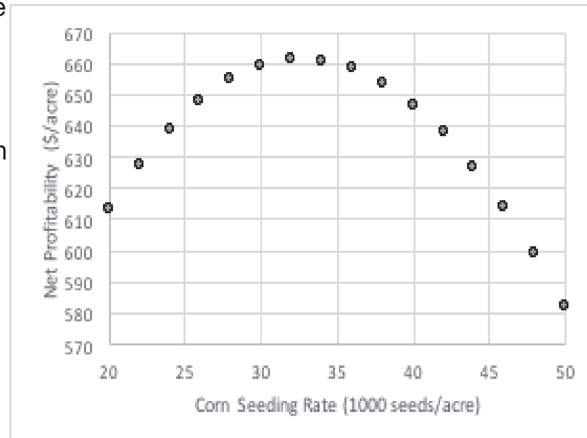
Variable Rate Seeding—Technology and Impacts

How and why does it work?

Background

Optimizing the number of plants per acre is a goal of many producers. An optimized population is when a farmer gets the most yield possible from the least amount of seed. Many companies discuss optimum seeding rates for specific corn hybrids, but seeding rate recommendations have traditionally been based on soil yield potential. Optimizing seeding rate is important to manage return on investment (i.e. balancing input costs with profits/losses from planting too many or too few seeds).

Typically, the closer plants are together, the thinner their stems become due to changes in light interception and canopy closure. For plants that can produce branches, like soybeans, more plants closer together may produce fewer branches per plant. The more plants there are per acre, the less yield produced per plant but more plants can help offset this loss. However, there comes a point where adding more plants does not outweigh the yield lost per plant, and can result in yield and revenue losses.



The optimum population to grow will vary from environment to environment, and may even vary from year to year. Modern producers are working to build maps using soil properties, yield patterns, and aerial imagery to determine what areas of their fields are consistently high yielding, consistently low yielding, and areas that are just variable. These maps and tools will help them get close to their optimum population for these different environments and allow for variable rate seeding maps to be built. For this exercise, we will look at how seeding rate affects plant growth parameters.

I. Corn plant measurements.

1. Take a meter stick, lay it on the ground in the plot, and count the number of plants on each side of the meter stick. Average these values and record it in the table.
2. Measure the height of three plants, and record the average.
3. Measure the stem diameter of three plants and record the average.

CORN	Plots 101 and 203 (24,000)	Plots 102 and 201 (34,000)	Plots 103 and 202 (44,000)
Average number of plants			
Average plant height (cm)			
Average stem diameter (cm)			

II. Soybean plant measurements.

1. Take a meter stick, lay it on the ground in between rows in the plot, and count the number of plants on each side of the meter stick. Average these values and record it in the table.
2. Measure the height of three plants, and record the average.
3. Count the number of branches of three plants and record the average.

SOYBEAN	Plots 301 and 402	Plots 302 and 403 (150,000)	Plots 303 and 401

	(100,000)		(200,000)
Average number of plants			
Average plant height (cm)			
Average branch number			

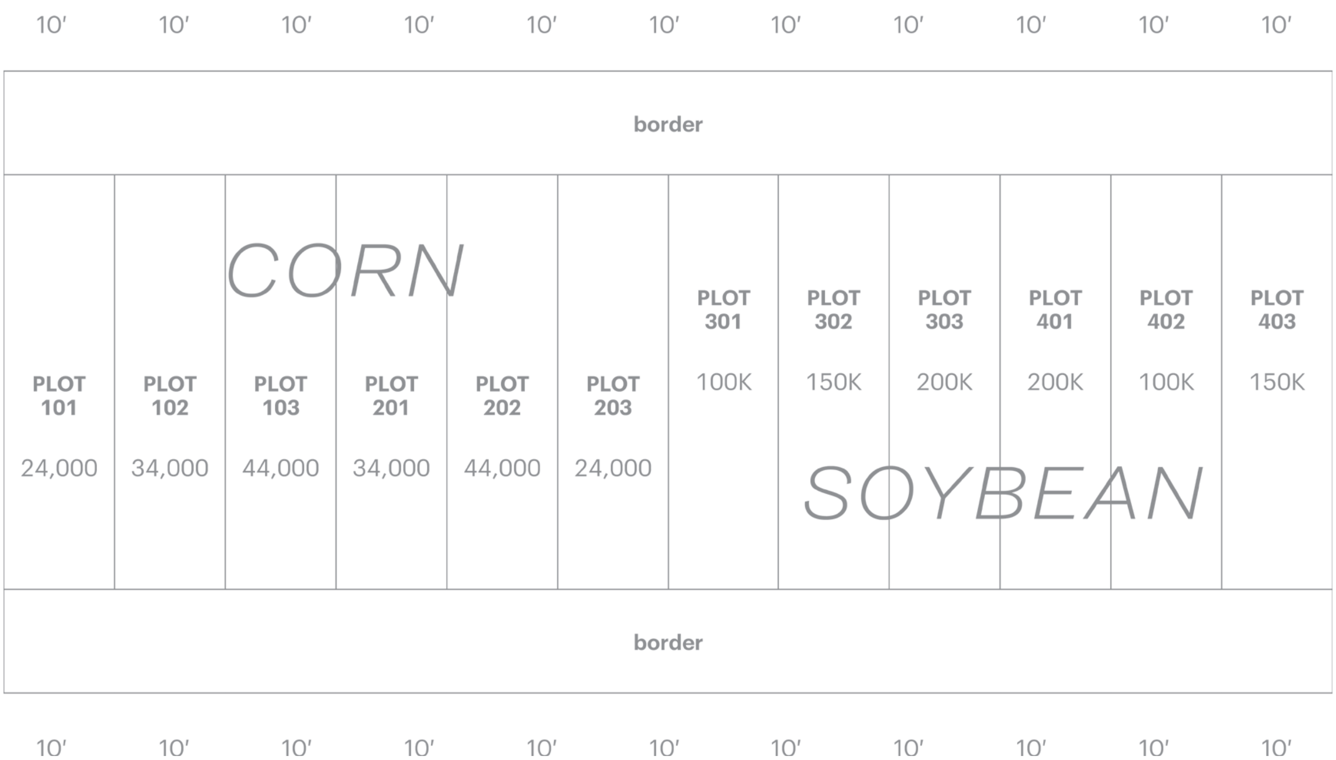
III. Data Comparison

1. Record your group's data in the spreadsheet.

Reflection

1. What surprised you about how planting density impacts on growth?
2. In the high yielding part of the field, what soybean density do you think would be best? What about in the part of the field that has water issues?
3. What corn population would be best for a "predicted" high yielding part of a field? What about a low yielding part?
4. What characteristics of a field do you think would be important to use to build a variable rate seeding map?

The map below shows the plots with varied seeding rates of both corn and soybean. If you were to try this research in your own test plots, you need to scale to the size of your plot.



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