

Fungal Wheat Disease Identification

Heather Young-Kelly
Assistant Professor
Field Crops Plant Pathology
Department of Entomology and Plant Pathology

Leaf Blotch (*Septoria tritici*)

- **Conditions for disease development** include temperatures between 59 to 77 F and periods of rainy or humid weather that last for more than one day. Disease outbreaks occur more commonly on lower leaves in the early spring after **cool, wet conditions**. The pathogen will start to decline as temperatures increase.
- **Symptoms** usually develop on winter wheat in early spring on the **lowest overwintered leaves** and will develop on higher leaves if cool, wet conditions persist. Lesions have tan to brown centers surrounded by yellow areas that are laterally restricted. Lesions may have small, black specks (pycnidia) in the necrotic areas of lesions. Lesions can be scattered over the leaf blade and may coalesce to cover large portions of the leaf blade.
- **Management** options include reducing risk of infection by growing wheat at 2-year intervals, implementing wide row spacing, planting resistant varieties, and making timely fungicide treatments (see UT Extension publication [W 341 Wheat Fungicide Table](#)).



Leaf blotch on wheat leaves and enlarged lesion with black pycnidia in the center of lesion.

Glume Blotch (*Stagonospora nodorum*)

- **Conditions for disease development** are more prevalent in **dense foliage** and **areas of heavy fertilization**. Risks of disease are higher in reduced-tillage fields or short-rotation wheat production. Disease outbreaks are promoted by **wet, warm** weather. Optimal temperature for symptom development is between 68 and 80 F.
- **Symptoms** are often first noted in the spring on the **lowest overwintered leaves** and will develop on higher leaves if warm, wet conditions persist. Foliar lesions begin as yellow flecks, becoming brown or grayish brown, elongated, and often lens-shaped. Stem infections are also common, especially at nodes. Glume infections result in purple brown or grayish brown streaks and blotches starting at the glume tips.
- **Management** options include reducing risk of infection by growing wheat at 2-year intervals, maintaining balanced fertilizer rates, implementing wide row spacing, planting resistant varieties, and making timely fungicide treatments (see UT Extension publication [W 341 Wheat Fungicide Table](#)).



Glume blotch on a wheat leaf and head (*APS Compendium of Wheat Diseases and Pests*, courtesy R. L. Bowden)

Leaf blotch and glume blotch may occur in different combinations within a field and on individual plants.

Stripe Rust/Yellow Rust (*Puccinia striiformis*)

- **Conditions for disease development** are optimal during **50 to 64 F with intermittent rain or dew**. High levels of disease can occur in years with cool and wet springs, cool summers, and mild winters, which allow spores to survive from season to season. Stripe rust can overwinter on leaf tissue, volunteer wheat and other grass hosts at temperatures as low as 23 F. The spores rapidly decline at temperatures above 59 F.
- **Symptoms** first appear as yellow, chlorotic patches on leaves. **Tiny, yellow to orange raised pustules** develop in these areas with thousands of yellow orange spores. **Distinct stripes** of pustules develop on upper leaves after stem elongation but not on seedling leaves. Depending on temperature and the resistance of the cultivar, yellow to tan spots or stripes of various sizes can develop with or without spores.
- **Management** options include growing resistant cultivars, destroying volunteer wheat, avoiding excessive water and fertilizer, and making timely fungicide applications (see UT Extension publication [W 341 Wheat Fungicide Table](#)). Resistant cultivar usually contain adult plant resistance, meaning the resistance occurs at later growth stages such as jointing/elongation or flag leaf emergence.



Stripe rust on wheat. Stripe pattern of raised pustules on leaves.

Leaf Rust (*Puccinia triticina*)

- **Conditions for disease development** include temperatures between **64 and 77 F with high humidity or moisture**. After spores land on leaves, infection is completed in 6 to 8 hours and disease symptoms can develop within 7 days.
- **Symptoms** include **small, round or oblong, raised pustules that are orange red** in color. Leaf rust pustules are more scattered and larger in size compared to stripe rust.
- **Management** options include growing resistant cultivars, destruction of volunteer wheat, avoiding excessive water and fertilizer, and making timely fungicide applications (see UT Extension publication [W 341 Wheat Fungicide Table](#)).



Leaf rust infected wheat leaves (from [ars.usda.gov](#)).

Powdery Mildew (*Blumeria graminis* syn. *Erysiphe graminis*)

- **Conditions for disease development** are optimal between **59 and 72 F with high humidity** and are more prevalent in dense foliage and **areas of heavy fertilization**. The pathogen can survive on volunteer wheat, and powdery mildew symptoms typically appear in the spring when wheat growth resumes.
- **Symptoms** will usually appear in the lower canopy on older leaves and are more prevalent on the upper surfaces of the leaf. Stems also can become infected and show the same symptoms as leaves. Symptoms include **patches of white, cottony growth** (colonies) on the surface of the plant that can turn a dull gray brown. As wheat and the powdery mildew mature, distinct brown black dots (the sexual fruiting structures, or cleistothecia) within aging colonies may be seen. Symptoms can occur at any time after seedlings emerge.
- **Management** options include growing resistant varieties, destruction of volunteer wheat, balanced fertilization rates, wide row spacing, and making timely fungicide applications (see UT Extension publication [W 341 Wheat Fungicide Table](#)).



Powdery mildew on lower leaves and stems and enlarged patches of white, cottony colonies on wheat.

Fusarium Head Blight/Scab (*Fusarium* species)

- **Conditions for disease development** are more prevalent in wheat planted behind corn and when warm, wet conditions occur during flowering. Although wheat can become infected from head emergence until harvest, infections initiated at and soon after flowering have the greatest destructive potential.
- **Symptoms** include bleaching of spikelets or entire heads of wheat. Superficial, often pink or orange masses of spores may be seen on and especially at the base of diseased spikelets. Small, dark (blue-black) fruiting structures will often be seen some time after the initial infection. Seed formed from infected heads is often shriveled or discolored. The fungus also may produce mycotoxins in the wheat. The most frequently associated mycotoxin is deoxynivalenol (vomitoxin, also referred to as DON), which can cause grain to be rejected if too much is present.
- **Management** options include crop rotation with at least a 1-year break from a host crop (corn, wheat, barley and other cereals), plowing to bury crop residues, using a less susceptible variety (research is ongoing to develop a commercial variety with improved resistance), and timely fungicide applications (see UT Extension publication [W 341 Wheat Fungicide Table](#) and [Fusarium Head Blight Prediction Center at www.wheatscab.psu.edu](#)).



Bleached spikelets infected with fusarium. Feekes 10.5.1, mid bloom is the best time for fungicide application for scab.



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