

Title

Plant Pathology Fact Sheet

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Northern Corn Leaf Blight

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INTRODUCTION

Northern corn leaf blight (NCLB) is a significant foliar corn disease in Kentucky. This disease has been damaging in the United States Corn Belt since the early 1900s (Carson, 2016), but has increased in severity and prevalence throughout the U.S., including Kentucky. This publication describes the symptoms and signs of NCLB, conditions that favor disease development, and management methods to reduce impact on yield.

FIGURE 1. EARLY LESIONS OF NORTHERN CORN LEAF BLIGHT CAN BE PALE AND HAVE A WATER-SOAKED APPEARANCE ON THE LESION EDGES.

FIGURE 2. MATURE LESIONS ARE ELLIPTICAL AND RUN PARALLEL TO LEAF MARGINS.



SYMPTOMS

Early symptoms of NCLB on a susceptible hybrid begin as small, cream-colored to gray lesions. Margins of these early lesions may have a water-soaked appearance (FIGURE 1). Approximately 1 to 2 weeks after infection, lesions become a tan or pale gray color. Mature lesions that characterize NCLB are elliptical (cigar-shaped), run parallel to the leaf margins, and are not restricted by leaf veins (FIGURE 2). These mature lesions can be 1 to 6 inches or more long (FIGURE 3) and often have dark-gray to greenish, dusty masses of fungal spores in the center of the lesion, giving it a dirty appearance (FIGURE 4A). These spores can be viewed in the field with the aid of a hand lens (FIGURE 4B) and can help distinguish NCLB from diseases with similar symptoms, such as *Diplodia* leaf streak. In severe cases, lesions can merge together across large areas of leaves (FIGURE 5).

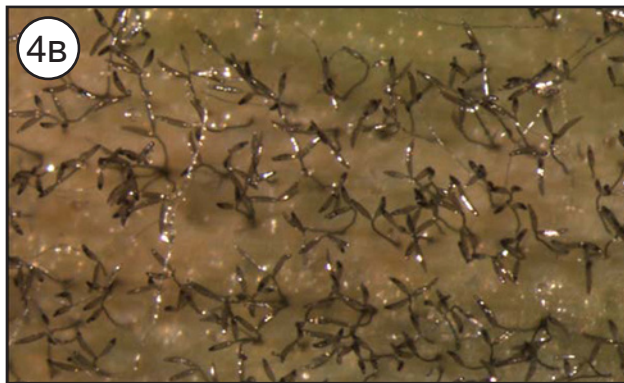


FIGURE 3. ON SUSCEPTIBLE VARIETIES, NORTHERN CORN LEAF BLIGHT LESIONS CAN EXPAND TO OVER 6 INCHES IN LENGTH.

FIGURE 4. FUNGAL SPORES IN THE CENTER OF A MATURE LESION CAN MAKE THE LESION APPEAR DIRTY OR DARK. **(A)** LESION WITH DARKENED CENTER AND **(B)** SPORES OF THE FUNGUS AS VIEWED WITH A HAND LENS.

FIGURE 5. SEVERE DISEASE CAN CAUSE EXTENSIVE BLIGHTING OF LEAF TISSUE.

FIGURE 6. LESIONS ON HYBRIDS WITH RACE-SPECIFIC RESISTANCE ARE USUALLY SMALLER. **(A)** LESION ON A HYBRID WITH RACE-SPECIFIC RESISTANCE AND **(B)** LESION ON A SUSCEPTIBLE HYBRID.

Symptoms of NCLB vary depending on hybrid resistance and races (genetic type) of the fungus that infects corn. Resistant reactions of corn hybrids may include fewer and smaller NCLB lesions, and/or lesions that are more yellow (chlorotic) in color when compared to lesions on a susceptible hybrid (FIGURE 6).

CAUSE & DISEASE DEVELOPMENT

Northern corn leaf blight is caused by the fungus *Exserohilum turcicum*. This fungus overwinters on corn residue; spores are dispersed from residue by rain and wind as temperatures increase in spring and early summer. Favorable conditions for infection include at least 6 hours of leaf moisture that can come from rain or heavy dew. Infection is favored by wet, humid environments with moderate to high temperatures (64° to 81°F). Lesions begin to form under these conditions as soon as 7 days after infection. Dry weather will slow the spread and development of disease.

Infections originating from residue typically produce lesions first on the lower leaves before tasseling (VT) and then further up the plant as the season progresses, with rain and wind aiding in spore dispersal. Wind-dispersed inoculum from other fields can cause lesions to appear in the upper canopy after tasseling and through senescence.

Yield loss from NCLB can be significant (as much as 30% to 50%) if lesions appear on the ear leaf 2 weeks before or 2 weeks after tasseling and conditions are favorable for disease development. NCLB appearance in the upper canopy late in the season has less impact on yield. If the disease is present in the upper canopy during early grain fill and becomes severe, it can reduce the photosynthetic capacity of leaves. This reduction in photosynthetic capability before grain fill is complete can cause the plant to draw on stalk reserves to finish grain fill, leaving plants prone to stalk rot and standability issues.

DISEASE MANAGEMENT

The best strategy to reduce yield loss from NCLB is by using multiple management methods, with an emphasis on disease management measures that prevent disease.

Cultural Practices

One of the most effective ways to manage NCLB is to plant hybrids that are less susceptible to the disease. Partial resistance and hybrids with race-specific (*Ht* genes) resistance are available, although what race-specific resistance would be needed to manage NCLB in Kentucky is not well-known. Research to characterize the race structure of *E. turcicum* has not occurred recently in Kentucky. Check with seed dealers to determine hybrid resistance ratings to NCLB and the source of resistance in a given hybrid.

Because corn residue serves as a source of inoculum for disease development, continuous corn and reduced tillage practices, such as no-till, increase the risk for disease. Crop rotation and good residue management can help reduce in-field sources of inoculum.

Fungicides

Fungicides are available in-furrow and in-season for NCLB management. When deciding whether or not to apply a fungicide, consider disease pressure, crop growth stage, hybrid disease resistance, environmental conditions, and economic factors. Current fungicides available for use in corn and their efficacy against NCLB can be found at the Crop Protection Network publication *Fungicide Efficacy Against Corn Diseases*.

ADDITIONAL RESOURCES

- Northern Corn Leaf Blight. In *Compendium of Corn Diseases* (4th ed, pp. 31-33) APS Press. <https://apsjournals.apsnet.org/doi/book/10.1094/9780890544945>
- Fungicide Efficacy Against Corn Diseases (Crop Protection Network) <https://cropprotectionnetwork.org/resources/publications/fungicide-efficacy-for-control-of-corn-diseases>.

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