

2006 Florida Plant Disease Management Guide: Carrot (*Daucus carota*)¹

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Specific Common Diseases

Alternaria Leaf Spot (*Alternaria dauci*)

Symptoms: The disease usually starts on the leaf margins of older leaves, causing dark-brown to black spots with yellow borders. The expansion of numerous spots on a leaf will cause chlorosis (yellowing) and eventually necrosis (death) of the entire leaflet. Likewise, a few spots on the petioles (stems) may result in the death of an entire leaf. This fungal pathogen may also cause a shallow, firm, black decay of the roots. Cool temperatures are most favorable for disease development.

Cultural Controls: Host-plant resistance is available for leaf spot, so resistant cultivars should be planted whenever possible.

Chemical Controls: See PPP-6.

Bacterial Blight (*Xanthomonas campestris* pv. *carotae*)

Symptoms: The disease appears as irregular brown spots on leaves and dark brown streaks and spots on petioles. Lesions begin as small yellow

spots with an irregular halo. Root infections appear as brown to reddish spots, which may be either sunken or raised, splitting open.

Seed Treatment: Use pathogen-free seed whenever possible. If seed is known to be contaminated, treat seed for 25 minutes in water at 126°F. Indexing of seed for this disease can be done using PCR.

Chemical Control: See PPP-6.

Cavity Spot: (*Pythium* spp.)

Symptoms: The disease appears as lens-shaped cavities on the roots with the longer axis of the cavity oriented perpendicular to the length of the roots. Spots may be up to 1/2 inch in length and are generally less than 1/4 inch deep. Spots may or may not have a dark color. Frequently, a depression may occur and the lesion remains orange.

Cultural Controls: Where feasible, fallow flooding is helpful in controlling this disease. Resistant varieties and crop rotation are also effective. In fields that are prone to standing water during the

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growing season, use raised beds. Early harvests also allow for less disease.

Chemical Control: Use Ridomil at the time of planting. See PPP-6. Seed treatments may also prove helpful.

Cercospora Leaf Spot (*Cercospora carotae*)

Symptoms: This fungal pathogen may affect all foliar portions of the plant but not the root. Young leaves are affected first, with the lesions starting toward the margins. Spots are small and round and frequently have a tannish-gray to black center with an indefinite yellow halo. Numerous spots on the same leaf may cause withering and death. Petiole lesions are pale centered, elliptical, and tan. In contrast to *Alternaria* leaf spot, *Cercospora* leaf spot is favored by warm temperatures. Both are favored by extended periods of leaf wetness.

Chemical Controls: See PPP-6.

Damping-Off (*Rhizoctonia* spp., *Pythium* spp., *Sclerotium rolfsii*, *Fusarium* spp., and *Sclerotinia sclerotiorum*)

Symptoms: Seedlings may damp-off at random or in rapidly enlarging circular areas. In the latter case, lesions may be observed well up on the petioles as well as at the soil line. Entire plantings may be lost unless adequate control measures are applied.

Cultural Controls: Plant carrots on raised beds that are free of non-decomposed plant tissues from a previous crop or weeds.

Chemical Controls: Use a fungicide seed treatment. See PPP-6.

Pythium Brown Root (*Pythium* spp.)

Symptoms: Early infection results in a seedling blight. Later infections result in the death of the root tip, causing roots to branch excessively. Above ground, infected plants will appear wilted and stunted, and may exhibit a yellowing of the lower leaves. Marketable yields may be drastically affected by the production of rough, "hairy-root" tubers.

Cultural Controls: There is circumstantial evidence that fallow flooding, similar to that performed for *Sclerotinia*, may be helpful in controlling this disease. Also, minimize damage to raised beds with tractor tires and implements. Plant in well-drained soil or fields not prone to flooding during the growing season.

Rhizoctonia Cavity Spot (*Rhizoctonia solani*)

Symptoms: Early infection will cause seedling damping-off. On more mature plants, the disease appears as a crown rot. Affected foliage will wilt and die, leaving only a few viable inner leaves. Infected crowns are dark brown to black, and infected roots develop dry, sunken lesions where the lateral roots emerge.

Cultural Controls: While there is no totally effective control, crop rotation may be of some benefit.

Sclerotinia Rot/White Mold (*Sclerotinia sclerotiorum*)

Symptoms: The fungal pathogen can cause a damping-off disease but most frequently infects the crown region where it may continue to develop after harvest, causing a storage rot. The fungus infects the base of the leaf stalk causing a brown tissue rot. Individual leaves wilt and die. The disease is characterized by the production of white cottony mycelium which may spread from the crown into the foliar tissues. Irregularly shaped, black fungal bodies are soon formed and these are called sclerotia. Infected roots may appear darker than normal at harvest and these soon develop a soft, watery rot either in the field or in storage. The disease may spread rapidly in storage by root-to-root contact.

Cultural Controls: A number of activities will assist in the control of white mold. All may be needed for satisfactory control. These are:

- 1) Rotate to a non-susceptible crop like sweet corn. Avoid rotating with susceptible crops like lettuce or celery.
- 2) Turn soil at least 6 inches deep to bury the sclerotia and old debris. These serve as inocula.

3) Flood infested fields either continuously or intermittently for 6 weeks during the summer where ever feasible.

Southern Blight (*Sclerotium rolfsii*)

Symptoms: Infection usually begins at or near the soil surface. Rotting begins at the top of the taproot and the base of the leaf petioles. Leaf tissues turn brown and may wilt. A white mycelial growth may appear on the soil surface. As the root rot progresses downward, small spherical tan fungal bodies called sclerotia may develop within the rotted root tissues. Sclerotia of *Sclerotium rolfsii* are about the size and shape of a cabbage seed and are usually brown, differentiating this disease from white mold caused by *Sclerotinia sclerotiorum*, which produces larger, irregularly-shaped black sclerotia.

Cultural Controls: Use crop rotation with grass crops and use a plow to aid in the burial of sclerotia after planting a susceptible crop such as carrots, pepper, tomato, beans, peanuts, etc.

Chemical Controls: See PPP-6. Strobilurin fungicides may be effective for this disease although it may not be officially listed on the label.