IOWA STATE UNIVERSITY

# 2006 EVALUATION OF INSECTICIDES AND PLANT-INCORPORATED PROTECTANTS

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# 2006 EVALUATION OF INSECTICIES AND PLANT-INCORPORATED PROTECTANTS

Department of Entomology

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Ames, Iowa 50011-3140

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|---|---|
| Project Leader: | Jon Tollefson |
| Agricultural Specialist: | Jim Oleson |
| Postdoctoral Research Associate: | Patricia Prasifka |
| Graduate Research Assistant: | Benjamen Kaeb |
| Technical Assistants: | Rob Acker<br>Seth Dodge<br>Nick Kiley<br>Jana Matthiesen<br>David Muehe<br>Nina Richtman<br>Ian Ringgenberg<br>Will Svec |
| University Research Station Managers: | David Haden<br>Kenneth Pecinovsky<br>David Rueber<br>David Starrett<br>Kevin Van Dee |

## Introduction

The corn rootworm species, *Diabrotica virgifera virgifera* (western corn rootworm) and *D. barberi* (northern corn rootworm), are the most serious pests of *Zea mays* (corn) in the United States Corn Belt. Eggs are laid in the soil during the fall and hatch the following spring. Larval feeding on corn roots in June not only causes physiological yield loss, but also results in harvesting losses because of plant lodging. Adult emergence from the soil is underway by early July and continues through late summer. Additional crop losses can be caused by the beetles feeding on the female flowers (silks) and soft kernels. In Iowa, crop rotation, where it fits cropping practices, remains the preferred method of control. However, it is also economically feasible to protect corn roots with insecticides and plant-incorporated protectants, i.e. transgenic seedcorn that contains a gene from the naturally occurring soil bacterium *Bacillus thuringiensis (Bt).*

Wireworms are a sporadic problem in Iowa, but their seed/seeding injury can reduce plant stands to levels that justify replanting entire fields or portions of fields "hot spots." The larvae cause injury by either boring into and hollowing out the seed or by boring into/through the seedling stalk. Wireworms are the larva stage of the click beetle. These adult beetles lay their eggs in the soil of grassy areas or cultivated fields. The larvae require from one to as many as seven years to develop into the adult beetles. Most problems occur where corn follows perennial grass stands.

Seedcorn maggots are another sporadic insect pest that can reduce plant stands. They feed primarily on decaying organic matter in the soil, but can also feed on corn seeds. The adult flies lay eggs just below the soil surface in tilled ground. The legless maggots are yellowish white and about ¼ inch when mature.

## Objective

Our goal is to serve Iowa agriculture by monitoring performance of registered insecticides and evaluating new chemical and transgenic tools that are more economical, efficacious, and environmentally compatible. Given this end, we maintain a viable, progressive, and scientifically sound product evaluation program.

## Testing Procedures and Evaluations

**Field Selection –** Product efficacy test plots were established at six Iowa locations in 2006. Corn rootworm (CRW) research areas are continually maintained on University farms located at: Ames-Johnson Farm, Crawfordsville-SE Research Farm, Kanawha-Northern Research Farm Nashua-NE Research Farm, and Sutherland-NW Research Farm. Each research area is divided into two sections, which annually alternate as test plot and late-planted trap crop. The seed used for the trap crop is a mixed-maturity blend with a greater proportion of late-maturing varieties. The trap crop constitutes a favorable environment for adult females late in the season when other fields are maturing.

A wireworm test was conducted in central Iowa. The plot was established in the part of the field that had received wireworm damage the past several years.

**Table 1** lists the type of test(s) conducted at each location, target pest, and other general plot information.

## Field Plot Design and Application Techniques

***Corn Rootworm Tests***:
The experimental design in all tests was a randomized complete block (RCB) with four replications. Treatments were applied to single 50-ft rows in all except the yield tests at Crawfordsville and Nashua. Treatments in the yield tests were paired rows 100-ft in length. Seeds were pre-bagged and planted with a 4-row John Deere Max-Emerge$^{TM}$ 7100 integral planter that had 30-inch row spacing. The standard planter fiberglass seed hoppers with attached “finger pickup mechanisms,” were replaced with modified units. On the new units, the metal plate that covered the “fingers” had been replaced with a 7/8-inch, clear Plexiglas plate. Inserted through the Plexiglas was a small stainless steel cylinder. The cylinder was positioned to deliver seed to the “pickup fingers.” At the beginning of each replication pre-bagged seed was dumped into the steel cylinder. At the end of each replication, a hydraulic motor (attached to the planter’s drive shaft) was activated to expel any unplanted seed. Granular insecticide formulations were applied with modified Noble® metering units mounted on the planter. The Noble units were calibrated in the laboratory to accurately deliver material at a tractor speed of 4 mph. Plastic tubes directed the granular treatments to either a 7-inch band ahead of the closing wheels (T-band, All-Terrain Banders), or to the seed furrow, placing all the insecticide directly in-furrow (Furrow). Wind shields were positioned around each row to prevent insecticide displacement. The wind shields consisted of a metal "U-frame" positioned parallel to the ground, above and surrounding each row's press wheels; the open end was adjacent to the gauge wheels. Eleven-inch poly-bristle skirts were attached to the frame and the frame positioned so the bristle tips touched the ground. Each row was constantly monitored to ensure that insecticides were correctly applied at all times. Final incorporation was accomplished with drag chains mounted behind the closing wheels.

All seed treatments except AGST 03001 were applied commercially.

Liquid A14974 250CS, Capture® LFR, Regent® 4SC, and EXP1A 2SC planting-time treatments were applied with a compressed-air system designed and built directly into the planter by Almaco manufacturing (Nevada, IA). This closed handling system consisted of 3-gallon product canisters equipped with quick disconnects. Pink microtubes were used to apply Regent 4SC and EXP1A 2SC. Twenty-two psi was used to deliver the water carrier rate of 4 gallons per acre (GPA). Stainless steel tube guides, placed directly behind the seed-drop tubes, positioned the microtubes for these in-furrow treatments. A14974 250CS and Capture LFR liquid treatments were applied either T-band or furrow using TeeJet® XR80015 spray nozzles at 21 psi to deliver 5 GPA of finished spray.

Aztec® 4.67G and Fortress® 5G treatments were applied with modified SmartBox™ metering units. The commercial SmartBox™ metering units were removed from their large-base containers and sandwiched between a flat metal plate on the bottom and a custommade, threaded plastic cap on the top. The bottom plate had been fabricated so that it could be slid in and out of the same planter mounting brackets used for the Noble units. An inverted 1000-ml Nalgene® bottle, screwed into the top cap, provided a secure and sealed container for insecticide. A short plastic tube attached to the dispenser opening of the metering unit could be connected to either the planter's T-band or Furrow tubes. The controllers (2), mounted in the tractor cab, were used to operate the SmartBox metering units (2/controller). All treatments were applied at 4 mph using the "fixed speed mode" on the SmartBox controllers.

***Wireworm Test:***
The experimental design for this test was a RCB, four replications, with treatments applied to single 50-ft length rows. All seed treatments except AGST 03001 were applied commercially. AGST 03001 seed treatment was applied by placing 300 grams of seedcorn in a 1-gallon plastic jar and adding the correct amount of seed-treatment formulation. The jar was then placed on a roller mill for mixing. All seeds, both treated and non-treated, were pre-weighed and bagged. Seeds were planted with the modified seed units described earlier. Granular insecticide formulations were applied with modified Noble or SmartBox metering units mounted on the planter (described earlier).

***Seedcorn Maggot Test:***
The experimental design was a RCB, four replications, with treatments applied to single 20-ft rows. A meat-and-bone meal bait was used to attract ovipositing flies. The corn planter, with seed hoppers turned off and press wheels tied up, was used to premark rows. Hoes were used to make shallow row furrows. The bait was hand applied (~1/3 oz per row-ft) to the bottom of the open seed furrows on May 8 and again on May 12. Corn seeds were carefully placed by hand (8-inch seed spacing) directly into the bait on May 15. Granular insecticide treatments were applied with modified Noble metering units mounted on a small-plot bicycle applicator. Seeds were covered with soil and the soil firmed by hand.

## Corn Rootworm Larval-Damage Evaluations

**Root-Injury** – After the majority of corn rootworms had finished feeding, five root systems were dug from each insecticide treatment row (three roots per row in the two-row yield tests). Prior to transport back to Ames, roots were tagged for identification and excess soil was removed. In Ames, a pressurized water spray was used to remove the remaining soil. Roots were then evaluated for rootworm feeding injury on the following Iowa State Node-Injury Scale (0–3):

**Node-Injury Scale (0–3)**

0.00 – No feeding damage (lowest rating that can be given)

1.00 – One node (circle of roots), or the equivalent of an entire node, eaten back to within ~ 1½ inches of the stalk (soil line on the 7th node)

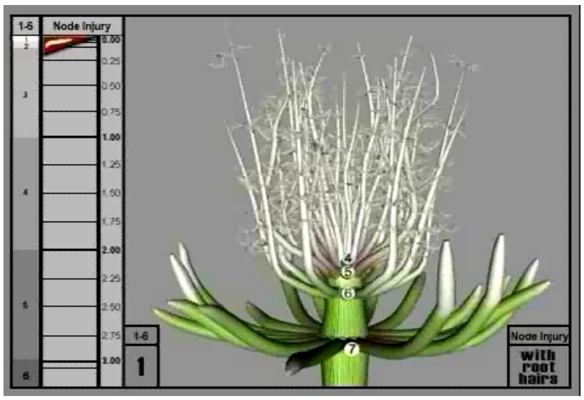
2.00 – Two nodes eaten

3.00 – Three or more nodes eaten (highest rating that can be give)

Damage in-between complete nodes eaten is noted as the percentage of the node missing, i.e. 1.50 = 1½ nodes eaten, 0.25 = ¼ of one node eaten, etc.

The linear node-injury scale allows injury to be expressed intuitively and has proved useful in evaluating minor injury, especially with transgenic seed corn. For an interactive guide to the Node-Injury Scale, see the Iowa State University Entomology web site at:

**rootworm/nodeinjury/nodeinjury.html**




A product consistency (%) was also calculated for each treatment. Product consistency equals the percentage of times a treatment limited feeding injury to 0.25 node or less (greater injury can result in economic yield loss, especially when plants are moisture stressed).

To determine insecticide effectiveness, data were analyzed with standard ANOVA procedures. Ryan's *Q* Test (REGWQ) was used to rank treatment means where significant differences ($P > F \leq 0.05$) occurred.

**Stand Counts** - The number of plants in either 17.5 or 20 row-ft was recorded (note distance in stand count tables).

**Lodging Counts** (Taken at harvest time) - A plant was considered lodged if it was leaning at least 30° from vertical. See individual table footnotes for length of row, or number of plants used to calculate percent lodging.

**Yields** - Tests that were taken to yield were either machine- or hand- harvested. Weights were converted to bushels/acre of No. 2 shelled corn at 15.5% moisture and analyzed for treatment effects.

## Comments on Trials and Product Performance

Tables list treatment rates as ounces a.i. per 1,000 row-ft unless otherwise indicated in the footnotes.

**AMES (central Iowa)**

***Experimental Test (Tables 2–4):*** There was moderate CRW feeding pressure in this test with 1.31 nodes eaten in the untreated check (UTC). Node-injury scores of all treatments were significantly different (s.d.) from the UTC. The seed treatment V-10112 (both rates) had significantly lower stand counts than all other treatments. Examination of the leftover seed from this treatment revealed very “damp” seeds. There was essentially no plant lodging (≤2%) in this test.

***YieldGard Plus and Herculex XTRA Tests (Table 5):*** In each test, the CRW transgenic and the Force treatment, were s.d. from the UTC. There were no significant yield differences in either test.

**CRAWFORDSVILLE (SE Iowa)**

***Yield Test (Tables 6–9):***

This test had heavy root feeding with just over two nodes injured in the UTC. All treatments were s.d. from the UTC in node-injury scores; however, several treatments had root injuries greater than one node of roots. Treatments with node-injury scores greater than one node had 50 percent or more lodging. Also, those same treatments had the lowest yields and were not s.d. from one another.

***YieldGard Plus and Herculex XTRA Tests (Table 10):***
The question has been asked, "how genetically similar are the corn rootworm transgenic hybrids to their respective near-isoline hybrid seed? Do they both have the same yield potential? In an attempt to answer this question, treatments were tested in the absence of corn rootworms. Tests were conducted on ground that had been planted to soybeans the previous year. Treatments were applied to paired rows, 100 ft in length, and replicated four time. Yields were machine harvested. YieldGard Plus had significantly higher yield than the near-isoline UTC, while Herculex XTRA did not. In the presence of rootworms (root injury) Herculex XTRA was s.d. from the near-isolione UTC, but not from the Force insecticide treatment. YieldGard Plus had significantly higher yields than the near-isoline UTC, the T-band applications of Force, as well as most insecticide treatments (Table 9).

**KANAWHA (North Central Iowa)**
***YieldGard Plus and Herculex XTRA Tests (Table 11):***
Treatments were applied to single rows, 50 ft in length, and replicated four times. Yields were obtained by hand harvesting 20 row-ft. The "corn on corn" test had lower CRW feeding pressure than was seen at Crawfordsville; around one node injured at Kanawha and around two nodes injured at Crawfordsville. There were no s.d. in yields between either transgenic and its near-isoline UTC, with (corn on corn) or without (corn on soybean) corn rootworm feeding. Good growing conditions existed throughout most of the season at Kanawha. The only significant lodging in any of these tests occurred in the near-isoline UTC of the Herculex on corn test (43% of those plants were lodged).

***Dow Herculex Test (Table 12):***
With good growing conditions, and essentially no lodging, even in the near-isoline Check, there were no s.d. among treatment yields.

***Stoller X-tra Power Test (Table 13):***
X-tra Power is a liquid mixture of the micronutrients magnesium, copper, manganese, and zinc. General information on the label states, "X-tra Power, when used as directed, will precondition the crop to better tolerate adverse weather conditions such as cold and hot weather, drought and flooded conditions." Again, with the good growing conditions at Kanawha, and only moderate CRW pressure, there were no s.d. among treatment yields.

***Syngenta Seed Treatment Test (Table 14):***
The root injury scores of both seed treatments were not s.d. from the UTC. Even with root injury >1 node, and some lodging, yields were similar to other tests conducted at Kanawha.

***Bayer Yield Tests (Table 15):***
The yield potentials of a corn rootworm transgenic, its respective near-isoline hybrid treated with Aztec 2.1G, and a competitive non-transgenic hybrid treated with Aztec 2.1G were addressed in these tests. Corn on corn observations: even with considerable nodal injury in the CHECKS there were no s.d. yield differences among treatments. Again, there were good growing conditions and adequate moisture throughout the growing season at Kanawha

in 2006. Of interest is the s.d. in lodging between the two hybrids near-isoline UTC. In the "corn on soybeans" observations, the only significant yield difference was between YieldGard Plus (DKC60-18) and its near-isoline UTC (DKC60-19).

**NASHUA (NE Iowa)**
***Yield Test (Tables 16–19):***
Corn rootworm feeding pressure was moderately heavy with 1.72 nodes injured in the UTC. In the months of May, July, and August, rainfall amounts averaged several inches below normal (see weather tables). All treatments had significantly lower node-injury scores than the UTC. There was no advantage to combining a seed treatment with an insecticide. In regards to the corn rootworm rate of the seed treatments (1.25 mg/seed), Poncho had a significantly lower node-injury score than Cruiser, 0.35 and 0.63 respectively. However, they were no s.d. in regards to product consistency, 67% and 46% respectively. YieldGard Plus had significantly higher yields than all other treatments.

***YieldGard Plus and Herculex XTRA Tests (Table 20):***
In the absence of root injury (corn on soybeans), Herculex XTRA had a significantly lower yield (15 bushels) than its near-isoline seed treated with Force. The opposite was true for YieldGard Plus which showed a significant 16 bushel yield advantage over its near-isoline seed treated with Force.

**SUTHERLAND (NW Iowa)**
***Experimental Test* (Tables 21–23):** There was heavy rootworm feeding with just over two nodes injured in the UTC. Products that kept node-injury scores 0.76 or lower were not s.d. from one another. As was seen in the Ames experimental test, the two rates of seed treatment V-10112 1.77SC had significantly lower stand counts. Straight line winds, with gusts up to 70 mph, hit this area on August 1st. Lodging counts were taken on September 13th. Much of the lodging observed was not the typical "goosenecking" of plants caused by early root injury. Many of the plant stalks were straight, but "leaning." Twenty-five percent of the plants were lodged in the UTC, but no treatment was s.d. from the UTC.

***YieldGard Plus and Herculex XTRA Test (Table 24):***
In the "corn on corn" test, both transgenics and Force were s.d. from their respective near-isoline UTC in regards to node-injury scores. With the extreme wind gusts up to 70 mph, there was considerably more lodging with the Pioneer hybrids than with the Dekalb hybrids. Significant yield increases were observed with the YieldGard Plus treatment over the Force and near-isoline UTC treatments.

***Syngenta Seed Treatment Test (Table 25):***
The node-injury scores of both seed treatments were not s.d. from the UTC. No explanation can be given as to why the seed treatments had significantly more lodging than the UTC. This same trend was reflected with lower yields with the seed treatments, but neither was s.d from the UTC.

