

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 watersoaked, 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 watersoaked, 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

Treatment Decisions

Fungicides are sometimes used in fields with histories of root rot or problems with drainage.

Common name (trade name)	Amount/Acre	R.E.I.+ (hours)	P.H.I.+ (days)



When choosing a pesticide, consider information relating to environmental quality.

- | | | | | |
|---|--|-------------|-----------|-----------|
| A. | MEFENOXM
(Ridomil Gold) EC | 1 pt | 48 | 7 |
| MODE OF ACTION GROUP NAME (NUMBER ¹): Phenylamide (4) | | | | |
| COMMENTS: Apply at planting and make 2 subsequent post-directed applications at 30-day intervals. Do not exceed 3 pt/acre/crop season. Mechanically incorporate or sprinkler-irrigate to move the material into the root zone. Do not use for peppers grown in greenhouses. | | | | |
| B. | PHOSPHOROUS ACID
(Various products) | Label rates | see label | see label |
| MODE OF ACTION GROUP NAME (NUMBER ¹): Phosphonate (33) | | | | |
| COMMENTS: Research on the use of this material has not been conducted in California, but field experience suggests that it may provide control in a preventive program. | | | | |

- + Restricted entry interval (R.E.I.) is the number of hours (unless otherwise noted) from treatment until the treated area can be safely entered without protective clothing. Preharvest interval (P.H.I.) is the number of days from treatment to harvest. In some cases the REI exceeds the PHI. The longer of two intervals is the minimum time that must elapse before harvest.

¹ Group numbers are assigned by the Fungicide Resistance Action Committee (FRAC) according to different modes of actions (for more information, see <http://www.frac.info/>). Fungicides with a different group number are suitable to alternate in a resistance management program. For fungicides with mode of action Group numbers 1, 4, 9, 11, or 17, make no more than one application before rotating to a fungicide with a different mode of action Group number; for fungicides with other Group numbers, make no more than two consecutive applications before rotating to fungicide with a different mode of action Group number.

PRECAUTIONS

PUBLICATION



UC IPM Pest Management Guidelines: Peppers

UC ANR Publication 3460

Diseases

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