IOWA STATE UNIVERSITY

OF SCIENCE AND TECHNOLOGY

2009 IOWA EVALUATION OF INSECTICIDES AND PLANT-INCORPORATED PROTECTANTS

CORN PESTS RESEARCH PROJECT

DEPARTMENT OF ENTOMOLOGY
AMES, IOWA 50011-3140
LES LEWIS, CHAIR

INSECTS INVESTIGATED

Corn Rootworm Black Cutworm European Corn Borer Corn Earworm

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IOWA STATE UNIVERSITY

2009 EVALUATION OF INSECTICIDES AND PLANT INCORPORATED PROTECTANTS

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INTRODUCTION

The corn rootworm species, which includes the western corn rootworm *Diabrotica virgifera virfigera* and northern corn rootworm *D. barberi* northern corn rootworm, are the most damaging pests of corn *Zea mays* in the Unites States Corn Belt. Eggs are laid in the soil during the fall and hatch the following spring. Larval feeding on corn roots in June may diminish yield both by reducing plant growth and drought tolerance and by imposing harvesting losses, due to 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 on soft doughy 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 (transgenic seedcorn that contains a gene from the naturally occurring soil bacterium *Bacillus thuringiensis (*Bt*).*

In additional to corn rootworm, several above-ground lepidopteran pests feed on corn in Iowa. These include the European corn borer *Ostrinia nubilalis*, black cutworm *Agrotis ipsilon*, and corn earworm *Helicoverpa zea*. Over the last decade, Bt corn varieties have been made commercially available to protect corn from these pests.

OBJECTIVE

The goal of this research program is to serve Iowa agriculture by monitoring and evaluating the performance of registered commercial insecticides and transgenic corn hybrids. To achieve this goal, we maintain a viable, proactive, progressive and scientifically sound product evaluation program.

TESTING PROCEDURES AND EVALUATIONS

Field Sites: Product efficacy study plots were established at four Iowa locations in 2009. Corn rootworm (CRW) research fields are continually maintained on University farms located at: Ames, Johnson Farm and the Field Extension and Education Laboratory (FEEL); Crawfordsville, S.E. Research and Demonstration Farm; Nashua, N.E. Research and Demonstration Farm; Sutherland, N.W. Research and Demonstration Farm. Each research field is divided into two sections (except at the FEEL location), which annually alternate as test plot and late planted trap crop. The seed planted for the trap crop is a mixed maturity blend with a greater proportion of late-maturing varieties. This trap crop constitutes a favorable environment for adult female CRW late in the season when other fields are maturing. In addition, two first year corn studies and two second year corn studies were established at both Ames, Johnson Farm and Nashua, N.E. Research and Demonstration Farm for the Seed treatment/Fungicide studies.

Table 1: Lists the research conducted at each location, target pest, and other general plot information.

Corn Rootworm Studies

Field plot design: The experimental design in most studies was a randomized complete block. Treatments in the studies at both Crawfordsville

(Tables 12-15) and Nashua (Tables 24-27) were paired rows 75-feet in length with four replications. Treatments for the Pioneer OAM1 study at both Ames-FEEL (Tables 4 and 5) and Crawfordsville (Tables 16 and 17) were four rows wide with 25 feet per row with three replications. The Monsanto-Bayer Yield Studies (Tables 2 and 3) at Ames was a split plot design with eight row treatments that were 75 feet in length with four replications. The treatments in the Syngenta-Force CS rates studies at Ames (Tables 6-11) Crawfordsville (Tables 18-23) and Nashua (Tables 28-33) were four rows wide with 25 feet per row with four replications. Treatments for the Monsanto-Smartstax study at Sutherland (Tables 34 and 35) were eight row wide treatments that were 75 feet in length with four replications.

Application techniques: Seeds were pre-bagged and planted with a four-row John Deere Max Emerge™ 7100 integral planter that had 30 inch row spacings. The standard planter fiberglass seed hoppers with attached "finger pickup mechanism," 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 seeds were dumped into the steel cylinder. At the beginning of each replication, a hydraulic motor (attached to the planter's drive shaft) was activated to deliver seed immediately into the ground. At the end of each replication, this same hydraulic motor was activated to expel any unplanted seed.

Plant-incorporated protectants: Plant-incorporated protectants were evaluated in corn hybrids producing insecticidal toxins derived from the bacterium *Bacillus thuringiensis* (Bt). These included the Yieldgard hybrids of Monsanto that produce the Bt toxin Cry3Bb1 and the Herculex hybrids of Pioneer and Dow AgroSciences that produce the binary Bt toxin Cry34/Cry35.

Seed treatments: All the Dekalb hybrids evaluated in the yield studies (Crawfordsville, Tables 12-15; Nashua, Tables 24-27) were treated by the respective company with Poncho 250. All the Mycogen hybrids evaluated in the Yield Studies (Crawfordsville, Tables 12-15; Nashua, Tables 24-27) were treated by the respective company with Cruiser Extreme® 250. For the Pioneer OAM1 studies (Ames, Tables 4-5; Nashua, Tables 16, 17) all hybrids were treated with Cruiser Extreme® 250. For the two Smartstax treatments (Table 46, 47), Monsanto applied an Poncho 250 seed treatment to one treatment and a Poncho 500 seed treatment was applied to the other treatment. All other treatments in this study were treated by Monsanto with a Poncho 250 seed treatment. With the AgriSure hybrids tested in the Syngenta-Force CS rates studies at (Ames, Tables 6-11; Crawfordsville, Tables 18-23; Nashua, Tables 28-33) these hybrids were treated with either Cruiser Extreme® 250 or Cruiser Extreme® 1250 seed treatment.

All these seed treatments target secondary soil-borne pests, such as wireworm and seedcorn maggot. For some treatments, plant-incorporated protectants were combined with conventional insecticides.

Granular application treatments: 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 in-furrow (Furrow). 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.

Liquid application treatments: The liquid products, Force 250 CS, Warrior II 2.09 CS, and Lorsban 4E were applied at planting with a compressed-air system built directly into the planter by Almaco manufacturing (Nevada, IA). These products were applied as "ounces per 1000 row feet". This closed handling system consisted of 3-gallon product canisters equipped with quick disconnects. These three liquid treatments were applied either T-Band or Furrow using Teejet XR80015 spray nozzles at 21 psi to deliver 5 GPA of finished spray.

SmartBox™ application treatments: SmartChoice 5G and Counter 20G, treatments were applied with modified SmartBox™ metering units. These products were applied as ounces per 1000 row feet. The commercial SmartBox™ were removed from their large-base containers and sandwiched between a flat metal plate on the bottom and a custom-made, threaded plastic cap on the top. The bottom plate had been fabricated so that it could slide 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 two controllers mounted in the tractor cab were used to operate the SmartBox™ metering units. All treatments were applied at 4 mph using the "fixed speed mode" on the SmartBox™ controllers.

Seed treatment/Fungicide Study

Field plot design: The experimental design in this Bayer yield studies (Ames-Tables 36, 37 and 38, 39; Nashua-Tables 40, 41 and 42, 43) was a randomized complete block with four replications respectively. Four hybrids were tested (two at each location-Ames, Nashua), DKC 61-69 (Corn following Corn)-Ames; LL # (Bayer Internal Code # 09HYBL112HOEF) (Corn following Soybeans)-Ames; Stine M911C-10 (Corn following Corn)-Nashua; DKC 61-72 (Corn following Soybeans)-Nashua. These treatments were eight rows wide, 35-feet in length.

Application techniques: The seed treatments were commercially applied, so the seed was ready to be counted and bagged for planting. All seeds were pre-bagged and planted with the modified seed units as described earlier in the corn rootworm studies section.

Granular application treatments: Granular insecticide formulations were applied with modified Noble® metering units mounted on the planter. There was only one treatment (A/4-Aztec 2.1G) which was applied with these Noble® units.

Liquid application treatments: There was one fungicide treatment (Stratego PRO-5 oz/A) applied to four entries (A/3, A/4, A/5, A/6) for two studies(Corn following Corn, Corn following Soybeans) using a Hagie high-boy sprayer provided and operated by the ISU Plant Pathology department for the Ames location studies. This same fungicide treatment was sprayed on the two studies (Corn following Corn, Corn following Soybeans) on entries (A/3, A/4, A/5, A/6) at the Nashua location using a Hand-held backpack sprayer. The fungicide application was applied to the Reproductive Stage 1 corn at Ames on July 24, 2009 (Corn following Soybeans), July 31, 2009 (Corn following Corn) and at Nashua (Corn following Corn and Corn following Soybeans) on July 29, 2009.

European Corn Borer Study

Field plot design: The experimental design in the Dow AgroSciences-efficacy of Herculex XTRA studies (Table 44) was a randomized complete block with four replications respectively. Two treatments were evaluated (Mycogen RR hybrid and Mycogen Herculex XTRA). These treatments were two rows wide, 15-feet in length. In each of these two row plots, 20 plants (10 plants/row) were marked with a flag on 6/30/09, designating these plants as ones to be infested with ECB insects.

Application techniques: The ECB larvae were obtained from the USDA-ARS Corn Insects and Crop Genetics Research Laboratory. Each of the 20 plants/plot was infested with two shots of first and insect instar larvae, which were placed in the whirl. Inoculum was equal to 100 ECB per plant and administered with bazooka inoculators. Stalks were split into three parts (top, shank, and bottom) with a curved linoleum knife. Total tunnel length (cm) and number of tunnels were scored for each plant part. On September 8 and 9, twenty plants per plot (80 plants per treatment) were sampled.

Black Cutworm Study

Field plot design: The experimental design was a randomized complete block with five replications. Two treatments (Mycogen RR hybrid and Mycogen Herculex XTRA hybrid) were evaluated. There were 6 seeds planted per treatment per replication for a total of 30 seeds per treatment. These seeds were planted within a 6 inch circle. We then placed over these seeds five gallon buckets with the bottom of these buckets cut out. This method is called the five gallon bucket method and was used to cover and protect the plants from other outside predators, for ease in infestation and to keep the BCW insects in close proximity to the corn plants. This study was conducted in Ames on previous years soybean ground, planted on 7/13/2009.

Application techniques: The BCW insects were obtained from the USDA-ARS Corn Insects and Crop Genetics Research Laboratory. Before infestation, every plot was thinned down to 5 plants per treatment per replication. On

7/22/09, (V1 stage, 2-4 inches tall corn), all plants were infested with four, stage L3-L4 BCW larvae/plant. At 7 and 12 days after infestation (DAI) corn plants were observed for cutting at ground level and counted.

Corn Earworm Study

Field plot design: The experimental design in this study was a randomized complete block with four replications. The treatments consisted of a Dekalb RR hybrid, VT Triple, Herculex XTRA/RR2, VT Triple Pro, Smartstax with Poncho 250 commercially applied and Smartstax with Poncho 500 commercially applied. These treatments were eight rows wide, 75-feet in length.

Application techniques: The CEW eggs were obtained on August 18, 2009 from Monsanto Company. These eggs were hatched overnight and mixed with corn grit at the field site (Sutherland, IA) on August 19, 2009. Prior to infestation, corn ear shoot bags were placed over the ear shoot of all plants in row 2 of each plot. Bazooka inoculators were used to infest all ears in row 2 on August 19. Each plant was given two shots of inoculum for a total of 40 CEW larvae per ear

Corn Rootworm Larval Evaluations

Stand counts: The number of plants in either 17.5 or 20 row-ft was recorded (note distance in foot notes of stand count tables). These were taken early in the grown season.

Root-Injury: After the majority of corn rootworms had finished feeding, roots were dug from 7/14/09 through 7/31/09. Five root systems total were dug from each insecticide treatment from the two-row yield studies (Crawfordsville, Table 12 & Nashua, Table 24) likewise ten roots total were dug per treatment from rows three and four of the Monsanto-Smartstax study (Sutherland, Table 34). With the Monsanto-Bayer yield study, five roots total were dug per treatment from rows two and five (Ames, Table 2). With the Syngenta-Force CS rates studies, five roots total were dug from row 1 and 4 of the four row plot (Ames, Table 6; Crawfordsville, Table 18; Nashua, Table 28). Prior to leaving the field, the roots were marked with a permanent marker with the plot number, study name and location. Excess soil was removed in the field as well. In Ames, roots were soaked in water overnight, and then a pressurized water spray was used to remove the remaining soil. Roots were then laid out by replications and 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 with-in ~ 1½ inches of the stalk (soil line on the 7th node).

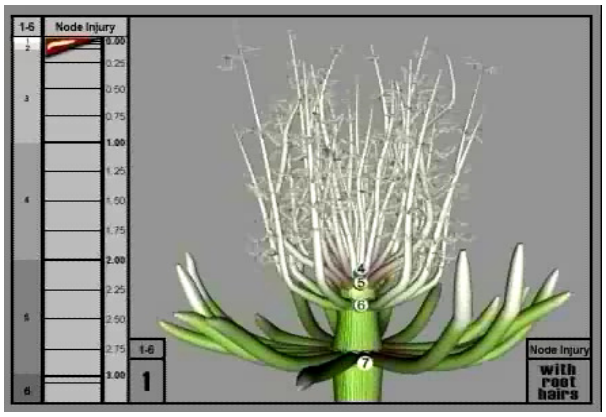
2.00 - Two nodes eaten.

3.00 - Three or more nodes eaten. (highest rating that can be given)

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, and so on.

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



Product consistency: The 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 and plant incorporated protectants effectiveness, data were analyzed with standard ANOVA procedures. Ryan's Q test (REGWQ) was used to rank treatments means where significant differences ($P > F \leq 0.05$) occurred.

Lodging counts: A plant was considered lodged if it was leaning at least 30 degrees from vertical. These were taken at harvest time along with final stand count numbers (note distance in footnotes of lodging count tables).

Yields: Studies that were taken to yield were machine harvested. Weights were converted to bushels/acre of No. 2 shelled corn (56 lbs/bu) at 15.5% moisture (noted in footnotes) and analyzed for treatment effects.

COMMENTS ON INSECTICIDES AND PLANT INCORPORATED PROTECTANTS (PIP) PERFORMANCE

Tables list treatment rates as ounces active ingredient per 1000 row foot unless otherwise indicated in the footnotes.

CORN ROOTWORM EVALUATIONS

AMES (Johnson farm)

Monsanto-Bayer Yield Study (Tables 2 & 3): There were two hybrids tested in this study, YieldGard CornBorer and YieldGard VT Triple. Both of these hybrids were treated with either Poncho 1250, Aztec, or given no additional protection. YieldGard CornBorer with no additional protection had significantly more injury than the other treatments. No significant differences were noted among stand counts or yields.

Syngenta-Force CS rates (Tables 6-7): There were no differences in stand counts, node injury, lodging, and yields among any treatments.

Syngenta-Force CS rates (Tables 8-9): There were no differences in node injury, lodging, and yields among any of the treatments. Regarding stand counts, the Agrisure non-RW Bt hybrid had significantly lower stand counts over than the Agrisure RW hybrid.

Syngenta-Force CS rates (Tables 10-11): There were no differences in stand counts, lodging, and yields among any of the treatments. The non-RW Bt hybrid (untreated check) had significantly more node-injury compared to the other treatments.

AMES (FEEL site)

Pioneer OAM1 (Tables 4 & 5): No significant differences were noted among stand counts. However, root injury differenced among the treatments. In OAM1, Herculex XTRA and Herculex 1 did not differ, and Herculex 1 in OAM 1 did not differ from Herculex 1 with Force. Untreated Herculex 1 had the greatest injury.