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**Wireworm Evaluations**
**Spring Hill (Tables 26 & 27)**

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Following stand counts, seeds/seedlings were carefully extracted from sections of each row, inspected for feeding, and rated on the following 1–4 damage scale:

1 - seed/seedling undamaged

2 - seed/seedling damaged, but plant established

3 - seed/seedling damaged, plant showing some signs of stress

4 - seed/seedling damaged, no plant or questionable establishment.

The seed/seedling evaluations revealed only very minor wireworm injury in the UTC. There were no s.d. among treatments in stand counts or damage ratings.

## Seedcorn Maggot Evaluations Ames (Tables 28 & 29)

Following stand counts, seeds/seedlings were carefully extracted from sections of each row and inspected for feeding, and rated on the 1–4 damage scale (describe previously). The Baited Check had 59% damaged seeds/seedlings, but the extent of the damage was very light (1.70 Baited Check damage rating). The seed treatment AGST 03001 was not s.d. from the Baited Check.

## Calibration Information

All Noble units were laboratory calibrated and units were randomly spot-checked in the field prior to planting. SmartBox units were calibrated on the planter in accordance with the SmartBox Operator's Manual instructions. During calibration and planting, the flowability of each formulation was noted, as well as any other calibration problems. There were no calibration or delivery problems with any treatment.

## Agronomic Information, Weather Data, and Materials Tested

Agronomic information and field insecticide history for each test plot are listed in **Appendix I**. Weather data from the test site or the nearest Iowa Climatological Station are listed in **Appendix II**. Information on materials tested is listed in **Appendix III.**

## Research Support

Our thanks to the Iowa Agriculture and Home Economics Experiment Station and the following companies for providing support for this research: AGRILIANCE LLC, AMVAC Chem. Corp., BASF Corp., Bayer Corp., Dow AgroSciences, FMC Corp., Helena Chemical Co., Monsanto Co., Pioneer Hi-Bred International, Inc., Stoller Enterprises, Inc., Syngenta, and Valent U.S.A. Corp.

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Table 1. Iowa insecticide test information for 2006.

| **Target Pest** Test Location | Type of Test[1] | Table # | # Entries[1] | Experimental Unit Size: Row Length (ft) | Experimental Unit Size: # Reps |
|---|---|---|---|---|---|
| **Corn Rootworms** | | | | | |
| Ames | Experimental | 2-4 | 35 | 50 | 4 |
| | YieldGard Plus | 5 | 3 | 50 | 4 |
| | Herculex XTRA | 5 | 3 | 50 | 4 |
| Crawfordsville | Yield | 6-9 | 21 | 100 | 4 |
| | Herculex XTRA | 10 | 3 | 100 | 4 |
| | YieldGard Plus (on beans) | 10 | 3 | 100 | 4 |
| | Herculex XTRA (on beans) | 10 | 3 | 100 | 4 |
| Kanawha | YieldGard Plus | 11 | 3 | 50 | 4 |
| | Herculex XTRA | 11 | 3 | 50 | 4 |
| | YieldGard Plus (on beans) | 11 | 3 | 50 | 4 |
| | Herculex XTRA (on beans) | 11 | 3 | 50 | 4 |
| | Dow Herculex Test | 12 | 3 | 50 | 4 |
| | Stoller X-tra Power Test | 13 | 4 | 50 | 4 |
| | Syngenta ST Test | 14 | 3 | 50 | 4 |
| | Bayer Yield Test | 15 | 5 | 100 | 4 |
| Nashua | Yield | 16–19 | 21 | 100 | 4 |
| | Herculex XTRA | 20 | 3 | 100 | 4 |
| | YieldGard Plus (on beans) | 20 | 3 | 100 | 4 |
| | Herculex XTRA (on beans) | 20 | 3 | 100 | 4 |
| Sutherland | Experimental | 21–23 | 35 | 50 | 4 |
| | YieldGard Plus | 24 | 3 | 50 | 4 |
| | Herculex XTRA | 24 | 3 | 50 | 4 |
| | Syngenta ST Test | 25 | 3 | 50 | 4 |
| **Wireworm** | | | | | |
| Spring Hill | Wireworm | 26, 27 | 21 | 50 | 4 |
| **Seedcorn maggot** | | | | | |
| Ames | Seedcorn maggot | 28, 29 | 15 | 20 | 4 |

[1]All tests were conducted on “trap crop corn” ground except where indicated (on beans = test conducted on ground that was planted to soybeans in 2005).

Table 2. Average root-injury and product consistency for planting-time insecticide treatments, experimental test, Ames, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | Node-Injury[4,5,6] | Product Consistency[6,7] |
|---|---|---|---|---|---|
| YieldGard Plus | Trans. | ---- | ---- | 0.02 a | 100 a |
| Fortress | 5G | 0.185 | Furrow SB | 0.04 a | 100 a |
| Aztec Poncho 1250 | 2.1G | 0.14+ST | Furrow+ST | 0.04 a | 100 a |
| Aztec | 2.1G | 0.17 | Furrow | 0.06 a | 100 a |
| Force | 3G | 0.12 | T-band | 0.07 a | 100 a |
| Fortress AMV-B | 2.5G | 0.15 | Furrow | 0.08 a | 100 a |
| Aztec | 2.1G | 0.14 | T-band | 0.09 a | 100 a |
| Fortress AMV-C | 2.5G | 0.15 | Furrow | 0.09 a | 95 ab |
| Aztec | 4.67G | 0.14 | Furrow SB | 0.09 a | 95 ab |
| Aztec | 2.1G | 0.14 | Furrow | 0.10 a | 100 a |
| Fortress AMV-A | 2.5G | 0.15 | Furrow | 0.10 a | 90 ab |
| Aztec | 2.1G | 0.17 | T-band | 0.11 a | 95 ab |
| A14974 | 250CS | 0.15 | Furrow | 0.13 ab | 100 a |
| A14974 | 250CS | 0.09 | T-band | 0.15 ab | 95 ab |
| Cruiser | 5FS | 1.25 mg | ST | 0.15 ab | 95 ab |
| Capture w/starter fert. | LFR | 0.09 | Furrow | 0.15 ab | 90 ab |
| A14974 | 250CS | 0.15 | T-band | 0.16 ab | 90 ab |
| Aztec+Poncho 250 | 2.1G | 0.14+ST | Furrow+ST | 0.17 ab | 95 ab |
| Capture+Poncho1250 | LFR | 0.075 | T-band | 0.18 abc | 90 ab |
| A14974 | 250CS | 0.09 | Furrow | 0.19 abc | 95 ab |
| V-10112 | 1.77SC | 1.25 mg | ST | 0.20 abc | 95 ab |
| V-10194 | ---EC | 1.25 mg | ST | 0.20 abc | 90 ab |
| V-10112 | 1.77SC | 1.50 mg | ST | 0.20 abc | 85 ab |
| Force | 3G | 0.12 | Furrow | 0.22 abc | 95 ab |
| A14974 | 250CS | 0.12 | T-band | 0.22 abc | 85 ab |
| A14974 | 250CS | 0.12 | Furrow | 0.27 abc | 75 ab |
| V-10170 | 2.32 SC | 1.25 mg | ST | 0.29 abc | 75 ab |
| Capture | LFR | 0.09 | Furrow | 0.33 abc | 85 ab |
| Capture | LFR | 0.09 | T-band | 0.33 abc | 75 ab |
| V-10194 | ---EC | 1.50 mg | ST | 0.39 abc | 70 abc |
| Regent | 4SC | 0.12 | Furrow-M | 0.39 abc | 70 abc |
| Cruiser | 5FS | 0.25 mg | ST | 0.48 abc | 45 bcd |
| EXP1A | 2SC | 0.23 | Furrow-M | 0.73 bc | 45 bcd |
| Poncho 250 | 600FS | 0.25 mg | ST | 0.79 c | 25 cd |
| CHECK | ---- | ---- | ---- | 1.31 d | 10 d |

[1] Planted May 4, 2006; evaluated July 19, 2006

[2] Ounces a.i. per 1,000 row-ft; seed treatments (ST) listed as mg a.i. per seed

[3] T-band & Furrow = insecticide applied at planting time; SB= SmartBox application; ST = seed treatment; M = microtube application

[4] Chemical and check means based on 20 observations (5 roots/row x 4 replications)

Table 2. Continued

[5] Iowa State Node-Injury Scale (0–3). Number of full or partial nodes completely eaten

[6] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

[7] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

Table 3. Average stand counts for planting-time insecticide treatments, experimental test, Ames, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | Stand Count[4,5] |
|---|---|---|---|---|
| V-10170 | 2.32 SC | 1.25 mg | ST | 35.50 a |
| Fortress AMV-C | 2.5G | 0.15 | Furrow | 35.25 a |
| Aztec | 4.67G | 0.14 | Furrow SB | 35.25 a |
| Aztec | 2.1G | 0.14 | Furrow | 35.25 a |
| A14974 | 250CS | 0.09 | T-band | 34.75 a |
| YieldGard Plus | Trans. | ---- | ---- | 34.50 a |
| Force | 3G | 0.12 | Furrow | 34.50 a |
| Aztec +Poncho 1250 | 2.1G | 0.14+ST | Furrow+ST | 34.25 a |
| A14974 | 250CS | 0.09 | Furrow | 34.25 a |
| Cruiser | 5FS | 1.25 mg | ST | 34.00 a |
| CHECK | ---- | ---- | ---- | 34.00 a |
| A14974 | 250CS | 0.12 | T-band | 33.75 a |
| A14974 | 250CS | 0.15 | T-band | 33.75 a |
| Aztec | 2.1G | 0.17 | Furrow | 33.75 a |
| Fortress | 5G | 0.185 | Furrow SB | 33.50 a |
| Aztec+Poncho 250 | 2.1G | 0.14+ST | Furrow+ST | 33.50 a |
| Cruiser | 5FS | 0.25 mg | ST | 33.50 a |
| Fortress AMV-B | 2.5G | 0.15 | Furrow | 33.25 a |
| V-10194 | ---EC | 1.25 mg | ST | 33.25 a |
| A14974 | 250CS | 0.12 | Furrow | 33.25 a |
| Poncho 250 | 600FS | 0.25 mg | ST | 33.25 a |
| Regent | 4SC | 0.12 | Furrow-M | 33.00 a |
| EXP1A | 2SC | 0.23 | Furrow-M | 33.00 a |
| V-10194 | ---EC | 1.50 mg | ST | 33.00 a |
| Force | 3G | 0.12 | T-band | 33.00 a |
| Capture | LFR | 0.09 | T-band | 33.00 a |
| Aztec | 2.1G | 0.14 | T-band | 33.00 a |
| Aztec | 2.1G | 0.17 | T-band | 33.00 a |
| Fortress AMV-A | 2.5G | 0.15 | Furrow | 32.75 a |
| A14974 | 250CS | 0.15 | Furrow | 32.75 a |
| Capture w/starter fert. | LFR | 0.09 | Furrow | 32.75 a |
| Capture+Poncho 1250 | LFR | 0.075 | T-band | 32.50 a |
| Capture | LFR | 0.09 | Furrow | 32.25 a |
| V-10112 | 1.77SC | 1.25 mg | ST | 27.50 b |
| V-10112 | 1.77SC | 1.50 mg | ST | 26.00 b |

[1] Planted May 4, 2006; evaluated June 2, 2006

[2] Ounces a.i. per 1,000 row-ft; seed treatments (ST) listed as mg a.i. per seed

[3] T-band & Furrow = insecticide applied at planting time; SB = SmartBox application; ST = seed treatment; M = microtube application

Table 3. Continued

[4] Means based on 4 observations (20 row-ft/treatment x 4 replications)

[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 4. Average percent lodging for planting-time insecticide treatments, experimental test, Ames, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | % Lodging[4,5] |
|---|---|---|---|---|
| A14974 | 250CS | 0.09 | T-band | 0 a |
| A14974 | 250CS | 0.09 | Furrow | 0 a |
| A14974 | 250CS | 0.12 | T-band | 0 a |
| A14974 | 250CS | 0.12 | Furrow | 0 a |
| A14974 | 250CS | 0.15 | T-band | 0 a |
| A14974 | 250CS | 0.15 | Furrow | 0 a |
| Aztec | 2.1G | 0.14 | Furrow | 0 a |
| Aztec | 2.1G | 0.14 | T-band | 0 a |
| Aztec | 2.1G | 0.17 | Furrow | 0 a |
| Aztec | 2.1G | 0.17 | T-band | 0 a |
| Aztec | 4.67G | 0.14 | Furrow SB | 0 a |
| Aztec +Poncho 1250 | 2.1G | 0.14+ST | Furrow+ST | 0 a |
| Aztec+Poncho 250 | 2.1G | 0.14+ST | Furrow+ST | 0 a |
| Capture | LFR | 0.09 | T-band | 0 a |
| Capture | LFR | 0.09 | Furrow | 0 a |
| Capture w/starter fert. | LFR | 0.09 | Furrow | 0 a |
| Capture+Poncho 1250 | LFR | 0.075 | T-band | 0 a |
| Cruiser | 5FS | 0.25 mg | ST | 0 a |
| Cruiser | 5FS | 1.25 mg | ST | 0 a |
| EXP1A | 2SC | 0.23 | Furrow-M | 0 a |
| Force | 3G | 0.12 | Furrow | 0 a |
| Force | 3G | 0.12 | T-band | 0 a |
| Fortress | 5G | 0.185 | Furrow SB | 0 a |
| Fortress AMV-A | 2.5G | 0.15 | Furrow | 0 a |
| Fortress AMV-B | 2.5G | 0.15 | Furrow | 0 a |
| Fortress AMV-C | 2.5G | 0.15 | Furrow | 0 a |
| Poncho 250 | 600FS | 0.25 mg | ST | 0 a |
| Regent | 4SC | 0.12 | Furrow-M | 0 a |
| V-10112 | 1.77SC | 1.25 mg | ST | 0 a |
| V-10112 | 1.77SC | 1.50 mg | ST | 0 a |
| V-10170 | 2.32 SC | 1.25 mg | ST | 0 a |
| V-10194 | ---EC | 1.25 mg | ST | 0 a |
| V-10194 | ---EC | 1.50 mg | ST | 0 a |
| YieldGard Plus | Trans. | ---- | ---- | 0 a |
| CHECK | ---- | ---- | ---- | 2 b |

[1] Planted May 7, 2006; evaluated October 2, 2006

[2] Ounces a.i. per 1,000 row-ft; Cruiser and Poncho ST listed as mg a.i. per seed

[3] T-band & Furrow = insecticide applied at planting time; SB = SmartBox application; ST = seed treatment; M = microtube application

[4] Means based on 4 observations (number lodged/10 plants x 4 replications)

Table 4. Continued

[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 5. Average root-injury, product consistency, percent lodging, stand counts, and yield for YieldGard Plus and Herculex XTRA tests, Ames, IA, 2006[1]

Test conducted on ground that had been planted to "trap crop corn" the previous year

| Treatment[2] | Place.[3] | Node-Injury[4,5] | Product Consistency[5,6] | Percent Lodging[5] | Stand Ct.[7] 20 row-ft | Yield[7] (bu/a) |
|---|---|---|---|---|---|---|
| YieldGard Plus | ---- | 0.05 a | 100 a | 0 a | 33.00 | 214 |
| Force 3G | T-band | 0.10 a | 95 a | 0 a | 32.00 | 184 |
| CHECK | ---- | 1.50 b | 0 b | 3 b | 34.25 | 198 |

Test conducted on ground that had been planted to "trap crop corn" the previous year

| Treatment[8] | Place.[3] | Node-Injury[4,5] | Product Consistency[5,6] | Percent Lodging | Stand Ct.[7] 20 row-ft | Yield[7] (bu/a) |
|---|---|---|---|---|---|---|
| Herculex XTRA | ---- | 0.03 a | 100 a | 0 | 33.50 | 178 |
| Force 3G | T-band | 0.16 a | 100 a | 0 | 32.00 | 194 |
| CHECK | ---- | 1.73 b | 0 b | 0 | 33.50 | 198 |

[1] Planted May 4 – evaluation dates: stand counts June 2; root injury August 7; lodging October 2; yield October 30, 2006

[2] YieldGard Plus (DKC60-18); near-isoline seed for Force and CHECK (DKC60-19)

[3] T-band = insecticide applied at planting time

[4] Iowa State Node-Injury Scale (0–3). Number of full or partial nodes completely eaten

[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

[6] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

[7] No significant differences between means (ANOVA, $P \leq 0.05$)

[8] Herculex XTRA (Pioneer 34A18); seed for Force and CHECK (Pioneer 34A16, a Herculex I conversion of 34A15)

