

Phytophthora Disease Symptom Characteristics

Nursery Inspection Guide

There are many species of *Phytophthora* that are considered important pathogens and they can infect a wide array of host plants including, but not limited to: rhododendron, azalea, hibiscus, rosemary, lavender, basil, vinca, gazania, fan palm, dogwood, holly, hemlock, forsythia, juniper, white pine, oak, beech, or maple. Almost all plants in nurseries can carry one or more *Phytophthora* species, so it is important to watch for symptoms of a *Phytophthora* infection in any plant. This photographic guide is meant to assist in the identification of potential *Phytophthora* infections with examples of classical symptoms observed on leaves, twigs, stem, trunk, and root, and to help determine if a sample should be taken for further lab analysis. Pay attention to the characteristics of each type of symptom.

Symptom #1: Leaf spot or blight



When a leaf exhibits leaf spot, look for diffused margin between healthy and necrotic tissue, most importantly, the connection of necrotic lesions to the midvein. When the entire leaf becomes necrotic, it is also called leaf blight.

In this case, the lesion expands to the petiole and possibly to the young twig. Any one of these characteristics signals a possible *Phytophthora* infection.

What to sample: At least 10 symptomatic leaves with petioles or stem.

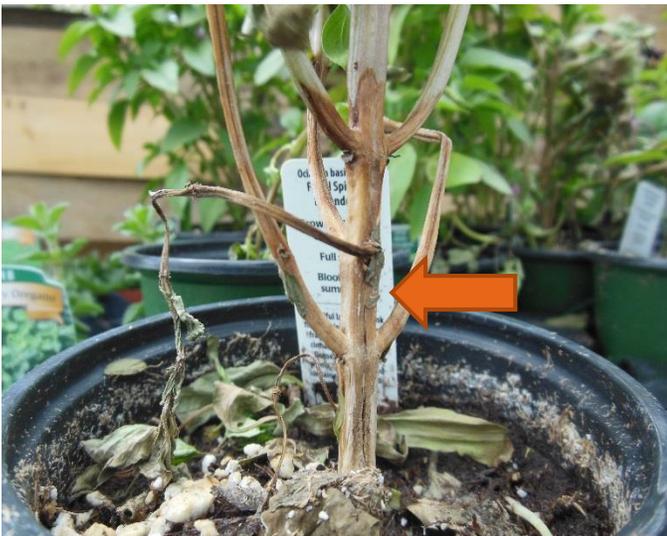
Symptom #2: Shoot Dieback



Twig dieback is a common symptom on plants infected by *Phytophthora*. Cold damage can cause similar symptoms, but a sample is worthy to check for *Phytophthora*. Shoot dieback can be noticed by leaf necrosis, wilting, or drooping. Careful examination of shoot stem can reveal brownish or blackish decay progressing down the stem.

What to sample: Multiple shoots with discolored stem tissue.

Symptom #3: Stem canker



When a stem exhibits brownish or dark discoloration, especially originating from the base of the stem, it is very likely that the plant is infected by *Phytophthora*. The infection starts from the base of stem and moves up. When inspecting the plant, make sure to examine the base of the stem and not just the foliage. Early infection on the stem may not result in visible foliar symptoms.

What to sample: Stems with canker or entire plant.

Symptom #4: Basal stem rot



It is very common that *Phytophthora* infects stem tissue near the soil line and causes lesions or rot at the base of stem. When a stem exhibits brownish or dark discoloration, especially originating at the base of the stem, it is very likely that the plant is infected by *Phytophthora*. The infection starts from the base of the stem and moves up. When inspecting the plant, make sure to examine the stem rather than just looking at the foliage. Early infection on the stem may not result in visible foliar symptoms.

What to sample: Basal stem with canker or entire stem/plant.

Symptom #5: bud Rot



This type of symptom applies only to palm species. When palms are infected by *Phytophthora*, they exhibit bud rot or leaf basal blade rot. When this occurs, the leaf pulls away from the stem easily. Rot at the base of the palm petiole can be noticed by brownish decay or grayish mold growth on the surface. Foliage may exhibit wilting, drooping, or a desiccated appearance.

What to sample: Leaf blade, petiole, rachis, or entire leaves with both healthy and rotted tissue. The top part of the stem with attached leaves is the best sample for lab analysis.

Symptom #6: Root Rot



Root rot should be suspected by observing wilted foliage or branches without any disease symptoms or insect damage above the soil line. When plants are lifted from the pot, the root system appears blackish in color and lacks new root growth. Healthy root systems should be light in color with visible new growth.

What to sample: Entire root system with soil attached for annuals. At least 10 pieces of discolored roots for perennials. The entire plant, if small, can be submitted as it is.

Symptom #7: Bleeding canker



When inspecting trees, examine the lower trunk of the tree for any sign of oozing sap or “bleeding” on the surface of the bark. Any wetness or staining by sap on trunk surface signals internal bark decay potentially caused by *Phytophthora*.

What to sample: Five to ten fresh bark tissue segments (1”W x1”Lx ½” D) containing the junction margin between alive (whitish or green) and dead (brown or dark) tissue.

Symptom #8: Late blight



Late blight occurs only on potato and tomato plants. This type of disease is airborne, different from other types of *Phytophthora* diseases. When inspecting tomato plants, examine lower side of leaves, stem, and shoots for any type of lesions, and fuzzy, fungal growth on both leaves and stem. The fungal symptom may not be typical when the environmental conditions are dry. It is always worthwhile to take a sample if leaf or stem lesions are present on tomato plants.

What to sample: Five to ten fresh leaves with leaf spots or 5 shoots containing lesions on stem or leaves, if available. This is a state quarantine disease, so secure the sample in the plastic bag and remove plants from sale.

All pictures presented here were taken by S. Wang except late blight photos adopted from APS website.