



Mississippi Corn Promotion Board 2024 Progress Report

Project

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

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Project Summary (Issue/Response)

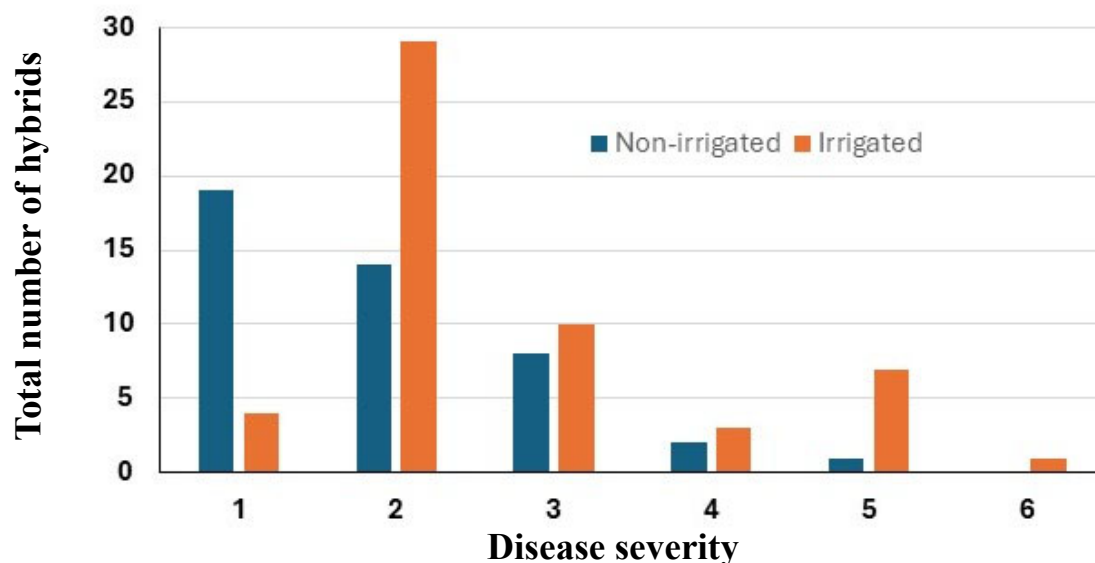
The foliar diseases that occur in the Mississippi corn production system continue to be a constant issue that have the ability to limit the profitability of corn production in Mississippi. One of the best ways to manage diseases are planting resistant hybrids. However, data are lacking on the response of commercially available corn hybrids to important diseases that regularly occur in the Mississippi corn production system including Curvularia leaf spot, Northern corn leaf blight, and southern corn rust. For the most part, Curvularia leaf spot remains a relatively “new” disease for Mississippi corn producers. However, over the past several seasons we have built a reliable disease observations database to describe some of the more susceptible as well as resistant commercial hybrids. Corn farmers rely on these data to make decisions regarding the hybrids to plant. Determining the response of corn hybrids to plant diseases in the Mississippi corn production system is an important first step to providing 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.



Project Results/Outcomes

During 2024, ten Mississippi State University official corn hybrid (OHT) trial locations were observed for the presence of foliar diseases. The only location that was not observed was Brooksville where dry conditions made observing symptoms prior to maturity difficult. Each location was evaluated shortly after dent for the presence of economically damaging foliar diseases as well as any additional issues. Curvularia leaf spot was evaluated at all locations except Rolling Fork where southern rust was the predominant disease. Even though southern rust has continued to be a persistent disease given the dry conditions that persisted throughout the season only Rolling Fork provided measurable disease data. Typically the presence of resistance within commercial germplasm to southern rust has not been observed for more than a decade when the last hybrid was sold with advertised resistance to southern rust. Overall, an extremely limited amount of southern rust occurred at each of the trial locations; however, evaluations were only deemed to produce meaningful data from one of those locations. As a result, the most meaningful data came from the observations of Curvularia leaf spot since this was the one disease that was consistently observed at all of the hybrid trial locations and there was good statistical separation between each of the hybrids evaluated when observations of Curvularia leaf spot were captured.

Project Results



Figures. Frequency response of the hybrids contained in the 2024 OHT program. Curvularia disease severity was averaged across all irrigated (n=5) and non-irrigated (n=5) locations and presented as an average of the severity of disease for each hybrid within a given severity category. Averages were based on each 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.

Project Impacts/Benefits

Based on the results of the evaluations conducted during 2023, corn farmers in Mississippi can rely on these data to aid in selecting corn hybrids that tend to be the most resistant to Curvularia leaf spot. In addition to evaluation data related to Curvularia leaf spot, one location provided exceptional differences in the relative amount of southern rust. Continuing to provide these types of valuable disease observations will greatly aid corn farmers in choosing hybrids with the best response to the specific diseases in our production system. In addition, continuing to evaluate commercial offerings in our production system will allow us to determine how great a threat diseases such as Curvularia leaf spot are to yield. At present, the hybrid trial observation data from the past five years continue to be analyzed and will aid in determining the specific yield loss potential associated with Curvularia leaf spot in the Mississippi corn production system.

Project Deliverables

Following the 2024 evaluations, two blog posts are in the process of development 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=5) while the second blog post covered the entries as evaluated at the non-irrigated locations (n=5).

In addition to the blog posts with the aid of the Mississippi Corn Promotion Board efforts have begun to work on a more comprehensive data analysis of the response of hybrids over the past five years to determine the impact of Curvularia leaf spot on yield and response of individual hybrids.