Table 6. Average root-injury and product consistency for planting-time insecticide treatments, yield test, Crawfordsville, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | Node-Injury[4,5,6] | Product Consistency[6,7] |
|---|---|---|---|---|---|
| YieldGard Plus | Trans. | --- | --- | 0.02 a | 100 a |
| Fortress | 2.5G | 0.185 | Furrow | 0.11 a | 100 a |
| Aztec | 2.1G | 0.14 | T-band | 0.13 a | 100 a |
| Aztec | 2.1G | 0.17 | T-band | 0.13 a | 100 a |
| Fortress | 5G | 0.185 | Furrow SB | 0.14 a | 96 a |
| DEFCON | 2.1G | 0.14 | T-band | 0.14 a | 96 a |
| Force | 3G | 0.12 | T-band | 0.15 a | 100 a |
| Aztec | 2.1G | 0.17 | Furrow | 0.17 a | 96 a |
| Aztec + Poncho 1250 | 2.1G | 0.14+ST | Furrow+ST | 0.20 a | 92 a |
| Aztec | 2.1G | 0.14 | Furrow | 0.20 a | 96 a |
| DEFCON | 2.1G | 0.14 | Furrow | 0.21 a | 92 a |
| Aztec | 4.67G | 0.14 | Furrow SB | 0.21 a | 83 a |
| Lorsban | 15G | 1.2 | T-band | 0.22 a | 96 a |
| Force | 3G | 0.12 | Furrow | 0.27 a | 79 a |
| Force + Poncho 250 | 3G | 0.12+ST | Furrow+ST | 0.31 a | 83 a |
| Capture | LFR | 0.09 | T-band | 0.39 a | 75 a |
| Poncho 1250 | 600FS | 1.25 mg | ST | 0.76 b | 25 b |
| Regent | 4SC | 0.12 | Furrow-M | 1.06 b | 13 b |
| Cruiser | 5FS | 1.25 mg | ST | 1.13 bc | 4 b |
| Poncho 250 | 600FS | 0.25 mg | ST | 1.45 c | 13 b |
| CHECK | ---- | ---- | ---- | 2.03 d | 0 b |

[1] Planted April 27, 2006; evaluated July 10, 2006

[2] Ounces a.i. per 1,000 row-ft; Cruiser and Poncho ST listed as mg a.i. per seed

[3] T-band & Furrow = insecticide applied at planting time; SB = SmartBox application; ST = seed treatment; M = microtube application

[4] Chemical and check means based on 24 observations (2-row trts x 3 roots/row x 4 replications)

[5] Iowa State Node-Injury Scale (0–3). Number of full or partial nodes completely eaten

[6] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

[7] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

Table 7. Average stand counts for planting-time insecticide treatments, yield test, Crawfordsville, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | Stand Count[4,5] |
|---|---|---|---|---|
| Aztec + Poncho 1250 | 2.1G | 0.14+ST | Furrow+ST | 30.38 |
| Regent | 4SC | 0.12 | Furrow-M | 30.13 |
| YieldGard Plus | Trans. | ---- | ---- | 29.75 |
| Force | 3G | 0.12 | Furrow | 29.50 |
| Fortress | 2.5G | 0.185 | Furrow | 29.25 |
| Capture | LFR | 0.09 | T-band | 29.13 |
| DEFCON | 2.1G | 0.14 | T-band | 29.13 |
| Poncho 250 | 600FS | 0.25 mg | ST | 29.00 |
| Aztec | 2.1G | 0.14 | T-band | 28.88 |
| Fortress | 5G | 0.185 | Furrow SB | 28.88 |
| Force | 3G | 0.12 | T-band | 28.88 |
| Aztec | 2.1G | 0.14 | Furrow | 28.75 |
| Poncho 1250 | 600FS | 1.25 mg | ST | 28.75 |
| Aztec | 2.1G | 0.17 | T-band | 28.63 |
| Aztec | 4.67G | 0.14 | Furrow SB | 28.63 |
| Force + Poncho 250 | 3G | 0.12+ST | Furrow+ST | 28.63 |
| CHECK | ---- | ---- | ---- | 28.63 |
| Lorsban | 15G | 1.2 | T-band | 28.50 |
| DEFCON | 2.1G | 0.14 | Furrow | 28.50 |
| Cruiser | 5FS | 1.25 mg | ST | 28.18 |
| Aztec | 2.1G | 0.17 | Furrow | 28.25 |

[1] Planted April 27, 2006; evaluated June 5, 2006

[2] Ounces a.i. per 1,000 row-ft; Cruiser and Poncho ST listed as mg a.i. per seed

[3] T-band & Furrow = insecticide applied at planting time; SB = SmartBox application; ST = seed treatment; M = microtube application

[4] Means based on 8 observations (2-row trt x17.5 row-ft/treatment x 4 replications).

[5] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 8. Average percent lodging for planting-time insecticide treatments, yield test, Crawfordsville, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | % Lodging[4,5] |
|---|---|---|---|---|
| Aztec | 2.1G | 0.14 | T-band | 0 a |
| Aztec | 2.1G | 0.14 | Furrow | 0 a |
| Aztec | 2.1G | 0.17 | T-band | 0 a |
| Aztec | 2.1G | 0.17 | Furrow | 0 a |
| Aztec | 4.67G | 0.14 | Furrow SB | 0 a |
| Aztec + Poncho 1250 | 2.1G | 0.14+ST | Furrow+ST | 0 a |
| DEFCON | 2.1G | 0.14 | T-band | 0 a |
| Force | 3G | 0.12 | T-band | 0 a |
| Force + Poncho 250 | 3G | 0.12+ST | Furrow+ST | 0 a |
| Fortress | 5G | 0.185 | Furrow SB | 0 a |
| Lorsban | 15G | 1.2 | T-band | 0 a |
| YieldGard Plus | Trans. | ---- | ---- | 0 a |
| Fortress | 2.5G | 0.185 | Furrow | 1 a |
| Force | 3G | 0.12 | Furrow | 1 a |
| DEFCON | 2.1G | 0.14 | Furrow | 1 a |
| Capture | LFR | 0.09 | T-band | 8 a |
| Poncho 1250 | 600FS | 1.25 mg | ST | 10 a |
| Regent | 4SC | 0.12 | Furrow-M | 50 b |
| Cruiser | 5FS | 1.25 mg | ST | 63 b |
| Poncho 250 | 600FS | 0.25 mg | ST | 81 c |
| CHECK | ---- | ---- | ---- | 88 c |

[1] Planted April 27, 2006; evaluated September 25, 2006

[2] Ounces a.i. per 1,000 row-ft; Cruiser and Poncho ST listed as mg a.i. per seed

[3] T-band & Furrow = insecticide applied at planting time; SB = SmartBox application; ST = seed treatment; M = microtube application

[4] Means based on 4 observations (lodged plants/10 plants x 4 replications)

[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 9. Average yield for planting-time insecticide treatments, yield test, Crawfordsville, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | Bushels/ Acre[4,5] |
|---|---|---|---|---|
| YieldGard Plus | Trans. | ---- | ---- | 210 a |
| Aztec+Poncho 1250 | 2.1G | 0.14+ST | Furrow+ST | 194 ab |
| DEFCON | 2.1G | 0.14 | T-band | 191 bc |
| Fortress | 2.5G | 0.185 | Furrow | 190 bc |
| Poncho 1250 | 600FS | 1.25 mg | ST | 190 bc |
| Aztec | 2.1G | 0.17 | Furrow | 187 bcd |
| DEFCON | 2.1G | 0.14 | Furrow | 185 bcd |
| Aztec | 2.1G | 0.17 | T-band | 183 bcd |
| Aztec | 4.67G | 0.14 | Furrow SB | 182 bcd |
| Force | 3G | 0.12 | Furrow | 181 bcd |
| Lorsban | 15G | 1.2 | T-band | 181 bcd |
| Aztec | 2.1G | 0.14 | Furrow | 180 bcd |
| Fortress | 5G | 0.185 | Furrow SB | 179 bcd |
| Aztec | 2.1G | 0.14 | T-band | 179 bcd |
| Force | 3G | 0.12 | T-band | 179 bcd |
| Capture | LFR | 0.09 | T-band | 178 bcd |
| Force+Poncho 250 | 3G | 0.12+ST | Furrow+ST | 177 bcd |
| Cruiser | 5FS | 1.25 mg | ST | 172 cde |
| Regent | 4SC | 0.12 | Furrow-M | 167 de |
| Poncho 250 | 600FS | 0.25 mg | ST | 167 de |
| CHECK | ---- | ---- | ---- | 156 e |

[1] Planted May 5, 2006; machine harvested October 12, 2006

[2] Ounces a.i. per 1,000 row-ft; Cruiser and Poncho ST listed as mg a.i. per seed

[3] T-band & Furrow = insecticide applied at planting time; SB = SmartBox application; ST = seed treatment; M = microtube application

[4] Means based on 4 observations (2-row trt x 91 row-ft/treatment x 4 replications)

[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 10. Average root-injury, product consistency, percent lodging, stand counts, and yield for YieldGard Plus and Herculex XTRA tests, Crawfordsville, IA, 2006[1]

YieldGard Plus on "trap crop corn" ground – see Crawfordsville tables 7–9

Test conducted on ground that had been planted to soybeans the previous year

| Treatment[2] | Place.[3] | Node-Injury[4,5] | Product Consistency[6,7] | Percent Lodging[7] | Stand Ct.[7] 17.5 row-ft | Yield[5] (bu/a) |
|---|---|---|---|---|---|---|
| YieldGard Plus | ---- | 0.000 a | 100 | 0 | 28.00 | 226 a |
| Force 3G | T-band | 0.003 ab | 100 | 0 | 27.88 | 215 ab |
| CHECK | ---- | 0.005 b | 100 | 0 | 28.50 | 202 b |

Test conducted on ground that had been planted to "trap crop corn" the previous year

| Treatment[8] | Place.[3] | Node-Injury[3,4] | Product Consistency[5,6] | Percent Lodging[5] | Stand Ct.[7] 17.5 row-ft | Yield[5] (bu/a) |
|---|---|---|---|---|---|---|
| Herculex XTRA | ---- | 0.02 a | 100 a | 0 a | 29.63 | 193 a |
| Force 3G | T-band | 0.15 a | 96 a | 0 a | 28.88 | 200 a |
| CHECK | ---- | 1.67 b | 0 b | 76 b | 28.88 | 174 b |

Test conducted on ground that had been planted to soybeans the previous year

| Treatment[8] | Place.[3] | Node-Injury[4,5] | Product Consistency[6,7] | Percent Lodging | Stand Ct.[7] 17.5 row-ft | Yield[7] (bu/a) |
|---|---|---|---|---|---|---|
| Herculex XTRA | ---- | 0.002 | 100 | 0 | 29.63 | 193 |
| Force 3G | T-band | 0.009 | 100 | 0 | 28.88 | 206 |
| CHECK | ---- | 0.010 | 100 | 0 | 28.88 | 208 |

[1] Planted April 27 – evaluation dates: stand counts June 4; root injury July 10; lodging September 25; yield October 12, 2006

[2] YieldGard Plus (DKC60-18); near-isoline seed for Force and CHECK (DKC60-19).

[3] T-band = insecticide applied at planting time

[4] Iowa State Node-Injury Scale (0–3). Number of full or partial nodes completely eaten

[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

[6] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

[7] No significant differences between means (ANOVA, $P \leq 0.05$)

[8] Herculex XTRA (Pioneer 34A18); seed for Force and CHECK (Pioneer 34A16, a Herculex I conversion of 34A15)

Table 11. Average root-injury, product consistency, percent lodging, stand counts, and yield for YieldGard Plus and Herculex XTRA tests, Kanawha, IA, 2006[1]

Test conducted on ground that had been planted to "trap crop corn" the previous year

| Treatment[2] | Place.[3] | Node-Injury[4,5] | Product Consistency[5,6] | Percent Lodging[7] | Stand Ct.[7] 20 row-ft | Yield[5] (bu/a) |
|---|---|---|---|---|---|---|
| YieldGard Plus | ---- | 0.01 a | 100 a | 0 | 33.25 | 234 a |
| Force 3G | T-band | 0.03 a | 100 a | 0 | 31.50 | 206 b |
| CHECK | ---- | 0.89 b | 15 b | 5 | 33.50 | 219 ab |

Test conducted on ground that had been planted to soybeans the previous year

| Treatment[2] | Place.[3] | Node-Injury[4,5] | Product Consistency[6,7] | Percent Lodging[7] | Stand Ct.[7] 20 row-ft | Yield[7] (bu/a) |
|---|---|---|---|---|---|---|
| YieldGard Plus | ---- | 0.002 a | 100 | 0 | 32.50 | 238 |
| Force 3G | T-band | 0.009 a | 100 | 0 | 33.00 | 222 |
| CHECK | ---- | 0.020 b | 100 | 0 | 33.00 | 224 |

Test conducted on ground that had been planted to "trap crop corn" the previous year

| Treatment[8] | Place.[3] | Node-Injury[4,5] | Product Consistency[5,6] | Percent Lodging[5] | Stand Ct.[7] 20 row-ft | Yield[7] (bu/a) |
|---|---|---|---|---|---|---|
| Herculex XTRA | ---- | 0.04 a | 100 a | 3 a | 32.25 | 204 |
| Force 3G | T-band | 0.12 a | 95 a | 0 a | 31.25 | 210 |
| CHECK | ---- | 1.39 b | 5 b | 43 b | 32.75 | 197 |

Test conducted on ground that had been planted to soybeans the previous year

| Treatment[8] | Place.[3] | Node-Injury[4,7] | Product Consistency[6,7] | Percent Lodging[7] | Stand Ct.[7] 20 row-ft | Yield[5] (bu/a) |
|---|---|---|---|---|---|---|
| Force 3G | T-band | 0.02 | 100 | 0 | 32.25 | 242 a |
| Herculex XTRA | ---- | 0.03 | 100 | 0 | 34.00 | 217 b |
| CHECK | ---- | 0.04 | 100 | 0 | 33.50 | 224 b |

[1] Planted May 8 – evaluation dates: stand counts June 6; root injury July 27; lodging September 22; yield October 10, 2006

[2] YieldGard Plus (DKC60-18); near-isoline seed for Force and CHECK (DKC60-19)

[3] T-band = insecticide applied at planting time

[4] Iowa State Node-Injury Scale (0–3). Number of full or partial nodes completely eaten

Table 11. Continued

[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

[6] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

[7] No significant differences between means (ANOVA, $P \leq 0.05$)

[8] Herculex XTRA (Pioneer 34A18); seed for Force and CHECK (Pioneer 34A16, a Herculex I conversion of 34A15)

Table 12. Average root-injury, product consistency, percent lodging, stand counts, and yield for Dow hybrids with the Herculex gene, Kanawha, IA, 2006[1]

| Treatment | Node-Injury[2,3,4] | Product Consist.[4,5] | % Lod.[6,7] | Stand Count[7,8] | Yield (bu/a)[7,9] |
|---|---|---|---|---|---|
| Herculex RW | 0.02 a | 100 a | 0 | 32.13 | 192 |
| Herculex XTRA | 0.03 a | 100 a | 0 | 32.13 | 190 |
| Near-Isoline Check | 1.09 b | 5 b | 3 | 32.88 | 185 |

[1] Planted May 8; evaluations – stand counts June 6, root injury July 27, lodging counts September 22, harvest October 10, 2006; Herculex RW (Mycogen 2D545) and Herculex XTRA (Mycogen 2E526) seed was treated with Cruiser at the rate of 0.25 mg/seed; near-isoline check is Mycogen 2E522

[2] Means based on 40 observations (2-row trt x 5 roots/row x 4 replications)

[3] Iowa State Node-Injury Scale (0–3). Number of full or partial nodes completely eaten

[4] Means sharing a common letter do not differ significantly according to Ryan's *Q* Test ($P \leq 0.05$)

[5] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

[6] Means based on 8 observations (number lodged/10 plants x 2-row treatment x 4 replications)

[7] No significant differences between means (ANOVA, $P \leq 0.05$)

[8] Means based on 8 observations (number plants/20 row-ft in each of 2 rows x 4 replications)

[9] Means based on 8 observations (20 row-ft harvested x 2-row treatment x 4 replications)

Table 13. Average root-injury, product consistency, percent lodging, stand counts, and yield for Stoller X-tra Power test, Kanawha, IA, 2006[1]

| Treatment | Node-Injury[3,4,5] | Product Consist.[5,6] | % Lod.[7,8] | Stand Count[8,9] | Yield (bu/a)[8,10] |
|---|---|---|---|---|---|
| Force 3G + X-Tra Power[2] | 0.04 a | 100 a | 5 | 31.50 | 210 |
| Force 3G | 0.06 a | 95 a | 0 | 31.25 | 211 |
| X-Tra Power[2] | 0.67 b | 25 b | 10 | 31.25 | 202 |
| CHECK | 0.94 b | 5 b | 5 | 31.50 | 205 |

[1] Planted May 8; evaluations – stand counts June 6, root injury July 27, lodging counts September 22, harvest October 10, 2006

[2] X-Tra Power applied at the rate of 2 pt/acre in 5 gallons of finished spray

[3] Means based on 20 observations (5 roots/row x 4 replications)

[4] Iowa State Node-Injury Scale (0–3). Number of full or partial nodes completely eaten

[5] Means sharing a common letter do not differ significantly according to Ryan's *Q* Test ($P \leq 0.05$)

[6] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

[7] Means based on 4 observations (number lodged/10 plants x 4 replications)

[8] No significant differences between means (ANOVA, $P \leq 0.05$)

[9] Means based on 4 observations (number plants/20 row-ft x 4 replications)

[10] Means based on 4 observations (20 row-ft harvested x 4 replications)

Table 14. Average root-injury, product consistency, percent lodging, stand counts, and yield for Syngenta seed treatment test, Kanawha, IA, 2006[1]

| Treatment | Node-Injury[3,4,5] | Product Consist.[5,6] | % Lod.[5,7] | Stand Count[5,8] | Yield (bu/a)[5,9] |
|---|---|---|---|---|---|
| STP15201[2] | 1.06 | 13 | 6 | 31.50 | 204 |
| A9765[2] | 1.33 | 4 | 9 | 31.63 | 197 |
| CHECK | 1.35 | 0 | 18 | 32.25 | 201 |

[1] Planted May 8; evaluations – stand counts June 6, root injury July 27, lodging counts September 22, harvest October 10, 2006

[2] Seed treatment

[3] Means based on 24 observations (2-row trt x 3 roots/row x 4 replications).

