.25 a	14.50 a
Poncho	0.25	0.00 a	12.00 a	0.00 a	14.00 a	0.00 a	14.50 a
UTC[4]	—	0.00 a	9.25 a	0.00 a	9.75 a	0.00 a	10.50 a

[1] DAI = days after infestation of second- and third-instar black cutworms.
[2] Rates of application for seed treatments are milligrams (mg) of active ingredient (a.i.) per seed.
[3] Means followed by the same letter do not differ significantly (P = 0.05, Duncan's New Multiple Range Test).
[4] UTC = untreated check.

SECTION 6

Evaluation of foliar- and seed-applied insecticides to control soybean aphids (*Aphis glycines*) in Illinois, 2007

Ronald E. Estes, Kevin L. Steffey, and Michael E. Gray

Location

We established one trial at the David and Carol Cook Farm near Sterling/Rock Falls (Whiteside County).

Experimental Design and Methods

The experimental design was a randomized complete block with four replications. The plot size for each treatment was 10 ft (four rows) x 30 ft. Insecticides were applied to designated plots on 3 August. At intervals before and after the insecticide application, densities of soybean aphids were estimated by counting the total number of aphids on three plants in each plot. Densities of soybean aphids after foliar insecticides were applied were assessed on 10 August (7 days after treatment, DAT), 17 August (14 DAT), and 24 August (21 DAT). Two rows from each plot were mechanically harvested on 11 October, and the weights were adjusted to bushels per acre at 13% moisture.

Planting and Insecticide Application

The trial was planted on 24 May using a four-row, Almaco constructed planter with John Deere 7300 row units. Precision cone units were used to plant the seeds. Insecticides were applied on 3 August with a CO_2 backpack sprayer and a four-row hand boom. TeeJet 8002VS spray tips were calibrated to deliver a volume of 20 gal per acre.

Active ingredients for all chemical insecticides, except those with experimental numbers, are listed in Appendix II.

Agronomic Information

Agronomic information is listed in Table 6.1.

Climatic Conditions

Temperature and precipitation data are presented in Appendix III.

Statistical Analysis

Data were analyzed using ARM 7 (Agricultural Research Manager), revision 7.3.6. (Copyright © 1982–2007 Gylling Data Management, Inc., Brookings, SD).

Results and Discussion

Densities of soybean aphids throughout the season are presented in Table 6.2. Soybean aphids on three plants in each plot were counted weekly or biweekly from 15 June to 24 August. Although there are some differences in densities of soybean aphids before the foliar insecticides were applied on 3 August, the focus of this discussion will be on the densities of soybean aphids on the dates following the foliar applications.

The overall mean for all plots (including those with seed-applied insecticides) was 252.29 aphids per plant (just above the economic threshold of 250 aphids per plant) two days before treating designated plots with foliar-applied insecticides. The overall mean for the designated plots that were treated only with foliar-applied insecticides was 256.78 aphids per plant before treatment. On 10 August (7 DAT), there was nearly an 80% reduction overall in aphid densities in the plots treated with foliar-applied insecticides.

On 10 August, the lowest mean density of aphids (22.08 aphids per plant) were found in the plots treated with Cobalt 2.55EC. The Cobalt-treated plots also had significantly fewer aphids than the plots with NUP 05071 5FS and V10170-1667 5SC and one of the two untreated checks (UTCs). Ten of the 19 plots treated with a foliar-applied insecticide had significantly fewer aphids than one of the two UTCs on 10 August.

TABLE 6.1 • Agronomic information for the efficacy trial of products to control soybean aphids, Sterling/Rock Falls, University of Illinois, 2007

Planting date	24 May
Row spacing	30 inches
Seeding rate	130,000/acre
Variety	Midwest Seed Genetics GR-2332
Previous crop	Corn
Tillage	Spring—disk

TABLE 6.2 • Evaluation of products to control soybean aphids, Sterling/Rock Falls, University of Illinois, 2007

Product	Mean no. soybean aphids per plant[1]										
	Before application of foliar insecticides on 3 August							After application of foliar insecticides on 3 August			
	Rate[2,3]	15 June[4]	21 June[4]	6 July[4]	13 July[4]	23 July[4,5]	1 Aug[4,5]	10 Aug[4,5] (7 DAT[6])	17 Aug[4,5] (14 DAT[6])	24 Aug[4,5] (21 DAT[6])	Mean yield (bu/A)[4,7] 11 Oct
Asana XL 0.66EC	6.4	0.00 a	0.92 a	0.42 a	0.50 b	10.17 d-g	222.50 abc	88.75 abc	0.00 d	3.75 b-f	59.79 b
Asana XL 0.66EC + Lannate 2.4SL	6.4 4	0.00 a	0.00 b	0.00 b	0.33 b	29.83 abc	227.00 abc	64.00 bc	1.58 cd	0.83 def	59.88 b
Asana XL 0.66EC + Lorsban 4E	6.4 4	0.00 a	0.00 b	0.00 b	0.50 b	23.17 a-f	282.33 ab	68.75 bc	9.25 a-d	2.17 b-f	58.80 b
Baythroid XL + Lorsban 4E	2 8	0.00 a	0.00 b	0.00 b	3.67 ab	47.42 abc	324.25 ab	22.50 bc	9.25 a-d	0.42 ef	66.12 ab
Cobalt 2.55 EC	13	0.00 a	0.00 b	0.00 b	1.00 ab	24.42 a-e	295.17 ab	22.08 c	4.25 bcd	2.25 b-f	67.82 ab
Dimethoate 4EC	8	0.00 a	0.00 b	0.00 b	1.25 ab	25.33 a-d	212.67 abc	101.17 abc	5.75 a-d	6.75 abc	67.31 ab
Dimethoate 4EC + Nufos 4EC	8 8	0.00 a	0.00 b	0.00 b	0.67 b	16.92 a-f	325.42 ab	40.58 bc	5.75 a-d	0.42 ef	64.22 ab
F-6113 1.25EC	5	0.00 a	0.00 b	0.00 b	3.92 ab	57.25 ab	362.08 ab	29.42 bc	2.83 a-d	0.00 f	68.70 ab
Lorsban 4E	12	0.00 a	0.00 b	0.00 b	1.92 ab	18.50 c-g	160.83 bc	33.58 bc	9.83 a-d	1.67 c-f	67.39 ab
Trimax[8] 4SC + NIS[9]	1.35 0.25	0.00 a	0.00 b	0.00 b	0.00 b	14.33 c-g	134.75 bc	73.25 bc	17.00 a-d	6.42 abc	63.79 ab
Trimax 4SC + Baythroid XL	1 2	0.00 a	0.00 b	0.00 b	1.50 ab	6.75 fg	215.08 abc	48.92 bc	6.83 a-d	3.50 b-e	67.14 ab
Warrior 1CS	1.92	0.00 a	0.00 b	0.00 b	1.67 ab	24.25 a-f	273.42 ab	101.42 abc	6.08 a-d	4.42 b-e	66.89 ab
Warrior 1CS	3.2	0.00 a	0.00 b	0.25 ab	1.33 ab	25.42 a-f	302.67 ab	26.25 bc	4.75 a-d	2.17 b-f	64.37 ab
Cruiser 5FS[10]	50	0.00 a	0.00 b	0.00 b	0.58 b	13.50 efg	288.42 abc	77.58 abc	5.75 a-d	2.58 b-f	70.18 a
NUP 05071 5FS[11]	3.2	0.00 a	0.00 b	0.00 b	0.25 b	18.00 efg	122.00 c	122.42 ab	11.25 a-d	6.33 abc	68.83 ab
NUP 07066 5 FS[11]	3.5	0.00 a	0.00 b	0.00 b	1.67 ab	4.67 g	115.17 c	74.42 abc	53.25 ab	4.67 b-e	61.44 ab
V-10170-1673 5 SC[10]	50	0.00 a	0.00 b	0.00 b	2.42 ab	60.08 a	271.17 ab	242.83 abc	10.00 a-d	5.75 a-d	63.84 ab
V-10170-1667 5 SC[10]	50	0.00 a	0.00 b	0.00 b	0.58 b	14.25 b-g	153.92 bc	148.42 ab	20.50 a-d	6.42 abc	67.13 ab
V-10170-1667 5 SC[10]	100	0.00 a	0.00 b	0.00 b	0.00 b	20.50 c-g	267.50 ab	165.25 abc	64.42 abc	7.33 abc	63.75 ab
UTC[12]	—	0.00 a	0.00 b	0.00 b	2.75 ab	51.92 a-d	476.00 a	359.50 a	8.42 a-d	12.00 ab	60.47 ab
UTC[12]	—	0.00 a	0.00 b	0.00 b	5.25 a	16.17 a-g	265.67 ab	115.42 abc	144.67 a	14.25 a	65.83 ab

