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Powdery Mildew of Cereals

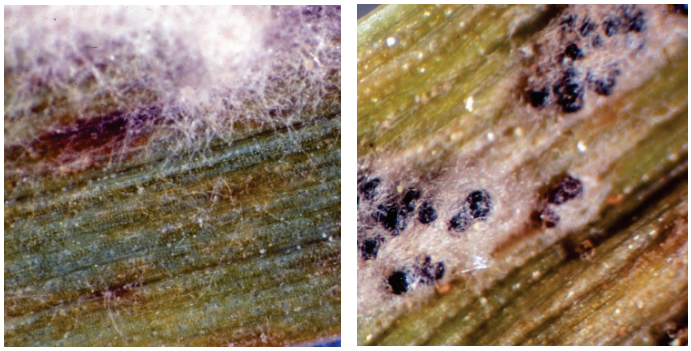
Pathogen Facts

- This fungal disease, caused by the obligate biotroph *Blumeria graminis,* is one of the most common diseases of wheat.
- Powdery mildew can be devastating, reducing yields up to 25%.
- This pathogen produces overwintering structures called chasmothecia that persist on infected crop residue.

Powdery mildew mycelium at the base of wheat stems where airflow is minimal and relative humidity is high. *Photo courtesy of Mary Burrows, Montana State University, Bugwood.org*

Symptoms and Signs

- Symptoms begin as minor yellow flecks on foliage closer to the soil surface, making them difficult to distinguish.
- As the disease progresses, fluffy white mycelium begins to grow on lower leaves, progressing up the plant and eventually reaches the wheat head.
- Lesions on the head turn gray with age before developing into darker colored overwintering structures (chasmothecia).



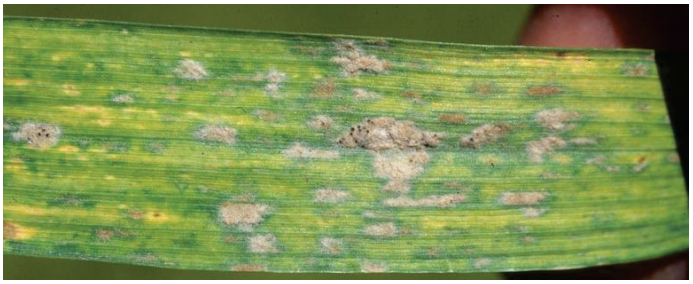
Mycelium and overwintering structures of *Blumeria graminis. Photo courtesy of Department of Plant Pathology , North Carolina State University, Bugwood.org*

Conditions Favoring Disease

- High relative humidity (70-95%) and moderate temperatures of 60-70 °F are conducive for disease development.
- Dense canopies increase humidity near leaf surfaces and facilitate the spread of the pathogen.
- Rapidly growing tissue and new growth is more susceptible to infection.
- Infection severity typically diminishes as temperatures increase during late spring and early summer.

Management Considerations

- Practices that decrease canopy density, like implementing lower planting populations and avoiding excess nutrient applications, will also disfavor the pathogen development.
- Increasing the diversity of crop rotations and eliminating volunteer plants removes host crops and decreases the inoculum in the cropping system.
- Resistant varieties can be used to help combat this disease.
- Seed treatments and fungicide applications are also available to prevent the spread of this disease.
  - Fungicides should be applied early in the season at the flag leaf stage.



Powdery mildew on wheat (note the tiny black chasmothecia nested inside some of the patches of mycelium). *Photo courtesy of Gerald Holmes, Cal. Polytechnic State Univ. at San Luis Obispo, Bugwood.org*

References

Department of Primary Industries and Regional Development. 2015. *Agriculture and Food.* Diagnosing powdery mildew in cereals: https://www.agric.wa.gov.au/mycrop/diagnosing-powdery-mildew-cereals

Grains Research & Development Corporation. 2019. Protecting cereal crops from powdery mildew: https://grdc.com.au/news-and-media/newsletters/paddock-practices/protecting-cereal-crops-from-powdery-mildew

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