

Corn Rust Identification and Management in Kansas

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When corn prices are high, Kansas corn growers become more interested in the use of foliar fungicides to manage foliar diseases and protect yields. While many foliar diseases attack corn in Kansas, only two — gray leaf spot and southern corn rust — typically reach economic thresholds that would make fungicide application profitable.

A third foliar disease, common rust, can be found regularly in Kansas corn fields. This disease, however, has not been shown to cause economic yield loss in Kansas; therefore, applying fungicides for its management would not be profitable. Because common rust and southern corn rust can look similar, especially in the early stages of disease development, it is important to be able to distinguish between the two.

Common Rust

Common rust is caused by the fungus *Puccinia sorghi*. Since the fungus does not overwinter in Kansas, spores must blow in from the south.

Initial infection of healthy corn plants usually occurs around mid-June when temperatures are still moderate. Frequent rains, heavy dews, and fog encourage disease development. Since only about 6 hours of free moisture on the leaf are required for spores to germinate and infect, infection can occur under relatively dry conditions. Common rust typically appears much earlier in the growing season than southern rust, often developing on the plant during the vegetative growth stages.

The number of pustules (uredinia) on a leaf can vary from one to as many as several dozen. Frequently, the

pustules appear in a band as a result of infection that took place when the leaf tissue was still in the whorl (Figure 1). The dark-brown reproductive spores (urediniospores) appear about 7 days after infection. Pustules develop on both the upper and lower leaf surfaces, which helps distinguish it from southern rust, which has sparse, if any, pustule development on the lower leaf surface (Figures 2 and 4).

Southern Rust

Southern rust is caused by the fungus *Puccinia polysora*. Like common rust, it does not overwinter in Kansas, but blows in from southern corn production areas. In Kansas, the disease generally arrives around the first of August, with about a 2-week variance. In years when corn is planted late and the disease arrives early, yield loss can be significant in susceptible hybrids. Temperatures above 80 degrees Fahrenheit with high relative humidity encourage southern rust development.

Symptoms of southern rust resemble those of common rust, with some subtle differences. The pustules are usually smaller and circular to oval, with a diameter of 0.2 to 2.0 millimeters. They typically are densely scattered on the upper leaf surface (Figure 3). The light-brown to orange spores are lighter in color compared to common rust. Sporulation can be so profuse that the leaf surface becomes covered with a layer of “spore dust” that transfers easily to clothing as a person walks through an infected field. Light-colored clothing will quickly take on an orange-brown color.



Figure 1. Common rust pustules in a band on the upper leaf surface.



Figure 2. Common rust pustules on the lower leaf surface.



Figure 3. *Densely packed, circular southern rust pustules on the upper leaf surface.*

Management of Common and Southern Rust

Since neither disease overwinters in Kansas, rotation and tillage are not useful management tools. As mentioned previously, management of common rust in Kansas field corn is not necessary. In certain situations, control of common rust on sweet corn may be desirable.

In years when the crop is planted on time and southern rust does not appear until August, fungicide applications are generally not economical. Some corn hybrids have good resistance to southern corn rust, although a new race that can overcome all of the currently deployed resistance genes has been identified in Alabama, Georgia, Illinois, and Nebraska.



Figure 4. *Lower leaf surface absent of southern rust pustules.*

When susceptible corn hybrids are planted late or the southern rust arrives early, fungicide applications can be beneficial. In the early stages of infection, strobilurin-containing fungicides such as Headline and Quadris can be used. As the infection progresses, a triazole fungicide or a strobilurin-triazole mixture should be used. Currently labeled products in Kansas include Headline Amp, Quilt, Quilt Xcel, and Stratego Pro.

No research data are currently available regarding how late fungicide may be successfully applied. Some reports indicate that applications through the end of the soft dough stage could still result in net economic gain.

This publication has been reviewed to ensure that the contents reflects current research and practice.

Reviewer: **Douglas J. Jardine**

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