



## ALTERNARIA AND CERCOSPORA LEAF SPOTS OF HORSERADISH

Alternaria leaf spot, caused by the fungus *Alternaria brassicae*, and Cercospora leaf spot, caused by the fungus *Cercospora armoraciae*, are common foliar diseases of horseradish. These diseases occur in all horseradish growing areas in the world. In Illinois, both diseases occur in the same field and often on the same plants. Severity of the diseases is higher in wet seasons. Significance of crop losses caused by these diseases have not been documented or reported.



Figure 1. Alternaria spots on a horseradish leaf.

### Symptoms

**Alternaria spot.** Symptoms begin as small, dark spots that gradually enlarge and turn dark-brown (Figure 1). Lesions may expand into roundish spots or may have an angular outline that is delimited by leaf veins. A chlorotic halo is often visible if surrounding leaf area is still green. The lesions are usually concentrically zonate like a target, and the center may become so brittle that it splits open. Lower leaves are normally infected first and have more and larger lesions than do upper leaves because they are older and more susceptible.

**Cercospora spot.** Symptoms first appear as small, light colored circular areas on the leaves (Figure 2). These lesions enlarge to reach up to 1/2 inch in diameter and light brown to grey in color. As the fungus sporulates, the center of the spots become



Figure 2. Cercospora spots on a horseradish leaf.

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darker. The spots can coalesce, killing large areas of the leaf.

## Disease Cycle

Both *A. brassicae* and *C. armoraciae* overwinter in infested leaf debris. When conditions are favorable, the fungi on the plant debris sporulate, spores are carried by wind onto growing plants, and infection of leaves take place. Both pathogens sporulate on infected leaves, spores are dispersed by wind, and new infections are initiated when the spores land on the leaves. *A. brassicae* produces dark-brown conidia (spores), with transverse and longitudinal septa, and measure 75-350  $\mu\text{m}$  (Figure 3). *C. armoraciae* produces hyaline conidia, which are straight to slightly curved, cylindrical to cylindro-obclavate (Figure 4). Conidia have several transverse septa and measure 2.5 - 6.0 x 20 - 150  $\mu\text{m}$ .

## Disease Management

Horseradish cultivars resistant to either *Alternaria* spot or *Cercospora* spot are not known. Crop rotations with non-brassica crops for 2- to 3-year could reduce primary inoculum in the field. Fungicide applications are effective for control of both of the diseases. Fungicides Bravo Weather Stik 6F (chlorothalonil), Fontelis 1.67SC (penthiopyrad), and Quadris 2.08SC (azoxystrobin) have been registered for use on horseradish and are effective for control of *Alternaria* and *Cercospora* spots. For the update on fungicide use for control of foliar diseases of horseradish consult the area extension specialists.



Figure 3. Spores (conidia) of *Alternaria brassicae*.



Figure 4. Spores (conidia) of *Cercospora armoraciae*.