Comparison of Corn Row Spacing and Seeding Rate - Storm Lake, IA

Trial Objective

- Several years of research have indicated that corn yield is positively correlated with plant population until a threshold is reached, beyond which yield decreases. Defining the population threshold for each corn product is difficult as it is highly impacted by several factors including row spacing, management practices, and the environmental conditions during the growing season.
- Adjusting row spacing is one method to spread plant spacing to maximize agronomics and plant-to-plant competition.
- The objective of this trail was to compare corn product yield at 20-inch and 30-inch row spacing at three seeding rates.

Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Storm Lake, IA	Silty clay loam	Soybean	No tillage	05/08/2018	09/28/2018	250	33K, 38K, 43K

- Four corn products (100-114 RM) were each planted at 33,000 (33K), 38,000 (38K), and 43,000 (43K) seeds/acre at both 20-inch and 30-inch row spacing.
- The trial was carried out in 10-ft-wide by 100-ft-long plots with two replications.
- A total fertilizer application consisted of 167-57-93-14-1 (N-P-K-S-Zn), of which 150 lb of nitrogen in the form of 32% UAN was applied in the spring.
- Weed management consisted of an early post-emergence program.
- No fungicide or insecticide was applied.

Understanding the Results

- Except for the 100 RM product, the seeding rate of 33K seeds/acre produced the highest yields in 20-inch row spacing (Figure 1) whereas 38K seeds/acre produced the highest yields in 30-inch row spacing (Figure 2).
- In both 20-inch and 30-inch row spacing, average yield (across all seeding rates) increased as the relative maturity of products increased, with up to a 40 bu/acre difference between the 100 RM and the 114 RM products in 20-inch row spacing (Figure 1) and a 27 bu/acre difference in 30-inch row spacing (Figure 2).
- Across all products, 20-inch row spacing substantially out-yielded 30-inch row spacing at all seeding rates (Figure 3). When averaged across all corn products, 33K seeds/acre was the highest yielding seeding rate in 20-inch row spacing and 38K seeds/acre was the highest yielder in 30-inch row spacing (Figure 3).

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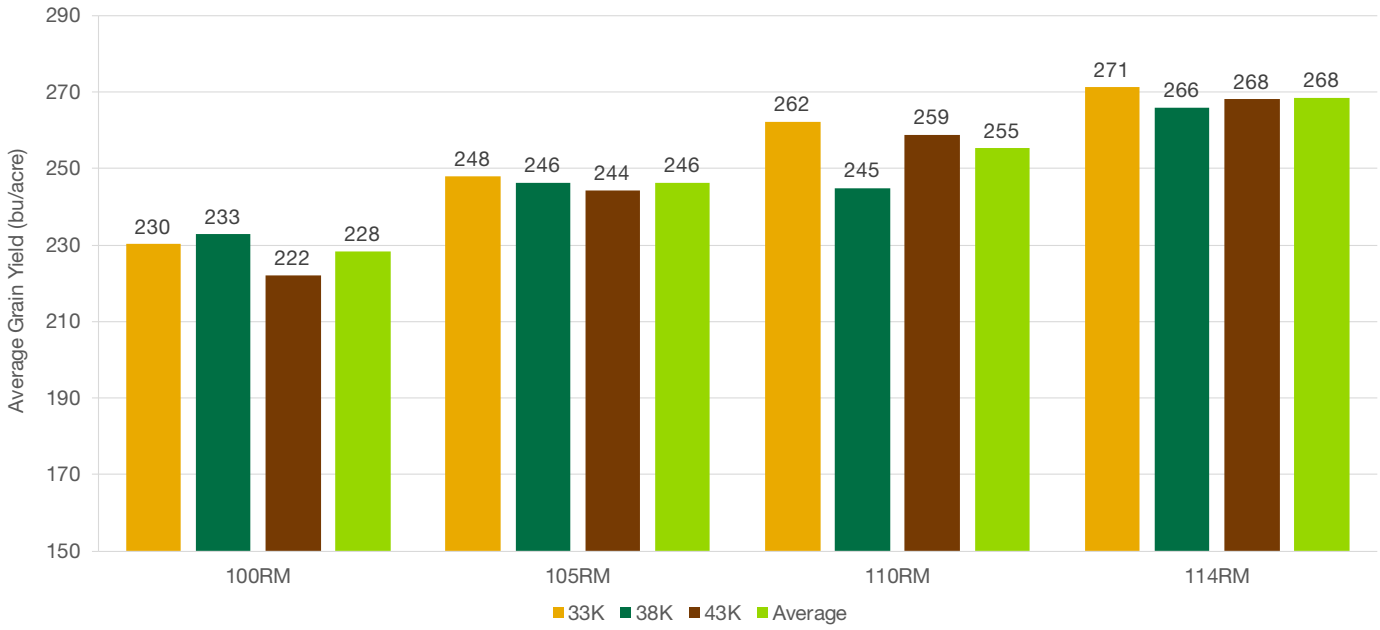