CRAWFORDSVILLE (S.E. R&D FARM)

Yield Study (Tables 12-15): There were no differences among treatments for stand counts. The rootworm feeding pressure in this study ranged from 0.00 to 0.37, indicating a light rootworm infestation. The lower than anticipated rootworm pressure was likely due in part to the very heavy rainfall in June, which was a record for the Crawfordsville site (19.7 cm). There were no significant differences among rootworm transgenic varieties (YieldGard VT Triple and Herculex XTRA) with or without a soil insecticide. Additionally, non-rootworm Bt corn with a soil insecticide performed as well as the rootworm transgenic corn. However, injury was significantly higher in two of the three untreated checks (YieldGard Corn Borer and YieldGard Roundup Ready) than in the other treatments. There were no differences among treatments for product consistency, percent lodging or yield.

Pioneer OAM1 (Tables 16 & 17): There were no significant differences among stand counts, noting only less than a two plant stand difference between the four treatments. Node injury was significantly greater for untreated Herculex 1 than with the other treatments, which did not differ from each other.

Syngenta-Force CS rates (Tables 18-19): There were no differences in stand counts, lodging, and yields among any of the treatments. The untreated non-RW Bt check had significantly higher injury than the other treatments..

Syngenta-Force CS rates (Tables 20-21): There were no differences in stand counts, node injury, lodging, and yields among any treatments.

Syngenta-Force CS rates (Tables 22-23): There were no differences in stand counts, node injury, lodging, and yields among any treatments.

NASHUA (N.E. R&D FARM)

Yield Study (Tables 24-27): Corn rootworm feeding pressure was moderately heavy, ranging from 1.45 to 1.69 nodes injured in the CHECKS. All Bt hybrid treatments (Mycogen Herculex and YieldGard VT Triple) with and without insecticide, did not differ significantly, with root injury ranging from 0.00 to 0.09. The root injury for the

non-RW Bt hybrids with insecticide (YieldGard CornBorer + Counter-SB, Mycogen Herculex XTRA + Lorsban + Warrior II) ranged from 0.72 to 1.69, and had significantly more injury than the RW-Bt hybrids with or without insecticide. The untreated checks had significantly more injury than the other treatments. For product consistency, the four non-Bt treatments with and without insecticide had significantly lower product consistency than the other RW-Bt hybrids with or without insecticides. No significant differences were noted among stand counts. Lodging was significantly greater in the untreated checks. Regarding yield, (Mycogen Herculex RR + Lorsban + Warrior II) and the untreated checks were significantly lower than the other treatments.

Syngenta-Force CS rates (Tables 28-29): There were no differences in stand counts, and yields among any treatments. Regarding node injury and product consistency, there were significant differences between the Agrisure non-RW Bt hybrid (with and without a Force application) and Agrisure RW hybrid (with and without a Force application). With lodging, the Agrisure non-RW Bt hybrid (check and Force 0.09 application), were significantly different than the Agrisure RW hybrid (with and without Force application) and the Agrisure non-RW Bt hybrid (0.12 T-band application).

Syngenta-Force CS rates (Tables 30-31): There were no differences among stand counts for any of the treatments. Regarding node injury, the Agrisure non-RW Bt hybrid (check) was significantly different from all the other treatments (Agrisure RW hybrid with and without a Force application, Agrisure non-RW Bt with a Force 0.12 application rate) except for the Agrisure non-RW Bt hybrid that had a Force application of 0.09 which was not significantly different. For percent lodging, both the Agrisure non-RW Bt (check) and the Agrisure non-RW Bt with a Force 0.09 application overtop was significantly different than the Agrisure RW hybrids alone and with the Force 0.09 and 0.12 application rates and the Agrisure non-RW Bt hybrid with an Force 0.12 application rate. Regarding yield, the Agrisure non-RW Bt hybrid (check) was significantly different from the Agrisure RW hybrid, alone and with the Force 0.09 and 0.12 application rates and the Agrisure non-RW Bt with a Force 0.12 application rate but not significantly different from the Agrisure non-RW Bt with an Force 0.09 application rate. With product consistency, the Agrisure non-RW Bt hybrid (check) was significantly different from the Agrisure RW hybrid with the Force 0.09 and 0.12 application rates but not significantly different from the Agrisure non-RW Bt hybrids with the Force 0.09 and 0.12 application rates and the Agrisure RW hybrid (check).

Syngenta-Force CS rates (Tables 32-33): There were no significant differences among product consistency and yield. Regarding node injury, the Agrisure non-RW Bt hybrid, alone and with a Force 0.12 application rate was significantly different from the Agrisure RW hybrid with the Force 0.09 and 0.12 application rates but not significantly different from the Agrisure RW alone or Agrisure non-RW Bt with an application rate of 0.09. With lodging, the Agrisure

non-RW Bt hybrid alone and with a Force application was significantly different than the Agrisure RW hybrid alone and with a Force application. Regarding stand counts, the Agrisure RW hybrids and Agrisure non-RW Bt hybrid with a Force 0.12 application rate was significantly different than these two hybrids (Agrisure RW hybrids and Agrisure non-RW Bt hybrid) alone or with the Force 0.09 application rate.

SUTHERLAND (N.W. R&D FARM)
Monsanto-Smartstax (Tables 34, 35): No differences were noted among stand counts for any of the treatments (Table 34). For root injury, the non-Bt hybrid (Dekalb RR only) with an Aztec 2.1G application overtop had significantly more injury (0.18) than the other treatments, which ranged from 0.00 to 0.02 (Table 35). None of the other hybrids differed significantly for rootworm injury.

SEED TREATMENT/FUNGICIDE STUDY

AMES (Johnson Farm)
Bayer Yield Study (Corn following Corn) (Tables 36 & 37): Although significant differences in stand count were present, no significant differences were noted in yields.

Bayer Yield Study (Corn following Soybeans) (Tables 38 & 39): No significant differences were observed for stand counts or yields.

NASHUA (N.E. R&D FARM)
Bayer Yield Study (Corn following Corn) (Tables 40 & 41): No significant differences were observed for stand counts or yields.

Bayer Yield Study (Corn following Soybeans) (Tables 42 & 43): No significant differences were observed for stand counts or yields.

EUROPEAN CORN BORER EVALUATIONS

AMES (Johnson farm)
Efficacy of Herculex XTRA (Table 44): The average number of tunnels was nearly 2X greater in the Mycogen RR only hybrid compared to the Mycogen Herculex XTRA hybrid. With this there was a significant difference between the two treatments.

For the average tunnel lengths (cm), there was no significant difference between the Mycogen RR only hybrid and the Mycogen Herculex XTRA hybrid.

BLACK CUTWORM EVALUATIONS

AMES (Johnson farm)
Herculex hybrids (Table 45):.For the evaluation date of July 29, 2009, 7 days after infestation (DAI), the average cut plants was significantly different for the Mycogen RR only hybrid (2.8) compared to the Mycogen Herculex XTRA hybrid (0.5). On the evaluation date of August 4, 2009, 12 days after infestation (DAI), there were no significant differences for the average cut plants between the Mycogen RR only hybrid and the Mycogen Herculex XTRA hybrid. It was determined that the decrease in the number of cut plants was due to regrowth.

CORN EARWORM (CEW) EVALUATIONS

SUTHERLAND (N.W. R&D FARM)
Monsanto-Smartstax Study (Tables 46 & 47): For corn earworm larval counts, the Dekalb RR only had the highest number of larvae (74). The Smartstax hybrids treatments with both Poncho 250 & 500 and VT Triple Pro had the lowest number of CEW larvae (3 to 8). Herculex XTRA and YieldGard VT Triple were intermediate, and the Dekalb RR only hybrid had the greatest number of larvae (Table 47). For kernel injury, Dekalb RR only hybrid and Herculex XTRA had the most injury and did not differ statistically. SmartStax performed significantly better than YieldGard VT Triple but had more CEW injury than VT Triple Pro (Table 48).

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 location 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

Many thanks to the Iowa Agriculture and Home Economics Experiment Station and the following companies for providing support for the evaluation of insecticides and plant-incorporated protectants (Corn Pests Research Project): AMVAC Chemical Corporation, Bayer CropScience, Dow AgroSciences, Monsanto, Pioneer Hi-Bred International, Inc., Syngenta.

WAIVER OF ENDORSEMENT

Table 1. Iowa evaluation of insecticides and plant-incorporated protectants for 2009.

Target Pest and Test Location	Type of Studies[1]	Table Numbers	Entries/ Test	Experimental Unit Size: Row Length (ft)	Experimental Unit Size: # Reps
Corn Rootworms					
Ames	Monsanto-Bayer yield	2,3	6	75	4
	Pioneer Optimum AcreMax 1 (OAM1)	4,5	4	25	3
	Syngenta-Force CS rates	6-11	6	25	4
Crawfordsville	Yield	12-15	10	75	4
	Pioneer Optimum AcreMax 1 (OAM1)	16,17	4	25	3
	Syngenta-Force CS rates	18-23	6	25	4
Nashua	Yield	24-27	10	75	4
	Syngenta-Force CS rates	28-33	6	25	4
Sutherland	Monsanto-Smartstax	34,35	6	75	4
Seed treatments/Fung.					
Ames	Bayer yield (C-C)	36,37	6	35	4
	Bayer yield (C-SB)	38,39	6	35	4
Nashua	Bayer yield (C-C)	40,41	6	35	4
	Bayer yield (C-SB)	42,43	6	35	4
European Corn Borer					
Ames	Herculex XTRA hybrids (SB's)	44	2	15	4
Black Cutworm					
Ames	Herculex XTRA hybrids (SB's)	45	2	2.5	5
Corn Earworm					
Sutherland	Monsanto-Smartstax	46,47	6	75	4

[1]All Studies were conducted on "trap crop corn" ground unless noted otherwise in parenthesis. (C-SB) = test conducted on ground that was planted to soybeans in 2008; (C-C) test conducted on ground that was planted to corn in 2008. (SB's) = test conducted on ground that was planted to soybeans in 2008.

Table 2. Average root-injury and product consistency for evaluation of insecticides treatments and plant-incorporated protectants. Monsanto-Bayer yield study: Ames, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[8,9]
Poncho1250	YGVT3	600FS	1.25	ST	0.00a	100
Aztec	YGVT3	2.1G	0.14	Furrow	0.00a	100
CHECK	YGVT3	------	------	------	0.00a	100
Aztec	YGCB	2.1G	0.14	Furrow	0.02a	100
Poncho1250	YGCB	600FS	1.25	ST	0.04ab	90
CHECK	YGCB	------	------	------	0.20 b	80

[1] Planted May 7, 2009; evaluated July 20, 2009
[2] YGVT3 = YieldGard VT Triple (DKC61-69); YGCB = YieldGard CornBorer (DKC61-73)
[3] Insecticide listed as ounces a.i. per 1,000 row-ft; seed treatment (ST) listed as mg a.i/seed
[4] Furrow = Insecticide applied at planting time; ST = seed treatment
[5] Chemical and check means based on 20 observations (5 roots/2 row treatment x 4 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[8] No significant differences between means (ANOVA, $P \leq 0.05$)
[9] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

Table 3. Average stand counts, percent lodging, and yield for evaluation of insecticides treatments and plant-incorporated protectants. Monsanto-Bayer yield study: Sutherland, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Stand Counts[5,6]	% Lodging[7,8]	Bushels/ Acre[9,10,11]
Poncho 1250	YGVT3	600FS	1.25	ST	119	12a	183
CHECK	YGVT3	------	------	------	117	8a	183
Aztec	YGVT3	2.1G	0.14	Furrow	117	4a	169
CHECK	YGCB	------	------	------	117	19ab	173
Poncho 1250	YGCB	600FS	1.25	ST	115	13 b	175
Aztec	YGCB	2.1G	0.14	Furrow	114	4a	173

[1] Planted May 7, 2009; evaluation dates: stand counts October 2; lodging October 2; yield October 28, 2009
[2] YGVT3 = YieldGard VT Triple (DKC61-69); YGCB = YieldGard CornBorer (DKC61-73);
[3] Insecticide listed as ounces a.i. per 1,000 row-ft; seed treatment (ST) listed as mg a.i/seed
[4] Furrow = Insecticide applied at planting time; ST = seed treatment
[5] Means based on 8 observations (2-row trt x 70 row-ft/treatment x 4 reps)
[6] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[7] Means based on 8 observations (2-row trt x 70 row-ft/treatment x 4 reps)
[8.] No significant differences between means (ANOVA, $P \leq 0.05$)
[9] Means based on 4 observations (2-row trt x 70 row-ft/treatment x 4 reps)
[10] Yields converted to 15.5% Moisture
[11] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 4. Average root-injury and product consistency for evaluation of insecticides treatments and plant-incorporated protectants. Pioneer Optimum AcreMax 1(OAM1) study: Ames, IA, FEEL site. 2009[1]

Hybrid[2]	Treatment	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[8,9]
HXX	-----	--	--	-----	0.02a	85a
HXX (OAM1)[10]		--	--	-----	0.05ab	97a
HX1 (OAM1)[11]		--	--	-----	0.15 bc	72a
HX1	Force	3G	0.12	T-band	0.18 c	70a
HX1	-----	--	--	-----	1.55 d	5 b

[1] Planted May 5, 2009; evaluated July 22, 2009
[2] HXX = Herculex XTRA hybrid (Pioneer 33W84); HX1 = Herculex 1 hybrid (Pioneer 33W83)
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Chemical and check means based on 18 observations (6 roots/2 rows x 3 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[8] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less
[9] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[10] For the 33W84-HXX (OAM1) treatment, 72 BT roots were dug (24 roots/2 rows x 3 replications)
[11] For the 33W83-HX1 (OAM1) treatment, 18 non-BT roots were dug (6 roots/2 rows x 3 replications)

Table 5. Average stand count for evaluation plant-incorporated protectants. Pioneer Optimum AcreMax 1 (OAM1) study: Ames, IA, FEEL site. 2009[1]

Hybrid[2]	Treatment	Form.	Rate[3]	Placement[4]	Stand Count[5,6]
HX1	Force	3G	0.12	T-band	37.00
HXX	---	--	--	-----	36.60
HX1	---	--	--	-----	36.20
HXX w/Blended Refuge		--		-----	34.75

[1] Planted May 5, 2009; evaluated June 5, 2009
[2] HXX = Herculex XTRA hybrid (Pioneer 33W84); HX1 = Herculex 1 hybrid (Pioneer 33W83)
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Means based on 12 observations (4 row trt x 20 row-ft/treatment x 3 replications)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 6. Average root-injury and product consistency for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Ames, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[8,9]
Force	Agrisure RW	250CS	0.12	T-band	0.00	100
Force	Agrisure RW	250CS	0.09	T-band	0.00	100
CHECK	Agrisure RW	------	------	------	0.01	100
Force	Agrisure CB	250CS	0.12	T-band	0.01	100
CHECK	Agrisure CB	------	------	------	0.03	100
Force	Agrisure CB	250CS	0.09	T-band	0.04	100

