

Spinach

Cercospora Leaf Spot

Howard F. Schwartz and David H. Gent

Identification and Life Cycle

Cercospora leaf spot is caused by the fungus *Cercospora betlicola*. The disease cycle is initiated by conidia disseminated by wind and splashing rain and irrigation water. Conidia germinate when humidity is high or free moisture is available under high (77 to 95°F) temperatures. The fungus sporulates optimally between 68 to 79°F and 90 to 100% relative humidity. The disease is highly influenced by weather conditions; plantings that mature in cool weather often escape severe infection. The fungus overwinters in infested seed and crop residues.

Plant Response and Damage

Cercospora leaf spot symptoms begin as small (0.1 to 0.2 inches in diameter), circular to angular, brown to dark green spots with a reddish brown margin form on older leaves. During periods of warm temperatures and high humidity or leaf wetness, tan necrotic spots on lower leaves will turn gray and lower quality or make the leaves unmarketable. The disease reduces spinach yield, quality, and marketability.

Management Approaches

Biological Control

No biological control practices have been developed for Cercospora leaf spot.

Cultural Control

Plant high quality spinach seed free from *C. betlicola*. Practice a three-year or longer rotation to nonhosts, such as small grains or corn. Avoid overhead irrigation, especially during humid, cloudy weather. Deeply bury crop residues soon after harvest to reduce pathogen survival and overwintering. Eliminate volunteer spinach, alternate hosts (mangel, red beet, Swiss chard, sugarbeet), and weeds (common lambsquarter, redroot pigweed, mallow, and bindweed) that can serve as Cercospora leaf spot inoculum sources. Reduce periods of leaf wetness by decreasing planting densities, orientating rows parallel to the prevailing wind direction, and avoiding overhead irrigation.

Chemical Control

Chemical controls are most effective when integrated with sound cultural control practices. Copper-based fungicides may leave unattractive residues on leaves and make them unmarketable.

Product List for Cercospora Leaf Spot:

Pesticide	Product per Acre	Application Frequency (days)	Remarks
Copper Fungicides—not all formulations available are listed			
Champ DP	1.33-2.66 lb	7-10 days	Can cause leaf flecking
Copper-Count-N	3 pt	7-10 days	Can cause leaf flecking
Cuprofix Disperss	2.5-4 lb	7-10 days	Can cause leaf flecking
Kocide 2000	1.5-2.25 lb	7-10 days	Can cause leaf flecking
Kocide 3000	0.75-1.25 lb	7-10 days	Can cause leaf flecking
Nordox	2-3 lb	7-10 days	Can cause leaf flecking
Nu-Cop 3L	1.33-2.66 pt	7-10 days	Can cause leaf flecking
Tri-Basic Copper	4 pt	7-10 days	1 day PHI
Neem			
Trilogy	2 pt	7-14 days	Maximum of 2 gallons per season; 0 day PHI
Potassium Bicarbonate			
Armcarb 100	2.5-5 lb	5-14 days	Apply in at least 20 gallons per acre; 0 day PHI
Strobilurin			
Amistar	2-5 oz	5-14 days	Maximum of 4 applications; rotate with a fungicide with a different mode of action; 0 day PHI
Quadris	6.2-15.4 fl oz	5-14 days	Maximum of 4

applications;
rotate with a
fungicide with a
different mode of
action; 0 day PHI

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