THE OHIO STATE UNIVERSITY EXTENSION

Extension FactSheet

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Plant Pathology, 2021 Coffey Road, Columbus, OH 43210-1087

Septoria tritici Blotch and Stagonospora nodorum Blotch

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Septoria and/or Stagonospora diseases can be found in nearly every wheat field in Ohio at some time during the growing season. These diseases have the potential to cause serious losses if the environmental conditions are favorable for their spread during late May and June. In years when wet and windy weather prevails during mid to late spring, losses can be as high as 20 to 30 percent. Greatest yield losses occur when the flag leaf and the two leaves below the flag leaf become infected by the time the wheat flowers in late May. If these leaves are killed before the soft dough stage, the grain will be lightweight and shriveled. Stagonospora glume blotch is a leading cause of poor quality wheat seed in Ohio. It affects germination of seed and causes seedling blight when infected seed are planted without an appropriate seed treatment fungicide.

The Fungi Causing Leaf Blotch Diseases

Three different fungi cause blotch diseases: *Stagonospora nodorum (Phaeosphaeria nodorum), Septoria tritici* (perfect state *Mycospharella graminicola*) and *Stagonospora avenae* f. sp. *triticea (Phaeosphaeria avenaria* f. sp. *triticea*). Differences in spore shape and size separate species of Stagonospora from species of Septoria.

In Ohio, *Stagonospora nodorum* is most important, but occasionally *Septoria tritici* causes yield losses in some locations. Stagonospora nodorum causes disease on leaves and glumes of the head, whereas Septoria tritici attacks leaves only.

Symptoms of Septoria tritici Blotch

Wheat plants are susceptible to infection at any stage of development from seedlings to adult plants. Symptoms

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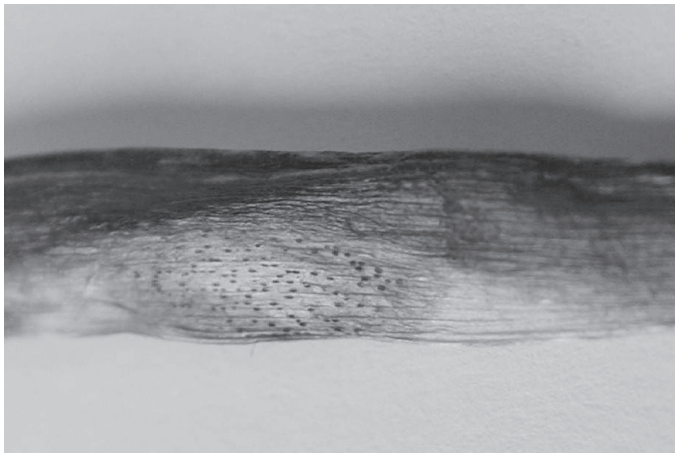
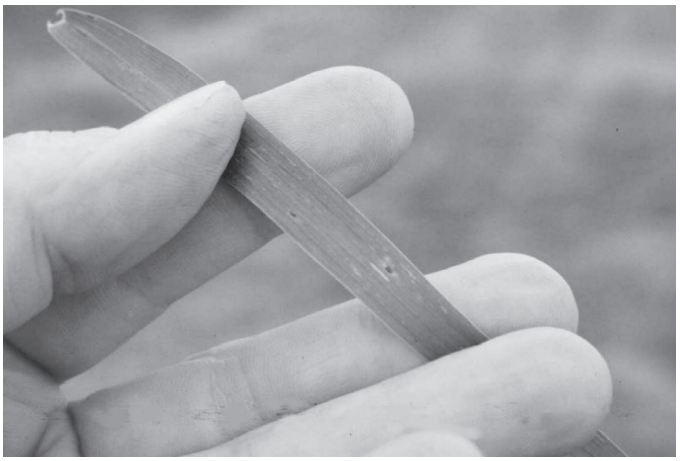
Symptoms of Septoria tritici leaf blotch (left) and Stagonospora nodorum leaf blotch (right). Note differences in lesion shapes.



Dennis Mills

Black fungal bodies in tan to brown lesions are diagnostic for Septoria tritici leaf blotch.



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Initial lesion development by Stagonospora nodorum. Small chocolate brown spots develop yellow halos as they enlarge.

