Trial Type: Crop Protection
Growing Season: 2025

Project Objective: This research is investigating the interactions of using a foliar applied fungicide, insecticide and chitosan on soybean yields, as well as the economic returns of using these tools to protect soybean yields.

Project Insights:

1. There was not a significant yield difference between the combined fungicide and insecticide versus fungicide alone.
2. Average yield results were higher for all products tested over the untreated control.
3. Chitosan did not show a significant response across all sites in the project.
4. Aside from Sudden Death Syndrome, little disease and insect pressure was observed.
5. Follow Integrated Pest Management (IPM) principles when making fungicide application decisions.

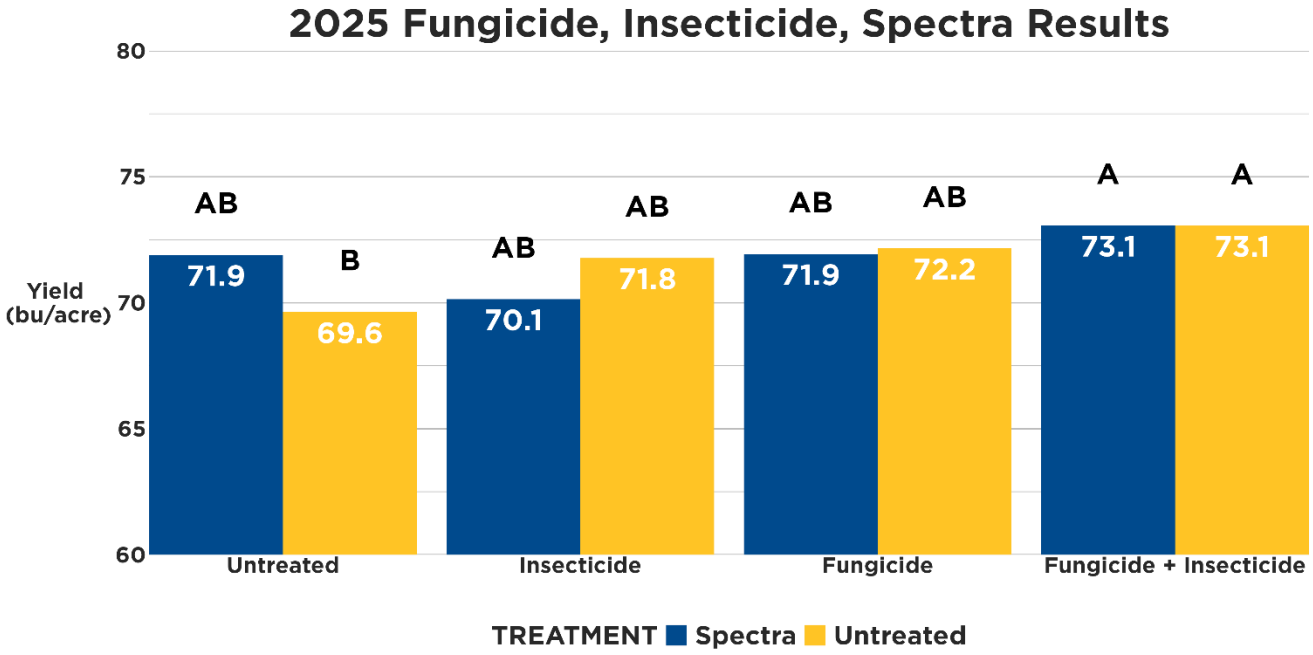


Figure 1. Yield results for 2025 comparing fungicide, insecticide and chitosan. Letters indicate yield groups.

2025 Project Discussion

With soybean prices continuing to be down, farmers are looking at their overall management programs and considering what inputs may be an option to cut. Iowa Soybean Association (ISA) has conducted fungicide trials in previous years looking at several different products but had not looked at how an insecticide in combination with the fungicide would perform. This has also been a key question over the years, and one that we wanted to investigate in 2025. In addition to the fungicide and insecticide products, a

biostimulant chitosan product called Spectra (Tidal Grow AgriScience) was included to test the efficacy of these types of products in combination with the fungicide and insecticide applications. Across all sites, a significant response was seen with the combination of fungicide and insecticide, with or without Spectra, compared to the untreated control (Figure 1). Fungicide and insecticide pairings for this project included Miravis Neo and Asana XL, Revytek and Sefina, or Veltyma and Sefina following labeled rates (Table 1). Ten sites (Figure 2) were established across the state looking at the fungicide alone, insecticide alone, combination of the two and an untreated control. The Spectra biostimulant product was applied over half of each block at a rate of 16 oz/acre. All sites were aerially applied using a drone at beginning pod (R3 growth stage). Following application, scouting of all sites occurred at beginning seed (R5 growth stage) to evaluate disease and insect control. Disease ratings were scored on a 1-5 scale with 1 indicating no or very little disease present and 5 indicating greater than 85% leaf coverage.

