Wheat Disease Management

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For a disease to develop, have significant effect on yield, and become a significant **PEST**, four major factors must align:

- Pathogen presence — Influenced by field history.
- Environment — The right conditions for disease to develop.
- Susceptible host — A variety that is susceptible to disease.
- Time — Regarding the growth stage of the plant and when the disease develops.

Wheat diseases that occur in Tennessee include glume (stagonospora) blotch, septoria (Leaf) blotch, leaf rust, stripe rust, powdery mildew and fusarium head blight (scab). Short descriptions of fungal wheat diseases which include conditions for disease development, symptoms and specific management options can be found along with images at UTCrops.com (Fungal Wheat Disease Identification).

Disease Scouting and Important Growth Stages

The last leaf (flag leaf) to emerge from the whorl is very significant because it makes up approximately 75 percent of the effective leaf area that contributes to grain fill. Hence, the amount of disease on the flag leaf correlates to yield loss and timing a ***fungicide application to protect the flag leaf can be critical***. Leaves in the lower canopy of wheat contribute little to yield, and thus, disease on lower canopy leaves has very little impact on yield. Therefore, ***disease scouting is very important from the time just before the flag leaf emergence until the end of flowering.***

To determine if the flag leaf has emerged, split the stem above the highest node. The flag leaf is confirmed if no additional leaves and the head are found inside. If the fungicide application is made too early, the flag leaf will not be protected, and if too late, disease may develop to the point that a fungicide application would not prevent yield loss.

Another potentially critical time for fungicide application is during early to mid-bloom (Feekes 10.5.1 - 10.5.2) to protect wheat from fusarium head blight/ head scab. Head scab can be more severe in wheat planted behind corn that has received large applications of N fertilizers. Rain events and warm temperatures during flowering are necessary for head scab to occur, and while Tennessee doesn't regularly experience substantial scab infestations, the risk varies from year to year. A disease risk forecasting tool is available at wheatscab.psu.edu.

Growth Stage	Disease Management Considerations
Feekes 1 - Feekes 8 Emergence through jointing and stem elongation	Scout for disease but fungicide applications are usually unnecessary.
Feekes 9 - Feekes 10.5 Flag leaf through head emergence	Apply fungicides to protect flag leaf from foliar diseases as needed.
Feekes 10.5.1 - Feekes 10.5.2 Early to mid-flowering	Check risk for fusarium head blight (scab) at wheatscab.psu.edu. Apply fungicides if warm and wet weather are expected.

To Spray or Not to Spray

The decision to apply a fungicide to wheat should be based upon multiple factors including: 1) disease presence or risk, 2) fertility and yield potential, 3) weather conditions, and 4) cropping history. For example, a fungicide application would be warranted if:

- Disease is present or moderate to high risk is predicted.
- Nitrogen (N) has been applied and the wheat has good yield potential.
- Weather conditions favor disease development (dependent on the disease, but most are favored by wet, humid conditions).
- Wheat has been planted in the field in the past 2 years or behind corn.

A detailed foliar fungicide point system can be found at UTCrops.com (Wheat Foliar Fungicide Point System) that can be used as a guide to determine the need for a fungicide application.

Fungicide Selection

There are multiple fungicides labeled for wheat and for the control of different diseases. The North Central Regional Committee on Management of Small Grain Diseases (NCERA-184) has developed information on fungicide efficacy for control of certain wheat diseases. This information can be found at UTCrops.com and in UT Extension publication W 341 Wheat Fungicide Table. Application coverage is also important and applications should be made in at least 5 gallons of water per acre by airplane or 15 gallons of water per acre by ground application.

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