

Interaction of Plant Population, Row Spacing and Variety Selection on Soybean Yield

Maximizing soybean yield requires optimum genetics along with the best agronomic practices and environmental conditions. Soybean product selection along with proper seeding rate and row spacing can help maximize soybean yield potential.

Study Guidelines

In 2009, trials were conducted throughout the Midwest region to evaluate the effects of seeding rate, row spacing and variety on soybean yield. Soybean varieties were selected based on the geographical location of the trial. Trials were located in Northern Illinois, Central Illinois, Northern Iowa, Minnesota and South Dakota. At each location, soybeans were planted in 20 inch and 30 inch rows at 90K, 115K, 140K, 165K and 190K seeds per acre (S/A). Weed control was maintained with a preemergence herbicide applied at planting followed by a postemergence herbicide application in the crop. Soybean yields were collected and adjusted to 13% moisture.

Results and Discussion

Combined data across all five locations and all soybean varieties showed no significant yield difference between 20 inch and 30 inch row spacing (Figure 1). These results are not consistent with internal trials conducted in prior years or University results which demonstrate narrow rows usually produce higher yields.

Higher seeding rates do not always result in higher yield since soybeans have the ability to adjust growth and development to compensate for different plant densities. Looking at average yield data across all five locations, the lowest seeding rate (90K S/A) did not maximize yield (Figure 2). Soybeans planted at 90K S/A yielded significantly less than all higher seeding rates in 20 inch rows and significantly less than soybeans planted at 115K, 165K and 190K S/A in 30 inch rows (Figure3). These results would suggest that optimum seeding rate would be between 115K and 190K S/A for both 20 inch and 30 inch populations.

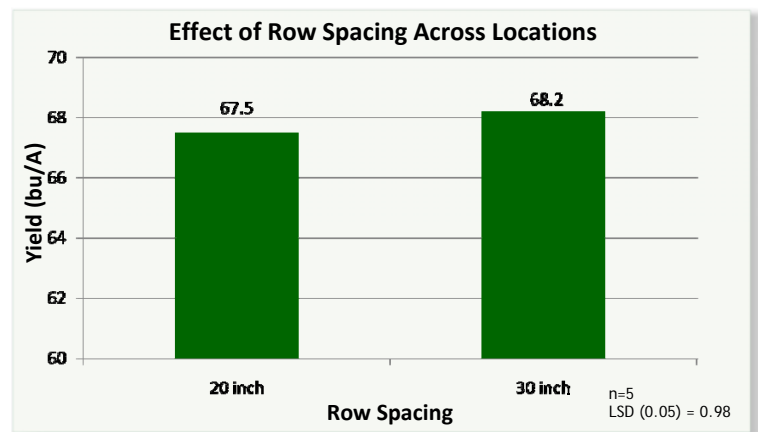


Figure 1. Yield results across five locations as influenced by row spacing.

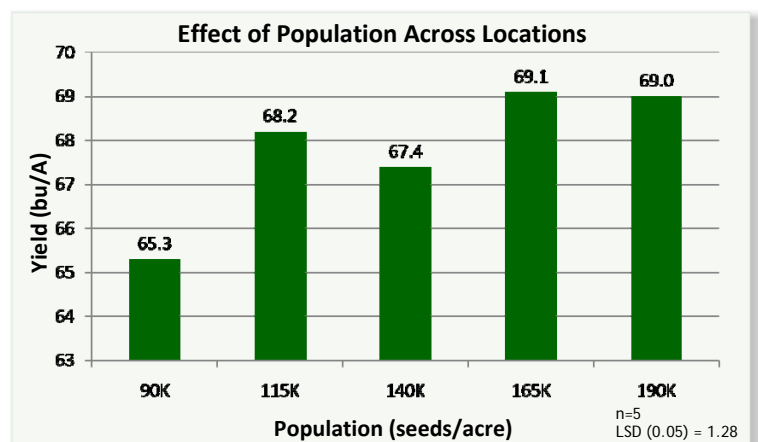


Figure 2. Yield results across five locations as influenced by five different planting populations.

to pg. 2

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Further testing is still needed to determine optimum seeding rate and plant density in relation to row spacing, soybean varieties and traits. Always consider proper soybean variety selection, seeding rate, row spacing and other agronomic practices to help optimize your soybean yield potential.

Conclusion

Greater yields were observed in soybeans planted at populations greater than 90K S/A. Soybean yields, when averaged across all five locations, showed little difference between seeding rates above 115K for both 20 inch and 30 inch row spacing. This would suggest that while yields may be maximized at higher populations, the economic return for the additional seed investment may not be covered by the increase in yield. A final plant stand of approximately 125K plants per acre may optimize economic return and yield.

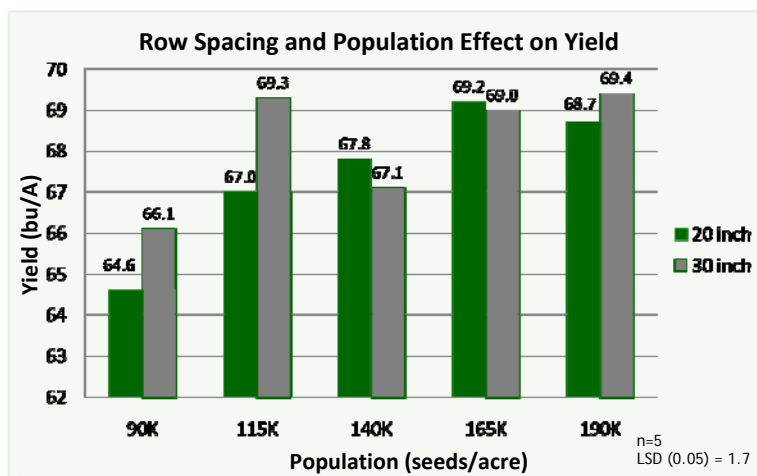


Figure 3. Yield results across five locations as influenced by five different planting populations and row spacing.

The 2009 testing also revealed that planting soybeans in narrow rows may not always increase crop yield. These results are not consistent with many university and internal trials conducted in previous years. Yield potential of narrow rows could be affected by planting date and other agronomic factors that may not have been favorable in 2009.

Before considering decreasing soybean seeding rates, farmers are encouraged to experiment on a few acres with different seeding rates to better understand how their agronomic practices will influence final plant density on their own farm.

More research will be conducted to further understand the interaction between soybean variety, soybean traits, seeding rate, row spacing and other agronomic practices.

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

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