In 2025, weather conditions at the proposed sites set expectations for the development of disease later in the season. However, field scouting showed very low pressure of the economically significant diseases we had hoped to find (Frogeye Leaf Spot, Septoria Brown Spot, White Mold) but an abundance of Sudden Death Syndrome (SDS) at 6 of the 10 sites. Given that foliar fungicides are not effective against SDS, suppressed yields were observed at those sites but affected all treatments.

Like disease pressure observed, insect pressure was relatively low across all sites in the project. The most common insects observed during the R5 scouting event were stink bugs and Japanese beetles but at levels below economic threshold.

Fungicide	Manufacturer	Group	Rate (oz/acre)
Miravis Neo	Syngenta	7, 3, 11	13.7
Revytek	BASF	3, 7, 11	15
Veltyma	BASF	3, 11	10

Insecticide	Manufacturer	Group	Rate (oz/acre)
Asana XL	Valent	3A	9.6
Sefina	BASF	9D	3

Table 1. Fungicides and Insecticides used in the 2025 project with respective parent company, group and application rate.

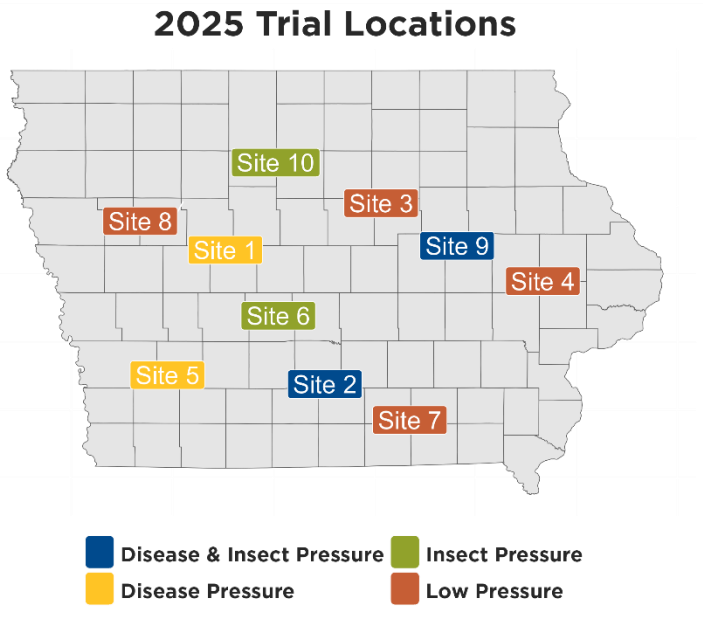


Figure 2. Site locations in 2025 with disease and insect pressure levels.

Fungicide and Insecticide Results

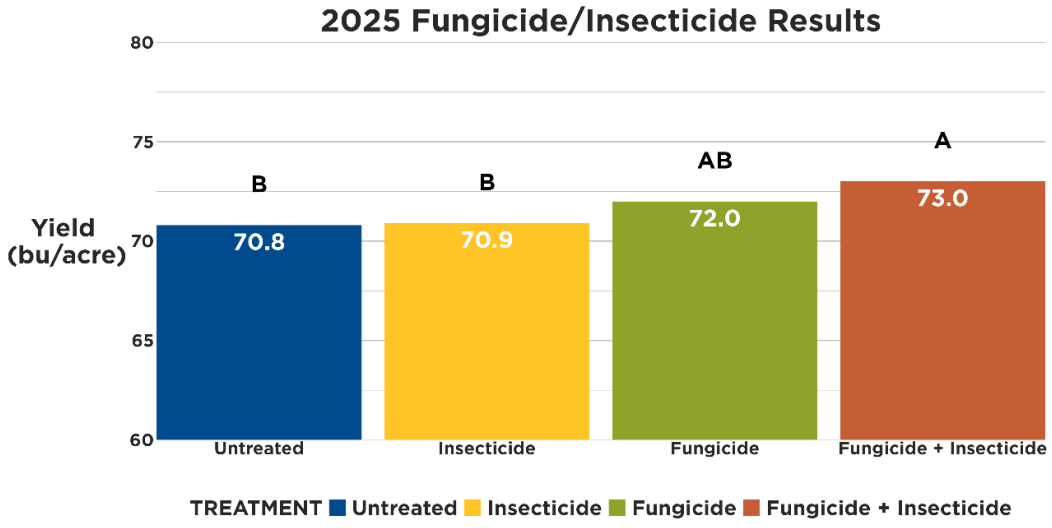


Figure 3. Yield results comparing fungicide alone, insecticide alone, combination of both, and untreated.

