

CONTROLLING DISEASES AND APHIDS ON YOUR

Roses



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Roses are the most popular perennial flowering plant in the United States, and they grow well in the Pacific Northwest (PNW). Our climate provides ample rainfall during the peak leaf growth period, moderate winters that rarely result in freezing damage, and warm, sunny summers for flower production. Wild roses grow throughout the region, testimony to this favorable climate.

Unfortunately, the same conditions that favor roses also favor their diseases and pests. Frequent rainfall and high humidity encourage several leaf diseases. Mild winters allow pests and diseases to live through the coldest part of the year, and warm summers give them the chance to build up their populations to survive yet another mild winter. Moreover, wild roses have the same diseases and pests as do domesticated varieties, so they serve as a constant reservoir of problems.

Because of their disease and insect problems, many home gardeners perceive roses as “trouble plants.” But roses need not be considered difficult to grow. Simple adjustments in how you tend your roses can improve your results.

This publication discusses the most common rose afflictions: black spot, rust, powdery mildew, and aphids. It identifies conditions that favor infection and suggests practices to help you effectively control these problems. Rather than discussing controls for each specific problem, the rose is treated as a whole. A year-round approach to pest control will help you manage all of these common problems.

In the PNW, you also might see brand and common canker, Botrytis blight, crown gall, downy mildew, and rose mosaic virus. These diseases are not covered in detail here. They occur less frequently and can be managed using the recommendations discussed under “Controlling diseases and aphids.”

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COMMON DISEASES

Black Spot

Rose black spot is characterized by dark spots with diffuse edges on leaves (Figure 1, page 4). In cases of severe infection, lesions also appear on stems. Infections are caused by a fungus, *Diplocarpon rosae*, and are visible first as small black flecks on upper leaf surfaces.

Leaves infected with black spot produce the plant hormone ethylene. High ethylene content in leaves causes leaf drop. As a result, rose plants infected with black spot lose their leaves early and look bare. The dropped leaves around the base of the plant serve as a reservoir of fungal spores, which reinfect the plant during subsequent rains.

The fungus overwinters (survives through the cold season) on living or dead plant tissue, such as leaves and stems, that was infected the previous growing season. Newly emerging leaves are most susceptible to this fungus. Spores produced on old plant material are splashed onto young leaves by winter and spring rains or by summer watering. If a leaf surface stays wet for 24 hours or longer, spores germinate and grow into the leaf tissue. In the PNW, this moisture requirement is met frequently.

Once the fungus is established in plant tissues, it grows and produces spore-forming structures on plant surfaces. The cycle is ready to begin again within 10 to 18 days after first infection.

In our region, conditions for growth and spread of the black spot fungus are most likely to occur in spring and fall. However, rainy periods in any season encourage black spot, as long as the temperature is between 50 and 80°F.

Rust

Rust of roses is a foliar disease that, like black spot, begins in spring and peaks in early summer. Symptoms are small, rusty orange lesions on the top surface of the leaf or sometimes on the stem. If you turn over an infected leaf, you'll see powdery, orange lesions (Figure 2, page 4). These lesions are called pustules, and the orange powder contains thousands of fungal spores.

Several rust fungi of the genus *Phragmidium* cause rust. Rust is favored by the kind of weather seen in late spring to early summer, when scattered showers are followed by warm sun.

Infected plant tissue on or around the plant is the source of the first infective spores. Rust spores are blown, rather than splashed, onto new, susceptible tissue.

Once in contact with a leaf, a rust spore germinates and enters the leaf by growing into natural openings such as stomata. Moisture must be on the leaf for 2 to 4 hours for spore growth and leaf penetration to occur. Growth and penetration are best when temperatures are from 65 to 70°F.

After penetrating the leaf tissue, the fungus grows farther into the leaf and produces pustules. The spores from the pustules then are blown onto uninfected leaves, and the cycle repeats, often many times within a growing season.

In late summer and early fall, the fungus produces a different type of spore, and the pustules turn dark brown. These late-season spores have thick, dark walls that help them survive the winter.

