

# AGRONOMIC Spotlight



## Common Rust in Corn – Central Corn Belt

Common corn rust is a fungal disease that affects corn after tasseling. Weather conditions can have a significant impact on the development and spread of the disease. It is important to scout fields during the onset of these weather conditions to identify and potentially manage the disease.

### Pathogen Life Cycle

Common rust is caused by the fungus *Puccinia sorghi* Schw. The pathogen does not overwinter in the Midwest because green tissue is required for the survival of the fungus. However, it does overwinter in southern United States and Mexico and summer winds can transport spores into the Midwest.

### Favorable Conditions

Young leaves are the most susceptible to common rust. Infection occurs within three to six hours of moderate temperatures, between 60 and 75°F, heavy dews, or high relative humidity ( $\geq 95\%$ ).

### Symptoms

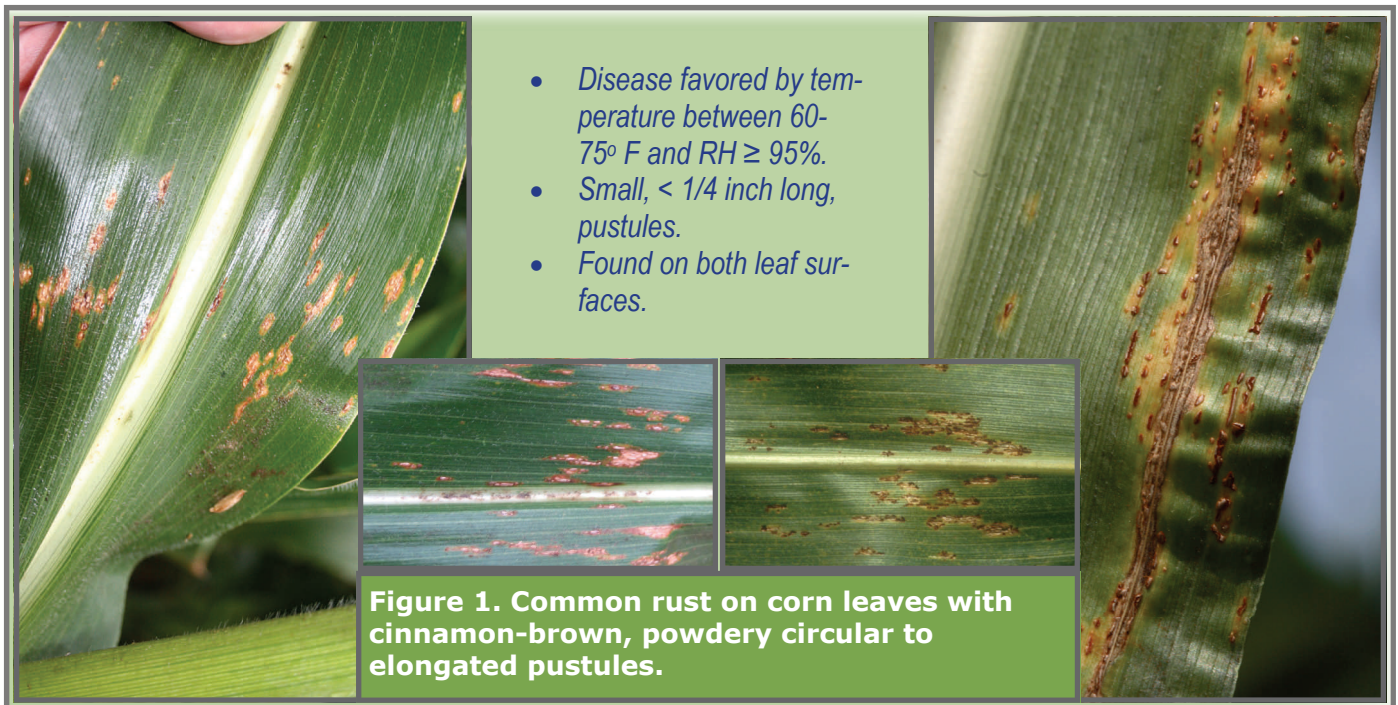
The disease can be easily recognized by the presence of small, cinnamon-brown, powdery pustules (Figure.1).