Across all locations, a statistically significant response was seen with the combined fungicide and insecticide application compared to the insecticide alone and untreated control (Figure 3). Because the common practice includes spraying foliar products over the entire field and not targeted areas, disease and insect ratings were averaged across all treatments at each site to find a single rating. Sites were categorized based on the average disease rating observed in the field (Figure 2), where anything below a 1.5 rating was categorized as little or no disease pressure (6 sites) and anything above 1.5 rating was categorized as disease (4 sites). Across all sites with a disease present, average yield showed 3.1-3.3 bushel advantage for treatments that included a fungicide product (Figure 4). Even at sites where little or no disease was present, the inclusion of a fungicide showed a 0.2-1.5 bushel advantage.

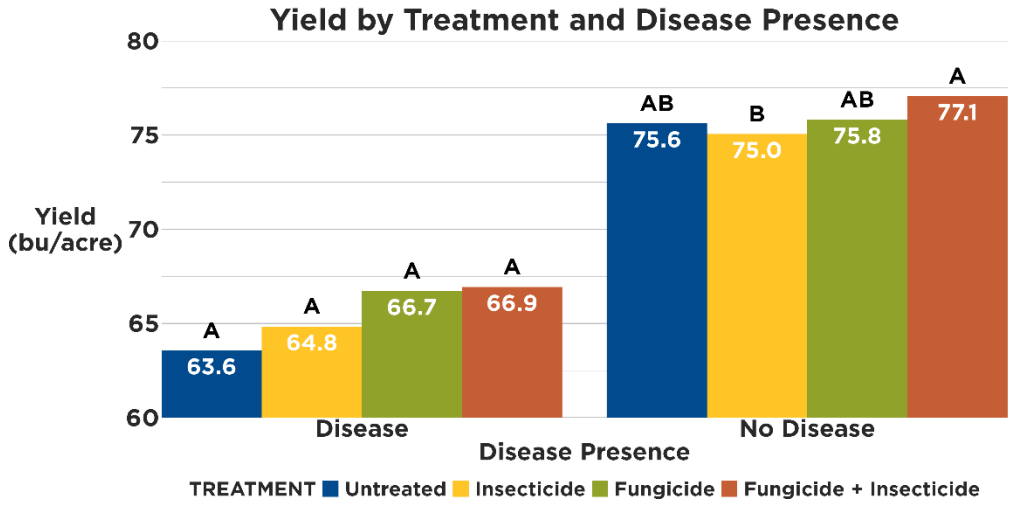


Figure 4. Comparison of treatments under observed disease presence. Letters indicate yield groups within each disease group.

Across all sites, there was little insect pressure observed. Like disease ratings, insect ratings were averaged for each site and then categorized (Figure 2) based on an average rating of 1, little or no insect pressure (5 sites), or greater than 1 where insect pressure was observed (4 sites). Across all sites with noted insect pressure, a significant yield difference was observed between the combined fungicide and insecticide application and insecticide alone (Figure 5). At sites where there was little or no insect pressure observed, positive yield response was seen with the combined application, but this was not significant.

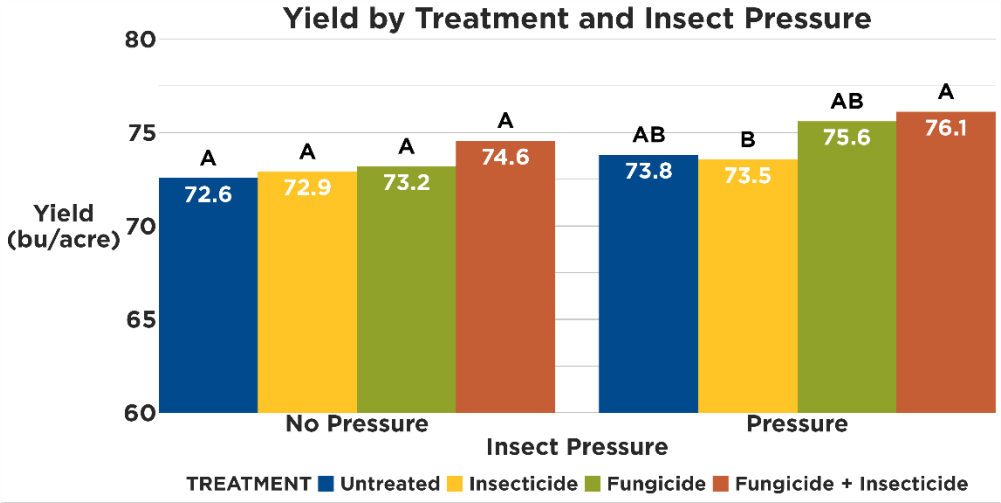


Figure 5. Comparison of treatments under observed insect presence. Letters indicate yield groups within each insect group.

