# Monsanto Learning Center at Monmouth, IL

# 2016 Demonstration Reports

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Thank you for visiting the Monsanto Learning Center at Monmouth, IL this past summer! 2016 was a year of challenges and rewards – a common theme in agriculture. We experienced a severe storm with hail on June 22nd which flattened many of our plots and severely damaged the plants. Fortunately, the timing of the damage early in the season was such that yield impacts were minimal. Additionally, it provided us an opportunity to gather data on fungicide response that would not have been possible in a 'normal' year!

As always, our goal here at the Monsanto Learning Center is to provide you with up-to-date, relevant agronomic information that will benefit you and your operation. With that goal in mind, this booklet contains summaries from a number of our key trials and demonstrations around corn and soybean management systems.

For 2017, we will continue to strive to meet that goal with new trials and demonstrations around cover crops, nitrogen management strategies, insect and weed resistance management, high yield management systems approaches, and many other aspects of crop production research. We also plan to continue showcasing our current and future technologies, such as our newest data science tools and our Roundup Ready® Xtend Soybean Crop System, pending regulatory approvals. We hope you find the information within these pages, as well as the rest of our field trials and demonstrations to be valuable to you and your operation.

Please contact us if you have any questions about these summaries, or any of the other projects here at the Monmouth Learning Center. Additionally, you can download the electronic versions of the reports contained in this booklet by visiting the Monsanto Learning Center at Monmouth, IL website. The address is listed on the opposite page as well as a QR code that you can scan to be taken there directly. You can also follow us on Facebook and Twitter for seasonal agronomic and tour updates all year long.

Thank you once again, and we look forward to hosting you again in 2017!

Sincerely,

Troy Coziahr, Manager
Monsanto Learning Center - Monmouth

Follow us! Scan the codes below to link to our social media sites.
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# EFFECTS OF FUNGICIDE APPLICATION TIMING IN HAIL-DAMAGED CORN

## TRIAL OVERVIEW

- There have been previous field reports from farmers regarding hail-damaged crops benefiting from a fungicide application.
- Foliar diseases such as gray leaf spot, leaf blights, and rusts, which may be managed by fungicide application, do not require plant wounds (such as from hail) for plant infection.
- Diseases such as Goss's wilt, common smut, and stalk rots, which are favored by plant wounds, are not controlled with fungicide application.
- A previous 2011 study at the Monsanto Learning Center at Monmouth, IL evaluating fungicide application on undamaged corn during vegetative growth stages did not produce a consistent yield response.

## RESEARCH OBJECTIVE

- The objective of the trial was to evaluate yield response to three different fungicide application timings on corn damaged by hail at two different growth stages.

| Location | Soil | Previous Crop | Tillage Type | Planting Date | Harvest Date | Potential Yield/Acre | Planting Rate/Acre |
|---|---|---|---|---|---|---|---|
| Monmouth, IL | Silt loam | Corn | Conventional | | 09/29/2016 | | 36,000 seeds |

SITE NOTES:

- Two plots with the same corn seed product (105 day RM SmartStax® RIB Complete® corn blend) at the Monsanto Learning Center at Monmouth, IL were damaged by hail on June 22, 2016.
- One plot was at V4 (4 leaf collars) growth stage and one plot was at V7 (7 leaf collars) growth stage when the hail event occurred.
- Treatments applied to both hail-damaged plots included the following:
  - Fungicide applied at vegetative growth stage on June 28.
  - Fungicide applied at R1 (silking) growth stage.
    - August 9 application on V4 hail damaged plot.
    - August 5 application on V7 hail damaged plot.
  - Fungicide applied at vegetative growth stage on June 28 followed by an application at R1 growth stage on:
    - August 9 for the V4 hail damaged plot.
    - August 5 for the V7 hail damaged plot.
- There were 2 replications.

## UNDERSTANDING THE RESULTS

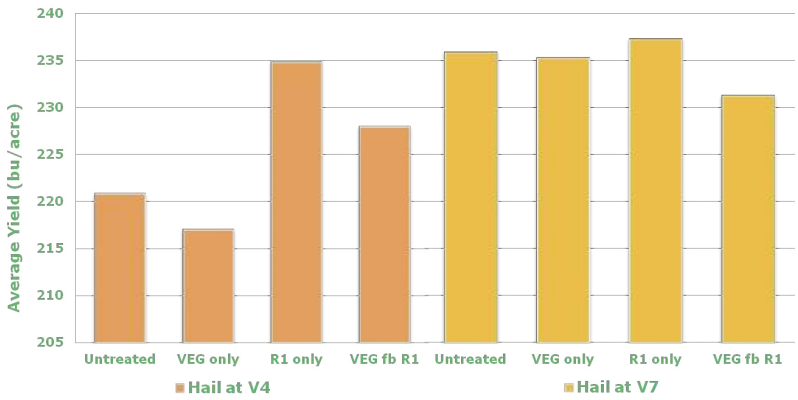


Figure 1. Average Yield From Timing of Fungicide Treatments

Figure 2. Top - Goss's wilt "leaf freckles" (yellow arrow) and necrotic streaks (red arrow). Bottom - Common smut

- **Hail-damaged corn at V4**
  - Fungicide application at vegetative growth stage did not result in a positive yield response compared to the untreated control.
  - Fungicide application at silking (R1) or in a combination with a vegetative growth stage application resulted in higher average yields compared to the untreated control.
- **Hail-damaged corn at V7**
  - All fungicide timing applications did not result in a positive economic yield response compared to the untreated control.
- **Comparing V4 and V7 hail-damaged corn plots**
  - Yield response of the two applications (Veg fb R1) treatment was less than the R1 only application in both hail damaged plots.
  - The hail-damaged V4 growth stage plot had a higher yield response from fungicide applications compared to the hail-damaged V7 growth stage plot.
  - The larger yield response at V4 growth stage may have been due to ear development taking place when hail damaged occurred.

## WHAT DOES THIS MEAN FOR YOUR FARM?

- Fungicide applications cannot recover lost yield potential due to hail damage.
- Fungicides protect yield potential by reducing disease infestations.
- Incidence of some corn diseases are not affected by fungicide application.
- Under these conditions the results of the fungicide application at vegetative growth stages indicated no return on investment, which is similar to previous results at the Monsanto Learning Center, at Monmouth IL.
- Corn yield response to fungicide application is highly variable due to seed product disease resistance, disease pressure, environment and other factors.

