2010 Foliar Fungicide Application to Soybean Trial Protocol

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The objective of this trial is to determine the effect of a foliar fungicide application on disease control and yield of soybean across Indiana. The specific intent behind this project is to better understand if yield benefits can be attributed to strobilurin fungicide applications across several environments within the state. This protocol outlines project design, implementation, and assessments required for this field scale, on-farm research.

Due to the complications of spraying more than one fungicide product in a field for comparative purposes, we will suggest that each on-farm location use only one fungicide product in the trial. Please select a fungicide containing a strobilurin mode of action, such as Headline, Quadris, or Stratego. Ideally, we would like an even distribution of trials across each region in the state examining different products (for example: 3 trials each with Headline, Quadris, and Stratego in the NW region of the state). While this approach will not allow us to directly compare product efficacy and yield results, it will increase the odds of success by not overly complicating the logistics of product application, and it will allow us to compare trends across regions.

This trial will target producers who will be able to obtain and utilize all of the necessary inputs and field equipment required to conduct the trial. Coordinating (Purdue) personnel will provide assistance with trial establishment, complete disease assessments, and work with the producer to obtain trial background information and aid in harvest and yield estimates. Purdue will not be able to provide chemical products or other inputs required for the trial.

The trial should be set up with plot lengths running the length of the field. Each plot should be a minimum of 350 feet long, and be the width of one spray pass (60-120 ft). Harvest data will be taken from a single combine header width swath out of the center of the plot (Table 1). The extra space on each side of the harvested area will serve as buffer space that will eliminate any confounding of data due to spray drift.

Table 1. Plot width and harvested area for different spray boom widths.

Sprayer boom width	Combine header width*	Plot width
60 ft	30 ft	60 ft, harvest center 30 ft
90 ft	30 ft	90 ft, harvest center 30 ft
120 ft	30 ft	120 ft, harvest center 30 ft

*If combine headers are different than 30 ft, contact Kiersten to determine the final harvested plot width.

The trial will consist of two treatments:

1. Selected fungicide, applied at labeled rate, with the recommended surfactant at the R3 growth stage
2. An unsprayed control

These treatments will be randomized and replicated within the field. We would like a minimum of three replications within a field, with four to six replications being the preferred number. Replication is necessary to enable the mathematical statistical analyses of the plot data. An example of the field layout is shown in Figure 1. Trial cooperators should work with producers to determine trial layout, and obtain accurate records of actual applications. If possible, cooperators should mark the plots with flags or stakes to ensure ease of treatment identification for disease ratings and harvest.

Figure 1. Example of a randomized, replicated plot layout for a trial examining foliar-applied fungicide applications to soybean. The order of the treatments within the replicate may change, but they should be arbitrarily assigned (no bias or yield map should be used when assigning treatments), and each replicate must contain both a fungicide treatment and an unsprayed control treatment. If a 90 foot spray boom is used, the total width of this example trial in the field will be 720 ft.

With the assumption that the sprayer used for such a trial will be equipped with GPS-enabled lightbar navigation (or possibly GPS-enabled autosteer navigation), we suggest that the applicator run the sprayer through both the fungicide and control plots in every replicate for two reasons. First of all, running both plots will eliminate the necessity of flagging the plots prior to the application (though you will want to flag the middles of the plots afterwards to facilitate harvest navigation). Secondly, running both plots in each replicate will impose the same amount of tire traffic in each plot and, thus, eliminate one minor source of yield variation in the harvest data.

Rep 1	Plot 1	Fungicide at R3 application
	Plot 2	Unsprayed control
Rep 2	Plot 3	Unsprayed control
	Plot 4	Fungicide at R3 application
Rep 3	Plot 5	Unsprayed control
	Plot 6	Fungicide at R3 application
Rep 4	Plot 7	Fungicide at R3 application
	Plot 8	Unsprayed control

Two disease assessments are needed for each plot in the trial. The first disease assessment should be taken one day prior to fungicide application, and the second should be taken when soybean has reached the late R5-early R6 growth stage. If the fungicide application is delayed after the first assessment is taken, another disease assessment will be necessary prior to the actual application. The disease

assessments will provide data that will help determine if any resulting yield increase due to a fungicide application can be attributed to disease within the plots. Each plot should be rated for disease incidence and severity. The person rating the disease should walk a "W" in each plot, stopping at each point of the W and rate 5 plants for disease, for a total of 25 plants/plot. The ratings should include the incidence (presence) of each foliar disease noticed, and also the severity of disease on the plant (amount of plant affected). Please also note if fields are affected by soil-borne diseases such as SDS, white mold, etc. Data collection sheets and disease assessment training will be provided.

Standard weed control and other production practices should be followed in the trial. Accurate yield estimates are necessary for this trial. We can provide assistance with yield monitor calibration, and data collection to ensure accurate results.