



Project Objective: Study on plant populations with the objectives of (1) characterize optimum seeding rates in soybeans at the field scale level, and (2) evaluate BASF Variable Rate Seed (VRS) recommendations based on the Varietal Profile Index (VPI) of the variety.

Project Results 2025

Project Insights:

1. No statistical difference observed for overall mean yield between the static seeding rates and variable rate seeding prescription in 2025.
2. VRS was the highest yielding treatment at 1 site out of 6.
3. The area averaged seeding rate for the VRS treatment was 138,807 seeds per acre.

The following graph (Figure 1) shows the yield response for the 6 successful trials and the overall mean for each treatment. We had statistical significance for yield between treatments in 2 of the individual trials but we had no statistical significance between treatments in the combined comparison. Overall, 80K was the lowest yielding treatment. Mean yields observed were 66.4 bu/acre for 80K, 67.8 bu/acre for VRS, 68.3 bu/acre for 110K, and 68.7 bu/acre for 140K.

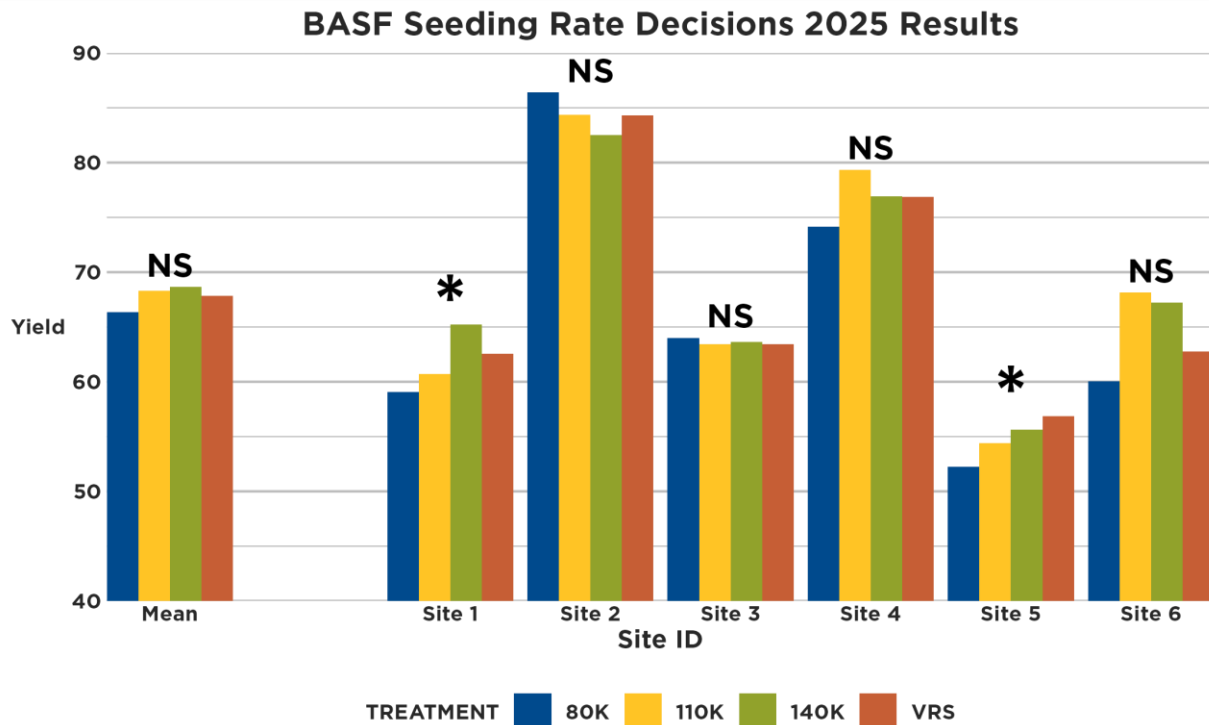


Figure 1 Yield results for 2025 trials. NS indicates no statistical significance and * indicates statistical significance.



Below is a map of the trial distribution and locations across the state (Figure 2). For 2025, 6 trials were successfully conducted.