While most sites during scouting showed either presence of disease OR insect pressure, there were 2 sites (Figure 2) where both were observed at higher levels. Looking at just these sites (Figure 6), we found that the combination of fungicide and insecticide, as well as the fungicide alone had a statistically significant yield response over the insecticide alone and untreated. With little difference between the combination and fungicide alone (0.2 bushel), it appears that fungicide was the important product behind the yield response.

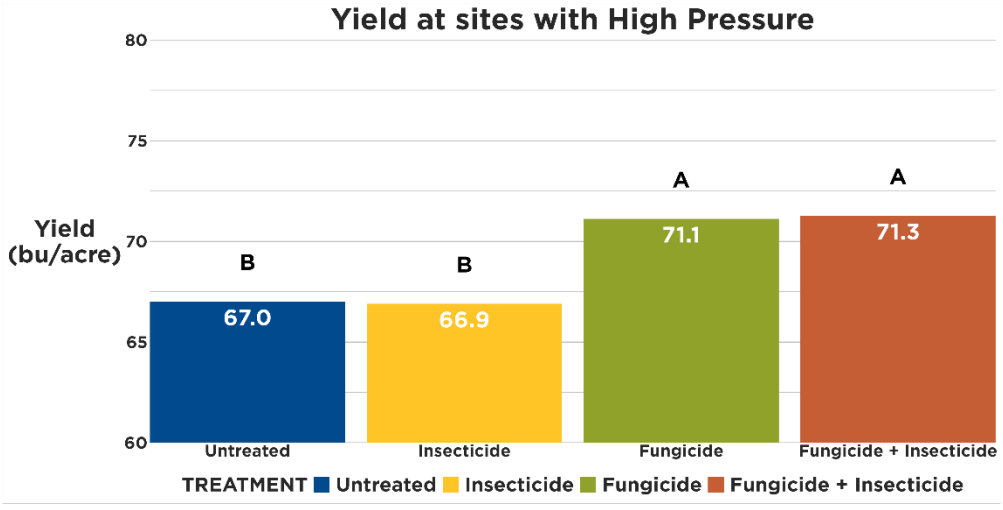


Figure 6. Comparison of treatments at sites with both disease and insect pressure. Letters indicate yield groups.

Tidal Grow Spectra

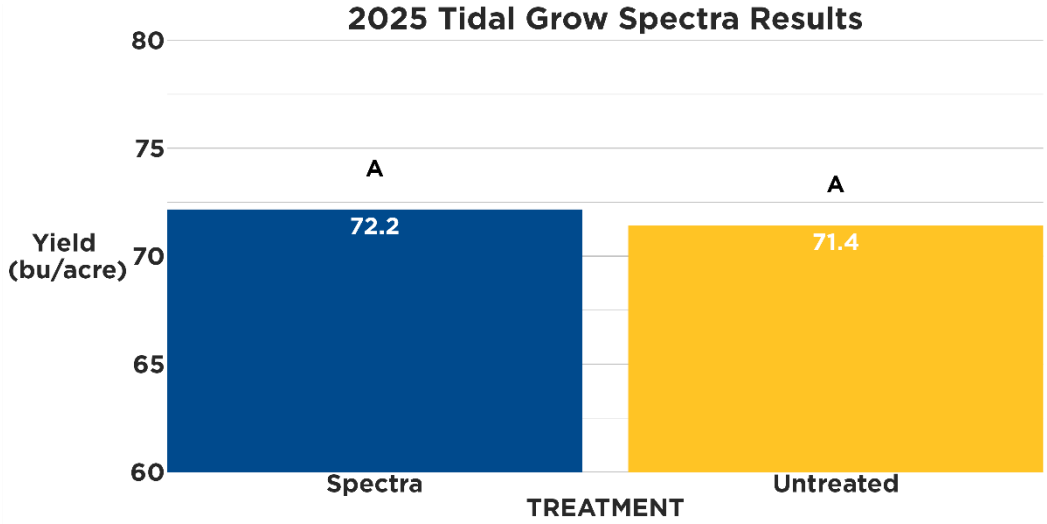
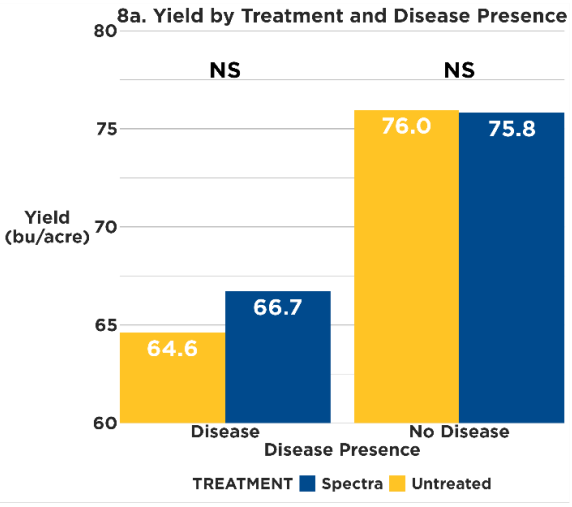


