Soybean Yield Response in 15 Inch Rows at Varying Planting Populations

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Objective

To evaluate soybean yield response planted in 15 inch rows at five populations.

Background

Crop Year:	2010	Tillage:	No-till
Location:	Logan County	Seed Variety:	Channel Bio 3501
Nearest Town:	Lewistown, Ohio	Soil Test:	pH 6.0, P 38 lbs/ac,
Soil type:	St. Clair Silt Loam 2-6%		K 232 lbs/ac
	St. Clair Silt Loam 6-12%	Planting Date:	May 29, 2010
	Lippincott Silty Clay Loam	Harvest Date:	October 7, 2010

Methods

The plot was established in a randomized complete block design. There were five treatments of five different planting rates. Treatments were replicated four times. Plot was planted with John Deere 1790 air planter (40 ft wide) and each pass was a different seeding rate. The plot length was 2,090 feet; therefore, each population rate (replicate) was 2 acres. Stand counts were conducted when soybeans were at V3 growth stage on June 21. This value is used in results as actual plant population. The seed was treated with Acceleron which was a combination of fungicide and insecticide containing pyraclostrobin, metalaxyl, and imidacloprid. Plots were harvested with John Deere 9770 combine with a GreenStar yield monitor which was utilized to determine yield measurements. The soybean yield values were adjusted to 13% moisture.

Results

Population Effects on Soybean Yield

Target Population	Actual Population	Yield
----------	Plants/Acre ----------	(bu/ac)
100,000	93,050	46.5 a
120,000	98,200	45.8 a
160,000	126,600	48.6 b
200,000	170,300	49.5 b
240,000	191,800	48.8 b
LSD (0.05)		1.9

Summary

Soybean yield was influenced by planting population. There was no significant difference in yield of the two lower planting populations. The higher planting populations of 160,000, 200,000, 240,000 seeds per acre were significantly different than two lower planting populations; although, there was no difference in soybean yield among the three higher planting populations. An economic comparison between the two planting populations of 160,000 and 120,000 with significant differences revealed $25.36 per acre advantage over seed costs. Assumptions were soybean seeds at 2,800 seeds per pound and 140,000 seeds per 50 pound unit priced at $45.00 per unit.

Return per Acre after Seed Costs

Target Population (seeds/ac)	Actual Population (plants/ac)	Yield (bu/ac)	Seed Cost ($/acre)	Soybean Price ($/bu)	Net Return ($/ac)
100,000	93,050	46.5[a]	$32.14	$13.65	$602.59
120,000	98,200	45.8[a]	$38.57	$13.65	$586.60
160,000	126,600	48.6[b]	$51.43	$13.65	$611.96
200,000	170,300	49.5[b]	$64.29	$13.65	$611.39
240,000	191,800	48.8[b]	$77.14	$13.65	$588.98

This researcher was somewhat surprised by the rather high reduction in plant population between target planting population and actual plant stand. Earlier research generally suggested a ten (10 %) percent difference between planting rate and actual plant population. This project revealed 15% – 21% difference in target planting population and actual plant stand. Further research is suggested to evaluate contributing factors that may result in stand reduction.

Acknowledgement:

The author expresses appreciation to R & K Farms for their cooperation in providing field area, equipment, seed, herbicides, and labor to establish and harvest plot.

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