



Mississippi Corn Promotion Board 2013 Progress Report

Project Title: V5 corn fungicide applications for disease management and yield enhancement and late fungicide applications in the presence of disease to prevent yield losses.

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Project Summary (Issue/Response)

Fungicide applications continue to be marketed as providing a yield benefit when applied at vegetative growth stages or early reproductive growth stages regardless of the presence of foliar disease. In most cases where corn is planted in MS, foliar disease is not normally present at early developmental stages. However, unbiased sources of data don't exist regarding the effect of vegetative stage applications in the presence or absence of disease. Moreover, the greater MS data set of VT fungicide trials (2007-2009) in the absence of disease suggested that an automatic yield return should not be expected.

Some fungicide labels recommend a herbicide tank-mix when applications are made at vegetative growth stages to serve as the adjuvant (e.g., glyphosate). Therefore, trials (4 total; 59 treatments/location) were conducted in Stoneville and Schlater. Two trials each were conducted with and without glyphosate as a tank-mix at V5. The fungicides products included were the strobilurin products: Evito, Headline, and Quadris; the strobilurin + triazole products: Headline AMP, Quilt Xcel, and Stratego YLD; as well as Tilt. Fungicides were applied at a full label rate at V6, R1, and at V6 followed by (fb) R1. All treatments were randomized and replicated four times. Yield was collected from both locations and disease ratings were conducted in Stoneville. Stoneville served as a location with prior corn production (2008-2011) but a history of low foliar disease. Conversely, the Schlater location served as a location with an extensive history of corn production (7 to 8 years) and a repeated history of gray leaf spot (GLS). In addition, two large plot locations were added. Fungicides were applied at V6 in a replicated strip plot fashion and harvested to determine effect of the fungicide on yield.

Project Results /Outcomes

For ease of data interpretation/presentation, figures are grouped and presented by mode-of-action of each of the fungicide chemistries from each of the locations. In addition, figures are only presented in this report from the applications made without glyphosate. with the results from both trials (application strategy: with or without glyphosate). However, differences between particular treatments that received a fungicide + glyphosate at V5 compared to the same fungicide without glyphosate should not be made since trials were conducted separately even though application date/timing were the same.

Shellmound, MS (corn hybrid: DeKalb 66-94; fungicides applied at V5 and R1)

Plots were sprayed on time and hand-harvested at the end of the season. Generally speaking, fungicide applications made at the vegetative timing with the strobilurin and pre-mix products did not positively influence yield. However, the application using the triazole product resulted in a 5.6 bu/A increase over the untreated check. In fact, the stand-alone triazole application resulted in the best yield performance regardless of application timing (Figure 1A).

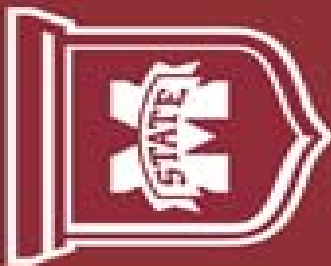
Stoneville, MS (corn hybrid: NK N78N; fungicides applied at V5 and R1)

Common rust, northern corn leaf blight (NCLB) were the two diseases observed throughout the season. As opposed to 2012, NCLB was severe in some plots and the majority of the response to fungicides was a result of the presence of the disease. Only the pre-mix application at V5 resulted in no positive yield response (Figure 1B).

Large plot trials (V6)

Two large plot replicated strip trials were conducted in east MS to determine the impact of a vegetative stage fungicide application on disease and yield. At both locations a vegetative fungicide application did not result in a positive yield response (Figure 2).

