

**Pinto bean response to starter and post-applied fertilizer, Carrington, 2016.**  
(Greg Endres, Mike Ostlie and Jesper Nielsen)

A field study was conducted at the NDSU Carrington Research Extension Center with support from Northarvest Dry Bean Growers Association to examine the performance of pinto bean with starter and post-applied fertilizer. Experimental design was a randomized complete block with four replications. The dryland trial was established on a conventional-tilled loam soil with 3.7% organic matter, 7.9-8.2 pH (0-24 inch depth), 63 lb/A nitrate-N, 7 ppm (low) phosphorus, 149 ppm (high) potassium and 0.52 ppm (low) zinc. Fungicide-treated ‘Lariat’ was planted with a 5-row planter in 22-inch rows on June 1 (Jday 152). Starter fertilizer treatments were band (2- by 0-inch) or in-furrow (IF) applied at planting. Post-emergence fertilizer treatments were applied on July 22 with a hand-boom sprayer delivering 14 gpa through 8001 flat-fan nozzles at 35 psi. Hail damage occurred on July 9 prior to plant bloom resulting in an estimated  $\leq 10\%$  leaf loss. Headline fungicide at 6 fl oz/A plus NIS at 0.25% v/v was applied with a tractor sprayer to 2 of 4 trial replications on July 15 to evaluate crop after hail injury. Plants were hand-pulled for field drying on September 14 and seed harvested with a plot combine on September 19.

Days from planting to plant emergence (Jday 161) and flower (Jday 202) were the same for all treatments (data not shown), Also, canopy closure, and plant maturity generally were similar among treatments (Table 1). Early season plant stand was similar among treatments though generally tended to be less with IF-applied fertilizer compared to the untreated check. Plant lodging was similar among treatments. Seed yield and quality were similar among treatments. Foliar fungicide applied after hail damage did not influence canopy closure, plant maturity, and seed yield or quality (Table 2).

Fertilizer treatment <sup>a</sup>	Plant <sup>b</sup>				Seed			
	Stand (13-Jun)	Canopy closure	Physiological maturity	Lodge (6-Sep)	Yield	Test weight	Seeds/lb	Protein
	plt/A	Jday		0-9	lb/A	lb/bu		%
untreated check	66,400	218	246	3	2,687	57.4	1,133	20.6
band 10-34-0 at 3 gpa	68,815	219	246	4	2,699	57.4	1,103	20.7
IF 10-34-0 at 3 gpa	63,385	216	246	4	2,732	57.6	1,157	20.2
IF NWC Zn at 0.25 + water at 2.75 gpa	60,670	221	246	3	2,638	57.1	1,074	20.8
IF 10-34-0 at 2.75 + NWC Zn at 0.25 gpa	59,460	221	246	3	2,696	57.1	1,145	20.4
IF 6-24-6 at 4.25 + NWC Zn at 0.25 gpa	60,065	222	245	4	2,609	57.2	1,146	20.4
IF Nachurs 3-18-18-1 at 2.75 + Zn at 0.25 gpa	57,650	220	246	3	2,700	57.6	1,106	20.2
IF 10-34-0 at 3 gpa/Post MAX-IN Ultra ZMB at 32 fl oz/A	61,575	219	246	3	2,586	57.1	1,091	20.2
IF 10-34-0 at 3 gpa/Post Ascend at 6.4 + MAX-IN Ultra ZMB at 32 fl oz/A	66,705	222	245	3	2,295	57.2	1,158	20.8
IF 10-34-0 at 2.75 + NWC Zn at 0.25 gpa/Post MAX-IN S at 64 fl oz/A	58,855	220	246	4	2,772	57.1	1,110	20.6
CV (%)	13.4	0.3	0.2	16.9	9.9	1.1	0.6	2.3
LSD (0.05)	NS	NS	NS	1	NS	NS	NS	NS

<sup>a</sup>NWC Zn: 9.5% N, 4% S and 10% Zn chelate. 6-24-6 (Gavilon). Nachurs Zn: 9% chelated. Ascend=plant growth regulator; MAX-IN Ultra ZMB=3.6% S, 0.1% B, 3.0% Mn and 4.0% Zn; MAX-IN S= 0-0-19-13 (Winfield).

<sup>b</sup>Jday: 220=Aug 8; 246=Sep 3. Canopy closure: Date recorded with plot at  $\geq 80\%$ . Lodge: 0=none; 9=all.

Table 2. Pinto bean response to foliar fungicide, Carrington, 2016.						
Treatment	Plant		Seed			
	Canopy closure	Physiological maturity	Yield	Test weight	KWT	Protein
	Jday		bu/A	lb/bu	seeds/250 g	%
untreated check	218	246	1880	54.1	99.4	20.8
fungicide <sup>a</sup>	221	246	1915	54.0	103.4	20.2
mean	220	246	1895	54.0	101.4	20.5
CV (%)	1.7	0.2	10.4	1.3	4.6	2.0
LSD (0.05)	NS	NS	NS	NS	NS	NS

<sup>a</sup>Headline applied at 6 fl oz/A + NIS at 0.25% v/v to pre-bloom plants 6 days after hail damage.