Powdery Mildew

Unlike the previous two diseases, powdery mildew hits the PNW during summer's driest time. You can recognize the symptoms easily. Leaf and bud parts are covered with a mat of white, powdery-looking fungal filaments (Figure 3, page 5). The powder consists of the clear spores of the fungus *Sphaerotheca pannosa*.

Severely affected young leaves become distorted and stunted. Older leaves that are infected after emergence have areas that are puckered or irregular and covered with white. When infection is severe, leaves, buds, and stems are depleted by the nutritional demands of the fungus. Entire areas of leaf surfaces are covered, plant parts are distorted, and the plant suffers from reduced vigor. Unless controlled early, an infection can affect most of the plant, with almost all of the leaves having some lesions.

The first infections on new growth arise from the previous year's infections, which can survive in protected leaf buds or bud scales. The fungus does not survive on dead plant tissue.

Conditions that favor black spot

- Presence of infected plant material
- Presence of susceptible plant tissue
- Splashing by rain or watering
- Leaves stay wet for 24 hours or longer

Conditions that favor rust

- Presence of infected plant material
- Presence of susceptible plant tissue
- Wind to blow the spores, followed by moisture on the leaf for 2 to 4 hours
- Alternating periods of weather that wet and then dry leaves

Conditions that favor powdery mildew

- Presence of infected tissue on the plant
- Vigorous, succulent plant growth
- Warm temperatures
- Dry days followed by nights with high humidity



Figure 1.—Symptoms of black spot.



Figure 2.—Rust on both sides of rose leaves.

Spores of the fungus move from plant to plant on air currents. Newly emerging young leaves are the most susceptible to infection by the airborne spores. Within hours of landing on a leaf, spores germinate and grow into leaf tissues through natural openings.

Germination and growth of spores happen most readily on nights with high humidity or heavy dew and at temperatures near 70°F. Too much water, such as flowing water or rainfall, destroys spores by causing them to burst.

Once the fungus is established in plant tissues, it does not grow deeper into a leaf, but rather across the surface. Small anchor cells remain inside the leaf and take nourishment from the rose plant, but the main filament and the multitudes of spores it produces are on the outer surface of the leaf (Figure 4).

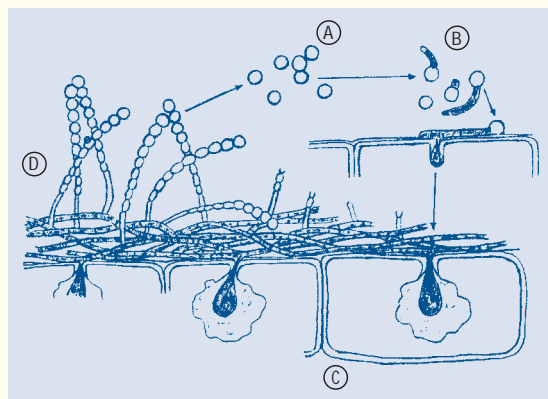


Figure 4.—Powdery mildew life cycle. A. Conidia are spread to healthy leaves. B. Conidia germinate when humidity is high. C. Most of the fungal colony is on the leaf surface. Haustoria act like roots, getting water and nutrients from the leaf. D. New conidia are formed on colonies to spread to more leaves.

Factors that favor aphids

- Ability to overwinter on the plant
- High reproductive rate
- Ability to reproduce asexually
- Populations allowed to increase in summer

Aphids

The main insect pest of roses in the PNW is the aphid. Other insect pests come and go, but various aphid species are present on roses from spring through fall, with some species spanning the entire growing period.

The physical impact of most aphids is minimal and they do not spread any rose diseases. Aphids are offensive mostly because they decrease aesthetic value, often clustering in large colonies on and below young flower buds and tender unfolding leaves (Figure 5). Larger colonies of feeding aphids can weaken flower bud necks (pedicles) and distort leaf growth.

Aphid eggs live through the winter in protected nooks and crannies on the plant. In the spring, eggs hatch into females that are capable of reproducing without mating. They give birth to live female aphid young that have the same capability. This process of asexual reproduction is called *parthenogenesis*, and it is a rapid and efficient way for insects to colonize a plant.

