Powdery mildew (Podosphaera macularis) is an emerging and potentially serious fungal disease of hops in Michigan. All green tissues are susceptible to infection. Early season infections appear on emerging shoots (flag shoots). Fungal colonies can appear individually on leaves (Fig. 1 and 2) or completely cover upper and lower surfaces of any green tissue. As colonies age they will turn dull and glandular in appearance and may develop necrotic areas beneath them. Other symptoms include raised blisters that sometimes appear on the upper leaf surface. Infections that occur on the underside of the leaves may produce pale to chlorotic spots on the upper surface. White colonies also appear on infected burrs and cones which progress to develop brown necrotic tissue (Fig. 3 and 4). If cones are infected late in development visible symptoms may not occur until near harvest or during drying.

Cultivars that are tolerant or resistant to powdery mildew are available; however the market for varieties is strongly influenced by brewer preference. Good cultural practices include maintaining healthy plants with adequate but not excessive application of fertilizer and water. Preventative management of and reduction of initial inoculum load are key components of effective control of the disease. Crowning or spring pruning will reduce the number of flag shoots. After bines have grown far enough up the string (8.2 ft. – 9.8 ft.) basal growth should be periodically removed by mechanical or chemical defoliation. Fungicide applications should be applied as a preventive measure and coupled with cultural practices. Apply fungicides at regular intervals and fungicides band onto hills before hill closure (the point at which the ground is not visible through the shoots). Once bines are trained fungicides should also be applied after any disturbance in basal growth. Always check to make sure any fungicide used is registered for use in the state and follow the labeled instruction as required by state and federal law. Fungicides labeled for use on hop and registered for use in the state of Michigan can be found in the tables following these pages.

Quick Facts About Powdery Mildew

- Hop powdery mildew caused by the fungus Podosphaera macularis is actually the oldest known fungal disease of hops.
- Hop powdery mildew was first detected in Michigan in 2014.
- Powdery, white colonies of the fungus can appear individually on leaves or completely cover upper and lower surfaces of any green tissue.
- The pathogen can overwinter as mycelia in crown buds or as resting spores (known as chasmothecia) in shoot and leaf litter.
- It is not known whether the pathogen overwinters as mycelia or resting spores in Michigan.
- Optimal conditions for infection, growth and sporulation occurs between 64.4°F to 69.8°F.
- For best results, fungicide applications should be applied as a preventive measure and coupled with cultural practices.


Michigan Resources for Hop Production: www.hops.msu.edu