Figure 7. Yield results comparing Spectra and untreated. Letters indicate yield groups.

In addition to the fungicide and insecticide products, a biostimulant chitosan product called Spectra by Tidal Grow AgriScience was applied over half of the plot to evaluate the interaction with the other products and yield response. This product was applied on the same day as the fungicide and insecticide application for each site. Across all locations, we did not see a statistically significant response with the chitosan product (Figure 7). Using the same method as the fungicide and insecticide analysis, sites were divided based on the average site ratings for disease and insect pressure observed (Figure 2). While there was a positive yield response (2.1 bushels) with the use of Spectra on sites with disease pressure (Figure 8a), there was little difference at sites with no disease observed. Similarly, there was little difference between treatments when looking at insect pressure levels (Figure 8b). At the 2 sites that showed disease and insect pressure, no yield differences were observed between the Spectra and Untreated treatments.



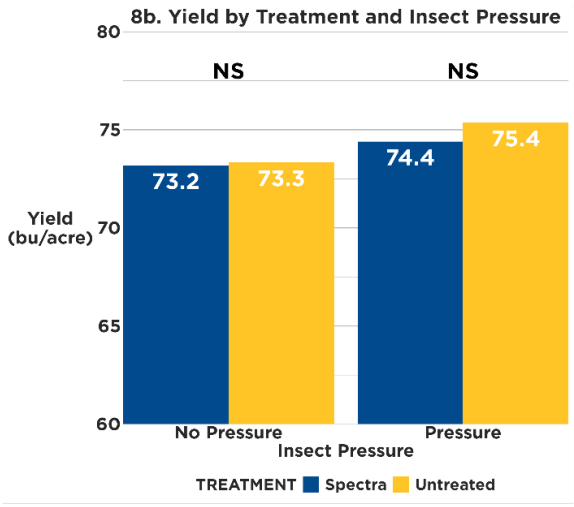


Figure 8a (Left). Treatments under observed disease presence. NS indicates no significant yield response.
Figure 8b (Right). Treatments under observed insect presence. NS indicates no significant yield response.

Return on Investment

Pricing on products can be difficult to source and depends on local availability, quantity ordered, and additional discounts that may be available to the farmer. Given that multiple fungicides and insecticides were used in this project, total cost per acre needed to break even are shown in Table 2 based on soybean price of $10.06 per bushel. With branded fungicides ranging between $20-$30 per acre, insecticides in the $5-$10 per acre range, and custom application costs, most treatments in the project were not profitable. Insecticide alone may have had a small positive return but varying yield responses across sites showed the inconsistencies and ranged from -$43 to $58 per acre return. At the two sites were disease and insect pressure were higher based on scouting (Figure 6), breakeven costs were $41 to $43 per acre.

TREATMENT	Average Yield bu/ac	Average Response bu/ac	Breakeven Cost $/ac
Fungicide	72.2	2.6	$26.16
Insecticide	71.8	2.2	$22.13
Fungicide + Insecticide	73.1	3.5	$35.21
Spectra	71.9	2.3	$23.14
Fungicide + Spectra	71.9	2.3	$23.14
Insecticide + Spectra	70.1	0.5	$5.03
Fungicide + Insecticide + Spectra	73.1	3.5	$35.21

Table 2. Average breakeven costs needed for application and product purchase for all treatments compared to untreated control.