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Management Recommendations and Considerations for Winter Wheat Based on Early Season Wheat Diseases

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Over the past week, we have been scouting the Winter Wheat Performance Trial fields at Arlington, Chilton, Janesville, and Lancaster. We have observed symptoms of powdery mildew and Septoria leaf blotch (Figures 1 and 2). The wheat growth stage is approximately Feekes 4-5 (jointing, Figure 3) at all locations except Janesville, where the wheat is slightly behind in development. This is a function of the later planting last fall (13 November). At this point in the growing season, it is time to start scouting for foliar diseases. As you begin these assessments, it is critical to estimate incidence and severity and how this may impact wheat productivity later in the growing season. We will discuss different factors that should be considered in more detail below.

Disease management decisions for wheat in 2010 begin with knowledge of the disease resistance package of the wheat variety or varieties that you planted last fall. As we have seen in our early-season scouting, not all varieties are susceptible to powdery mildew and/or Septoria, as evidenced by the lack of symptoms in many of our plots. The second step is to actively scout in your wheat fields to determine which diseases are present and what the incidence and severity levels are in those fields. Incidence is defined as the number of plants infected by a specific disease and severity is defined as the average area of the leaf covered with a specific disease. We recommend taking these assessments from

10 locations within the field and 10 plants within a location. The most important wheat growth stages for field assessments of diseases are: (i) jointing (Feekes 4-5 or Zadoks 30), (ii) second detectable node (Feekes 7 or Zadoks 32), (iii) flag emergence into early boot (Feekes 8-10 or Zadoks 39-45), and (iv) flowering (Feekes 10.51). Throughout the growing season, we will provide updated reminders of these growth stages in relation to the diseases we observe. In terms of foliar disease management, most control efforts are targeted toward protecting the flag leaf from disease, which becomes visible around Feekes 8. However, if you begin scouting for wheat diseases early and make a committed effort to continue scouting throughout the growing season, you will be better prepared to determine if a foliar fungicide spray will be warranted. A recent check of some of the local co-ops in Wisconsin indicates that fungicide prices (product alone) are ranging from \$13-14/acre to \$20-23/acre, and these prices are dependent on the different active ingredient and recommended application rates.

As discussed earlier, symptoms of powdery mildew (*Blumeria graminis*) were observed at Arlington and Chilton. Symptoms of this disease and signs of the pathogen were found primarily in the lower canopy, which is typical for this time of the growing season, although we are seeing symptoms earlier than in 2009. Powdery mildew is characterized by powdery white to gray fungal growth that can occur on leaves, stems, and heads (Figure 1). This disease is quite common in Wisconsin and is often one of the earliest diseases to develop each spring. Infection can occur during the fall.

At Arlington, *Septoria leaf blotch* (*Septoria tritici*) was also found. This is another fungal disease that is commonly found in the lower canopy early in the growing season. There are two phases to *Septoria leaf blotch*: the first occurs during the fall just after wheat emerges and the second occurs both in the spring and summer on the upper leaves of wheat plants. The source of inoculum is either pycnidia (survival structure, Figure 2) that can survive on infested residue upwards of 2-3 years or mycelia in diseased live wheat.

Part of the reason we may be observing powdery mildew and *Septoria leaf blotch* earlier in 2010 compared with 2009 is conditions late last fall. The cool and wet conditions during the fall may have promoted early establishment of both diseases in some areas of

the state. Late planted wheat, such as our Janesville performance trial location, may have escaped these fall infections. Conditions this spring have largely been warm and wet, both of which favor disease development.

Evidence of disease in the lower canopy at this time of the growing season may not translate to subsequent problems later in the growing season. Recommendations for fungicides at jointing are limited and thresholds for foliar fungicides applications exist mainly for powdery mildew, wheat leaf rust, and Septoria leaf blotch. For powdery mildew, the early-season threshold for considering a foliar fungicide is an average of 10 powdery mildew pustules per leaf on the uppermost leaf. However, consider the cost of application (discussed above) and the potential return on investment. Based on multiple years of research, our results suggest that the most optimum timing for fungicide applications for control of foliar diseases is during flag leaf emergence (Feekes 8 and 9) and not with early season applications.

Several useful resources are available to help in guiding disease management decisions in wheat. These include multiple [Wisconsin Crop Manager](#) articles that discuss scouting and disease management for wheat diseases:

- 1) [Foliar Fungicides for Winter Wheat in 2008](#), 10 April 2008
- 2) [Identifying Wheat Diseases Controlled by Foliar Fungicides](#), 10 April 2008
- 3) [Flag Leaf Emergence and Foliar Fungicides in Winter Wheat](#), 29 May 2008
- 4) [Do I need to Spray a Foliar Fungicide in Wheat in 2009?](#), 26 March 2009

Further online resources to use during 2010 to stay up to date on wheat production and management in Wisconsin:

- The Soy Report Blog: <http://thesoyreport.blogspot.com>
- Field Crops Plant Pathology: <http://www.uwex.edu/ces/croppathology>
- CoolBean.info: <http://coolbean.info>
- USDA Cereal Rust Laboratory – Reports and Bulletins: <http://www.ars.usda.gov/Main/docs.htm?docid=9757>
- Fusarium Head Blight Prediction Center: <http://www.wheatscab.psu.edu/>

Figure 1. Powdery mildew pustules on wheat leaves. Powdery mildew was observed in the Winter Wheat Performance Trials at both Arlington and Chilton the week of April 12th. (Image sources: John Gaska and Karen Lackermann)



Figure 2. Septoria leaf blotch observed at Arlington, WI on 14 April 2010. Note the characteristic necrotic brown lesion with black pycnidia. (Image source: Karen Lackermann)



Figure 3. Wheat approaching Feekes 4 (jointing). The growing point (pictured at right) was just below the soil surface when this picture was taken (14 April 2010). (Image source: Karen Lackermann)

