

IOWA STATE UNIVERSITY

Extension and Outreach

Integrated Crop Management

Corn Row Spacing Considerations

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Corn row spacing and plant population have been the focus of many studies throughout the years in an effort to identify ways to increase yields and minimize production costs. Many studies have shown that there was a yield increase going from a 40-inch row spacing to a 30-inch row spacing. Studies had varying results when it comes to less than a 30-inch row spacing. In some cases, row spacing has had no effect on yield whereas others have seen anywhere from a 2-7% increase in yield by narrowing row spacing from the more common 30-inch.

Since 2009, there have been 10 site-years of research trials done in western Iowa looking at the interaction of row spacing and plant population. The objective of this article is to compare various trials to better understand row spacing effects on yield across a broad range of environments. The results from this data suggest that there is a slight yield advantage to 20-inch row spacing compared to 30-inch. In 50% of the site-years, corn planted at a 20-inch row spacing yielded 4.8-15.9 bu/ac more than the 30-inch row spacing. The remaining 50% had no yield difference between 20- and 30-inch row spacing. This serves as a reminder that growing season and hybrid can significantly influence row spacing effect on yield.

Yield Response Comparison between 20-in and 30-in Row Spacing

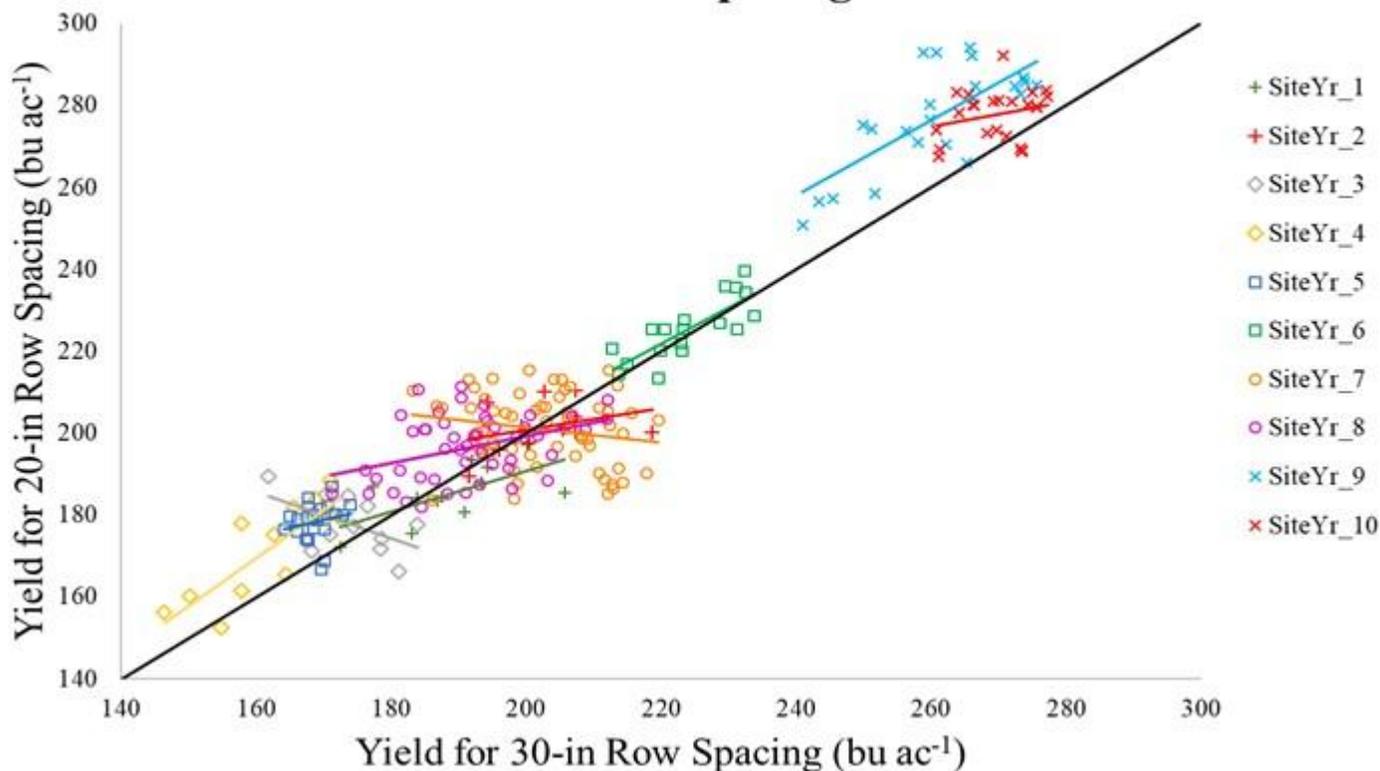


Figure 1. Corn yield response for 20-inch and 30-inch row spacing for ten site-years in northwest Iowa from 2009 through 2016. The solid line is the 1:1 yield line.

Corn row spacing, plant population interactions were evaluated across the 10 site-years and there was no significant interaction. In other words, the recommended plant populations for Iowa are around 34,000-37,000 plants per acre, and these plant populations would not need to be changed if row spacing was reduced from 30 inches to 20 inches.

Rapid canopy closure is one attribute of narrow row spacing that has multiple benefits including inhibiting weed emergence and reducing soil moisture evaporation while increasing light interception. However, there are disadvantages that largely center on equipment setup and capital expenses. In 20-inch row spacing, tire spacing is often adjusted for tractors and sprayer operations to help control traffic between the rows, both in and out of the growing season. In some instances, especially with high clearance sprayers, a narrower tire is desired to minimize traffic on the corn row (i.e. increase the margin for error). The major capital equipment expense is not just the upfront cost of the planter, additional expense is needed for a combine head.

Equipment costs should be taken into account and balanced against the returns from a possible yield increase half of the years and a negligible difference in yield for the remaining years. With the likelihood of improving soybean yields with narrow row spacing, it may be worthwhile to have equipment, such as a split-row planter, that can be used to plant both corn and soybean thus helping to mitigate the cost.

In conclusion, 20-inch row spacing in corn has shown to provide a comparable yield and even a yield advantage to the typical 30-inch row spacing. If narrow row spacing is feasible, there could be benefits for both corn and soybean yields, as well as benefits for weed control and soil moisture retention. Narrow row spacing will require alterations to existing equipment or alternative methods for harvesting and possibly pesticide applications.

References

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