



# Mississippi Corn Promotion Board 2012 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)

Over the past several years, fungicide applications have been marketed as providing a yield benefit when applied at vegetative growth stages in the absence of disease. In most cases, foliar disease is not normally present at early developmental stages unless the field has a history of continuous corn where disease has been identified. However, little data exists 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 Shellmound. 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 V5, VT/R1, and at V5 followed by (fb) VT/R1. In addition, a half-rate application of each product was made at V5 fb VT/R1. All treatments were randomized and replicated four times. Disease ratings and yield were collected at both locations in addition to SPAD readings (a measurement of leaf chlorophyll content) from the Stoneville location. Stoneville served as a location with prior corn production (2008-2011) but a history of low foliar disease. Conversely, the Shellmound location served as a location with an extensive history of corn production (6 to 7 years) and a repeated history of gray leaf spot (GLS).

In addition to claims of yield benefits following fungicide application, fungicides are oftentimes suggested to reduce such phenomena such as green snap which occurs when high, straight-line winds damage corn plants prior to tassel. Typically, the stalk will break below the point where an ear forms as a result of the damaging wind. Some particular corn hybrids are reported to have a "brittle stem" that increases the likelihood of green snap. Fungicide applications at vegetative growth stages have been reported to prevent green snap; however, little data exists regarding this topic.

## Project Results/Outcomes

For ease of data interpretation/presentation, figures are presented 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.

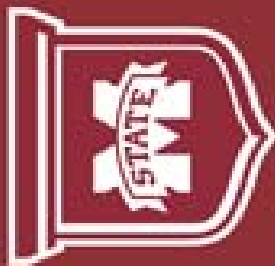
### Shellmound, MS (corn hybrid: Pioneer 1184; fungicides applied at V5 and R1)

A wind event occurred on June 11, approximately 20 days post-V5 application, and as a result excessive green snap occurred. All corn stalks in the middle two rows of each plot were counted and averaged to determine a percent green snap/plot ((average of green snapped stalks/total stalks)\*100%). In summary, fungicides, regardless of a.i., rate, or V5 application strategy did not prevent green snap. Percent green snap per plot ranged from 1.5 to 40% (Figure 1). The occurrence of GLS was rated approximately 21 days post -V5 application. Fungicide application with ( $R^2=0.6739$ ,  $CV=34.16$ ,  $LSD=1.0$ ,  $p$ -value < 0.0001) or without glyphosate ( $R^2=0.6009$ ,  $CV=34.04$ ,  $LSD=0.99$ ,  $p$ -value < 0.0001), significantly reduced GLS symptoms compared to the untreated (data not presented).

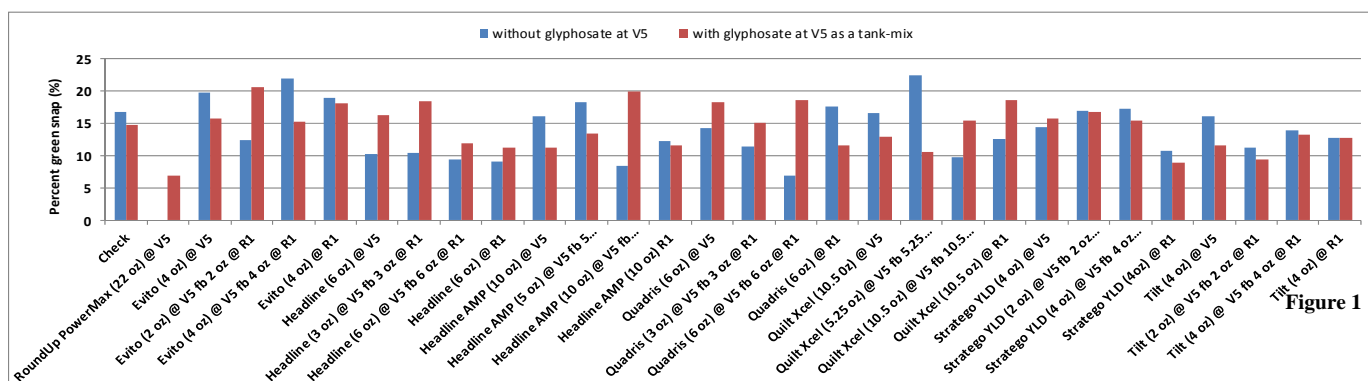
### Stoneville, MS (corn hybrid: NK N78N; fungicides applied at V5 and R1)

Common rust, northern corn leaf blight, and southern rust were observed; however, the frequency of disease was much less than one on a scale of 1-9 (data not presented). Significant differences in yield between the untreated and fungicide treated plots occurred; however, there were differences between application strategies (Figure 2).