Figure 1. Effects of seeding rate on corn product performance in 20-inch row spacing.

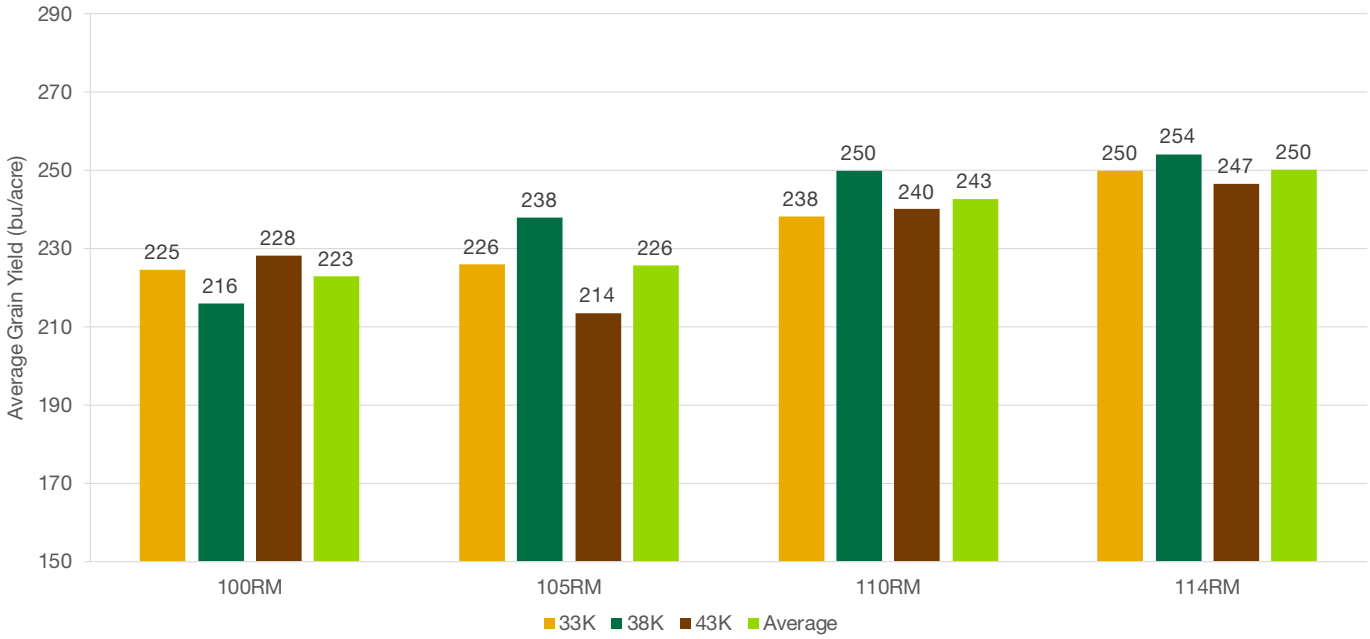

Figure 2. Effects of seeding rate on corn product performance in 30-inch row spacing.