[4] Iowa State Node-Injury Scale (0–3). Number of full or partial nodes completely eaten

[5] No significant differences between means (ANOVA, $P \leq 0.05$)

[6] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

[7] Means based on 8 observations (number lodged/10 plants x 2-row treatment x 4 replications)

[8] Means based on 8 observations (number plants/20 row-ft x 2-row treatment x 4 replications)

[9] Means based on 8 observations (20 row-ft harvested x 2-row treatments x 4 replications)

Table 15. Average root-injury and product consistency for planting-time insecticide treatments, Special Bayer Yield test, Kanawah, IA, 2006[1]

Test conducted on ground that had been planted to “trap crop corn” the previous year

| Treatment | Seed Variety | Node-Injury[3,4,5] | Product Consist.[5,6] | % Lod.[5] | Stand Count[7,8] | Yield (bu/a)[8,9] |
|---|---|---|---|---|---|---|
| YieldGard Plus | DKC60-18 | 0.06 a | 100 a | 0 a | 28.88 | 210 |
| Aztec 2.1G Furrow[2] | DKC60-19 | 0.08 a | 96 a | 0 a | 30.25 | 205 |
| Aztec 2.1G Furrow[2] | Pioneer 34A16 | 0.24 a | 83 a | 0 a | 28.38 | 201 |
| CHECK | DKC60-19 | 1.47 b | 4 b | 9 a | 28.88 | 200 |
| CHECK | Pioneer 34A16 | 1.71 b | 0 b | 71 b | 29.50 | 199 |

Test conducted on ground that had been planted to soybeans the previous year

| Treatment | Seed Variety | Node-Injury[3,4,5] | Product Consist.[5,6] | % Lod.[8] | Stand Count[7,8] | Yield (bu/a)[5,9] |
|---|---|---|---|---|---|---|
| YieldGard Plus | DKC60-18 | 0.001 a | 100 a | 0 | 29.63 | 234 a |
| Aztec 2.1G Furrow[2] | DKC60-19 | 0.012 a | 100 a | 0 | 27.63 | 228 ab |
| Aztec 2.1G Furrow[2] | Pioneer 34A16 | 0.032 a | 100 a | 0 | 28.88 | 229 ab |
| CHECK | DKC60-19 | 0.044 a | 100 a | 0 | 29.38 | 221 b |
| CHECK | Pioneer 34A16 | 0.180 b | 83 b | 0 | 30.13 | 228 ab |

[1] Planted May 8 (4-row treatments, 100 ft long x 4 replications); stand counts June 1; root injury July 17; lodging September 22; yield October 10, 2006

[2] Applied at the rate of 0.14 ounces a.i. per 1,000 row-ft; Furrow = insecticide applied in-furrow at planting time.

[3] Means based on 24 observations (center 2-rows x 3 roots/row x 4 replications)

[4] Iowa State Node-Injury Scale (0–3). Number of full or partial nodes completely eaten

[5] Means sharing a common letter do not differ significantly according to Ryan’s Q Test ($P \leq 0.05$)

[6] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

Table 15. Continued

[7] Means based on 8 observations (number plants/17.5 row-ft x 2-row trt x 4 replications)

[8] No significant differences between means (ANOVA, $P \leq 0.05$)

[9] Means based on 4 observations (91 row-ft harvested x center 2-rows x 4 replications)

Table 16. Average root-injury and product consistency for planting-time insecticide treatments, yield test, Nashua, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | Node-Injury[4,5,6] | Product Consistency[6,7] |
|---|---|---|---|---|---|
| YieldGard Plus | Trans. | --- | --- | 0.01 a | 100 a |
| Aztec+Poncho 250 | 2.1G | 0.14+ST | Furrow+ST | 0.04 a | 100 a |
| Aztec | 2.1G | 0.14 | T-band | 0.06 a | 100 a |
| Aztec | 2.1G | 0.17 | Furrow | 0.06 a | 100 a |
| Force | 3G | 0.12 | T-band | 0.06 a | 100 a |
| Aztec+Poncho 1250 | 2.1G | 0.14+ST | Furrow+ST | 0.07 a | 100 a |
| Fortress | 2.5G | 0.225 | Furrow | 0.08 a | 100 a |
| DEFCON | 2.1G | 0.14 | Furrow | 0.08 a | 100 a |
| Force+Poncho 250 | 3G | 0.12+ST | Furrow+ST | 0.09 a | 96 ab |
| DEFCON | 2.1G | 0.14 | T-band | 0.09 a | 96 ab |
| Force | 3G | 0.12 | Furrow | 0.10 a | 96 ab |
| Aztec | 2.1G | 0.14 | Furrow | 0.10 a | 96 ab |
| Aztec | 4.67G | 0.14 | Furrow SB | 0.14 a | 92 ab |
| Regent | 4SC | 0.12 | Furrow-M | 0.18 a | 92 ab |
| Capture | LFR | 0.09 | T-band | 0.21 a | 76 ab |
| Fortress | 5G | 0.225 | Furrow SB | 0.23 a | 88 ab |
| Lorsban | 15G | 1.2 | T-band | 0.31 a | 75 ab |
| Poncho 1250 | 600FS | 1.25 mg | ST | 0.35 a | 67 bc |
| Cruiser | 5FS | 1.25 mg | ST | 0.63 b | 46 cd |
| Poncho 250 | 600FS | 0.25 mg | ST | 0.70 b | 27 d |
| CHECK | ---- | ---- | ---- | 1.72 c | 0 e |

[1] Planted May 5, 2006; evaluated July 17, 2006

[2] Ounces a.i. per 1,000 row-ft; Cruiser and Poncho ST listed as mg a.i. per seed

[3] T-band & Furrow = insecticide applied at planting time; SB = SmartBox application; ST = seed treatment; M = microtube application

[4] Chemical and check means based on 24 observations (2-row trts x 3 roots/row x 4 replications)

[5] Iowa State Node-Injury Scale (0–3). Number of full or partial nodes completely eaten

[6] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

[7] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

Table 17. Average stand counts for planting-time insecticide treatments, yield test, Nashua, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | Stand Count[4,5] |
|---|---|---|---|---|
| YieldGard Plus | Trans. | ---- | ---- | 31.13 |
| Aztec | 2.1G | 0.14 | Furrow | 30.50 |
| CHECK | ---- | ---- | ---- | 30.38 |
| Aztec | 2.1G | 0.14 | T-band | 30.25 |
| Capture | LFR | 0.09 | T-band | 29.63 |
| Fortress | 2.5G | 0.225 | Furrow | 29.63 |
| Force | 3G | 0.12 | Furrow | 29.63 |
| Lorsban | 15G | 1.2 | T-band | 29.50 |
| Force | 3G | 0.12 | T-band | 29.50 |
| Poncho 1250 | 600FS | 1.25 mg | ST | 29.50 |
| DEFCON | 2.1G | 0.14 | Furrow | 29.13 |
| DEFCON | 2.1G | 0.14 | T-band | 29.00 |
| Poncho 250 | 600FS | 0.25 mg | ST | 28.88 |
| Regent | 4SC | 0.12 | Furrow-M | 28.88 |
| Aztec+Poncho 250 | 2.1G | 0.14+ST | Furrow+ST | 28.75 |
| Aztec | 4.67G | 0.14 | Furrow SB | 28.75 |
| Aztec | 2.1G | 0.17 | Furrow | 28.38 |
| Cruiser | 5FS | 1.25 mg | ST | 28.38 |
| Aztec+Poncho 1250 | 2.1G | 0.14+ST | Furrow+ST | 28.25 |
| Fortress | 5G | 0.225 | Furrow SB | 28.25 |
| Force+Poncho 250 | 3G | 0.12+ST | Furrow+ST | 27.75 |

[1] Planted May 5, 2006; evaluated June 1, 2006

[2] Ounces a.i. per 1,000 row-ft; Cruiser and Poncho ST listed as mg a.i. per seed

[3] T-band & Furrow = insecticide applied at planting time; SB = SmartBox application; ST = seed treatment; M = microtube application

[4] Means based on 8 observations (2-row trt x 17.5 row-ft/treatment x 4 replications).

[5] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 18. Average percent lodging for planting-time insecticide treatments, yield test, Nashua, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | % Lodging[4,5] |
|---|---|---|---|---|
| Aztec | 2.1G | 0.14 | Furrow | 0 a |
| Aztec | 2.1G | 0.14 | T-band | 0 a |
| Aztec | 2.1G | 0.17 | Furrow | 0 a |
| Aztec | 4.67G | 0.14 | Furrow SB | 0 a |
| Aztec+Poncho 1250 | 2.1G | 0.14+ST | Furrow+ST | 0 a |
| Aztec+Poncho 250 | 2.1G | 0.14+ST | Furrow+ST | 0 a |
| Capture | LFR | 0.09 | T-band | 0 a |
| Cruiser | 5FS | 1.25 mg | ST | 0 a |
| DEFCON | 2.1G | 0.14 | Furrow | 0 a |
| DEFCON | 2.1G | 0.14 | T-band | 0 a |
| Force | 3G | 0.12 | Furrow | 0 a |
| Force | 3G | 0.12 | T-band | 0 a |
| Force+Poncho 250 | 3G | 0.12+ST | Furrow+ST | 0 a |
| Fortress | 2.5G | 0.225 | Furrow | 0 a |
| Fortress | 5G | 0.225 | Furrow SB | 0 a |
| Lorsban | 15G | 1.2 | T-band | 0 a |
| Poncho 1250 | 600FS | 1.25 mg | ST | 0 a |
| Poncho 250 | 600FS | 0.25 mg | ST | 0 a |
| Regent | 4SC | 0.12 | Furrow-M | 0 a |
| YieldGard Plus | Trans. | ---- | ---- | 0 a |
| CHECK | ---- | ---- | ---- | 5 b |

[1] Planted May 5, 2006; evaluated October 6, 2006

[2] Ounces a.i. per 1,000 row-ft; Cruiser and Poncho ST listed as mg a.i. per seed

[3] T-band & Furrow = insecticide applied at planting time; SB = SmartBox application; ST = seed treatment; M = microtube application

[4] Means based on 4 observations (number lodged/10 plants x 4 replications)

[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 19. Average yield for planting-time insecticide treatments, yield test, Nashua, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | Bushels/ Acre[4,5] |
|---|---|---|---|---|
| YieldGard Plus | Trans. | ---- | ---- | 214 a |
| Aztec+Poncho 1250 | 2.1G | 0.14+ST | Furrow+ST | 189 b |
| Aztec+Poncho 250 | 2.1G | 0.14+ST | Furrow+ST | 183 bc |
| Force+Poncho 250 | 3G | 0.12+ST | Furrow+ST | 182 bcd |
| Aztec | 4.67G | 0.14 | Furrow SB | 181 bcd |
| Capture | LFR | 0.09 | T-band | 180 bcd |
| DEFCON | 2.1G | 0.14 | T-band | 178 bcd |
| Lorsban | 15G | 1.2 | T-band | 178 bcd |
| Force | 3G | 0.12 | Furrow | 177 bcd |
| Force | 3G | 0.12 | T-band | 177 bcd |
| Poncho 1250 | 600FS | 1.25 mg | ST | 177 bcd |
| Aztec | 2.1G | 0.17 | Furrow | 177 bcd |
| Cruiser | 5FS | 1.25 mg | ST | 176 bcd |
| DEFCON | 2.1G | 0.14 | Furrow | 176 bcd |
| Aztec | 2.1G | 0.14 | Furrow | 175 bcd |
| Fortress | 5G | 0.225 | Furrow SB | 173 bcd |
| Regent | 4SC | 0.12 | Furrow-M | 173 bcd |
| Fortress | 2.5G | 0.225 | Furrow | 171 bcd |
| Aztec | 2.1G | 0.14 | T-band | 170 bcd |
| Poncho 250 | 600FS | 0.25 mg | ST | 167 cd |
| CHECK | ---- | ---- | ---- | 162 d |

[1] Planted May 5, 2006; machine harvested October 12, 2006

[2] Ounces a.i. per 1,000 row-ft; Cruiser and Poncho ST listed as mg a.i. per seed

[3] T-band & Furrow = insecticide applied at planting time; SB = SmartBox application; ST = seed treatment; M = microtube application

[4] Means based on 4 observations (2-row trt x 91 row-ft/treatment x 4 replications)

[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 20. Average root-injury, product consistency, percent lodging, stand counts, and yield for YieldGard Plus and Herculex XTRA tests, Nashua, IA, 2006[1]

YieldGard Plus following "trap crop corn" - see previous Nashua tables 16-19

Test conducted on ground that had been planted to soybeans the previous year

| Treatment[2] | Place.[3] | Node-Injury[4,5] | Product Consistency[6,7] | Percent Lodging[7] | Stand Ct.[7] 17.5 row-ft | Yield[5] (bu/a) |
|---|---|---|---|---|---|---|
| YieldGard Plus | ---- | 0.00 a | 100 | 0 | 27.25 | 225 a |
| Force 3G | T-band | 0.00 a | 100 | 0 | 28.25 | 209 b |
| CHECK | ---- | 0.01 b | 100 | 0 | 28.25 | 198 c |

Test conducted on ground that had been planted to "trap crop corn" the previous year

| Treatment[8] | Place.[3] | Node-Injury[4,5] | Product Consistency[5,6] | Percent Lodging[5] | Stand Ct.[7] 17.5 row-ft | Yield[5] (bu/a) |
|---|---|---|---|---|---|---|
| Herculex XTRA | ---- | 0.03 a | 100 a | 5 a | 28.88 | 210 a |
| Force 3G | T-band | 0.21 a | 92 a | 0 a | 30.38 | 202 a |
| CHECK | ---- | 2.07 b | 0 b | 16 b | 28.25 | 172 b |

Test conducted on ground that had been planted to soybeans the previous year

| Treatment[8] | Place.[3] | Node-Injury[4,5] | Product Consistency[6,7] | Percent Lodging[7] | Stand Ct.[7] 17.5 row-ft | Yield[5] (bu/a) |
|---|---|---|---|---|---|---|
| Herculex XTRA | ---- | 0.002 a | 100 | 0 | 29.63 | 199 b |
| Force 3G | T-band | 0.003 a | 100 | 0 | 30.13 | 214 a |
| CHECK | ---- | 0.012 b | 100 | 0 | 28.63 | 216 a |

[1] Planted May 5 – evaluation dates: stand counts June 1; root injury July 17; lodging October 6; yield October 12, 2006

[2] YieldGard Plus (DKC60-18); near-isoline seed for Force and CHECK (DKC60-19)

[3] T-band = insecticide applied at planting time

[4] Iowa State Node-Injury Scale (0–3). Number of full or partial nodes completely eaten

[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

[6] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

[7] No significant differences between means (ANOVA, $P \leq 0.05$)

[8] Herculex XTRA (Pioneer 34A18); seed for Force and CHECK (Pioneer 34A16, a Herculex I conversion of 34A15)

Table 21. Average root-injury and product consistency for planting-time insecticide treatments, experimental test, Sutherland, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | Node-Injury[4,5,6] | Product Consistency[6,7] |
|---|---|---|---|---|---|
| YieldGard Plus | Trans. | ---- | ---- | 0.01 a | 100 a |
| Fortress AMV-B | 2.5G | 0.15 | Furrow | 0.03 a | 100 a |
| Fortress | 5G | 0.15 | Furrow SB | 0.03 a | 100 a |
| Fortress AMV-C | 2.5G | 0.15 | Furrow | 0.04 ab | 100 a |
| Aztec | 2.1G | 0.14 | T-band | 0.04 ab | 100 a |
| Aztec | 2.1G | 0.17 | T-band | 0.04 ab | 100 a |
| Fortress AMV-A | 2.5G | 0.15 | Furrow | 0.04 ab | 100 a |
| A14974 | 250CS | 0.12 | T-band | 0.05 ab | 100 a |
| A14974 | 250CS | 0.09 | T-band | 0.05 ab | 100 a |
| A14974 | 250CS | 0.12 | Furrow | 0.07 ab | 100 a |
| Aztec+Poncho 1250 | 2.1G | 0.14+ST | Furrow+ST | 0.08 ab | 100 a |
| Aztec | 2.1G | 0.14 | Furrow | 0.08 ab | 100 a |
| Capture | LFR | 0.09 | T-band | 0.09 ab | 95 a |
| Force | 3G | 0.12 | T-band | 0.10 ab | 100 a |
| A14974 | 250CS | 0.15 | T-band | 0.12 ab | 100 a |
| Capture | LFR | 0.09 | Furrow | 0.14 ab | 95 a |
| A14974 | 250CS | 0.09 | Furrow | 0.15 ab | 100 a |
| Force | 3G | 0.12 | Furrow | 0.15 ab | 95 a |
| Aztec | 2.1G | 0.17 | Furrow | 0.15 ab | 90 a |
| Aztec+Poncho 250 | 2.1G | 0.14+ST | Furrow+ST | 0.16 ab | 100 a |
| A14974 | 250CS | 0.15 | Furrow | 0.17 ab | 95 a |
| Capture+Poncho 1250 | LFR | 0.075 | T-band | 0.19 ab | 80 abc |
| Aztec | 4.67G | 0.14 | Furrow SB | 0.20 ab | 85 ab |
| Capture w/starter fert. | LFR | 0.09 | Furrow | 0.32 ab | 60 abcd |
| Regent | 4SC | 0.12 | Furrow-M | 0.54 abc | 50 bcde |
| V-10170 | 2.32 SC | 1.25 mg | ST | 0.56 abc | 45 cde |
| V-10112 | 1.77SC | 1.50 mg | ST | 0.76 abcd | 20 ef |
| Cruiser | 5FS | 0.25 mg | ST | 0.82 bcd | 20 ef |
| V-10194 | ---EC | 1.50 mg | ST | 1.14 cde | 25 de |
| V-10194 | ---EC | 1.25 mg | ST | 1.16 cde | 0 f |
| V-10112 | 1.77SC | 1.25 mg | ST | 1.22 cde | 15 ef |
| EXP1A | 2SC | 0.23 | Furrow-M | 1.40 def | 0 f |
| Cruiser | 5FS | 1.25 mg | ST | 1.57 ef | 15 ef |
| Poncho 250 | 600FS | 0.25 mg | ST | 1.83 ef | 0 f |
| CHECK | ---- | ---- | ---- | 2.01 f | 0 f |

[1] Planted May 10, 2006; evaluated July 24, 2006

[2] Ounces a.i. per 1,000 row-ft; seed treatments (ST) listed as mg a.i. per seed.

