

# Phytophthora of Roses

Ashley Brake, Extension Assistant  
 Kevin Ong, Associate Professor and Extension Plant Pathologist\*

Phytophthora root rot, also known as crown rot or basal stem rot is one of the most common and severe root-decaying diseases worldwide. It can occur in many types of host plants including trees, shrubs, and roses.

A soilborne pathogen, *Phytophthora* survives in wet or moist soils, waiting for a living host to infect. There are several different species in the genus *Phytophthora*, and they all produce similar symptoms on diseased hosts. On rose plants, several species of *Phytophthora*, such as *P. megasperma*, *P. cactorum*, and *P. citrophthora*, are pathogenic and can cause the plant to wilt and die.



**Figure 1.** Aboveground symptoms of *Phytophthora* root rot (as seen on the right side of this diseased plant) include general chlorosis, wilted leaves, and dieback of the foliage and stems. Source: Texas Plant Disease Diagnostic Laboratory



**Figure 2.** The roots and crowns of plants infected with *Phytophthora* show poor structure and discoloration associated with rotting or dying tissue. Source: Texas Plant Disease Diagnostic Laboratory

## Symptoms

Phytophthora root rot can result in leaf chlorosis, wilting, and dieback of canes (Fig. 1). Below the soil, the crown tissue and roots become dark brown and necrotic (Fig. 2). Infected roots often appear water-soaked as they rot away. Larger roots, weakened by rot, can be easy to break off.

Typical plant disease symptoms can be mistaken for other abiotic (non-living) ailments and lead to misdiagnosis. For example, chlorosis of the leaves is often confused with nutrient deficiencies. The drought-like appearance on the foliage causes gardeners to compensate by overwatering, resulting in saturated soils—a favorable condition for this pathogen. Because roses that succumb to infection do not usually survive, it is important to recognize *Phytophthora* root rot symptoms to manage the problem accordingly.

Because it is difficult to make an accurate diagnosis based solely on the aboveground symptoms, carefully inspect the crown and roots of potentially infected plants and send a sample to a plant diagnostic clinic for analysis.

\*Texas A&M AgriLife Extension Service, The Texas A&M University System

## Cause

Commonly known as water mold, *Phytophthora* is an oomycete, a fungus-like organism more closely related to algae than to fungi.

When conditions are favorable, this pathogen can survive in the soil, infect susceptible plant roots, and spread throughout the root system. This infection destroys the root tissue structure and causes rot. The rot prevents the plant from transporting water and nutrients to its above-ground parts, resulting in drought-like symptoms from water deprivation.

Displaced rainwater can carry the organism's sexual spores (oospores) to neighboring plants or into the surrounding soil, where they await suitable conditions to infect the next host. Zoospores, the asexual spores, have two flagella (appendages) that allow them to "swim" in water for short distances. This ability makes the disease much more prevalent in moist soils with poor drainage where the free water triggers the release of zoospores that swim to nearby roots and infect them. This pathogen also produces chlamydospores that can survive unfavorable conditions by becoming dormant in the soil for long periods, making control much more challenging.

## Environmental Factors

*Phytophthora* spores can survive in the soil for years without infecting a host plant, but can become infectious in suitable weather and soil conditions when they encounter a susceptible host. Conditions that favor infection are

- Cool, wet weather typical of early spring and late fall
- Flooded or waterlogged soil conditions in or after seasons of heavy rainfall

Because *Phytophthora* symptoms and damage are most obvious during the hot, dry summer months when plants are already water-stressed, it is important to differentiate between drought symptoms and *Phytophthora* symptoms.

## Control

Unfortunately, no known cure exists for *Phytophthora* root rot, and once established, it is not easily eradicated

from an area. Prevention is the best control method and cultural practices that control disease development and spread include

- Ensuring good soil drainage and avoiding overwatering or overfertilizing
- Practicing good hygiene and sterilization of garden tools
- Maintaining a good cover of organic matter or composted mulch on the soil
- Using fungicides that are effective at preventing infection, especially those containing phosphorus, which boosts the plant's natural defenses; as always, read all directions and labels before using any chemical control
- Removing infected roses right away; get as much of the roots and soil surrounding the roots out of the ground as possible

## Sources

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