

Managing Wheat Diseases for Higher Yields

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Effective management of wheat diseases can contribute significantly to higher yields and increased profits. To apply the correct management measure, it is essential to first identify the disease. This can be done at your local extension office, by submitting a sample to the Plant and Pest Diagnostic Clinic, or by a crop consultant. The management measure to apply depends on the disease. Some management measures are applicable to several different diseases whereas others are applicable only to specific diseases.

For purposes of choosing or deciding which management measures to apply, wheat diseases that commonly occur in Nebraska can be classified into the following major groups: fungal, bacterial, and viral. Fungal diseases that occur in Nebraska include the rusts, leaf spots, bunts/smuts, Fusarium head blight (scab), seedling blights, and crown and root rots. Black chaff, also known as bacterial stripe or bacterial leaf streak, is the only bacterial disease of wheat that has been observed in Nebraska. The most important viral disease in Nebraska is wheat streak mosaic. Other viral diseases include barley yellow dwarf and soil-borne mosaic.

Several strategies can be used to manage fungal diseases of wheat. It is essential to scout fields for disease detection starting early in the growing season. Most fungal diseases of wheat are favored by wet weather. Therefore, monitoring the weather can provide information useful in deciding whether or not to apply a disease management measure. The rusts overwinter in the warmer southern states and are blown north during the spring. Staying abreast of information on the status of rust diseases in states south of Nebraska can help prepare us to take timely management measures. Because of the wide variation in climate in Nebraska, plant wheat varieties adapted to your area and plant at the recommended date for your area. This will ensure a vigorous, healthy crop that is less vulnerable to diseases. Plant resistant/tolerant varieties and avoid varieties known to be highly susceptible to diseases.

In conditions favorable to development of foliar fungal diseases, it is often necessary to apply a fungicide to prevent or reduce disease. All of the fungicides used to control foliar fungal diseases in Nebraska are very effective. Some fungicides are more efficacious on specific diseases than others. To maximize the return on a fungicide application, use the fungicide that is most efficacious on the target disease and least expensive. Foliar fungicide applications on wheat are most profitable if timed to protect the flag leaf. In cases where disease pressure is high early in the growing season, it may be necessary to apply a fungicide before flag leaf emergence for early season disease suppression. The decision to apply a foliar fungicide depends on several factors including favorability of the environment to disease development, susceptibility of the variety planted to disease, fungicide application cost, yield saved due to fungicide application, and the price of wheat. Management strategies for Fusarium head blight (scab) include applying an appropriate fungicide during early flowering, irrigation management, avoiding planting wheat into corn stubble, and planting tolerant varieties. The bunts/smuts, seedling blights, and crown and root rots are effectively controlled with fungicide seed treatments. To maximize yields, it is recommended that certified, fungicide treated seed be planted every year.

Black chaff can be managed by planting certified, pathogen free seed, irrigation management to allow the foliage to dry between irrigations, and avoiding varieties known to be highly susceptible.

Viral diseases can be managed with a combination of cultural practices and planting resistant/tolerant varieties. The most effective management strategy for wheat streak mosaic virus is controlling volunteer wheat. All volunteer wheat should be completely dead at least two weeks before planting in the fall. Other management strategies for wheat streak mosaic include planting on the recommended date for your area (avoid early planting), planting tolerant varieties, controlling post-harvest weeds, and avoiding curl mite-virus host crops growing after wheat emergence.

Incidence of barley yellow dwarf virus can be reduced and yield loss minimized by controlling aphids. However, this may not be economical as the disease may be spread by aphids that escape treatment or migrate from non-treated areas. Barley yellow dwarf can be more effectively managed by planting on the recommended date for your area (avoid early planting), planting resistant/tolerant varieties, and controlling grassy weeds.

The primary management strategy for soil-borne mosaic virus is planting resistant varieties. Avoiding early planting also can help reduce damage caused by the virus.