

Pests in Gardens and Landscapes

Carnation

Alternaria blight—*Alternaria* spp.

Alternaria blight is a disease on carnation. It causes tan spots or blotches with purple margins to occur on leaves, flowers, or stems. Lesions may be around the stem base.

Solutions

Use good sanitation. Remove infected plants and debris. Avoid overhead irrigation. Water in the morning so that plants dry quickly.



Alternaria leafspot lesion

Armillaria root rot (Oak root fungus)

— *Armillaria mellea*

Armillaria root rot, also known as oak root fungus disease or shoestring disease, affects mostly woody plants but also affects certain herbaceous perennials, such as begonia, carnation, daffodil, dahlia, geranium, and peony. *Armillaria* infects and kills cambial tissue, causing major roots and the trunk near the ground to die.

Identification

The first aboveground symptoms are often undersized, discolored, and prematurely dropping leaves. Branches die, often beginning near the tops of plants; on herbaceous hosts, stems become discolored and cankered. Eventually the entire plant can be killed. *Armillaria* forms characteristic white mycelial plaques that have a mushroomlike odor when fresh. Mycelia grow between the bark and wood on woody hosts and can grow through soft plant tissue and appear on the surface, especially with herbaceous hosts. Clusters of mushrooms may form at the base of infected woody plants. Black or dark reddish brown rootlike structures (rhizomorphs) are frequently attached to the surface of roots or the root crown.

Dematophora root rot also causes white growths that may be confused with *Armillaria*, but *Dematophora* tends to occur in smaller patches and grows



Above ground symptoms of oak root fungus



Mushrooms at base of infected tree



Mycelial fans between bark and wood

throughout the wood rather than just under the bark.

Life cycle

Armillaria thrives under moist conditions, for example when irrigated turf is planted around the roots of California native oaks. Plants become infected through root contact with infected plants or **rhizomorphs** attached to infected roots. Armillaria root rot can develop slowly, and symptoms may not appear until the fungus is well established. The fungus can survive for many years in dead or living tree roots.

Solutions

Preventing infection of new plants and planting resistant species are the only effective controls for *Armillaria*. Prepare the site well. Remove old roots and debris from the soil before planting. Use pathogen-free plants and air-dry soil well before planting. Provide plants with appropriate cultural care, especially proper irrigation, and adequate drainage.

Bacterial soft rots, leaf spots, blights, wilts— *Erwinia*, *Pseudomonas*, *Xanthomonas* spp.

Bacterial soft rots affect many plants including begonia, carnation, daffodil, geranium, impatiens, and zinnia. Soft rot bacteria cause infected tissue to turn brown, become mushy, and develop an unpleasant odor. Stem tissue turns brown and deteriorates near the soil. Plants grow slowly and seedlings collapse. Bacterial spots often start out as tiny water-soaked areas on leaves, stems, or blossoms. Spots or blotches turn dark gray or blackish as they enlarge and sometimes have yellow borders. Initial spots are circular but may become angular and coalesce and cause plant tissue death or necrosis. Cankers may form on stems. Under wet conditions, infected tissue may exude brownish masses of bacteria. Dead tissue may tear out, leaving holes and a ragged appearance.

Pathogens causing spots, blights, and soft rots can also cause vascular wilt if the infecting bacteria become systemic. Aboveground plant parts yellow, droop, wilt, and die.

Solutions

Use disease-free cuttings, corms, and other stock. Avoid planting too deeply. Provide good drainage. Do not overwater and avoid overhead irrigation. Keep foliage dry and provide good air circulation. Don't crowd plantings. Bacteria commonly infect through wounds, so avoid injuring plants. Use good sanitation. Regularly inspect plants for disease and remove infected plants immediately. Some cultivars are more susceptible to infections than others. Seek information on resistant cultivars and consider planting them.



Wilted lilac leaves and blossoms caused by *Pseudomonas* bacterial blight



Bacterial leaf spot on Geranium

Leaf spot diseases

Many fungi cause leaf spots on different hosts. Spots may vary from small discrete dots and raised areas to irregular yellow or brownish patches that cover much of the leaf surface. Leaves may fall off the tree if the problem is severe, but these pathogens rarely cause long-term damage to trees. Similar spots can be caused by bacterial pathogens, insects and mites, or abiotic factors on some plants.

Solutions

In most cases, infections can be tolerated. Remove fallen leaves and debris promptly. Many of the pathogens are favored by moisture, so avoid overhead sprinklers and irrigate early in the day so that the foliage dries more quickly. Generally, fungicide treatment is not warranted.



Leaf spot on freesia



***Phyllosticta* leaf spot on maple**