

Soybean Yield Response to Plant Populations

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Objective

To determine the response of soybean yield to soybean plant populations

Background

Crop Year: 2016

Location: Wapakoneta, Ohio

County/Town: Auglaize County

Soil Type: Blount and Glynwood silt loam

Drainage: Systematic

Previous Crop: Soybean

Tillage: Spring field cultivation

Planting Date: May 24, 2016

Nitrogen: None

Seeding Rate: 120,750 to 241,500 seeds/A

Harvest Date: November 2, 2016

Methods

A soybean plant population trial was established having four seeding rates and three replications in a randomized complete block design. The targeted plant populations were 105,000, 140,000, 175,000, and 210,000 plants/A. The germination rate for Stewart 3213RR2 was 85%, so actual seeding rates were 120,750, 161,000, 201,250, and 241,500 seeds/A. A John Deere 750, 15 foot grain drill with 7.5 inch rows was used to seed the soybean at settings of 12, 14, 17, and 19. Planted plot width was 30 feet by the length of the field (~2,100 feet). Seed was planted 1.25" deep. Stand counts were taken June 13 and October 18, 2016. Stand counts were taken by counting plants in a single row for a distance of 69 feet 8 inches to represent 1/1000th of an acre. Plants were counted three times in each plot and averaged. The center 25 feet of the plot for a length of 1,405 feet was harvested with a commercial combine. Yield was adjusted to 13% moisture. Data were analyzed using the ANOVA procedure and mean separation at $\alpha=0.05$.

Results

Table 1. Yield Response to Plant Populations.

Targeted Plant Population (plants/A)	June 13 th population (plants/A)	October 18 th population (plants/A)	Yield (bushels/acre)	Adjusted Gross ¹ (\$/A)
105,000	106,577	108,194	48.9 _A	413
140,000	154,783	151,167	49.9 _A	405
175,000	187,889	162,167	52.4 _A	412
210,000	211,121	191,833	52.0 _A	390

LSD (0.05)

N.S.

C.V. = 3.05

¹Adjusted Gross = yield * \$9.50/bu - \$0.428/1000 seed*actual seeding rate



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Summary

The actual final soybean stand counts were 3,000 to 18,000 plants per acre within the targeted population. This is a little more variable than desired and may be caused by the condition of the drill. Soybean yield was not different among the four seeding rates. Literature from The Ohio State University and Purdue University claim maximum soybean yields can be achieved at populations of 100,000 to 120,000 plants per acre at harvest. The results of this trial would agree with those recommended populations. Adjusted gross income was highest for the 105,000 plant population. If soils are prone to crusting, seeding to a targeted plant population of 105,000 could be risky.

Acknowledgement

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