2019 Corn Disease Recap for Kentucky

Kiersten Wise-Extension Plant Pathologist

Corn Diseases were present across Kentucky in 2019, but overall levels were low to moderate in most areas. The delayed start to the season and early wet weather created a situation where corn in Kentucky was at higher risk for disease impact, however the weather at and after tasseling in many areas was hot and dry, and these conditions persisted into the fall, limiting yield loss due to disease. Most of our economically important corn diseases, like gray leaf spot and southern rust, need moisture and humidity to develop and spread, and dry weather slows their development. This was good news for many farmers that had other concerns about yield impacts, but it is important to remember that each year is a unique situation and 2020 may bring a different set of disease concerns.

Figure 1: Early lesions of Diplodia leaf Streak (photo by Kiersten Wise)

Overall, the major diseases observed in Kentucky corn were gray leaf spot, Diplodia leaf streak, northern corn leaf blight, southern rust, and some stalk and ear rots at the end of the season. Of these diseases, I want to focus on Diplodia leaf streak and southern rust and the impact of fungicide application as you plan for 2020.

Diplodia Leaf Streak

Diplodia leaf streak is a disease that has recently become more prominent in Kentucky corn. This disease was present in almost every field I scouted in 2019, and was at moderate to severe levels in some fields. The link between disease and yield loss has not been established, but this is one to pay attention to in 2020, and make sure it is accurately identified to document if yield loss due to this disease is occurring in your field. Diplodia leaf streak, caused by the fungus *Stenocarpella macrospora*, can be confused with gray leaf spot in the early stages of development, and northern corn leaf blight as it develops. Small, elongated lesions appear on leaves (Fig. 1), sometimes in the mid-canopy, which can help distinguish it from gray leaf spot, which typically appears in the lower canopy and progresses into the mid-upper canopy. The lesions will expand over time into streaks that are several inches or more long, which can look like northern corn leaf blight. Small black fungal structures may be visible in the center of the elongated lesions (Fig. 2). Currently, there are no fungicides labeled for Diplodia leaf streak, however we are conducting research at the University of Kentucky Research and Education Center to better understand how fungicides may work against this disease. The fungus that causes Diplodia leaf streak survives in residue and therefore rotation or residue management can help reduce disease in future years. More information on Diplodia leaf streak can be found in the UK Extension publication: http://plantpathology.ca.uky.edu/files/ppfs-ag-c-08.pdf

Figure 2: Fungal structures in elongated lesions of Diplodia leaf streak (photo by Kiersten Wise)

Southern Rust

Southern rust of corn, caused by *Puccinia polysora*, is an annual concern in Kentucky. This disease is characterized by orange pustules that form on the upper surface of the corn leaf (Fig. 3) The fungus that causes this disease does not survive winters in Kentucky, but moves north each year from Mexico, and states in the southeastern U.S. Therefore, the timing and onset of the disease from year to year is impossible to predict until we are in the growing season. If corn can reach milk stage (R3) before southern rust appears in Kentucky, there is likely to be little to no impact on yield. Also, if fields have already received a fungicide application, they are not likely to need a second application of fungicide once corn

Figure 3: Southern rust of corn (photo by Kiersten Wise)

reaches the blister (R2) growth stage. **In 2019, many fields already had fungicide applied prior to the onset of southern rust in Kentucky, which likely limited the impact of this disease.** More information on timing of fungicide applications for southern rust can be found in Table 2 of the Crop Protection Network publication "Southern Rust" which can be read here: https://cropprotectionnetwork.org/resources/publications/southern-rust. Real-time in-season monitoring of southern rust can be observed by checking https://corn.ipmpipe.org/southerncornrust/

Fungicide Application Response

Yield response to foliar fungicide application was mixed in 2019. Some of this is attributed to the dry weather that slowed disease development in the later part of the season. Gray leaf spot was present in the lower to mid canopy prior to tasseling and influenced some fungicide application decisions, however the dry weather limited disease development. Ultimately, the impact of disease on yield loss was not as severe as expected in some fields. While less disease is usually good news, this also means that foliar fungicide response may not have been as high as expected in certain fields. Hybrid, environment, and disease pressure all influence foliar fungicide response. **When disease levels are low, yield response due to foliar fungicide application may also be low.**

Fungicide application may be beneficial in certain situations, but this should be determined on a case-by-case basis in 2020. In general, fields with production practices that favor disease development are more likely to benefit from a fungicide application. These practices are:

1. Planting a hybrid susceptible to foliar diseases
2. Continuous corn
3. No-till or reduced tillage
4. Irrigated corn

Fields that have more than one of these practices are more likely to see a response from a fungicide application, but environment will be the driving factor in how severe disease will be in a given field. Fungicide efficacy of specific fungicide products for diseases are described in the updated fungicide efficacy table for management of corn diseases, which is developed by the national Corn Disease Working Group, and posted on the Crop Protection Network website: https://cropprotectionnetwork.org/resources/publications/fungicide-efficacy-for-control-of-corn-diseases