

Diseases of Potato: Early Blight

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Early blight, caused by the fungus *Alternaria solani*, is one of the most common foliar diseases of potato in Michigan. It emerges almost every year in every location. The name of the disease is a bit misleading, as it actually appears late in the growing season.

Symptoms usually develop first on the older leaflets of mature plants, spreading to the younger leaves under favorable weather conditions. Yield reductions of 50 bushels or more per acre due to early blight are not uncommon. This disease occurs over a wider range of climatic conditions than late blight, another important foliar disease of potato.

Symptoms

On leaflets, symptoms begin as small, dark brown to black spots. As these spots enlarge, they develop a characteristic "target spot" or "bull's-eye" appearance due to concentric rings appearing in the dead tissue (Fig. 1). Spots are irregular in shape. Enlarged leaf spots are often limited by large leaf veins (Fig. 2). A narrow light green to yellow zone which fades into the normal green of the unaffected part of the leaflet usually surrounds the spot. Spots may enlarge, coalesce, and cause leaflets to die, dry up and drop. Spots may appear on vines, but usually do only minor damage.

Early blight lesions appear on the surface of tubers as dark, sunken, roughly circular to irregularly shaped areas often surrounded by a raised border colored grey to violet. The fungus will invade the tuber, causing shallow, dark, necrotic, hollowed-out areas in the tuber that can be traced to surface lesions (Fig. 3).



Fig. 1. "Bull's-eye" appearance of early blight on leaflets. (Photos courtesy of Randall Rowe, Ohio Agricultural Research and Development Center, Wooster, Ohio.)

Tuber lesions have not been linked to the appearance of earlier-than-normal early blight in potatoes planted with infected tubers, but they may serve as sources of infection.

The early blight fungus can often be recovered from healthy-looking leaf tissue prior to the onset of tubers, but causes no visible symptoms until potatoes approach maturity. The reasons for this are not clearly understood. Evidently the early blight fungus is not a strong pathogen on young healthy tissue, but can attack older, less vigorous tissues. This helps explain why infection usually begins as foliage becomes mature.

Disease Cycle

Alternaria solani overwinters in the field on dead leaves and vines, or on infected tubers. Spores are carried primarily by wind and infect potato leaves under favorable conditions of warm temperatures (68-86 F) and



Fig. 2. Enlarged, irregular leaf spots are often limited by leaf veins.

heavy dews or rain. Disease development is favored by high (about 95%) relative humidity. Most rapid progress of the disease

occurs during periods of alternating wet and dry weather. Early blight is often more severe when the potato crop has been under stress of poor nutrition, injury, insect damage, drought, or other types of stress.

Control

While no truly resistant cultivars are available, highly susceptible cultivars such as Onaway, Superior, Norland or Norchip should be avoided where losses to early blight are significant. Onaway is particularly susceptible to tuber infection, which can lead to storage problems. Because early maturing varieties become diseased earlier than do later varieties, early and late varieties should not be planted in the same or adjacent fields because the early variety could act as a source of infection of the later variety.

Regular sprays of recommended fungicides (see Extension Bulletin E-312 for current recommendations) are the best defense against



Fig. 3. The shallow, dark, necrotic, hollowed-out areas show where early blight has invaded the tuber.

damage by the early blight fungus. Sprays should commence just before bloom or at the first sign of early blight infection, whichever is

earlier. Regular inspection of fields after plants reach 12 inches in height can be very helpful in detecting early infections.

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