



## Effect of Fungicide on Yield

### **Trial Objective**

- Application of a fungicide has been shown to protect corn plants from foliar diseases and improve overall plant appearance, which may lead to increased grain yield.
- Yield increases observed from the application of fungicide in the absence of foliar disease greatly depends on the corn product, as individual products respond differently to fungicide application. While fungicide is often used as a high-yield management strategy, it can also be used to protect the yield of products with poor plant and stalk strength ratings.
- The objective of this study was to evaluate the impact fungicide application has on corn yield and good plant appearance.

### **Research Site Details**

- Thirteen DEKALB® brand corn products were tested, broken out into two different sets based on relative maturity (RM). The northern set included products that ranged from 97 to 111 RM and the southern set included products that ranged from 108 to 115 RM.
- Marble Rock and Storm Lake were the north locations; Victor and Atlantic were the south locations. Due to its central location, both the northern and southern sets were located at Huxley, giving each product three locations.
- Plots were planted as strip trials at four of the locations, with Huxley being arranged as a small-plot trial.
- The locations served as replications.
- Each site was sprayed with USF0411 fungicide at 8 oz/acre with a ground sprayer at the R1 corn growth stage.
- Foliar disease and stalk quality ratings were taken at R4 growth stage and grain moisture and yield were collected at harvest.

# Effect of Fungicide on Yield

## Understanding the Results



**Figure 1. Pictures of DEKLAB® DKC62-53RIB brand blend with and without USF0411 fungicide. Photos taken at the R4 growth stage (left) and pre-harvest (right). RIB is Refuge-In-a Bag.**

- All research locations had some levels of corn disease incidence, with disease level averaging from low to moderate across locations. Gray leaf spot, Northern Corn Leaf Blight and Anthracnose stalk rot were the most predominant diseases across locations. Disease incidence was observed in both fungicide-treated and untreated plots, and there were no differences in disease incidence and severity between treatments.
- Late season stay green and intactness scores were taken but there were no differences observed between the fungicide-treated and untreated plots.
- Across all corn products, spraying fungicide resulted in an average of 12-13 bu/acre advantage vs. the unsprayed treatment (Figures 2 and 3). For this study, a 7 bu/acre response was considered a profitable response (\$24/acre cost for fungicide application with \$3.50 corn).
- Fungicide application had a small effect on grain moisture, with an overall average of 0.6% difference in moisture between the sprayed and unsprayed treatments. The total difference in moisture for the southern set was 0.4% vs. 0.7% for the northern set (Table 1).
- Three products; DKC58-34RIB, DKC59-81RIB and DKC61-98RIB were planted in both north and south locations to understand product response to fungicide at different geographies. When planted in the appropriate geography for their relative maturities (northern half of Iowa), DKC58-34RIB and DKC59-81RIB provided economic returns to fungicide application (Fig. 1). However, they did not provide economic response to fungicide when planted in the south (Fig. 2). DKC61-98RIB did not provide economic gains to fungicide application in the north but a good gain in the south where it is well suited for its relative maturity (Figures 1 and 2).

