



# Septoria Leaf Spot of Field Hemp

Nicole Gauthier  
*Plant Pathology*  
*Extension Specialist*

Mostafa Rahnama  
*Plant Pathology*  
*Postdoctoral Scholar*

Kim Leonbergerr  
*Plant Pathology*  
*Extension Associate*

## IMPORTANCE

Septoria leaf spot is the most commonly reported leaf spot disease of field-grown hemp in Kentucky. This fungal leaf disease can rapidly spread throughout fields during periods of extensive rain or high humidity. Under extreme conditions, plants can lose 50% to 90% of leaves in the lower to mid-canopy. In some years, disease can be severe enough that processors reject shipments. No direct biomass or cannabinoid yield losses have been observed.



**FIGURE 1.** BROWN, IRREGULAR SPOTS WITH YELLOW HALOS ARE TYPICAL SYMPTOMS OF SEPTORIA LEAF SPOT IN HEMP.

## SYMPTOMS & SIGNS

Disease symptoms begin in lower leaves and within the inner canopy where leaf wetness and high humidity occur. Small irregularly shaped spots with bright yellow margins form on leaves. Spots expand to about ¼ inch in diameter and appear brown with a prominent yellow halo (FIGURE 1).

As spots enlarge, brown areas become more irregular and develop gray to white centers. Small, black structures (pycnidia) that resemble pepper flakes, may be present in spots (FIGURE 2). Yellow halos expand outward from spots. Advanced symptoms include coalescence of yellow areas and/or coalescence of brown spots. Entire leaves rapidly turn yellow and drop from plants (FIGURE 3). If disease becomes severe early in the season, plant stunting and loss of vigor is possible.

## CAUSE & DISEASE DEVELOPMENT

Septoria leaf spot is caused by *Septoria cannabis*. In general, *Septoria* spp. infect specific hosts or a specific group of hosts. For example, *Septoria lycopersici*, causing a leaf spot of tomato, affects tomato and other solanaceous plants, and *Septoria tritici*, which causes blotch of wheat, affects only wheat and grass hosts. *Septoria cannabis* is known to cause disease only in hemp.

Septoria leaf spot spreads by spores called conidia. Infective conidia develop within capsule-like structures called pycnidia, which contain several hundred conidia. When excess moisture is present, conidia are released from pycnidia in a curling, oozing formation (FIGURE 4). Conidia move short distances via rain splash and long distances by wind-driven rain.



**FIGURE 2.** SMALL, BLACK FUNGAL STRUCTURES (PYCNIDIA) INDICATE THE PRESENCE OF REPRODUCTIVE STRUCTURES.

**FIGURE 3.** ENTIRE LEAVES RAPIDLY TURN YELLOW AND DROP FROM PLANTS AS A RESULT OF SEPTORIA LEAF SPOT.

**FIGURE 4.** CONIDIA ARE RELEASED IN A CURLING, OOZING FORMATION UNDER MOIST OR WET CONDITIONS.



with low relative humidity, pycnidia may remain viable for up to 9 months in debris. In contrast, survival of pycnidia decreases dramatically in hot weather. When buried in soil, pycnidia survive less than 1 month.

Although alternative hosts have not been identified for *Septoria cannabis*, it is likely that weeds or another similar “green bridge” can also help the pathogen survive from one growing season to the next.

## DISEASE MANAGEMENT

### Cultural Practices

- Increase plant spacing to allow for improved air flow and rapid drying.
- Thin plants to allow for better air movement.
- Maintain plant health.
- Apply a mulch layer to limit movement of fungal structures.
- Deep till fields at the end of the season and again before planting to thoroughly bury debris.

### Fungicides

At this time, there are no conventional fungicides labeled for use on hemp. Biological products that include the active ingredient *Bacillus* (*Bacillus amyloliquefaciens*, *B. mycooides*, *B. subtilis*) have shown suppression in lab and greenhouse experiments. No field data is currently available.

Conidia are capable of creating new infections, with leaf spots developing in 7 to 10 days from the time of infection. When excess moisture or high humidity is available, fungal life cycles are shorter, and larger numbers of spores are produced. Thus, as canopies become denser and humidity increases, disease becomes more severe. During rainy summers, disease can spread rapidly through fields.

*Septoria* species can overwinter in fields on infected plants or in debris. Pycnidia serve as survival structures, protecting conidia from extreme environmental conditions such as desiccation. Under cool conditions

## ADDITIONAL RESOURCES

- Plant Pathology Extension Publications  
<https://plantpathology.ca.uky.edu/extension/publications>
- Kentucky Hemp Disease Website  
<http://www.kyhempdisease.com/>

**Editor:** Cheryl Kaiser, Extension Plant Pathology Support

**Photos:** University of Kentucky—Nicole Gauthier (1 & 3), Desiree Szarka (2 & 4)

*September 2021*