[1] Mean densities of soybean aphids were derived from the total number of aphids on three plants per treatment in each of four replications.
[2] Rates of application of foliar-applied insecticides are ounces (oz) of product per acre.
[3] Rates of application of NIS (non-ionic surfactant) are percentage volume of product per volume of spray solution (% v/v).
[4] Means followed by the same letter do not differ significantly (P = 0.05, Duncan's New Multiple Range Test).
[5] Data were transformed (log transformation) for analysis; the actual means are shown.
[6] DAT = days after treatment (with foliar-applied insecticides).
[7] Soybeans were harvested from 30 ft of the center two rows of each plot, and weights were converted to bushels per acre (bu/A) at 13% moisture.
[8] At the time of this publication, Trimax is currently not registered for use on soybeans.
[9] NIS = non-ionic surfactant.
[10] Rates of application for these seed treatments are grams (g) of active ingredient (a.i.) per 100 kg of seed.
[11] Rates of application for these seed treatments are ounces (oz) of product per hundredweight (cwt) of seed.
[12] UTC = untreated check.

By 17 August (14 DAT), mean densities of soybean aphids had declined dramatically to <25 aphids per plant in all plots except one of the UTCs and the plots with the seed treatments V10170-1667 and NUP 07066, with mean densities of 144.67, 64.42, and 53.25 aphids per plant, respectively. There were no significant differences in aphid densities among the rest of the plots on 17 August. We were unable to determine the exact cause of the dramatic reductions in densities of soybean aphids from 10 August to 17 August, although evidence from nearby experiments suggested that predation by the insidious flower bug (*Orius insidiosus*) played a role. Other possible causes for the reduction in aphid densities may have been heavy rainfall and/or emigration of winged aphids away from the plots.

On 24 August (21 DAT), densities of soybean aphids had declined in all plots to a range of 0.00 to 14.25 aphids per plant. Although there were significant differences in aphid densities among the treatments, the differences were not biologically significant.

Mean yields among treatments in the trial ranged from 58.80 to 70.18 bushels per acre. The mean yield for the plots treated with Cruiser were significantly higher than the mean yields for any of the plots treated with Asana XL, either by itself or in combination with another insecticide. There were no other significant differences in yields among treatments.

SECTION 7

Evaluation of resistant cultivars and seed-applied insecticides to control soybean aphids (*Aphis glycines*) in Illinois, 2007

Nicholas A. Tinsley, Ronald E. Estes, Kevin L. Steffey, Michael E. Gray, and Brian Diers

Location

We established two trials. One trial was located at the Agricultural Engineering Farm near Urbana (Champaign County). Due to low numbers of soybean aphids at this location, the data are not included in this report. The other trial was located at the David and Carol Cook Farm near Sterling/Rock Falls (Whiteside County). Funding for this experiment was provided by the Illinois Soybean Association and the North Central Soybean Research Program.

Experimental Design and Methods

The experimental design was a split-plot, randomized complete block with three replications. The plot size for each treatment was 10 ft (four rows) x 20 ft. The soybean cultivars with putative resistance to soybean aphids (LD05-16060, LD05-16529, and LD05-16611) and the aphid-susceptible isolines (SD01-76R, LD05-16519, and LD05-16621) were provided from the soybean breeding program at the University of Illinois. Half of the seed of each cultivar (three resistant and three susceptible cultivars) was treated (by Syngenta Crop Protection personnel) with Cruiser 5FS at 50 g a.i. per 100 kg of seed. The other half of the seed of each cultivar was not treated with a seed-applied insecticide. The soybean cultivar was the whole plot, and the seed treatments (with or without) were the subplots.

Other cultivars with putative resistance to soybean aphids were provided from the soybean breeding programs at Kansas State University, South Dakota State University, and Michigan State University. Although the data from the plots with these cultivars were included in the analyses, they are not included in this report.

Densities of soybean aphids were determined by counting the total number of aphids on three plants in each plot. Aphid densities were assessed on 15, 21, and 27 June, on 6, 13, and 23 July, on 1, 8, 15, 22, and 28 August, and on 5 September. Two rows of each plot were mechanically harvested on 11 October, and the weights were adjusted to bushels per acre (bu/A) at 13% moisture.

Planting Information

All plots were planted on 24 May using a four-row, Almaco constructed planter with John Deere 7300 row units. Precision cone units were used to plant the seeds. Cruiser 5FS was applied to designated seed lots by Syngenta Crop Protection personnel.

Active ingredients for all chemical insecticides, except those with experimental numbers, are listed in Appendix II.

Agronomic Information

Agronomic information is listed in Table 7.1.

Climatic Conditions

Temperature and precipitation data are presented in Appendix III.

Statistical Analysis

Data were analyzed using SAS (Statistical Analysis System), version 9.1 (Copyright© 2003 SAS Institute, Cary, NC).

Results and Discussion

Densities of soybean aphids assessed on seven dates (15 June through 1 August) are presented in Table 7.2. Densities of soybean aphids assessed on five dates (8 August through 5 September) and yields (bu/A) are presented in Table 7.3.

