Fungicide Aggregate Report, Soybeans 2018

Introduction

Use of foliar fungicides in soybeans has been shown to improve crop health in soybean varieties susceptible to various fungal diseases. This improvement in crop health can result in a 2.6 bushel per acre increase in yield. When insecticide was included in treatment, response increased to 5.3 bushels. (Pioneer) Many factors must be considered before choosing to apply a foliar fungicide. These include current and forecasted humidity levels, amount of rainfall, and type and amount of residue from the previous crop. Additionally, type of disease present is important in soybeans. Diseases originating in the root system will not be controlled with fungicides. Neither will diseases stemming from bacterial or viral diseases such as bacterial blight or soybean vein necrosis.

Fungicides will be effective on fungal diseases for 14-21 days after application. Applications are usually timed to ensure this timeframe for protection falls between pod set and maturity to protect the reproductive stages of the growing season. Generally, we shoot for applications around R3, which is the start of pod development. Some research from the University of Illinois suggests that a single application at R3 is just as effective as two applications at R3 and R5. Other research from BASF suggests that two fungicide applications are beneficial. We wanted to discover what the average response in our geography is. Over the past 4 years, we have tested fungicide trials across the county to see what kind of response we can see in a typical year.

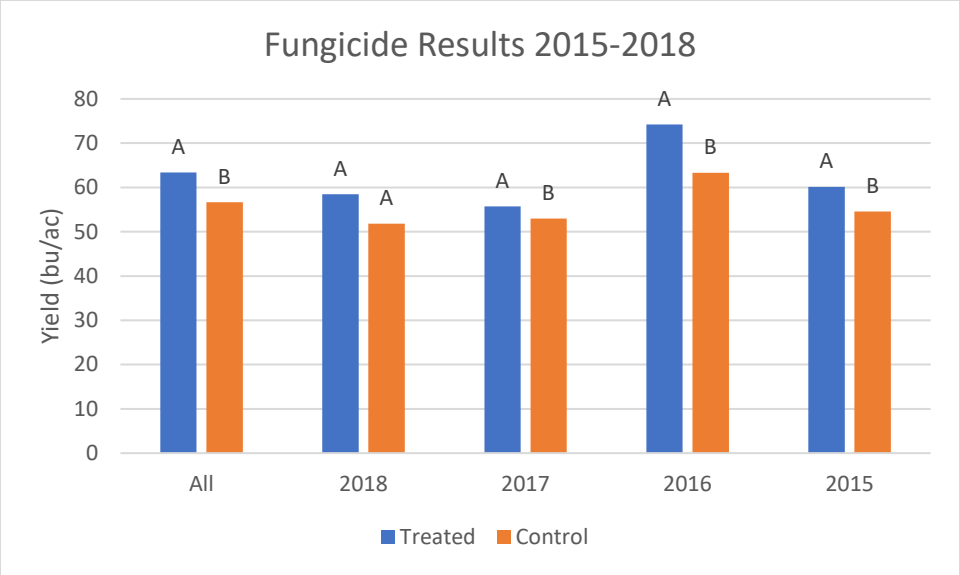
Setup

Side by side trials of fungicide treatments and no fungicide treatments were set up in 2015, 2016, 2017, and 2018. Its important to note that the trials in our studies, as well as many national studies, include an insecticide in the treatment. The results we see are the compounding effects of both fungicide and insecticide. Plots were paired strips at multiple field sites across the county; yield was collected with calibrated yield monitors. Six plots were analyzed in 2015, eight sites in 2016, seven sites in 2017, and three sites in 2018. Results were analyzed using a randomized complete block design with each field site considered a separate replication. Mean separation was performed with Tukey's HSD.