During the warm growing season, aphids reproduce on roses through parthenogenesis. In the fall, triggered by the change in day length, winged sexual forms (males and females) are produced. They mate, and the females lay eggs for overwintering.

Aphids feed on plant cell contents and sap by piercing the plant and sucking up the liquids. This feeding method requires a sedentary lifestyle, and most aphids remain in one small area for their entire lives. Thus, one aphid becomes many, and the many stay together in a colony of feeding individuals, loosely attached to the plant surface.

These colonies make for easy pickings by aphid predators and parasites, of which there are many. However, many of the natural enemies of aphids are more susceptible to chemical controls than are the aphids.



Figure 3.—Powdery-mildew-susceptible plant on the right; resistant plant on the left.



Figure 5.—Colony of aphids on underside of leaf.

CONTROLLING DISEASES AND APHIDS

Choose Disease-resistant Plants

Before you plant, consider buying disease-resistant rose cultivars. The disease reactions of many rose cultivars are listed in the *Pacific Northwest Plant Disease Control Handbook* (see “For further reading,” page 6). Or, your local plant nursery should be able to provide information on disease resistance for any cultivar you select. Cultivars with good resistance to all three major diseases are available.

It might be hard to find a cultivar with disease resistance and the color and fragrance you desire. However, selecting plants that have even moderate resistance can reduce the care required.

Provide Air Circulation

When you plant new roses, take care to plant the bushes far enough from each other, from other plantings, and from fences and walls to allow adequate air circulation. Remember, plants that don’t dry quickly enough are more susceptible to black spot infections; poor air circulation also means higher humidity, which is conducive to both rust and powdery mildew attack. Roses like lots of sunshine, but their diseases don’t.

While you’re dead-heading your roses (removing spent blooms), take time to prune out stems that arise in the center of the bush. During the dormant season, prune again to open the canopy. Encourage your rose bush to grow in a shape that is open and allows air movement within the plant. This allows wet leaves to dry and reduces humidity.

Practice Sanitation

When caring for established roses, sanitation is of primary importance. Sanitation means removal and destruction of any diseased or infested plant parts. Sanitation includes dormant-season pruning of diseased stems, and raking and removal of **all** leaves, dead flowers, and plant trash from around the plant. Prune severely to two buds if cane infections are present.

Destroy diseased material rather than composting it or using it as a mulch. Improperly composted debris can reintroduce diseases when returned to the rose garden. Destroy debris by burning, burying, or sending it to the landfill.

At any time in the growing season, you can remove diseased leaves, prune lesioned stems, and rake fallen leaves. Also dead-head spent blooms to remove aphid colonies and the beginning of powdery mildew infestations.

Other Cultural Controls

Avoid overhead watering, especially during black spot season, to keep from splashing the spores and wetting the leaves. To keep nighttime humidity at a minimum and reduce powdery mildew, water in the early part of the day.

In the summer, once conditions favorable for black spot have passed and there are no black spot symptoms on the plant, there is a nontoxic way to control both powdery mildew and aphids. These fungi and insects are loosely attached to the surface of the plant, so they can be dislodged by a strong stream of water from a hose sprayer. This method sometimes is called hosing.

Hosing is most effective when powdery mildew is just beginning. Frequent repetition is required—every 3 to 5 days—to be effective. Remember: because black spot is spread by splashing water, hosing could prove disastrous if that disease is present.

Aphids can be removed by any force, and often it's sufficient simply to knock them to the ground. They are poor climbers and probably will not reestablish, and they run a high risk of getting eaten by ground-roving insect predators.

During the season, use a slow-release nitrogen fertilizer such as ammonium- or urea-based commercial fertilizer, composted manure, or fish meal. Aphids have high nitrogen requirements, and their populations boom when plants receive a flush of nitrogen. Excess nitrogen also encourages rapid new plant growth, providing an abundance of susceptible leaves for foliar diseases.

Spray Applications

By carefully following the cultural controls outlined above, you can minimize the need to spray. Nonetheless, roses grow rapidly in the peak growing season, and susceptible new leaves are emerging constantly. To protect new growth, you might need to supplement your care with various spray applications.

