

Pinto bean response to row spacing and plant population, Carrington, 2019.

(Greg Endres and Mike Ostlie)

The field trial was conducted at the NDSU Carrington Research Extension Center with support from Northarvest Dry Bean Growers Association to examine the response of pinto bean to row spacing and plant population. Experimental design was a randomized complete block with split plot arrangement (whole plot = row spacings, split plot = plant populations) with four replications. 'ND Palomino' was planted on May 29 on a conventionally-tilled Heimdal-Emrick loam soil in 28- and 21-inch rows, and 7-inch paired rows (centered at 28 inches) with planting rates of 60,000, 80,000 and 100,000 PLS/acre to establish targeted stands of 50,000, 70,000 and 90,000 plants/acre, respectively. After maturity, plants were hand-pulled and placed in windrows on September 16 and seed was harvested with a plot combine on September 20. Low incidence of white mold was present in the trial with essentially no impact on seed yield.

Averaged across planting rates, plant stand was less with 21-inch and paired rows compared to 28-inch rows. Plant emergence and maturity was delayed 1-3 days with 21-inch or paired rows compared to 28-inch rows. Canopy closure and plant lodging were slightly greater with narrow rows. Though stand was reduced, seed yield increased 14-16% with 21-inch and paired rows compared to wide rows. Test weight was heavier with 21 inch and paired rows compared to 28-inch rows.

Averaged across row spacings, early season plant population was 46,460, 61,600 and 68,910 plants/A with low, medium and high planting rates, respectively. Plant development and lodging were similar among plant populations. Canopy closure percentage increased slightly with increasing plant population. Yield, test weight and seed count were similar among plant populations.

First flower date was the only agronomic factor that had statistical significance with the interaction of row spacing and plant population.

Table. Pinto bean response to row spacing and plant population, Carrington, 2019.									
Treatment	Plant ¹						Seed		
	Emerge	Stand (June 12)	Flower	Canopy closure (July 15)	Physiological maturity	Lodge (Sept. 5)	Yield	TW	Count
	DOY	plt/A	DOY	%	DOY	0-9	lb/A	lb/bu	no./lb
Row spacing (inches):									
28	158	65,600	195	74	243	3	2834	59.8	1599
21	160	61,190	196	84	244	4	3384	60.5	1629
paired 7	160	50,180	196	85	246	4	3295	60.4	1599
LSD (0.10)	1	4,080	NS	7	1	1	179	0.5	NS
CV (%)	0.5	8.7	0.0	11.1	0.7	4.7	8.0	1.0	3.2
Planting rate (pls/acre):									
60,000	159	46,460	196	75	245	4	3135	60.2	1607
80,000	159	61,600	196	83	245	4	3126	60.3	1605
100,000	159	68,910	196	86	244	4	3251	60.3	1616
LSD (0.10)	NS	6,780	NS	3	NS	NS	NS	NS	NS
CV (%)	0.4	16.2	0.0	5.9	0.5	15.3	7.6	0.7	2.1

¹DOY (day of year): 158=June 7; 195=July 14; 243=August 31. Lodging: 0=all stems vertical; 9=all stems horizontal.