

Evaluation of Effects of Population and Row Spacing on Soybean Yields

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Objective

To compare soybean yield response and seeding cost to row spacing and plant population using a no-till drill and a no-till planter.

Background

Crop Year:	2010	Tillage:	No-till
Location:	Milan, OH	Soil Test:	April 2009
County:	Erie County	Planting Date:	5/24/2010
Soil Type:	Kibbie silt loam	Seeding Rate:	135,000 seeds/acre to 195,000 seeds/acre
Drainage:	Clay tile on 60 foot centers 0 – 2% slope	Variety:	Pioneer 93Y20 RR Soybeans
Previous Crop:	Corn	Harvest Date:	October 16, 2010

Methods

This study was designed with eight treatments replicated three times in a randomized complete block design. Treatment plots were 30 feet in width and roughly 500 in length. To achieve 7 ½ inch row spacing using a planter, the plots were planted twice using an offset hitch. Proposed treatments were:

	<u>Actual Stands</u>
1. Drilled 7 ½ inch rows w/120,000	134,000
2. Drilled 7 ½ inch rows w/180,000	184,000
3. Drilled 15 inch rows/120,000	122,000
4. Drilled 15 inch rows/180,000	177,000
5. Planted 7 ½ inch rows/120,000	135,000
6. Planted 7 ½ inch rows/180,000	188,000
7. Planted 15 inch rows/120,000	125,000
8. Planted 15 inch rows/180,000	176,000

All of the soybeans used in the trial were Pioneer 93Y20 RR planted into very heavy corn fodder using no tillage of any kind. All of the trials were planted on May 24, 2010 which is 14 days later than the ideal planting date for this site. The field was treated with a burndown treatment of glyphosate and 2,4-D ester with Envive as a residual 20 days prior to planting. The field was virtually weed-free at planting.

Early Season Observations: Emergence was remarkably fast for the planter seeded trials. The first beans in the planter trials emerged in 4 days with stand establishment in only 7 days. Every attempt was made to seed all of the trials at a consistent depth. The drilled beans first emerged in 6 days with stand establishment in 12 days.

The entire plot was sprayed with a single application of 1 lb a/acre glyphosate on July 3, 2010. No other pesticides were needed.

Results

Soybean Yield (bu/A) Response to Population and Row Spacing	
	Yield (bu/A)
Treatment 1 7 ½ inch drilled 134,000 stand	63.48
Treatment 2 7 ½ inch drilled 184,000 stand	63.28
Treatment 3 15 inch drilled 122,000 stand	63.68
Treatment 4 15 inch drilled 177,000 stand	63.86
Treatment 5 7 ½ inch planted 135,000 stand	64.19
Treatment 6 7 ½ inch planted 188,000 stand	64.21
Treatment 7 15 inch planted 125,000 stand	63.96
Treatment 8 15 inch planted 176,000 stand	63.41
	LSD (0.05) NS
	Tukey's 4.27
	CV 2.32
NS = no significant difference	

Summary

As observed in previous seasons, even though the soybeans seeded using a no-till planter emerged and established more quickly than those planted with a no-till drill, no significant difference in yield was observed. Moreover, no significant difference in yield was observed when comparing 120,000 plant population to 180,000 plant population using either a drill or a planter in 7 ½" or 15" rows. Assuming a seed cost of \$0.40/1000 seeds, the plots planted at 120,000 as compared to 180,000 would net an additional \$24 per acre.

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