

# **Powdery Mildew of Grapes**



**Symptoms Management Options** Causes More info

Lorraine Berkett & Morgan Cromwell, University of Vermont

## **Symptoms**

All green tissues of the grapevine are susceptible to powdery mildew (Erysiphe necator (Schw.) Burr.) infection. The disease appears as a whitish-gray powdery coating on the leaves or fruit caused by fungal mycelium and conidia on the surface of the plant. On leaves, initial symptoms appear as chlorotic spots on the upper leaf surface that soon become whitish lesions. Late in the season, small black round structures (chasmothecia) begin to appear on the white powdery lesions. On shoots, infected areas have the appearance of brown/black diffuse patches; on dormant canes, these patches are reddish brown. Severe leaf infections can cause distortion, drying, and premature drop. Infected berries can become covered with the fungus, may turn dark brown, shrivel, and split, and/or may not ripen properly. Berry infection may lead to further infection by spoilage microorganisms that reduce the quality of wine, even if the powdery mildew infection is mild.

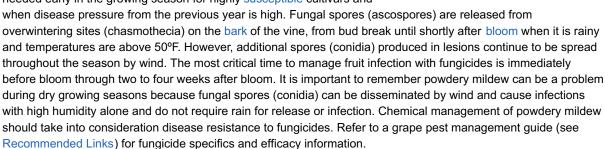
Powdery mildew lesions. Photos by Lorraine Berkett, University of Vermont.

# **Cultural Management Options**

Disease development is strongly favored by high humidity and cloudy weather, in addition to relatively warm temperatures. Therefore, pruning and training practices that promote an open canopy with good air circulation and light penetration can reduce the favorable conditions for powdery mildew development. Selection of an open planting site with rows in the direction of the prevailing wind and direct sunlight will also promote air circulation and decrease shading. These cultural methods may not only decrease the incidence and severity of the disease, but also promote thorough fungicide spray coverage.

#### Chemical Management Options

For effective management of powdery mildew, fungicide sprays may be needed early in the growing season for highly susceptible cultivars and







#### Causes

Powdery mildew is caused by a fungus, *Erysiphe necator* (Schw.) Burr., which is native to eastern North America. The fungus overwinters as tiny black fruiting bodies (chasmothecia) in bark crevices on the grapevine. Spores

(ascospores) from overwintering sites are initially released with 0.1 inch of rain when temperatures are 50°F. These spores are carried by the wind and cause primary infections. Primary infections develop into lesions which produce another type of spore (conidia) that, within six to eight days, result in the powdery or dusty appearance of the lesions. These conidia cause secondary infections throughout the remainder of the growing season and result in the exponential spread of the disease throughout a vineyard. Infection can occur during temperatures of 59°F to 90°F, but temperatures from 68°F to 77°F are ideal. High relative humidity is conducive for conidia production and rainfall actually negatively impacts spore production (which is the opposite from other grape diseases caused by fungi). Overwintering structures (chasmothecia) are formed in the fall and are washed into the crevices of the bark on the vine trunk where they will remain and release ascospores during the start of the next growing season.

### **Recommended Resources**

Video: Grape Powdery Mildew in Pinot Noir Vines, Oregon State University

Grapevine Powdery Mildew, Cornell University

Powdery Mildew on Grape, Ohio State University

Grape Powdery Mildew, University of California

New York and Pennsylvania Pest Management Guidelines for Grapes

Midwest Small Fruit and Grape Spray Guide

Grape Diseases and Management Guides, Washington State University

Powdery Mildew in Eastern Washington Commercial Grape Production, Washington State University

Powdery Mildew in Western Washington Commercial Grape Production, Washington State University

Field Guide for Integrated Pest Management in Pacific Northwest Vineyards, Washington State University

Video: Grape Powdery Mildew, University of Kentucky

Reviewed by Stephen Jordan, University of Wisconsin-Madison and Damon Smith, Oklahoma State University