All Years Results

Yield

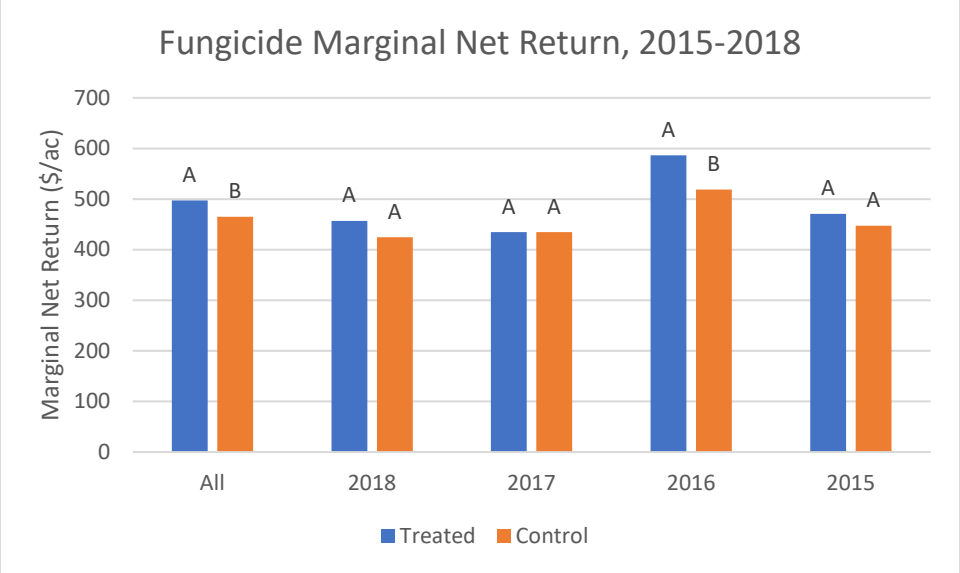
When aggregating the results from the last four years, we see that our fungicide treatment averaged 63.35 bushels, while our control treatment averaged 56.68 bushels. We are 99% confident that the difference in these results is due to the treatment and not any other variability in field conditions, management practices, or environmental variation.



Marginal Net Return

Marginal Net Return of treatments was calculated based on $22.50 product and application cost, assuming an average of $12 for fungicide treatment and $6 for insecticide treatment. Additionally, a $4.50 application fee was assumed to account for the average of aerial vs ground application costs. Application costs for no treatment were assumed to be $0.

The marginal net return for the treated groups were $496.99 while the marginal net return for the untreated control group was $464.77. To pay for the cost of treatment, approximately 2.7 bushels are needed. The average yield of the treatment group was 4 bushels above the breakeven bushels and resulted in an additional $32.22 in marginal net return.



2015 Results

When looking at 2015's results alone, we see that while we did have a 5.5 bushel increase by applying fungicide, we did not have a statistical difference in marginal net return. This is likely because in several cases, although the treatment yielded more, it did not yield consistently high enough to cover the cost of treatment resulting in marginal net returns that barely broke even, were less than control, and were higher than the control.

2016 Results

In 2016, the treatment yielded 11 bushels higher than the control treatment. Additionally, we had a marginal net return that was $67/acre higher for the fungicide treatments. It was quite profitable to apply fungicide in 2016.

2017 Results

Yield results in 2017 showed a 2.7 bushel advantage to the fungicide treatment. This is the exact amount of bushels needed to break even. Consequently, the marginal net return was the exact same for both treatments at $434 per acre. It did not hurt or help to put on fungicide in 2017.

2018 Results

In 2018, there was no difference between the treated and control yields. While numerically there appears to be a difference in yield, there was too much variation in the results to determine if this yield difference was due to the treatments. Similarly, there was no difference in marginal net return between the treatments. While there was a $32.26 per acre numerical difference between treatments, we are less than 80% sure that those results are because of the treatments and not just noise from soil, environment and experimental error.

Summary

When we look at an aggregate of all the years, we have a yield increase of over 6.5 bushels per acre. Similarly, we have an increase in marginal net return of over $32 per acre. However, when we look year by year, the results are a little different, likely due to influence of weather and pest pressures from year to year. In three of the four years analyzed there was a difference in yield between treatments. Only in 2018 was there no difference in yield between treatments. Concerning marginal net return, there was no difference in treatments in three of the years. Only in 2016 did we see a difference in marginal net return between treatments of over $67 per acre.

In the long run, it appears that the yield between treatments is fairly consistent. With this in mind, applying fungicide yearly should be a priority. When considering return on investment, keep in mind that while totaling all four years resulted in an increase in marginal net return, year by year results only showed that it paid to apply in a single year. It is important to consider your fungicide a long term investment.