

Small Grain Disease Control Strategies

Erik L. Stromberg, Extension Plant Pathologist
Wade Thomason, Extension Grains Specialist

The major diseases likely to reduce wheat yields and quality in Virginia are powdery mildew, leaf and glume blotch (*Stagonospora nodorum*), tan spot, and scab (fusarium head blight). If cultivars were selected with at least moderate powdery mildew resistance these diseases should not reach treatment thresholds until at least the fully tillered stage in late March. Selection of cultivars with genetic resistance to the above and other potential diseases is the first step toward a successful control program.

Economic thresholds can be useful in making decisions as when to apply a fungicide for control of a particular disease. The following information is based on recommendations in the 2005 Virginia Tech Pest Management Guide VCE Publication 450-016. Wheat should be evaluated on a weekly basis for potential diseases and insects from fully tillered in late March (Zadoks' Growth Stage 30) through head emergence in early June (Zadoks' Growth Stage 59) (Figure 1). During tillering to early heading the crop should be evaluated and treated if powdery mildew or tan spot covers 5-10 percent of the fully expanded upper two leaves (Figure 2), or if leaf and glume blotch levels meet recommendations in Figure 3 below. If the powdery mildew treatment threshold is reached, fungicides such as Tilt, PropiMax, or Stratego should be applied according to the label. If the leaf and glume blotch and/or tan spot threshold is reached Tilt, PropiMax, Stratego, Quadris or Headline are recommended. In all cases it is extremely important to get as thorough coverage of the leaves as possible. Fungicide applications should be made with at least 20 gallons of water/acre using either flat fan or hollow cone nozzles delivering at least 40 psi.

Figure 1. Stages of growth of small grains.

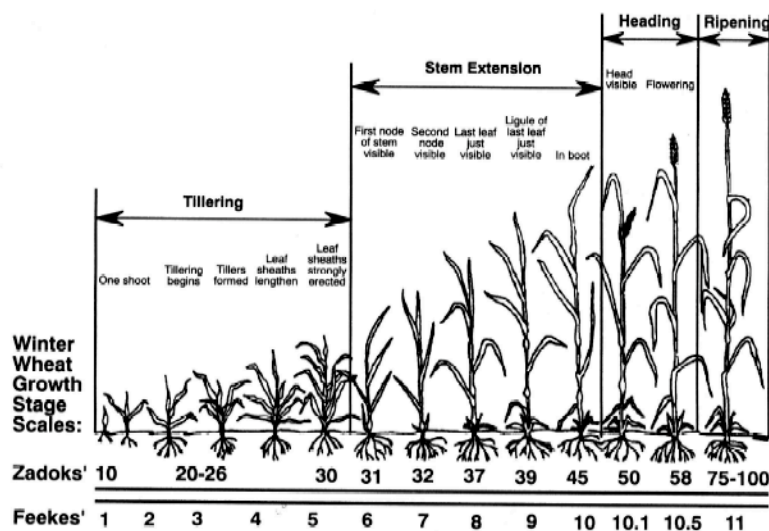
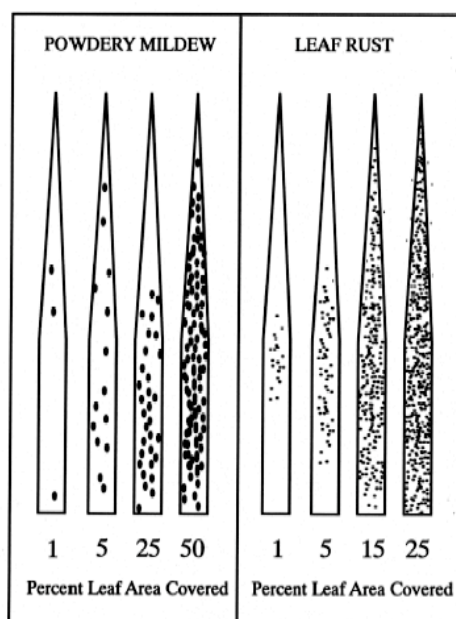


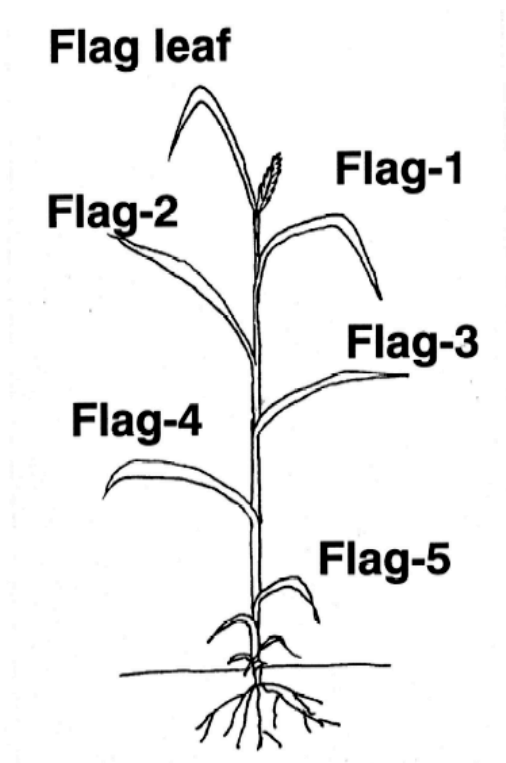
Figure 2. Percent leaf area affected by powdery mildew and leaf rust.



(After C. James. 1971. A Manual of Assessment Keys for Plant Diseases, Canada Department of Agriculture, Publication No. 1458).

Figure 3: Determination of treatment threshold for leaf and glume blotch in wheat.

Scout fields weekly from Zadoks' Growth stage 31 through 73 (Feeks' 6 through 11). Randomly select 10 locations within a wheat field. At each randomly selected location, examine and record number of indicator leaves out of ten main tillers with one or more leaf and glume blotch lesion(s). If 25% of the (100) indicator leaves in the field have one or more lesions then a fungicide application is indicated



Indicator Leaves are:

Flag-4 and Flag-5 for Zadoks' Growth Stages 31-37 (Feeks' 6-8)

Flag-3 for Zadoks' Growth Stages 38-45 (Feeks' 8-10)

Flag-2 for Zadoks' Growth Stages 46-59 (Feeks' 10-10.51)

Flag-1 from Zadoks' Growth Stages 60-73 (Feeks' 10.52-11)

Fusarium head blight is extremely difficult to control with fungicides. To obtain any level of control the fungicide must be applied as the wheat is heading, but before flowering, in sufficient water and pressure to get thorough coverage of the head (at least 20 gallons of water per acre with at least 50 pounds of pressure). Even when applied correctly, current fungicides are only rated as poor for fusarium head blight control. Current research results indicate that **if** a fungicide is going to be applied for fusarium head blight control at early heading, the best choice to reduce fusarium and the toxin it produces is propiconazole. Limited research shows that Quadris and Headline may reduce fusarium head blight, but may not reduce the toxin it produces. Further research is needed to develop effective application recommendations for fusarium head blight control in wheat. Selecting cultivars with at least some genetic resistance to fusarium

head blight is one of the important steps in reducing infection by *Fusarium graminearum* (the causal agent of fusarium head blight) and the problems it creates.