SOURCES
1 Jackson-Ziems, T.A. 2014. Fungicide in corn after hail or wind damage. CropWatch. University of Nebraska-Lincoln. http://cropwatch.unl.edu/fungicide-use-corn-after-hail-or-wind-damage.
2 Robertson, A.R. and Mueller, D. 2009. Should hail damaged crops be sprayed with a fungicide? Integrated Crop Management. Iowa State University. http://crops.extension.iastate.edu/cropnews/2009/07/should-hail-damaged-crops-be-sprayed-fungicide. Web sources verified 11/10/16. 161107090114

# EFFECTS OF POPULATION AND ROW SPACING IN CORN

## TRIAL OVERVIEW

- Response to different row spacing and different plant populations can vary by corn product.

## RESEARCH OBJECTIVE

| Location | Soil | Previous Crop | Tillage Type | Planting Date | Harvest Date | Potential Yield/Acre | Planting Rate/Acre |
|---|---|---|---|---|---|---|---|
| Monmouth, IL | Silt Loam | Corn | Conventional | 05/19/2016 | 10/03/2016 | | 30K, 40K, 45K seeds/acre |

SITE NOTES:

- Two corn products ( a 105-day RM product and a 114-day RM product) were each planted in three row configurations (30-inch rows, 20-inch rows, and 30-inch twin rows) at populations of 35,000, 40,000, and 45,000 seeds/acre.
- Plots were planted conventionally on May 19, 2016 and harvested on October 3, 2016.

## UNDERSTANDING THE RESULTS

Figure 1. 30 Inch Rows

Figure 2. 20 Inch Rows

Figure 3. Twin Rows

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## WHAT DOES THIS MEAN FOR YOUR FARM?

- Each corn product responds different to planting configurations and plant populations.
- Data shows that yield can be affected by plant population, row configuration, and corn product.

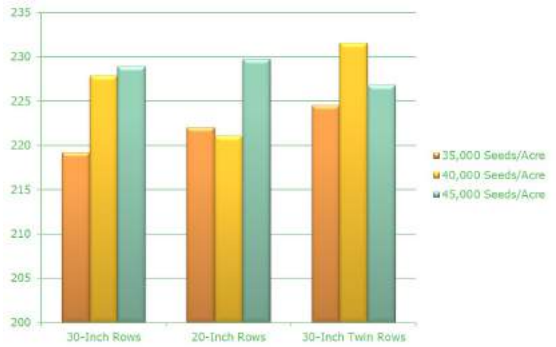


Figure 2. Effect on yield of a 105-day RM corn product planted at three different populations and three different row spacings.

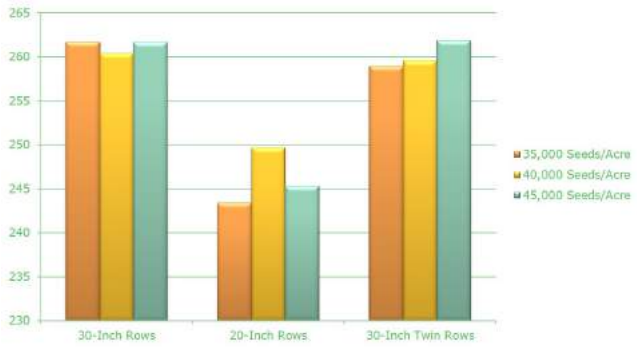


Figure 3. Effect on yield of a 114-day RM corn product planted at three different populations and three different row spacings.

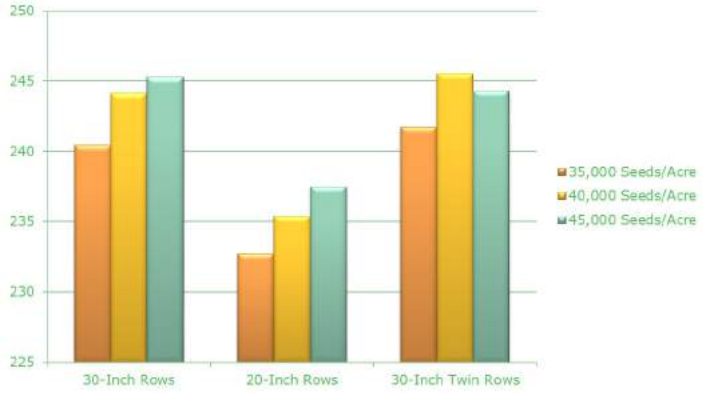


Figure 4. Effect on average yield of two corn products planted at three different populations and three different row spacings.

- We need to continue to look at narrow row planting in corn determine the optimal plant population and row configuration for each corn product in a given area.
- Contact your local DSM or Technical Agronomist for local recommendations on plant population and row spacing for individual corn products.
- We will continue to look at population and row spacing here at the Learning Center to determine the optimal plant population and row configuration for each hybrid for a given area.

# FUNGICIDE RESPONSE BY CORN PRODUCT

## TRIAL OVERVIEW

- Corn leaf diseases may lead to reduced photosynthesis during grain fill, which may reduce levels of carbohydrates to the stalks and roots.[1]
- Fungicides may be applied to help prevent the development or spread of corn leaf diseases.

## RESEARCH OBJECTIVE

- A study was established to determine whether corn products differ in their yield response to fungicide application.

| Location | Soil | Previous Crop | Tillage Type | Planting Date | Harvest Date | Potential Yield/Acre | Planting Rate/Acre |
|---|---|---|---|---|---|---|---|
| Monmouth. IL | Silt Loam | Corn | Conventional | 04/15/2016 | 09/20/2016 | | 36,000 |

SITE NOTES:

- Eight corn products, ranging in maturity from 108 RM to 116 RM were planted in two replications. Corn was planted in 30-inch rows at 36,000 seeds/acre with conventional tillage.
- Eight rows of each corn product were planted, four rows were treated with Headline AMP® Fungicide at tassel (July 25, 2016) and four rows were left as untreated checks. Yield was adjusted to 15% moisture content.