Soybean aphids were either absent or at relatively low densities (<35 aphids per plant) through 23 July (Table 7.2). The

TABLE 7.1 • **Agronomic information for efficacy trial of resistant cultivars and seed-applied insecticides to control soybean aphids, Sterling/Rock Falls, University of Illinois, 2007**

Planting date	24 May
Row spacing	30 inches
Seeding rate	125,000/acre
Previous crop	Corn
Tillage	Spring—disk
Harvest date	11 October

densities of soybean aphids increased noticeably from 23 July to 1 August (Table 7.2), exceeding 100 aphids per plant in the susceptible cultivars LD05-16519 (with and without Cruiser), LD05-16621 (with and without Cruiser), and SD01-76R (without Cruiser) on 1 August. The numbers of aphids in the aforementioned plots were significantly greater than the numbers of aphids in almost all other plots, although the numbers in plots with SD01-76R without Cruiser were not significantly greater than the numbers in SD01-76R with Cruiser. The mean densities of soybean aphids on 1 August were significantly lower in the plots with aphid-resistant cultivars (both with and without Cruiser) than in plots with the aphid-susceptible isolines.

The numbers of soybean aphids in the trial increased noticeably again from 1 August to 8 August (tables 7.2 and 7.3). The densities of soybean aphids on 8 August exceeded 100 aphids per plant in all cultivars except the resistant cultivar LD05-16060 treated with Cruiser. The numbers of aphids in all plots with aphid-susceptible cultivars (with and without Cruiser) were greater than the economic threshold (250 aphids per plant) on 8 August (Table 7.3), with an average of approximately 555 aphids per plant over all six plots (aphid-susceptible cultivars with and without Cruiser). The mean densities of soybean aphids on 8 August were significantly lower in the plots with aphid-resistant cultivars (both with and without Cruiser) than in plots with the respective aphid-susceptible isolines (both with and without Cruiser).

Numbers of soybean aphids declined dramatically from 8 August through 15 August, with <20 aphids per plant in all plots. We were unable to determine the exact cause of the dramatic reductions in densities of soybean aphids from 8 August to 15 August, although evidence from nearby experiments suggested that predation by the insidious flower bug (*Orius insidiosus*) played a role. Other possible causes for the reduction in aphid densities may have been heavy rainfall and/or emigration of winged aphids away from the

TABLE 7.2 • Evaluation of resistant cultivars and seed-applied insecticides to control soybean aphids (densities of aphids on seven dates), Sterling/Rock Falls (Whiteside County), University of Illinois, 2007

Product	Resistant	Rate[3]	Rate unit[3]	Mean no. aphids per plant[1,2]						
				15 June	21 June	27 June	6 July	13 July	23 July	1 Aug
SD01-76R + Cruiser 5FS	No	50	g a.i./100 kg	0.00 a	0.00 a	0.00 b	0.00 b	0.22 cd	7.33 d–h	83.67 bc
LD05-16060 + Cruiser 5FS	Yes	50	g a.i./100 kg	0.00 a	0.00 a	0.00 b	0.00 b	0.00 d	1.44 hij	31.78 cd
LD05-16519 + Cruiser 5FS	No	50	g a.i./100 kg	0.00 a	0.00 a	0.00 b	0.00 b	1.78 bcd	11.89 cde	262.44 a
LD05-16529 + Cruiser 5FS	Yes	50	g a.i./100 kg	0.00 a	0.00 a	0.00 b	0.00 b	0.00 d	1.56 g–j	43.33 cd
LD05-16621 + Cruiser 5FS	No	50	g a.i./100 kg	0.00 a	0.00 a	0.00 b	0.00 b	0.44 bcd	11.22 bcd	247.89 a
LD05-16611 + Cruiser 5FS	Yes	50	g a.i./100 kg	0.00 a	0.00 a	0.00 b	0.00 b	0.44 bcd	0.78 hij	38.22 cd
SD01-76R	No	—	—	0.00 a	0.00 a	0.00 b	0.00 b	0.78 d	3.22 f–j	130.67 ab
LD05-16060	Yes	—	—	0.00 a	0.00 a	0.00 b	0.56 a	0.78 bcd	0.67 g–j	26.44 d
LD05-16519	No	—	—	0.00 a	0.00 a	3.56 a	0.00 b	8.00 a	30.00 a	289.78 a
LD05-16529	Yes	—	—	0.00 a	0.00 a	0.00 b	0.00 b	0.00 d	3.33 e–i	28.44 cd
LD05-16621	No	—	—	0.00 a	0.00 a	0.00 b	0.56 a	2.67 abc	32.00 ab	170.56 ab
LD05-16611	Yes	—	—	0.00 a	0.00 a	0.00 b	0.00 b	1.22 bcd	3.67 f–i	84.33 cd

[1] Means were derived from the numbers of soybean aphids on three plants in each plot in each replication. Means followed by the same letter do not differ significantly (P = 0.05, PROC GLM, SAS).
[2] Statistical analyses were conducted using a square root transformation; actual means are shown.
[3] Rates indicated are for Cruiser 5FS seed treatment.

plots. Densities of soybean aphids remained low in all plots for the duration of the experiment from 15 August through 5 September. Although there were significant differences in aphid densities among plots from 15 August through 5 September, the differences were not biologically significant.

When densities of soybean aphids in plots of a given cultivar without Cruiser were compared with densities of soybean aphids in plots of the same cultivar with Cruiser, some significant differences were observed. However, all of these differences occurred when numbers of aphids were fewer than 35 aphids per plant (before 1 August, Table 7.2; after 8 August, Table 7.3). None of these differences were observed on either date (1 or 8 August) when aphid densities were at economically threatening levels. However, cumulative aphid days (data not shown) (see Appendix I) revealed a trend for lower numbers of aphids in all cultivars treated with Cruiser than in cultivars without Cruiser, with the exception of LD05-16529 (resistant).

Yield data for the six cultivars (with and without Cruiser) are reported in Table 7.3. Yields ranged from 45.57 to 57.37 bu/A. There were no significant differences in yield between a given cultivar without Cruiser and the same cultivar with Cruiser. There were also no significant differences in yield between most resistant cultivars and their respective susceptible isolines both with and without Cruiser. However, the yield of LD05-16519 (susceptible) without Cruiser was significantly higher than the yield of LD05-16529 (resistant isoline) without Cruiser.

Some of the cultivars with putative resistance to soybean aphids show promise for future development. The impact of Cruiser on densities of aphids in both resistant and susceptible cultivars remains unclear and deserves further study.