[1] Planted May 15, 2009; evaluated July 20, 2009
[2] Agrisure RW hybrid = N51T-3000GT; Agrisure CornBorer (CB) hybrid = N51-GT/CB/LL
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Chemical and check means based on 20 observations (5 roots/2 row treatment x 4 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] No significant differences between means (ANOVA, $P \leq 0.05$)
[8] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less
[9] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 7. Average stand counts, percent lodging, and yield for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Ames, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Stand Counts[5,6]	% Lodging[7,8]	Bushels/ Acre[9,10,11]
Force	Agrisure CB	250CS	0.09	T-band	32.20	0	190
CHECK	Agrisure CB	------	------	------	33.20	0	186
Force	Agrisure RW	250CS	0.12	T-band	32.70	0	184
Force	Agrisure RW	250CS	0.09	T-band	34.65	0	183
CHECK	Agrisure RW	------	------	------	34.75	0	173
Force	Agrisure CB	250CS	0.12	T-band	33.10	0	168

[1] Planted May 15, 2009; evaluation dates: stand counts June 3 & October 5; lodging October 5; yield October 28, 2009
[2] Agrisure RW hybrid = N51T-3000GT; Agrisure CornBorer (CB) hybrid = N51-GT/CB/LL
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Means based on 16 observations (2-rows x 17.5 row-ft/treatment x 4 reps x 2 evaluations)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)
[7] Means based on 8 observations (2-rows x 17.5 row-ft/treatment x 4 reps)
[8] No significant differences between means (ANOVA, $P \leq 0.05$)
[9] Means based on 4 observations (2-rows x 20 row-ft/treatment x 4 reps)
[10] No significant differences between means (ANOVA, $P \leq 0.05$)
[11] Yields converted to 15.5% Moisture

Table 8. Average root-injury and product consistency for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Ames, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[8,9]
Force	Agrisure RW	250CS	0.12	T-band	0.00	100
Force	Agrisure RW	250CS	0.09	T-band	0.00	100
CHECK	Agrisure RW	------	------	------	0.00	100
CHECK	Agrisure CB	------	------	------	0.00	100
Force	Agrisure CB	250CS	0.12	T-band	0.03	100
Force	Agrisure CB	250CS	0.09	T-band	0.13	90

[1] Planted May 12, 2009; evaluated July 20, 2009
[2] Agrisure RW hybrid = H8211-3000GT ; Agrisure CornBorer (CB) hybrid = H8212 GT/CB/LL
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Chemical and check means based on 20 observations (5 roots/2 row treatment x 4 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] No significant differences between means (ANOVA, $P \leq 0.05$)
[8] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less
[9] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 9. Average stand counts, percent lodging, and yield for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Ames, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Stand Counts[5,6]	% Lodging[7,8]	Bushels/ Acre[9,10,11]
Force	Agrisure CB	250CS	0.09	T-band	32.80a	28	188
Force	Agrisure CB	250CS	0.12	T-band	31.40a	23	187
CHECK	Agrisure RW	------	------	------	20.90 b	15	179
Force	Agrisure RW	250CS	0.09	T-band	22.50 b	10	178
Force	Agrisure RW	250CS	0.12	T-band	21.00 b	14	168
CHECK	Agrisure CB	------	------	------	29.30a	24	156

[1] Planted May 12, 2009; evaluation dates: stand counts June 3 & October 5; lodging October 5; yield October 28, 2009
[2] Agrisure RW hybrid = H8211-3000GT ; Agrisure CornBorer (CB) hybrid = H8212 GT/CB/LL
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Means based on 16 observations (2-rows x 17.5 row-ft/treatment x 4 reps x 2 evaluations)
[6] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[7] No significant differences between means (ANOVA, $P \leq 0.05$)
[8] Means based on 8 observations (2-rows x 17.5 row-ft/treatment x 4 reps)
[9] Means based on 4 observations (2-rows x 20 row-ft/treatment x 4 reps)
[10] No significant differences between means (ANOVA, $P \leq 0.05$)
[11] Yields converted to 15.5% Moisture

Table 10. Average root-injury and product consistency for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Ames, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[8,9]
Force	Agrisure RW	250CS	0.12	T-band	0.00a	100
CHECK	Agrisure RW	------	------	------	0.00a	100
Force	Agrisure RW	250CS	0.09	T-band	0.01a	100
Force	Agrisure CB	250CS	0.12	T-band	0.02a	100
Force	Agrisure CB	250CS	0.09	T-band	0.04a	100
CHECK	Agrisure CB	------	-----	------	0.12 b	90

[1] Planted May 15, 2009; evaluated July 20, 2009
[2] Agrisure RW hybrid = N68B CB/LL/RW; Agrisure CornBorer (CB) hybrid = N68-B8
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Chemical and check means based on 20 observations (5 roots/2 row treatment x 4 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[8] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less
[9] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 11. Average stand counts, percent lodging, and yield for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Ames, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Stand Counts[5,6]	% Lodging[7,8]	Bushels/ Acre[9,10,11]
CHECK	Agrisure RW	------	------	------	34.00	4	174
Force	Agrisure RW	250CS	0.12	T-band	32.80	1	173
Force	Agrisure CB	250CS	0.12	T-band	34.00	2	167
Force	Agrisure RW	250CS	0.09	T-band	34.10	0	167
Force	Agrisure CB	250CS	0.09	T-band	33.00	1	162
CHECK	Agrisure CB	------	------	------	33.90	3	157

[1] Planted May 15, 2009; evaluation dates: stand counts June 3 & October 5; lodging October 5; yield October 28, 2009
[2] Agrisure RW hybrid = N68B CB/LL/RW; Agrisure CornBorer (CB) hybrid = N68-B8
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Means based on 16 observations (2-rows x 17.5 row-ft/treatment x 4 reps x 2 evaluations)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)
[7] Means based on 8 observations (2-rows x 17.5 row-ft/treatment x 4 reps)
[8] No significant differences between means (ANOVA, $P \leq 0.05$)
[9] Means based on 4 observations (2-rows x 20 row-ft/treatment x 4 reps)
[10] No significant differences between means (ANOVA, $P \leq 0.05$)
[11] Yields converted to15.5% Moisture

Table 12. Average root-injury and product consistency for evaluation of insecticide treatments and plant-incorporated protectants. Yield study: Crawfordsville, IA. 2009[1]

Treatment[2]	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[8,9]
My-HXT	------	------	------	0.00a	100
My-HXT + Counter-SB	20G	0.90	Furrow	0.00a	100
YGVT3 + SmartChoice-SB	5G	0.18	Furrow	0.00a	100
My-HXT + SmartChoice-SB	5G	0.18	Furrow	0.00a	100
YGCB + Counter-SB	20G	1.20	Furrow	0.01ab	100
YGVT3 + Counter-SB	20G	0.90	Furrow	0.02ab	100
YGVT3	------	------	------	0.04ab	95
My-Iso	------	------	------	0.14 bc	85
DeKalb-Iso	------	------	------	0.33 cd	60
YGCB	------	------	------	0.37 d	60

[1] Planted May 11, 2009; evaluated July 16, 2009
[2] My-HXT = Mycogen brand Herculex XTRA (Mycogen 2K662); My-Iso = Mycogen brand RR Isoline (Mycogen EXP660) YGCB = YieldGard CornBorer (DKC61-73); YGVT3 = YieldGard VT Triple (DKC61-69); DeKalb-Iso = Dekalb brand RR Isoline (DKC 61-72).
[3] Insecticide listed as ounces a.i. per 1,000 row-ft; seed treatment (ST) listed as mg a.i/seed
[4] Furrow = insecticide applied at planting time; SB = SmartBox application at planting time
[5] Chemical and check means based on 20 observations (5 roots/2 rows x 4 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[8] Product consistency = Percentage of times nodal injury was 0.25 (¼ node eaten) or less
[9] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 13. Average stand counts for evaluation of insecticides treatments and plant-incorporated protectants. Yield study: Crawfordsville, IA. 2009[1]

Treatment[2]	Form.	Rate[3]	Placement[4]	Stand Count[5,6]
YGVT3	------	------	------	35.75
YGCB	------	------	------	35.65
My-Iso	------	------	------	34.90
YGVT3 + SmartChoice-SB	5G	0.18	Furrow	33.80
YGCB + Counter-SB	20G	1.20	Furrow	33.60
My-HXT + Counter-SB	20G	0.90	Furrow	33.10
YGVT3 + Counter-SB	20G	0.90	Furrow	33.10
My-HXT	------	------	------	32.90
Dekalb-Iso	------	------	------	32.80
My-HXT + SmartChoice-SB	5G	0.18	Furrow	31.80

[1] Planted May 11, 2009; evaluated June 4 & September 29, 2009
[2] My-HXT = Mycogen brand Herculex XTRA (Mycogen 2K662); My-Iso = Mycogen brand RR Isoline (Mycogen EXP660) YGCB = YieldGard CornBorer (DKC61-73); YGVT3 = YieldGard VT Triple (DKC61-69); Dekalb-Iso = Dekalb brand RR Isoline (DKC 61-72).
[3] Insecticide listed as ounces a.i. per 1,000 row-ft; seed treatment (ST) listed as mg a.i/seed
[4] Furrow = insecticide applied at planting time; SB = SmartBox application at planting time
[5] Means based on 16 observations (2-row trt x17.5 row-ft/treatment x 4 replications x 2 evaluations)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 14. Average percent lodging for evaluation of insecticide treatments and plant-incorporated protectants. Yield study: Crawfordsville, IA. 2009[1]

Treatment[2]	Form.	Rate[3]	Placement[4]	% Lodging[5,6]
YGVT3	------	------	------	0
YGVT3 + SmartChoice-SB	5G	0.18	Furrow	0
YGVT3 + Counter-SB	20G	0.90	Furrow	0
My-HXT	------	------	------	0
My-HXT + SmartChoice-SB	5G	0.18	Furrow	0
My-HXT + Counter-SB	20G	0.90	Furrow	1
YGCB	------	------	------	1
YGCB + Counter-SB	20G	1.20	Furrow	2
My-Iso	------	------	------	2
DeKalb-Iso	------	------	------	2

[1] Planted May 11, 2009; evaluated September 29, 2009
[2] My-HXT = Mycogen brand Herculex XTRA (Mycogen 2K662); My-Iso = Mycogen brand RR Isoline (Mycogen EXP660) YGCB = YieldGard CornBorer (DKC61-73); YGVT3 = YieldGard VT Triple (DKC61-69); Dekalb-Iso = Dekalb brand RR Isoline (DKC 61-72).
[3] Insecticide listed as ounces a.i. per 1,000 row-ft; seed treatment (ST) listed as mg a.i/seed
[4] Furrow = insecticide applied at planting time; SB = SmartBox application at planting time
[5] Means based on 8 observations (2-row trt x17.5 row-ft/treatment x 4 replications)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 15. Average yield for evaluation of insecticide treatments and plant-incorporated protectants. Yield study: Crawfordsville, IA. 2009[1]

Treatment[2]	Form.	Rate[3]	Placement[4]	Bushels/ Acre[5,6,7]
YGCB + Counter-SB	20G	1.2	Furrow	215
Dekalb-Iso	------	------	------	209
YGCB	------	------	------	206
YGVT3 + Counter-SB	20G	0.90	Furrow	205
YGVT3	------	------	------	204
YGVT3 + SmartChoice-SB	5G	0.18	Furrow	199
My-HXT + Counter-SB	20G	0.90	Furrow	199
My-HXT	------	------	------	199
My-HXT + SmartChoice-SB	5G	0.18	Furrow	187
My-Iso	------	------	------	179

[1] Planted May 11, 2009; machine harvested November 6, 2009
[2] My-HXT = Mycogen brand Herculex XTRA (Mycogen 2K662); My-Iso = Mycogen brand RR Isoline (Mycogen EXP660) YGCB = YieldGard CornBorer (DKC61-73); YGVT3 = YieldGard VT Triple (DKC61-69); Dekalb-Iso = Dekalb brand RR Isoline (DKC 61-72).
[3] Insecticide listed as ounces a.i. per 1,000 row-ft; seed treatment (ST) listed as mg a.i/seed
[4] Furrow = insecticide applied at planting time; SB = SmartBox application at planting time
[5] Means based on 3 observations (2-row trt x 68.75 row-ft/treatment x 3 replications)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)
[7] Yields converted to 15.5% Moisture

Table 16. Average root-injury and product consistency for evaluation of insecticides treatments and plant-incorporated protectants. Pioneer Optimum AcreMax 1 (OAM1) study: Crawfordsville, IA. 2009[1]

Hybrid[2]	Treatment	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[8,9]
HXX	---	--	--	-----	0.02a	90a
HXX (OAM1)[10]		---	--	-----	0.02a	98a
HX1 (OAM1)[11]		---	--	-----	0.04a	100a
HX1	Force	3G	0.12	T-band	0.10a	95a
HX1	---	--	--	-----	0.56 b	45 b

[1] Planted May 11, 2009; evaluated July 17, 2009
[2] HXX = Herculex XTRA hybrid (Pioneer 33W84); HX1 = Herculex 1 hybrid (Pioneer 33W83)
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Chemical and check means based on 18 observations (6 roots/2 rows x 3 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[8] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less
[9] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[10] For the 33W84-HXX (OAM1) treatment, 72 BT roots were dug (24 roots/2 rows x 3 replications)
[11] For the 33W83-HX1 (OAM1) treatment, 18 non-BT roots were dug (6 roots/2 rows x 3 replications)

Table 17. Average stand count for evaluation plant-incorporated protectants. Pioneer Optimum AcreMax 1 (OAM1) study: Crawfordsville, IA. 2009[1]

Hybrid[2]	Treatment	Form.	Rate[3]	Placement[4]	Stand Count[5,6]
HXX w/Blended Refuge		--	--	-----	32.75
HXX	---	--	--	-----	32.60
HX1	Force	3G	0.12	T-band	31.35
HX1	---	--	--	-----	31.20

[1] Planted May 11, 2009; evaluated June 4, 2009
[2] HXX = Herculex XTRA hybrid (Pioneer 33W84); HX1 = Herculex 1 hybrid (Pioneer 33W83)
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Means based on 12 observations (4 row trt x 20 row-ft/treatment x 3 replications)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 18. Average root-injury and product consistency for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Crawfordsville, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[8,9]
Force	Agrisure CB	250CS	0.12	T-band	0.01a	100
Force	Agrisure RW	250CS	0.12	T-band	0.02a	100
Force	Agrisure RW	250CS	0.09	T-band	0.02a	100
CHECK	Agrisure RW	------	------	------	0.02a	100
Force	Agrisure CB	250CS	0.09	T-band	0.03a	100
CHECK	Agrisure CB	------	------	------	0.17 b	80

[1] Planted May 11, 2009; evaluated July 16, 2009
[2] Agrisure RW hybrid = 83X61-3000GT; Agrisure CornBorer (CB) hybrid = 83X58 CB/LL
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Chemical and check means based on 20 observations (5 roots/2 row treatment x 4 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[8] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less
[9] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 19. Average stand counts, percent lodging, and yield for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Crawfordsville, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Stand Counts[5,6]	% Lodging[7,8]	Bushels/ Acre[9,10,11]
Force	Agrisure CB	250CS	0.09	T-band	29.00	0	198
Force	Agrisure CB	250CS	0.12	T-band	27.90	0	197
Force	Agrisure RW	250CS	0.09	T-band	29.80	0	182
Force	Agrisure RW	250CS	0.12	T-band	28.10	0	187
CHECK	Agrisure RW	------	------	------	29.70	0	180
CHECK	Agrisure CB	------	------	------	28.10	0	177