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Project Results

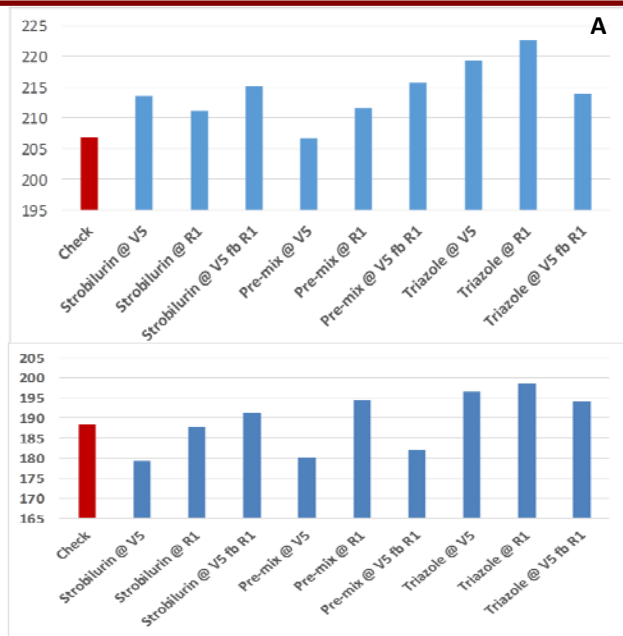


Figure 1. Yield (bu/A) following fungicide application from **A)** Stoneville, MS and **B)** Schlater, MS. For ease of presentation, chemical class and timing are grouped together.

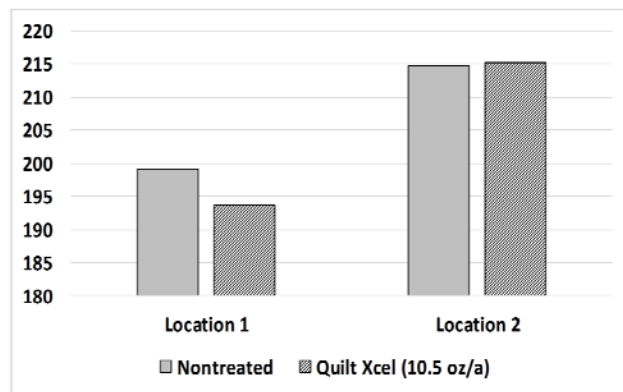


Figure 2. Yield (bu/A) following fungicide application with Quilt Xcel (10.5 fl oz/A) from two large plot replicated strip trials conducted in eastern MS during 2013.

Project Impacts/Benefits

MS corn farmers should have an unbiased source of information regarding the role of fungicide applications in the absence of foliar disease at vegetative growth stages. In most cases, foliar diseases are more of a concern when corn reaches reproductive growth stages since corn leaf protection is extremely important at advanced developmental stages. However, in situations where excessive inoculum may be present or in environmental situations where cooler conditions prevail, such as occurred during 2013, foliar disease can occur at earlier developmental stages triggering the need for a fungicide application. In some specific situations, to prevent the likelihood of excessive yield loss, particularly in fields where continuous corn production has occurred, a carefully timed fungicide application could result in an economic benefit especially if susceptible hybrids are planted. But, early fungicide applications are typically not suggested since limited trials have been conducted in MS and between the two years when trials have been conducted (2012 and 2013) different results have occurred. Additional research trials during 2014 could provide additional data and benefit farmers by either suggesting that an automatic fungicide is or is not necessary.

Results from these experiments should aid in the specific placement of fungicide applications in **A)** situations where continuous corn production and disease susceptible hybrids are planted and may benefit from a vegetative fungicide application, **B)** provide information to farmers regarding the potential benefits of tank mixing fungicides with herbicides at vegetative timings, and **C)** provide valuable insight into the economics behind automatic fungicide applications in the absence or presence of particular diseases (specifically GLS and NCLB) in the MS corn production system. In addition, results from the late-fungicide applications made in the presence of extreme GLS pressure (Schlater, MS) and NCLB (Stoneville, MS) should aid our farmers in deciding what will be economically beneficial in their particular production system.

Project Deliverables

To date, three presentations have been made regarding some of the preliminary data from the trials: Stoneville corn and soybean field day (July 18, 2013), MS Delta Ag Expo (January 22, 2014), and MS Crop Consultants Meeting (February 4, 2014).

Several Plant Disease Management Reports are currently in progress to be published regarding the data collected over the two years.