# Effect of Fungicide on Yield

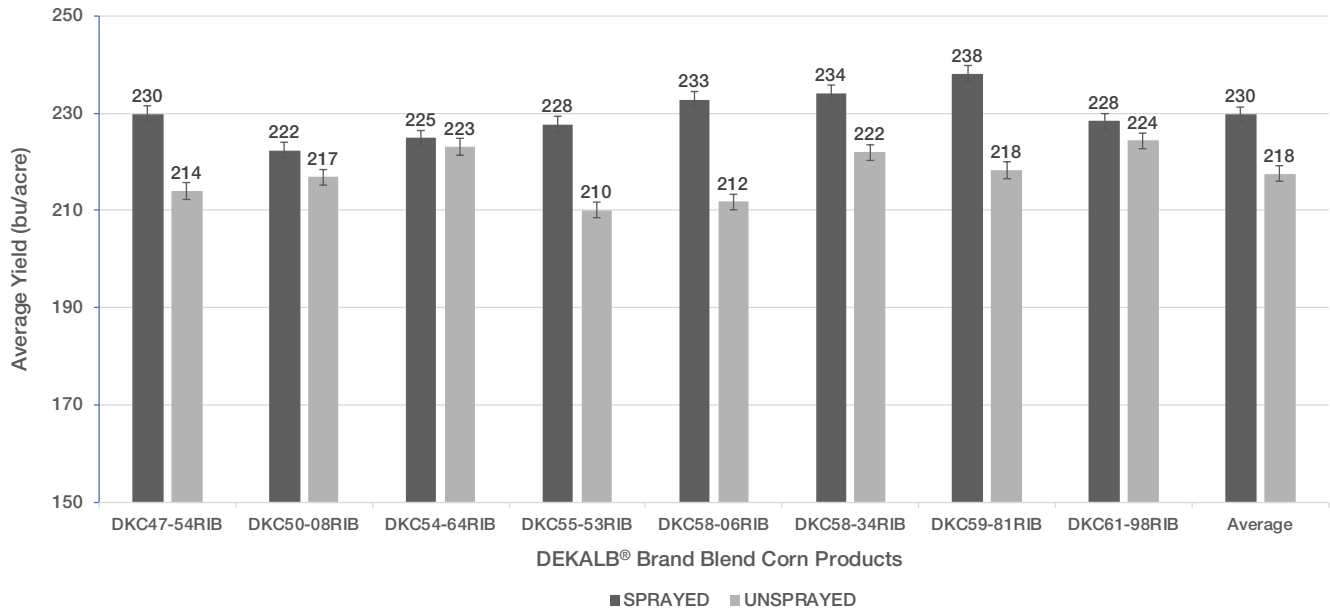


Figure 2. Response of DEKALB® brand north set products to USF0411 fungicide, adjusted to 15.5% grain moisture content. Standard error bars are shown. RIB is Refuge-In-a Bag.

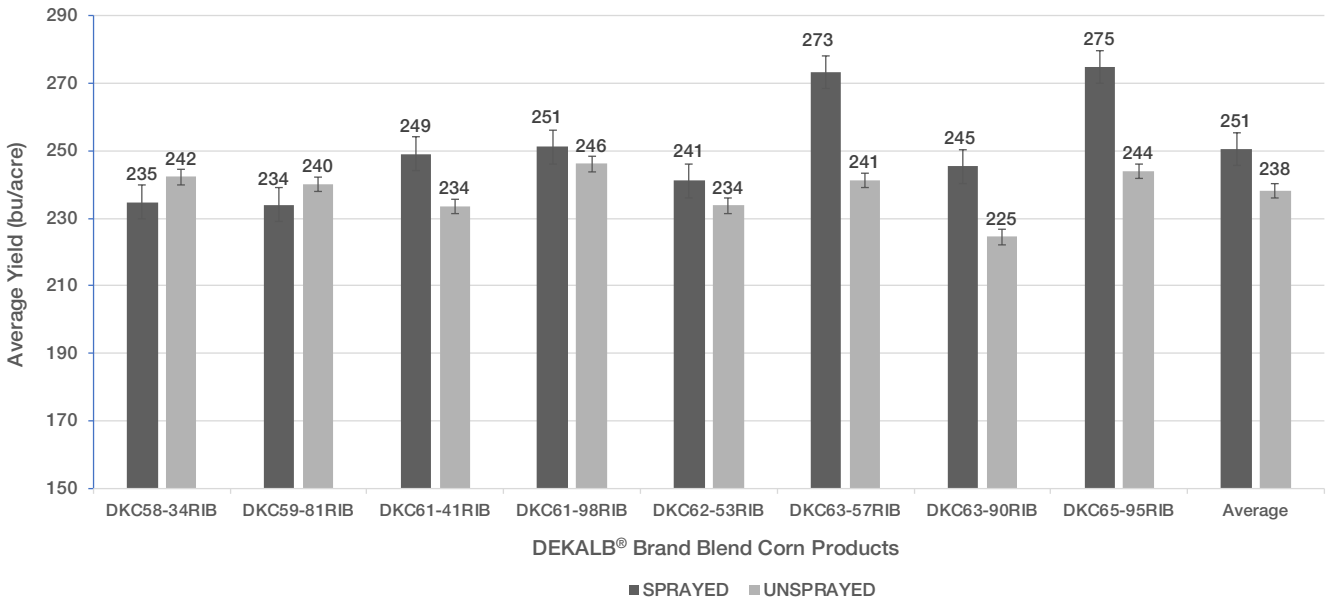


Figure 3. Response of DEKALB® brand south set products to USF0411 fungicide, adjusted to 15.5% grain moisture content. Standard error bars are shown. RIB is Refuge-In-a Bag.