[1] Planted May 11, 2009; evaluation dates: stand counts June 4 & September 29; lodging September 29; yield-November 6, 2009
[2] Agrisure RW hybrid = 83X61-3000GT; Agrisure CornBorer (CB) hybrid = 83X58 CB/LL
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Means based on 16 observations (2-rows x 17.5 row-ft/treatment x 4 reps x 2 evaluations)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)
[7] Means based on 8 observations (2-rows x 17.5 row-ft/treatment x 4 reps)
[8] No significant differences between means (ANOVA, $P \leq 0.05$)
[9] Means based on 4 observations (2-rows x 20 row-ft/treatment x 4 reps)
[10] No significant differences between means (ANOVA, $P \leq 0.05$)
[11] Yields converted to 15.5% Moisture

Table 20. Average root-injury and product consistency for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Crawfordsville, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[8,9]
Force	Agrisure RW	250CS	0.09	T-band	0.01	100
CHECK	Agrisure RW	------	------	------	0.01	100
Force	Agrisure CB	250CS	0.09	T-band	0.01	100
Force	Agrisure RW	250CS	0.12	T-band	0.02	100
Force	Agrisure CB	250CS	0.12	T-band	0.02	100
CHECK	Agrisure CB	------	------	------	0.15	90

[1] Planted May 12, 2009; evaluated July 16, 2009
[2] Agrisure RW hybrid = N72Q CB/LL/RW; Agrisure CornBorer (CB) hybrid = N72-Q6 CB/LL
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Chemical and check means based on 20 observations (5 roots/2 row treatment x 4 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] No significant differences between means (ANOVA, $P \leq 0.05$)
[8] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less
[9] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 21. Average stand counts, percent lodging, and yield for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Crawfordsville, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Stand Counts[5,6]	% Lodging[7,8]	Bushels/ Acre[9,10,11]
CHECK	Agrisure RW	------	------	------	31.60	0	209
Force	Agrisure RW	250CS	0.09	T-band	30.80	0	209
Force	Agrisure RW	250CS	0.12	T-band	32.00	0	203
Force	Agrisure CB	250CS	0.09	T-band	32.25	0	194
CHECK	Agrisure CB	------	------	------	31.80	0	188
Force	Agrisure CB	250CS	0.12	T-band	31.30	0	184

[1] Planted May 12, 2009; evaluation dates: stand counts June 4 & September 29; lodging September 29; yield November 6, 2009
[2] Agrisure RW hybrid = N72Q CB/LL/RW; Agrisure CornBorer (CB) hybrid = N72-Q6 CB/LL
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Means based on 16 observations (2-rows x 17.5 row-ft/treatment x 4 reps x 2 evaluations)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)
[7] Means based on 8 observations (2-rows x 17.5 row-ft/treatment x 4 reps)
[8] No significant differences between means (ANOVA, $P \leq 0.05$)
[9] Means based on 4 observations (2-rows x 20 row-ft/treatment x 4 reps)
[10] No significant differences between means (ANOVA, $P \leq 0.05$)
[11] Yields converted to 15.5% Moisture

Table 22. Average root-injury and product consistency for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Crawfordsville, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[8,9]
Force	Agrisure RW	250CS	0.12	T-band	0.00	100
Force	Agrisure RW	250CS	0.09	T-band	0.00	100
CHECK	Agrisure RW	------	------	------	0.00	100
Force	Agrisure CB	250CS	0.12	T-band	0.01	100
Force	Agrisure CB	250CS	0.09	T-band	0.02	100
CHECK	Agrisure CB	------	-----	------	0.22	75

[1] Planted May 12, 2009; evaluated July 20, 2009
[2] Agrisure RW hybrid = N68B CB/LL/RW; Agrisure CornBorer (CB) hybrid = N68-B8
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Chemical and check means based on 20 observations (5 roots/2 row treatment x 4 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] No significant differences between means (ANOVA, $P \leq 0.05$)
[8] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less
[9] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 23. Average stand counts, percent lodging, and yield for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Crawfordsville, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Stand Counts[5,6]	% Lodging[7,8]	Bushels/ Acre[9,10,11]
Force	Agrisure RW	250CS	0.12	T-band	30.60	0	245
Force	Agrisure RW	250CS	0.09	T-band	32.30	0	217
Force	Agrisure CB	250CS	0.12	T-band	31.00	0	216
CHECK	Agrisure RW	------	------	------	30.30	0	208
CHECK	Agrisure CB	------	------	------	29.80	0	200
Force	Agrisure CB	250CS	0.09	T-band	29.30	0	188

[1] Planted May 12, 2009; evaluation dates: stand counts June 4 & September 29; lodging September 29; yield November 6, 2009
[2] Agrisure RW hybrid = N68B CB/LL/RW; Agrisure CornBorer (CB) hybrid = N68-B8
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Means based on 16 observations (2-rows x 17.5 row-ft/treatment x 4 reps x 2 evaluations)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)
[7] Means based on 8 observations (2-rows x 17.5 row-ft/treatment x 4 reps)
[8] No significant differences between means (ANOVA, $P \leq 0.05$)
[9] Means based on 4 observations (2-rows x 20 row-ft/treatment x 4 reps)
[10] No significant differences between means (ANOVA, $P \leq 0.05$)
[11] Yields converted to 15.5% Moisture

Table 24. Average root-injury and product consistency for evaluation of insecticide treatments and plant-incorporated protectants. Yield study: Nashua, IA. 2009[1]

Treatment[2]	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[8,9]
My-HXT + SmartChoice-SB	5G	0.18	Furrow	0.00a	100a
YGVT3 + SmartChoice-SB	5G	0.18	Furrow	0.00a	100a
YGVT3 + Counter-SB	20G	0.90	Furrow	0.01a	100a
My-HXT + Counter-SB	20G	0.90	Furrow	0.02a	100a
YGVT3	------	------	------	0.04a	95a
My-HXT	------	------	------	0.09a	90a
YGCB + Counter-SB	20G	1.20	Furrow	0.72 b	35 b
My-Iso+Lorsban+Warrior II 4E	+2.09	1.94+0.189	Furrow	1.02 b	30 bc
YGCB	------	------	------	1.45 c	10 bc
My-Iso	------	------	------	1.69 c	0 bc

[1] Planted April 23, 2009; evaluated July 23, 2009
[2] My-HXT = Mycogen brand Herculex XTRA (Mycogen 2W587); My-Iso = Mycogen brand RR (Mycogen 2W583); YGCB = YieldGard CornBorer (DKC61-73); YGVT3 = YieldGard VT Triple (DKC61-69)
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] Furrow = insecticide applied at planting time; SB = SmartBox application at planting time
[5] Chemical and check means based on 20 observations (5 roots/2 rows x 4 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[8] Product consistency = Percentage of times nodal injury was 0.25 (¼ node eaten) or less
[9] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 25. Average stand counts for evaluation of insecticide treatments and plant-incorporated protectants. Yield study: Nashua, IA. 2009[1]

Treatment[2]	Form.	Rate[3]	Placement[4]	Stand Count[5,6]
My-HXT + SmartChoice-SB	5G	0.18	Furrow	38.20
YGVT3 + SmartChoice-SB	5G	0.18	Furrow	36.95
My-HXT + Counter-SB	20G	0.90	Furrow	36.90
My-HXT	------	------	------	36.70
YGVT3 + Counter-SB	20G	0.90	Furrow	36.25
YGVT3	------	------	------	35.95
YGCB	------	------	------	35.50
YGCB + Counter-SB	20G	1.20	Furrow	35.10
My-Iso	------	------	------	34.60
My-Iso+Lorsban+Warrior II 4E	+2.09	1.94+0.189	Furrow	34.25

[1] Planted April 23, 2009; evaluated June 1 & September 15, 2009
[2] My-HXT = Mycogen brand Herculex XTRA (Mycogen 2W587); My-Iso = Mycogen brand RR (Mycogen 2W583); YGCB = YieldGard CornBorer (DKC61-73); YGVT3 = YieldGard VT Triple (DKC61-69)
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] Furrow = insecticide applied at planting time; SB = SmartBox application at planting time;
[5] Means based on 16 observations (2-row trt x17.5 row-ft/treatment x 4 replications x 2 evaluations)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 26. Average percent lodging for evaluation of insecticide treatments and plant-incorporated protectants. Yield study: Nashua, IA. 2009[1]

Treatment[2]	Form.	Rate[3]	Placement[4]	% Lodging[5,6]
My-HXT + Counter-SB	20G	0.90	Furrow	0a
YGVT3 + Counter-SB	20G	0.90	Furrow	0a
My-HXT + SmartChoice-SB	5G	0.18	Furrow	0a
My-HXT	------	------	------	1a
YGVT3	------	------	------	1a
YGCB + Counter-SB	20G	1.20	Furrow	9ab
YGVT3 + SmartChoice-SB	5G	0.18	Furrow	12ab
My-Iso+Lorsban+Warrior II	4E+2.09	1.94+0.189	Furrow	37ab
YGCB	------	------	------	54 b
My-Iso	------	------	------	63 b

[1] Planted April 23, 2009; evaluated September 15, 2009
[2] My-HXT = Mycogen brand Herculex XTRA (Mycogen 2W587); My-Iso = Mycogen brand RR (Mycogen 2W583); YGCB = YieldGard CornBorer (DKC61-73); YGVT3 = YieldGard VT Triple (DKC61-69)
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] Furrow = insecticide applied at planting time; SB = SmartBox application at planting time;
[5] Means based on 8 observations (2-row trt x17.5 row-ft/treatment x 4 replications)
[6] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 27. Average yield for evaluation of insecticides treatment and plant-incorporated protectants. Yield study: Nashua, IA. 2009[1]

Treatment[2]	Form	Rate[3]	Placement[4]	Bushels/ Acre[5,6,7]
YGVT3	------	------	------	185a
YGVT3 + SmartChoice-SB	5G	0.18	Furrow	174ab
YGVT3 + Counter-SB	20G	0.90	Furrow	168ab
My-HXT + Counter-SB	20G	0.90	Furrow	158ab
My-HXT + SmartChoice-SB	5G	0.18	Furrow	158ab
My-HXT	------	------	------	156ab
YGCB + Counter-SB	20G	1.20	Furrow	149 bc
My-Iso+Lorsban+Warrior II	4E+2.09	1.94+0.189	Furrow	125 cd
YGCB	------	------	------	118 d
My-Iso	------	------	------	107 d

[1] Planted April 23, 2009; machine harvested November 10, 2009
[2] My-HXT = Mycogen brand Herculex XTRA (Mycogen 2W587); My-Iso = Mycogen brand RR (Mycogen 2W583); YGCB = YieldGard CornBorer (DKC61-73); YGVT3 = YieldGard VT Triple (DKC61-69)
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] Furrow = insecticide applied at planting time; SB = SmartBox application at planting time;
[5] Means based on 4 observations (2-row trt x 68.75 row-ft/treatment x 4 replications)
[6] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[7] Yields converted to 15.5% Moisture

Table 28. Average root-injury and product consistency for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Nashua, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[8,9]
Force	Agrisure RW	250CS	0.12	T-band	0.05a	100a
Force	Agrisure RW	250CS	0.09	T-band	0.06a	90a
CHECK	Agrisure RW	------	------	------	0.38ab	70a
Force	Agrisure CB	250CS	0.12	T-band	1.03 bc	10 b
Force	Agrisure CB	250CS	0.09	T-band	1.25 bc	10 b
CHECK	Agrisure CB	------	------	------	1.61 c	10 b

[1] Planted April 23, 2009; evaluated July 29, 2009
[2] Agrisure RW hybrid = N51T-3000GT; Agrisure CornBorer (CB) hybrid = N51T GT/CB/LL
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Chemical and check means based on 20 observations (5 roots/2 row treatment x 4 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[8] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less
[9] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 29. Average stand counts, percent lodging, and yield for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Nashua, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Stand Counts[5,6]	% Lodging[7,8]	Bushels/ Acre[9,10,11]
CHECK	Agrisure RW	------	------	------	34.60	1a	173
Force	Agrisure RW	250CS	0.12	T-band	33.10	0a	160
Force	Agrisure RW	250CS	0.09	T-band	34.50	0a	157
Force	Agrisure CB	250CS	0.12	T-band	30.50	1a	142
CHECK	Agrisure CB	------	------	------	28.60	49 b	137
Force	Agrisure CB	250CS	0.09	T-band	31.00	38 b	136

[1] Planted April 23, 2009; evaluation dates: stand counts June 1 & September 15; lodging September 15; yield November 10, 2009
[2] Agrisure RW hybrid = N51T-3000GT; Agrisure CornBorer (CB) hybrid = N51T GT/CB/LL
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Means based on 16 observations (2-rows x 17.5 row-ft/treatment x 4 reps x 2 evaluations)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)
[7] Means based on 8 observations (2-rows x 17.5 row-ft/treatment x 4 reps)
[8] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[9] Means based on 4 observations (2-rows x 20 row-ft/treatment x 4 reps)
[10] No significant differences between means (ANOVA, $P \leq 0.05$)
[11] Yields converted to 15.5% Moisture

Table 30. Average root-injury and product consistency for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Nashua, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[8,9]
Force	Agrisure RW	250CS	0.12	T-band	0.05a	100a
Force	Agrisure RW	250CS	0.09	T-band	0.15ab	80ab
Force	Agrisure CB	250CS	0.12	T-band	0.45ab	40abc
CHECK	Agrisure RW	------	------	------	0.47ab	30abc
Force	Agrisure CB	250CS	0.09	T-band	0.99 bc	25 bc
CHECK	Agrisure CB	------	------	------	1.49 c	5 c

[1] Planted April 24, 2009; evaluated July 28, 2009
[2] Agrisure RW hybrid = H8211-3000GT; Agrisure CornBorer (CB) hybrid = H8212 GT/CB/LL
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Chemical and check means based on 20 observations (5 roots/2 row treatment x 4 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[8] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less
[9] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 31. Average stand counts, percent lodging, and yield for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Nashua, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Stand Counts[5,6]	% Lodging[7,8]	Bushels/ Acre[9,10,11]
Force	Agrisure RW	250CS	0.12	T-band	23.30	0a	178a
Force	Agrisure RW	250CS	0.09	T-band	25.20	0a	172a
CHECK	Agrisure RW	------	------	------	26.50	1a	170a
Force	Agrisure CB	250CS	0.12	T-band	29.90	4a	168a
Force	Agrisure CB	250CS	0.09	T-band	28.70	47 b	112ab
CHECK	Agrisure CB	------	------	------	29.15	76 b	86 b

[1] Planted April 24, 2009; evaluation dates: stand counts June 1 & September 15; lodging September 15; yield November 10, 2009
[2] Agrisure RW hybrid = H8211-3000GT; Agrisure CornBorer (CB) hybrid = H8212 GT/CB/LL
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Means based on 16 observations (2-rows x 17.5 row-ft/treatment x 4 reps x 2 evaluations)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)
[7] Means based on 8 observations (2-rows x 17.5 row-ft/treatment x 4 reps)
[8] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[9] Means based on 4 observations (2-rows x 20 row-ft/treatment x 4 reps)
[10] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[11] Yields converted to 15.5% Moisture

Table 32. Average root-injury and product consistency for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Nashua, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[8,9]
Force	Agrisure RW	250CS	0.09	T-band	0.04 b	100
Force	Agrisure RW	250CS	0.12	T-band	0.14 b	80
CHECK	Agrisure RW	------	------	------	0.39 bc	40
Force	Agrisure CB	250CS	0.09	T-band	0.65 bc	25
Force	Agrisure CB	250CS	0.12	T-band	0.95 c	30
CHECK	Agrisure CB	------	-----	------	1.01 c	15