[3] T-band & Furrow = insecticide applied at planting time; SB= SmartBox application; ST = seed treatment; M= microtube application

[4] Chemical and check means based on 20 observations (5 roots/row x 4 replications)

Table 21. Continued

[5] Iowa State Node-Injury Scale (0–3). Number of full or partial nodes completely eaten

[6] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

[7] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

Table 22. Average stand counts for planting-time insecticide treatments, experimental test, Sutherland, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | Stand Count[4,5] |
|---|---|---|---|---|
| A14974 | 250CS | 0.15 | T-band | 34.50 a |
| Fortress AMV-C | 2.5G | 0.15 | Furrow | 34.00 a |
| Capture w/starter fert. | LFR | 0.09 | Furrow | 34.00 a |
| Aztec | 2.1G | 0.14 | Furrow | 33.75 a |
| Aztec | 4.67G | 0.14 | Furrow SB | 33.50 a |
| YieldGard Plus | Trans. | ---- | ---- | 33.50 a |
| Regent | 4SC | 0.12 | Furrow-M | 33.50 a |
| Capture | LFR | 0.09 | T-band | 33.50 a |
| Fortress AMV-B | 2.5G | 0.15 | Furrow | 33.25 a |
| V-10194 | ---EC | 1.50 mg | ST | 33.00 a |
| Aztec | 2.1G | 0.17 | Furrow | 33.00 a |
| EXP1A | 2SC | 0.23 | Furrow-M | 32.75 a |
| Aztec+Poncho 250 | 2.1G | 0.14+ST | Furrow+ST | 32.75 a |
| Cruiser | 5FS | 0.25 mg | ST | 32.75 a |
| Force | 3G | 0.12 | Furrow | 32.75 a |
| A14974 | 250CS | 0.09 | T-band | 32.75 a |
| Capture | LFR | 0.09 | Furrow | 32.75 a |
| Aztec | 2.1G | 0.14 | T-band | 32.75 a |
| Fortress AMV-A | 2.5G | 0.15 | Furrow | 32.50 a |
| Aztec+Poncho 1250 | 2.1G | 0.14+ST | Furrow+ST | 32.50 a |
| A14974 | 250CS | 0.09 | Furrow | 32.50 a |
| Capture+Poncho 1250 | LFR | 0.075 | T-band | 32.50 a |
| V-10194 | ---EC | 1.25 mg | ST | 32.25 a |
| A14974 | 250CS | 0.12 | Furrow | 32.25 a |
| Force | 3G | 0.12 | T-band | 32.00 a |
| Aztec | 2.1G | 0.17 | T-band | 32.00 a |
| A14974 | 250CS | 0.15 | Furrow | 31.75 a |
| Fortress | 5G | 0.15 | Furrow SB | 31.50 a |
| Poncho 250 | 600FS | 0.25 mg | ST | 31.25 a |
| Cruiser | 5FS | 1.25 mg | ST | 31.00 a |
| CHECK | ---- | ---- | ---- | 31.00 a |
| V-10170 | 2.32 SC | 1.25 mg | ST | 31.75 a |
| A14974 | 250CS | 0.12 | T-band | 31.75 a |
| V-10112 | 1.77SC | 1.25 mg | ST | 22.50 b |
| V-10112 | 1.77SC | 1.50 mg | ST | 19.50 b |

[1] Planted May 10, 2006; evaluated June 8, 2006

[2] Ounces a.i. per 1,000 row-ft; seed treatments (ST) listed as mg a.i. per seed

[3] T-band & Furrow = insecticide applied at planting time; SB = SmartBox application; ST = seed treatment; M = microtube application

Table 22. Continued

[4] Means based on 4 observations (20 row-ft/treatment x 4 replications)

[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 23. Average percent lodging for planting-time insecticide treatments, experimental test, Sutherland, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | % Lodging[4,5] |
|---|---|---|---|---|
| Aztec | 2.1G | 0.14 | T-band | 0 a |
| Aztec | 2.1G | 0.17 | T-band | 0 a |
| Aztec+Poncho 250 | 2.1G | 0.14+ST | Furrow+ST | 0 a |
| A14974 | 250CS | 0.09 | T-band | 0 a |
| A14974 | 250CS | 0.12 | T-band | 0 a |
| A14974 | 250CS | 0.15 | T-band | 0 a |
| Fortress AMV-C | 2.5G | 0.15 | Furrow | 0 a |
| Aztec+Poncho 1250 | 2.1G | 0.14+ST | Furrow+ST | 3 ab |
| Force | 3G | 0.12 | Furrow | 3 ab |
| A14974 | 250CS | 0.09 | Furrow | 3 ab |
| A14974 | 250CS | 0.12 | Furrow | 3 ab |
| Capture+Poncho 1250 | LFR | 0.075 | T-band | 3 ab |
| Aztec | 4.67G | 0.14 | Furrow SB | 5 ab |
| Force | 3G | 0.12 | T-band | 5 ab |
| Cruiser | 5FS | 0.25 mg | ST | 8 ab |
| A14974 | 250CS | 0.15 | Furrow | 8 ab |
| Capture | LFR | 0.09 | Furrow | 8 ab |
| Capture | LFR | 0.09 | T-band | 8 ab |
| Capture w/starter fert. | LFR | 0.09 | Furrow | 8 ab |
| Aztec | 2.1G | 0.14 | Furrow | 8 ab |
| Aztec | 2.1G | 0.17 | Furrow | 8 ab |
| Regent | 4SC | 0.12 | Furrow-M | 10 ab |
| Fortress AMV-A | 2.5G | 0.15 | Furrow | 13 ab |
| Fortress AMV-B | 2.5G | 0.15 | Furrow | 13 ab |
| Fortress | 5G | 0.15 | Furrow SB | 18 ab |
| V-10112 | 1.77SC | 1.50 mg | ST | 18 ab |
| V-10194 | ---EC | 1.50 mg | ST | 18 ab |
| V-10112 | 1.77SC | 1.25 mg | ST | 20 ab |
| V-10170 | 2.32 SC | 1.25 mg | ST | 20 ab |
| EXP1A | 2SC | 0.23 | Furrow-M | 23 ab |
| V-10194 | ---EC | 1.25 mg | ST | 25 ab |
| CHECK | ---- | ---- | ---- | 25 ab |
| Poncho 250 | 600FS | 0.25 mg | ST | 33 ab |
| Cruiser | 5FS | 1.25 mg | ST | 35 ab |
| YieldGard Plus | Trans. | ---- | ---- | 40 b |

[1] Planted May 10, 2006; evaluated September 13, 2006

[2] Ounces a.i. per 1,000 row-ft; seed treatments (ST) listed as mg a.i. per seed

[3] T-band & Furrow = insecticide applied at planting time; SB = SmartBox application; ST = seed treatment; M = microtube application

Table 23. Continued

[4] Means based on 4 observations (number lodged/10 plants x 4 replications)

[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 24. Average root-injury, product consistency, percent lodging, stand counts, and yield for YieldGard Plus and Herculex XTRA tests, Sutherland, IA, 2006[1]

Test conducted on ground that had been planted to "trap crop corn" the previous year

| Treatment[2] | Place.[3] | Node-Injury[4,5] | Product Consistency[5,6] | Percent Lodging[5] | Stand Ct.[7] 20 row-ft | Yield[5] (bu/a) |
|---|---|---|---|---|---|---|
| YieldGard Plus | ---- | 0.03 a | 100 a | 27 b | 33.75 | 219 a |
| Force 3G | T-band | 0.05 a | 100 a | 7 a | 34.50 | 184 b |
| CHECK | ---- | 1.96 b | 0 b | 33 b | 32.00 | 143 c |

Test conducted on ground that had been planted to "trap crop corn" the previous year

| Treatment[8] | Place.[3] | Node-Injury[4,5] | Product Consistency[5,6] | Percent Lodging[7] | Stand Ct.[7] 20 row-ft | Yield[7] (bu/a) |
|---|---|---|---|---|---|---|
| Herculex XTRA | ---- | 0.06 a | 100 a | 97 | 33.25 | 182 |
| Force 3G | T-band | 0.12 a | 95 a | 83 | 31.25 | 162 |
| CHECK | ---- | 1.59 b | 0 b | 93 | 32.50 | 149 |

[1] Planted May 10 - evaluation dates: stand counts June 8; root injury July 24; lodging September 13; yield October 31, 2006

[2] YieldGard Plus (DKC60-18); near-isoline seed for Force and CHECK (DKC60-19)

[3] T-band = insecticide applied at planting time

[4] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten

[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

[6] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

[7] No significant differences between means (ANOVA, $P \leq 0.05$)

[8] Herculex XTRA (Pioneer 34A18); seed for Force and CHECK (Pioneer 34A16, a Herculex I conversion of 34A15)

Table 25. Average root-injury, product consistency, percent lodging, stand counts, and yield for Syngenta seed treatment test, Sutherland, IA, 2006[1]

| Treatment | Node-Injury[3,4,5] | Product Consist.[5,6] | % Lod.[6,8] | Stand Count[5,9] | Yield (bu/a)[5,10] |
|---|---|---|---|---|---|
| STP15201[2] | 1.69 | 0 | 100 b | 33.63 | 115 |
| A9765[2] | 2.07 | 0 | 100 b | 33.50 | 128 |
| CHECK | 2.07 | 0 | 80 a | 32.50 | 150 |

[1] Planted May 10; evaluations – stand counts June 8, root injury July 24; lodging counts September 13; yield October 31, 2006

[2] Seed treatment

[3] Means based on 24 observations (2-row trt x 3 roots/row x 4 replications)

[4] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely pruned

[5] No significant differences between means (ANOVA, $P \leq 0.05$)

[6] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

[7] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

[8] Means based on 4 observations (number lodged/10 plants x 4 replications)

[9] Means based on 8 observations (number plants/20 row-ft x 2-row trt x 4 replications)

[10] Means based on 4 observations (20 ft x 2-row trt x 4 replications)

Table 26. Average stand counts for planting-time insecticide treatments, wireworm test, Spring Hill, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | Stand Count[4,5] |
|---|---|---|---|---|
| AGST 03001 | ST | 1.5 oz mat./42# sd | ST | 31.75 |
| V-10112 | 1.77 SC | 0.25 mg ai/sd | ST | 31.00 |
| Poncho 1250+03001 | 5FS | ST+1.5 oz mat./42#sd | ST | 29.75 |
| V-10170 | 2.32 SC | 0.25 mg ai/sd | ST | 29.75 |
| V-10112 | 1.77 | 0.35 mg ai/sd | ST | 29.75 |
| V-10194 | EC | 0.30 mg ai/sd | | 29.75 |
| Poncho 1250 | 600FS | 1.25 mg ai/sd | ST | 29.75 |
| Cruiser | 5FS | 0.25 mg ai/sd | ST | 29.50 |
| CHECK | ---- | ---- | ---- | 29.50 |
| Aztec | 4.67G | 2 oz | Furrow SB | 29.25 |
| V-10170 | 2.32 SC | 0.35 mg ai/sd | ST | 29.25 |
| V-10194 | EC | 0.25 mg ai/sd | ST | 29.25 |
| Fortress | 5G | 1.5 oz | Furrow SB | 29.00 |
| Force | 3G | 5 oz | Furrow | 29.00 |
| Aztec | 2.1G | 6.7 oz | Furrow | 29.00 |
| Fortress | 5G | 2 oz | Furrow SB | 28.75 |
| Fortress | 5G | 1 oz | Furrow SB | 28.00 |
| Aztec | 4.67G | 1 oz | Furrow SB | 28.00 |
| Aztec | 4.67G | 1.5 oz | Furrow SB | 28.00 |
| Regent | 750 TS | --- | ST | 27.75 |

[1] Planted May 6, 2006; evaluated June 2, 2006

[2] Granular formulations expressed as ounces material per 1,000 row-ft

[3] ST = seed treatment; Furrow = insecticide applied at planting time; SB = SmartBox

[4] Means based on 4 observations (17.5 row-ft/treatment x 4 replications)

[5] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 27. Average percentage of damaged seeds/seedlings and damage ratings for planting-time insecticide treatments, wireworm test, Spring Hill, IA, 2006[1]

| Treatment | Form. | Rate[2] | Placement[3] | % Dam.[4,5] | Damage Rating[5,6] |
|---|---|---|---|---|---|
| Fortress | 5G | 1 oz | Furrow SB | 0 | 1.00 |
| Cruiser | 5FS | 0.25 mg ai/sd | ST | 5 | 1.05 |
| V-10194 | EC | 0.25 mg ai/sd | ST | 5 | 1.05 |
| Poncho 1250 | 600FS | 1.25 mg ai/sd | ST | 5 | 1.05 |
| V-10112 | 1.77 SC | 0.35 mg ai/sd | ST | 5 | 1.10 |
| V-10170 | 2.32 SC | 0.30 mg ai/sd | ST | 5 | 1.15 |
| Fortress | 5G | 1.5 oz | Furrow SB | 10 | 1.10 |
| Fortress | 5G | 2 oz | Furrow SB | 10 | 1.10 |
| Aztec | 4.67G | 1 oz | Furrow SB | 10 | 1.10 |
| Force | 3G | 5 oz | Furrow | 10 | 1.10 |
| Regent | 750 TS | --- | ST | 10 | 1.15 |
| Aztec | 4.67G | 2 oz | Furrow SB | 10 | 1.15 |
| Aztec | 2.1G | 6.7 oz | Furrow | 10 | 1.15 |
| V-10112 | 1.77 SC | 0.25 mg ai/sd | ST | 10 | 1.20 |
| AGST 03001 | ST | 1.5 oz mat./42# sd | ST | 20 | 1.30 |
| Poncho 1250+03001 | 5FS | ST+1.5 oz | ST | 20 | 1.25 |
| V-10194 | EC | 0.25 mg ai/sd | | 21 | 1.31 |
| V-10170 | 2.32 SC | 0.35 mg ai/sd | ST | 25 | 1.25 |
| Aztec | 4.67G | 1.5 oz | Furrow SB | 25 | 1.45 |
| CHECK | ---- | ---- | ---- | 30 | 1.40 |

[1] Planted May 6, 2006; evaluated June 2, 2006

[2] Granular formulations expressed as ounces material per 1,000 row-ft

[3] ST = seed treatment; Furrow = insecticide applied at planting time; SB = SmartBox

[4] Means based on 20 observations (5-plants evaluated/treatment x 4 replications)

[5] No significant differences between means (ANOVA, $P \leq 0.05$)

[6] Rating scale: (1) seed/seedling undamaged, (2) seed/seedling damaged but plant established, (3) seed/seedling damaged, plant showing some signs of stress, (4) seed/seedling damaged, no plant or questionable establishment

Table 28. Average stand counts for planting-time insecticide treatments, seedcorn maggot test, Ames, IA, 2006[1]

| Insecticide | Form. | Rate[2] | Placement[3] | Stand Count[4,5] |
|---|---|---|---|---|
| Unbaited Check | ---- | ---- | ---- | 22.00 |
| Poncho 1250+03001 | 5FS | ST+1.5 oz | ST | 21.25 |
| Aztec | 2.1 G | 3.4 oz | Furrow | 21.00 |
| Poncho 1250 | 600FS | 1.25 mg ai/sd | ST | 21.00 |
| Fortress | 2.5G | 4 oz | Furrow | 20.75 |
| Fortress | 2.5G | 3 oz | Furrow | 20.50 |
| Aztec | 2.1G | 4.5 oz | Furrow | 20.50 |
| Force | 3G | 5 oz | Furrow | 20.25 |
| Fortress | 2.5G | 2 oz | Furrow | 20.00 |
| Baited Check | ---- | ---- | ---- | 19.75 |
| Regent | 750 TS | --- | ST | 19.50 |
| Aztec | 2.1G | 2.2 oz | Furrow | 19.25 |
| Aztec | 2.1G | 6.7 oz | Furrow | 19.25 |
| AGST 03001 | ST | 1.5 oz mat./42# sd | ST | 18.50 |
| Cruiser | 5FS | 0.25 mg ai/sd | ST | 18.50 |

