



Mississippi Corn Promotion Board 2022 Progress Report

Project

Title: **Evaluating the Mississippi State University Corn Hybrid Trial Program for Plant Diseases**

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Project Summary (Issue/Response)

Foliar diseases continue to be a potentially yield-limiting for the profitability of corn production in Mississippi. One of the best ways to manage diseases remains the use of disease resistant hybrids. However, data continue to be lacking on the response of commercially available corn hybrids to important diseases that regularly occur in the Mississippi corn production system including Curvularia leaf spot and southern corn rust. For the most part, Curvularia leaf spot remains a relatively “new” disease in the Mississippi corn production system. However, over the past several seasons we have been able to build a reliable series of disease observations to describe some of the more susceptible as well as resistant commercial hybrids. Farmers rely on these data to make decisions regarding the hybrids to plant on their farms. Determining the response of corn hybrids to plant diseases in the Mississippi corn production system is an important first step to providing corn farmers with valuable information as to the response of corn hybrids to potentially yield-limiting foliar diseases. Even though seed companies provide information on the hybrids sold in our production system, evaluating commercial offerings within our production system is important to determine how the environment impacts the incidence and severity of plant diseases and how those diseases may ultimately impact yield.



Project Results/Outcomes

During 2022, ten Mississippi State University official corn hybrid (OHT) trial locations were observed for the presence of naturally occurring foliar diseases. The only location that was not observed was Brooksville where severe drought stress made disease evaluations difficult. Each location was evaluated shortly after dent for the presence of economically damaging foliar diseases. Curvularia leaf spot, SCLB, southern rust at one location, and Physoderma brown spot. Curvularia leaf spot was the most commonly observed disease and was evaluated at all locations. Unlike in 2021 when southern rust was one of the diseases that could be evaluated, the drought that occurred reduced the levels of disease across the hybrid trial locations. As a result, southern rust was only observed at one location, in Lake Cormorant, and could only be evaluated since that particular location was planted a little later than normal. In general, even though Curvularia leaf spot was evaluated at all of the locations in 2022, the drought that occurred throughout the majority of the season reduced the amount of disease at dryland locations. Therefore, the disease at dryland locations will appear to be substantially reduced as compared to irrigated locations. Even though drought impacted the diseases that occurred during 2022, the information obtained from hybrid trials can provide farmers with valuable insight into the specific response of commercial hybrids in our corn production system.

Project Results

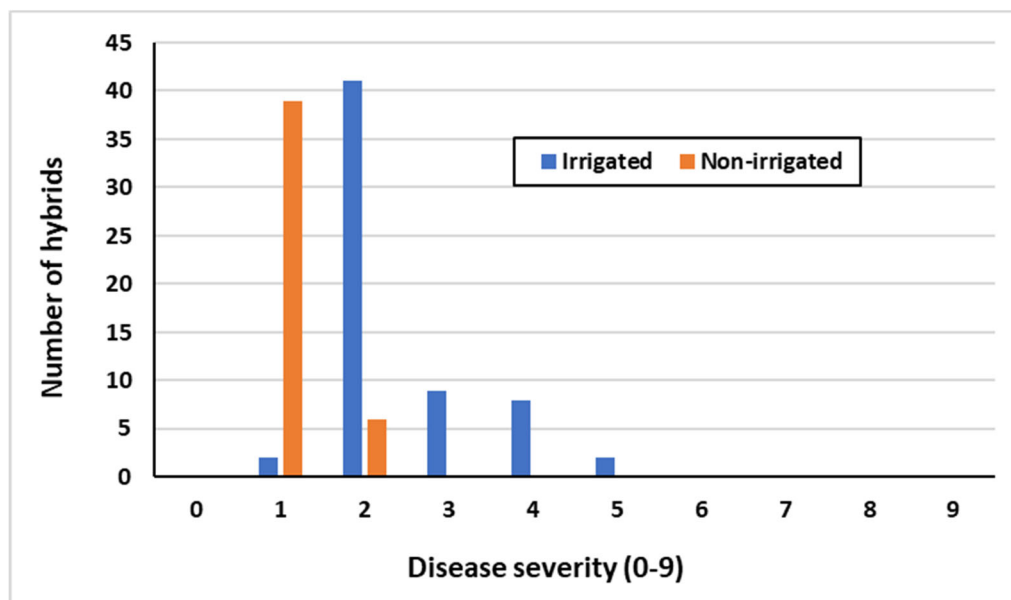


Figure. Frequency of hybrids contained in the irrigated and non-irrigated OHTs exhibiting Curvularia leaf spot in each evaluation category based on a 0-9 evaluation score where 0-3 essentially represents Resistant entries, 4-5 represents moderately-resistant entries, 6 represents moderately-susceptible entries, and 7-9 represents Susceptible entries. Drought stress that occurred during the season reduced the amount of observable disease at most locations. NOTE: frequency is based on the average of each hybrid evaluated at all locations that either represented the irrigated or non-irrigated locations.

Project Impacts/Benefits

Based on the results of the evaluations conducted during 2022, corn farmers in Mississippi can rely on these data to aid in selecting corn hybrids based on their response to Curvularia leaf spot from throughout the state. As one example from the 2022 season, Curvularia leaf spot was widespread throughout the production system. Observations were made at ten key OHT locations that suggested there were significant differences between the sensitivities of commercially available corn hybrids to the fungus that causes Curvularia leaf spot. Not only will these data aid corn farmers in making informed decisions as to the most resistant corn hybrids this may also provide valuable insight on the differences between commercial offerings over time. Since fungicides are not labeled to be used to manage Curvularia leaf spot these data are important to help guide hybrid selection in field situations where Curvularia leaf spot has been a historical concern, such as fields in a more continuous corn system.

Project Deliverables

Following the 2022 evaluations, two blog posts were developed to disseminate the information to the broader ag-related community as to the response of the hybrids in the MSU OHT program. One blog post covered the entries as evaluated at the irrigated locations (n=6) while the second blog post covered the entries as evaluated at the non-irrigated locations (n=4). Copies of the reports that were included on the blog were also included in the appendices of the proposal.