[1] Planted April 24, 2009; evaluated July 28, 2009
[2] Agrisure RW hybrid = N68B CB/LL/RW; Agrisure CornBorer (CB) hybrid = N68-B8
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Chemical and check means based on 20 observations (5 roots/2 row treatment x 4 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[8] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less
[9] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 33. Average stand counts, percent lodging, and yield for evaluation of insecticide treatments and plant-incorporated protectants. Syngenta study: Nashua, IA. 2009[1]

Treatment	Hybrid[2]	Form.	Rate[3]	Placement[4]	Stand Counts[5,6]	% Lodging[7,8]	Bushels/ Acre[9,10,11]
Force	Agrisure RW	250CS	0.09	T-band	36.00a	0b	195
Force	Agrisure RW	250CS	0.12	T-band	30.90 b	0b	187
CHECK	Agrisure RW	------	------	------	33.30ab	0b	185
Force	Agrisure CB	250CS	0.09	T-band	32.85ab	8bc	153
CHECK	Agrisure CB	------	------	------	33.20ab	20 c	151
Force	Agrisure CB	250CS	0.12	T-band	31.25 b	7bc	150

[1] Planted April 24, 2009; evaluation dates: stand counts June 1 & September 15; lodging September 15; yield November 10, 2009
[2] Agrisure RW hybrid = N68B CB/LL/RW; Agrisure CornBorer (CB) hybrid = N68-B8
[3] Insecticide listed as ounces a.i. per 1,000 row-ft
[4] T-band = Insecticide applied at planting time
[5] Means based on 16 observations (2-rows x 17.5 row-ft/treatment x 4 reps x 2 evaluations)
[6] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[7] Means based on 8 observations (2-rows x 17.5 row-ft/treatment x 4 reps)
[8] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[9] Means based on 4 observations (2-rows x 20 row-ft/treatment x 4 reps)
[10] No significant differences between means (ANOVA, $P \leq 0.05$)
[11] Yields converted to15.5% Moisture

Table 34. Average stand count for evaluation plant-incorporated protectants. Monsanto Smartstax study: Sutherland, IA, 2009[1]

Hybrid[2]	Treatment	Form.	Rate[3]	Placement[4]	Stand Counts[5,6]
HXX/RR2	--	--	--	----	35.90
Smartstax	P250	600FS	0.25	ST	35.80
VT Triple Pro	--	--	--	----	35.75
Smartstax	P500	600FS	0.50	ST	35.60
VT Triple	--	--	--	----	34.70
RR hybrid	Aztec	2.1G	0.14	Furrow	34.30

[1] Planted May 28, 2009; evaluated June 23, 2009
[2] RR hybrid- DKC61-22, VT Triple- DKC61-19, HXX/RR2- NC6214QGV1, VT Triple Pro-NC6214MQK1, Smartstax (VT3P/HXX)-DKC61-21
[3] Insecticide listed as ounces a.i. per 1,000 row-ft; seed treatment (ST) listed as mg a.i/seed
[4] Furrow = Insecticide applied at planting time, ST = Seed Treatment
[5] Means based on 16 observations (4 row trt x 17.5 row-ft/treatment x 4 replications)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)

Table 35. Average root-injury and product consistency for evaluation of insecticides treatments and plant-incorporated protectants. Monsanto Smartstax study: Sutherland, IA, 2009[1]

Hybrid[2]	Treatment	Form.	Rate[3]	Placement[4]	Node-Injury[5,6,7]	Product Consistency[7,8]
Smartstax	P500	600FS	0.50	ST	0.00a	100a
Smartstax	P250	600FS	0.25	ST	0.00a	100a
VT Triple	--	--	--	-----	0.00a	100a
VT Triple Pro	--	--	--	-----	0.00ab	100a
HXX/RR2	--	--	--	-----	0.02 b	98a
RR hybrid	Aztec	2.1G	0.14	Furrow	0.18 c	83 b

[1] Planted May 28, 2009; evaluated August 3, 2009
[2] RR hybrid- DKC61-22, VT Triple- DKC61-19, HXX/RR2- NC6214QGV1, VT Triple Pro- NC6214MQK1, Smartstax (VT3P/HXX)-DKC61-21
[3] Insecticide listed as ounces a.i. per 1,000 row-ft; seed treatment (ST) listed as mg a.i/seed
[4] Furrow = Insecticide applied at planting time, ST = Seed Treatment
[5] Chemical and check means based on 40 observations (10 roots/2 rows x 4 replications)
[6] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten
[7] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[8] Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less

Table 36. Average stand counts for planting-time seed treatments. Bayer special yield study: ISU Johnson Farm, Ames, IA. 2009[1]

Entry/Treatment	Form.	Rate[2]	Placement[3]	Stand Counts[4,5]
A/6. Vortex FL	FS	0.324	ST	41.19a
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Purple Clnt	FS	1.899	ST	
L1463-B	AL	18.93	ST	
L1273-B	AL	2.26	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/3.Vortex FL	FS	0.324	ST	40.25ab
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5.0 oz/A	R1	
A/2 Vortex FL	FS	0.324	ST	39.69abc
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
A/5. Vortex FL	FS	0.324	ST	39.69abc
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/4.Vortex FL	FS	0.324	ST	39.00 bc
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5.0 oz/A	R1	
Aztec	2.1 GR	0.14	Furrow	

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Table 36. Average stand counts for planting-time seed treatments. Bayer special yield study: ISU Johnson Farm, Ames, IA. 2009[1] (continued)

Entry/Treatment	Form.	Rate[2]	Placement[3]	Stand Counts[4,5]
A/1. Maxim XL	LS	0.63	ST	37.88 c
Apron XL	ES	0.166	ST	
Dynasty	FS	0.584	ST	
Pro-ized Red Clnt	FS	1.14	ST	

[1] Planted May 15, 2009; evaluated June 3, 2009: Hybrid planted in this study- DeKalb DKC61-69
[2] Seed treatment's listed as ounces product per 100 weight seed; Fungicide's (R1) listed as oz/A=ounces per Acre; Insecticide (Furrow) listed as ounces a.i. per 1,000 row-ft
[3] ST = seed treatment; R1 = Reproductive Stage 1; Furrow = Insecticide applied at planting time
[4] Means based on 16 observations (4 center rows x 17.5 row-ft x 4 replications)
[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 37. Average yields for planting-time seed treatments. Bayer special yield study: ISU Johnson Farm, Ames, IA. 2009[1]

Entry/Treatment	Form.	Rate[2]	Placement[3]	Bushels/ Acre[4,5,6]
A/6. Vortex FL	FS	0.324	ST	189
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Purple Clnt	FS	1.899	ST	
L1463-B	AL	18.93	ST	
L1273-B	AL	2.26	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/5. Vortex FL	FS	0.324	ST	155
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/2. Vortex FL	FS	0.324	ST	151
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
A/4. Vortex FL	FS	0.324	ST	144
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5.0 oz/A	R1	
Aztec	2.1 GR	0.14	Furrow	
A/3. Vortex FL	FS	0.324	ST	141
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5.0 oz/A	R1	

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Table 37. Average yields for planting-time seed treatments. Bayer special yield study: ISU Johnson Farm, Ames, IA. 2009[1]

Entry/Treatment	Form.	Rate[2]	Placement[3]	Bushels/ Acre[4,5,6]
A/1. Maxim XL	LS	0.63	ST	130
Apron XL	ES	0.166	ST	
Dynasty	FS	0.584	ST	
Pro-ized Red Clnt	FS	1.14	ST	

[1] Planted May 15, 2009; machine harvested November 12, 2009, Hybrid planted in this study- DeKalb DKC61-69
[2] Seed treatment's listed as ounces product per 100 weight seed; Fungicide's (R1) listed as oz/A=ounces per Acre; Insecticide (Furrow) listed as ounces a.i. per 1,000 row-ft
[3] ST = seed treatment; R1 = Reproductive Stage 1; Furrow = Insecticide applied at planting time
[4] Means based on 4 observations (4 center rows x 30 row-ft x 4 replications)
[5] No significant differences between means (ANOVA, $P < 0.05$)
[6] Yields converted to 15.5% Moisture

Table 38. Average stand counts for planting-time seed treatments. Bayer special yield study: Ames, IA. 2009[1,2]

Entry/Treatment	Form.	Rate[3]	Placement[4]	Stand Counts[5,6]
A/5. Raxil	FS	0.265	ST	40.56
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/3. Raxil	2.6FS	0.265	ST	40.19
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/4 Raxil	2.6FS	0.265	ST	39.75
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.9	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	4.0 oz/A	R1	
Aztec	2.1 GR	0.14	Furrow	
A/6. Raxil	2.6FS	0.265	ST	39.56
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Purple Clnt	FS	1.9	ST	
L1463-B	AL	19	ST	
L1273-B	AL	2.26	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/1. Maxim XL	LS	0.63	ST	39.50
Apron XL	ES	0.166	ST	
Pro-ized Red Clnt	FS	1.14	ST	
Dynasty	FS	0.584	ST	

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Table 38. Average stand counts for planting-time seed treatments. Bayer special yield study: Ames, IA. 2009[1,2] (continued)

Entry/Treatment	Form.	Rate[3]	Placement[4]	Stand Counts[5,6]
A/2. Raxil	2.6FS	0.265	ST	39.19
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	

[1] Planted May 5, 2009; evaluated June 3, 2009: Hybrid planted in this study- Liberty Link (Bayer Internal Code # 09HYBL112HOEF)
[2] A blanket herbicide treatment of Ignite 280 (22 oz/A) + AMS (1.5 lbs/A) was applied on June 10, 2009
[3] Seed treatment's listed as ounces product per 100 weight seed; Fungicide's (R1) listed as oz/A=ounces per Acre Insecticide (Furrow) listed as ounces a.i. per 1,000 row-ft
[4] ST = seed treatment; R1 = Reproductive Stage 1; Furrow = Insecticide applied at planting time
[5] Means based on 16 observations (4 center rows x 17.5 row-ft x 4 replications)
[6] No significant differences between means (ANOVA, $P < 0.05$)

Table 39. Average yield for planting-time seed treatments. Bayer special yield study: ISU Johnson farm Ames, IA. 2009[1,2]

Entry/Treatment	Form.	Rate[3]	Placement[4]	Bushels/ Acre[5,6,7]
A/2. Raxil	2.6FS	0.265	ST	209
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
A/6. Raxil	2.6FS	0.265	ST	206
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Purple Clnt	FS	1.9	ST	
L1463-B	AL	19	ST	
L1273-B	AL	2.26	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/4. Raxil	2.6FS	0.265	ST	206
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.9	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	4.0 oz/A	R1	
Aztec	2.1 GR	0.14	Furrow	
A/3. Raxil	2.6FS	0.265	ST	203
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/5. Raxil	2.6FS	0.265	ST	191
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	

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Table 39. Average yield for planting-time seed treatments. Bayer special yield study: ISU Johnson farm, Ames, IA. 2009[1,2] (continued)

Entry/Treatment	Form.	Rate[3]	Placement[4]	Bushels/ Acre[5,6,7]
A/1. Maxim XL	LS	0.63	ST	189
Apron XL	ES	0.166	ST	
Pro-ized Red Clnt	FS	1.14	ST	
Dynasty	FS	0.584	ST	

[1] Planted May 5, 2009; machine harvested November 12, 2009; Hybrid planted in this study- Liberty Link (Bayer Internal Code # 09HYBL112HOEF)
[2] A blanket herbicide treatment of Ignite 280 (22 oz/A) + AMS (1.5 lbs/A) was applied on June 10, 2009
[3] Seed treatment's listed as ounces product per 100 weight seed; Fungicide's (R1) listed as oz/A=ounces per Acre Insecticide (Furrow) listed as ounces a.i. per 1,000 row-ft
[4] ST = seed treatment; R1 = Reproductive Stage 1; Furrow = Insecticide applied at planting time
[5] Means based on 4 observations (4 center rows x 30 row-ft x 4 replications)
[6] No significant differences between means (ANOVA, $P \leq 0.05$)
[7] Yields converted to 15.5% Moisture

Table 40. Average stand counts for planting-time seed treatments. Bayer special yield study: ISU NE R&D Farm, Nashua, IA. 2009[1].

Entry/Treatment	Form.	Rate[3]	Placement[4]	Stand Counts[5,6]
A/1. Maxim XL	LS	0.63	ST	38.88
Apron XL	ES	0.166	ST	
Pro-ized Red Clnt	FS	1.14	ST	
Dynasty	FS	0.584	ST	
A/2. Raxil	2.6FS	0.265	ST	37.44
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
A/3. Raxil	2.6FS	0.265	ST	36.88
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/5. Raxil	2.6FS	0.265	ST	36.75
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/6. Raxil	2.6FS	0.265	ST	36.69
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Purple Clnt	FS	1.9	ST	
L1463-B	AL	19	ST	
L1273-B	AL	2.26	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	

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Table 40. Average stand counts for planting-time seed treatments. Bayer special yield study: ISU NE R&D Farm, Nashua, IA. 2009[1] .

Entry/Treatment	Form.	Rate[2]	Placement[3]	Stand Counts[4,5]
A/4. Raxil	2.6FS	0.265	ST	35.00
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.9	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	4.0 oz/A	R1	
Aztec	2.1 GR	0.14	Furrow	

[1] Planted April 22, 2009; evaluated June 1, 2009: Hybrid planted in this study- Stine M911C-10
[2] Seed treatment's listed as ounces product per 100 weight seed; Fungicide's (R1) listed as oz/A=ounces per Acre Insecticide (Furrow) listed as ounces a.i. per 1,000 row-ft
[3] ST = seed treatment; R1 = Reproductive Stage 1; Furrow = Insecticide applied at planting time
[4] Means based on 16 observations (4 center rows x 17.5 row-ft x 4 replications)
[5] No significant differences between means (ANOVA, $P < 0.05$)

Table 41. Average yield for planting-time seed treatments. Bayer special yield study: ISU NE R&D Farm, Nashua, IA. 2009[1].

Entry/Treatment	Form.	Rate[3]	Placement[4]	Bushels/ Acre[5,6,7]
A/1. Maxim XL	LS	0.63	ST	183
Apron XL	ES	0.166	ST	
Pro-ized Red Clnt	FS	1.14	ST	
Dynasty	FS	0.584	ST	
A/2. Raxil	2.6FS	0.265	ST	178
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
A/6. Raxil	2.6FS	0.265	ST	178
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Purple Clnt	FS	1.9	ST	
L1463-B	AL	19	ST	
L1273-B	AL	2.26	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/5. Raxil	2.6FS	0.265	ST	174
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/3. Raxil	2.6FS	0.265	ST	169
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	

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Table 41. Average yield for planting-time seed treatments. Bayer special yield study: ISU NE R&D Farm, Nashua, IA. 2009[1].