[1] Row furrows baited May 8 & re-baited May 12; hand planted and insecticide treatments applied May 15; stand counts taken on May 31, 2006

[2] Granular formulations as ounces material per 1,000 row-ft

[3] ST = seed treatment; Furrow = insecticide applied at planting time

[4] Means based on 4 observations (15 row-ft/treatment x 4 replications)

[5] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 29. Average percentage of damaged seeds/seedlings and damage ratings for planting-time insecticide treatments, seedcorn maggot test, Ames, IA, 2006[1]

| Insecticide | Form. | Rate[2] | Place.[3] | % Damage[4,5] | Damage Rating[4,5,6] |
|---|---|---|---|---|---|
| Aztec | 2.1G | 6.7 oz | Furrow | 0 a | 1.00 a |
| Fortress | 2.5G | 3 oz | Furrow | 3 a | 1.03 a |
| Aztec | 2.1 G | 3.4 oz | Furrow | 3 a | 1.03 a |
| Force | 3G | 5 oz | Furrow | 3 a | 1.03 a |
| Unbaited Check | ---- | ---- | ---- | 3 a | 1.03 a |
| Fortress | 2.5G | 2 oz | Furrow | 8 a | 1.03 a |
| Poncho 1250 | 600FS | 1.25 mg ai/sd | ST | 10 a | 1.10 ab |
| Fortress | 2.5G | 4 oz | Furrow | 10 a | 1.10 ab |
| Aztec | 2.1G | 4.5 oz | Furrow | 10 a | 1.13 ab |
| Cruiser | 5FS | 0.25 mg ai/sd | ST | 10 a | 1.13 ab |
| Aztec | 2.1G | 2.2 oz | Furrow | 11 a | 1.14 ab |
| Regent | 750 TS | --- | ST | 13 a | 1.19 ab |
| Poncho 1250+03001 | 5FS | ST+1.5 oz | ST | 18 a | 1.18 ab |
| AGST 03001 | ST | 1.5 oz mat./42# | ST | 34 ab | 1.47 bc |
| Baited Check | ---- | ---- | ---- | 59 b | 1.70 c |

[1] Row furrows baited May 8 & re-baited May 12; hand planted and insecticide treatments applied May 15; evaluated for damage on May 31, 2006

[2] Granular formulations expressed as material per 1,000 row-ft

[3] ST = seed treatment; Furrow = insecticide applied at planting time with Noble units

[4] Means based on 40 observations (two 5-plant evaluations/treatment x 4 replications)

[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

[6] Rating scale: (1) seed/seedling undamaged, (2) seed/seedling damaged but plant established, (3) seed/seedling damaged, plant showing some signs of stress, (4) seed/seedling damaged, no plant or questionable establishment

# APPENDIX I

## Agronomic Information

2006
Field History Data

| | Ames, IA<br>Corn Rootworm Tests<br>(following trap crop) | Crawfordsville, IA<br>Corn Rootworm Tests<br>(following trap crop) |
|---|---|---|
| Insecticide History | | |
| 2005 | No Insecticide (trap crop) | No Insecticide (trap crop) |
| 2004 | No Insecticide (soybeans) | Insecticide Test Plot |
| 2003 | Insecticide Test Plot | No Insecticide (trap crop) |
| 2002 | No Insecticide (trap crop) | Insecticide Test Plot |
| Tillage | Fall chisel; spring cult. | Fall chisel; spring cult. |
| Variety | DKC60-18 & DKC60-19<br>Pioneer 34A18 & 34A16 | DKC60-18 & DKC60-19<br>Pioneer 34A18 & 34A16 |
| Planting Date | May 4 | April 27 |
| Planting Rate | 29,900 | 29,900 |
| Herbicide[1] | 2 qt Harness Extra – April 24; 0.76 oz Beacon – June 13 | 2.5 pt Dual II Magnum – May 5; 1 qt Laddok S-12– May 27 |
| Fertilizer[2] | N P K | N P K |
| Fall Applied | --- --- --- | --- --- --- |
| Preplant | 156 --- --- | 120 --- ---<br>3 ton lime - Nov. 6 |
| Dates | | |
| Cultivation | None | None |
| Stand Count | June 2 | June 5 |
| Root Digging | July 19 (Exp.); Aug. 7 (trans.) | July 10 |
| Lodging | October 2 | September 25 |
| Harvest | October 30 | October 12 |
| Soil Type | Clay Loam | Silty Clay Loam |
| Soil Organic Matter % | --- | 4.70 |
| Soil pH | --- | 5.10 |

[1]Expressed as formulation per acre
[2]Expressed as pounds per acre

## 2006
## Field History Data

| | Crawfordsville, IA<br>Corn Rootworm Tests<br>(following soybeans) | Kanawha, IA<br>Corn Rootworm Tests<br>(following trap crop) |
|---|---|---|
| Insecticide History | | |
| 2005 | No Insecticide (soybeans) | No Insecticide (trap crop) |
| 2004 | No Insecticide (corn) | No Insecticide (corn) |
| 2003 | No Insecticide (soybeans) | No Insecticide (soybeans) |
| 2002 | No Insecticide (corn) | Force 3G (corn) |
| Tillage | Spring disked and field cult. | Fall chisel; spring disk and field cult. |
| Variety | DKC60-18 & DKC60-19<br>Pioneer 34A18 & 34A16 | See table footnotes |
| Planting Date | April 27 | May 8 |
| Planting Rate | 29,900 | 29,900 |
| Herbicide[1] | 2.5 pt Dual II Magnum – April 16; 1 qt Laddok S-12 – May 31 | 19 oz Outlook – May 9; 0.4 pt Clarity + 6 oz Attrex 9-0 – May 30 |
| Fertilizer[2] | <u>N</u> <u>P</u> <u>K</u> | <u>N</u> <u>P</u> <u>K</u> |
| Fall Applied | --- --- --- | --- --- --- |
| Preplant | 190 --- ---<br>3 ton lime | 153 133 --- |
| Dates | | |
| Cultivation | none | none |
| Stand Count | June 5 | June 6 |
| Root Digging | July 10 | July 27 |
| Lodging | September 25 | September 22 |
| Harvest | October 12 | October 10 |
| Soil Type | Silty Clay Loam | Loam |
| Soil Organic Matter % | 4.3 | 6.1 |
| Soil pH | 5.70 | 5.65 |

[1]Expressed as formulation per acre
[2]Expressed as pounds per acre

# 2006
# Field History Data

| | Kanawha,IA<br>Corn Rootworm Tests<br>(following soybeans) | | | Nashua, IA<br>Corn Rootworm Tests<br>(following trap crop) | | |
|---|---|---|---|---|---|---|
| Insecticide History | | | | | | |
| 2005 | No Insecticide (soybeans) | | | No Insecticide (trap crop) | | |
| 2004 | No Insecticide (corn) | | | Insecticide Test Plot | | |
| 2003 | No Insecticide (soybeans) | | | No Insecticide (trap crop) | | |
| 2002 | No Insecticide (soybeans) | | | Insecticide Test Plot | | |
| Tillage | Spring field cult. | | | Chopped stalks & fall chisel; spring field cult. | | |
| Variety | DKC60-18 & DKC60-19<br>Pioneer 34A18 & 34A16 | | | DKC60-18 & DKC60-19<br>Pioneer 34A18 & 34A16 | | |
| Planting Date | May 8 | | | May 5 | | |
| Planting Rate | 29,900 | | | 29,900 | | |
| Herbicide[1] | 16 oz Outlook – May 30; 0.4 pt Clarity + 6 oz Attrex 9-0 – May 30 | | | 2.3 qt Harness Extra – May 7; 2.5 pt Marksman – May 31 | | |
| Fertilizer[2] | N | P | K | N | P | K |
| Fall Applied | 161 | --- | --- | --- | 65 | 160 |
| Preplant | --- | --- | --- | 180 | --- | --- |
| Dates | | | | | | |
| Cultivation | none | | | none | | |
| Stand Count | June 6 | | | June 1 | | |
| Root Digging | July 27 | | | July 17 | | |
| Lodging | September 22 | | | October 6 | | |
| Harvest | October 10 | | | October 12 | | |
| Soil Type | Loam | | | Loam | | |
| Soil Organic Matter % | 6.7 | | | 3.85 | | |
| Soil pH | 6.5 | | | 7.6 | | |

[1] Expressed as formulation per acre
[2] Expressed as pounds per acre

## 2006
## Field History Data

| | Nashua, IA<br>Corn Rootworm Tests<br>(following soybeans) | Sutherland, IA<br>Corn Rootworm Tests<br>(following trap crop) |
|---|---|---|
| Insecticide History | | |
| 2005 | No Insecticide (soybeans) | No Insecticide (trap crop) |
| 2004 | No Insecticide (corn) | Insecticide Test Plot |
| 2003 | No Insecticide (soybeans) | No Insecticide (trap crop) |
| 2002 | No Insecticide (corn) | Insecticide Test Plot |
| Tillage | Spring field cult. | Fall chisel; spring field cult. |
| Variety | DKC60-18 & DKC60-19<br>Pioneer 34A18 & 34A16 | DKC60-18 & DKC60-19 |
| Planting Date | May 5 | May 10 |
| Planting Rate | 29,900 | 29,900 |
| Herbicide[1] | 2.75 pt Harness – May 7;<br>2.5 pt Marksman – May 31 | 3 oz Balance + 20 oz Outlook + 32 oz Atrazine – May 10;<br>0.75 oz Steadfast + 2.5 oz Calisto + 8 oz Atrazine – June 2 |
| Fertilizer[2] | N / P / K | N / P / K |
| Fall Applied | --- / 26 / 152 | --- / --- / --- |
| Preplant | 140 / --- / --- | 175 / --- / --- |
| Dates | | |
| Cultivation | none | none |
| Stand Count | June 1 | June 8 |
| Root Digging | July 17 | July 24 |
| Lodging | October 6 | September 13 |
| Harvest | October 12 | October 31 |
| Soil Type | Loam | Silty Clay Loam |
| Soil Organic Matter % | 4.80 | --- |
| Soil pH | 6.84 | --- |

[1] Expressed as formulation per acre
[2] Expressed as pounds per acre

# 2006
# Field History Data

| | Ames, IA<br>Seedcorn Maggot Test | Spring Hill, IA<br>Wireworm Test |
|---|---|---|
| Insecticide History | | |
| 2005 | No insecticide (soybeans) | Corn |
| 2004 | No insecticide (corn) | Soybeans |
| 2003 | No insecticide (soybeans) | --- |
| 2002 | No Insecticide (corn) | --- |
| Tillage | Field cult. (spring) | Spring disk and field cult. |
| Variety | DKC60-19 | DKC60-19 |
| Planting Date | May 15 | May 2 |
| Planting Rate | 26,100 | 29,900 |
| Herbicide[1] | 2 qt Guardsman Max – April 20 | Lumax + Atrazine + crop oil |
| Fertilizer[2] | N P K | N P K |
| Fall Applied | --- --- - | --- --- --- |
| Preplant | --- --- --- | 135 --- --- |
| Dates | | |
| Stand Count | May 31 | June 2 |
| Seed/Seedling Eval. | May 31 | June 2 |

[1] Expressed as formulation per acre
[2] Expressed as pounds per acre

# APPENDIX II

## Weather Data

Ames[1]
Rainfall and Temperature 2006

| | April | | | May | | | June | | |
|---|---|---|---|---|---|---|---|---|---|
| | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall |
| Day | Low | High | Inches | Low | High | Inches | Low | High | Inches |
| 1 | 38 | 45 | | 52 | 58 | 1.04 | 57 | 85 | |
| 2 | 38 | 52 | 0.33 | 43 | 59 | | 53 | 84 | |
| 3 | 42 | 53 | 0.43 | 45 | 77 | T | 54 | 89 | |
| 4 | 30 | 52 | | 45 | 68 | | 58 | 88 | 0.17 |
| 5 | 27 | 62 | | 43 | 62 | | 60 | 81 | |
| 6 | 40 | 72 | | 32 | 54 | | 59 | 84 | |
| 7 | 52 | 70 | 0.07 | 32 | 65 | | 65 | 90 | |
| 8 | 28 | 55 | | 42 | 70 | | 60 | 90 | |
| 9 | 27 | 54 | | 55 | 73 | 0.34 | 62 | 88 | T |
| 10 | 33 | 64 | | 51 | 75 | | 54 | 79 | 0.07 |
| 11 | 43 | 81 | | 45 | 74 | T | 54 | 60 | 0.05 |
| 12 | 51 | 75 | 0.17 | 43 | 54 | T | 47 | 62 | |
| 13 | 50 | 76 | | 40 | 62 | 0.09 | 47 | 79 | |
| 14 | 53 | 89 | | 41 | 51 | | 52 | 86 | |
| 15 | 47 | 85 | | 43 | 58 | 0.03 | 63 | 83 | T |
| 16 | 47 | 83 | 0.36 | 49 | 63 | 0.05 | 67 | 86 | T |
| 17 | 51 | 66 | 0.09 | 50 | 74 | T | 72 | 92 | |
| 18 | 46 | 66 | | 50 | 79 | T | 67 | 85 | |
| 19 | 40 | 70 | 0.25 | 48 | 70 | 0.02 | 61 | 91 | T |
| 20 | 39 | 68 | | 48 | 84 | | 59 | 86 | |
| 21 | 42 | 63 | | 48 | 79 | | 63 | 84 | 0.07 |
| 22 | 42 | 68 | | 51 | 65 | | 65 | 87 | T |
| 23 | 36 | 69 | | 52 | 76 | | 57 | 84 | T |
| 24 | 37 | 76 | | 54 | 84 | 0.41 | 58 | 87 | |
| 25 | 42 | 73 | 0.16 | 63 | 84 | T | 56 | 80 | 0.31 |
| 26 | 30 | 50 | 0.03 | 60 | 76 | 0.05 | 56 | 72 | 0.05 |
| 27 | 30 | 65 | | 60 | 80 | 0.14 | 57 | 79 | |
| 28 | 37 | 69 | | 66 | 85 | 0.04 | 51 | 84 | 0.05 |
| 29 | 52 | 65 | 0.41 | 69 | 91 | | 51 | 83 | |
| 30 | 52 | 56 | 1.02 | 68 | 89 | | 52 | 86 | |
| 31 | | | | 62 | 78 | T | | | |
| Mean/Total | 53.6 | | 3.32 | 60.8 | | 2.21 | 70.5 | | 0.77 |
| Normal | 47.5 | | 3.06 | 60.0 | | 4.16 | 68.9 | | 5.14 |
| D.F.N. | +6.1 | | +0.26 | +0.8 | | -1.95 | +1.6 | | -4.37 |

[1]Weather station located 2 miles SE of test site

Ames[1]
Rainfall and Temperature 2006

| | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall |
| Day | Low | High | Inches | Low | High | Inches | Low | High | Inches |
| 1 | 67 | 86 | 0.06 | 78 | 97 | | 54 | 79 | |
| 2 | 70 | 94 | 0.26 | 73 | 89 | 0.33 | 53 | 78 | |
| 3 | 69 | 85 | 0.38 | 65 | 84 | | 57 | 76 | 1.61 |
| 4 | 61 | 88 | 0.02 | 58 | 84 | | 52 | 73 | 0.29 |
| 5 | 54 | 80 | | 58 | 85 | | M | M | M |
| 6 | 53 | 80 | | 65 | 83 | 0.34 | 51 | 80 | |
| 7 | 53 | 83 | | 66 | 89 | | 53 | 82 | |
| 8 | 56 | 83 | | 65 | 82 | | 54 | 82 | |
| 9 | 58 | 83 | | 65 | 75 | 1.47 | 54 | 83 | |
| 10 | 59 | 92 | | 67 | 86 | 0.07 | 57 | 71 | 0.18 |
| 11 | 66 | 77 | 1.04 | 67 | 84 | 1.3 | 56 | 63 | 3.25 |
| 12 | 69 | 83 | 0.69 | 55 | 80 | | 55 | 61 | 0.09 |
| 13 | 67 | 81 | | 54 | 82 | | 46 | 62 | 0.01 |
| 14 | 63 | 90 | 0.91 | 62 | 82 | 0.85 | 46 | 75 | |
| 15 | 64 | 87 | | 59 | 79 | | 49 | 78 | |
| 16 | 67 | 92 | | 58 | 84 | | 53 | 81 | 0.06 |
| 17 | 69 | 96 | | 59 | 82 | 0.32 | 64 | 85 | 0.52 |
| 18 | 62 | 95 | | 62 | 80 | 0.89 | 45 | 66 | 0.02 |
| 19 | 62 | 89 | | 69 | 83 | 0.27 | 44 | 58 | |
| 20 | 70 | 91 | | 56 | 74 | | 33 | 57 | |
| 21 | 67 | 86 | | 56 | 77 | | 33 | 63 | |
| 22 | 57 | 79 | 0.12 | 58 | 83 | | 51 | 64 | 0.59 |
| 23 | 59 | 84 | | 60 | 86 | | 49 | 73 | |
| 24 | 61 | 89 | | 64 | 88 | | 50 | 65 | 0.02 |
| 25 | 69 | 88 | T | 66 | 88 | | 45 | 69 | |
| 26 | 68 | 90 | 1.61 | 66 | 84 | | 46 | 75 | |
| 27 | 69 | 88 | | 61 | 77 | | 45 | 78 | |
| 28 | 68 | 88 | | 60 | 78 | 1.92 | 42 | 65 | |
| 29 | 68 | 92 | | 59 | 65 | 0.1 | 42 | 59 | |
| 30 | 72 | 94 | | 56 | 79 | 0.13 | 45 | 71 | 0.03 |
| 31 | 75 | 96 | | 56 | 81 | | | | |
| Mean/Total | 75.8 | | 5.09 | 72.1 | | 7.99 | 60.3 | | 6.67 |
| Normal | 73.8 | | 4.90 | 71.2 | | 4.70 | 64.2 | | 2.98 |
| D.F.N. | +2.0 | | +0.19 | +0.9 | | +3.29 | -3.9 | | +3.69 |

