

Plant Pathology Fact Sheet

Cercospora Leaf Blight in Kentucky

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Importance

In most years, Cercospora leaf blight (CLB) is a minor disease problem in Kentucky soybeans. It is one of the more common “late-season” diseases, but usually comes in too little, too late to cause damage. However, in wet, late seasons like the one we experienced in 2009, significant yield and grain/seed quality losses can occur in fields that develop severe CLB before pod fill has completed.

Symptoms & Disease Development

CLB is caused by the fungus *Cercospora kikuchii* and is usually first noticed by producers when the upper leaves in the canopy begin to turn yellow (FIGURE 1), usually with a bronze tint. A close inspection of affected leaves reveals very small, dark lesions that are frequently on or near major leaf veins and on petioles (FIGURE 2). Symptoms on petioles are somewhat sunken in appearance. “Bronzing” is the result of a multitude of lesions that have coalesced (FIGURE 3). When symptoms are severe, the upper surfaces of affected leaves have a puckered, leathery appearance. Severely affected leaves are blighted and eventually



FIGURE 1. CERCOSPORA LEAF BLIGHT
 (PHOTO: D. HERSHMAN, UNIVERSITY OF KENTUCKY)

drop off the plant; diseased petioles may remain attached to the stem (FIGURE 4). Blighting of upper canopy leaves was rapid in some fields in 2009 due to the unusually wet late-season conditions. Some producers suggested that the visual impact was akin to frost injury or sunburn.

Pods are also commonly infected and both pods and seeds can have purplish discoloration (FIGURE 5). The purplish seed discoloration is known as “purple seed stain”. Extensive purple seed stain can reduce

grain marketability, and planting severely infected seed can result in stand reductions in subsequent soybean crops.



FIGURE 2. CERCOSPORA LEAF BLIGHT CLOSE-UP SHOWING INITIAL SYMPTOM EXPRESSION (SPOTS AND LESIONS). (PHOTO: D. HERSHMAN, UNIVERSITY OF KENTUCKY)

The pathogen produces a light-activated plant toxin called cercosporin. Cercosporin is red, which accounts for the tendency of diseased tissue to develop a purplish discoloration. The toxin causes plant cells to rupture and die, resulting in most of the symptoms observed.



FIGURE 3. THE "BRONZING" SYMPTOM IS THE RESULT OF MULTIPLE SMALL LESIONS COALESCING. (PHOTO: X.B. YANG, IOWA STATE UNIVERSITY)

The impact of CLB is highly variable and ranges from no significant impact to substantial yield and grain/seed quality reductions.

The foliar phase of the disease contributes the most to yield loss when the disease is extensive. The time of disease onset relative to crop growth stage, as well as the speed with which the disease develops, are the



FIGURE 4. A SEVERELY AFFECTED FIELD IN LOUISIANA. NOTE HOW THE DISEASED PETIOLES HAVE PERSISTED ON THE STEM EVEN AFTER THE LEAFLETS HAVE DEFOLIATED. (PHOTO: B. PADGETT, LOUISIANA STATE UNIVERSITY)

key factors that determine crop impact. If blighting occurs while pods are filling, then significant yield loss can be anticipated. However, if pod-fill is mostly complete prior to the onset of blighting, then damage will be minimal.

Disease Management

Past experience and observations suggest that most commercially available soybean varieties grown in Kentucky have at least some resistance to CLB, in spite of limited breeding efforts targeting the disease. However, no variety is immune. Fungicides can reduce CLB, but no fungicides are highly effective. In general, strobilurin fungicides (or mixtures containing a strobilurin) do a slightly better job than triazoles or thiophanate-methyl. Also, single applications applied at the R4 to R5 (full-pod to beginning-seed) growth stages tend to perform better than applications made at the R3



FIGURE 5. POD PURPLING AND "PURPLE SEED STAIN." (PHOTO: A. DORRANCE, OHIO STATE UNIVERSITY)

(beginning-pod) stage. Applications made prior to the R3 stage have little impact on CLB. Of course, multiple applications often perform better than single applications, but even then, results are not exceptional. Crop rotation and tillage of infested crop residue, prior to planting soybean, are of some value, but do not expect these measures to provide significant relief from CLB if conditions favor development.

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Additional Resources

- Kentucky Integrated Crop Management Manual for Field Crops: Soybeans, IPM-3 (2009)
<http://www.uky.edu/Ag/IPM/manuals/ipm3soy.pdf>
- Cercospora Leaf Blight (North Central Soybean Research Program, 2009)
http://www.planthealth.info/cercospora_basics.htm
- Purple Seed Stain and Cercospora Blight (University of Nebraska-Lincoln, 2009)
<http://pdc.unl.edu/agriculturecrops/soybean/purpleseedstain>