



Agronomic Spotlight

Disease Management with Fungicides in Corn and Soybean

- Application of a fungicide could reduce foliar diseases depending on corn and soybean product resistance and disease pressure.
- Fields should be scouted based on weather forecasts, field history, corn or soybean product, and susceptibility to disease.
- Fungicides should be properly timed based on crop growth stage and potential for disease development.

Foliar fungicide applications to corn and soybean has increased over the past 10 years.^{1,2} The development of strobilurins, such as pyraclostrobin fungicides has contributed to the increased use of fungicides in corn and soybean. Pyraclostrobins are effective at controlling multiple diseases, locally systemic, and have the ability to block spore germination and host penetration when applied prior to disease establishment.

Corn

Prioritize Fields. Products susceptible or moderately susceptible to diseases should be monitored before tasseling. Because many foliar diseases survive on corn residue and begin producing spores when wet weather favors disease development, scouting fields in a continuous corn rotation is important. It is also practical to scout fields with greater than 35 percent residue and with a history of foliar disease.³ Cool and humid weather conditions at vegetative growth stages and during grain fill can increase common rust and northern corn leaf blight in some fields. Warm and humid weather favors northern corn leaf blight, gray leaf spot, common rust, and other fungal diseases that can be managed with fungicides. These diseases can develop to levels that could reduce yields if they severely infect the ear leaf or leaves above the ear during the weeks surrounding tasseling and pollination and thereafter.

Scouting. Fungicides may work better at preventing rather than curing disease. Lesions can take up to two weeks to become visible after infection. Therefore, scouting when weather conditions favor disease development is important.

The Purdue University pdf www.extension.purdue.edu/extmedia/BP/BP-160-W.pdf can be referenced for a more complete list of fungicides, recommended rates, and their efficacy against disease.

Fungicides are generally considered effective for 21 days for two reasons: 1) fungicides degrade or are lost from leaf surfaces and 2) new unprotected leaf growth occurs after application.¹ For these reasons, timing is important to help maximize potential activity of the fungicide. In some cases, poorly formed ears have been associated with improper timing

of fungicide applications. Always read and follow label directions.

Scouting for lesions at stages early enough to prevent substantial infection of ear leaves helps establish timing for an economical fungicide treatment. The ear leaf and leaves higher on corn plants should be protected from disease because they contribute the most energy supplied during grain fill.³ A general disease treatment guideline may be to spray when disease symptoms have developed on the third leaf below the ear leaf, or on leaves above that, on 50 percent of the plants during the tasseling stage.⁴

Soybean

Prioritize Fields. Keeping a close watch on fields for disease symptoms and a review of soybean growth stages can help properly time fungicide applications.

Anthracoze, Cercospora leaf blight, white mold, brown spot, frogeye leaf spot, and soybean rust may be managed with a



Figure 1. Soybean plant during full flower (R2) growth stage. Photo courtesy of Iowa State University.



Figure 2. Soybean plant during beginning pod (R3) growth stage. Photo courtesy of Iowa State University.

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timely fungicide treatment. A relatively early fungicide application at R2.5 (full flower) growth stage may have yield benefit over fungicide applications at R4 (full pod) growth stage.⁵

Fungicide application in soybean differs from corn as there is additional leaf development beyond application. Therefore, the more leaves present at the time of spraying, the more potential protection from foliar disease. Soybean plants treated with a fungicide at R3 (beginning pod) may have 14 to 16 nodes. The plant with 16 nodes at application time has two more nodes protected from disease compared to the 14-node plant at the same beginning pod growth stage.⁶ Application timing is important for effective disease control. Fungicide applications made prior to the R1 (beginning flower) growth stage, or after the R6 (full seed) growth stage are often not economical.¹ Foliar diseases are often not an issue until the R3 growth stage. If uncontrolled, potential yield loss may occur due to premature leaf drop reducing the photosynthesizing ability of the crop to produce grain.²

Weather conditions can also help guide fungicide timing in soybean. Response from fungicide treatment may be greater when conditions favor disease development and the product lacks resistance. If this type of environment is anticipated at R3 growth stage, treatment with a fungicide may be warranted. Subsequent fungicide applications may be needed in environments with high disease pressure. Also, a compatible herbicide or insecticide may be included if labeled for soybean and there is a weed or insect pest present that justifies treatment. For more information on fungicides for soybean diseases, see <https://www.extension.purdue.edu/extmedia/BP/BP-161-W.pdf> from Purdue University.

Summary

Foliar fungicides may be warranted in years with high disease pressure, stressful conditions, and susceptible seed products. A disease risk assessment for corn and soybean should consider the additional factors listed in Table 1. Scouting fields for crop growth stage and disease symptoms is important as crops get closer to reproductive growth stages. Protection of leaf area is important for maintaining yield potential.

Sources:

- ¹ Hershman, D.E., Vincelli, P., and Kaiser, C.A. 2011. Foliar fungicide use in corn and soybean. University of Kentucky. PPFS-GEN-12.
- ² Navi, S.S. 2014. Efficacy tests of foliar fungicides on soybean diseases and yield during 2012 and 2013 growing seasons in Northeast Iowa. Iowa State University.
- ³ Mueller, D. and Roberston., A. 2008. Preventative vs. curative fungicides. Iowa State University. Integrated Crop Management News.
- ⁴ Robertson, A., Abendroth, L., and Roger, E. 2007. Yield responsiveness of corn to foliar fungicide application in Iowa. www.agronext.iastate.edu.
- ⁵ Bohner, H. 2014. What is the correct time to apply foliar fungicides to soybeans? Crop Talk. www.omafra.gov.on.ca.
- ⁶ Koger T. July 2, 2008. Soybeans reaching critical stage for fungicide. Delta Farm Press. Purdue University. Corn & Soybean FieldGuide. 2008 Edition. Web sources verified 6/16/2015.



Figure 3. Soybean pods during the full pod (R4) growth stage. Photo courtesy of Iowa State University.

Table 1. Factors that increase risk for disease development in corn and soybean.

Corn	Soybean
Disease activity prior to and at tasseling	Disease activity in field
Disease-favorable weather	Disease-favorable weather
Susceptible corn product	Susceptible or early maturing product
Irrigation	Irrigation
Field history of disease and lodging	Historical disease problems in field
Late planting	Early planting
High plant population and/or yield potential	Dense crop canopy; high yield potential
Continuous corn	Continuous soybean, especially in no-till systems
No-till	

Source: Hershman, D.E., Vincelli, P., and Kaiser, C.A. 2011. Foliar fungicide use in corn and soybean. University of Kentucky. PPFS-GEN-12.

For additional agronomic information, please contact your local seed representative. Developed in partnership with Technology, Development, & Agronomy by Monsanto.

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Tank mixtures: The applicable labeling for each product must be in the possession of the user at the time of application. Follow applicable use instructions, including application rates, precautions and restrictions of each product used in the tank mixture. Monsanto has not tested all tank mix product formulations for compatibility or performance other than specifically listed by brand name. Always predetermine the compatibility of tank mixtures by mixing small proportional quantities in advance. All other trademarks are the property of their respective owners.

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