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PLANT PATHOLOGY & MICROBIOLOGY

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Septoria Leaf Blotch, Stagonospora Glume Blotch

Summary

Septoria leaf blotch and Stagonospora glume blotch are very common diseases of wheat, prevalent in rainy years and under continuous wheat production. Leaf blotch primarily affects leaves; glume blotch affects leaves, glumes and nodes.
The diseases can cause kernel shrivel and yield reduction, and if infected seeds are planted, reduction of germination and seedling blight.
Crop rotation and plowing under, resistant varieties, adequate nutrition and seeding rate, and protectant fungicides should help in reducing the severity of both diseases.

Symptoms

Lesions start in the lower leaves as irregular water soaked chlorotic flecks developing into linear or rectangular (leaf blotch) or lens-shaped (glume blotch) spots, often with dark-brown borders. As the lesions expand the centers become pale, straw colored, and slightly necrotic.

Figure 1.Glume damage due to Stagonospora glume blotch. APS Digital Image.

Leaf blotch is usually limited to wheat leaves. In addition, glume blotch causes gray to brown discoloration of the glumes beginning at the glume tip and progressing towards the base (Figure 1), and can also affect leaf sheaths and nodes causing bending of the stems.
Leaf blotch mature lesions are characterized by the presence of numerous small readily visible black dots (pycnidia, Figure 2). The characteristic brown pycnidia in the Glume blotch are difficult to see without the help of a magnifying glass. Microscopic examination of spores is necessary for the proper identification of the pathogen.

Figure 2. Pycnidia bearing Septoria leaf blotch lesion. APS Digital Image.

Wheat is susceptible to infection at any stage of development from seedlings to adult plants. Light infection produces only scattered lesions, but heavy infection can cause serious grain losses by killing leaves, spikes, or even the entire plant. The diseases affect yield, through shriveling and light weight grain. If *Stagonospora* infected seed is planted, low germination and seedling blight are most likely to occur.

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Causal Agent

Septoria leaf blotch is caused by *Septoria tritici* (telomorph/sexual stage *Mycosphaerella graminicola*) and *Stagonospora avenae* f.sp. *triticea* (telomorph/sexual stage *Phaeosphaeria avenaria* f.sp. *triticea*). Stagonospora Glume blotch is caused by *Stagonospora nodorum* (telomorph/sexual stage *Phaeosphaeria nodorum*). The fungi may occur individually in a crop or at the same time, even on the same leaves. Accurate diagnosis requires microscopic examination, because Stagonospora and Septoria are differentiated by the shape and size of the spores.

Inoculum Source and conditions

The fungi overwinter on wheat stubble, volunteer wheat plants, and in the case of *S. nodorum*, also carried by seed. Early-plantings are more vulnerable since they are exposed to the pathogen over a longer period of time. Spread of both fungi is favored by wet (leaf wetness of 6 hours or more), windy weather, spreading the fungi from the lower leaves to the upper leaves by waterborne and windborne spores. Infections are particularly damaging in years of higher and prolonged rainfall. Cool temperatures (59° to 68°F) and wet, cloudy weather favor *S. tritici*, and as temperatures rise in spring, spread of Septoria blotch decreases. Glume blotch can occur very early in the season, but is favored by warmer temperature *(*68° to 81°F) prevalent at heading.

Control

- Rotation with non-cereal crops for three or more years, and plowing under wheat residue help reduce the primary inoculum.
- Planting treated pathogen-free seed (e.g. certified seed) of varieties moderately resistant to both diseases is highly recommended. If non commercial seed is used, should be treated with common fungicides such as triazole, phenylamide, thyram, or tebuconazole.
- Avoiding excessive nitrogen and excessive seeding rates help develop an aired canopy which provides less favorable conditions for fungal infection and development.
- Protecting the flag leaf with foliar fungicide treatments (propiconazole, mancozeb, or triadimefon) protects yield.
- Crop monitoring to assess the level of disease during the growing season is advised.

References

- Compendium of Wheat Diseases. 2nd Ed. 1987. M. V. Wiese. APS Press. The American Phytopathological Society.
- Wheat diseases Atlas. McCoy N. L. and R. W. Berry. Texas Agricultural extension Service. Texas A&M University System
- Wheat Diseases and Pests: a guide for field identification. J. M. Prescott, P. A. Burnett, E. E. Saari, J. Ranson, J. Bowman, W. de Milliano, R. P. Singh, G. Bekele. International Maize and Wheat Improvement Center.
- Biology of the Septoria/Stagonospora Pathogens: An Overview. A.L. Scharen. In Septoria and Stagonospora Diseases of Cereals: A Compilation of Global Research. 2001. CIMMYT.

Links

http://www.uky.edu/Ag/IPM/scoutinfo/wheat/disease/dislist.htm

http://wheat.pw.usda.gov/ggpages/wheatpests.html

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