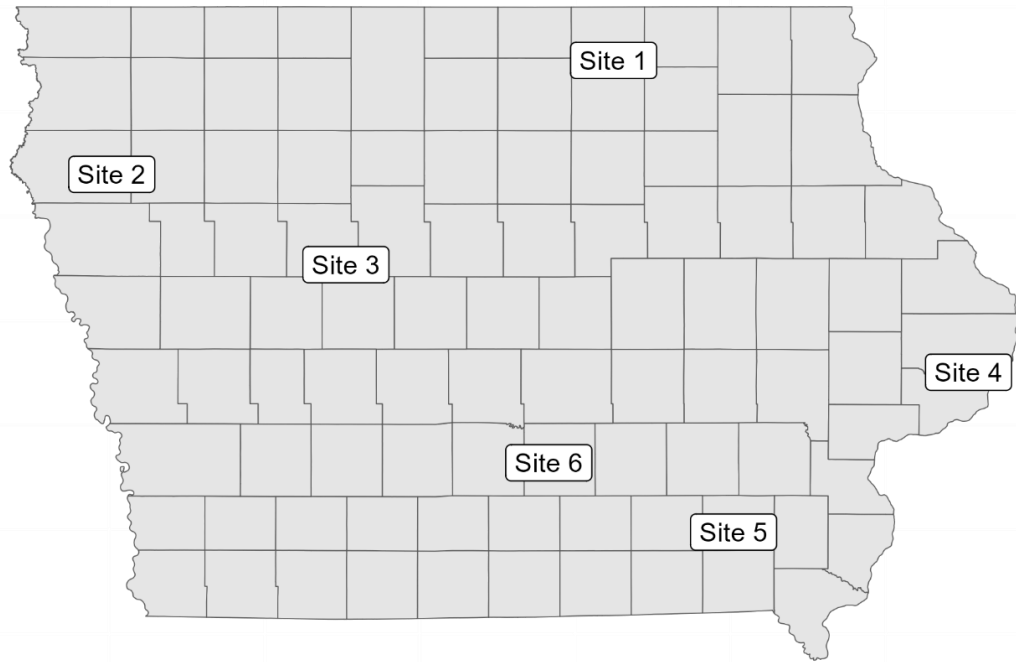


Figure 2 Trial locations for 2025.

The table on the right (Table 1) shows the seed maturity for each site. Based on our small sample size the maturity does not appear to be significantly affecting whether the VRS is the highest yielding treatment. VRS was the highest yielding treatment at site 5, but that site was also our lowest yielding location. The VRS was also significant at this site but only when compared to the 80K rate. In all other sites the VRS was not statistically significant and varied in ranking for each location.

Site ID	Maturity
Site 1	2
Site 2	2
Site 3	2.8
Site 4	2.8
Site 5	3.3
Site 6	3.3

Table 1 Seed maturity for each site in the study.

Economic Analysis

To further explore the economics of seeding rate for these trials, the graph below displays the number of locations where each rate was the most economical (Figure 3). The 80K and 110K rates won the most across our trials at 2 trials each, and then 140K and VRS won in only one trial each. These results follow a similar pattern to our seeding rate trials that have been conducted over the last 3 years where the 80K and 110K rates have been the most economical at most sites compared to the 140K and 170K rates. The higher rates win less because the increase in seed cost for those rates is not offset by the yield increase at the higher rates. In this scenario we compared the ROI with a bag of seed costing \$65 to 2025 prices (\$10.06 per bushel) and 2023 prices (\$14.06 per bushel). Even in the increased market price scenario the higher seeding rates did not generate the most ROI.