TABLE 7.3 • Evaluation of resistant cultivars and seed-applied insecticides to control soybean aphids (densities of aphids on five dates; yields), Sterling/Rock Falls (Whiteside County), University of Illinois, 2007

Product	Resistant	Rate[3]	Rate unit[3]	Mean no. aphids per plant[1,2]					Mean yield (bu/acre)[4]
				8 Aug	15 Aug	22 Aug	28 Aug	5 Sep	11 Oct
SD01-76R + Cruiser 5FS	No	50	g a.i./100 kg	296.20 cde	1.33 cde	6.67 d–i	5.33 a–e	1.11 cde	57.01 ab
LD05-16060 + Cruiser 5FS	Yes	50	g a.i./100 kg	75.90 gh	1.89 b–e	1.11 i	1.56 efg	2.33 cde	53.56 bcd
LD05-16519 + Cruiser 5FS	No	50	g a.i./100 kg	751.00 ab	15.11 a–e	8.11 a–e	3.67 a–f	7.67 ab	54.28 bc
LD05-16529 + Cruiser 5FS	Yes	50	g a.i./100 kg	235.20 def	3.67 b–e	3.44 f–i	2.89 b–g	3.89 cd	48.23 cd
LD05-16621 + Cruiser 5FS	No	50	g a.i./100 kg	376.10 bcd	2.67 b–e	14.33 a	6.11 ab	1.44 cde	55.71 abc
LD05-16611 + Cruiser 5FS	Yes	50	g a.i./100 kg	113.20 fg	5.22 a–e	1.67 hi	3.33 b–g	0.22 de	50.51 bcd
SD01-76R	No	—	—	420.10 bc	5.78 abc	11.89 abc	4.22 abc	7.22 ab	51.61 bcd
LD05-16060	Yes	—	—	119.00 fg	4.00 a–e	2.11 f–i	3.00 a–e	2.00 cd	48.87 bcd
LD05-16519	No	—	—	939.70 ab	3.33 a–e	7.33 b–g	4.33 a–f	11.11 a	57.37 ab
LD05-16529	Yes	—	—	195.00 ef	12.44 ab	12.22 abc	5.33 a–d	13.78 ab	45.57 de
LD05-16621	No	—	—	544.30 b	6.89 a–d	12.56 ab	6.22 ab	9.44 a	54.39 bc
LD05-16611	Yes	—	—	152.90 ef	1.56 b–e	5.56 c–h	2.11 b–g	9.00 ab	52.80 bcd

[1] Means were derived from the numbers of soybean aphids on three plants in each plot in each replication. Means followed by the same letter do not differ significantly (P = 0.05, PROC GLM, SAS).
[2] Statistical analyses were conducted using a square root transformation; actual means are shown.
[3] Rates indicated are for Cruiser 5FS seed treatment.
[4] Soybeans were harvested from the center two rows of each plot, and weights were converted to bushels per acre (bu/A) at 13% moisture. Means followed by the same letter do not differ significantly (P = 0.05, PROC GLM, SAS).

APPENDIX I • References Cited

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Hills, T. M., and D. C. Peters. 1971. A method of evaluating postplanting insecticide treatments for control of western corn rootworm larvae. Journal of Economic Entomology 64: 764–765.

Oleson, J. D., Y. L. Park, T. M. Nowatzki, and J. J. Tollefson. 2005. Node-injury scale to evaluate root injury by corn rootworms (Coleoptera: Chrysomelidae). Journal of Economic Entomology 98: 1–8.

Node-Injury Scale (from Oleson et al. 2005)

0.0 No feeding damage

1.0 One node (circle of roots), or the equivalent of an entire node, pruned back to within approximately 3.8 cm (1.5 in) of the stalk (or soil line if roots originate from above ground nodes)

2.0 Two complete nodes pruned

3.0 Three or more complete nodes pruned (highest rating that can be given)

Damage in between complete nodes pruned is noted as the percentage of the node missing, e.g., 1.50 = 1½ nodes pruned.

For a complete explanation of the node-injury scale and a comparison with the Iowa State University 1-to-6 root rating scale (Hills and Peters 1971), visit the "Interactive Node-Injury Scale" Web site, http://www.ent.iastate.edu/pest/rootworm/nodeinjury/nodeinjury.html.

Cumulative Aphid Days (from Hanafi et al. 1989)

$$\sum_{i=d} a = \left(\frac{\bar{x}_d + \bar{x}_{d-1}}{2}\right) t$$

a = aphid days

$\bar{x}_d$ = mean number of aphids per plant from current sampling date

$\bar{x}_{d-1}$ = mean number of aphids per plant from previous sampling date

t = days between sampling

APPENDIX II • Common Names of Pesticides

Product name	Common name
Asana XL 0.66EC	esfenvalerate
Aztec 2.1G	tebupiriphos + cyfluthrin
Aztec 4.67G	tebupiriphos + cyfluthrin
Baythroid XL	cyfluthrin
Capture 2EC	bifenthrin
Cobalt 2.55EC	chlorpyrifos + gamma-cyhalothrin
Counter 15G	terbufos
Cruiser 5FS	thiamethoxam
Defcon 2.1G	tebupiriphos + cyfluthrin
Dimethoate 4EC	dimethoate
Force 2.1G	tefluthrin
Force 2.25CS	tefluthrin
Fortress 2.5G	chlorethoxyfos
Fortress 5G	chlorethoxyfos
Gaucho	imidacloprid
Lannate 2.4SL	methomyl
Lorsban 15G	chlorpyrifos
Lorsban 4E	chlorpyrifos
Mustang Max	zeta-cypermethrin
Nufos 4E	chlorpyrifos
Poncho 1250	clothianidin
Poncho 250	clothianidin
Regent 4SC	fipronil
Saurus 15G	chlorpyrifos
Trimax Pro	imidacloprid
Warrior 1CS	lambda-cyhalothrin

APPENDIX III • Temperature and Precipitation

2007 Daily Weather Data for DeKalb, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
April 1	0.47	55
April 2	0.08	48
April 3	0.01	48
April 4	0.15	48
April 5	T	28
April 6	0.00	30
April 7	0.00	27
April 8	0.00	26
April 9	0.00	33
April 10	T	36
April 11	0.33	40
April 12	0.28	33
April 13	0.03	34
April 14	0.00	41
April 15	0.00	41
April 16	0.00	45
April 17	0.00	49
April 18	T	54
April 19	T	44
April 20	0.00	49
April 21	0.00	55
April 22	0.00	57
April 23	0.00	68
April 24	0.00	58
April 25	1.32	58
April 26	0.40	47
April 27	0.28	48
April 28	0.00	51
April 29	0.00	59
April 30	0.17	68
Total	**3.52**	-

M=Missing
T=Trace

2007 Daily Weather Data for DeKalb, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
May 1	0.00	62
May 2	0.00	65
May 3	0.00	55
May 4	0.00	59
May 5	0.02	59
May 6	0.00	59
May 7	0.00	58
May 8	0.00	68
May 9	0.00	73
May 10	0.00	70
May 11	0.00	72
May 12	0.00	64
May 13	0.00	59
May 14	0.10	58
May 15	0.00	74
May 16	0.07	61
May 17	0.02	54
May 18	0.00	53
May 19	0.00	62
May 20	0.00	67
May 21	0.00	56
May 22	0.00	67
May 23	0.02	75
May 24	0.02	75
May 25	0.11	70
May 26	0.84	62
May 27	0.78	57
May 28	0.00	64
May 29	0.12	67
May 30	0.13	76
May 31	0.03	77
Total	**2.26**	-