[1]Weather station located at test site

Crawfordsville[1]
Rainfall and Temperature 2006

| | April | | | May | | | June | | |
|---|---|---|---|---|---|---|---|---|---|
| | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall |
| Day | Low | High | Inches | Low | High | Inches | Low | High | Inches |
| 1 | 40 | 54 | | 54 | 64 | | 62 | 82 | |
| 2 | 40 | 48 | | 40 | 65 | | 55 | 84 | |
| 3 | 41 | 66 | 0.85 | 42 | 77 | | 54 | 86 | |
| 4 | 30 | 55 | | 44 | 70 | 0.53 | 59 | 87 | 0.04 |
| 5 | 30 | 61 | | 41 | 64 | | 54 | 83 | |
| 6 | 32 | 68 | 0.72 | 31 | 59 | | 59 | 83 | 0.05 |
| 7 | 51 | 62 | 0.11 | 35 | 66 | | 63 | 81 | 0.68 |
| 8 | 28 | 68 | | 46 | 72 | | 58 | 87 | |
| 9 | 27 | 54 | | 56 | 74 | 0.28 | 62 | 90 | |
| 10 | 32 | 60 | | 46 | 75 | 0.05 | 51 | 77 | |
| 11 | 41 | 76 | | 46 | 69 | | 51 | 64 | 0.08 |
| 12 | 53 | 76 | 0.15 | 45 | 59 | | 48 | 63 | |
| 13 | 48 | 77 | | 40 | 48 | | 49 | 78 | |
| 14 | 51 | 86 | | 40 | 48 | | 52 | 85 | |
| 15 | 46 | 87 | | 47 | 56 | 0.55 | 52 | 85 | |
| 16 | 55 | 81 | | 52 | 68 | 0.04 | 63 | 84 | |
| 17 | 50 | 71 | 0.74 | 49 | 69 | 0.02 | 70 | 91 | |
| 18 | 44 | 69 | | 44 | 79 | | 68 | 88 | 0.03 |
| 19 | 45 | 75 | | 46 | 70 | | 60 | 88 | |
| 20 | 40 | 72 | | 45 | 79 | | 56 | 87 | |
| 21 | 38 | 69 | | 53 | 76 | | 63 | 81 | 0.06 |
| 22 | 40 | 71 | | 53 | 73 | | 64 | 86 | 0.61 |
| 23 | 35 | 71 | | 49 | 74 | | 58 | 77 | 0.03 |
| 24 | 43 | 75 | | 55 | 82 | 0.10 | 58 | 83 | |
| 25 | 43 | 75 | 0.19 | 66 | 89 | | 58 | 83 | |
| 26 | 29 | 49 | | 61 | 77 | | 58 | 77 | 0.55 |
| 27 | 30 | 65 | | 62 | 85 | | 52 | 74 | 0.03 |
| 28 | 38 | 71 | | 71 | 92 | | 55 | 81 | |
| 29 | 47 | 68 | | 73 | 94 | | 52 | 81 | |
| 30 | 54 | 59 | 0.97 | 67 | 92 | | 56 | 84 | |
| 31 | | | | 63 | 83 | | | | |
| Mean/Total | 54.3 | | 3.73 | 61.5 | | 1.57 | 69.7 | | 2.16 |
| Normal | 51.1 | | 3.04 | 62.0 | | 5.72 | 71.3 | | 3.67 |
| D.F.N. | +3.2 | | +0.69 | -0.5 | | -4.15 | -1.6 | | -1.51 |

[1]Weather station located at test site

Crawfordsville[1]
Rainfall and Temperature 2006

| | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall |
| Day | Low | High | Inches | Low | High | Inches | Low | High | Inches |
| 1 | 67 | 83 | | 74 | 97 | | 55 | 81 | |
| 2 | 68 | 90 | 0.20 | 76 | 94 | | 56 | 80 | |
| 3 | 69 | 87 | 1.07 | 68 | 89 | 1.00 | 58 | 80 | |
| 4 | 65 | 89 | | 60 | 84 | | 52 | 72 | |
| 5 | 55 | 82 | | 61 | 88 | | 51 | 73 | 0.61 |
| 6 | 51 | 80 | | 68 | 85 | | 52 | 79 | |
| 7 | 53 | 84 | | 71 | 93 | 0.88 | 52 | 83 | |
| 8 | 54 | 84 | | 68 | 84 | | 52 | 83 | |
| 9 | 65 | 87 | | 64 | 74 | 0.95 | M | M | |
| 10 | 69 | 92 | | 65 | 85 | 0.35 | 59 | 73 | |
| 11 | 71 | 89 | | 66 | 84 | 0.04 | 59 | 71 | 0.42 |
| 12 | 70 | 84 | 0.06 | 60 | 82 | | 55 | 74 | 0.13 |
| 13 | 68 | 84 | | 62 | 83 | | 54 | 61 | |
| 14 | 65 | 91 | 0.33 | 69 | 86 | 0.13 | 46 | 75 | |
| 15 | 65 | 89 | | 56 | 80 | | 47 | 79 | |
| 16 | 66 | 95 | | 57 | 84 | | 55 | 81 | |
| 17 | 73 | 95 | | 58 | 83 | | 65 | 85 | |
| 18 | 66 | 98 | 0.11 | 65 | 83 | 0.35 | 45 | 74 | 0.26 |
| 19 | 64 | 88 | | 66 | 76 | 0.52 | 44 | 66 | |
| 20 | 65 | 91 | | 59 | 78 | | 33 | 56 | |
| 21 | 67 | 87 | | 56 | 81 | | 33 | 66 | 0.04 |
| 22 | 57 | 77 | 0.57 | 57 | 82 | | 54 | 68 | 0.03 |
| 23 | 59 | 83 | | 58 | 85 | | 52 | 77 | |
| 24 | 62 | 88 | | 62 | 87 | | M | M | |
| 25 | 67 | 87 | | 65 | 89 | | 43 | 71 | |
| 26 | 69 | 86 | 1.11 | 70 | 90 | | 43 | 76 | |
| 27 | 68 | 87 | | 66 | 82 | | 44 | 78 | |
| 28 | 66 | 87 | | 60 | 75 | 1.15 | 42 | 68 | |
| 29 | 69 | 91 | | 59 | 65 | 0.30 | 39 | 64 | |
| 30 | 75 | 96 | | 55 | 76 | | 44 | 69 | |
| 31 | 75 | 98 | | 55 | 81 | | | | |
| Mean/Total | 76.6 | | 3.45 | 73.2 | | 5.67 | 61.6 | | 1.49 |
| Normal | 75.8 | | 3.34 | 69.9 | | 3.33 | 61.6 | | 2.58 |
| D.F.N. | +0.8 | | +0.11 | +3.3 | | +2.34 | 0.0 | | -1.09 |

[1]Weather station located at test site

Kanawha[1]
Rainfall and Temperature 2006

| | April | | | May | | | June | | |
|---|---|---|---|---|---|---|---|---|---|
| | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall |
| Day | Low | High | Inches | Low | High | Inches | Low | High | Inches |
| 1 | 36 | 43 | 0.15 | 50 | 61 | 0.17 | 60 | 84 | |
| 2 | 34 | 46 | 0.93 | 44 | 58 | T | 53 | 82 | T |
| 3 | 36 | 47 | 0.11 | 46 | 71 | T | 58 | 89 | |
| 4 | 27 | 49 | | 39 | 67 | | 54 | 88 | 0.18 |
| 5 | 27 | 59 | | 37 | 57 | | 53 | 88 | |
| 6 | 41 | 70 | | 31 | 57 | | 65 | 85 | |
| 7 | 47 | 60 | 0.35 | 37 | 70 | | 58 | 89 | |
| 8 | 28 | 50 | T | 45 | 72 | | 61 | 89 | |
| 9 | 27 | 49 | | 54 | 73 | 0.05 | 62 | 86 | 0.03 |
| 10 | 38 | 63 | | 47 | 75 | | 52 | 77 | 0.80 |
| 11 | 44 | 81 | | 40 | 67 | | 52 | 56 | 0.07 |
| 12 | 46 | 76 | | 41 | 55 | T | 44 | 62 | |
| 13 | 46 | 77 | | 42 | 59 | 0.28 | 50 | 75 | |
| 14 | 47 | 89 | | 41 | 47 | 0.01 | 58 | 86 | |
| 15 | 48 | 80 | | 41 | 61 | | 58 | 86 | 0.40 |
| 16 | 48 | 78 | 0.77 | 47 | 64 | 0.11 | 64 | 84 | 0.17 |
| 17 | 42 | 55 | T | 43 | 72 | | 68 | 92 | 0.01 |
| 18 | 36 | 69 | | 45 | 76 | T | 65 | 84 | |
| 19 | 37 | 65 | 0.28 | 48 | 70 | | 56 | 88 | |
| 20 | 38 | 57 | | 44 | 81 | | 59 | 82 | 0.15 |
| 21 | 38 | 57 | T | 40 | 79 | | 60 | 81 | 0.55 |
| 22 | 37 | 61 | T | 44 | 61 | T | 58 | 81 | 0.67 |
| 23 | 35 | 73 | | 48 | 80 | | 53 | 81 | |
| 24 | 35 | 73 | | 58 | 85 | 0.21 | 60 | 82 | |
| 25 | 36 | 70 | 0.07 | 58 | 85 | T | 55 | 81 | 0.07 |
| 26 | 28 | 54 | | 59 | 76 | T | 54 | 69 | 0.23 |
| 27 | 29 | 65 | | 60 | 80 | | 56 | 80 | |
| 28 | 47 | 72 | | 60 | 79 | | 49 | 80 | |
| 29 | 48 | 58 | 0.50 | 68 | 94 | | 53 | 81 | |
| 30 | 54 | 61 | 1.13 | 72 | 84 | | 61 | 86 | |
| 31 | | | | 61 | 78 | 0.03 | | | |
| Mean/Total | 51.1 | | 4.29 | 59.4 | | 0.86 | 69.4 | | 3.33 |
| Normal | 50.5 | | 3.24 | 60.2 | | 3.83 | 69.3 | | 4.81 |
| D.F.N. | +0.6 | | +1.05 | -0.8 | | -2.97 | +0.1 | | -1.48 |

[1]Weather station located at test site

Kanawha[1]
Rainfall and Temperature 2006

| | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall |
| Day | Low | High | Inches | Low | High | Inches | Low | High | Inches |
| 1 | 68 | 93 | | 72 | 97 | 0..5 | 52 | 78 | |
| 2 | M | M | 0.11 | 69 | 85 | 0.78 | M | M | |
| 3 | 66 | 88 | | 61 | 77 | | 52 | 78 | 2.45 |
| 4 | M | M | 0.02 | 59 | 84 | | M | M | 0.40 |
| 5 | 52 | 84 | | M | M | | 48 | 71 | 0.23 |
| 6 | 54 | 80 | | 60 | 85 | | 48 | 80 | |
| 7 | 56 | 83 | | 59 | 86 | | 51 | 81 | |
| 8 | 55 | 84 | T | 60 | 83 | | 54 | 83 | |
| 9 | M | M | 0.02 | 64 | 79 | 0.39 | M | M | |
| 10 | 59 | 91 | | 66 | 85 | 0.09 | M | M | 0.04 |
| 11 | 64 | 79 | 0.10 | 66 | 83 | 0.05 | 53 | M | 0.51 |
| 12 | 66 | 73 | 0.04 | M | M | | 53 | 60 | T |
| 13 | 66 | 83 | 0.11 | M | M | | 41 | 65 | T |
| 14 | 62 | 89 | | 57 | 82 | 0.37 | 42 | 75 | |
| 15 | 63 | 92 | | 55 | 79 | | 42 | 80 | |
| 16 | 70 | 97 | | 56 | 83 | | M | M | 0.65 |
| 17 | 70 | 95 | | 61 | 84 | 0.31 | M | M | 1.20 |
| 18 | 60 | 94 | 0.28 | 61 | 84 | 0.04 | 41 | 85 | |
| 19 | 66 | 87 | | 60 | 82 | 0.01 | 40 | 56 | 0.01 |
| 20 | 69 | 82 | 0.48 | M | M | T | 32 | 51 | |
| 21 | 64 | 87 | | 55 | 79 | | 32 | 64 | 0.10 |
| 22 | M | M | | 60 | 83 | | 48 | 60 | 0.66 |
| 23 | M | M | | 60 | 85 | 0.35 | M | M | 0.03 |
| 24 | 54 | 91 | | 64 | 87 | | M | M | T |
| 25 | 66 | 89 | T | 67 | 90 | | 40 | 68 | |
| 26 | 65 | 90 | 1.53 | 68 | 73 | | 39 | 73 | |
| 27 | 68 | 88 | | 57 | 79 | | 41 | 77 | |
| 28 | 68 | 88 | | 57 | 80 | 0.27 | 37 | 62 | |
| 29 | M | M | | 59 | 69 | 0.22 | 36 | 57 | |
| 30 | M | M | | 55 | 78 | | M | M | 0.08 |
| 31 | 72 | 96 | | 53 | 80 | | | | |
| Mean/Total | 75.5 | | 2.69 | 71.5 | | 3.23 | M | | 6.36 |
| Normal | 72.7 | | 3.95 | 70.5 | | 4.00 | 61.4 | | 3.20 |
| D.F.N. | +2.8 | | -1.26 | +1.0 | | -0.77 | M | | +3.16 |

[1]Weather station located at test site; M = missing

Nashua[1]
Rainfall and Temperature 2006

| | April | | | May | | | June | | |
|---|---|---|---|---|---|---|---|---|---|
| | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall |
| Day | Low | High | Inches | Low | High | Inches | Low | High | Inches |
| 1 | 37 | 44 | | 51 | 56 | 0.03 | 54 | 82 | |
| 2 | 39 | 44 | 1.02 | 42 | 71 | T | 51 | 86 | |
| 3 | 38 | 50 | | 54 | 65 | | 57 | 85 | 0.07 |
| 4 | 31 | 56 | | 40 | 64 | | 59 | 80 | |
| 5 | 32 | 66 | | 42 | 56 | | 57 | 84 | 0.32 |
| 6 | 50 | 65 | | 31 | 65 | | 63 | 84 | 0.03 |
| 7 | 41 | 53 | 0.18 | 40 | 70 | | 60 | 85 | |
| 8 | 26 | 50 | | 52 | 70 | 0.13 | 58 | 85 | |
| 9 | 28 | 60 | | 57 | 71 | | 58 | 73 | 0.38 |
| 10 | 42 | 79 | | 50 | 73 | | 47 | 68 | 1.65 |
| 11 | 55 | 78 | | 40 | 64 | | 50 | 57 | |
| 12 | 51 | 74 | 0.20 | 39 | 50 | 0.39 | 42 | 73 | |
| 13 | 42 | 85 | | 37 | 49 | 0.02 | 50 | 81 | |
| 14 | 49 | 85 | | 41 | 56 | 0.01 | 62 | 82 | 0.90 |
| 15 | 40 | 79 | 0.62 | 48 | 65 | 0.08 | 63 | 76 | 0.10 |
| 16 | 49 | 72 | 0.80 | 50 | 73 | 0.15 | 70 | 89 | |
| 17 | 48 | 66 | | 47 | 73 | | 72 | 88 | |
| 18 | 42 | 68 | 0.13 | 43 | 69 | 0.02 | 66 | 85 | |
| 19 | 40 | 68 | 0.04 | 44 | 73 | | 60 | 83 | |
| 20 | 42 | 66 | T | 43 | 79 | T | 54 | 77 | 0.45 |
| 21 | 42 | 59 | 0.02 | 43 | 79 | T | 69 | 80 | 0.11 |
| 22 | 43 | 62 | 0.06 | 40 | 72 | | 58 | 81 | |
| 23 | 36 | 70 | | 51 | 80 | | 56 | 80 | |
| 24 | 41 | 71 | 0.01 | 63 | 82 | 0.02 | 58 | 79 | 0.14 |
| 25 | 37 | 68 | 0.07 | 63 | 77 | 0.1 | 56 | 79 | 0.40 |
| 26 | 29 | 65 | | 59 | 82 | | 55 | 75 | |
| 27 | 35 | 71 | | 64 | 86 | 0.08 | 57 | 77 | |
| 28 | 48 | 70 | 0.07 | 69 | 92 | | 51 | 78 | |
| 29 | 48 | 56 | 0.76 | 72 | 93 | 0.1 | 53 | 81 | |
| 30 | 51 | 60 | 0.81 | 67 | 90 | 0.2 | 63 | 87 | |
| 31 | | | | 56 | 82 | 0.03 | | | |
| Mean/Total | 53.2 | | 4.79 | 60.7 | | 1.33 | 68.8 | | 4.55 |
| Normal | 50.5 | | 3.42 | 60.2 | | 4.34 | 69.3 | | 5.03 |
| D.F.N. | +2.9 | | +1.37 | +0.5 | | -3.01 | -0.5 | | -0.48 |