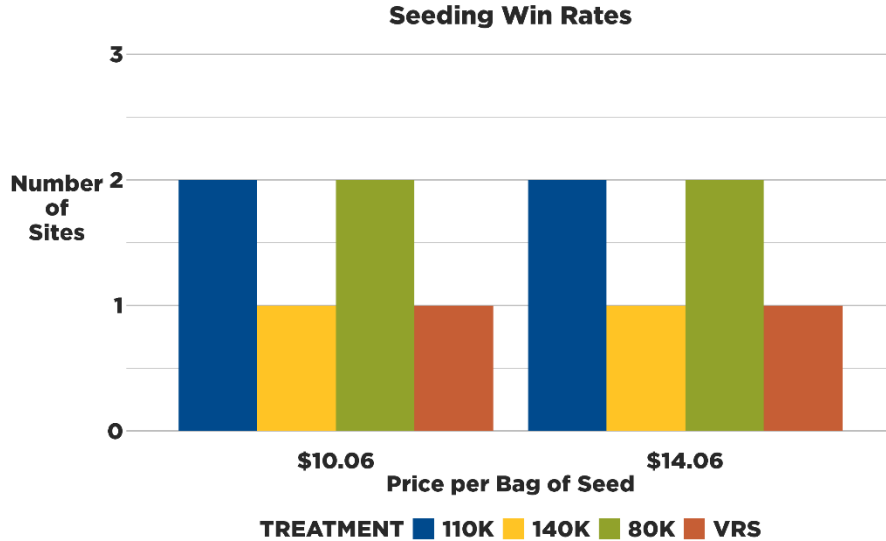


Figure 3 Total number of sites where each rate was the most economical. Economic values were calculated using soybean sale prices of \$10.06 and \$14.06 per bushel and a seed cost of \$65 per 140K seeds.

Stand Count Results

The results comparing stand count populations with target seeding rates are seen below (Figure 4). Stand counts were collected early in the growing season in each treatment pass. As target seeding rates increased, the difference between the target rate and stand count increased. A good example of this is that within the 80k target rate the average stand count was 68,759 plants per acre in comparison to the 140k target rate which averaged 112,448 plants per acre. These differences were likely influenced by the improved planting equipment performance at the lower seeding rates compared to the higher seeding rates. The VRS rate was very similar in average rate to the 140K treatment, and that is reflected in the stand counts as well.

Stand Count Population

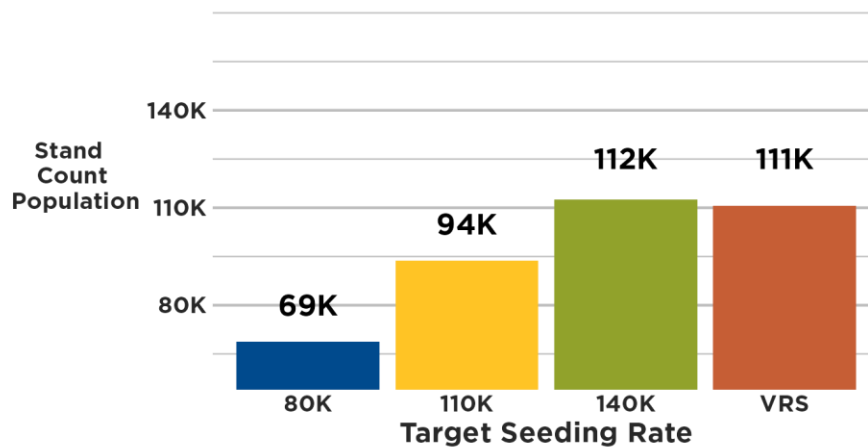


Figure 4 Comparison of stand count population at each seeding rate. The higher the rate of seeding the greater the difference between the target seeding rate and the stand count population. Mean values are labeled above each target rate.



The table on the right (Table 2) breaks down the area for each VRS seeding rate and the mean yield for those rates. The weighted area mean seeding rate was 138,807. Most higher yields were in the lower seeding rate, but we suspect that is because the higher yielding areas of a field are more likely to have lower seeding rates recommended and vice versa for the lower yielding areas. We would like to expand these trials to larger areas so we can get more area for the rates in between 80K, 110K, and 140K. This would allow us to better understand the effectiveness of the VRS.

Seeding Rate	Area (acre)	Mean Yield
120000	5.7	74.6
125000	1.5	64.6
130000	1.7	76.3
135000	3.1	72.6
140000	4.9	71.2
145000	2.0	59.2
150000	0.5	60.2
155000	0.7	83.0
160000	0.4	58.3
165000	2.2	54.1
175000	0.8	69.4
180000	0.8	61.7

Table 2 Area for each VRS seeding rate in this study and the average yield within each seeding rate.