M=Missing
T=Trace

2007 Daily Weather Data for DeKalb, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
June 1	0.24	70
June 2	0.44	73
June 3	T	69
June 4	0.68	67
June 5	0.32	60
June 6	0.07	56
June 7	0.04	60
June 8	0.00	77
June 9	0.00	61
June 10	0.00	67
June 11	0.00	70
June 12	0.00	75
June 13	0.00	74
June 14	0.00	76
June 15	0.00	79
June 16	0.00	79
June 17	0.00	80
June 18	0.00	80
June 19	1.44	77
June 20	0.00	69
June 21	0.00	72
June 22	0.05	70
June 23	0.16	68
June 24	0.50	63
June 25	0.00	70
June 26	0.00	77
June 27	0.05	78
June 28	0.10	77
June 29	0.00	62
June 30	0.00	62
Total	**4.09**	-

M=Missing
T=Trace

2007 Daily Weather Data for DeKalb, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
July 1	0.00	67
July 2	0.00	67
July 3	0.00	69
July 4	0.48	73
July 5	T	76
July 6	0.00	76
July 7	0.00	74
July 8	0.00	78
July 9	0.00	80
July 10	3.32	79
July 11	0.90	73
July 12	0.00	66
July 13	0.00	67
July 14	T	70
July 15	0.00	71
July 16	0.00	70
July 17	0.64	72
July 18	0.70	74
July 19	1.20	77
July 20	0.05	69
July 21	0.00	66
July 22	0.00	66
July 23	0.00	68
July 24	0.00	71
July 25	0.00	74
July 26	0.03	75
July 27	0.35	74
July 28	0.53	75
July 29	0.00	71
July 30	0.00	73
July 31	0.00	75
Total	**8.20**	-

M=Missing
T=Trace

2007 Daily Weather Data for DeKalb, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
August 1	0.00	78
August 2	0.00	79
August 3	0.00	77
August 4	0.00	76
August 5	0.45	72
August 6	0.11	77
August 7	1.51	79
August 8	0.20	81
August 9	0.27	78
August 10	T	76
August 11	0.00	77
August 12	0.14	76
August 13	0.00	76
August 14	0.57	73
August 15	0.07	74
August 16	0.04	73
August 17	0.00	68
August 18	0.00	68
August 19	0.38	62
August 20	1.71	66
August 21	0.05	73
August 22	0.08	77
August 23	1.51	79
August 24	4.85	78
August 25	0.08	73
August 26	0.00	68
August 27	0.00	69
August 28	0.00	70
August 29	0.00	79
August 30	0.00	71
August 31	0.00	65
Total	**12.02**	-

M=Missing
T=Trace

2007 Daily Weather Data for DeKalb, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
September 1	0.00	67
September 2	0.00	68
September 3	0.00	73
September 4	0.00	75
September 5	0.00	78
September 6	0.00	78
September 7	T	75
September 8	0.20	72
September 9	T	68
September 10	0.00	69
September 11	0.15	60
September 12	0.00	55
September 13	0.00	55
September 14	0.00	64
September 15	0.00	49
September 16	0.00	49
September 17	0.00	60
September 18	0.00	70
September 19	0.00	76
September 20	0.00	71
September 21	0.00	71
September 22	0.01	71
September 23	0.00	64
September 24	0.00	70
September 25	0.00	79
September 26	0.08	68
September 27	0.00	59
September 28	0.00	63
September 29	0.00	63
September 30	0.00	66
Total	**0.44**	-

M=Missing
T=Trace

2007 Daily Weather Data for DeKalb, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
October 1	0.17	69
October 2	0.01	65
October 3	0.09	65
October 4	0.00	63
October 5	0.00	68
October 6	0.00	76
October 7	0.00	77
October 8	0.00	77
October 9	0.04	67
October 10	0.00	59
October 11	0.00	49
October 12	0.00	47
October 13	0.00	48
October 14	0.02	53
October 15	0.14	58
October 16	1.01	63
October 17	0.00	56
October 18	0.61	60
October 19	0.01	65
October 20	0.00	52
October 21	0.00	58
October 22	0.00	67
October 23	0.15	47
October 24	0.00	48
October 25	0.00	46
October 26	0.01	49
October 27	0.22	56
October 28	0.00	44
October 29	0.00	44
October 30	0.00	49
October 31	0.00	53
Total	**2.48**	-

M=Missing
T=Trace

2007 Daily Weather Data for Monmouth, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
April 1	M	59
April 2	0.00	49
April 3	0.21	57
April 4	0.00	43
April 5	0.00	28
April 6	0.00	32
April 7	0.00	26
April 8	0.00	28
April 9	0.00	34
April 10	0.00	39
April 11	0.58	40
April 12	0.16	39
April 13	0.00	34
April 14	0.03	41
April 15	0.00	38
April 16	0.00	49
April 17	0.00	57
April 18	0.00	56
April 19	0.00	50
April 20	0.00	49
April 21	0.00	57
April 22	0.00	64
April 23	T	71
April 24	0.00	52
April 25	1.37	62
April 26	0.37	50
April 27	0.13	47
April 28	0.00	57
April 29	0.00	63
April 30	0.00	73
Total	**2.85**	-

M=Missing
T=Trace

2007 Daily Weather Data for Monmouth, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
May 1	0.00	72
May 2	0.00	68
May 3	T	61
May 4	0.08	58
May 5	0.08	58
May 6	0.00	66
May 7	T	61
May 8	0.02	69
May 9	0.00	69
May 10	0.00	70
May 11	0.00	71
May 12	0.00	68
May 13	0.00	66
May 14	0.00	67
May 15	0.00	77
May 16	0.07	59
May 17	0.00	56
May 18	0.00	52
May 19	0.00	59
May 20	0.00	69
May 21	0.00	68
May 22	0.00	72
May 23	0.00	75
May 24	0.00	76
May 25	0.24	69
May 26	2.00	66
May 27	0.00	65
May 28	0.00	65
May 29	0.29	71
May 30	0.00	74
May 31	0.16	70
Total	**2.94**	-

M=Missing
T=Trace

2007 Daily Weather Data for Monmouth, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
June 1	0.05	69
June 2	0.33	74
June 3	0.47	67
June 4	0.00	66
June 5	0.01	65
June 6	0.00	61
June 7	0.00	70
June 8	0.00	73
June 9	0.00	61
June 10	0.00	66
June 11	0.01	70
June 12	0.00	71
June 13	0.00	73
June 14	0.00	76
June 15	0.00	76
June 16	0.00	77
June 17	0.00	78
June 18	0.00	77
June 19	0.45	73
June 20	0.00	68
June 21	0.00	72
June 22	2.12	75
June 23	0.32	66
June 24	0.49	68
June 25	0.00	70
June 26	0.00	76
June 27	0.00	79
June 28	0.00	77
June 29	0.00	63
June 30	0.00	62
Total	**4.25**	-

