

Managing Powdery Mildew by Paul Pilon

There are several pathogens (*Erysiphe*, *Leveillula*, *Microsphaera*, *Podosphaera*, and *Spaerotheca*) that cause powdery mildew diseases. These pathogens are host specific, meaning that the pathogen that infects one type of plant is usually different from the mildew that attacks another. Powdery mildew attacks a great number of bedding plants, perennials, and woody ornamentals. Powdery mildew usually does not result in plant mortality, but does reduce a plant's performance, affects plant quality, and greatly reduces the aesthetic appeal of infected ornamentals.

Initially, powdery mildew is difficult to identify on many plant species as the infected leaves develop a purplish discoloration which resemble nutrient disorders. The presence of whitish-grey talcum-like powdery patches (¼ to ½ inch in diameter) of fungal growth on the leaf surfaces is the most common method of verifying mildew infections. These patches, also referred to as colonies, often go undetected until the environmental conditions become favorable for widespread infections. Colonies of fungal growth appear quickly, seemingly overnight, and can rapidly cover much of the plant if the conditions are favorable for disease development persists. Severe infections restrict plant growth and may cause the leaves to turn yellow and appear wilted.

Powdery mildew occurs most prevalently during warm, dry spells or during cool to warm, humid periods. Spores of this pathogen are spread by air movement. Once the spores land on plants, it takes 3 to 7 days for an infection to develop and form visible colonies, provided favorable conditions are present. The spores release, germinate, and cause infections without a film of water on the plant surface. A fairly high relative humidity (greater than 70%) and moderate temperatures (62 to 86° F) will promote the initial infection. Once the pathogen begins to infect the host plant, the relative humidity is no longer a factor as it can prosper regardless of the humidity.

The occurrence of these mildew diseases can be reduced if high humidity levels or dramatic swings in humidity are avoided. When production occurs within enclosed structures, it is beneficial to provide humidity purges during night to reduce the humidity inside the structure as the humidity usually rises at night. Maintaining sufficient plant spacing and increasing the air circulation are useful to reduce the humidity levels near the plant canopy where infections typically occur.

Routine scouting on susceptible crops should occur at least on a weekly basis, more if favorable conditions for this disease have occurred. The first mildew colonies are difficult to detect; look for small colonies on the lower and middle portion of the plants. Examine the upper and lower leaf surfaces.

Detecting powdery mildews early and implementing control strategies upon detection will help growers greatly reduce the severity of mildew infections. Growers should take note that it is very difficult to eradicate existing, well-established mildew colonies. Effective fungicides include products containing *Bacillus subtilis*, copper sulphate pentahydrate, kresoxim-methyl, myclobutanil, petroleum oil (horticultural oil), potassium bicarbonate, piperalin, propiconazole, pyraclostrobin, pyraclostrobin + boscalid, triadimefon, and triflumizole. Using non-ionic spreaders with many of the above fungicides often helps them penetrate the established mycelium and improves the efficacy of these applications; refer to each product's label for information regarding the use of spreaders. Be sure to rotate between chemical classes when applying fungicides to reduce the likelihood of mildew diseases from developing resistance to these fungicides.

With the host specific nature of powdery mildews and several different species of mildews attacking ornamentals, there is not a single fungicide that works equally well on all mildew species. One fungicide may provide excellent control on one mildew species, but provide little, if any, control on another. Although the powdery colonies look similar, they each have different fungicide sensitivities.

Control strategies should be implemented as soon as powdery mildew is detected. Preventative strategies are usually not necessary unless routine scouting is not being performed. When detected and treated early, mildew colonies can be eradicated with no reduction in plant performance or quality.

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