

With many fungicide applications already underway, we do want to make our growers aware of the possibility of infection of Northern Corn Leaf Blight. While the forecast going forward does seem to favor the development of Gray Leaf Spot more so than NCLB, we still cannot dismiss some potential disease development while temperatures have been cooler over the last week.

What Is Northern Corn Leaf Blight?

NCLB is very similar to GLS in the fact that it does overwinter in crop residue, so continuous corn fields are more susceptible, as well as disease development begins in the lower canopy and spreads upward on the plant. NCLB does need cooler temperatures, below 80 degrees, while GLS needs 80 degrees or warmer. One of the key differences between these diseases is how they can be identified, Northern Corn Leaf blight forms long "cigar" shaped lesions that go through the leaf veins. This is much different than the Gray Leaf Spot Lesions that form a rectangle within the leaf veins.

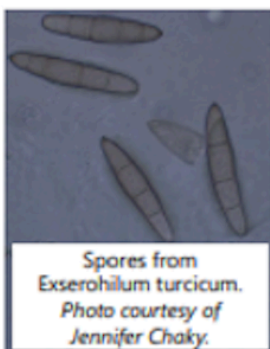
What Can We Do About it?

As we stated before the forecast should favor GLS over NCLB but regardless many of the fungicides we are already using have great control of both of these diseases. Varietal resistance is also a key part of potential infection but with such favorable conditions for one of these two diseases to develop widespread fungicide applications should be considered.

Northern Corn Leaf Blight

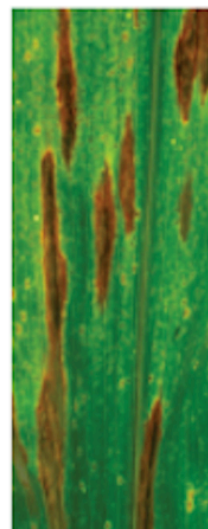
Pathogen Facts

- Northern corn leaf blight (NCLB) is a foliar disease caused by the fungus *Exserohilum turcicum*.
- Disease development is favored by moderate temperatures (64-81 °F) and extended periods of leaf wetness (6-18 hours).
- Heavy dew, overcast days, or humid field margins near tree lines can create an environment conducive for disease.
- *Exserohilum turcicum* overwinters in corn residue, allowing inoculum to build up from year to year.
- Cropping systems with reduced or no-till and/or continuous corn are at higher risk of northern corn leaf blight outbreaks.