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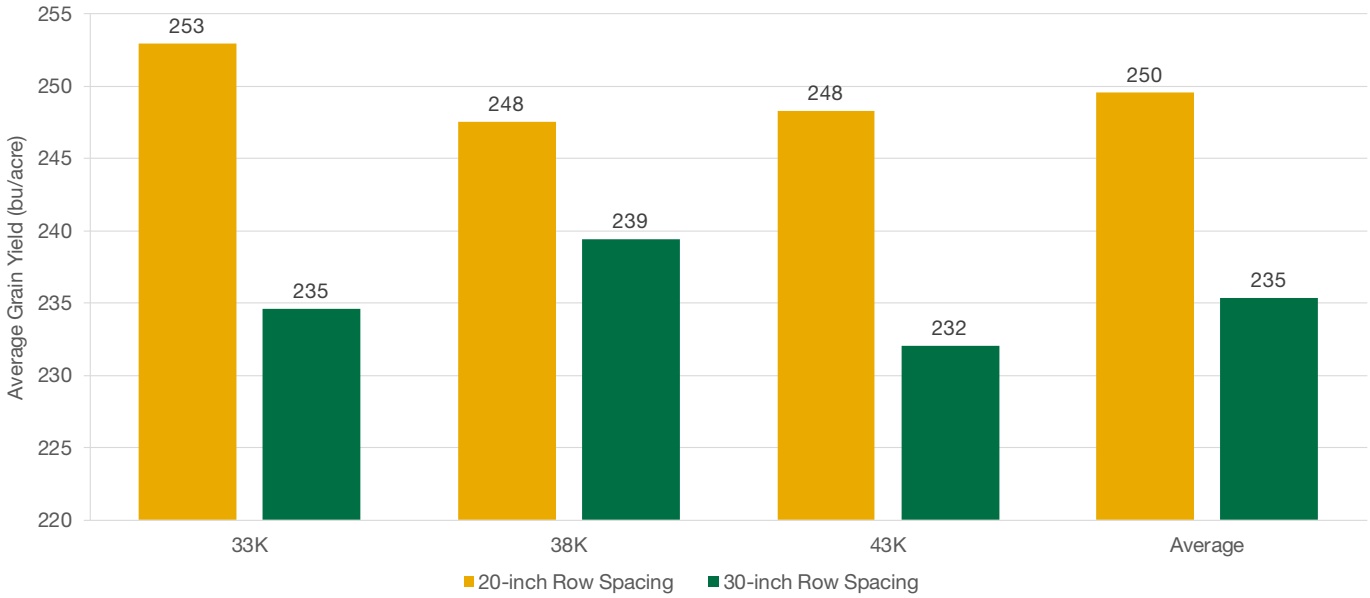

Figure 3. Effects of seeding rate and row spacing on corn product performance, averaged across all four corn products.

What Does This Mean for Your Farm?

- At most production sites, 20 inches has been shown to be a better row spacing than 30 inches for corn production. Where equipment is available, this option should be considered. In this trial, an average yield advantage of 15 bu/acre was realized with 20-inch row spacing (Figure 3).
- By rule of thumb, we consider a 6.25 bu/acre response in a 5K seeds/acre increment to be economical. Thus, 38K seeds/acre was only economical in the 105 and 110 RM products in 30-inch row spacing. All other configurations were most economical at the 33K seeds/acre seeding rate.
- The research site experienced a tremendous amount of rainfall during the growing season. Such a growing condition affects nutrient status and does not favor high populations, especially in narrow row spacing. This may be part of the reason for the poor performance of the 43K seeds/acre seeding rate across the products. However, this doesn't represent every year or what we should expect for a response next season.

Legal Statements

The information discussed in this report is from a single site, replicated demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.