## UNDERSTANDING THE RESULTS

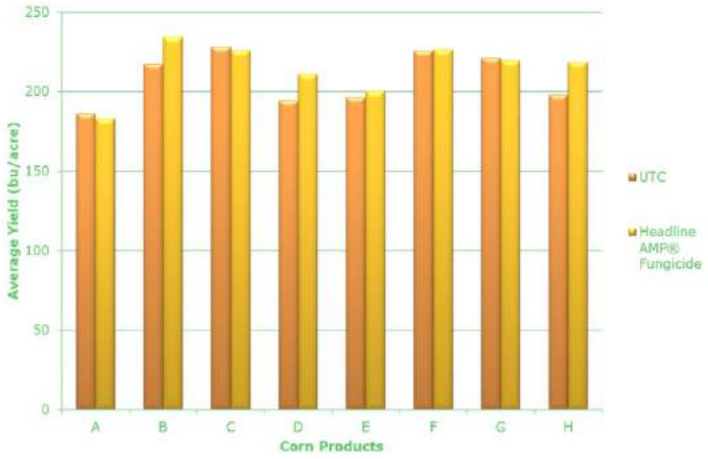


Figure 1. The effect of Headline AMP® Fungicide on average yield potential of eight different corn products.
UTC = untreated check

- Rainfall contributed to conditions for disease development, but the onset of disease symptoms occurred very late in the season.
- Four of the eight corn products showed a positive response to the fungicide application (Figure 1).
- The late onset of disease symptoms in these plots may have minimized the yield response to fungicide application.

## WHAT DOES THIS MEAN FOR YOUR FARM?

- When planting corn products with susceptible genetics or in fields with a history of disease, scout fields for leaf diseases prior to tassel.
- To determine if a fungicide application is warranted, consider yield potential, corn growth stage, potential for additional development of disease symptoms, fungicide application cost, and the price of corn.


Figure 2. Corn product untreated check compared to Headline AMP® fungicide.

- Talk with your local DSM and TA to learn more about fungicide response to corn products.

SOURCES
1 Nielsen, R.L. 2013. Stress during grain fill: A harbinger of stalk health problems. Purdue University. https://www.agry.purdue.edu/ext/corn/news/timeless/stalkhealth.html. Web sources verified 11/1/2016

# IMPACT OF UNEVEN EMERGENCE IN CORN

## TRIAL OVERVIEW

- Corn yield potential can be affected negatively by uneven seedling emergence. Factors that can adversely affect seedling emergence include:
  - Plant residue (trash)
  - Large soil clods or chunks
  - Poor soil conditions (cool temperatures and excessively wet/dry soil)
  - Poor soil-to-seed contact
  - Uneven planting depth

## RESEARCH OBJECTIVE

- Determine the impact on yield potential of late emerging corn plants.

| Location | Soil | Previous Crop | Tillage Type | Planting Date | Harvest Date | Potential Yield/Acre | Planting Rate/Acre |
|---|---|---|---|---|---|---|---|
| Monmouth, IL | Silt loam | Soybean | Conventional | 05/09/2016 | 09/28/2016 | NA | 36,000 seeds/acre |

SITE NOTES:

- Marking of seedling emergence
  - Seedlings emerging first were marked with red flags.
  - Seedlings emerging on day 3 or two days after first emerging seedlings were marked with white flags.
  - Seedlings emerging on day 5 or two days after second seedling group were marked with blue flags.
- Harvest
  - Five randomly selected ears from each seedling group were hand harvested.
  - Ears were weighed and average kernels/ear calculated.

## UNDERSTANDING THE RESULTS

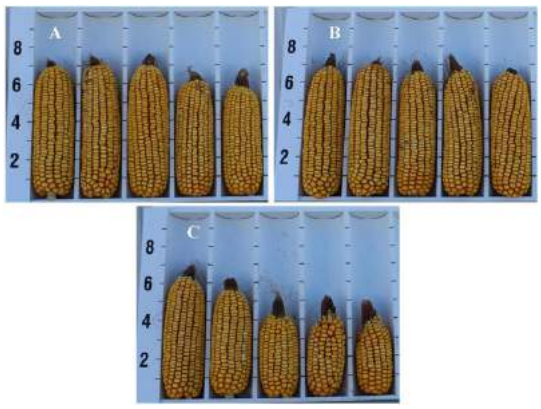


Figure 1. Ear samples of A) Seedlings emerging on day 1; B) Seedlings emerging on day 3; C) Seedlings emerging on day 5.

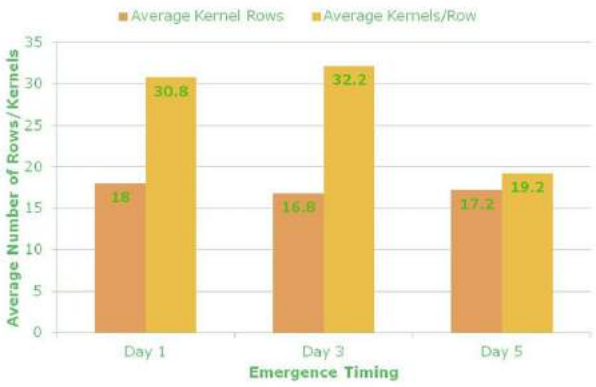


Figure 2. Average kernel rows and kernels/row when corn seedlings emerge erratically.

- Late emerging seedlings suffer from extra competition and struggle to become established.
- Late emerging seedlings exhibit reduced growth throughout the growing season and at harvest have smaller ears, reduced kernel count, and reduced yield (Figures 1, 2, and 3).
  - Figure 1A shows ear samples of seedlings emerging on day 1(average of 18 kernel rows, 30.8 kernels/row, and 554 kernels/ear).
  - Figure 1B shows ear samples of seedlings emerging on day 3 (average of 16.8 kernel rows, 32.2 kernels/row, and 540.96 kernels/ear).


Figure 3. Average kernel count and weight of 5 ears when corn seedlings emerge erratically.

- Figure 1C shows ear samples of seedlings emerging on day 5 (average of 17.2 kernel rows, 19.2 kernels/row, and 330.24 kernels/ear).

- Seedling emergence on Day 1 represents yield potential of 100%, Day 3 represents 98%, and Day 5 represents 60%, respectively.