The pustules are found on the upper and lower surface of the leaf, in contrast to the pustules caused by the southern corn rust fungus that are mostly found on the upper leaf surface. The pustules become darker brown to black late in the season. The lesions have the potential to cannibalize the leaf and cause leaf chlorosis and reduce photosynthesis.

### Expectation

In many Midwestern States, common rust can appear every year to some degree, although it usually occurs late enough in the season that the potential for economic yield loss is rather low. However, if the disease develops early in the season and conditions are favorable for development and spread of the disease, the potential for economic yield loss increases.

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**Figure 1. Common rust on corn leaves with cinnamon-brown, powdery circular to elongated pustules.**

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Corn products have differences in their level of resistance to common rust. Therefore, the level of infection may appear different for each product that is growing.

As a rule of thumb, if there is less than 10-15% infection after mid-silk, there should not be significant yield loss. At three to four weeks past mid-silk, each 1% increase in disease infection above 15% may reduce yield by approximately 0.5%. You may apply the above figures to the following example to find out how much potential yield reduction may be expected from common rust infection:

If there is 45% infection at 4 weeks after silk, potential yield reduction is expected to be 15%;  $(45\% - 15\% \{15\% \text{ infection has no effect}\} = 30\% \times 0.5\% \text{ or } 15\%)$ .

### Management Options

The best protection from common rust in corn is to choose corn products with higher levels of tolerance to this disease. Refer to the Seed Resource Guide for more information on corn product tolerance to common rust and other diseases.

Crop rotation away from corn is not very effective in controlling the disease since it does not survive in the crop residue in the Midwest. The spores are moved by the wind typically from the South to the North and can be spread over large distances (hundreds of miles). The spores land on the leaves of a susceptible corn product and if weather conditions are favorable, infection begins.

Another management option to control common rust in corn is to make a timely fungicide application.

In the Midwest, common rust hasn't caused significant corn yield reduction like some other foliar diseases such as gray leaf spot. The decision to apply a fungicide to control common rust in corn should be based on the following questions:

- What is the tolerance of the corn product to

common rust?

- What crop growth stage is the corn at?
- What is % infection level of the disease on the corn leaves and is it moving up the plant?
- Are there other leaf diseases present on the corn or would you anticipate a later infection of another foliar fungal disease such as Southern rust or gray leaf spot?
- What does the extended weather pattern look like for the next 2 to 3 weeks?

In most cases, common rust would need to be present on at least 50% of the leaves of a susceptible corn product and moving up the plant, corn stage at or near tassel, and the extended forecast calling for high humidity and moderate temperatures for the next 2 to 3 weeks to justify a fungicide application. However, if other foliar fungal diseases such as gray leaf spot or southern rust are present or anticipated and the corn is near or at full tassel emergence a fungicide application should be considered.

Choose a fungicide that will provide curative activity on the existing infection and residual activity to prevent re-infection after application.

The strobilurin family of fungicides, such as Headline<sup>®</sup>, is very effective at preventing common rust in corn and providing long residual protection from all other major foliar diseases such as gray leaf spot and anthracnose. Combination fungicide products, which contain both strobilurin and triazole fungicides such as Headline Amp<sup>™</sup> fungicide, are effective at controlling existing infections of common rust and provide residual foliar disease protection.

Sources: Koening, S. 2005. *Southern Rust for Corn*. Corn Disease Information Note 2. North Carolina State Univ. <http://www.ces.ncsu.edu> (5/10/2010)  
 K. Wise. 2008. *Common rust on hybrid corn*. Pest & Crop Newsletter, Entomology Ext. Purdue Univ. <http://extension.entm.purdue.edu>, (4/30/10).  
 Common Rust. 2001. *Field Crop Diseases*. Crop Sci. Univ. of Illinois. <http://cropdisease.cropsci.uiuc.edu>, (4/30/10).  
 P. Lipps & et al. *Common corn rust*. AC-0031-01. <http://ohioline.osu.edu>, (4/30/10).  
 L. Sweets & A. Wrather. 2000. *Corn Diseases*. Univ. of Missouri Ext. IPM1001. <http://extension.missouri.edu>, (4/30/10).

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.** Technology Development by Monsanto and Design(SM) is a servicemark of Monsanto Technology LLC. Headline<sup>®</sup> is a registered trademark of BASF Corporation. ©2010 Monsanto Company. 06232010SMK