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PHYTOPHTHORA BLIGHT OF PEPPER

Phytophthora blight is caused by a fungus-like organism *Phytophthora capsici*. This is a devastating disease of pepper that results in stem cankers, fruit rot, plant collapse, and complete crop loss in rainy weather.

SYMPTOMS AND DIAGNOSTICS

All parts of a plant can be affected, but the most common symptoms are stem cankers and fruit rot. Because the primary inoculum of the disease persists in the soil, infections often start as root and crown rots. Water-soaked, dark brown lesions first appear on the lower parts of the stem, and extend upward to girdle the stem and block upward movement of water and nutrients (Figure 1). Girdled stems result in a sudden wilting of foliage, often without yellowing of the leaves. Affected plants progressively decline and die (Figure 2). Fine, white, thread-like growth of the pathogen on affected stems and fruit may be evident under wet conditions (Figure 1 and 2).

Fruit lesions appear as enlarging, water-soaked areas without clear margins. Infected fruit shrivel and rot. Under wet conditions, the fine, thread-like growth of the pathogen may be visible on infected fruit (Figure 2). This growth can be extensive and result in rotting of the fruit. Since decay can only take a few days to develop, fruit that are infected in the field may be symptomless at harvest, but

Figure 1. Dark brown cankers and white mold on infected stems (arrow) by Phytophthora blight.

Figure 2. Symptoms of leaf wilting and fruit rot with white mold on the fruit surface (arrows).

may rot a few days later. This can result in substantial post-harvest losses.

Foliar lesions can occur under favorable conditions. The classic leaf lesion caused by *P. capsici* is fairly circular with a tan margin and necrotic center. Infected leaves can rapidly develop circular or irregular, dark green, water-soaked lesions, which dry and appear light tan. The disease can cause early defoliation during extended rainy weather and warm temperatures, followed by complete plant collapse.

DISEASE DEVELOPMENT

Phytophthora capsici is a soilborne pathogen that has a wide host range, including pepper, tomato, eggplant, and most cucurbits (cucumber, squash, pumpkins, watermelon, and muskmelons). The pathogen can survive in soil many years in the form of resting spores (oospores), which serve as primary inoculum. The pathogen also survives as chlamydospores or mycelium in infected tissues of susceptible crops, or in weed species such as Carolina wild geranium and black nightshade. Under moist conditions, the pathogen produces other types of spores (sporangia and zoospores) on infected plants that enable it to spread throughout a field by wind, wind-driven and splashing rain, and run-off water. The pathogen can be transmitted from field to field through diseased plants, contaminated soil, and contaminated equipment.

Heavy rainfall, saturated soils, and warm temperatures (75° to 85°F) favor disease development. Phytophthora blight usually starts on the plants in low and poorly drained areas of a field, especially after excessive rains.

MANAGEMENT

Because the pathogen can survive in soil for several years, avoid planting pepper in the field with a history of Phytophthora blight. If it is possible, practice crop rotation for a minimum of three or four years, and use non-host crops, such as corn, small grains, crucifers, potatoes, and tobacco in the rotation. This disease is particularly severe in pepper fields following a cucurbit crop.

Grow plants in well-drained soil on raised beds (6-7 inch minimum). Allow rain water to drain from the end of the rows. Avoid excessive overhead irrigation. Cover beds and furrows with small-grain mulches to limit splash dispersal and surface water movement. Remove and destroy diseased plants from the field to reduce the inoculum of the disease. Clean equipment and tools after working in the diseased plants and contaminated fields.

Resistant varieties should be planted when possible. Phytophthora blight-resistant or tolerant bell pepper varieties include Paladin, Aristotle, Revolution, Conquest, Declaration, Emerald, and Isle.

A chemical control program is most effective when combined with planting resistant varieties and cultural practices. Chemical products that are registered for use in Connecticut are potassium phosphate and copper hydroxide. The fungicide label will contain information on dosage rates, pre-harvest interval (PHI), and safety precautions.

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