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Severe Stagonospora leaf blotch on flag leaf of a susceptible wheat variety.

are usually detected on lower leaves in the fall and early spring, but as temperatures rise in late May, spread of Septoria tritici blotch decreases. Thus, Septoria tritici blotch is more common on lower leaves of plants than upper leaves. The initial symptoms are yellowish or chlorotic flecks usually on the lowermost leaves, especially those in contact with the soil. These flecks enlarge into irregular lesions, brown-to-reddish brown in color. As the lesions age, the centers become somewhat bleached with gray or ash-white centers. During this time, small, dark brown to black specks form in the center. These are pycnidia or spore producing bodies of the fungus. The presence of small, black pycnidia in lesions is the most reliable character for identifying the disease.

Symptoms of Stagonospora nodorum Blotch

Symptoms usually appear within two or three weeks of head emergence. Leaf lesions begin as very dark brown flecks or spots, sometimes with a yellow halo. These small irregular lesions expand into oval light brown lesions with dark brown centers. On the wheat heads the lesions begin as either grayish or brownish spots on the chaff, usually on the upper third of the glume. As the lesions enlarge, they become dark brown and the centers turn grayish-white in color as tiny brown pycnidia develop within them. These pycnidia are difficult to see without the aid of a magnifying hand lens.

Disease Cycles of Blotch Diseases

The fungi survive on wheat stubble and other wheat residues and volunteer wheat plants. They survive from one crop to the next as mycelium in living, volunteer plants or as pycnidia on wheat residues.

The fungi can survive up to three years in wheat stubble on the soil surface. *S. nodorum* infects seed and is seed borne. Studies in New York indicate that seed infection above 3% significantly contributes to fall infection of seedlings resulting in survival of the pathogen over winter and the development of epidemics in the spring. Thus, seed borne inoculum can be a sufficient source of the fungus for epidemic development.

Leaf infections require 6 hours or more of leaf wetness. After initial infection, 10 to 20 days are required before new spores are released from developing pycnidia. The wheat plant is more susceptible to infection by *S. nodorum* at later growth stages, usually during and after

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Symptoms of Stagonospora nodorum glume blotch on a wheat head showing brown to tan lesions on glumes and awns.

heading, whereas *S. tritici* is more common on plants earlier in the spring during stem elongation to flag leaf emergence. *S. tritici* is most aggressive between 50° and 68°F (15° to 20°C), whereas *S. nodorum* is most aggressive between 68° and 81°F (20° to 27°C).

Spread of both fungi is favored by wet, windy weather. During periods of wet weather, these fungi spread rapidly from the lower leaves to the upper leaves. Dry weather not only prevents infections, but also stops the development of lesions and pycnidia.

Management of Septoria Diseases

1. Crop rotation: Since these leaf blotch pathogens can survive in infested wheat residues for several years, a rotation where wheat is planted in only 1 of 3 years is recommended.
2. Destroy volunteer wheat, rye, barley, and wild grasses in the field before planting.
3. Varieties differ greatly in their reaction to infection by *Stagonospora nodorum* and *Septoria tritici*. In areas with a history of high disease pressure, plant varieties resistance to these diseases. All varieties are susceptible to infection to some extent, but planting varieties with good levels of resistance will limit yield losses. Varieties with resistance to Stagonospora nodorum leaf blotch may be susceptible to the glume blotch phase of the disease and vice versa. Select varieties with moderate resistance to both phases of this disease where possible.
4. Plant certified, disease-free seed that has been treated with a recommended, seed-protectant fungicide. See "Seed Treatment for Agronomic Crops," Extension Bulletin 639 or www.oardc.ohio-state.edu/ohiofieldcropdisease, for recommended seed treatment fungicides.
5. Planting Date: Sow winter wheat after the Hessian fly-safe date recommended for your county.
6. Fertilize wheat based on a soil test. Adequate amounts of N, P, and K should be applied at planting to insure good seedling growth in the fall. Spring top dress nitrogen at moderate levels to achieve your yield goal, but excessively high rates of nitrogen will make the field prone to damage by Stagonospora blotch. Avoid high rates of nitrogen that would increase the potential for lodging.
7. Chemical control of Stagonospora leaf blotch may be necessary when environmental conditions favor epidemics. Obtain current fungicide recommendations from your local Ohio State University Extension office or online at the Ohio Field Crop Disease web site www.oardc.ohio-state.edu/ohiofieldcropdisease.

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