



# Effect of Fungicide on Yield and Plant Health – Iowa

## Trial Objective

- The application of a fungicide can protect corn plants from foliar diseases and increase overall plant health, which can lead to increased grain yield.
- Yield increases observed from the application of fungicide greatly depend on corn product selection, as individual products respond differently to a fungicide application. While fungicide is often used as a high-yield management strategy, it can also be used to protect the yield of corn products with poor plant and stalk health ratings.
- The objective of this trial was to evaluate the impact that a fungicide application has on corn yield and late-season plant health.

## Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Fungicide Date	Planting Rate
Atlantic, IA (southern set)	Silty Clay Loam	Soybean	Conventional	4/27/2018	10/31/2018	7/21/2018	35,000
Huxley, IA (both northern and southern sets)	Clay Loam	Soybean	Strip Till	5/9/2018	10/17/2018	7/17/2018	34,000
Marble Rock, IA (northern set)	Loam	Soybean	Strip Till	5/18/2018	10/24/2018	7/30/2018	36,000
Storm Lake, IA (northern set)	Silty Clay Loam	Soybean	Fall Vertical	5/8/2018	10/26/2018	7/24/2018	39,000
Victor, IA (southern set)	Silty Clay Loam	Soybean	Conventional	4/30/2018	10/27/2018	7/18/2018	35,000

- 10 DEKALB® corn products were divided into two different sets based on relative maturity, with the northern set being located at Marble Rock, Storm Lake, and Huxley, and the southern set being located at Atlantic, Victor, and Huxley.
- Plots were planted as strip trials at four locations, with Huxley being arranged as a small-plot trial.
- The trial was replicated by location.
- Staygreen and disease ratings were collected during the growing season, and stalk strength and intactness were collected at harvest.
- Each site was sprayed with Delaro™ 325 SC fungicide (12 oz/acre) with a ground sprayer at brown silk.

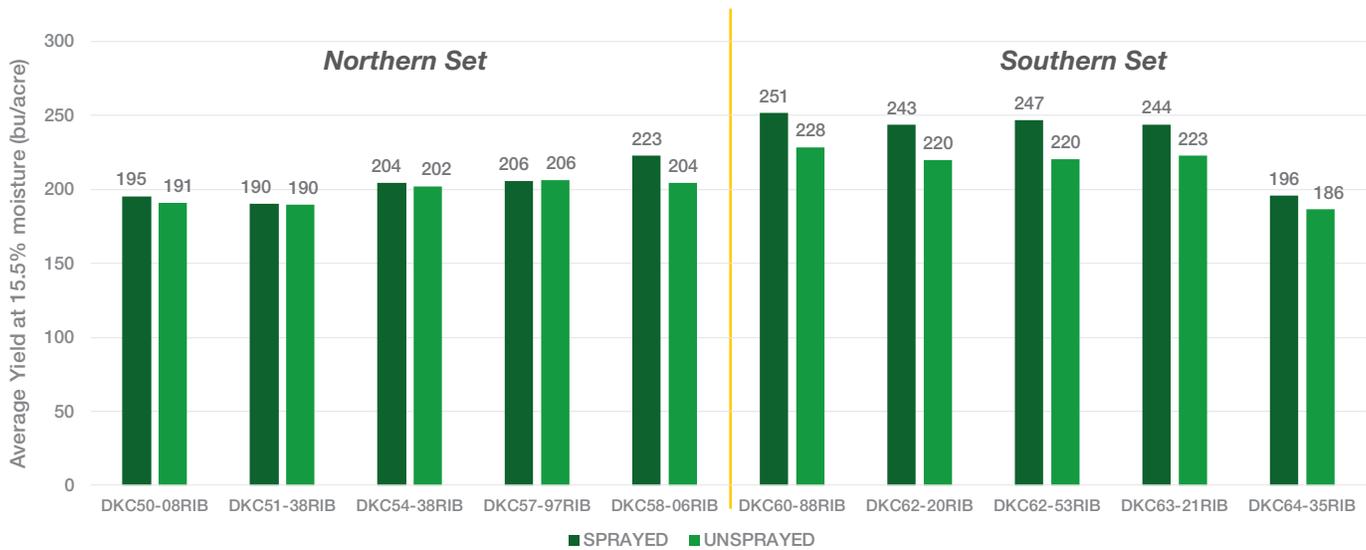
**Table 1. DEKALB® corn brand blends used in the trial with their associated ratings for stalk strength, staygreen, and harvest appearance. Ratings shown are general product ratings from the seed guide.**