# Effect of Fungicide on Yield

Table 1. Effects of USF0411 fungicide on grain moisture content of DEKALB® brand corn blends in Iowa.					
Product	Grain Moisture Content (%) Northern Set		Product	Grain Moisture Content (%) Southern Set	
	SPRAYED	UNSPRAYED		SPRAYED	UNSPRAYED
DKC47-54RIB	18.2	17.7	DKC58-34RIB*	19.8	19.8
DKC50-08RIB	19.3	18.8	DKC59-81RIB*	19.8	19.7
DKC54-64RIB	19.0	18.5	DKC61-41RIB	20.5	19.7
DKC55-53RIB	20.4	19.5	DKC61-98RIB*	18.9	19.4
DKC58-06RIB	20.8	20.1	DKC62-53RIB	21.0	20.1
DKC58-34RIB*	20.2	19.6	DKC63-57RIB	20.7	20.0
DKC59-81RIB*	19.0	18.9	DKC63-90RIB	21.4	21.2
DKC61-98RIB*	21.5	19.8	DKC65-95RIB	21.6	21.2
Average	19.8	19.1	Average	20.5	20.1

\*Indicates products that were grown in both north and south locations. RIB is Refuge-In-a Bag.

## Key Learnings

- The 2019 growing season saw a range of moisture and temperature extremes across the state of Iowa. Generally, the research sites experienced wet planting conditions, a hot and dry July, and a wet late summer/harvest season. This led to some levels of stalk strength and plant appearance issues due to excess moisture, nutrient shortages, and prolonged harvest conditions.
- Such conditions may explain why fungicide was profitable across nearly all products tested in 2019. While plant appearance was notably improved by fungicide use, we did not observe dramatic differences in stalk strength between sprayed and unsprayed products. This could be due, in part, to improvements in our corn germplasm to inherently tolerate some of these adverse growing conditions.
- The results of this study suggest that fungicide application could promote a healthier upper canopy that would lead to increased photosynthetic activity and better plant stress tolerance, which might result in increased corn yields. To gain the full benefits of a fungicide, the right corn product should be selected for the growing region.
- Going forward, protecting yield and improving overall plant appearance with the use of a fungicide may be a management decision worth considering on your operation.

## 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.

**ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** Performance may vary, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields.

All other trademarks are the property of their respective owners. For additional product information call toll-free 1-866-99-BAYER (1-866-992-2937) or visit our website at [www.BayerCropScience.us](http://www.BayerCropScience.us). Bayer CropScience LP, 800 North Lindbergh Boulevard, St. Louis, MO 63167. ©2019 Bayer Group. All rights reserved. 6005\_R2



# Legal Statements

The information discussed in this report is from a single site, replicated research 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.

Monsanto Company is a member of Excellence Through Stewardship® (ETS). Monsanto products are commercialized in accordance with ETS Product Launch Stewardship Guidance, and in compliance with Monsanto's Policy for Commercialization of Biotechnology-Derived Plant Products in Commodity Crops. This product has been approved for import into key export markets with functioning regulatory systems. Any crop or material produced from this product can only be exported to, or used, processed or sold in countries where all necessary regulatory approvals have been granted. It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted. Growers should talk to their grain handler or product purchaser to confirm their buying position for this product. Excellence Through Stewardship® is a registered trademark of Excellence Through Stewardship.

XtendiMax® herbicide with VaporGrip® Technology is part of the Roundup Ready® Xtend Crop System and is a restricted use pesticide. ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. It is a violation of federal and state law to use any pesticide product other than in accordance with its labeling. XtendiMax® herbicide with VaporGrip® Technology and products with XtendFlex® Technology may not be approved in all states and may be subject to use restrictions in some states. Check with your local product dealer or representative or U.S. EPA and your state pesticide regulatory agency for the product registration status and additional restrictions in your state. For approved tank-mix products and nozzles visit XtendiMaxApplicationRequirements.com.

NOT ALL formulations of dicamba or glyphosate are approved for in-crop use with Roundup Ready 2 Xtend® soybeans. ONLY USE FORMULATIONS THAT ARE SPECIFICALLY LABELED FOR SUCH USES AND APPROVED FOR SUCH USE IN THE STATE OF APPLICATION. Contact the U.S. EPA and your state pesticide regulatory agency with any questions about the approval status of dicamba herbicide products for in-crop use with Roundup Ready 2 Xtend® soybeans or cotton with XtendFlex® Technology.

Performance may vary, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields.

