Powdery Mildew

O & T Guide OD-4

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Hosts: Powdery mildew is caused by many different species of fungi which all belong to the same fungal group. Powdery mildews are some of the most common diseases worldwide. Almost all plants can be affected by powdery mildew; however different powdery mildew fungi cause disease on different plants. Powdery mildew fungi may be restricted by plant family or may be restricted to a single host. In New Mexico, powdery mildew is common on rose, euonymus, crape myrtle, lilac, verbena, sunflower, photinia, zinnia, mesquite, Mexican bird of paradise, Mexican elder, turfgrass and many other ornamentals, fruits, and vegetables.

Symptoms: All powdery mildew fungi produce a common appearance on affected plants: a white, powdery growth on the surface of affected plant parts. Individual spots may enlarge and coalesce until the entire leaf, stem or flower is covered with white powder. Any above ground plant part, including fruit are susceptible to infection. Affected parts may be dwarfed, distorted, and curled. If the disease is severe, the leaves often turn yellow, wither, and drop prematurely. Infected flower buds may fail to open. Toward the end of the growing season, tiny black fruiting bodies (cleistothecia) may be produced within the white mycelium. Powdery mildew fungi are obligate parasites (they survive only on a living host plant) and typically do not kill their hosts, but infected plants become unsightly and are weakened to attack by other pathogens, insects and environmental stresses.

Powdery mildew on rose. Photo: J. K. Clark, The University of California.

Powdery mildew on euonymus. Photo: J. K. Clark, The University of California.

Powdery mildew on verbena. Photo: N. P. Goldberg, New Mexico State University.

Powdery mildew fruiting bodies (cleistothecia) on a lilac leaf. Photo: E. Shannon, New Mexico State University.

Conditions for Disease: Powdery mildew fungi overwinter as cleistothecia on fallen leaves or as mycelium and spores in or on infected plants. In spring, new shoots become infected from old mycelium, from conidia (asexual spores) or ascospores (sexual spores). These spores are spread to other susceptible hosts by air currents and splashing water.

In general, powdery mildew fungi are favored by high humidity in the plant canopy and warm temperatures (60-80ºF). The fungal spores cannot germinate in free water. But they germinate readily when the relative humidity in the plant canopy is high (97-99% at night and 40-70% during the day). The severity of the disease depends on several factors including the cultivar, age of the plant at the time of infection, overall condition of the plant prior to infection, and weather conditions. Young succulent growth is most vulnerable to the disease. The disease is common in crowded plantings, in heavily shaded areas, and in locations with limited air circulation.

Management: Cultural practices which help to reduce the occurrence and severity of the disease include:

- Prune out infected plant parts if possible.
- Remove fallen leaves (reduce overwintering inoculum).
- Destroy all infected plant material.
- Increase air flow around plants and prune or thin plants in overcrowded areas; thereby reducing humidity in the plant canopy.
- Selectively prune other trees and shrubs to reduce shade.
- Maintain appropriate fertilizer levels.
- Avoid excessive nitrogen applications.
- Provide adequate water.
- Where mildew has been a persistent problem, replant using tolerant cultivars.
- Contact and systemic fungicides are available for most plants. However proper timing of applications and thorough coverage of all above ground plant parts is critical for control.