

## Field Pea Response to Nitrogen Fertilizer

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**A** trial to assess the response of field pea to varying levels of nitrogen (N) fertilizer was conducted at the NDSU Carrington Research Extension Center in 2004. Uninoculated seed of cultivar 'Integra' was sown on 7 May on a field which tested 15 lbs. NO<sub>3</sub><sup>-</sup>-N / acre (0-24") and 16 ppm P<sub>2</sub>O<sub>5</sub> (0-6") the previous fall. Individual plot N levels were brought up to 50, 75, 100, 125, 150, or 200 lbs. total N / acre with a broadcast application of urea, which was incorporated prior to

planting. Plots of 15, 50, and 75 lbs. total N / acre were sown both with and without CellTech-C liquid inoculant. In addition, plots of 100 lbs. total N were also sown with either 15 or 30 lbs. P<sub>2</sub>O<sub>5</sub> / acre broadcast as triple superphosphate and incorporated before planting.

Incremental increases in N level without inoculation and without additional P reduced nodulation and tended to delay maturity (Table 1). With the exception of the 150 lb. N treatment, increasing N fertilizer numerically increased yield. Grain protein also increased with additional N. Seed inoculation at planting tended to increase yield at all three of the lowest N levels on a field with a history of field pea production (Tables 1 and 2). Although more data are needed to draw firm conclusions, these results suggest that there may be a benefit to applying starter fertilizer (bringing the soil N up to 50 lbs. N / acre). The effects of added P fertilizer on yield were inconsistent (Table 1), but the soil test for P was in the "very high" range and a yield benefit would be surprising.

**Table 1. Field pea response to soil nitrogen level, NDSU Carrington, 2004.**

Treatment (lb total N/ac)	Visual Nodulation (1-9) <sup>1</sup>	Beginning Bloom (DAP) <sup>2</sup>	End Bloom (DAP)	Physiological Maturity (DAP)	Lodging (1-9) <sup>3</sup>	Yield (lb/ac)	Yield (bu/ac)	Test Weight (lb/bu)	Seed Weight (g/250)	Seed Protein (%)
15 lbs N	3.8	56.0	77.5	88.5	2.8	2831	47.2	64.6	69.9	18.4
15 N + Inoc	4.8	56.0	78.8	90.5	2.5	3265	54.4	64.9	70.4	18.6
50 N	5.5	56.3	78.0	91.3	2.3	3052	50.9	63.7	69.2	18.3
50 N + Inoc	4.3	56.3	79.3	91.3	2.0	3378	56.3	64.6	70.7	18.5
75 N	5.5	56.3	78.3	89.8	2.0	3113	51.9	64.8	70.5	18.8
75 N + Inoc	5.5	56.3	79.5	92.0	2.3	3221	53.7	64.2	73.3	19.1
100 N	6.0	56.0	79.3	91.5	2.3	3334	55.6	64.1	69.4	19.4
100 N + 15 P	6.8	56.3	79.0	91.0	1.8	3099	51.7	63.9	71.6	19.9
100 N + 30 P	6.3	56.3	79.5	91.3	1.8	3581	59.7	64.3	73.2	19.4
125 N	7.0	56.8	78.8	90.3	2.5	3393	56.6	64.1	70.0	20.0
150 N	7.0	56.8	79.5	91.5	2.8	3128	52.1	64.1	71.2	21.1
200 N	8.0	56.5	80.0	91.8	3.0	3525	58.7	64.1	70.3	21.6
Mean	5.9	56.3	78.9	90.9	2.3	3236	53.9	64.3	70.8	19.4
C.V. (%)	22.5	0.6	0.7	1.6	24.4	11.2	11.2	0.8	3.0	3.7
LSD (0.05)	1.9	0.5	0.8	NS	NS	NS	NS	NS	NS	1.1
LSD (0.01)	2.6	NS	1.0	NS	NS	NS	NS	NS	NS	1.4
<sup>1</sup> 1 = profuse, 9 = none		<sup>2</sup> Days after planting			<sup>3</sup> 1 = erect, 9 = prostrate					

**Table 2. Main effects of N rates with and without inoculation in the pea N response trial, NDSU Carrington, 2004.**

		Beginning	End	Physiological				Test	Seed	Seed	
Treatment	Nodulation	Bloom	Bloom	Maturity	Lodging	Yield	Yield	Weight	Weight	Protein	
	(1-9) <sup>1</sup>	(DAP) <sup>2</sup>	(DAP)	(DAP)	(1-9) <sup>3</sup>	(lb/ac)	(bu/ac)	(lb/bu)	(g/250)	(%)	
<b><i>N Level (lbs total N/acre)</i></b>											
15	4.3	56.0	78.1	89.5	2.6	3048	50.8	64.7	70.1	18.5	
50	4.9	56.3	78.6	91.3	2.1	3215	53.6	64.1	70.0	18.4	
75	5.5	56.3	78.9	90.9	2.1	3167	52.8	64.5	71.9	19.0	
LSD (0.05)	NS	NS	0.6	1.4	NS	NS	NS	NS	NS	NS	
LSD (0.01)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
<b><i>Inoculation</i></b>											
- Inoculant	4.9	56.2	77.9	89.8	2.3	2999	50.0	64.4	69.9	18.5	
+ Inoculant	4.8	56.2	79.2	91.3	2.3	3288	54.8	64.5	71.5	18.7	
<i>t</i> -test (5%)	NS	NS	**	*	NS	NS	NS	NS	*	NS	
<sup>1</sup> 1 = profuse, 9 = none		<sup>2</sup> Days after planting			<sup>3</sup> 1 = erect, 9 = prostrate						
* and ** denote significant differences between means at P < 0.05 and P < 0.01, respectively											