

Cercospora Leaf Spot of Table Beet

Cercospora leaf spot (CLS) is caused by the fungus, *Cercospora beticola*. CLS is the most important disease affecting table beet in New York. In processing table beet crops, epidemics cause significant defoliation and may disrupt mechanized harvest. For fresh market table beet production, roots may be sold with or without intact foliage. The presence of CLS lesions on the foliage may lead to rejection for fresh market sale.



DISEASE SYMPTOMS ARE INITIALLY DISCRETE, NECROTIC LESIONS SURROUNDED BY A RED TO PURPLE MARGIN IN A RED TABLE BEET CULTIVAR (FIG. 1). IN A YELLOW CULTIVAR, MARGINS OF LESIONS ARE TAN BROWN (FIG. 2). CLS LESIONS HAVE A GRAY CENTER ON ALL CULTIVARS.

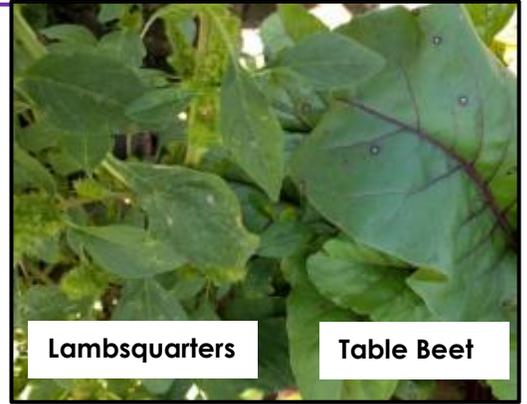
Prepared by Lori Koenick, Julie Kikkert and Sarah Pethybridge (July 2017)

Disease Cycle

Cercospora beticola can overwinter in infected host debris



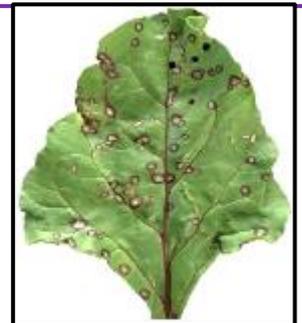
Cercospora beticola can also survive between growing seasons on alternative hosts (e.g. weeds)



Under warm and humid conditions, *Cercospora beticola* becomes active and can infect and cause lesions on table beet leaves



Each lesion contains hundreds of spores that may disperse by rain splash to cause new infections



Lesions can quickly expand to encompass the entire leaf surface



CLS may first appear as small diseased areas within the field which rapidly expand with time



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Managing Cercospora Leaf Spot

To design an effective management strategy for CLS in table beet, we need to understand how the pathogen can be introduced into crops. Below are summaries of the key inoculum sources and management strategies for CLS.

Inoculum Sources:



Alternative Hosts

CLS can also occur on swiss chard (Fig. 3), spinach, and sugar beet. Commonly encountered weeds also serve to perpetuate *Cercospora beticola* inoculum. Susceptible weeds include:

- Lambsquarters
- Pigweed

Soil and Plant Residues

Cercospora beticola is able to survive in the soil on infested plant residues for up to 3 years.



Management Strategies:

Field Conditions

- Rotate with non-susceptible crops for 3 years
- Bury plant debris
- Optimize weed control

Planting Arrangement

Planting arrangements that decrease relative humidity and promote rapid leaf drying will reduce CLS spread. Practices that support disease management include:

- Wide row spacing
- Decreased in-row plant density
- Orienting rows to promote wind-flow
- Weed management

Plant density also strongly dictates final root size and shape and should be considered when altering planting arrangements with trade-offs for disease management.

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Cultivar Selection

Table beet cultivars vary in their agronomic characteristics (e.g. root size, color, and shape) and susceptibility to CLS. In our research, all table beet varieties were susceptible to CLS. Boldor, Detroit, Falcon, Merlin, Rhonda, and Touchstone Gold were of similar susceptibility. Ruby Queen was slightly less susceptible.



Control Tactics:

Conventional Options

Conventional fungicides are available for the control of CLS on table beet. Fungicides significantly increase the dry weight of foliage and extend the survival of leaves but do not affect the dry weight of roots and root shoulder diameter. Resistance to Group 11 strobilurin fungicides is common within *Cercospora beticola* populations. Use products from different fungicide resistance action groups to adhere to best resistance management guidelines.

Organic Options

There are also a range of effective products registered for the control of CLS in organic table beet production. In our research, Cueva (copper octanoate) + Double Nickel LC (*Bacillus amyloliquefaciens* strain D747) resulted in significantly improved disease control in comparison to either product alone and was equivalent to conventional fungicides.

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