

Soybean Response to Row Spacing and Planting Rate, 2021

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A field trial was conducted at the NDSU Langdon Research Extension Center to examine the response of soybean to row spacing and planting rate in northeast North Dakota. Experimental design was a randomized complete block split plot (whole plots = row spacing, sub-plot = planting rate) with four replications. A RR2X 00.7 maturity variety was planted on May 26 on a conventionally tilled Svea-Barnes loam soil in 24, 12 and 6-inch rows with planting rates of 125,000, 150,000, 175,000 and 200,000 pure live seeds (PLS)/acre. Harvest date was September 24.

There was no significant row spacing by planting rate interactions or significant responses to row spacing among the agronomic traits (Table 1). Plant stand and yield were the only traits that had significant responses to planting rate (Table 2). Plant stands increased with planting rates and had a 20 percent average mortality for each planting rate. The 200,000 PLS/a planting rate had the highest yield with no difference between the 125,000 to 175,000 PLS/a planting rate. No visual differences were observed in the trial for lodging or plant maturity.

Previous research on soybean response to planting rates and row spacings across North Dakota (NDSU Extension publication A1961, June 2020) indicated that in eastern North Dakota row spacing of 15 inches or less at a planting rate of about 170,000 PLS/a provided optimum yields. Seedling mortality averaged 8% across the various research trials. Yields averaged about 107 percent of the mean at 6-7 inch rows and 97 percent of the mean at 22-24 inch rows. Drier soil conditions at planting for this study may have increased seedling mortality and resulted in no significant differences in yield among row spacings.

Table 1. Soybean response to row spacing averaged over planting rates.

Row Spacing	Plant Stand	PLSE ¹	Seedling Mortality	Protein	Oil	Test Weight	Yield
inches	plt/a	%	%	%	%	lbs/bu	bu/a
6	130,831	81	19	31.7	16.5	57.1	43.1
12	131,690	81	19	31.8	17.0	57.1	46.9
24	131,690	81	19	31.6	16.8	57.0	44.2
LSD 5%	NS	NS	NS	NS	NS	NS	NS
C.V. %	8.3	6.5	27.6	1.1	1.5	0.4	8.6

¹Pure live seed emergence

Table 2. Soybean response to planting rate averaged over row spacings.

Planting Rate	Plant Stand	PLSE ¹	Seedling Mortality	Protein	Oil	Test Weight	Yield
pls/acre	plt/a	%	%	%	%	lbs/bu	bu/a
125,000	102,208	82	18	31.5	16.6	57.1	42.9
150,000	120,082	78	22	31.7	16.7	57.0	44.6
175,000	142,080	82	18	31.7	16.6	57.0	43.9
200,000	161,242	82	18	31.9	16.6	57.0	47.6
LSD 5%	9135	NS	NS	NS	NS	NS	3.2

¹Pure live seed emergence