Entry/Treatment	Form.	Rate[2]	Placement[3]	Bushels/ Acre[4,5,6]
A/4. Raxil	2.6FS	0.265	ST	167
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.9	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	4.0 oz/A	R1	
Aztec	2.1 GR	0.14	Furrow	

[1] Planted April 22, 2009; machine harvested November 6, 2009; Hybrid planted in this study- Stine M911C-10
[2] Seed treatment's listed as ounces product per 100 weight seed; Fungicide's (R1) listed as oz/A=ounces per Acre Insecticide (Furrow) listed as ounces a.i. per 1,000 row-ft
[3] ST = seed treatment; R1 = Reproductive Stage 1; Furrow = Insecticide applied at planting time
[4] Means based on 4 observations (4 center rows x 30 row-ft x 4 replications)
[5] No significant differences between means (ANOVA, $P \leq 0.05$)
[6] Yields converted to 15.5% Moisture

Table 42. Average stand counts for planting-time seed treatments. Bayer special yield study: ISU NE R&D Farm, Nashua, IA. 2009[1]

Entry/Treatment	Form.	Rate[2]	Placement[3]	Stand Counts[4,5]
A/6. Vortex FL	FS	0.324	ST	39.00
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Purple Clnt	FS	1.899	ST	
L1463-B	AL	18.93	ST	
L1273-B	AL	2.26	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/2. Vortex FL	FS	0.324	ST	38.69
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
A/3. Vortex FL	FS	0.324	ST	38.56
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5.0 oz/A	R1	
A/1. Maxim XL	LS	0.63	ST	38.25
Apron XL	ES	0.166	ST	
Dynasty	FS	0.584	ST	
Pro-ized Red Clnt	FS	1.14	ST	
A/5. Vortex FL	FS	0.324	ST	38.06
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	

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Table 42. Average stand counts for planting-time seed treatments. Bayer special yield study: ISU NE R&D Farm, Nashua, IA. 2009[1] (continued)

Entry/Treatment	Form.	Rate[2]	Placement[3]	Stand Counts[4,5]
A/4. Vortex FL	FS	0.324	ST	37.85
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5.0 oz/A	R1	
Aztec	2.1 GR	0.14	Furrow	

[1] Planted April 22, 2009; evaluated June 1, 2009: Hybrid planted in this study- DeKalb DKC61-72
[2] Seed treatment's listed as ounces product per 100 weight seed; Fungicide's (R1) listed as oz/A=ounces per Acre Insecticide (Furrow) listed as ounces a.i. per 1,000 row-ft
[3] ST = seed treatment; R1 = Reproductive Stage 1; Furrow = Insecticide applied at planting time
[4] Means based on 16 observations (4 center rows x 17.5 row-ft x 4 replications)
[5] No significant differences between means (ANOVA, $P < 0.05$)

Table 43. Average yields for planting-time seed treatments. Bayer special yield study: ISU NE R&D Farm, Nashua, IA. 2009[1]

Entry/Treatment	Form.	Rate[2]	Placement[3]	Bushels/ Acre[4,5,6]
A/5. Vortex FL	FS	0.324	ST	232
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/6. Vortex FL	FS	0.324	ST	230
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Purple Clnt	FS	1.899	ST	
L1463-B	AL	18.93	ST	
L1273-B	AL	2.26	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5 oz/A	R1	
A/1. Maxim XL	LS	0.63	ST	219
Apron XL	ES	0.166	ST	
Dynasty	FS	0.584	ST	
Pro-ized Red Clnt	FS	1.14	ST	
A/3. Vortex FL	FS	0.324	ST	218
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5.0 oz/A	R1	
A/4.Vortex FL	FS	0.324	ST	216
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Stratego PRO	EC	5.0 oz/A	R1	

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Table 43. Average yields for planting-time seed treatments. Bayer special yield study: ISU NE R&D Farm, Nashua, IA. 2009[1]

Entry/Treatment	Form.	Rate[2]	Placement[3]	Bushels/ Acre[4,5,6]
A/2. Vortex FL	FS	0.324	ST	208
Allegiance FL	FS	0.365	ST	
Trilex flow Fungicide	FS	0.605	ST	
Poncho FS	FS	-------	----	
Pro-ized Green Clnt	FS	1.138	ST	
Precise S Finisher	AL	15.1	ST	
TALC	WP	3.8	ST	
Aztec	2.1 GR	0.14	Furrow	

[1] Planted April 22, 2009; machine harvested November 6, 2009, Hybrid planted in this study- DeKalb DKC61-72
[2] Seed treatment's listed as ounces product per 100 weight seed; Fungicide's (R1) listed as oz/A=ounces per Acre; Insecticide (Furrow) listed as ounces a.i. per 1,000 row-ft
[3] ST = seed treatment; R1 = Reproductive Stage 1; Furrow = Insecticide applied at planting time
[4] Means based on 4 observations (4 center rows x 30 row-ft x 4 replications)
[5] No significant differences between means (ANOVA, $P < 0.05$)
[6] Yields converted to 15.5% Moisture

Table 44. European CornBorer average stand counts, average tunnels and lengths (cm) in the efficacy of Herculex XTRA, Ames, IA. 2009[1]

Hybrid[2]	Stand Counts[3]	Average Tunnels[4,5]	Average Tunnel Lengths (cm)[6,7]
HXT/RR2	23.50	0.25a	0.72
RR Hybrid	23.50	0.44 b	0.96

[1] Planted May 19, 2009; Infested with ECB insects on July 1, 2009
[2] RR hybrid- Mycogen EXP 660, HXT/RR2-Mycogen Herculex XTRA 2K662
[3] Stand counts based on 13 feet of row and completed on June 15, 2009
[4] These totals based on 80 observations (20 plants/plot x 4 reps) and completed on September 8 & 9, 2009
[5] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[6] These totals based on 80 observations (20 plants/plot x 4 reps) and completed on September 8 & 9, 2009
[7] No significant differences between means (ANOVA, $P < 0.05$)

Table 45. Black Cutworm total stand counts and average number of plants cut in the efficacy of Herculex XTRA, Ames, IA. 2009[1]

Hybrid[2,3]	Stand Counts[4]	Average Cut Plants[5,6]	Average Cut Plants[7,8]
HXT/RR2	25	0.5a	0.4
RR Hybrid	20	2.8 b	0.8

[1] Planted July 13, 2009; Infested with L3-L4 Black Cutworm larvae on July 22, 2009 at V1 stage of corn, 2-4 inch tall
[2] Infested 25 plants (5 plants/rep x 5 reps) of Mycogen EXP660 & 20 plants (5 plants/rep x 4 reps) of Mycogen Herculex XTRA 2K662 with four Black Cutworm insects per plant on July 22, 2009
[3] RR hybrid- Mycogen EXP 660, HXT/RR2-Mycogen Herculex XTRA 2K662
[4] Stand counts based on 25 observations (5 replications x 5 plants/rep) for Mycogen 2K662 hybrid; Stand counts based on 20 observations (4 replications x 5 plants/rep) for Mycogen EXP660 hybrid
[5] Evaluation on July 29, 2009, 7 days after infestation (DAI)
[6] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)
[7] Evaluation on August 4, 2009, 12 days after infestation (DAI)
[8] No significant differences between means (ANOVA, $P < 0.05$)

Table 46. Corn Earworm larvae counts for evaluation of insecticides treatments and plant-incorporated protectants. Monsanto Smartstax study: Sutherland, IA, 2009[1,2]

					Larvae size			
Hybrid[3]	Treatment	Form.	Rate[4]	Placement[5]	S[6,7,8]	M[6,7,8]	L[6,7,8]	TOTAL[7,8]
Smartstax	P250	600FS	0.25	ST	3a	0a	0a	3a
VT Triple Pro	--	--	--	----	4a	0a	0a	4a
Smartstax	P500	600FS	0.50	ST	8a	0a	0a	8a
VT Triple	--	--	--	----	23ab	11a	2a	36 b
HXX/RR2	--	--	--	----	33 b	21 b	1a	55 b
RR Hybrid	Aztec	2.1G	0.14	Furrow	32 b	26 b	16 b	74 c

[1] Planted May 28, 2009; evaluated September 1, 2009
[2] All corn ears in row 2 of each plot were infested on August 19, 2009 with 40 CEW insects per ear using Bazooka inoculators.
[3] RR hybrid- DKC61-22, VT Triple- DKC61-19, HXX/RR2- NC6214QGV1, VT Triple Pro- NC6214MQK1, Smartstax (VT3P/HXX)- DKC61-21
[4] Insecticide listed as ounces a.i. per 1,000 row-ft; seed treatment (ST) listed as mg a.i/seed
[5] Furrow = Insecticide applied at planting time, ST = Seed Treatment
[6] S = Small; M = Medium; L = Large
[7] Small, medium, large larvae size and total based on 40 observations (10 ears/trt x 4 replications)
[8] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

Table 47. Average grand total kernels, damaged kernels counts, and percent damaged for evaluation of plant-incorporated protectants. Monsanto Smartstax study: Sutherland, IA, 2009[1,2]

Hybrid[3]	Treatment	Form.	Rate[4]	Placement[5]	Total Kernels[6]	Damaged Kernels[6]	% Damaged[6,7]
VT Triple Pro	--	--	--	----	5489	14.00	0.25a
Smartstax	P250	600FS	0.25	ST	6081	39.50	0.64 b
Smartstax	P500	600FS	0.50	ST	5847	38.25	0.66 b
VT Triple	--	--	--	----	5765	70.75	1.21 c
RR Hybrid	Aztec	2.1G	0.14	Furrow	5499	117.75	2.18 d
HXX/RR2	--	--	--	----	5582	144.25	2.61 d

[1] Planted May 28, 2009; evaluated October 19, 2009
[2] All corn ears in row 2 of each plot were infested on August 19, 2009 with 40 CEW insects per ear using Bazooka inoculators.
[3] RR hybrid- DKC61-22, VT Triple- DKC61-19, HXX/RR2- NC6214QGV1, VT Triple Pro- NC6214MQK1, Smartstax (VT3P/HXX)- DKC61-21
[4] Insecticide listed as ounces a.i. per 1,000 row-ft; seed treatment (ST) listed as mg a.i/seed
[5] Furrow = Insecticide applied at planting time, ST = Seed Treatment
[6] Mean total kernels, damaged kernels counts and % damaged based on 40 observations (10 ears/trt x 4 replications)
[7] Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$)

APPENDIX I

Agronomic Information

2009
Field History Data

	Ames, IA Corn Rootworm Studies (following trap crop)	Crawfordsville, IA Corn Rootworm Studies (following trap crop)
Insecticide History		
2008	No Insecticide (trap crop)	No Insecticide (trap crop)
2007	No Insecticide (soybeans)	Insecticide Test Plot
2006	Insecticide Test Plot	No Insecticide (trap crop)
2005	No Insecticide (trap crop)	Insecticide Test Plot
Tillage	Fall-Disk ripper; Spring-(2X) field cultivation	Fall chisel; spring cult.
Variety	DKC61-69 & DKC61-73; 3-Agrisure RW hybrids, 3-Agrisure CB hybrids	DKC61-69 & DKC61-73; 3-Agrisure RW hybrids, 3-Agrisure CB hybrids; DKC61-72; Pioneer 33W83, 33W84; Mycogen EXP660 & Mycogen 2K662
Planting Date(s)	May 12,15,19	May 11,12
Planting Rate	41,000 seeds/A	41,000 seeds/A
Herbicide[1]	28 oz/A Parallel + 1.5 lb/A Atrazine –April 22; 1 qt/A Laddock-June 10	1 qt Roundup Weathermax + 1 qt Dual II Magnum + 2.5 lbs AMS-May 20 2.5 pts Laddock +.5 Atrazine +1 qt COC + 2.5 AMS-May 29
Fertilizer[2]	N P K	N P K
Fall Applied	0 0 0	--- --- ---
Preplant	150 --- ---	175 --- ---
Side-dress		50 --- ---
Dates		
Cultivation	None	None
Stand Count	June 3	June 4
Root Digging	July 16,17	July 14
Lodging	October 5	September 29
Harvest	October 28	November 6
Soil Type	Clay Loam	Silty Clay Loam
Soil Organic Matter %	---	5.10
Soil pH	---	4.90

[1] Expressed as formulation per acre.
[2] Expressed as pounds per acre. Spring-Preplant: 150 lbs actual nitrogen applied as urea on April 22 (Ames); Spring-Preplant 175 lbs actual nitrogen applied as anhydrous ammonia (82.5-0-0) on April 10 and side-dressed 50 lbs/A 32% UAN on May 30, 2009 (Crawfordsville).

2009
Field History Data

	Nashua, IA Corn Rootworm Studies (following trap crop)	Sutherland, IA Smartstax Corn Rootworm Study (following trap crop)
Insecticide History		
2008	No Insecticide (trap crop)	No Insecticide (trap crop)
2007	Insecticide Test Plot	Insecticide Test Plot
2006	No Insecticide (trap crop)	No Insecticide (trap crop)
2005	Insecticide Test Plot	Insecticide Test Plot
Tillage	Fall-chopped stalks & chisel; Spring-field cult.	Fall-chopped stalks & chisel; Spring-disk & field cult.
Variety	DKC61-69 & DKC61-73; Mycogen 2W583, Mycogen 2W587; 3-Agrisure RW hybrids, 3-Agrisure CB hybrids	DKC61-72, DKC61-22, DKC61-19, DKC62-14, DKC61-21 (Smartstax),
Planting Date(s)	April 23, 24	May 28
Planting Rate	41,000 seeds/A	35,600 seeds/A
Herbicides[1]	22 oz. Outlook-April 24; 2.5 pts. Marksman-May 31;	1.5 qts Harness Xtra + 10 oz Atrazine-May 29; 32 oz Roundup Weathermax + 27 AMS-July 13
Fertilizer[2]	N P K	N P K
Fall Applied	--- --- ---	--- --- ---
Preplant	180 --- ---	27 69 23 150
Dates		
Cultivation	none	none
Stand Count	June 1	June 23
Root Digging	July 21	July 31
Lodging	September 15	-----
Harvest	November 10	-----
CEW Larvae counts	-----	September 1
Kernel counts	-----	October 1
Soil Type	Loam	Galva Silty Clay Loam
Soil Organic Matter %	3.85	5.1
Soil pH	7.6	5.3

[1] Expressed as formulation per acre.
[2] Expressed as pounds per acre. Spring-preplant 180 lbs actual nitrogen applied as anhydrous ammonia (82.5-0-0) on May 1 (Nashua): Spring-preplant 27-69-23 applied on May 18 (Sutherland), 150 lbs N applied as 28% UAN on May 18 (Sutherland).

2009
Field History Data

	Ames, IA- FEEL Corn Rootworm Studies (following continuous corn)
Insecticide History	
2008	Corn/Force 3G applied in strips
2007	Corn
2006	Corn
2005	Corn
Tillage	Spring-(2X) field cultivation
Variety	Pioneer 33W83, 33W84
Planting Date	May 5
Planting Rate	41,000 seeds/A
Herbicides[1]	PRE-2 pts/A Dual II Magnum- May 7
Fertilizer[2]	N P K
Fall Applied	--- --- ---
Preplant	150 --- ---
Dates	
Cultivation	none
Stand Count	June 5
Root Digging	July 20
Lodging	-----
Harvest	-----
Soil Type	Webster silty clay loam
Soil Organic Matter	
Soil pH	6.75

[1] Expressed as formulation per acre.
[2] Expressed as pounds per acre. Spring-preplant, 150 lbs N as 32% UAN injected on June 17 between rows.