M=Missing
T=Trace

2007 Daily Weather Data for Monmouth, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
July 1	0.00	M
July 2	0.00	M
July 3	0.00	69
July 4	0.00	74
July 5	0.23	75
July 6	0.00	74
July 7	M	M
July 8	M	M
July 9	M	M
July 10	1.00	79
July 11	0.00	74
July 12	0.03	70
July 13	0.00	66
July 14	T	69
July 15	0.00	68
July 16	0.00	73
July 17	0.00	74
July 18	1.25	72
July 19	0.26	73
July 20	1.42	76
July 21	0.04	69
July 22	0.00	63
July 23	0.00	64
July 24	0.00	66
July 25	0.00	67
July 26	0.00	68
July 27	0.00	72
July 28	0.38	77
July 29	0.00	76
July 30	0.00	70
July 31	0.00	76
Total	**4.61**	-

M=Missing
T=Trace

2007 Daily Weather Data for Monmouth, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
August 1	0.00	74
August 2	0.00	77
August 3	0.00	78
August 4	0.00	75
August 5	0.28	72
August 6	0.00	82
August 7	T	80
August 8	1.07	81
August 9	1.35	76
August 10	0.01	77
August 11	0.00	76
August 12	0.00	79
August 13	0.00	81
August 14	0.00	77
August 15	0.02	81
August 16	0.01	81
August 17	0.17	70
August 18	0.00	70
August 19	0.55	69
August 20	0.05	78
August 21	0.23	74
August 22	0.01	79
August 23	0.88	79
August 24	1.53	77
August 25	0.24	72
August 26	0.00	69
August 27	0.00	70
August 28	0.00	76
August 29	0.00	79
August 30	0.00	74
August 31	0.00	65
Total	**6.40**	-

M=Missing
T=Trace

2007 Daily Weather Data for Monmouth, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
September 1	0.00	65
September 2	0.00	67
September 3	0.00	69
September 4	0.00	74
September 5	0.00	78
September 6	0.15	78
September 7	0.32	76
September 8	0.00	71
September 9	0.00	70
September 10	0.00	70
September 11	0.14	62
September 12	0.00	56
September 13	0.00	58
September 14	0.00	66
September 15	0.00	48
September 16	0.00	53
September 17	0.00	64
September 18	0.00	76
September 19	0.01	76
September 20	0.00	70
September 21	0.00	71
September 22	0.00	70
September 23	0.00	65
September 24	0.00	76
September 25	0.00	80
September 26	0.26	62
September 27	0.00	59
September 28	0.00	63
September 29	0.00	64
September 30	0.00	69
Total	**0.88**	-

M=Missing
T=Trace

2007 Daily Weather Data for Monmouth, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
October 1	0.11	72
October 2	0.02	63
October 3	0.37	62
October 4	0.00	64
October 5	0.00	71
October 6	0.00	77
October 7	0.00	77
October 8	0.00	77
October 9	0.00	64
October 10	0.00	62
October 11	0.00	46
October 12	0.00	48
October 13	0.00	53
October 14	0.02	54
October 15	0.00	64
October 16	0.00	60
October 17	0.00	52
October 18	1.80	58
October 19	0.06	63
October 20	0.00	49
October 21	0.00	60
October 22	0.00	60
October 23	0.03	43
October 24	0.00	49
October 25	0.00	45
October 26	0.00	48
October 27	0.12	52
October 28	0.00	45
October 29	0.00	45
October 30	0.00	50
October 31	0.00	55
Total	**2.53**	-

M=Missing
T=Trace

2007 Daily Weather Data for Perry, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
April 1	0.14	62
April 2	0.00	55
April 3	0.00	62
April 4	0.49	46
April 5	0.00	33
April 6	0.00	35
April 7	T	27
April 8	0.00	30
April 9	0.00	36
April 10	0.00	41
April 11	1.00	48
April 12	0.08	43
April 13	0.00	35
April 14	0.03	43
April 15	T	38
April 16	0.00	46
April 17	0.00	58
April 18	0.00	60
April 19	0.00	49
April 20	0.00	48
April 21	0.00	57
April 22	0.00	65
April 23	0.17	71
April 24	0.00	55
April 25	1.12	67
April 26	0.21	54
April 27	0.01	54
April 28	0.00	61
April 29	0.00	64
April 30	0.00	69
Total	**3.25**	-

M=Missing
T=Trace

2007 Daily Weather Data for Perry, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
May 1	0.00	75
May 2	0.07	69
May 3	0.46	60
May 4	0.15	61
May 5	0.38	63
May 6	0.00	68
May 7	0.00	66
May 8	0.00	71
May 9	0.00	72
May 10	0.00	73
May 11	0.00	73
May 12	0.00	70
May 13	0.00	67
May 14	0.00	69
May 15	0.00	75
May 16	0.06	62
May 17	0.00	58
May 18	0.00	50
May 19	0.00	57
May 20	0.00	64
May 21	0.00	69
May 22	0.00	71
May 23	T	76
May 24	0.00	75
May 25	0.50	68
May 26	0.03	60
May 27	0.67	71
May 28	0.10	69
May 29	0.00	73
May 30	T	74
May 31	0.10	71
Total	**2.52**	-

M=Missing
T=Trace

2007 Daily Weather Data for Perry, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
June 1	0.05	71
June 2	0.07	74
June 3	T	68
June 4	0.05	68
June 5	0.16	68
June 6	0.00	62
June 7	0.00	75
June 8	0.42	75
June 9	0.00	62
June 10	0.00	66
June 11	0.02	62
June 12	0.00	71
June 13	0.00	71
June 14	0.00	74
June 15	0.00	77
June 16	0.00	77
June 17	0.00	82
June 18	T	79
June 19	0.08	77
June 20	0.00	69
June 21	0.00	73
June 22	0.00	79
June 23	0.09	79
June 24	0.04	75
June 25	0.00	71
June 26	0.00	79
June 27	0.00	80
June 28	1.03	79
June 29	0.61	67
June 30	0.00	64
Total	**2.62**	-

M=Missing
T=Trace

2007 Daily Weather Data for Perry, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
July 1	0.00	68
July 2	0.00	68
July 3	0.00	69
July 4	0.00	76
July 5	T	79
July 6	0.00	76
July 7	0.00	78
July 8	0.00	77
July 9	0.00	80
July 10	0.48	80
July 11	T	73
July 12	0.00	72
July 13	0.12	73
July 14	0.00	71
July 15	0.00	75
July 16	0.00	74
July 17	0.06	77
July 18	0.36	76
July 19	T	82
July 20	T	71
July 21	0.00	64
July 22	0.00	65
July 23	0.00	67
July 24	0.00	68
July 25	0.00	71
July 26	0.00	74
July 27	0.05	78
July 28	0.01	79
July 29	0.00	77
July 30	0.00	72
July 31	0.00	73
Total	**1.08**	-