## WHAT DOES THIS MEAN FOR YOUR FARM?

- Utilization of available tools and techniques can help ensure uniform plant emergence and can help maximize yield potential. Tools and techniques include:
  - Waiting to plant until soil moisture and temperatures are conducive to seed germination.
  - Tilling appropriately to create a uniform seed bed.
  - Planter set and adjusted properly to help ensure even planting depths.
    - Row cleaners properly set to push aside plant residue and soil chunks.
    - Use of seed firmers to help ensure good seed-to-soil contact.

# PLACEMENT OF NITROGEN DURING SIDEDRESSING

## TRIAL OVERVIEW

- Farmers are interested in the question of nitrogen placement and if it has an effect on nitrogen uptake and yield.
- Nitrogen is a significant cost in corn production. Knowing where to place the sidedressed nitrogen can help a grower decide what method is best for their operation.

## RESEARCH OBJECTIVE

- To see if there is an advantage to placing nitrogen right at the base of the plants vs down the center of the row.

| Location | Soil | Previous Crop | Tillage Type | Planting Date | Harvest Date | Potential Yield/Acre | Planting Rate/Acre |
|---|---|---|---|---|---|---|---|
| Monmouth, IL | Silt Loam | Corn | Conventional | 04/26/2016 | 09/20/2016 | 240 bu/acre | 36,000 seeds/acre |

SITE NOTES:

- A 114 RM corn product was planted conventionally planted on April 26, 2016 and harvested on September 20, 2016.
- Eighty pounds of 32% UAN (32-0-0) was applied and incorporated before planting.
- Sidedress nitrogen (32% UAN) was applied at a rate of 100 lbs/acre at growth stage V6 on June 14, 2016.
- Sidedressing was applied with a rolling coulter in the center of the row on half of the trial.
- Sidedressing was applied with Y-Drop® applicators on the other half of the trial.
- There were 4 replications in this trial.

## UNDERSTANDING THE RESULTS

Figure 1. Rolling coulter

Figure 2. Y-Drop® applicator

## WHAT DOES THIS MEAN FOR YOUR FARM?

- Average yield for the coulter-applied sidedressing was 252.55 bu/acre.
- Average yield for the Y-Drop® sidedressing was 248.07 bu/acre.
- Application of sidedressed nitrogen at V6 shows no clear advantage to either method.
- Timing of application with the rolling coulter was limited due to the height of the corn.
- The Y-Drop applicator allows a wider application window and is not limited to early season sidedressing.
- The ideal placement of sidedressed nitrogen could change from year to year due to weather and environment.
- Individual corn products may respond differently to timing of sidedressed nitrogen application.
- Farmers should consult their local DSM or Technical Agronomist for recommendations.

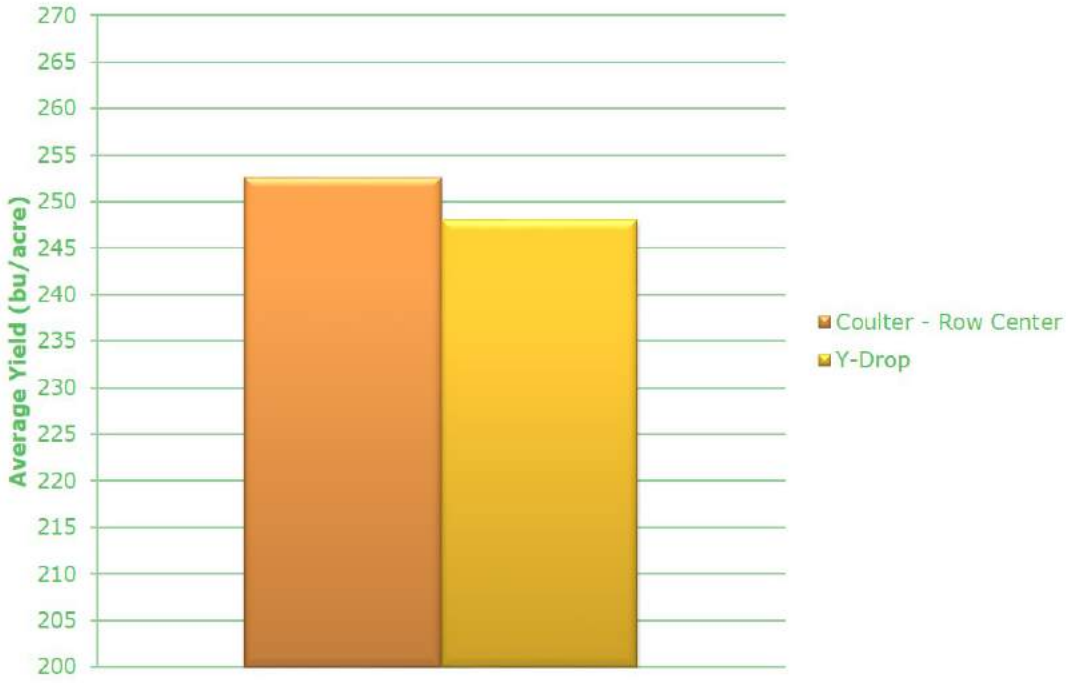


Figure 3. The effect of two methods of sidedress nitrogen application (Coulter – Row Center and Y-Drop®) on corn yield.

- Yield increases may not be economically feasible when all costs are considered.
- Consider all local costs when making nitrogen management decisions.

# TIMING OF NITROGEN BY CORN PRODUCT

## TRIAL OVERVIEW

- Nitrogen is a significant cost in the production of a corn crop.
- Understanding when a corn product reacts best to nitrogen applications can help a farmer decide when to apply fertilizer to optimize yield potential.
- There is a lot of interest in late-season nitrogen applications and understanding if corn products react differently to split nitrogen applications.

## RESEARCH OBJECTIVE

- The objective of this trial was to compare corn product response to different nitrogen application timings.

| Location | Soil | Previous Crop | Tillage Type | Planting Date | Harvest Date | Potential Yield/Acre | Planting Rate/Acre |
|---|---|---|---|---|---|---|---|
| Monmouth, IL | Silt Loam | Corn | Conventional | 05/16/2016 | 09/28/2016 | 240 | 36,000 |

SITE NOTES:

- Fifteen different corn products were selected for the trial.
- Nitrogen was applied using 32% UAN (32-0-0) for all treatment types.
- Corn products received nitrogen by either:

-- Preplanting nitrogen application at 180 lbs of 32% UAN and then incorporated.

