

Wheat Stripe Rust

Erick De Wolf, Plant Pathologist

Stripe rust has recently emerged as a serious threat to wheat production in Kansas and the southern Great Plains. The disease had been reported in Kansas for decades, but warm spring temperatures typically diminished the risk of severe disease development and yield losses. Kansas, and several other states in the Southern Great Plains, experienced a series of stripe rust epidemics between 1999 and 2005. Research indicates the population of the fungus that causes stripe rust has changed and this new population appears to be better adapted to warm temperatures. Therefore, stripe rust is likely to remain an important disease in Kansas.

Stripe rust is also a significant problem in other parts of the world including Europe and Australia. This disease is commonly referred to as yellow rust in these areas.

Symptoms

Symptoms of stripe rust include long stripes of small yellow or orange blister-like lesions called “pustules” (Figure 1). The disease primarily occurs on the leaves; however, glumes and base of the awns also can be affected. The blister-like lesions produce massive amounts of spores that are easily dislodged. These spores may appear as orange dust on the clothing of individuals that have recently walked through heavily disease fields.

The genetic resistance of a variety can modify the symptoms of stripe rust. For example, the size of the pustules is often smaller on moderately resistant varieties

Quick Facts

- Stripe rust typically produces yellow or orange blister-like lesions that are arranged in stripes. The disease is most common on leaves but also can affect glumes and awns of some varieties.
- The fungus that causes stripe rust rarely survives the winter in Kansas and must be reintroduced from overwintering locations each season. Outbreaks of severe stripe rust in Texas and Oklahoma often indicate a high risk of disease in Kansas.
- Planting disease-resistant varieties can effectively control stripe rust. A recent change in the stripe rust population has reduced the resistance of many popular varieties.
- Foliar fungicides also can be used to control the disease. The most effective fungicide applications are typically applied at the boot stage of crop growth and provide protection of the upper leaves during the early stages of grain development. Products containing a triazole fungicide are considered the best option when the disease is established in a field.



Figure 1. Symptoms of stripe rust on wheat.



Figure 2. The symptoms of stripe rust may vary among varieties. Varieties that are moderately resistant to the disease often will have more of tan coloration to the lesion.

(Figure 2). These disease symptoms may resemble bacterial leaf streak (black chaff) or Septoria leaf blotch. Stripe rust is occasionally confused with leaf rust or stem rust; however, these diseases tend to form darker lesions relative to stripe rust. The pustules of leaf rust and stem rust are not arranged in stripes and tend to be randomly distributed over the leaf surface.

Life Cycle

The fungus *Puccinia striiformis* causes wheat stripe rust. The fungus has specialized forms that are able to infect either wheat or barley. However, the forms of the fungi attacking barley are not well adapted for causing disease in wheat. The fungus cannot survive for extended periods on plant debris, but can persist for a long time inside a living host plant.

Stripe rust is favored by cool, humid weather and disease development is most rapid between 50 and 60 degrees Fahrenheit. The disease is inhibited when nighttime temperatures get above 68 degrees Fahrenheit or there are several days in a row in the mid 80s.

Stripe has the potential to cause losses of 40 percent or more when the disease becomes established on susceptible varieties before heading. The disease does not typically overwinter in Kansas, and years with heavy yield losses are strongly associated with disease outbreaks in Texas and Oklahoma. Monitoring reports of disease in these areas can provide an important early warning for producers in Kansas.

Control

Planting disease-resistant varieties is the most effective and economical way to control stripe rust. The population of the fungus that causes stripe rust continues to change. This new population of stripe rust can overcome the resistance of many popular varieties including Fuller, Santa Fe, Overley, Jagger, and Jagalene. More information regarding disease resistant varieties can be found in the K-State Research and Extension publication *Wheat Variety Disease and Insect Ratings*, MF-991.

Foliar fungicides can effectively control stripe rust. Applied when the crop is at the boot stage of development, the fungicides should provide protection for the upper leaves that contribute most of the energy used to produce grain. Products belonging to the strobilurin class of fungicides (Headline, Quadris) provide excellent activity against stripe rust but are most effective when applied before infection. If stripe rust is already present in a field at the time of application, it may be better to use products belonging to the triazole class of fungicides (Folicur, Prosaro, Tilt) or premixes of the two classes (Quilt, Stratego, Twinline). The triazole class of fungicide is generally considered to have stronger curative activity. Additional information on product efficacy can be found in the *Foliar Fungicide Efficacy Ratings for Wheat Disease Management*, EP-130.

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