M=Missing
T=Trace

2007 Daily Weather Data for Perry, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
August 1	0.00	75
August 2	0.00	78
August 3	0.00	82
August 4	0.00	80
August 5	0.00	82
August 6	0.00	86
August 7	0.08	85
August 8	0.03	84
August 9	T	83
August 10	0.00	78
August 11	0.00	80
August 12	0.00	82
August 13	0.04	84
August 14	0.00	81
August 15	0.00	84
August 16	0.00	88
August 17	0.54	74
August 18	0.00	76
August 19	0.04	79
August 20	0.02	82
August 21	0.20	77
August 22	0.00	82
August 23	0.00	83
August 24	0.02	82
August 25	0.56	76
August 26	0.00	69
August 27	0.00	73
August 28	0.00	79
August 29	0.00	84
August 30	0.00	78
August 31	0.00	68
Total	**1.53**	-

M=Missing
T=Trace

2007 Daily Weather Data for Perry, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
September 1	0.00	67
September 2	0.00	67
September 3	0.00	72
September 4	0.00	74
September 5	0.00	77
September 6	0.00	79
September 7	0.44	78
September 8	0.01	74
September 9	0.00	73
September 10	0.00	73
September 11	0.07	69
September 12	0.00	59
September 13	0.00	58
September 14	0.00	67
September 15	0.00	51
September 16	T	55
September 17	0.00	66
September 18	0.00	75
September 19	0.13	78
September 20	0.00	75
September 21	0.00	76
September 22	0.00	76
September 23	0.00	69
September 24	0.00	79
September 25	0.00	80
September 26	0.13	69
September 27	0.00	60
September 28	0.00	65
September 29	0.00	65
September 30	0.00	66
Total	**0.78**	-

M=Missing
T=Trace

2007 Daily Weather Data for Perry, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
October 1	0.33	73
October 2	0.00	63
October 3	2.07	65
October 4	0.00	64
October 5	0.00	71
October 6	0.00	79
October 7	0.00	77
October 8	0.00	78
October 9	T	66
October 10	0.00	62
October 11	0.00	50
October 12	0.00	49
October 13	0.01	55
October 14	0.13	54
October 15	0.00	62
October 16	T	62
October 17	0.00	54
October 18	0.82	61
October 19	0.03	65
October 20	0.00	56
October 21	0.00	65
October 22	0.00	68
October 23	0.18	47
October 24	0.00	49
October 25	0.00	48
October 26	0.06	47
October 27	0.33	50
October 28	0.00	44
October 29	0.00	45
October 30	0.00	51
October 31	0.00	55
Total	**3.96**	-

M=Missing
T=Trace

2007 Daily Weather Data for Rock Falls, Illinois (Midwest Climate Center)

Date	Precipitation (inches)
April 1	0.83
April 2	0.00
April 3	0.07
April 4	0.06
April 5	0.00
April 6	0.00
April 7	0.00
April 8	0.00
April 9	0.00
April 10	0.00
April 11	0.36
April 12	0.61
April 13	0.00
April 14	0.00
April 15	0.00
April 16	0.00
April 17	0.00
April 18	0.00
April 19	0.00
April 20	0.00
April 21	0.00
April 22	0.00
April 23	0.00
April 24	0.00
April 25	2.10
April 26	0.37
April 27	0.25
April 28	0.00
April 29	0.00
April 30	0.12
Total	**4.77**

M=Missing
T=Trace

2007 Daily Weather Data for Rock Falls, Illinois (Midwest Climate Center)

Date	Precipitation (inches)
May 1	0.00
May 2	0.00
May 3	0.00
May 4	0.00
May 5	0.08
May 6	0.00
May 7	0.00
May 8	0.00
May 9	0.00
May 10	0.00
May 11	0.00
May 12	0.00
May 13	0.19
May 14	0.00
May 15	0.00
May 16	0.07
May 17	0.00
May 18	0.00
May 19	0.00
May 20	0.00
May 21	0.00
May 22	0.00
May 23	0.00
May 24	0.00
May 25	0.09
May 26	0.06
May 27	1.04
May 28	0.00
May 29	0.00
May 30	0.00
May 31	0.00
Total	**1.53**

M=Missing
T=Trace

2007 Daily Weather Data for Rock Falls, Illinois (Midwest Climate Center)

Date	Precipitation (inches)
June 1	0.00
June 2	1.74
June 3	0.01
June 4	0.06
June 5	0.09
June 6	T
June 7	0.04
June 8	0.82
June 9	0.00
June 10	0.00
June 11	0.00
June 12	0.00
June 13	0.00
June 14	0.00
June 15	0.00
June 16	0.00
June 17	0.00
June 18	0.00
June 19	0.30
June 20	0.00
June 21	0.00
June 22	0.44
June 23	0.99
June 24	0.26
June 25	0.00
June 26	0.00
June 27	0.00
June 28	0.09
June 29	0.00
June 30	0.00
Total	**4.84**

M=Missing
T=Trace

2007 Daily Weather Data for Rock Falls, Illinois (Midwest Climate Center)

Date	Precipitation (inches)
July 1	0.00
July 2	0.00
July 3	0.00
July 4	0.94
July 5	0.37
July 6	0.00
July 7	0.00
July 8	0.00
July 9	0.00
July 10	1.42
July 11	0.13
July 12	0.00
July 13	0.00
July 14	0.00
July 15	0.00
July 16	0.00
July 17	0.52
July 18	2.76
July 19	0.84
July 20	0.00
July 21	0.00
July 22	0.00
July 23	0.00
July 24	0.00
July 25	0.00
July 26	0.00
July 27	0.11
July 28	0.09
July 29	0.00
July 30	0.00
July 31	0.00
Total	**7.18**

M=Missing
T=Trace

2007 Daily Weather Data for Rock Falls, Illinois (Midwest Climate Center)

Date	Precipitation (inches)
August 1	0.00
August 2	0.00
August 3	0.00
August 4	0.00
August 5	0.37
August 6	0.00
August 7	0.02
August 8	0.40
August 9	0.52
August 10	0.00
August 11	0.00
August 12	0.00
August 13	0.00
August 14	0.54
August 15	0.03
August 16	0.00
August 17	0.00
August 18	0.00
August 19	0.37
August 20	0.81
August 21	0.03
August 22	0.01
August 23	1.75
August 24	2.33
August 25	0.07
August 26	0.00
August 27	0.00
August 28	0.00
August 29	T
August 30	0.00
August 31	0.00
Total	**7.25**

M=Missing
T=Trace

2007 Daily Weather Data for Rock Falls, Illinois (Midwest Climate Center)

Date	Precipitation (inches)
September 1	0.00
September 2	0.00
September 3	0.00
September 4	0.00
September 5	0.00
September 6	0.00
September 7	0.15
September 8	0.07
September 9	0.00
September 10	0.00
September 11	0.12
September 12	0.00
September 13	0.00
September 14	0.00
September 15	0.00
September 16	0.00
September 17	0.00
September 18	0.00
September 19	0.00
September 20	0.00
September 21	0.00
September 22	0.11
September 23	0.00
September 24	0.00
September 25	0.00
September 26	0.70
September 27	0.00
September 28	0.00
September 29	0.00
September 30	0.00
Total	**1.15**

