

Phytophthora Root Rot

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Phytophthora diseases are some of the most difficult to control in the ornamentals industry. These diseases include blights, cankers, root and crown rots and are caused by many different species of *Phytophthora* on a diversity of ornamental plants. One of the most serious of these *Phytophthora* diseases in the United States is sudden oak death, caused by *Phytophthora ramorum*, which is a quarantine pathogen. Equally devastating is *P. cinnamomi*, an exotic *Phytophthora* common throughout the southeast United States. In the Midwest, the more common *Phytophthora* species include *P. nicotianae*, *P. dreschleri*, and *P. citricola*, although there are many others. Due to the nature of the *Phytophthora* pathogen and its ability to spread, it is critically important that all *Phytophthora* species be properly identified in a diagnostic clinic. This will prevent the spread of potentially invasive *Phytophthoras*. You simply cannot tell just by looking at the symptoms. Even with incubation and a good microscope, and even if oospores and/or zoospores are readily visible, a diagnostic lab and DNA analysis is necessary to identify which species of *Phytophthora* is causing the problem.

Phytophthora root and crown rot often causes symptoms of smaller-than-normal foliage. In many instances, the first symptoms of disease may be mistaken for nutrient deficiency. Examination of the root and crown of these plants may reveal dead feeder roots, and as symptoms progress, dark streaks may be observed on the crown and stem. Plants with severe root rot often



These vinca plants are exhibiting early symptoms of *Phytophthora*.

exhibit stunting or even death of the entire plant. On some woody hosts, aerial blight caused by *Phytophthora* spp. can result in cankering, dieback and death, but the root tissue may not be infected. In some instances, a plant can have root rot, crown rot and aerial blight, and it can be caused by one or multiple species of *Phytophthora*.

In some hosts, *Phytophthora* can also cause an aerial blight. Observed in both poinsettia and vinca (and many others under wet conditions), aerial blight by *P. dreschleri* and *P. nicotianae* begins with foliar and stem lesions. Roots can also become infected. Symptoms often begin with discoloration to blackening of the foliage and leaves which rapidly collapse. The pathogen continues to colonize the leaf, and grows into the

petiole and stem of the plant, resulting in a blighted appearance. Wilting often follows if stems are girdled.

One thing that all of these diseases share in common is that they are more severe when excess water is present. Historically, and for this reason, *Phytophthora* species were called “water molds.” The key to managing this disease is prevention, by good regulation of watering, whenever possible. Disease prevention must be the primary goal as fungicides cannot “cure” these diseases.

Fungicides can be used to protect the plant from infection; they are not successful when used as a therapeutic remedy. When protecting plants, they must be applied regularly and preventively if there is a history of *Phytophthora*.

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Aerial blight caused by Phytophthora (such as *P. dreschleri* and *P. nicotianae*) begins with foliar and stem lesions, as seen in this vinca.



This Russian sage has been infected by Phytophthora, a disease that is more severe when water is present.

FUNGICIDES* FOR PHYTOPHTHORA MANAGEMENT		
COMMON NAME	FRAC CODE	TRADE NAME
Ametoctradin+dimethomorph	45+40	Orvego
Azoxystrobin	11	Heritage
Cyazofamid	21	Segway
Dimethomorph	40	Stature DM
Etridiazole	M	Truban, Terrazole
Etridiazole + Thiophanate methyl	1 + M	Banrot
Fenamidone	11	Fenstop
Fluopicolide	43	Adorn
Fosetyl-AI	U	Aliette
Mefenoxam	4	Subdue Maxx
Phosphorous acid	U	Alude, Biophos, Rampart
Propamocarb	28	Banol
Pyraclostrobin	11	Empress

**Inclusion does not imply endorsement; exclusion does not imply discrimination.*

Other important management tactics include:

- Using low(er) nitrogen fertilizers
- Irrigating earlier in the day to allow time for the shoot portion of the plant to dry out.
- Avoiding irrigation practices that splash water, result in standing water, or drench leaves.
- Using mulch around plants to prevent splash of pathogen from soil to plant.
- Growing plants in well-drained soil and preventing standing water near plants.
- Planting in raised beds in the landscape.
- Growing plants on benches, as far above the soil as feasible in the greenhouse.
- Maintain appropriate soil/media pH.

CHEMICAL MANAGEMENT. Fungicides are unlikely to kill the fungus in infected plants, but can reduce the spread of Phytophthora throughout the site and protect healthy plants from infection. Remove severely infected plants prior to treatment. Be sure to read the product label to determine if the plant to be

treated is listed. As always, follow label instructions as to rate and frequency of application to protect healthy plants. Never rely on any one fungicide, but rotate through several different classes to minimize the risk of fungicide resistance.

Phytophthora diseases are difficult to manage, especially since multiple species of Phytophthora can cause the problem. Fortunately, good cultural practices and a diversity of fungicides have greatly improved Phytophthora management in the nursery, greenhouse and landscape.

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