-- Preplanting/Sidedress nitrogen application at 140 lbs of 32% UAN and then incorporated, followed by 40 lbs 32% UAN with a urease inhibitor at V8 growth stage. (Sidedress applications were made at the V8 growth stage (6/15/2016) with 360 Y-DROP® on a high clearance sprayer).

## UNDERSTANDING THE RESULTS

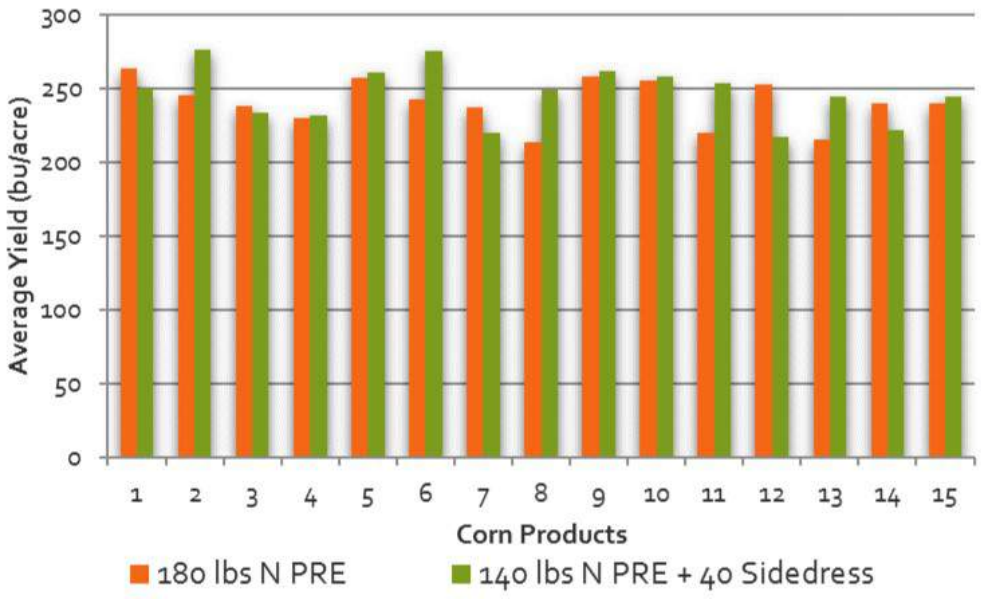


Figure 1. Effect of nitrogen application and different corn products on average yield potential.

- Ten of the 15 corn products had higher average yield with the preplanting/sidedress nitrogen applications.
- Five of the 15 corn products had higher yield with the preplanting nitrogen application.

## WHAT DOES THIS MEAN FOR YOUR FARM?

- The response to split nitrogen applications varied between corn products.
- The ideal timing of a late-season application could change from year-to-year due to the weather and environment.
- Individual corn products may respond differently to the timing of nitrogen application.
- Yield differences may not be economically feasible when all costs are factored in. Always consider all local costs when making nitrogen management decisions.
- Consult your local District Sales Manager or Technical Agronomist for recommendations.

# TIMING OF NITROGEN SIDEDRESS APPLICATION IN CORN

## TRIAL OVERVIEW

- There is substantial interest among farmers in mid-season nitrogen (N) application.
- N uptake by corn plants is usually greatest from V8 (8 leaf collars) growth stage through pollination and is weather dependent.
- Adequate N from V5 (5 leaf collars) through V8 growth stages can be critical as the plant is determining the number of potential ears and ear girth at this time.
- Sidedressing can help minimize N losses because N is applied closer to the time of plant uptake.
- N is a significant input cost. Determining when corn responds best to N sidedress application timing might contribute to maximizing net return.

## RESEARCH OBJECTIVE

- The objective of the trial was to evaluate different timings for N sidedress applications.

| Location | Soil | Previous Crop | Tillage Type | Planting Date | Harvest Date | Potential Yield/Acre | Planting Rate/Acre |
|---|---|---|---|---|---|---|---|
| Monmouth, IL | Silt loam | corn | conventional | 04/26/2016 | 09/20/2016 | 240 bu/acre | 36,000 seeds |

SITE NOTES:

- A 114 relative maturity SmartStax® RIB Complete® corn blend product was planted in all treatments.
- 80 lbs/acre of 32% UAN (32-0-0) was applied before planting in the spring and incorporated for all treatments.
- 100 lbs/acre UAN with a urease inhibitor was sidedressed using a high-clearance sprayer with 360 Y-DROP® at three different corn growth stages.
- Treatment timings were:
  - V4 (4 leaf collars) on June 3, 2016
  - V8 (8 leaf collars) on June 21, 2016
  - V12 (12 leaf collars) on July 5, 2016
- The trial had three replications.

## UNDERSTANDING THE RESULTS

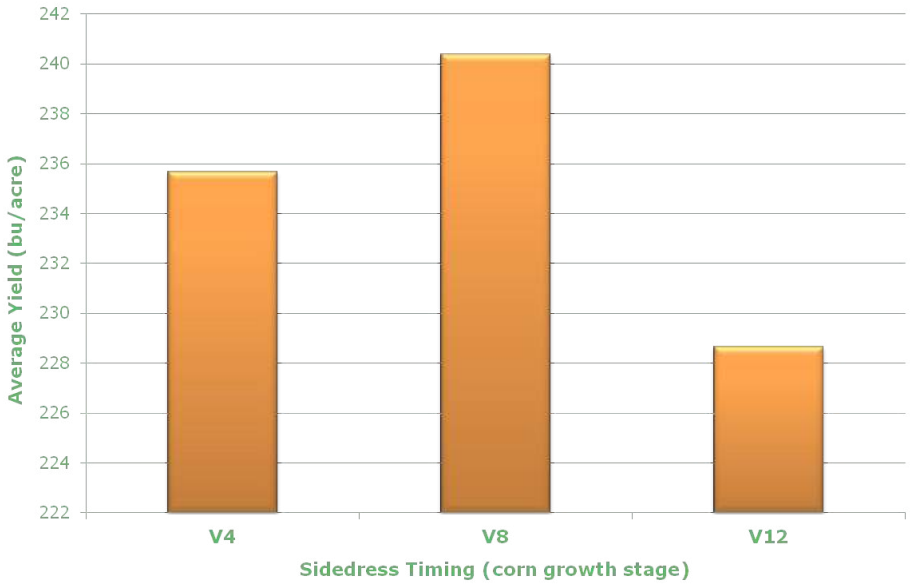


Figure 1. Average Yield by Timing of Sidedress Application.
2016 Monsanto Learning Center at Monmouth, IL.

