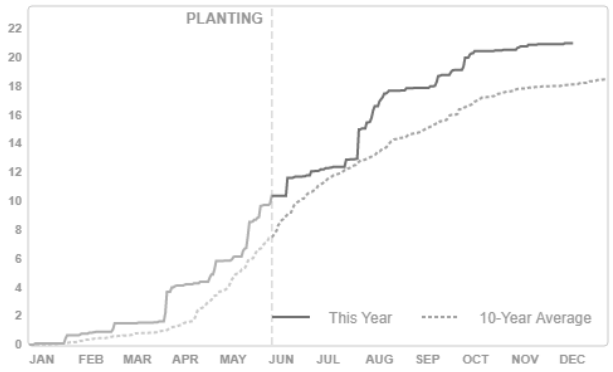
Planting Populations for Direct Harvested Dry Beans

Study ID: 608013201701
County: Box Butte
Soil Type: Creighton very fine sandy loam 3-6% slopes; Creighton very fine sandy loam 6-11% slopes; Duroc loam 1-3% slope; Keith loam 1-3% slope
Planting Date: 6/3/17
Harvest Date: 9/14/17
Row Spacing (in): 7.5
Variety: Sinaloa
Reps: 4
Previous Crop: Corn
Tillage: Vertical till, chisel, and 2 packings
Herbicides: ***Pre:*** Post-plant, pre-emerge: 35 oz/ac Roundup® ***Post:*** 21 oz/ac Varisto™, 8 oz/ac Basagran®, 8 oz/ac Section®, 4.8 oz/ac Preference®; Desiccant of Roundup® and Valor® on 8/29/17.

Foliar Fungicides: Priaxor® fungicide, Nu-Cop® HB copper fungicide, and Ascend® growth promotor on 7/25/17
Fertilizer: 50 lb/ac N, 40 lb/ac P, 10 lb/ac S, and 12 lb/ac Zn
Irrigation: Pivot, Total: 3.5"
Rainfall (in):



Introduction: The purpose of this study was to compare several planting rates of dry edible beans (Sinaloa variety pinto) drilled in 7.5" rows. The Sinaloa variety is indeterminate. Target populations were 90,000, 110,000, and 130,000 seeds/ac. The plots were drilled with a JD1990 single disk drill. Serious hail on July 27 resulted in 50 percent loss. The plots were harvested on September 14 using a John Deere 9760 STS combine and a 35 foot John Deere flex auger head with Crary Wind and flex fingers. A yield monitor was used to evaluate treatment yields. Samples from each plot were analyzed for bean quality parameters. Pod height measurements were taken to determine the percent of pods 2" or greater above the soil surface. Harvest loss estimates were determined by taking counts in 12 one-square-foot frames randomly chosen in the harvested area but equally representing left side of header, center of header, and right side of header area behind the combine.

Results:

Treatment (seeds/ac)	Early Season Stand Count	Pods >2" above ground (%)	Harvest Loss (bu/ac)	Split (%)	Small (%)	Moisture (%)	Test Weight (lb/bu)	Seeds per lb	Yield (bu/ac)†	Marginal Net Return‡ ($/ac)
90,000	87,851 C*	82 B	2.3 B	0.7 A	13.4 A	10.7 A	62 A	1,603 A	24 A	279.60 A
110,000	121,104 B	86 AB	2.6 AB	0.6 A	16.4 A	10.4 A	63 A	1,565 A	26 A	281.44 A
130,000	138,529 A	88 A	2.8 A	0.5 A	18.2 A	10.4 A	62 A	1,660 A	26 A	262.92 A
P-Value	<0.0001	0.061	0.074	0.343	0.176	0.107	0.837	0.339	0.501	0.699

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 14% moisture and is adjusted for clean yield (% splits, % small, and % foreign material removed).
‡Marginal net return based on $24/cwt ($14.40/bu at 60lb/bu).

Summary:

- Actual stand counts were higher for the 110,000 and 130,000 seeds/ac treatment and lower for the 90,000 seeds/ac treatment.
- 88 percent of the pods in the 130,000 seeds/ac treatment were 2" or more above the soil as compared with only 82 percent in the 90,000 seeds/ac treatment.
- Harvest loss was significantly greater for the 130,000 seeds/acre treatment, compared with the 90,000 seeds/ac treatment. Considering that pod height in all the treatments was less than 90 percent above 2", the harvest loss range of 2.3 to 2.8 bu/ac is very low.
- There was no difference in the percent splits, percent small beans, moisture, seed density, or seed per lb between the three seeding rates.
- Yield and net return was not significantly different between the three seeding rates.

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