

## BECK'S SOYBEAN FUNGICIDE PROJECT - 2009

Beck's Hybrids Practical Farm Research conducted soybean fungicide research trials throughout Illinois, Indiana, Ohio, and Kentucky. These fungicide trials were developed to analyze the performance of fungicides at growth stages of R2 through R4. Weather data was collected at each trial site to monitor leaf wetness, humidity, temperature, and rainfall using a weather station shown in Figure 1. Over 30 Beck's Hybrid's customers participated in this study, allowing PFR to expand fungicide research to a greater capacity.



**Headline**<sup>®</sup>  
fungicide

**STRATEGO** 

Figure 1. Beck's Hybrid's Weather Station

The protocol for this study required each trial site to spray a fungicide beginning at R2 growth stage. Thereafter, fungicide applications were made weekly through the R4 growth stage. Products used in this study were Headline<sup>®</sup>, a strobilurin fungicide manufactured by BASF, and Stratego<sup>®</sup>, a strobilurin/triazole combination fungicide manufactured by Bayer CropScience. As producers made weekly fungicide applications, weather data was summarized and calculated for a period of seven days for each treatment, with the spray date being the nucleus. Yields of each week's treatment were then calculated and compared for general fungicide performance and correlation to any weather variables at 32 locations.

Typical fungicide costs in Beck's 2009 studies averaged \$16.40/A. Combined with \$5.50/A. ground application cost, break-even yields for fungicides were 2.3 Bu./A., considering \$9.55/Bu. soybeans. Evaluating all thirty two locations in our four state study, (Figure 2.) highest fungicide gains for both fungicide products occurred at the R2 growth stage with average yield increases of 2.4 Bu./A., falling just over break-even yields. R3 applications gave similar yield responses of 2.2 Bu./A. and R4 fungicide applications only saw yield increases of 1.4 Bu./A., thus both growth stages encountered

negative returns on investment. Indiana showed R2 applications proved more positive, while Illinois and the Southern location resulted in more profitable returns at R3 growth stage.

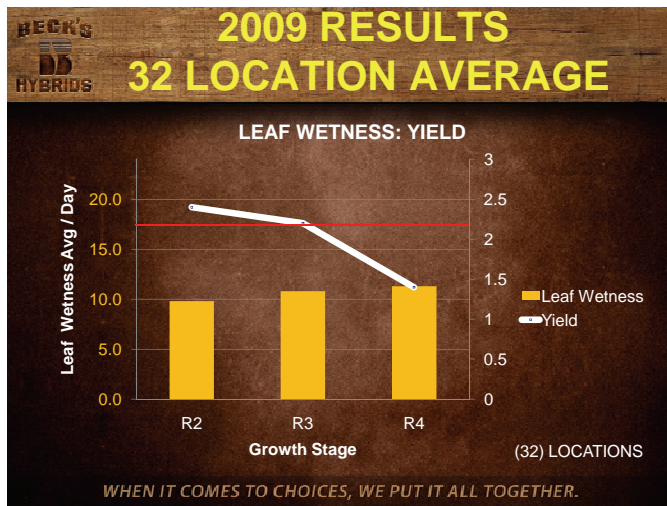


Figure 2. Four State Average Fungicide Yields

Leaf wetness values were very high on average and did not differ much from each growth stage. Disease levels on average were very low and few reports indicated that leaf diseases were apparent. Illinois reported areas of Sclerotinia White Mold disease, and one trial location was lost due to the variability that the disease caused. Overall, even though moisture levels were very high in most trial locations, disease pressure was very low. Low average daily temperatures may have been the reason why more leaf diseases did not develop in the high moisture conditions. Both temperature and moisture are two components of the disease triangle, but temperature was not normal due to a record cool summer. With leaf wetness values as high as they were this year, what growth stage was most beneficial to spray a fungicide? Given low variation of leaf wetness and the general high levels, R2 and R3 growth stages outperformed R4 in most situations. Although overall average leaf wetness values from our weather stations did not indicate the ideal time to spray a soybean fungicide, certain trial locations did in fact reveal that leaf wetness could possibly be a factor in determining when or if to spray a soybean fungicide. Figure 4 shows a trial location in East Central Illinois where Stratego was sprayed from R2 – R4 growth stages. Dry soil conditions persisted in the early R2 growth stages with leaf wetness values averaging only 3 hours/day. However, as rainfall and leaf wetness levels increased to nearly 10 hours/day, yields were elevated near 2.5 Bu./A.

Leaf wetness data was analyzed at all trial locations (Figure 2.) and all three growth stages averaged very high levels of 9.8, 10.8 and 11.3 hours/day, indicating that the soybean leaves in the canopy were in fact wet for a lengthy period of the day. The purpose of evaluating leaf wetness values is to determine if high leaf moisture levels in the canopy could be an indicator of a favorable environment for leaf disease outbreaks.



Figure 3. Leaf Wetness Sensor and Data Logger

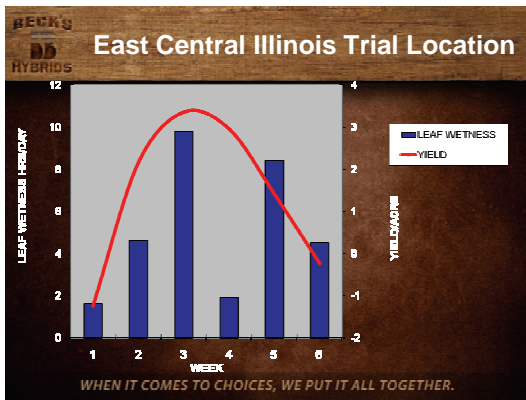


Figure 4. East Central Illinois Trial Location

applied during these dry stages, no yield response was noted. As rainfall entered into the R4 growth stage, fungicide application were in fact able to increase yields up to 3 Bu./A. This is a prime example of how weather and/or environmental conditions can factor into leaf disease and fungicide application management.

Another trial location in Kentucky revealed similar yield results (Figure 5.) where the highest leaf wetness values occurred during the R3 growth stage. Yields in this study ranged from 5 – 12.2 Bu./A., with R3 offering the highest yield response from Headline fungicide. Very few trial locations offered stressful environments due to droughty conditions. However, Figure 6 illustrates a study located in Ohio that revealed very dry conditions during the R3 and R4 growth stages. As Stratego fungicide applications were

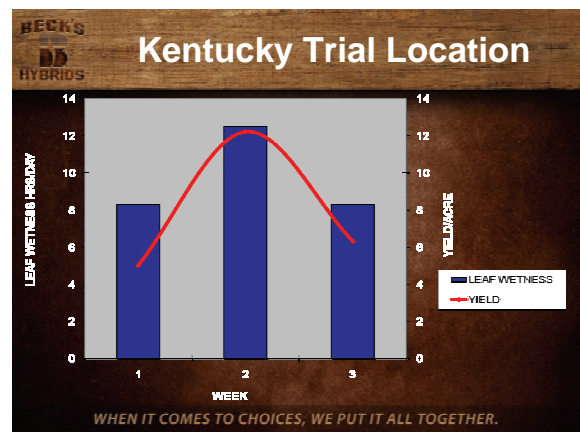


Figure 5. Kentucky Trial Location



Figure 6. Ohio Soybean Fungicide Response to Rainfall

Currently, more research needs to be done to fully realize the correlation, if any, between leaf diseases, weather data, and fungicide yield response. This study in Beck’s Practical Farm Research shows that work is being evaluated to determine the value and economics of soybean fungicide applications. Thank you to the many Beck’s Dealers, Customers, and District Sales Managers who participated in this project.