M=Missing
T=Trace

2007 Daily Weather Data for Rock Falls, Illinois (Midwest Climate Center)

Date	Precipitation (inches)
October 1	0.32
October 2	0.00
October 3	0.29
October 4	0.00
October 5	0.00
October 6	0.00
October 7	0.00
October 8	0.00
October 9	0.00
October 10	0.00
October 11	0.00
October 12	0.00
October 13	0.00
October 14	0.15
October 15	0.00
October 16	0.04
October 17	0.00
October 18	0.50
October 19	0.02
October 20	0.00
October 21	0.00
October 22	0.00
October 23	0.06
October 24	0.00
October 25	0.00
October 26	0.00
October 27	0.11
October 28	0.00
October 29	0.00
October 30	0.00
October 31	0.00
Total	**1.49**

M=Missing
T=Trace

2007 Daily Weather Data for Urbana, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
April 1	0.03	60
April 2	0.00	63
April 3	0.55	66
April 4	0.00	44
April 5	0.00	36
April 6	0.00	33
April 7	0.00	27
April 8	0.00	35
April 9	0.00	40
April 10	0.00	44
April 11	0.67	50
April 12	0.01	41
April 13	0.00	42
April 14	0.32	43
April 15	0.00	45
April 16	0.00	50
April 17	0.00	60
April 18	0.00	55
April 19	0.00	49
April 20	0.00	55
April 21	0.00	63
April 22	0.00	68
April 23	0.00	71
April 24	0.00	65
April 25	0.67	64
April 26	0.39	61
April 27	0.04	56
April 28	0.00	63
April 29	0.00	70
April 30	0.00	76
Total	**2.68**	-

M=Missing
T=Trace

2007 Daily Weather Data for Urbana, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
May 1	0.10	75
May 2	0.00	70
May 3	0.00	64
May 4	0.17	63
May 5	0.00	70
May 6	0.00	65
May 7	0.00	68
May 8	0.00	77
May 9	0.02	75
May 10	0.00	74
May 11	0.00	76
May 12	0.00	66
May 13	0.00	63
May 14	0.00	73
May 15	0.37	76
May 16	0.03	60
May 17	0.00	56
May 18	0.00	57
May 19	0.00	66
May 20	0.00	71
May 21	0.00	70
May 22	0.00	75
May 23	0.00	77
May 24	0.00	77
May 25	0.01	72
May 26	0.01	74
May 27	0.51	71
May 28	0.00	72
May 29	0.00	78
May 30	0.00	79
May 31	0.01	75
Total	**1.23**	-

M=Missing
T=Trace

2007 Daily Weather Data for Urbana, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
June 1	0.00	77
June 2	0.00	77
June 3	0.13	73
June 4	0.15	68
June 5	0.02	67
June 6	0.00	68
June 7	0.00	82
June 8	0.00	81
June 9	0.00	69
June 10	0.00	70
June 11	0.00	76
June 12	0.00	76
June 13	0.00	77
June 14	0.00	81
June 15	0.00	81
June 16	0.00	83
June 17	0.00	85
June 18	0.23	81
June 19	0.17	79
June 20	M	M
June 21	0.00	79
June 22	0.56	75
June 23	1.60	70
June 24	0.10	74
June 25	0.00	77
June 26	2.11	78
June 27	0.26	79
June 28	1.13	76
June 29	0.00	67
June 30	0.00	70
Total	**6.46**	-

M=Missing
T=Trace

2007 Daily Weather Data for Urbana, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
July 1	0.00	71
July 2	0.00	68
July 3	0.00	71
July 4	0.01	79
July 5	0.00	79
July 6	0.00	79
July 7	0.00	77
July 8	0.00	82
July 9	0.12	82
July 10	0.08	79
July 11	0.00	74
July 12	0.00	72
July 13	0.03	74
July 14	0.00	70
July 15	0.12	75
July 16	0.00	75
July 17	1.92	75
July 18	0.65	76
July 19	0.08	79
July 20	0.00	67
July 21	M	M
July 22	0.00	69
July 23	0.00	70
July 24	0.00	72
July 25	0.00	76
July 26	0.04	76
July 27	0.76	77
July 28	0.00	76
July 29	0.08	77
July 30	0.00	75
July 31	0.00	77
Total	**3.89**	-

M=Missing
T=Trace

2007 Daily Weather Data for Urbana, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
August 1	0.00	79
August 2	0.00	80
August 3	0.00	83
August 4	0.66	75
August 5	0.02	81
August 6	0.00	84
August 7	0.00	87
August 8	0.00	83
August 9	0.00	83
August 10	0.00	82
August 11	0.00	79
August 12	0.00	85
August 13	0.00	81
August 14	0.34	76
August 15	0.00	80
August 16	0.11	81
August 17	0.00	77
August 18	0.11	72
August 19	0.02	78
August 20	0.64	79
August 21	0.04	82
August 22	0.00	84
August 23	0.00	82
August 24	0.18	82
August 25	0.10	76
August 26	0.00	72
August 27	0.00	75
August 28	0.00	82
August 29	0.00	85
August 30	0.00	75
August 31	0.00	69
Total	**2.22**	-

M=Missing
T=Trace

2007 Daily Weather Data for Urbana, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
September 1	0.00	70
September 2	0.00	75
September 3	0.00	78
September 4	0.00	81
September 5	0.00	82
September 6	0.33	79
September 7	0.45	78
September 8	1.02	74
September 9	0.01	74
September 10	0.00	73
September 11	0.17	67
September 12	0.00	59
September 13	0.00	66
September 14	0.00	70
September 15	0.00	53
September 16	0.00	63
September 17	0.00	71
September 18	0.00	76
September 19	0.00	77
September 20	0.00	77
September 21	0.00	80
September 22	0.00	76
September 23	0.00	75
September 24	0.00	81
September 25	0.16	80
September 26	0.03	67
September 27	0.00	66
September 28	0.00	68
September 29	0.00	69
September 30	0.00	71
Total	**2.17**	-

M=Missing
T=Trace

2007 Daily Weather Data for Urbana, Illinois (Midwest Climate Center)

Date	Precipitation (inches)	Mean Temperature (°F)
October 1	0.16	69
October 2	0.00	71
October 3	0.77	68
October 4	0.00	72
October 5	0.00	78
October 6	0.00	80
October 7	0.00	80
October 8	0.03	80
October 9	0.34	68
October 10	0.00	60
October 11	0.00	51
October 12	0.00	52
October 13	0.00	53
October 14	0.00	67
October 15	0.00	67
October 16	0.11	65
October 17	0.06	63
October 18	1.10	72
October 19	0.18	63
October 20	0.00	62
October 21	0.00	69
October 22	0.19	61
October 23	0.31	52
October 24	0.00	50
October 25	0.02	52
October 26	M	M
October 27	0.06	55
October 28	0.00	46
October 29	0.00	49
October 30	0.00	53
October 31	0.00	55
Total	**3.33**	-

M=Missing
T=Trace