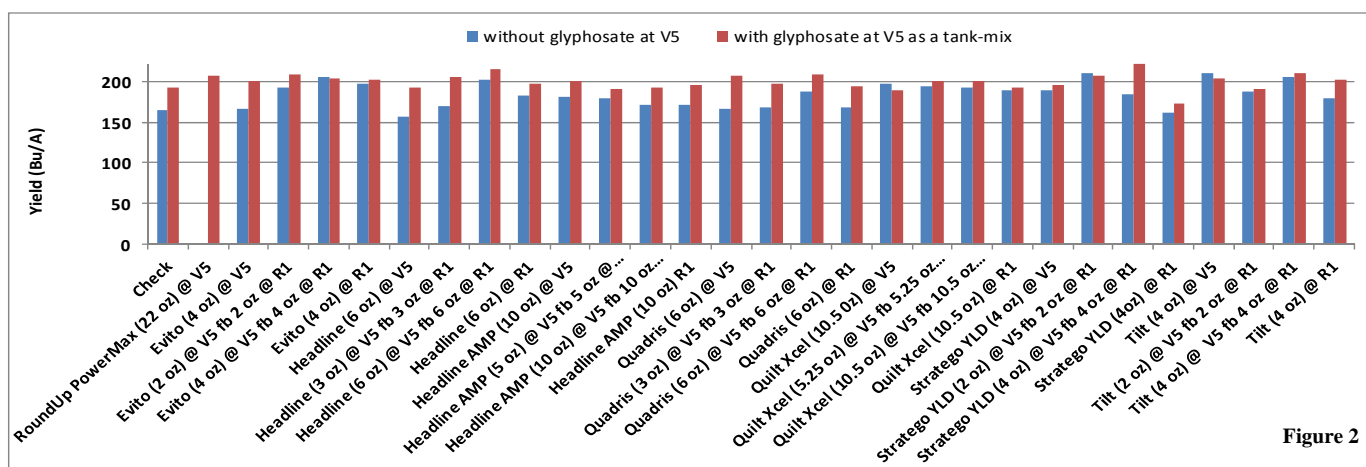
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# Project Results



**Figure 1.** Percent green snap (%) ratings from Shellmound following the V5 fungicide application. Note, the R1 fungicide had not yet been applied.



**Figure 2.** Yield (Bu/A) from Stoneville. Even though, data are presented in one figure the trials were conducted separately. Statistics: without glyphosate ( $R^2=0.4679$ ,  $CV=11.61$ ,  $LSD=31.46$ ,  $p$ -value 0.003); with glyphosate ( $R^2=0.4018$ ,  $CV=7.05$ ,  $LSD=20.42$ ,  $p$ -value 0.0261).

## Project Impacts/Benefits

MS corn farmers need information regarding the role of fungicide applications in the absence of foliar disease symptoms at vegetative growth stages. In most cases, foliar diseases are more of a concern when corn reaches reproductive growth stages since protecting corn leaves at the ear leaf and above is most important. However, in situations where excessive inoculum may be present, as can be the case in continuous corn systems that rely on minimum or no-till, foliar disease can occur at vegetative growth stages depending on the environmental conditions. 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 trials have not previously been conducted to determine their effect. The research conducted during 2012 will provide insight into the role of vegetative stage fungicide applications in two different environments.

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) in the MS corn production system. In addition, results from the late-fungicide applications made in the absence of disease as well as extreme GLS pressure should aid our farmers in deciding what will be economically beneficial in their particular production system.

## Project Deliverables

To date, two presentations have been made regarding some of the preliminary data from the trials: Stoneville corn and soybean field day (July 19, 2012), MS Delta Crop Summit (November 13, 2012).