Corn Product	Stalk Strength	Staygreen	Harvest Appearance
DKC50-08RIB	3	3	4
DKC51-38RIB	3	2	2
DKC54-38RIB	2	3	3
DKC57-97RIB	2	2	2
DKC58-06RIB	4	2	2
DKC60-88RIB	3	3	3
DKC62-20RIB	3	4	4
DKC62-53RIB	3	4	5
DKC63-21RIB	3	3	3
DKC64-35RIB	1	1	1



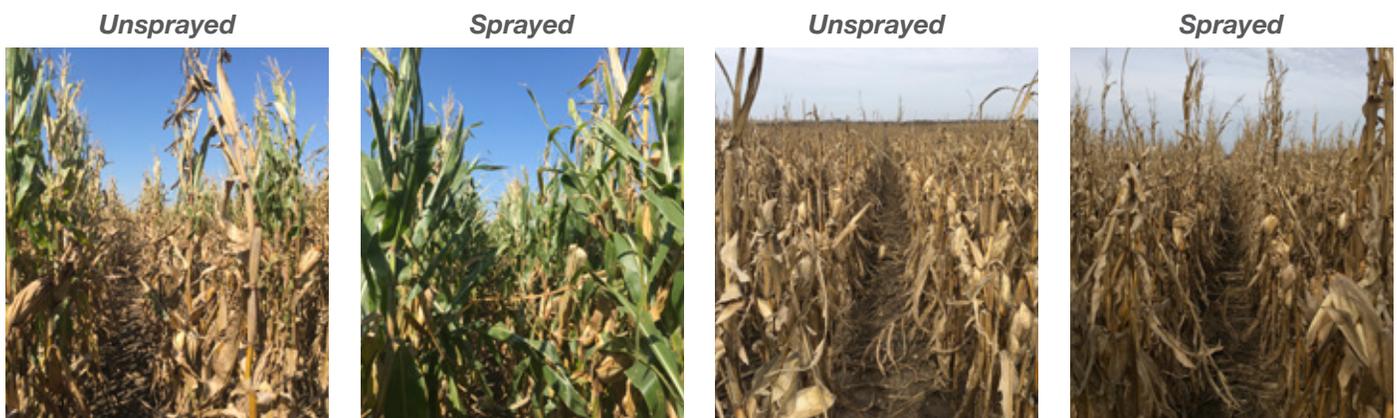
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## Understanding the Results



**Figure 1. Yield of DEKALB® corn brand blends with and without fungicide.**

- Across all corn products, spraying a fungicide offered a 13 bu/acre advantage vs. the unsprayed treatment. For this study, a 6.8 bu/acre response was considered a profitable response (\$24/acre cost for fungicide application with \$3.50 corn).
- Fungicide use also increased plant health, as the average staygreen and intactness ratings improved from 5 to 3 and 6 to 2, respectively, for the sprayed products compared to the unsprayed products (data not shown).
- Fungicide application had a minimal effect on grain moisture, with a 0.6% difference in moisture between the sprayed and unsprayed treatments.



**Figure 2. Pictures of DKC62-53RIB brand blend taken on 9/11 (left) and at harvest (10/30) at Atlantic, IA.**

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## What does this mean for your farm?

- The 2018 growing season saw a range of moisture and temperature extremes occur across the state of Iowa. Generally, the research sites saw a wet June, a dry July, and a very wet late summer/harvest season. This led to high levels of stalk and plant health issues due to excess moisture, disease, and lack of nitrogen.
- Such conditions may explain why a fungicide application was profitable across nearly all corn products tested in 2018. While fungicides do not cure plant diseases, a timely application can prevent foliar diseases from infecting the upper canopy.
- The results of this study suggest that a healthier upper canopy lead to increased photosynthetic activity later in the growing season, which resulted in increased yield in corn products sprayed with fungicide. While plant health was notably improved by fungicide use, we did not observe dramatic differences in stalk health between sprayed and unsprayed corn products.
- Going forward, this trial will be repeated in 2019, with more focus placed on potential stalk health benefits derived from applying fungicide.

## Legal Statements

The information discussed in this report is from a multiple site, replicated demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

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**SmartStax®** multi-event technology developed by Monsanto Company and Dow AgroSciences.

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