[1]Weather station located at test site

Nashua[1]
Rainfall and Temperature 2006

| | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall |
| Day | Low | High | Inches | Low | High | Inches | Low | High | Inches |
| 1 | 68 | 89 | 0.08 | 73 | 93 | 0.06 | M | M | |
| 2 | 65 | 87 | | 70 | 81 | 0.10 | M | M | |
| 3 | 67 | 85 | 0.10 | 61 | 84 | | M | M | 0.12 |
| 4 | 60 | 81 | | 58 | 86 | | M | M | 0.04 |
| 5 | 51 | 79 | | 67 | 85 | | M | M | |
| 6 | 53 | 82 | | 67 | 86 | 0.92 | M | M | |
| 7 | 56 | 81 | | 59 | 84 | | M | M | |
| 8 | 62 | 80 | | 59 | 80 | | M | M | |
| 9 | 63 | 90 | | 64 | 84 | 0.22 | M | M | |
| 10 | 62 | 88 | | 70 | 83 | 0.16 | M | M | 2.40 |
| 11 | 67 | 77 | 0.45 | 65 | 81 | | M | M | 1.00 |
| 12 | 65 | 83 | | 60 | 81 | | M | M | |
| 13 | 65 | 85 | 0.03 | 64 | 80 | 0.18 | M | M | |
| 14 | 63 | 88 | 0.07 | 59 | 80 | | M | M | |
| 15 | 65 | 92 | | 53 | 82 | | M | M | |
| 16 | 69 | 93 | | 58 | 85 | | M | M | 0.14 |
| 17 | 74 | 92 | 0.13 | 65 | 82 | 0.65 | M | M | 0.48 |
| 18 | 58 | 90 | | 65 | 73 | | M | M | 0.02 |
| 19 | 63 | 83 | 0.46 | 65 | 76 | | M | M | |
| 20 | 68 | 85 | 0.37 | 53 | 79 | | M | M | |
| 21 | 66 | 82 | | 56 | 83 | | M | M | 0.64 |
| 22 | 57 | 82 | | 59 | 85 | | M | M | |
| 23 | 57 | 86 | | 61 | 87 | | M | M | |
| 24 | 69 | 89 | 0.03 | 67 | 89 | | M | M | |
| 25 | 69 | 86 | 0.10 | 66 | 87 | 0.23 | M | M | |
| 26 | 68 | 87 | 0.46 | 65 | 76 | | M | M | |
| 27 | 68 | 87 | 0.03 | 55 | 78 | | M | M | 0.04 |
| 28 | 65 | 91 | | 61 | 78 | 0.16 | M | M | |
| 29 | 72 | 91 | | 60 | 79 | | M | M | 0.03 |
| 30 | 72 | 94 | | 53 | 79 | | M | M | 0.03 |
| 31 | 75 | 95 | | 54 | 77 | | | | |
| Mean/Total | 75.5 | | 2.31 | 71.9 | | 2.68 | M | | 4.94 |
| Normal | 72.7 | | 4.66 | 70.5 | | 4.83 | 61.4 | | 2.93 |
| D.F.N. | +2.8 | | -2.35 | +1.4 | | -2.15 | M | | +2.01 |

[1]Weather station located at test site

Spring Hill[1]
Rainfall and Temperature 2006

| | April | | | May | | | June | | |
|---|---|---|---|---|---|---|---|---|---|
| | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall |
| Day | Low | High | Inches | Low | High | Inches | Low | High | Inches |
| 1 | 39 | 49 | | 51 | 55 | 0.67 | 61 | 83 | |
| 2 | 39 | 55 | 0.37 | 43 | 60 | | 53 | 84 | T |
| 3 | 42 | 65 | 0.53 | 44 | 75 | 0.3 | 58 | 87 | |
| 4 | 28 | 54 | | 46 | 67 | | 63 | 88 | |
| 5 | 29 | 63 | | 44 | 64 | | 59 | 81 | |
| 6 | 44 | 75 | | 31 | 60 | | 61 | 82 | |
| 7 | 50 | 72 | 0.16 | 35 | 64 | | 61 | 91 | |
| 8 | 28 | 68 | | 44 | 70 | 0.01 | 60 | 91 | |
| 9 | 30 | 57 | | 56 | 72 | 0.24 | 62 | 91 | T |
| 10 | 33 | 63 | | 51 | 76 | | 53 | 80 | 0.03 |
| 11 | 47 | 79 | | 44 | 68 | T | 50 | 61 | T |
| 12 | 51 | 74 | 0.27 | 41 | 57 | | 54 | 64 | |
| 13 | M | 76 | | 41 | 67 | 0.04 | 50 | 74 | |
| 14 | 54 | 87 | | 43 | 52 | | 52 | 88 | |
| 15 | 53 | 88 | | 45 | 59 | 0.09 | 63 | 83 | |
| 16 | 54 | 79 | 0.85 | 51 | 67 | 0.02 | 66 | 83 | T |
| 17 | 51 | 70 | 0.14 | 48 | 72 | 0.12 | 72 | 91 | |
| 18 | 46 | 65 | | 48 | 80 | T | 64 | 85 | |
| 19 | 37 | 71 | 0.1 | 49 | 73 | T | 60 | 89 | 0.13 |
| 20 | 39 | 68 | | 52 | 85 | | 63 | 88 | T |
| 21 | 38 | 68 | | 53 | 73 | | 66 | 86 | 0.47 |
| 22 | 38 | 70 | | 51 | 67 | T | 63 | 88 | 0.2 |
| 23 | 41 | 70 | | 55 | 74 | | 59 | 80 | |
| 24 | 45 | 73 | | 58 | 82 | 0.36 | 60 | 86 | |
| 25 | 43 | 72 | 0.32 | 64 | 85 | | 59 | 82 | 0.45 |
| 26 | 34 | 43 | 0.17 | 60 | 79 | 0.02 | 58 | 77 | 0.38 |
| 27 | 35 | 62 | | 60 | 79 | 0.21 | 56 | 79 | |
| 28 | 39 | 67 | 0.02 | 66 | 87 | | 53 | 83 | 0.04 |
| 29 | 52 | 64 | 0.49 | 72 | 91 | | 58 | 81 | |
| 30 | 52 | 55 | 1.36 | 64 | 88 | 0.18 | 63 | 85 | |
| 31 | | | | 63 | 79 | T | | | |
| Mean/Total | 54.7 | | 4.78 | 61.3 | | 2.26 | 71.2 | | 1.70 |
| Normal | 48.8 | | 3.67 | 62.7 | | 4.59 | 73.2 | | 4.60 |
| D.F.N. | +5.9 | | +1.11 | +1.4 | | -2.33 | +2.0 | | -2.90 |

[1]Weather station located at Indianola

Sutherland[1]
Rainfall and Temperature 2006

| | April | | | May | | | June | | |
|---|---|---|---|---|---|---|---|---|---|
| | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall |
| Day | Low | High | Inches | Low | High | Inches | Low | High | Inches |
| 1 | 35 | 44 | 0.61 | 50 | 61 | 2.69 | 56 | 87 | 0.10 |
| 2 | 35 | 48 | 0.13 | 40 | 63 | | 48 | 85 | |
| 3 | 33 | 46 | | 45 | 74 | | 57 | 90 | |
| 4 | 25 | 52 | | 40 | 64 | | 58 | 91 | |
| 5 | 26 | 63 | | 39 | 59 | | 63 | 87 | |
| 6 | 47 | 76 | 0.46 | 33 | 55 | | 65 | 85 | |
| 7 | 50 | 75 | | 46 | 66 | | 52 | 89 | |
| 8 | 25 | 51 | | 51 | 70 | | 60 | 90 | |
| 9 | 27 | 54 | | 49 | 75 | | 65 | 85 | |
| 10 | 36 | 66 | | 46 | 74 | 0.20 | 54 | 86 | |
| 11 | 46 | 81 | | 43 | 66 | | 51 | 57 | |
| 12 | 46 | 77 | | 38 | 58 | | 44 | 65 | |
| 13 | 48 | 79 | | 41 | 66 | | 49 | 76 | |
| 14 | 49 | 89 | | 42 | 53 | 0.02 | 58 | 86 | 1.14 |
| 15 | 53 | 79 | | 46 | 60 | | 65 | 80 | |
| 16 | 53 | 82 | 0.82 | 46 | 64 | | 65 | 82 | |
| 17 | 50 | 55 | | 41 | 73 | | 66 | 89 | |
| 18 | 47 | 64 | 0.04 | 43 | 79 | | 60 | 80 | 0.35 |
| 19 | 35 | 58 | | 49 | 71 | | 54 | 84 | 0.45 |
| 20 | 38 | 61 | 0.07 | 47 | 86 | | 60 | 82 | |
| 21 | 40 | 57 | | 49 | 82 | | 60 | 85 | 0.31 |
| 22 | 36 | 64 | | 48 | 66 | | 57 | 81 | |
| 23 | 35 | 69 | | 52 | 81 | 0.72 | 55 | 81 | |
| 24 | 35 | 74 | 0.23 | 61 | 90 | | 60 | 86 | |
| 25 | 37 | 64 | | 64 | 80 | | 56 | 86 | |
| 26 | 27 | 53 | | 51 | 77 | | 52 | 77 | 0.06 |
| 27 | 27 | 65 | 0.21 | 55 | 85 | | 56 | 81 | |
| 28 | 48 | 71 | | 69 | 87 | | 48 | 78 | |
| 29 | 51 | 59 | | 73 | 92 | | 53 | 82 | 0.21 |
| 30 | 51 | 55 | | 68 | 91 | | 62 | 88 | |
| 31 | | | | 54 | 88 | | | | |
| Mean/Total | 52.0 | | 2.57 | 60.9 | | 3.63 | 69.8 | | 2.62 |
| Normal | 47.4 | | 2.82 | 59.5 | | 3.70 | 69.1 | | 4.43 |
| D.F.N. | +4.6 | | -0.25 | +1.4 | | -0.07 | +0.7 | | -1.81 |

[1]Weather station located at test site

Sutherland[1]
Rainfall and Temperature 2006

| | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall | Temp (°F) | | Rainfall |
| Day | Low | High | Inches | Low | High | Inches | Low | High | Inches |
| 1 | 68 | 88 | | 72 | 99 | 0.40 | M | M | |
| 2 | 67 | 89 | | 69 | 93 | 2.51 | M | M | |
| 3 | 66 | 86 | 0.11 | 58 | 81 | | M | M | |
| 4 | 54 | 89 | | 57 | 86 | | M | M | |
| 5 | 48 | 78 | | 60 | 85 | 0.34 | M | M | |
| 6 | 49 | 80 | | 65 | 90 | | M | M | |
| 7 | 54 | 82 | | 59 | 85 | | M | M | |
| 8 | 65 | 85 | | 62 | 82 | | M | M | |
| 9 | 60 | 86 | | 65 | 78 | | M | M | |
| 10 | 62 | 93 | | 69 | 88 | 0.45 | M | M | 1.45 |
| 11 | 63 | 84 | | 66 | 85 | 0.05 | M | M | |
| 12 | 63 | 85 | | 67 | 81 | | M | M | |
| 13 | 67 | 82 | 0.14 | 68 | 83 | 0.07 | M | M | |
| 14 | 63 | 89 | | 55 | 82 | | M | M | |
| 15 | 65 | 92 | | 55 | 81 | | M | M | |
| 16 | 65 | 97 | | 55 | 84 | 0.85 | M | M | |
| 17 | 74 | 99 | | 61 | 82 | | M | M | 0.80 |
| 18 | 53 | 91 | | 67 | 78 | | M | M | |
| 19 | 60 | 90 | | 65 | 77 | | M | M | |
| 20 | 70 | 100 | | 52 | 75 | 0.14 | M | M | 0.26 |
| 21 | 64 | 89 | | 52 | 76 | | M | M | 1.97 |
| 22 | 54 | 78 | | 59 | 85 | | M | M | |
| 23 | 60 | 85 | | 60 | 85 | | M | M | |
| 24 | 67 | 94 | 0.05 | 67 | 87 | | M | M | |
| 25 | 70 | 94 | 0.12 | 67 | 92 | | M | M | |
| 26 | 69 | 92 | | 58 | 76 | | M | M | |
| 27 | 67 | 92 | | 54 | 79 | 0.32 | M | M | 0.25 |
| 28 | 68 | 92 | | 58 | 79 | | M | M | |
| 29 | 72 | 99 | | 59 | 68 | | M | M | |
| 30 | 73 | 97 | | 46 | 78 | | M | M | |
| 31 | 75 | 100 | | 47 | 79 | | | | |
| Mean/Total | 76.6 | | 0.42 | 71.5 | | 5.13 | | | 4.73 |
| Normal | 73.3 | | 4.11 | 71.0 | | 4.63 | 61.8 | | 3.08 |
| D.F.N. | +3.3 | | -3.69 | +0.5 | | +0.50 | | | +1.65 |

[1]Weather station located at test site

# APPENDIX III

## Materials Tested

## Materials Tested in 2006 Iowa State University Efficacy Tests

| Common/code name | Formulation | Chemical name | Company |
|---|---|---|---|
| A14974 | 250CS | tefluthrin | Syngenta |
| A9765 | --- | Maxim 4FS + Apron XL 3LS + Dynasty 83FS + A9765 1.25 mg/seed | Syngenta |
| AGST 03001 | Hopperbox ST | imidacloprid & metalaxyl | AGRILIANCE LLC |
| Aztec | 4.67G | tebupirimphos & cyfluthrin | AMVAC Chem. Corp. |
| Aztec | 2.1G | tebupirimphos & cyfluthrin | Bayer Corp. |
| Capture | LFR | bifenthrin | FMC Corp. |
| Cruiser | Commercially applied seed trt (0.25 or 1.25 mg/sd) | thiamethoxam | Syngenta |
| DEFCON | 2.1G | tebupirimphos & cyfluthrin | Helena Chem. Co. |
| EXP1A | 2SC | --- | BASF |
| Force | 3G | tefluthrin | Syngenta |
| Fortress | 2.5G | chlorethoxyfos | AMVAC Chem. Corp. |
| Fortress | 5G | chlorethoxyfos | AMVAC Chem. Corp. |
| Herculex XTRA (Pioneer 34A18) with Poncho 250 seed trt | Pioneer Background | Cry34AB1 & Cry35Ab1 + Cry1F + LibertyLink gene + clothianidin seed trt (0.25 mg/seed) | Pioneer Hi-Bred International, Inc. |
| Herculex RW (Mycogen 2D545) with Cruiser seed trt | Dow Background | Cry34AB1 & Cry35Ab1 + LibertyLink gene + thiamethoxam seed trt (0.25 mg/seed) | Dow AgroSciences |
| Herculex XTRA (Mycogen 2E526) with Cruiser seed trt | Dow Background | Cry34AB1 & Cry35Ab1 + Cry1F + LibertyLink gene + thiamethoxam seed trt (0.25 mg/seed) | Dow AgroSciences |
| Lorsban | 15G | chlorpyrifos | Dow AgroSciences |
| Pioneer 34A16 seedcorn (no seed trt) | 34A16 (HX1, LL) , a Herculex I conversion of 34A15 | Cry1F + LibertyLink gene | Pioneer Hi-Bred International, Inc |

## Materials Tested … Continued

| Common/code name | Formulation | Chemical name | Company |
|---|---|---|---|
| Poncho 250 | Commercially applied seed trt (0.25 mg/seed) | clothianidin | Bayer |
| Poncho 1250 | Commercially applied seed trt (1.25 mg/seed) | clothianidin | Bayer |
| Regent | 4SC | fipronil | BASF |
| STP15201 | --- | Maxim 4FS + Apron XL 3LS + Dynasty 83FS + STP15201 1.25 mg/seed | Syngenta |
| V-10107 | 1.77SC | --- | Valent U.S.A. Corp. |
| V-10112 | 1.77SC | --- | Valent U.S.A. Corp. |
| V-10194 | --- | --- | Valent U.S.A. Corp. |
| X-tra Power | --- | Liquid mixture of the micronutrients magnesium, copper, manganese, and zinc | Stoller Enterprises, Inc. |
| YieldGard Plus (DKC60-18 with seed trt) | Transgenic seedcorn (YGRW+YGCB+RR2) + commercially applied Poncho 250 | Cry3Bb1 (MON 863) + Cry1Ab (MON810) + Roundup Ready Corn 2 + fludioxonil & mefenoxam fungicides + clothianidin seed trt (0.25 mg/seed) | Monsanto |
| DKC60-19 seedcorn (no seed trt) | (YGCB+RR2) “near-isoline seed” of DKC60-18 | Cry1Ab (MON810) + Roundup Ready Corn 2 + fludioxonil & metalaxyl fungicides | Monsanto |