2009
Field History Data

	Ames, IA Bayer Yield study (following soybeans)	Ames, IA Bayer Yield study (following corn)
Insecticide History		
2008	No insecticide (SB's)	No insecticide (corn)
2007	No insecticide (corn)	No insecticide (SB's)
2006	No insecticide (SB's)	No insecticide (corn)
2005	No insecticide (corn)	No insecticide (SB's)
Tillage	Spring-field cult.(2X)	Fall-chisel; Spring-field cult.
Variety	LL# (Bayer Internal Code # 09HYBL112HOEF)	DeKalb DKC61-69
Planting Date	May 5	May 15
Planting Rate	41,000 seeds/A	41,000 seeds/A
Herbicides[1]	22 oz Ignite 280 + 1.3 lbs AMS-June 10.	22 oz Roundup PowerMax + 3 qt Liquid AMS + 3 oz Laudis - June 25.
Fertilizer[2]	N P K	N P K
Fall Applied	--- --- ---	--- --- ---
Preplant	150 --- ---	150 --- ---
Dates		
Cultivation	None	None
Stand Count	June 3	June 3
Root Digging	-----	-----
Lodging	-----	-----
Harvest	November 12	November 12
Soil Type		
Soil Organic Matter %	7.3	7.3
Soil pH	4.4	4.4

[1] Expressed as formulation per acre.
[2] Expressed as pounds per acre. Spring-preplant 150 lbs actual nitrogen (urea) applied on April 22.

2009
Field History Data

	Nashua, IA Bayer Yield study (following soybeans)	Nashua, IA Bayer Yield study (following corn)
Insecticide History		
2008	No insecticide (SB's)	No insecticide (corn)
2007	No insecticide (corn)	No insecticide (SB's)
2006	No insecticide (SB's)	No insecticide (corn)
2005	No insecticide (corn)	No insecticide (SB's)
Tillage	Fall-chisel; Spring-field cult.	Fall-chisel; Spring-field cult.
Variety	DeKalb DKC61-72	Stine M911C-10
Planting Date	April 22	April 22
Planting Rate	41,000 seeds/A	41,000 seeds/A
Herbicides[1]	22 oz. Outlook-April 24; 2.5 pts. Marksman-May 31;	22 oz. Outlook-April 24; 2.5 pts. Marksman-May 31;
Fertilizer[2]	N P K	N P K
Fall Applied	--- --- ---	--- --- ---
Preplant	180 --- ---	180 --- ---
Dates		
Cultivation	None	None
Stand Count	June 1	June 1
Root Digging	-----	-----
Lodging	-----	-----
Harvest	November 6	November 6
Soil Type	Loam	Loam
Soil Organic Matter %	3.95	3.95
Soil pH	6.58	6.58

[1] Expressed as formulation per acre.
[2] Expressed as pounds per acre. Spring-preplant 180 lbs actual nitrogen applied as anhydrous ammonia (82.5-0-0) on April 10.

2009
Field History Data

	Ames, IA Black Cutworm (following soybeans)	Ames, IA European Corn Borer (following soybeans)
Insecticide History		
2008	No insecticide (SB's)	No insecticide (SB's)
2007	No insecticide (corn)	No insecticide (corn)
2006	No insecticide (SB's)	No insecticide (SB's)
2005	No insecticide (corn)	No insecticide (corn)
Tillage	Spring-field cult.(2X)	Spring-field cult.(2X)
Variety	Mycogen EXP660 & Mycogen 2K662	Mycogen EXP660 & Mycogen 2K662
Planting Date	July 13	May 19
Planting Rate	6 seeds/trt/replication	41,000 seeds/A
Herbicides[1]	22 oz Roundup PowerMax + 3 qt Liquid AMS - June 25.	22 oz Roundup PowerMax + 3 qt Liquid AMS - June 25.
Fertilizer[2]	N P K	N P K
Fall Applied	--- --- ---	--- --- ---
Preplant	150 --- ---	150 --- ---
Dates		
Cultivation	None	None
Stand Count	-----	June 15
Evaluations	July 29 & August 4	September 8,9
Soil Type	Loam	Loam
Soil Organic Matter %	7.3	7.3
Soil pH	4.4	4.4

[1] Expressed as formulation per acre.
[2] Expressed as pounds per acre. Spring-preplant 150 lbs actual nitrogen (urea) applied on April 22.

APPENDIX II

Weather Data

Ames[1]
Rainfall and Temperature 2009

Day	May Temp (°F) Low	May Temp (°F) High	May Rainfall Inches	June Temp (°F) Low	June Temp (°F) High	June Rainfall Inches	July Temp (°F) Low	July Temp (°F) High	July Rainfall Inches
1	60	43	0.02	79	62	0.12	79	58	
2	65	41		70	55	0.14	82	57	
3	70	44		71	52		80	59	0.16
4	70	49		76	53		69	61	0.57
5	74	51	0.05	80	53		80	59	
6	68	54	0.05	77	56	0.63	84	62	
7	72	50	0.10	76	60	0.03	84	63	0.43
8	74	48	0.12	68	54	0.26	77	61	0.51
9	62	42	0.24	67	50	0.02	77	59	0.18
10	60	43		72	57	0.04	84	63	0.26
11	67	38		75	58		79	65	
12	71	49		75	58	0.07	76	61	0.03
13	73	48	0.64	74	56	0.47	81	60	
14	65	41		75	54		82	68	0.09
15	62	48	0.16	76	60	0.02	78	64	
16	60	40	0.12	75	62	0.04	73	53	
17	60	38	0.14	88	60	0.02	67	52	
18	78	48	T	90	64	0.84	72	57	
19	87	55		82	67	0.21	74	56	
20	84	60		85	63		79	55	0.11
21	77	57		88	69	0.98	75	59	0.19
22	76	56		93	69		82	55	
23	79	61	T	95	67	0.16	83	60	
24	77	58		84	65	0.08	87	60	
25	73	57	T	90	71		80	60	
26	65	55	0.72	85	69		81	59	
27	60	52	1.66	86	67		84	60	
28	74	50		81	58		77	61	
29	78	54		82	58		77	53	0.02
30	78	54		76	58		74	57	0.03
31	81	47					79	54	
Mean/Total	58.6		4.02	69.9		4.11	66.6		2.58
Normal	61.3		4.19	70.4		4.76	73.8		4.43
D.F.N.	-2.7		-0.17	-0.5		-0.65	-7.2		-1.85

[1]Weather station located 5 miles WSW of test site.

Ames[1]
Rainfall and Temperature 2009

Day	August Temp (°F) Low	August Temp (°F) High	August Rainfall Inches	September Temp (°F) Low	September Temp (°F) High	September Rainfall Inches	October Temp (°F) Low	October Temp (°F) High	October Rainfall Inches
1	73	54	0.02	70	48		60	50	1.14
2	85	52		73	49		52	49	0.34
3	84	64	0.15	73	50		54	44	
4	81	59		76	51		57	41	
5	78	55		77	57		59	44	
6	78	58	0.01	78	53		55	45	0.12
7	84	65	0.44	76	56		68	40	
8	91	70	0.01	78	57		52	41	0.15
9	79	67	0.63	80	57		51	31	
10	82	65		80	57		39	25	
11	83	63		79	59		39	25	
12	85	64		81	63		41	31	
13	86	68		79	57		47	26	0.03
14	87	67		75	54		45	35	0.12
15	82	66	0.25	80	49		45	40	0.10
16	79	64	0.06	82	56		46	36	0.02
17	78	61		78	54		45	31	0.01
18	80	56		81	53		61	30	
19	78	60	1.13	78	55		68	40	
20	71	58	0.24	76	55		61	51	0.01
21	62	57		71	56	0.36	67	44	0.14
22	61	55		72	56		44	40	2.67
23	77	54		74	51		42	32	0.34
24	81	54		72	61	0.19	55	28	0.07
25	80	64		73	54	0.60	54	37	0.01
26	71	62	0.53	69	53	0.08	52	34	
27	65	59	0.02	79	53		55	30	
28	77	60		62	50		57	44	
29	69	50		65	46		56	50	1.27
30	66	46		68	42		61	38	0.07
31	69	49					49	33	
Mean/Total		66.4	3.49		64.5	1.23		43.5	6.61
Normal		71.2	4.55		64.2	3.00		50.4	2.37
D.F.N.		-4.8	-1.06		0.3	-1.77		-6.9	4.24

[1]Weather station located 5 miles WSW of test site.

Ames[1]
Rainfall and Temperature 2009

	November		
	Temp (°F)		Rainfall
Day	Low	High	Inches
1	36	64	
2	34	54	
3	27	47	
4	31	52	
5	27	59	
6	41	67	
7	46	70	
8	42	74	
9	42	63	
10	36	62	
11	35	58	
12	35	60	
13	44	57	
14	36	52	
15	29	42	
16	38	48	
17	34	50	
18	37	44	0.08
19	34	45	
20	29	53	0.01
21	25	51	0.01
22	52	44	
23	54	44	
24	47	41	1.01
25	41	33	0.07
26	34	26	
27	45	25	
28	54	28	0.01
29	39	32	
30	49	23	
31			
Mean/Total	43.7		1.19
Normal	36.3		2.29
D.F.N.	7.4		-1.10

[1]Weather station located 5 miles WSW of test site.

Crawfordsville[1]
Rainfall and Temperature 2009

Day	May Temp (°F) Low	May Temp (°F) High	May Rainfall Inches	June Temp (°F) Low	June Temp (°F) High	June Rainfall Inches	July Temp (°F) Low	July Temp (°F) High	July Rainfall Inches
1	60	47	0.01	81	60	0.58	72	59	
2	67	43		61	53	0.24	77	58	
3	72	40		70	52		82	55	0.19
4	73	46		74	50		68	60	1.33
5	75	52		80	51		82	57	
6	73	55	0.03	79	56	0.21	84	59	
7	76	51	0.01	80	64	1.12	83	60	0.27
8	77	48	0.56	74	54	0.30	73	60	
9	62	44	0.01	68	49		77	60	
10	64	41		73	56	0.01	82	66	1.27
11	68	40		77	60	0.49	83	63	0.01
12	74	42	0.3	76	59	0.09	78	59	
13	71	54	0.67	68	54	0.09	83	58	
14	67	46		74	51		80	64	
15	59	53	1.66	77	57	0.77	82	64	0.01
16	59	40		74	62	0.03	79	56	
17	62	36		86	66	1.09	67	52	
18	70	49		88	65	0.21	69	52	
19	83	52		87	67		75	51	
20	83	57		86	66	1.70	78	50	
21	84	56		86	69	0.01	69	59	1.09
22	83	55		93	70	0.49	78	57	
23	85	57	0.20	95	68		83	56	
24	82	58		88	65		86	57	0.32
25	70	56	0.15	91	71		80	60	
26	75	60	1.49	88	67	0.31	81	59	
27	66	55		92	66		84	59	
28	67	52		82	61		80	58	
29	78	50		82	59		78	53	
30	82	48		72	58		77	58	
31	80	45					79	53	
Mean/Total		59.1	5.09		70.1	7.74		66.0	4.49
Normal		62.0	4.45		71.3	4.11		75.8	4.15
D.F.N.		-2.9	0.64		-1.2	3.63		-9.8	0.34

[1]Weather station located at test site.

Crawfordsville[1]
Rainfall and Temperature 2009

	August			September			October		
	Temp (°F)		Rainfall	Temp (°F)		Rainfall	Temp (°F)		Rainfall
Day	Low	High	Inches	Low	High	Inches	Low	High	Inches
1	75	55	0.16	69	44		58	49	1.19
2	81	52		72	46		51	45	0.11
3	84	65	0.04	73	48		53	42	0.05
4	83	60		77	49		59	37	0.01
5	79	54		77	53		64	35	
6	80	55		77	50		62	44	0.25
7	78	62	0.70	77	55		64	36	
8	90	73		78	55		53	44	0.06
9	86	66	0.69	80	54		50	32	0.10
10	82	64	0.02	81	56		40	25	
11	83	61	0.01	81	58		41	26	
12	84	57		81	55		44	35	
13	85	66	0.04	80	52		50	27	0.03
14	86	64		80	49		46	37	0.13
15	84	61	0.01	82	51		43	39	0.15
16	81	68	0.33	81	54		50	34	
17	77	64	0.30	76	47		50	29	
18	79	59		79	45		59	28	
19	78	58	0.40	79	54		68	43	
20	75	60	0.61	73	53		68	48	
21	69	57	0.08	75	53	0.22	71	52	0.02
22	73	52		71	57	0.07	54	44	0.53
23	77	49		75	52		47	37	0.43
24	79	52		73	59	0.20	56	34	0.18
25	83	60		72	52	0.70	63	42	0.04
26	72	62	2.22	71	49		51	32	0.02
27	65	60	2.57	79	48		56	28	0.72
28	75	59	0.39	61	49		56	46	
29	68	50		63	40		60	50	0.65
30	66	45		67	37		64	40	0.89
31	69	44					49	30	0.29
Mean/Total	66.3		8.57	63.1		1.19	44.5		5.85
Normal	69.9		3.91	61.6		3.75	53.8		2.61
D.F.N.	3.6		4.66	1.5		-2.56	-9.3		3.24

[1]Weather station located at test site.

Crawfordsville[1]
Rainfall and Temperature 2009

	November		
	Temp (°F)		Rainfall
Day	Low	High	Inches
1	31	61	0.02
2	34	57	
3	25	51	
4	30	52	
5	25	58	
6	47	70	
7	43	73	
8	40	74	
9	45	65	
10	33	61	0.61
11	29	59	
12	28	55	
13	41	58	
14	37	54	0.01
15	33	44	
16	37	45	0.61
17	38	45	0.55
18	39	46	
19	36	48	
20	30	53	
21	28	53	
22	60	42	
23	57	38	
24	49	38	
25	45	34	
26	36	27	
27	46	23	
28	60	26	
29	44	32	
30	46	29	
31			
Mean/Total	44.1		1.80
Normal	38.1		2.36
D.F.N.	6.0		-0.56

[1]Weather station located at test site.

Nashua[1]
Rainfall and Temperature 2009

Day	April Temp (°F) Low	April Temp (°F) High	April Rainfall Inches	May Temp (°F) Low	May Temp (°F) High	May Rainfall Inches	June Temp (°F) Low	June Temp (°F) High	June Rainfall Inches
1	49	30		59	43		77	52	
2	47	24		65	37		77	55	
3	51	24		70	37		70	50	
4	46	30		72	45		75	46	
5	39	31		73	51	0.70	82	53	
6	42	29		67	53	0.23	59	52	0.06
7	49	25		68	52	0.01	75	50	1.23
8	53	26		72	48	0.94	62	49	0.15
9	54	26		59	44	0.10	68	46	
10	54	31		58	40		72	54	
11	59	28		66	36		73	56	
12	57	29		73	45	0.68	74	52	0.10
13	51	37	0.01	62	49	0.22	75	55	0.01
14	64	37		64	43		78	54	
15	66	33		61	48	0.39	76	57	0.01
16	69	37		57	38		67	62	0.35
17	72	40		64	34		85	60	0.01
18	64	44	0.35	75	50		85	66	0.38
19	53	34		88	54		81	65	0.02
20	48	31	0.03	86	60		85	63	
21	58	34		73	57		82	68	0.55
22	66	36		69	57		91	67	
23	79	44		73	57	0.65	93	65	0.29
24	87	50	0.04	74	52		81	62	0.06
25	50	43	0.90	74	53	0.31	89	67	0.08
26	65	44	2.97	66	53	0.59	87	64	
27	58	32	0.41	57	51	0.33	84	66	0.01
28	60	38		72	51		79	56	
29	57	44	0.23	74	53		76	57	
30	66	45	0.09	74	52		69	58	
31				79	45				
Mean/Total		46.2	5.03		56.9	5.15		67.6	3.31
Normal		60.2	4.34		69.3	5.03		72.7	4.66
D.F.N.		-14.0	0.69		-12.4	0.12		-5.1	-1.35

[1]Weather station located at test site.

