

Dry Bean Response to Row Spacing and Planting Rates, Carrington

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The field study was conducted at the NDSU Carrington Research Extension Center with support from Northarvest Dry Bean Growers Association to examine the response of navy and black bean to row spacing and planting rates. Experimental design was a randomized complete block with split-plot arrangement (whole plot = market types; split plot = 3 row spacings; and split-split plot = 3 planting rates) with four replications. The dryland experiment was conducted on a conventionally-tilled Heimdal-Emrick loam soil. ‘Avalanche’ navy and ‘Eclipse’ black bean were planted on May 29 in 14-, 21- and 28-inch rows with planting rates of 100,000, 125,000 and 150,000 pure live seed (pls)/acre. After maturity, plants were hand-pulled and placed in windrows, and seed was harvested with a plot combine on September 15.

Plant height was uniformly short across the trial and lodging did not occur. Averaged across market types and planting rates, seed yield with 14-, 21-, and 28-inch rows was 2175, 1955, and 1665 lb/acre, respectively [LSD (0.05):155 lb/acre]. However, seed yield was similar among planting rates with range of 1915 to 1950 lb/acre.

Averaged across planting rates, navy and black bean plant canopy closure was advanced with 14-inch rows compared to wider rows (Tables 1 and 2). Yield tended to increase as row spacing decreased with each market type. Averaged across row spacings, early season navy bean plant stand with planting rates of 100,000, 125,000, and 150,000 pls/acre was 90,620, 110,240, and 133,960 plants/acre, respectively (Table 1). Also, black bean plant stand with planting rates of 100,000, 125,000 and 150,000 pls/acre was 88,760, 111,220 and 126,940 plants/acre, respectively (Table 2). Seed yield with each market type was similar among planting rates (Tables 1 and 2).

Interaction of market types, row spacing and planting rates was statistically significant for plant emergence dates and seed count (data not shown).

Table 1. Navy Bean Market Class Response to Row Spacing and Planting Rates, Carrington

	Plant					Seed		
			Stand	Canopy	Physiological		Test	
Treatment	Emerge	Flower	(June 18)	Closure	Maturity	Yield	Weight	Count
	Jday		plt/A	%	Jday	lb/A	lb/bu	no./lb
Row Spacing (inches):								
14	158	201	121,890	77	240	2400	62.8	2555
21	158	201	106,560	6	239	2050	62.8	2625
28	158	201	106,340	4	239	1735	62.5	2605
LSD (0.05)	NS	NS	NS	10	1	NS	NS	NS
Planting Rate (pls/acre):								
100,000	158	201	90,620	29	240	2050	62.7	2555
125,000	158	201	110,240	28	239	2065	62.9	2615
150,000	158	201	133,960	31	239	2075	62.5	2615
LSD (0.05)	NS	NS	NS	NS	NS	NS	NS	NS
C.V. %	0.1	0.1	7.0	19.0	0.3	9.4	0.6	3.0

Table 2. Black Bean Market Class Response to Row Spacing and Planting Rates, Carrington

Treatment	Plant					Seed		
	Emerge	Flower	Canopy			Yield	Test	
			Stand	Closure	Physiological		Weight	Count
			(June 18)	(August 15)	Maturity		lb/bu	no./lb
	Jday		plt/A	%	Jday	lb/A		
Row Spacing (inches):								
14	159	203	117,500	27	237	1945	60.8	2940
21	158	202	103,500	1	237	1860	61.1	2820
28	158	203	105,910	0	238	1595	60.9	2605
LSD (0.05)	NS	NS	NS	10	1	NS	NS	NS
Planting Rate (pls/acre):								
100,000	158	203	88,760	7	238	1785	61.0	2820
125,000	158	202	111,220	10	237	1790	60.9	2870
150,000	158	203	126,940	10	237	1825	60.9	2880
LSD (0.05)	NS	NS	NS	NS	NS	NS	NS	NS
C.V. %	0.1	0.1	7.0	19.0	0.3	9.4	0.6	3.0