Symptoms and Signs Charcoal Rot

Charcoal rot symptoms appear during hot weather when foliage of affected plants wilts and turns yellow, symptoms that may be confused with Verticillium wilt or bacterial early dying. Wilting caused by *Macrophomina* usually develops quickly, in contrast to Verticillium wilt.

Infected stems develop a soft, dark rot similar to blackleg. Affected stems take on a dusty black appearance when small, black fungal structures (microsclerotia) are formed. This "charcoal dust" symptom, sometimes called ashy stem blight, helps distinguish charcoal rot from other stem rot diseases.

Tubers can be infected by *Macrophomina* before harvest. Infections occur around eyes, in lenticels that are enlarged because of high soil moisture, and where the stolon attaches. Shallow, water-soaked lesions develop. Tuber tissue within these lesions turns gray, and eventually the lesion tissue becomes filled with black fungal mycelium. If tuber infections develop quickly, much of the tuber tissue may develop a soft rot that turns from white to pink and then black, similar to pink rot, when diseased tubers are cut open.

Comments on the Disease

Charcoal rot affects a wide range of crop plants including other solanaceous crops, beans, corn, and cucurbits. The disease becomes economically important only when soil moisture is high and soil temperature is above 82°F. In California, it is an important disease of potato only in the Central Valley.

The fungus that causes charcoal rot survives as microsclerotia that form on infected host tissue. The pathogen can be spread on contaminated seed tubers. Microsclerotia can survive for long periods on plant debris in the soil. Tubers are predisposed to infection when soil temperatures are 90°F or higher.

Management

Plant certified seed tubers. No potato cultivars are resistant, but early-season cultivars may escape damage in infested fields. Harvest as soon as tubers have matured and, when possible, before soil temperature exceeds 82°F. Avoid injuring tubers during harvest. Rotation to nonhost crops for several years is required to reduce incidence of the disease.