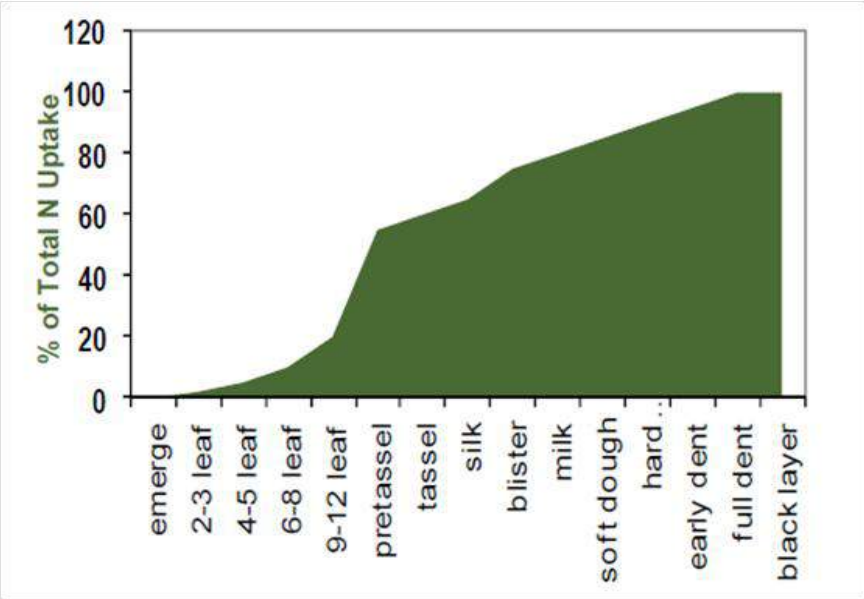


Figure 2. Percent of total N uptake for corn by growth stage.Source: Nitrogen data adapted from "How a corn plant develops". Special Report 48. Iowa State University.

- Sidedress application at the V8 growth stage had the largest yield response in this study.
- High clearance equipment with 360 Y-DROP® allows application timing flexibility and allows later application of N in taller corn.

## WHAT DOES THIS MEAN FOR YOUR FARM?

- Ideal later season N application timing could vary from year to year due to weather and environmental conditions.
- Individual seed products may respond differently to timing of N application. Consult your local DSM or Technical Agronomist for timing recommendations.
- All costs should be considered when making N management decisions, as yield differences due to N sidedress applications may not be economically justified in all cases.

SOURCES
1 Fernandez, F.G., Nafziger, E.D., Ebelhar, S.E., and Hoeft, R.G. 2009. Managing nitrogen. Chapter 9. Illinois Agronomy Handbook, 24th edition. C1394. University of Illinois. http://extension.cropsci.illinois.edu/handbook/.
2 Abendroth, L.J., Elmore, R.W., Boyer, M.J., and Marlay, S.K. 2011. Corn growth and development. PMR 1009. Iowa State University Extension.
3 Miller, E., Nielsen, R.L., and Camberato, J. 2011. Response of corn to late-season nitrogen application. Corny News Network. Purdue University. https://www.agry.purdue.edu/ext/corn/news/timeless/CornRespLateSeasonN.html.
Web source verified 11/07/16. 161031152414

# TIMING OF STRESS MITIGATION IN CORN

## TRIAL OVERVIEW

- Stress affects plants in different ways at different times, depending on what growth stage the plants are in when stress is experienced.

## RESEARCH OBJECTIVE

- This trial was designed to determine the impact of stress on ear development at different growth stages.

| Location | Soil | Previous Crop | Tillage Type | Planting Date | Harvest Date | Potential Yield/Acre | Planting Rate/Acre |
|---|---|---|---|---|---|---|---|
| Monmouth, IL | Silt Loam | Soybean | Conventional | 05/09/2016 | | | 48,000 seeds/acre |

SITE NOTES:

- Corn was planted at 48,000 seeds/acre on May 9, 2016, using conventional planting methods.
- Every other plant was thinned out at growth stages V3, V5, V7, V9, V11, and R2.
- Each thinned plot was compared to an un-thinnned check (UT).
- Measurements Taken:
  - Combined weight of 5 ears
  - Average kernel count (number of rows X kernels/row)

## UNDERSTANDING THE RESULTS

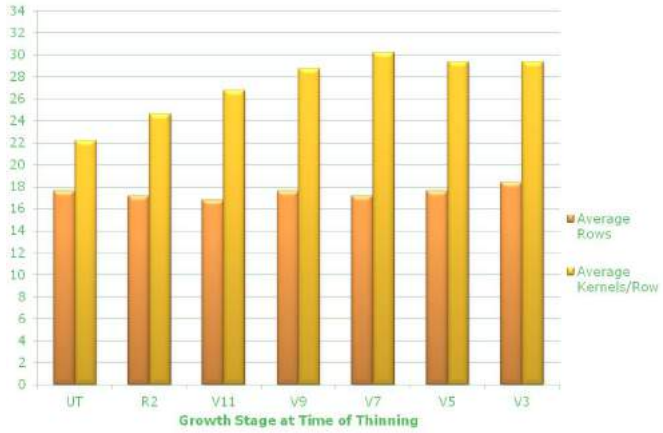


Figure 1. Average number of rows and kernels/row in stands thinned at various growth stages.

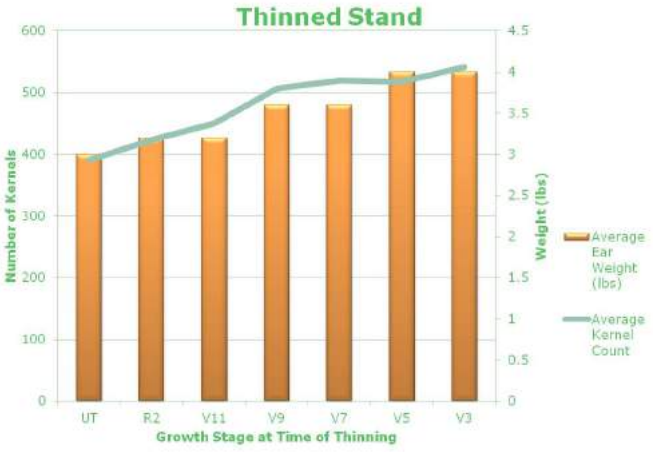


Figure 2. Average weight of 5 ears and average kernel count in stands thinned at various growth stages.

