

Soybean Yield Response in 30 Inch Rows at Varying Planting Populations at Late Planting

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Objective

To evaluate soybean yield response over five plant populations when planted in 30 inch rows.

Background

Crop Year:	2011	Seed Trtmnt:	Maxim at .08fl oz/cwt + Apron XL at 0.64 fl oz/cwt
Location:	Defiance County	Soil Test:	June 23, 2011
Nearest Town:	Sherwood, Ohio		pH 6.1, P 38 ppm, K 206 ppm, CEC 23
Soil type:	Latty Silty Clay	Planting Date:	June 7, 2011
Tillage:	To The Max™ harrow fall and spring	Row width:	30 inches
Drainage:	Surface drainage	Harvest Date:	October 30, 2011
Seed Variety:	Kottman (Rps1k/3 + high partial resistance)		

Methods

The plot was established in a randomized complete block design. There were five different planting population treatments. Treatments were replicated six times. Plot was planted using a two-row, tractor mounted, plot planter. Each treatment area was four 30-inch rows measuring 10 feet wide by 30 feet long. Stand counts were conducted when soybeans were at VE/VC growth stage on June 23 and repeated pre-harvest on October 6 at R7 growth stage. Stand measurements were conducted by counting all plants in the second of four rows in each replication. These values are reported as actual plant population. All four rows in the plots were harvested with a small plot combine with an on-board calibrated scale to determine yield measurements. The soybean yield values were adjusted to 13% moisture.

Results

Target Population (plants/acre)	Actual population at growth stage VE/VC (plants/acre)	Actual population at growth stage R7 (plants/acre)	Yield (Bu/acre)
80,000	75,388 e	74,226 e	43.1 c
100,000	96,006 d	95,948 d	45.3 c
140,000	131,145 c	131,958 c	48.3 b
180,000	165,644 b	165,121 b	50.2 ab
220,000	200,144 a	201,886 a	52.6 a
LSD (0.05)			2.7

Soybean yield was influenced by planting population shown in Table 1. One replication of treatment 220,000 target population was removed from analysis due to a planting error of wrong soybean variety and seeding rate. There was no significant difference in yield of the two lower planting populations. The higher planting populations of 140,000, 180,000, 220,000 seeds per acre were significantly different than two lower planting populations. Additionally, the highest planting population was significantly different than the three lower planting populations. There was no difference in soybean yield among the two highest planting populations.

Results of an economic comparison among all planting populations are shown in Table 2. Net return was calculated by yield multiplied by soybean price minus seed cost per acre. Assumptions were soybean seed cost was \$0.326/1000 seeds and a market price of \$12.00 per bushel. Net return increased as target and actual final plant populations increased. However, caution should be given to the rising net returns above the 180,000 seeding rate because the yield response at 220,000 target population was not significantly different than the 180,000 target population yield.

Target Population (seeds/ac)	Yield (bu/ac)	Seed Cost (\$/acre)	Soybean Price (\$/bu)	Net Return (\$/ac)
80,000	43.1 ^c	\$26.08	\$12.00	\$491.12
100,000	45.3 ^c	\$32.60	\$12.00	\$511.00
140,000	48.3 ^b	\$45.64	\$12.00	\$537.56
180,000	50.2 ^{ab}	\$58.68	\$12.00	\$543.72
220,000	52.6 ^a	\$71.72	\$12.00	\$559.48

Month	Precipitation (inches)	Departure from Normal Precipitation
April	6.9	3.6
May	8.0	4.4
June	1.4	-2.4
July	2.2	-1.7
August	4.2	1.0
September	7.0	3.8
October	3.7	1.1

Summary

Overall yields for the field were very good for the late planting date and weather conditions compared to historical averages. No significant disease or insects was observed during the growing season.

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