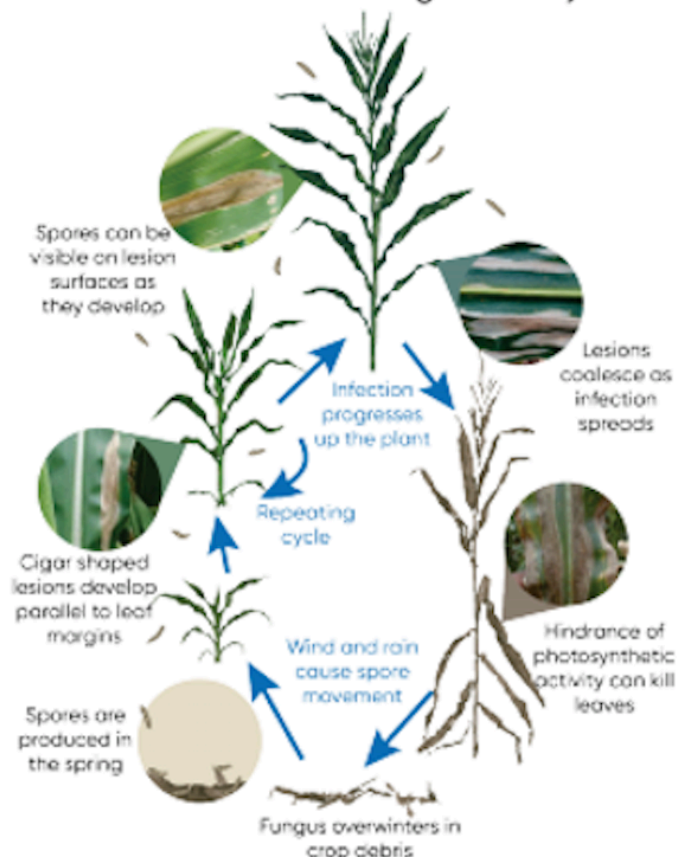


Identification

- Infections generally begin on lower leaves and progress up the plant, but infections may begin in the upper plant canopy when spore loads are high.
- Spores progress up the plant by wind or rain splash and may be carried long distances by the wind.
- With optimum conditions, lesions can form 7 to 12 days after infection.
- Lesions are unrestricted by leaf veins, beginning as elliptical and becoming long, narrow, and "cigar shaped".
- Coloration of lesions starts as tan or gray-green, and takes on a darker shade as *Exserohilum turcicum* sporulates.
- Spore coloration ranges from olive green to black, and can be visible with a hand lens. Lesions are often described as appearing "dirty".
- Lesions can coalesce to form large areas of necrotic leaf tissue, making leaves appear gray/burned.
- New lesions can produce spores in as little as one week, allowing northern corn leaf blight to spread much faster than many other corn leaf diseases.



Northern Corn Leaf Blight Life Cycle



Crop Damage

- Lesions on corn leaves hinder photosynthetic activity, reducing the amount of carbohydrates allocated towards grainfill.
- If lesions progress to the ear leaf or higher two weeks before or after tasseling and pollination, yield loss can occur.
- Yield losses are most severe when northern corn leaf blight infects corn plants early and progresses to the upper plant leaves by pollination or early ear fill.
- Yield losses up to 30% have been reported.
- Because a decrease in functioning leaf area limits photosynthates dedicated towards grainfill, the plant may mobilize more carbohydrates from the stalk to fill kernels, which can make plants more susceptible to stalk rots and lodging.

Figure 1. Life cycle of northern corn leaf blight *Exserohilum turcicum* in corn. Spores and lesions are enlarged to show detail.



Management Considerations

Cultural Practices

- *Exserohilum turcicum* overwinters in corn debris, so production practices such as tillage and crop rotation, that reduce the amount of corn residue on the surface, will decrease the amount of primary inoculum.
- However, reducing corn residue does not protect against spore showers carried into a field on wind currents.

Hybrid Resistance

- Planting hybrids with a high level of genetic resistance can help reduce the risk of yield loss due to northern corn leaf blight.
- Pioneer® brand hybrids and parent lines are improved through a screening process in areas with a high incidence of northern corn leaf blight and specialized "disease nurseries".
- Pioneer hybrids are rated for northern corn leaf blight resistance. Most hybrids are rated from 3 to 7 on the Pioneer 1 to 9 scale, where 9 indicates highly resistant.
- Susceptible hybrids are more likely to benefit from a foliar fungicide application.
- Two types of resistance are available in hybrids (Table 1).



Corn leaf of showing a mixed reaction to NCLB. The Ht1 hybrid shows resistance to Race 0 (yellow lesions in the center and in the left side of the leaf) and susceptibility to race 1 (the susceptible lesion on the right side of the leaf).

Table 1. Comparison between multigenetic and single Ht resistance.

Multigenetic Resistance	Single Gene "Ht" resistance
Non-race-specific	Race-specific
More stable over time	May be overcome in time
Reduces number of lesions on a leaf	Delays spore production, limits sporulation

Fungicides

- Several foliar fungicides are labeled for control of northern corn leaf blight (Table 2).
- Northern corn leaf blight may not always be controlled as completely as some other diseases. This is due to the more rapid life cycle, which may be as short as one week under favorable conditions.
- Because northern corn leaf blight sporulates so rapidly, it is more difficult to time a single fungicide application.
- Weather conditions anticipated during ear fill are a primary factor for disease development and often have the most impact (along with hybrid disease rating) on the profitability of fungicide applications.

Table 2. Fungicide efficacy for northern corn leaf blight (Wise, 2019).

Fungicide	Active Ingredients	NCLB Efficacy
DuPont™ Approach®	picoxystrobin	Very good
DuPont™ Approach® Prima	picoxystrobin + cyproconazole	Very Good
Headline®	pyraclostrobin	Very Good
Headline® AMP	pyraclostrobin + metconazole	Very Good
Quadris®	azoxystrobin	Good
Quilt® Xcel	propiconazole + azoxystrobin	Very Good
Stratego® YLD	prothioconazole + trifloxystrobin	Very Good
Trivapro®	benzovindiflypyr + azoxystrobin + propiconazole	Very Good



Corn leaves with large northern corn leaf blight lesions. Note how the coloration varies from gray-green to tan.

References

- Wise, K. 2019. Fungicide Efficacy for Control of Corn Diseases. Crop Protection Network.
- Wise, K. 2011. Northern Corn Leaf Blight. Purdue Extension.

