

Powdery Mildew of Roses

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Powdery mildew is one of the most serious diseases of roses grown in greenhouses and in the field. Caused by a variety of fungi, this disease affects more than 7,600 species of host plants throughout the world, although only a few species of fungi cause the disease on roses. But once infected, powdery mildew can inflict immense damage on rose bushes.

Symptoms

Early symptoms of powdery mildew can include red blister-like areas on the upper leaf surface, followed by a white, powdery growth on the aerial parts of the plant (Fig. 1). Powdery mildew is sometimes confused with downy mildew, which occurs on the underside of the leaves.

Though the fungus can infect any part of the plant, younger, more succulent tissue typically shows the first signs of disease. The fungus can also infect the flowers,

sepals (the green coverings of a flower bud), and unopened buds.

Once the fungus takes over the plant, the leaves become disfigured, impairing the plant's ability to photosynthesize food and causing rosebuds to fail to open properly. Severe infections stunt leaf growth, cause leaves to drop prematurely, and reduce flowering, making the plant impossible to sell. If left unchecked, the fungal growth can cover the entire plant (Fig. 2) and completely defoliate the rose bush.



Figure 1. A common sign of powdery mildew is a white, moldy growth on upper leaf surfaces that spreads as the fungus grows, interrupting plant processes such as photosynthesis. *Source: Texas Plant Disease Diagnostic Laboratory*



Figure 2. Powdery mildew growth can spread over the stems and buds of an entire plant. *Source: Texas Plant Disease Diagnostic Laboratory*

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Cause

The fungus *Sphaerotheca pannosa* var. *rosae*, also known as *Podosphaera pannosa*, causes powdery mildew on roses and is the most common species of the powdery mildew pathogen. This fungus must have a living host to complete its life cycle, which can be as short as 72 to 96 hours in favorable conditions.

Fungal spores attack the plant's new growth by penetrating the cells and taking moisture and nutrients from the host cell as the mold spreads across the foliage. Spores develop in chains, causing the powdery growth, and spread to new plants by way of wind currents (Fig. 3). To survive unfavorable conditions, the fungus can remain dormant in buds or develop as spherical fruiting bodies (chasmothecia or cliestothecia).

Environmental Factors

Powdery mildew is most active in spring conditions of hot or warm days with cool nights. Like most fungi, poor air circulation and high humidity promote growth, although the fungus develops on dry leaf surfaces. Unlike most fungal pathogens, water on leaf surfaces prevents the spores from germinating.



Figure 3. Fungal spores, arranged in chains to form the mass of mycelia, give the fungus its powdery look. Source: *Texas Plant Disease Diagnostic Laboratory*

Control

This fungus is present in all areas of the soil, waiting for favorable conditions to infect susceptible plants. Use proper cultural techniques to prevent and control it.

- Clean up and dispose of fallen leaves and debris surrounding plants.
- Prune infected plant parts and dispose of them properly.
- Provide plants with adequate nutrients and water to maintain their immune defenses.
- Keep the soil well watered and mulched to prevent moisture loss and to cover up overwintering spores.
- Space plants far enough apart to provide good air circulation and prune them regularly to prevent overcrowding.
- Use fans to provide adequate ventilation during humid nights.
- Water the roses in mid-morning so the foliage can dry rapidly and to avoid infection by other fungal pathogens.
- Use fungicides as a preventive measure during optimal growth conditions. Be sure to read the product labels and follow all directions.

Sources

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