Black Bean Seed Yield with Row Spacing and Plant Population

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A field study is being conducted to examine the response of black and navy bean to row spacing and plant population. 'Eclipse' black and 'Avalanche' navy bean were planted in 14-, 21- and 28-inch rows at 100,000, 125,000 and 150,000 pure live seeds (PLS)/acre at Carrington in 2014 and 2016-17. In addition, the two dry bean market classes were planted at the three planting rates at Park River in 2014, and Prosper in 2014 and 2016-17. This preliminary report provides current seed yield results on black bean.

Averaged across three years and plant populations at Carrington, 21-inch rows increased black bean yield by 240 lb/acre compared to 28-inch rows (Table 1). Yield with 14-inch rows was statistically similar to 21-inch rows.

Table 1. Black bean seed yield with row spacing[1], Carrington, 2014 and 2016-17.

Row Spacing	Seed Yield (lb/acre)			
Inch	2014	2016	2017	3-year average
14	1945	2356	2078	2126ab
21	1860	3162	1988	2337a
28	1595	2618	2074	2096b
LSD (0.10)				210

[1]Variety = 'Eclipse'. Averaged across three plant populations.

a, b Numbers followed by different letters are statistically different at $P<0.1$.

Averaged across seven site-years and three rows spacings, black bean planted at the low, medium and high rates produced 99,950, 118,530 and 140,480 plants/acre, respectively. Yield increased with the high- versus low-plant population, while the intermediate plant population was statistically similar to the high plant population (Table 2). Based on these data, return-on-investment would indicate that the intermediate planting rate would be appropriate.

Table 2. Black bean response to plant population, North Dakota, 2014, 2016-17 (7 site-years)[1].

Planting Rate	Plant Population	Seed Yield
PLS/acre (x1000)	number/acre	lb/acre
100	99,950	2430b
125	118,530	2470ab
150	140,480	2510a
LSD (0.10)	x	75

[1]Variety = 'Eclipse'. Trial locations: Carrington and Prosper (2014, 2016-17); Park River (2014). Averaged across three row spacings at Carrington.

a, b Numbers followed by different letters are statistically different at $P < 0.1$.

These preliminary data would suggest black bean planted in narrow rows and with a planting rate to achieve 115,000 to 125,000 plants/acre would optimize yield potential. The study will be continued in 2018 at Carrington to expand the database before plant establishment recommendations by NDSU are likely revised for black bean.

Partial funding for this research was provided by Northarvest Bean Growers Association.