

## **Soybean Yield Response to Foliar Fungicide and Boron with Nitrogen Blend**

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Mark Badertscher, OSU Extension – Hardin County

### **Objective**

Determine soybean yield response to foliar fungicide and boron with nitrogen blend.

### **Background**

A producer wanted to understand if fungicide, fungicide with boron, or fungicide with boron and nitrogen blend increased soybean yield. Information was provided to him by an industry retailer that by adding foliar applied boron or boron with nitrogen blend would increase yield. However, it was unknown by the producer if this was true, and if it was, would the economic impact of applying boron or boron with nitrogen blend would pay the extra input cost of this micronutrient and nitrogen blend? It was suggested by the industry retailer that this micronutrient and nitrogen blend would enhance yield when applied at the same time as a fungicide application.

### **Methods**

The experiment was a randomized complete block with five treatments and three replications. The first treatment was a check with no fungicide, no boron, and no nitrogen blend. The second treatment was fungicide applied only. The third treatment was fungicide plus 24 ounces of boron with nitrogen blend. The fourth treatment fungicide plus 12 ounces of boron. The fifth treatment was fungicide plus 24 ounces of boron. The treatments were applied at R3. The fungicide used was Revytek, manufactured by BASF was applied at the rate of 8 ounces per acre. Revytek has three modes of action, including Groups 3, 7, and 11. The foliar fungicide does not control Sudden Death Syndrome.

The soybean variety was Stewarts 3731XF, which has a good disease rating of 5 for Phytophthora Root Rot, 4 for Frogeye Leaf Spot, 5 for Sudden Death Syndrome, and 3 for Stem Canker. Boron was applied as a 5% solution at the rate of both 12 and 24 ounces per acre. Foliar nitrogen was applied as a 5% Boron/1% Nitrogen blend solution at the rate of 24 ounces per acre. The plots were 120 feet wide and field length. The field was scouted at R2, R5, and R7 for disease and insect pressure using leaf area affected by disease infection or insect defoliation, as well as general plant health as determined by leaf appearance. The center passes of the treatment strip plots were harvested for grain yield using a calibrated yield monitor with actual yield and moisture. The statistical analysis used was ANOVA. This study was conducted in the 2022 growing season.

## Results

Scouting at R2 indicated brown spot was low and Fusarium seedling rot was low with the field showing less than 5% insect defoliation and no weeds. One possible concern was a manganese deficiency in an area of the field. Scouting at R5 indicated low infections of brown spot in the bottom portion of the canopy, bacteria blight, and Sudden Death Syndrome (SDS) with less than 5% insect defoliation and few weeds. Scouting at R7 indicated low to medium bacteria blight and SDS with 10% insect defoliation. The field had little weed pressure over the growing season. These ratings were based on subjective quantification. The LSD was 4.0 and so there was not a significant difference in yield with the different treatments in this study as compared to the control.

See table below.

Table 1. Soybean Yield Response to Foliar Fungicide and Boron with Nitrogen Blend (bushels/acre)		
Treatment	Moisture %	Yield (bushels/acre)
Check	8.9	74 a
Fungicide	8.8	75 a
Fungicide + 24 oz BoronRX (N)	9.1	79 a
Fungicide + 12 oz Boron	9.0	75 a
Fungicide + 24 oz Boron	9.1	76 a
C.V. = 3.3%		LSD (0.1) 4.0

## Summary

There was no significant difference in yield or grain moisture at harvest between all treatments; foliar fungicide, foliar fungicide plus boron at both the 12-ounce and 24-ounce rates, or foliar fungicide plus 24 ounces of boron with nitrogen blend as compared to the check across all replications of this trial. As a result, there would be no positive economic impact to apply these foliar products. It should be mentioned that there was low disease pressure in the field, so the results could be different if there were higher levels of disease pressure. In this case, this would suggest that further studies would be recommended.

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## For more information, contact:

Mark Badertscher  
Hardin County OSU Extension Educator  
1021 W Lima Street, Suite 103  
Kenton, Ohio 43326  
badertscher.4@osu.edu