UNIVERSITY OF DELAWARE
COOPERATIVE EXTENSION

Powdery Mildew on Small Grains

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May 2025

Introduction

- Powdery Mildew (PM) is a fungal leaf disease caused by Blumeria graminis , which can reduce grain yield and quality in cereal crops.
- B. graminis species can be subdivided into Formae specialis groups (f. sp.) based on host: Wheat (f. sp. tritici), Barley (f. sp. hordei), Rye (f.sp. secalis), and Oats (f.sp. avenae).
- PM is not typically observed until temperatures reach 59-60°F for 1-2 weeks.

Identification

- Early symptoms begin as small yellow flecks visible on the leaf surface, affected crops may appear yellow when viewed from a distance.
- Fluffy white to gray mycelia develop on the top of the leaf (Fig 1A), starting low in the plant and moving up the canopy (Fig 1B).
- Black fruiting bodies for fungal reproduction (chasmothecia), may form within the mycelia.
- During severe infections, mycelia can spread to the plant stems, awns, and glumes.

Fig 1: Powdery mildew on wheat leaf (A); Powdery mildew low in the canopy (B). Photo by Dr. Alyssa K. Betts

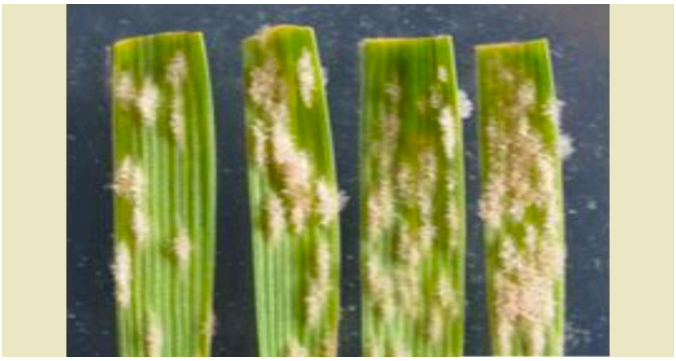

Fig 2: Different growth of powdery mildew on lines with most (left) to least (right) resistance. Photo by E. Myers

Management

- PM is favored by cool, humid weather, declining once temperatures are above 75°F.
- Crops are particularly susceptible when plants are rapidly growing, such as the beginning of tillering and after nitrogen applications. Avoid over-fertilization.
- Selecting varieties with complete or partial resistance is an effective strategy and often sufficient to keep PM at low levels.
- If PM moves up the canopy and the environment stays conducive, multiple fungicides are labeled to manage PM and can be sprayed according to the label.

References

Crop Protection Network (2022, January 24). Powdery Mildew of Wheat. Retrieved from: https://cropprotectionnetwork.org/encyclop ed ia/powdery-mildew-of-wheat

Troch, V., Audenaert, K., Wyand, R.A., Haesaert, G., Höfte, M. and Brown, J.K., 2014. Formae speciales of cereal powdery mildew: close or distant relatives?. Molecular Plant Pathology, 15(3), pp.304-314.