## WHAT DOES THIS MEAN FOR YOUR FARM?

- The effects that stress can have on yield potential will vary depending on the growth stage(s) of the plants when they are stressed.
- Mitigation of stress at the V3 growth stage resulted in maximizing both number of kernel rows and kernels per row.
- Mitigation of stress at the V5 up to V9 growth stages resulted in fewer kernel rows, but slightly increased kernels per row. However, the longer rows were generally not enough to make up for the loss in total ear weight.
- Waiting until after the V9 growth stage to mitigate stress resulted in both reduced number of rows and the number of kernels per row.

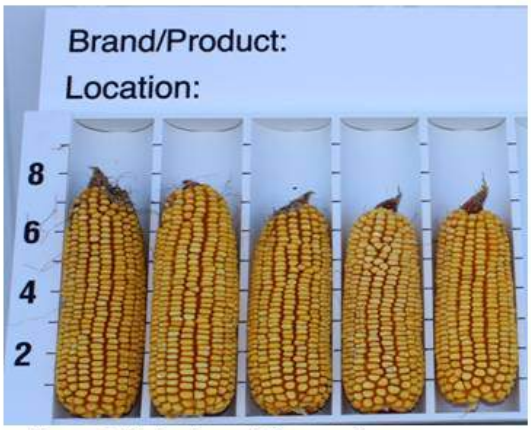

Figure 3. Thinning at V3 growth stage.

Figure 4. Thinning at V7 growth stage.

Figure 5. Thinning at V11 growth stage.

Figure 6. Un-thinned.

- Although individual kernel size was not measured, it did seem to be an important factor. Total kernel count was fairly even across the first four timings, but ear weight dropped over 12% in the V7 and V9 growth stages timings compared to V3 and V5 growth stages.
- Ear size became much more variable in the V11 growth stage and later timings.
- Environmental conditions would likely have a significant impact on these results. For example, in drought conditions, the effects of stress from high populations may be much more pronounced.

# UTILIZING CLIMATE FIELDVIEW™ NITROGEN MONITORING TOOL

## TRIAL OVERVIEW

- Nitrogen (N) is the most vital fertilizer that farmers have to manage in a corn crop.
- Previous crop, growing conditions, product genetics, commodity price, and N cost are factors to consider when determining the highest return for N investment.
- Weather plays an important role in determining how growers manage N. Programs like Climate FieldView™ nitrogen monitoring tool can help farmers in their N decision making process.

## RESEARCH OBJECTIVE

| Location | Soil | Previous Crop | Tillage Type | Planting Date | Harvest Date | Potential Yield/Acre | Planting Rate/Acre |
|---|---|---|---|---|---|---|---|
| Monmouth, IL | Silt Loam | Corn | Conventional | 05/06/2016 | 09/26/2016 | - | 36,000 |

SITE NOTES:

- A study was established to help understand how Climate FieldView nitrogen monitoring tool can help corn farmers make N decisions on their farm.
- Six different N application treatments were applied to corn products with two replications.
  -- Treatment 1: 200 lbs N/acre (32% UAN) applied preplant on May 6,2016.
  -- Treatment 2: 170 lbs N/acre (32% UAN) applied preplant on May 6, 2016 + 30 lbs N/acre applied pretassel to tassel on July 5, 2016.
  -- Treatment 3: 200 lbs N/acre (32% UAN) applied preplant on May 6,2016 + the Climate FieldView nitrogen monitoring tool recommended rate applied at pre-tassel to tassel (Climate FieldView showed a surplus of N at time of application so no additional N was applied)
  -- Treatment 4: 100 lbs N/acre (32% UAN) applied preplant + 100 lbs N/acre (32% UAN) sidedressed on June 14, 2016.
  -- Treatment 5: 100 lbs N/acre (32% UAN) applied preplant + 45 lbs N/acre (32% UAN) sidedressed on June 14, 2016 (Climate FieldView nitrogen monitoring tool sidedress recommended rate)
  -- Treatment 6: 170 lbs N/acre (32% UAN) applied preplant + Climate FieldView nitrogen monitoring tool recommended rate for sidedress or late application, no applications recommended.
- Cost and net profit is based on N cost of $0.50/lb, sidedress cost of $8/acre, corn price of $3.2o/bushel.

## UNDERSTANDING THE RESULTS

- The highest yielding treatment was not a recommendation from Climate FieldView nitrogen monitoring tool. However, the most profitable N treatment was from a Climate FieldView insight.
- The most profitable application did not require N to be applied during the growing season, saving time and input cost by using Climate FieldView nitrogen monitoring tool.
- Two of the three nitrogen treatments that were Climate FieldView insights still reached a high yield and had the most profitability.

## WHAT DOES THIS MEAN FOR YOUR FARM?

- Climate FieldView nitrogen monitoring tool provided the most profitable treatment in this trial.
- Climate FieldView nitrogen monitoring tool will continue to be analyzed to see how the program can benefit farmers with preplant and in-season N application decisions.

