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CERCOSPORA LEAF SPOT OF SUGAR BEETS

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Cercospora leaf spot, a foliar disease of sugar beets, has become an increasing concern to Idaho sugar beet growers. The disease has been observed in sugar beet fields for several years, but in recent years it has caused measurable losses. This disease presently is most severe on sugar beets grown in southwestern Idaho; however, some losses have been reported in southcentral Idaho since 1967. Beets produced under sprinkler irrigation are more often attacked than those produced under furrow irrigation. The disease is still of minor importance in the sugar beet producing areas east of Minidoka and Cassia counties.

Cause of the Disease

Cercospora leaf spot is caused by the fungus **Cercospora beticola.** In addition to sugar beets, the fungus attacks table beets, chard and weeds such as pigweed, lambsquarter and dock. The disease-causing fungus overwinters in infected, dead, nondecomposed plant material on the ground. Growing sugar beets in short, succeeding rotations enables the fungus to flourish in the fields because nondecomposed, infected sugar beet refuse is maintained from year to year.

The fungus in such material produces spores in spring and these become airborne to nearby hosts. Free moisture in the form of dew, rain or high humidity is essential for germination of the spores. Optimal humidity is 90%, but spores germinate in humidity as low as 60%. Spore germination also requires temperatures between 60° and 90°F (optimum is about 77°).

After germination of the spore, penetration of the fungus occurs mostly through the natural openings (stomata) of the leaves. Penetration and infection occur most rapidly at about 84°F. Within 7-10 days at temperatures favorable for disease development, new spores are produced in the infection sites. The new spores are blown or splashed to new sites on the same plant or to adjacent plants, initiating new infections.

Symptoms

Cercospora leaf spot appears usually on the older leaves of the sugar beet. The first symptoms are visible as small, brownish spots with reddish-purple borders, giving the leaf a speckled appearance. As the disease advances, the spots enlarge and turn gray. The center tissue of the old lesions drops out leaving ragged holes. Infection on the leaf petioles (leaf stalks) may cause the leaves to turn yellow. Eventually, an infected leaf dies resulting in defoliation. The beet usually will have a high conical crown caused by defoliation of older leaves and production of new leaves in the center of the crown.

The fungus does not attack the root of the plant.

Infection early or at mid-season will reduce yields and sugar content since the plant nutrients are expended in replacing the leaves killed by the fungus. Infection late in the season (mid-September) may reduce yields to some extent, but the greatest loss is the reduction in sugar content. Cercospora leaf spot is more severe when sugar beets are infected with sugar beet mosaic virus and/or western yellow virus.

Control

Cercospora leaf spot can be controlled by crop rotation, weed control and the proper use of fungicides.

Increases in prices for cereals and legumes enable sugar beet growers to lengthen rotations which will result in complete decomposition of infected sugar beet refuse. Weed control in the crops in the rotation will assist in maintaining a low level of inoculum (the fungus).

Fungicidal sprays should be applied just before the first leaf spot symptoms appear on the sugar beet leaves. Determine when to apply the first spray by observing weed hosts adjacent to the field or sugar beet plants at the edges of fields near weed hosts. Usually the first spray will be required about the time the beet foliage begins to cover the rows.

Sugar beets grown under furrow irrigation may require one to three fungicidal applications spaced about 10 days apart. Those grown under sprinkler irrigation may require sprays at each sprinkling interval after the initial spray has been applied.

Several chemical materials control Cercospora leaf spot (Table 1).

Treated tops should not be grazed or fed to livestock unless the label of the product you choose states it may be fed.

Frequency of application varies with the chemical material used. Apply according to label directions.

Coverage of leaf surfaces can be improved by adding a spreader-sticker agent to the spray material. Use the spreader-sticker suggested by the manufacturer of the fungicide you purchase.

Table 1. Chemicals registered for control of Cercospora leaf spot of sugar beets.

Fixed coppers (various formulations)
Dithane M-45 (Manzate 200)
Maneb
Polyram
Mertect
Du-Ter
[1]Benomyl (Benlate)

[1]Recent information from another state has reported a strain of the fungus to be resistant to Benomyl.

Pesticide Residues. These recommendations for use are based on the best information currently available for each chemical listed. If followed carefully, residues should not exceed the tolerance established for any particular chemical. To avoid excessive residues, follow recommendations carefully with respect to dosage levels, number of applications and minimum interval between application and harvest.

THE GROWER IS RESPONSIBLE for residues on his crops as well as for problems caused by drift from his property to other properties or crops.

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