Some chemicals, such as sulfur-based products and insecticidal soaps, are considered organic. Others, such as chlorothalonil (sold as Daconil), are not.

Read product labels carefully to learn how to best and most effectively use the product. Attention to proper use and timing guidelines usually makes spraying more effective and can reduce the need to spray.

In addition to growing-season sprays, a dormant-season application of lime-sulfur is effective for control of overwintering fungal spores and/or fruiting bodies of all three major fungal diseases.

A dormant-season spray of horticulture oil suffocates overwintering aphid eggs. Good spray coverage is critical. Follow directions carefully to achieve good control and limit the possibility of plant damage.

Consult your county Extension office for specific product recommendations and spray schedules for your area.

A YEAR-ROUND STRATEGY

Consult the "Rose care schedule" (page 7) to plan a disease and pest control schedule for your roses. Tailor your approach to your individual plants to save time and effort. For instance, if your roses are resistant to black spot, there is no need to monitor your plants for disease in the early spring.

Watch your plants to learn their specific needs and reactions. The time you invest initially will be repaid by the time you save by skipping unnecessary measures.

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FOR FURTHER READING

Pacific Northwest Plant Disease Control Handbook, by Jay W. Pscheidt and Cynthia Ocamb (Oregon State University, Corvallis, revised annually).

Pacific Northwest Insect Control Handbook, by Jack DeAngelis, et al. (Oregon State University, Corvallis, revised annually).

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Use sprays safely!

- Read the label—even if you've used the pesticide before. Follow closely the instructions on the label (and any other directions you have).
- Wear protective clothing and safety devices as recommended on the label. Bathe or shower after each use.
- Be cautious when you apply sprays. Know your legal responsibility as a pesticide applicator. You may be liable for injury or damage resulting from its use.

R O S E C A R E S C H E D U L E

When	What	How	Why
Before buying	Find cultivars with the best disease resistance available.	Ask a nursery for information; consult the <i>Pacific Northwest Plant Disease Control Handbook</i> .	Disease resistance reduces the care required.
	Do not purchase plants with galls on roots, stems, or crowns.	Look for gnarled, lump-like growth.	Avoid crown gall infections.
Before planting	Give each plant at least 3 feet of space.	Plant away from other plantings, structures, and fences.	Improved air flow increases leaf drying and reduces plant humidity to reduce diseases.
Dormant season	Prune plants and remove leaves.	Prune to open the canopy and remove any infected plant parts and all leaves. Prune severely to two buds if cane infections are present.	Pruning removes overwintering black spot, rust, other diseases, and pests; encourages more open growth; and reduces diseases by improving air flow.
	Rake fallen leaves.	Remove and destroy all infected plant debris.	Eliminates overwintering black spot and rust.
	Apply lime-sulfur spray.	Follow the product label.	Kills overwintering fungal spores.
	Apply horticultural oil spray.	Follow the product label.	Suffocates overwintering eggs of aphids and mites.
Early spring through late summer	Apply fungicides if needed.	Follow the product label.	Controls black spot, powdery mildew, and rust.
	Apply insecticides (either superficial or systemic) if needed.	Follow the product label.	Controls aphids.
	Apply a combination of fungicide and insecticide if needed.	Follow the product label.	Controls diseases and aphids.
	Apply insecticidal soap if needed.	Follow the product label.	Controls aphids and powdery mildew.
	Prune.	Maintain an open canopy; remove diseased parts.	Allows air flow, reduces diseases.
	Rake up debris.	Remove and destroy all infected plant debris.	Reduces disease spread from old infections.
Summer only	Hose off affected leaves and buds.	Use a forceful stream of water, in early- to mid-afternoon on sunny days, every 3 to 5 days.	Controls aphids and powdery mildew. <i>Do not hose plants when black spot is present.</i>
Fall	Prune.	Maintain an open canopy; remove diseased parts.	Allows air flow, reduces diseases.
	Rake up debris.	Remove and destroy all plant debris.	Reduces disease spread from old infections.

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