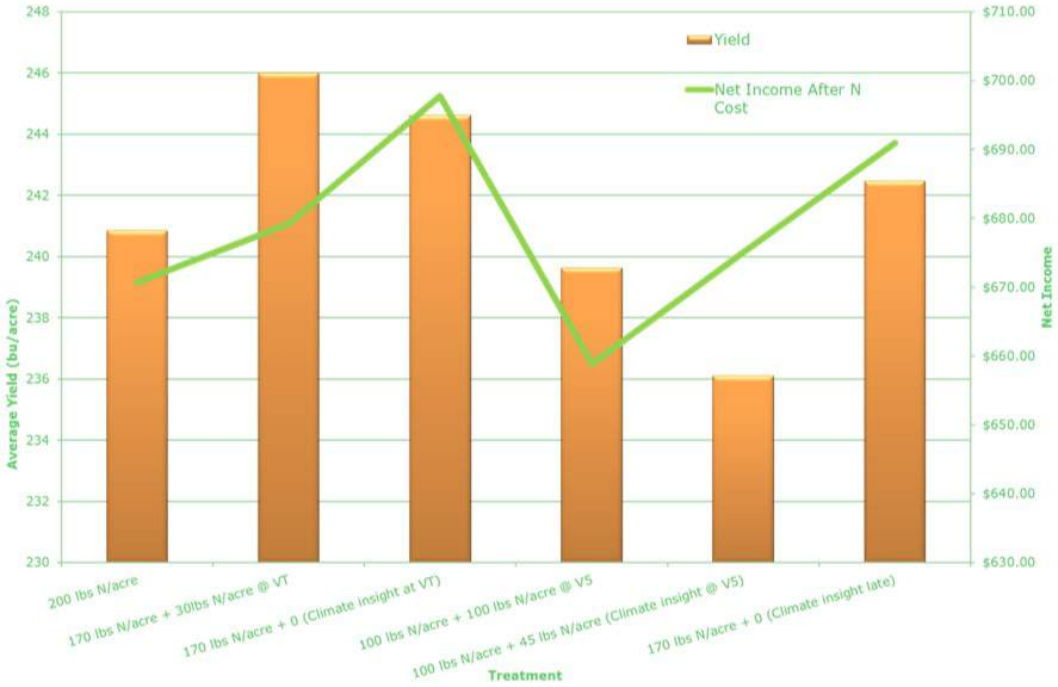


Figure 1. Average yield and net income of different nitrogen treatments.

# FUNGICIDE RESPONSE AND PLANTING DATE IN SOYBEAN

## TRIAL OVERVIEW

- In many cases, the application of a foliar fungicide can protect plant health and help maintain the yield potential of a soybean product.
- In past Monsanto Learning Center studies, yield potential has been influenced by planting date and the amount of disease pressure.

## RESEARCH OBJECTIVE

- This study was developed to help determine the impact of a foliar fungicide application on soybean yield potential with respect to planting date.

| Location | Soil | Previous Crop | Tillage Type | Planting Date | Harvest Date | Potential Yield/Acre | Planting Rate/Acre |
|---|---|---|---|---|---|---|---|
| Monmouth, IL | Silt loam | Corn | Conventional | 04/25/2016 | 10/17/2016 | 70 bu/acre | 130,000 seeds/acre |
| Monmouth, IL | Silt loam | Corn | Conventional | 05/23/2016 | 10/17/2016 | 70 bu/acre | 130,000 seeds/acre |

SITE NOTES:

- A foliar fungicide containing both a strobiluron and a succinate dehydrogenase inhibitor (SDHI) was applied at R3 growth stage and compared to an untreated check.
- Two replications were planted.

## UNDERSTANDING THE RESULTS

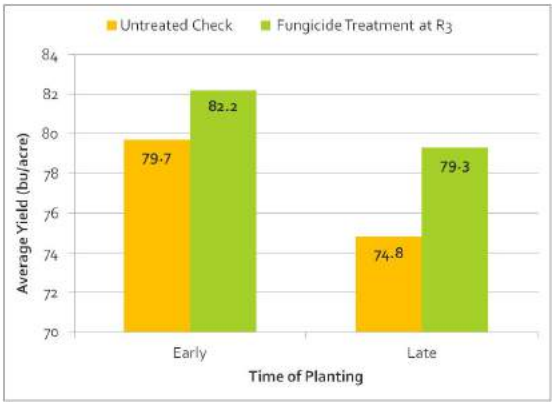


Figure 1. Average soybean yield based on the time of planting and fungicide application at R3 growth stage in 2016.

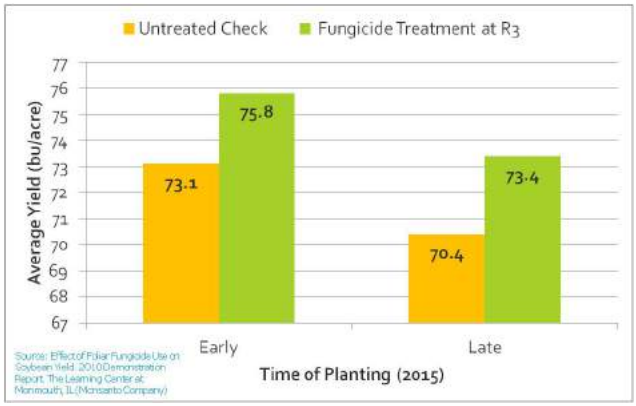


Figure 2. Average soybean yield based on the time of planting and fungicide application at R3 growth stage in 2015.

- Little disease pressure observed in the plots aside from Septoria brown spot (Septoria glycines) and very mild, late occurring sudden death syndrome (SDS) (Fusarium virguliforme).
- Early planting led to substantial yield advantages over late planting (Figure 1).
- Average yield response to a fungicide application was positive, even in the absence of major disease pressure.
- Average yield response to a fungicide application was similar for both planting dates (Figure 1).
- 2016 results mirrored 2015 results.

  - May 14, 2015 planting date provided a yield advantage compared to the June 2, 2015 planting date across treatments (Figure 2).
  - Adding a fungicide application at R3 growth stage increased yield potential.

(http://www.monsanto.com/products/documents/learning-center-research/2015/fungicide%20application%20yield%20response%20by%20soybean%20planting%20dates%20-%20mlc.pdf)

- In 2010 at the Monsanto Learning Center at Monmouth, Illinois, the earlier planting demonstrated an average yield increase of 9.6 bu/acre compared to the later planting when a fungicide application was applied at the R3 growth stage. http://www.monsanto.com/products/documents/learning-center-research/2010/summary%20mlc%202010-effect%20of%20foliar%20fungicide%20use%20on%20soybean%20yield.pdf

## WHAT DOES THIS MEAN FOR YOUR FARM?

- A rigorous crop scouting program is important for accurate and quick identification of developing diseases and determination of appropriate actions including the timely application of a fungicide.
- Fungicide applications have provided yield protection in the absence of disease pressure.
- Regardless of planting date, fungicide applications have helped to protect yield potential.

# Notes

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