



# Extension FactSheet

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## Powdery Mildew of Wheat

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**P**owdery mildew, caused by *Blumeria graminis* f. sp. *tritici*, is widely distributed throughout the world, particularly in humid regions. Over the past 20 years, powdery mildew has been the most common disease of wheat in Ohio. It is most damaging in years with relatively mild weather during April and May. Mild temperatures, high relative humidity and dense stands of wheat favor mildew development. It is most prevalent on the lower leaves of susceptible varieties in late April or early May when wheat is in the joint to flag-leaf stage of development. This disease results in reduced kernel size and test weight, and ultimately lower yield. The earlier in the spring mildew begins to develop on the plant and the higher on the plant it develops by flowering the greater the yield loss. Greatest yield losses occur when the flag leaf becomes severely diseased by heading. Losses up to 45 percent have been documented in Ohio on susceptible varieties when plants are infected in April and weather conditions are favorable for spread of the fungus throughout the growing season.

### Symptoms

Powdery mildew is characterized by a powdery white to gray fungal growth on leaves, stems and heads. The fluffy white pustules are first detected on the lowest leaves of plants in early to mid April. As the plant matures, the white powdery growth changes to a grey-brown color. The leaf tissue on the opposite side of the leaf from the white mold growth becomes yellow, later turning tan or brown. Small, black fruiting bodies (cleistothecia) develop on leaves as plants mature in June. Cleistothecia are recognized as distinct round, black dots within older, grey colonies of powdery mildew. Cleistothecia contain spores (ascospores) that serve to infect wheat.

### Disease Cycle

Most years, wheat becomes infected with powdery mildew in the fall soon after planting. Autumn infections on newly planted wheat result from spores produced on volunteer wheat plants or spores developing within cleistothecia. The mildew fungus survives over winter as cleistothecia on wheat straw or

as mycelium on infected wheat. Conidia produced on wheat plants are wind dispersed. Conidia germinate and infect plants under cool, moist conditions. Infection does not require free water on the plant surfaces, but high relative humidity (near 100 percent) favors infection. Optimum development of powdery mildew occurs between 59 and 71 degrees F and is retarded above 77 degrees F. Under optimum conditions, a new crop of conidia are produced every 7 to 10 days. Mildew is more severe in dense stands of heavily fertilized wheat. Plants are most susceptible during periods of rapid growth, especially from stem elongation through heading growth stages.

### Controls

1. Growing mildew resistant varieties is the most economical way to control powdery mildew. Wheat varieties vary in their resistance to powdery mildew and new races of the fungus develop that attack previously resistant varieties. Therefore, it is important to get current information on the varieties with effective resistance to powdery mildew. Obtain information on disease susceptibility from seed dealers or the OSU Extension office in your county.



Figure 1. Powdery mildew can be recognized as fluffy white mold growth on leaf surfaces during cool, humid weather.

2. Powdery mildew thrives where high rates of nitrogen have been used. Nitrogen not only promotes tiller formation, causing dense stands, but also increases the susceptibility of the crop. Use a correct and balanced fertilization program with proper levels of N, P and K. Watch for mildew in fields receiving greater than 70 lb N/A.
3. In fields with persistent disease problems, the wheat stubble and other residues should be tilled into the soil to permit disease causing fungi to die out before another wheat crop is planted. Incorporating wheat residues into the soil, destroying volunteer wheat and crop rotation will lessen the amount of overwintering inoculum in the field.
4. Fungicides are available that provide excellent control of powdery mildew. Their application is based on scouting fields for symptoms and assessing disease severity from tiller elongation through flowering stages of growth. It is important to keep the top two leaves of the plant as disease free as possible so that the plant can use its full potential to fill the grain. Fungicides can be applied based on the level of disease in the field, the known susceptibility of the variety, and the selling price of the grain. Contact the OSU Extension office in your county for up-to-date fungicide recommendations and a listing of susceptible varieties. OSU Extension bulletin 785 “Wheat Disease Control in Ohio” provides information on scouting for diseases in the field.

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