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# Before applying fungicides to corn: Stop! Look! Consider!

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## **Abstract**

There is considerable interest across Iowa and the whole Corn Belt in applying fungicides to field corn. In the past when corn prices were down below \$2 a bushel, the decision to apply a fungicide was easy--no. This growing season, the high price of corn and increased disease risk due to increased corn-after-corn acreage has many producers considering fungicide applications as a means to increase yields.

## **Keywords**

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## **Disciplines**

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## Before applying fungicides to corn: Stop! Look! Consider!

*by Alison Robertson and Daren Mueller, Department of Plant Pathology*

There is considerable interest across Iowa and the whole Corn Belt in applying fungicides to field corn. In the past when corn prices were down below \$2 a bushel, the decision to apply a fungicide was easy--no. This growing season, the high price of corn and increased disease risk due to increased corn-after-corn acreage has many producers considering fungicide applications as a means to increase yields.

### Stop!

Before applying a fungicide to corn this season, it would be prudent to note the resistance to foliar disease of the hybrid being grown. The most common foliar diseases in Iowa are common rust, gray leaf spot, northern leaf blight, and, to a lesser extent, eyespot (see photos). Back in the mid-1990s, research done in southeast Iowa by Gary Munkvold, Iowa State University plant pathologist, and others demonstrated a single application of fungicide could be profitable; however, profitability was strongly influenced by gray leaf spot susceptibility. In other words, the chance of increased yield and making a profit only was likely on highly susceptible hybrids. On intermediate and moderately resistant hybrids, any yield benefit would not cover the costs of the fungicide application.



*Gray leaf spot (early symptoms). (Alison Robertson)*

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*Northern leaf blight. (Alison Robertson)*



*Eyespot. (Alison Robertson)*

## **Look!**

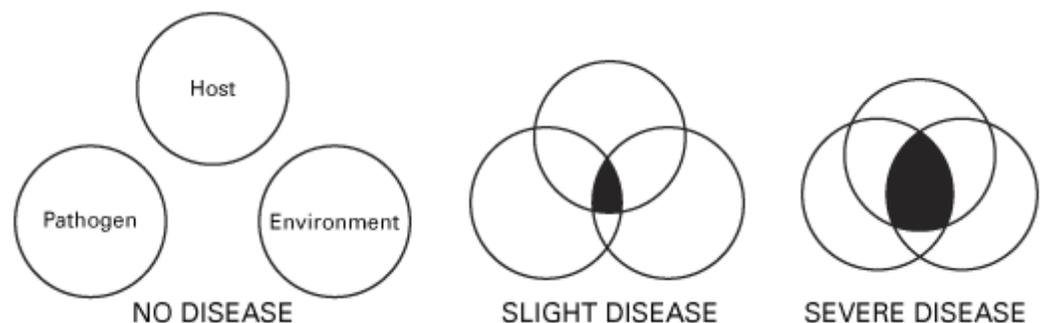
Many of the foliar diseases in Iowa start on the bottom leaves of the corn plant and gradually move up the plant depending on environmental conditions. Thus, scouting the field can give us a very good indication of the disease pressure in that field. The best time to start scouting is immediately

prior to tasseling. Look for disease development on the lower leaves of the corn plant up to and including the ear leaf. Remember, it is the ear leaf and leaves above that contribute 75 to 90 percent of the carbohydrates to grain fill. Thus, these are the leaves we need to protect. If disease is not present on the leaves below the ear leaf, a fungicide application may not be warranted. Continue scouting on a weekly basis.

## Consider!

Other factors to consider when deciding whether to spray a fungicide or not include:

- **Anticipated environmental conditions.** Environment plays a significant role in disease development (see the disease triangle below). Hot, humid weather favors gray leaf spot. Wet, warm (64-81 °F) conditions favor infection and spore production by the fungus that causes northern leaf blight. Dry weather halts the development of most fungal diseases.
- **Planting date.** Infection at earlier growth stages will have a greater impact on yield. In central Iowa, we usually see gray leaf spot starting on the lower leaves around the end of July and beginning of August. This year, corn has been planted at [essentially three planting dates](#). It is possible that the later planted corn (planted mid-May) will be at a greater risk for yield loss from foliar disease.
- **Corn-following-corn fields.** Many of the foliar disease pathogens survive winters in infested crop residue. Infested residue on the soil surface significantly increases the risk and development of gray leaf spot, northern leaf blight, and eyespot.
- **Fungicide activity.** Most fungicides are effective against disease for 14 to 21 days. Corn takes approximately 60 days from silking to physiological maturity, depending on the hybrid. Therefore, spraying a fungicide too early could negate any beneficial effect against disease development that occurs during grain fill.
- **Plant health.** In last week's issue of *The Bulletin--Pest Management and Crop Development* information for Illinois, Emerson Nafziger [eloquently addressed the use of fungicides on corn for plant health](#). In the absence of disease averaged over 10 sites, fungicides increased yields by 6.2 bushels per acre, which would not cover the cost of the fungicide plus application.
- **Stalk rots.** Foliar fungicides will have no direct effect on stalk rots. The fungi that cause stalk rots systemically infect the corn plant and currently available fungicides are not systemic enough to be effective against stalk rot pathogens. However, foliar disease severity is highly correlated with stalk rot prevalence. Leaf spot diseases reduce the area of photosynthetic tissue and increase susceptibility to stalk rot. Therefore, fungicide applications may indirectly reduce stalk rots by managing foliar disease and reducing plant stress.



*Degrees of severity in the disease triangle.*

There are numerous fungicides listed for use on corn in Iowa. Research has shown that those containing active ingredients belonging to the strobilurin and/or triazole groups are the most effective against foliar pathogens of corn (Table 1).

In conclusion, producers who are considering making fungicide applications for "plant health" benefits should be aware that a significant economic response is not assured. The jury is still out. The profitability of fungicide applications on corn is determined by numerous factors, so stop, look, and consider the above factors before you spray.

**Table 1. Fungicides listed for use on corn in Iowa.**

Fungicide	Target Diseases	Application Rate (fl oz/acre)	Application Timing	Adjuvants		Coverage (gpa)	
				Ground	Air	Ground	Air
Headline®	Anthracnose Common rust Gray leaf spot Northern leaf blight Northern leaf spot Physoderma brown spot Southern leaf blight Southern rust Yellow leaf blight	6-12	Prior to disease development	NIS @ 1 pt/100 gal	COC @ 1 pt/acre	20	2-5
Quadris®	Common rust Eyespot Gray leaf spot Northern leaf blight Northern leaf spot Southern leaf blight Southern rust	6-15.5	Prior to disease development	NIS @ 1 pt/100 gal		Sufficient water volume for adequate coverage	5
Quilt®	Common rust Eyespot Gray leaf spot Northern leaf blight Northern leaf spot Southern leaf blight Southern rust	7-14	At onset of disease to brown silk	NIS @ 1 pt/100 gal	NIS @ 1 qt/100 gal spray COC @ 1 pt/acre	Sufficient water volume for adequate coverage	2-5
Stratego®	Common rust Eyespot Gray leaf spot Northern leaf blight Northern leaf spot Southern leaf blight Southern rust	7-12	At onset of disease through to end of silking (R2)	NIS @ 1 pt/100 gal	COC @ 1 pt/acre	10	2-5
Tilt®, Propimax®	Common rust Eyespot Gray leaf spot Northern leaf	2-4	Apply when disease first appears	NIS @ 1 pt/100 gal		10	5

blight  
Northern leaf  
spot  
Southern  
leaf blight  
Southern  
rust

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