Roundup Ready 2 Xtend® soybeans contain genes that confer tolerance to glyphosate and dicamba. Glyphosate will kill crops that are not tolerant to glyphosate. Dicamba will kill crops that are not tolerant to dicamba. Contact your seed brand dealer or refer to the Monsanto Technology Use Guide for recommended weed control programs.

Not all products are registered in all states and may be subject to use restrictions. The distribution, sale, or use of an unregistered pesticide is a violation of federal and/or state law and is strictly prohibited. Check with your local dealer or representative for the product registration status in your state. Roundup PowerMAX®, Roundup Ready 2 Xtend®, Roundup Ready®, VaporGrip®, Warrant® and XtendiMax® are registered trademarks of Bayer Group. All other trademarks are the property of their respective owners. ©2019 Bayer Group. All rights reserved.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Performance may vary, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields.

Delaro® is a registered trademark of Bayer Group. All other trademarks are the property of their respective owners. For additional product information call toll-free 1-866-99-BAYER (1-866-992-2937) or visit our website at [www.BayerCropScience.us](http://www.BayerCropScience.us). Bayer CropScience LP, 800 North Lindbergh Boulevard, St. Louis, MO 63167. ©2020 Bayer Group. All rights reserved.

Commercialization of XtendFlex® soybeans is dependent on multiple factors, including successful conclusion of the regulatory process. The information presented herein is provided for educational purposes only, and is not and shall not be construed as an offer to sell. Soybeans with XtendFlex® Technology contain genes that confer tolerance to glyphosate, glufosinate and dicamba. Glyphosate will kill crops that are not tolerant to glyphosate. Dicamba will kill crops that are not tolerant to dicamba. Glufosinate will kill crops that are not tolerant to glufosinate. Contact your seed brand dealer or refer to the Monsanto Technology Use Guide for recommended weed control programs.

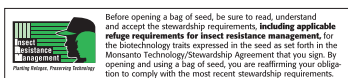
B.t. products may not yet be registered in all states. Check with your seed brand representative for the registration status in your state.

Roundup Ready® 2 Technology contains genes that confer tolerance to glyphosate. Roundup Ready 2 Xtend® soybeans contain genes that confer tolerance to glyphosate and dicamba. Glyphosate will kill crops that are not tolerant to glyphosate. Dicamba will kill crops that are not tolerant to dicamba. Contact your seed brand dealer or refer to the Monsanto Technology Use Guide for recommended weed control programs.

Climate FieldView™ services provide estimates or recommendations based on models. These do not guarantee results. Consult your agronomist, commodities broker and other service professionals before making financial, risk management, and farming decisions. More information at <http://www.climate.com/disclaimers>. FieldView™ is a trademark of The Climate Corporation.

Herculex® is a registered trademark of Dow AgroSciences LLC. LibertyLink® and the Water Droplet Design® is a trademark of BASF Corporation. Respect the Refuge and Corn Design® and Respect the Refuge® are registered trademarks of National Corn Growers Association. Asgrow and the A Design®, Asgrow®, DEKALB and Design®, DEKALB®, DroughtGard®, RIB Complete®, Roundup Ready 2 Technology and Design™, Roundup Ready® and SmartStax® and VT Double PRO® are trademarks of Bayer Group. Accelaron®, Bayer and Bayer Cross Design, Delaro®, and Roundup Ready 2 Xtend® VaporGrip®, Warrant®, XtendFlex®, XtendiMax®, Dekalb®, and Asgrow® are registered trademarks of Bayer Group. Dual Magnum® is a registered trademark of a Syngenta group company. Liberty®, LibertyLink® and LibertyLink® and the Water Droplet Design® are trademarks of BASF Corporation. Mauler™ is a trademark of Valent U.S.A. Corporation. All other trademarks are the property of their respective owners. ©2020 Bayer Group. All rights reserved.

Accelaron® and Delaro® are registered trademarks of Bayer Group. ILeVO® is a trademark of BASF Corporation. All other trademarks are the property of their respective owners. For additional product information call toll-free 1-866-99-BAYER (1-866-992-2937) or visit our website at [www.BayerCropScience.us](http://www.BayerCropScience.us). Bayer CropScience LP, 800 North Lindbergh Boulevard, St. Louis, MO 63167. ©2019 Bayer Group. All rights reserved.








---

Bayer Crop Science - Huxley Learning Center

1551 Hwy 210 | Huxley, IA 50124 | (515) 597-5900

[www.cropscience.bayer.us](http://www.cropscience.bayer.us) |  @TheHuxleyLC |  @Bayer4CropsHuxleyLC