Cercospora Leaf Spot

(Cercospora beticola)

Economic damage: Commonly occurs, can result in considerable loss in yield and quality and reduces storability of sugarbeet roots in piles.

- Cercospora leaf spots are circular, about 1/8 to 3/16 inch in diameter, with light to dark tan centers and dark-brown to reddish-purple borders. Elliptical lesions may occur on leaf blades, veins, and petioles.

- Stromata (black dots about the size of pepper grains) form during humid weather in leaf spots on sugarbeet debris or newly infected leaves; they are easily seen with a hand lens.

- When weather is warm and wet, stromata produce silver or steel-gray spores which gives the leaf spot a fuzzy appearance.

Bacterial Leaf Spot

(Pseudomonas syringae pv. aptata)

Economic damage: Commonly occurs but usually not of economic importance; some rhizomania-resistant varieties have shown increased susceptibility to bacterial leaf spot.

- Bacterial leaf spot produces irregular-shaped to circular spots measuring 3/16 to 1/4 inch in diameter. Note tan to dark brown centers with very dark to nearly black borders.

- No stromata (black dots) form in bacterial leaf spots; soil particles can lodge onto leaf spots, so brush lesions gently to remove loose debris.

- Bacteria also enter at the leaf margins (initially may appear water-soaked) and leaf edges turn yellow and then necrotic.
**Cercospora Leaf Spot**

Leaf spots coalesce and kill large areas of leaf tissue. Severely diseased leaves wither and die, but remain attached to the crown.

**Sources and spread of inoculum**
- Old, partially buried sugarbeet debris from previous crop
- Infected sugarbeet plants during field season
- Common weed hosts such as lambsquarters, pigweed, mallow, bindweed, crops related to sugarbeet (table beet, Swiss chard, spinach) and most wild *Beta* species
- Spreads via wind, water, and insects

**Conditions for disease**
- Favored by warm, humid, rainy weather
- *Cercospora* spores form most readily at 68-79°F at relative humidities of 90-100% (spores do not form at temperatures less than 50°F).
- Spores germinate and infect leaves through stomata (natural openings) at daytime temperatures of 77-95°F, night temperatures above 60°F, and high relative humidities (90-95%) or free moisture. Infection is reduced or inhibited at temperatures less than 59°F or when leaves are wet for less than 11 hours.
- Leaf spots develop from 5 to 21 days after infection, depending on amount of inoculum, temperature, and duration of wet period. Leaf spots typically occur first on lower, older leaves and progress to younger leaves.

**Disease Management**
- Avoid planting within 100 yards of an infected sugarbeet field from the previous year.
- Bury sugarbeet leaf debris by fall tillage.
- Plant to nonhost crops for at least two successive seasons
- Plant tolerant sugarbeet varieties.
- Apply fungicides judiciously (monitor for disease and conditions favorable for disease).
- Alternate different classes of fungicides to avoid development of resistant strains of *Cercospora* (see current Sugarbeet Production Guide, Cooperative Ext. Serv., North Dakota State Univ., and Univ. Minnesota).

**Photo credits**
Figures provided by H.L. Bissonnette, W.M. Bugbee, M.F.R. Khan, and C.E. Windels.

**Selected references**

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**Bacterial Leaf Spot**

Bacterial leaf spots coalesce between leaf veins; this tissue tears easily and is ragged in appearance.

**Sources and spread of inoculum**
- Old, partially buried sugarbeet debris from previous crop
- Newly infected sugarbeet plants
- Other hosts include bean, eggplant, lettuce, and pepper
- Infected sugarbeet seed (results in seedling damage)
- Bacterial inoculum spread by splashing rainfall, mechanical and insect injuries

**Conditions for disease**
- During cool rainy weather, leaf spots usually develop in young plants and before canopy closure; disease may occur throughout the season.
- Infections occur above 36°F and below 95°F; optimal temperatures are between 77-86°F.
- Bacteria enter stomata (natural openings) or through wounds and injuries caused by hail or wind damage, insects, farming practices, etc.
- Bacteria also enter margins of leaves through hydathodes (natural openings).
- Bacterial leaf spot may be intermixed with *Cercospora* leaf spot – on the same leaf or even in the same leaf spot.

**Disease management**
- No effective field controls have been developed.