Nashua[1]
Rainfall and Temperature 2009

Day	July Temp (°F) Low	July Temp (°F) High	July Rainfall Inches	August Temp (°F) Low	August Temp (°F) High	August Rainfall Inches	September Temp (°F) Low	September Temp (°F) High	September Rainfall Inches
1	72	56		71	53	0.01	70	43	
2	79	51		82	50		73	46	
3	78	56	0.04	83	59		73	46	
4	71	61	0.22	77	55		77	47	
5	81	59		77	51		78	52	
6	83	59		79	55	0.02	78	48	
7	78	61		72	62	0.87	79	53	
8	69	59	0.10	88	67	0.23	78	55	
9	75	57	0.08	78	67	0.14	80	53	
10	82	63	2.20	83	64	0.29	80	55	
11	78	62		82	59	0.01	81	56	
12	77	59		84	60		81	57	
13	79	58		85	65	0.51	82	53	
14	75	65	0.70	86	69		78	49	
15	77	60		79	64	0.01	81	52	
16	71	53		79	63	0.30	81	56	
17	63	50		77	60		77	53	
18	67	53		76	54		82	50	
19	73	52		74	59	0.68	80	56	
20	76	52		71	59	0.20	77	54	
21	72	57		69	56	0.21	71	52	0.60
22	80	55		72	51		63	59	0.25
23	81	54		76	48		74	58	
24	84	58		78	54		71	60	0.03
25	76	56		81	61		68	53	1.09
26	79	57		73	61	0.16	71	49	
27	84	59		64	59	0.01	76	49	
28	75	55		76	55		59	49	
29	77	51		66	48		59	37	
30	74	57	0.13	66	46		64	38	
31	77	51		69	42				
Mean/Total	64.4		3.47	64.9		3.64	63.0		1.97
Normal	70.5		4.83	61.4		2.93	49.5		2.45
D.F.N.	-6.1		-1.36	3.5		0.71	13.5		-0.48

[1]Weather station located at test site.

Nashua[1]
Rainfall and Temperature 2009

Day	October Temp (°F) Low	October Temp (°F) High	October Rainfall Inches	November Temp (°F) Low	November Temp (°F) High	November Rainfall Inches
1	56	47	1.61	31	61	
2	51	44	0.10	30	53	
3	50	41	0.03	23	48	0.06
4	51	35		27	47	
5	53	36	0.13	23	58	
6	56	42	0.41	42	67	
7	65	34		39	68	
8	51	39	0.03	40	70	
9	49	28		39	62	
10	41	25		36	61	
11	40	22		30	57	
12	38	28		33	52	
13	44	24		44	54	
14	43	34	0.20	30	51	
15	41	36	0.18	25	44	
16	49	39		32	48	
17	50	29		31	51	
18	59	28		35	44	
19	70	40		31	49	
20	63	48	0.01	29	52	
21	65	44	0.25	28	50	
22	44	39	1.14	56	46	
23	40	35	0.88	52	43	
24	56	30	0.19	47	43	
25	51	37		44	33	
26	50	32		34	23	
27	54	28		40	21	
28	54	39		55	26	
29	55	50	1.14	40	31	
30	61	36	0.04	45	24	
31	47	31				
Mean/Total	41.7		4.73	42.3		0.06
Normal	50.5		2.45	34.4		2.13
D.F.N.	-8.8		2.28	7.9		-2.07

[1]Weather station located at test site.

Sutherland[1]
Rainfall and Temperature 2009

Day	May Temp (°F) Low	May Temp (°F) High	May Rainfall Inches	June Temp (°F) Low	June Temp (°F) High	June Rainfall Inches	July Temp (°F) Low	July Temp (°F) High	July Rainfall Inches
1	59	38		80	60		81	52	
2	65	33		76	51		83	52	
3	69	37		69	45		72	59	0.56
4	70	41	0.07	73	50		70	58	0.54
5	73	51	0.08	81	51	0.01	80	56	
6	70	51	0.05	56	48	0.61	84	56	
7	70	47	0.28	55	50	0.07	83	60	0.86
8	65	42	0.25	62	47	0.01	74	60	
9	64	37		66	43		79	60	0.48
10	60	35		69	52		81	63	0.19
11	68	36	0.02	72	52		76	59	
12	67	51	0.27	61	49	0.56	75	61	0.11
13	70	43		72	46		78	58	0.01
14	65	41	0.05	74	56		81	62	0.23
15	66	42		67	56	0.36	76	58	0.01
16	60	35		77	62		69	49	0.08
17	61	38		88	64	0.02	68	47	
18	83	47		84	62	0.47	71	46	
19	91	59		78	62	0.01	73	43	
20	87	64		83	56		72	58	0.31
21	71	54		84	67	0.09	77	54	0.01
22	63	52	0.49	93	63		80	51	0.02
23	65	57		89	65	0.17	80	52	0.01
24	75	52		84	65	0.14	84	56	
25	80	58		88	68	0.01	77	53	
26	65	52		85	65	0.01	79	53	
27	60	51		81	57	0.03	81	61	
28	82	43		81	52		74	51	
29	79	53		83	52		77	46	0.45
30	76	49		78	53		72	51	
31	86	47					78	48	0.27
Mean/Total	56.8		1.49	65.9		2.57	63.6		4.14
Normal	59.5		3.70	69.1		4.43	73.3		4.11
D.F.N.	-2.7		-2.21	-3.2		-1.86	-9.7		0.03

[1]Weather station located at test site.

Sutherland[1]
Rainfall and Temperature 2009

Day	August Temp (°F) Low	August Temp (°F) High	August Rainfall Inches	September Temp (°F) Low	September Temp (°F) High	September Rainfall Inches	October Temp (°F) Low	October Temp (°F) High	October Rainfall Inches
1	70	51		71	42		60	43	1.38
2	83	49	0.58	74	53		49	42	0.32
3	81	59		73	51	0.10	52	35	0.02
4	73	55		75	46		54	33	
5	79	52		78	50		47	42	0.37
6	75	55	0.01	78	54		49	33	0.14
7	84	66	0.04	76	50		69	30	
8	88	70		80	62		50	35	0.28
9	80	63	0.01	81	56		50	25	
10	78	57		80	49		38	19	
11	83	54		80	55	0.20	37	18	
12	88	62		75	60	0.36	36	27	0.12
13	85	65		79	56		42	24	
14	85	65		77	52		40	31	0.49
15	77	66	0.13	79	51		45	37	0.06
16	74	53	0.42	82	50		41	36	0.05
17	77	49		83	53		48	32	0.01
18	77	47		82	52		62	32	
19	76	58	0.20	78	50		67	38	
20	72	54	0.12	79	53		63	43	
21	69	50		64	48	0.27	51	37	1.09
22	75	48		69	45		38	35	1.09
23	77	51		72	46		46	29	0.57
24	82	58		72	52		52	28	0.01
25	73	63	0.17	71	52	0.21	48	30	0.01
26	69	58		73	52		53	27	
27	74	51		75	48		57	32	
28	76	49		60	38		54	40	
29	66	45		66	34		52	49	0.55
30	67	39		68	39		56	33	0.05
31	69	37					48	28	
Mean/Total		63.9	1.68		62.5	1.14		39.9	6.61
Normal		71.0	4.63		61.8	3.08		48.7	1.93
D.F.N.		-7.1	-2.95		0.7	-1.94		-8.8	4.68

[1]Weather station located at test site.

APPENDIX III

Materials Tested

Materials Tested in 2009 Iowa State University Efficacy Studies			
Common/code name	**Formulation**	**Chemical name**	**Company**
A1,A2,A3,A4,A5,A6	N/A	See tables "36 thru 43"	Bayer CropScience
AgriSure 83X61-3000GT	Transgenic seedcorn Bt11+MIR604+GA21	Cry1Ab (Bt11) + mCry3A (MIR604) + mEPSPS (GA21)	Syngenta
AgriSure 83X58 CB/LL	Bt11	Cry1Ab (Bt11)	Syngenta
AgriSure N72Q CB/LL/RW	Transgenic seedcorn Bt11+MIR604	Cry1Ab (Bt11) + mCry3A (MIR604)	Syngenta
AgriSure N72-Q6 CB/LL	Bt11	Cry1Ab (Bt11)	Syngenta
AgriSure N68B CB/LL/RW	Transgenic seedcorn Bt11+MIR604	Cry1Ab (Bt11) + mCry3A (MIR604)	Syngenta
AgriSure N68-B8	Bt11	Cry1Ab (Bt11)	Syngenta
AgriSure H-8211-3000GT	Transgenic seedcorn Bt11+MIR604+GA21	Cry1Ab (Bt11) + mCry3A (MIR604) + mEPSPS (GA21)	Syngenta
AgriSure H-8212 GT/CB/LL	Bt11+GA21	Cry1Ab (Bt11) + mEPSPS (GA21)	Syngenta
AgriSure N51T-3000GT	Transgenic seedcorn Bt11+MIR604+GA21	Cry1Ab (Bt11) + mCry3A (MIR604) + mEPSPS (GA21)	Syngenta
AgriSure N51T GT/CB/LL	Bt11+GA21	Cry1Ab (Bt11) + mEPSPS (GA21)	Syngenta
Aztec	2.1G	tebupirimphos & cyfluthrin	Bayer CropScience
Counter	20G	terbufos	AMVAC Chem. Corp.
Cruiser	Commercially applied seed trt (0.25 mg/sd)	thiamethoxam	Syngenta
Cruiser Extreme 250	Commercially applied seed trt (0.25 mg/sd)	thiamethoxam+ three fungicides (Maxim XL+Apron XL and Dynasty)	Syngenta
DKC61-19	Transgenic seedcorn (CRW/RR2(VT)) +BT (VT) commercially applied Poncho 250	Cry3Bb1 & RR2 (MON 88017) + Cry1Ab (MON810) + fludioxonil & mefenoxam fungicides + clothianidin seed trt (0.25 mg/seed)	Monsanto
DKC61-21	Transgenic seedcorn (CRW/RR2(VT)) +BT (VT)+CRW (HXRW)+BT (HX1) commercially applied Poncho 250	Cry3Bb1 & RR2 (MON 88017) + Cry1A.105&Cry2Ab2(MON89034) +Cry34Ab1&Cry35Ab1(DAS59122) +Cry1F&LL(TC1507)+ fludioxonil & mefenoxam fungicides + clothianidin seed trt (0.25 mg/seed)	Monsanto
DKC61-21	Transgenic seedcorn (CRW/RR2(VT)) +BT (VT)+CRW (HXRW)+BT (HX1) commercially applied Poncho 500	Cry3Bb1 & RR2 (MON 88017) + Cry1A.105&Cry2Ab2(MON89034) +Cry34Ab1&Cry35Ab1(DAS59122) +Cry1F&LL(TC1507)+ fludioxonil & mefenoxam fungicides + clothianidin seed trt (0.50 mg/seed)	Monsanto
DKC61-22	DKC61-22 (RR2) ''true isoline seed" of DKC61-69 + commercially applied Poncho 250.	Roundup Ready Corn 2 + fludioxonil & mefenoxam fungicides + clothianidin seed trt (0.25 mg/seed)	Monsanto

Materials Tested for 2009 (Continued)

Common/code name	Formulation	Chemical name	Company
DKC61-69 (YieldGard Plus with commercial 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
DKC61-69 (YieldGard Plus with commercial seed trt)	Transgenic seedcorn (YGRW+YGCB+RR2) + commercially applied Poncho 1250.	Cry3Bb1 (MON 863) + Cry1Ab (MON810) + Roundup Ready Corn 2 + fludioxonil & mefenoxam fungicides + clothianidin seed trt (1.25 mg/seed)	Monsanto
DKC61-72	DKC61-72 (RR2) ''true isoline seed" of DKC61-69 + commercially applied Poncho 250.	Roundup Ready Corn 2 + fludioxonil & mefenoxam fungicides + clothianidin seed trt (0.25 mg/seed)	Monsanto
DKC61-73	DKC61-73 (YGCB+RR2) " near isoline seed" of DKC61-69) + commercially applied Poncho 1250.	Cry1Ab (MON810) + Roundup Ready Corn 2 + fludioxonil & mefenoxam fungicides + clothianidin seed trt (1.25 mg/seed)	Monsanto
DKC61-73 (with commercial seed trt)	DKC61-73 (YGCB+RR2) " near isoline seed" of DKC61-69).	Cry1Ab (MON810) + Roundup Ready Corn 2 + fludioxonil & mefenoxam fungicides + clothianidin seed trt (0.25 mg/seed)	Monsanto
Force	3G	tefluthrin	Syngenta
Force	250CS	tefluthrin	Syngenta
Liberty Link # (Bayer Internal Code # 09HYBL112HOEF)	---	---	Bayer CropScience
Mycogen 2W583	Mycogen 2W583 "true isoline seed" of Mycogen 2W587	Roundup Ready Corn 2 + Thiamethoxam seed trt (0.25 mg/seed)	Dow AgroSciences
Mycogen EXP660	Mycogen EXP660 "true isoline seed" of Mycogen 2K662	Roundup Ready Corn 2 + Thiamethoxam seed trt (0.25 mg/seed)	Dow AgroSciences
Mycogen 2K662 (Herculex RW) with Cruiser Extreme 250 seed trt	Dow Background	Cry34AB1 & Cry35Ab1 + LibertyLink gene + thiamethoxam seed trt (0.25 mg/seed)	Dow AgroSciences
Mycogen 2W587 (Herculex RW) with Cruiser Extreme 250 seed trt	Dow Background	Cry34AB1 & Cry35Ab1 + LibertyLink gene + thiamethoxam seed trt (0.25 mg/seed)	Dow AgroSciences

Materials Tested for 2009 (Continued)			
Common/code name	**Formulation**	**Chemical name**	**Company**
NC62-14QGV1	Transgenic seedcorn CRW (HXRW)+BT (HX1)+RR2+ commercially applied Poncho 250	Cry34AB1 & Cry35Ab1 (DAS59122)+ Cry1F (TC1507)+ mefenoxam fungicide + Clothianidin seed trt (0.25 mg/seed)	Monsanto
NC62-14MQK1	Transgenic seedcorn (CRW/RR2(VT)) +BT (VT)+ commercially applied Poncho 250	Cry3Bb1 & RR2 (MON 88017) + Cry1A.105&Cry2Ab2(MON89034) + fludioxonil & mefenoxam fungicides + clothianidin seed trt (0.25 mg/seed)	Monsanto
Pioneer 33W83 (HX1) with Cruiser 250 seed trt	Pioneer 33W83 "near isoline seed" of Pioneer 33W84	mefenoxam fungicide + Clothianidin + s thiamethoxam seed trt (0.25 mg/seed)	Pioneer Hi-Bred International, Inc
Pioneer33W84 (Herculex XTRA) with Cruiser 250 seed trt	Pioneer Background	Cry34AB1 & Cry35Ab1 + Cry1F + mefenoxam fungicide + thiamethoxam seed trt (0.25 mg/seed)	Pioneer Hi-Bred International, Inc.
Poncho 250	Commercially applied seed trt (0.25 mg/seed)	clothianidin	Bayer CropScience
Poncho 500	Commercially applied seed trt (0.50 mg/seed)	clothianidin	Bayer CropScience
Poncho 1250	Commercially applied seed trt (1.25 mg/seed)	clothianidin	Bayer CropScience
SmartChoice	5G	Chlorethoxyfos	AMVAC Chem. Corp
Stine M911C-10	Stine Background	Stine Background	Bayer CropScience