

Peppers

Phytophthora Root and Crown Rot

Pathogens: *Phytophthora capsici*, *P. nicotinae* var. *parasitica*

(Reviewed 8/07, updated 8/07)

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disease can develop at any stage of pepper plant growth. Tap roots and smaller lateral roots show water-soaked, very dark brown discoloration of cortical and xylem tissue. Very few lateral roots remain on diseased plants and the tap roots may also be shorter compared to those of healthy plants. The most striking difference between healthy and diseased plants is the total amount of root tissue. Stems are usually infected at the soil line. Stem lesions are first dark green and water-soaked, then dry and turn brown. The lesions may girdle the stem and result in wilting of plants above the lesions and subsequent death.



COMMENTS ON THE DISEASE

The fungus can survive on and in seed and in soil. The fungus also produces thick-walled oospores that can survive prolonged periods of adverse conditions. Contaminated seed and transplants, or soilborne inoculum are sources of primary infections. Irrigation water often disseminates fungal propagules from infested areas to other parts of the field. Thus, irrigation can significantly increase the incidence and severity of root and crown rot in pepper. Increased frequency and duration of irrigation favor disease development.

Water, temperature, and soil texture are the major factors affecting the development of root and crown rot. The presence of water is mandatory; soil saturation for as little as 5 to 6 hours can result in infection, and susceptible varieties can become severely diseased in as little as 5 days. Optimum temperature for plant infection is 75° to 92°F (24° to 33°C). Symptoms usually appear following a warm, wet period. The disease is severe in fine-textured (clay) soils that drain slowly and in highly compacted soils.

Infections that occur late in the season may reduce vigor and yield of plants without killing them. However, the foliage wilts during the hottest time of day, exposing fruit to sunburn.

MANAGEMENT

Phytophthora fungi survive in soil as oospores for several years. Factors that influence the development of root and crown rot in peppers in a given season include varietal susceptibility, amount and frequency of irrigation, and soil compaction and drainage. Crop rotation, proper irrigation, and clean seed and transplants are critical in managing this disease. Fields that have a history of *Phytophthora* rots may need treatment at planting.

Cultural Control

The disease can be effectively prevented by a program integrating crop rotations of 2 years that exclude susceptible plants, irrigation management, and clean seed and transplants. In heavy soils that are poorly drained, root and crown rot may be reduced by irrigating every second furrow at one irrigation and the alternate furrows at the next, or by carefully managed drip irrigation. Practices that reduce or alleviate soil compaction may improve control; for example, growing plants on raised beds. Commercial cultivars with acceptable levels of resistance to the disease are available.

SYMPTOMS

Aboveground symptoms of *Phytophthora* root and crown rot include rapid wilting and death of affected pepper plants. Close examination of the roots and stems of affected plants is necessary to confirm the cause of disease. The

