Stagonospora leaf and glume blotch of wheat

Date Published: 10/15
Author(s): Nathan Kleczewski, Ph.D.
Extension Plant Pathologist

Introduction

*Stagonospora nodorum* blotch occurs frequently throughout the Mid-Atlantic and other regions where wheat is grown. The disease has the potential to significantly reduce yields, particularly if the environment favors their development before or during grain fill. The incidence and severity of Stagonospora blotch has been increasing in many areas where wheat is grown in a no-till system. Under optimal conditions the disease can result in losses upwards of 30%. Infection of the head can cause grain to shrivel. This fact sheet describes how to identify Stagonospora leaf and glume blotch in wheat, the pathogen disease cycle, and management recommendations.

Disease Identification

Wheat plants are susceptible to *S. nodorum* blotch at any time during development. Often the disease is first detected in the lower canopy, typically after canopy closure. Over time, given a proper environment, the disease may spread to the upper canopy and heads. Foliage infected with *S. nodorum* will develop light brown lesions surrounded by a smooth, thin yellow boarder. Lesions start as small black flecks which expand to oval or, “cat eyed” lesions (Figure 1). Small brownish lumps may be observed in the lesion, but these are difficult to see even with the aid of a hand lens. Initial symptoms of head infection start with small gray, purple, or brown spots on the chaff, which often are found on the upper ½ of the glume. Significant losses may occur if leaves and glumes are affected before grain fill is complete.

Figure 1. A typical cats eye lesion indicative of *S. nodorum*. Photo obtained from bugwood image archive (www.bugwood.org).
Disease Cycle

The most common source of the pathogen in Delaware and Maryland is from infected wheat residue, which serves as an overwintering site for the pathogen. *S. nodorum* can survive on wheat residue up to three years. In addition infested seed lots can be a source of primary inoculum. Spores are locally disseminated by rain or dispersed into the atmosphere, where they may spread long distances.

Once established, the pathogen produces spores which are dispersed upwards in the wheat canopy. As a result, the disease often progresses vertically from the lower canopy to the upper canopy and eventually the heads. Infection requires at least 12 hours of continuous moisture; optimal infection and disease occurs between 68 and 81°F. The disease progresses relatively slowly as 10 to 20 days are required before spores are produced from lesions. Disease progress, lesion development, and spore production stops during dry periods. Although symptoms can develop throughout the growing season, older wheat, particularly plants near heading, tend to be more susceptible to the disease.

Disease Management

*Cultural*

**Tillage** to bury crop residue will reduce the amount of inoculum available to produce spores during the growing and facilitate residue decomposition. **Rotation** to non-host crops such as soybean, corn, or vegetables for 2-3 years will help further reduce inoculum. Avoid planting at excessive populations and applying excessive nutrients as this promotes a dense canopy and increases the potential for disease development. Avoid excessive overhead irrigation, particularly if the disease has been detected in the canopy. Irrigation after flower is not recommended and may facilitate glume infection.

*Resistant wheat varieties*

In fields with a history of glume blotch, plant varieties with excellent glume blotch resistance ratings. Resistance to glume blotch is not complete, meaning that it is not a yes or no resistance reaction. Instead, lesion development may be slower or sporulation reduced compared to susceptible varieties, resulting in lower overall disease. Investment in a highly resistant variety with good yield potential can save growers additional input costs associated with pesticide application.
Chemical controls

Fungicides applied to protect the head and flag leaf can significantly reduce the effects of glume blotch (Figure 2). In Delaware, *S. nodorum* typically starts to develop later in the season. Consequently, applications made between Feekes growth stages 8-10.5.1 have been shown to be the most efficacious. Fungicide profitability is likely to occur under high yield potential environments (>75 bu/A), in no-till environments, and when wheat is exposed to persistent rain or irrigation. Several fungicides belonging to the DMI (Group 3; triazole) QoI (Group 11- strobilurin) and group 7 (SDHI) are very effective for managing this disease if applied preventatively. See the University of Delaware factsheet on Wheat Fungicide Recommendations for Small Grains for more information.

Figure 2. Fungicides can significantly reduce glume blotch. Left, no fungicide, Right, fungicide applied at heading. Photo: N Kleczewski