Mississippi Corn Promotion Board
2014 Progress Report

Project Title: V5 corn fungicide applications for yield loss prevention

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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. At vegetative growth stages yield-limiting foliar diseases are generally not observed and the need for a fungicide at early growth stage timings is essentially non-existent. However, data originating from unbiased sources has generally been limited 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 by a timed fungicide application.

Some fungicide labels recommend a herbicide tank-mix when fungicide applications are to be made at vegetative growth stages to serve as the adjuvant (e.g., glyphosate). Therefore, since 2012 fungicide trials were conducted at two distinctly different locations (Schlater 2012 & 2013; and Stoneville 2012-2014). For the purposes of this report, the six trials conducted in Stoneville over the three years will be highlighted. Two trials each were conducted with and without glyphosate as a tank-mix at V5. The fungicides applied included the strobilurins: Evito, Headline, and Quadris; the strobilurin + triazole products: Headline AMP, Quilt Xcel, and Stratego YLD; and the triazole: 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 trials and disease ratings were conducted.

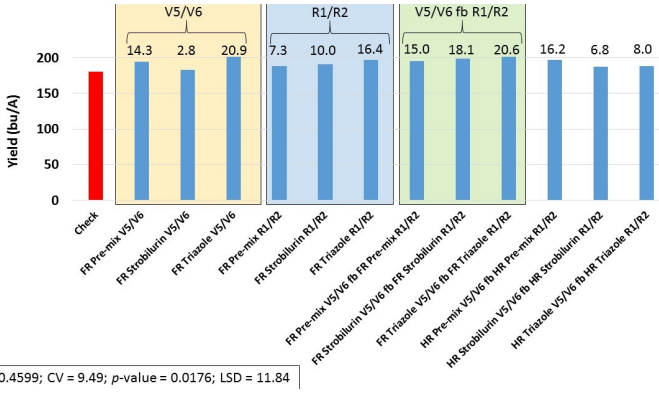
Project Results/Outcomes

For ease of interpretation/presentation, figures are presented by fungicide mode of action (e.g., pre-mix, strobilurin, triazole) and only from the Stoneville location. Data were combined across the three years of the trial to determine the overall benefit of each of the specific fungicide treatments. 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.

In general, in the trials conducted without the herbicide, and averaged over all three years, the V5/V6 application with a triazole (as 4 oz of Tilt) produced a significant yield benefit compared to the nontreated check. A stand-alone triazole application also provided the most yield benefit at the R2/R2 timing. Moreover, in the double application, V5/V6 fb R1/R2, the triazole provided the greatest yield benefit. However, in the trials conducted with the herbicide as a tank mix component at the V5/V6 timing, the fungicide applications, regardless of timing or product were not near as beneficial in the trials conducted without the herbicide component at the single timing.

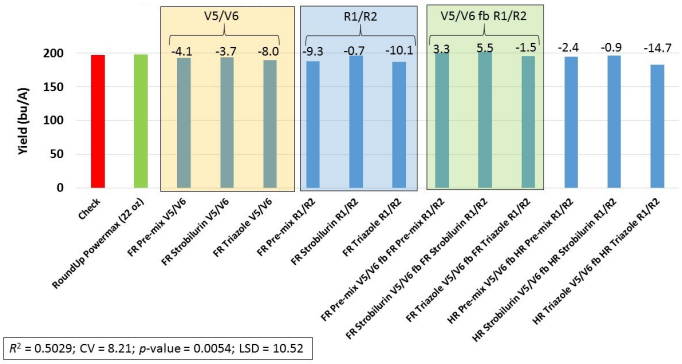
Project Results

Figure 1. Fungicides applied without a herbicide (RoundUp PowerMax) in Stoneville, MS.



R^2 = 0.4599; CV = 9.49; *p*-value = 0.0176; LSD = 11.84

Figure 2. Fungicides applied with a herbicide (22 fl oz/A of RoundUp PowerMax) in Stoneville, MS.



R^2 = 0.5029; CV = 8.21; *p*-value = 0.0054; LSD = 10.52

Legend:

Pre-mix products = Headline AMP, Quilt Xcel, Stratego YLD
Strobilurin products = Evito, Headline, Quadris
FR = full rate of associated fungicide product (fl oz/A) (Evito 4 fl oz, Headline 6 fl oz, Headline AMP 10 fl oz, Quadris 6 fl oz, Quilt Xcel 10.5 fl oz, Stratego YLD 4 fl oz, Tilt 4 fl oz)
HR = half rate of the associated fungicide product

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 and more specifically information regarding whether or not the vegetative applications would beneficial in our corn production system. In most cases, foliar diseases are a greater concern when corn reaches reproductive growth stages. During reproductive growth stages it is imperative to protect the ear leaf and leaves above. 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. But, in these specific situations, early fungicide applications are typically not suggested since trials have not previously been conducted to determine their effect and the environment will dictate whether or not a disease occurs. The research conducted during this three project will help corn producers decide if a vegetative fungicide application would be beneficial in their production system.
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 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, numerous presentations have included data from the above outlined trials. More specifically: Stoneville corn and soybean field day (2012, 2013, and 2014), MS Delta Crop Summit (November 13, 2012). In addition, numerous blog articles have been drafted with the associated material and posted on the Mississippi Crop Situation Blog (www.mississippi-crops.com).

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