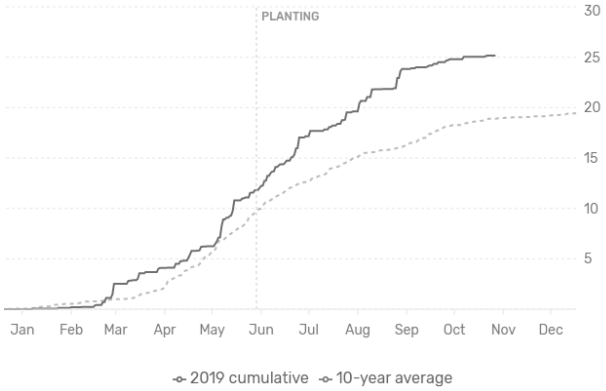
Dry Bean Direct Harvest Great Northern Variety

Study ID: 0152013201901
County: Box Butte
Soil Type: Keith loam, 0-1% slope; Goshen loam, 0-1% slope
Planting Date: 6/12/19
Harvest Date: 10/7/19
Seeding Rate: 110,000
Row Spacing (in): 15
Reps: 4
Previous Crop: Corn
Tillage: Disked once, then rolled before planting
Herbicides: ***Pre:*** 30 oz/ac Prowl®, 15 oz/ac Outlook®, and 1 qt/ac Roundup® on 6/10/19 ***Post:*** 30 oz/ac Basagran®, 4 oz/ac Raptor®, and 15 oz/ac Select® on 7/15/19 ***Desiccant:*** 2 pt/ac Gramoxone® with 1 qt/ac crop oil on 9/16/19
Seed Treatment: Apron XL®, Maxim®, Rancona®, Dynasty®, and Cruiser®

Foliar Insecticides: None
Foliar Fungicides: Copper Plus on 8/1/19
Fertilizer: 50 lb N/ac and 50 lb P/ac, dry spread; 900 gal/ac 32-0-0 through pivot
Irrigation: Pivot, Total: 7"
Rainfall (in):



Introduction: The purpose of this study was to compare four different great northern bean varieties in a direct harvest bean production system, looking at both yield and harvest loss. Currently, most dry beans in western Nebraska are harvested in a two-step process starting with a cutting windrowing operation, and then combining. Direct harvest is simply one pass through the field with the combine. A good upright bean variety, proper level field conditions, and a combine header suitable for direct harvest are essential to minimize harvest loss and economically justify direct harvest.

The study evaluated Draco, Andromeda, Virgo, and 14172. The study was planted with a 20-foot soybean drill in 15" rows. The target population for the study was 110,000 plants per acre. Because of the inaccuracy of drills, normally as a result of seed size and seed flow through the machine, actual plant populations determined by early season stand counts were 82,115 plants/ac for Draco, 74,928 plants/ac for Andromeda, 85,819 plants/ac for Virgo, and 83,967 seeds/ac for 14172. Planting populations were assumed to be approximately 10% greater at 90,300 seeds/ac for Draco, 82,420 seeds/ac for Andromeda, 94,400 seeds/ac for Virgo, and 92,400 seeds/ac for 14172. Low hanging pods are a major cause of harvest loss in the direct harvest process; therefore, pod height measurements were taken to determine the percent of pods greater than 2" above the ground just before harvest.

The plots were direct harvested on October 7 with a CaseIH® 7088 combine with a MacDon® 30-foot flex draper head. The temperature at harvest was 69°F and 15% relative humidity. Hot and dry weather conditions at harvest generally result in greater harvest loss through pod shattering.

Results:

	Early Season Stand Count (plants/ac)	Pods > 2" above-ground (%)	Harvest Loss (bu/ac)	Small (%)	Split (%)	Foreign Material (%)	Damaged (%)	Moisture (%)	Density (lb/bu)	Seeds per lb	Yield (bu/ac)†	Marginal Net Return‡ ($/ac)
GN Draco	82,115 AB*	38 B	13 A	2 AB	1 B	1 A	4.2 A	14.2 A	57.8 A	1,240 B	36 B	546.55 B
GN Andromeda	74,928 B	46 B	16 A	1 B	1 A	1 A	3.7 A	14.4 A	57.1 A	1,023 C	35 B	529.51 B
GN Virgo	85,818 A	67 A	8 B	2 AB	1 B	0 A	3.2 A	13.6 B	59.1 A	1,258 B	44 A	698.48 A
GN 14172	83,967 AB	50 B	13 A	2 A	1 AB	1 A	3.3 A	13.4 B	59.0 A	1,340 A	32 C	468.74 C
P-Value	0.076	0.003	0.004	0.117	0.048	0.232	0.317	0.001	0.388	<0.0001	<0.0001	<0.0001

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre adjusted to 14% moisture and adjusted for clean yield (% splits, % small, and % foreign material removed).
‡Marginal net return based on $30/cwt ($18/bu at 60 lb/bu). Seed cost for the bean seed was $73/100,000 seeds. Seed costs for each treatment were adjusted to represent the estimated actual seeding rate based on stand counts: Draco $75/100,000 seeds; Andromeda $79/100,000 seeds; Virgo: $77/100,000 seeds; 14172: $77/100,000 seeds.

Summary:

- There were significant differences in stand counts among the treatments.
- Virgo had a higher percentage of pods greater than 2" above the soil than the other varieties; however, the percent of pods greater than 2" above the soil was lower than desired for all varieties tested.
- A greater percentage of pods 2" above the soil resulted in Virgo having less harvest loss than the other varieties tested.
- Percent splits and percent smalls varied among treatments; however, values for all varieties were fairly low and in an acceptable range.
- There was no difference among varieties in percent foreign material, density, or percent damage. Market value for net return was adjusted for beans having more than 2% damage in great northerns.
- Seeds per lb varied among treatments with 14172 having the greatest number of seeds per lb.
- Virgo had the highest yield, followed by Draco and Andromeda. 14172 had the lowest yield.
- Net return followed the same pattern as yield; Virgo had the highest net return followed by Draco and Andromeda. 14172 had the lowest net return.
- The surrounding field was planted to Draco variety great northerns and the overall average yield for the surrounding field was 35 bu/ac.

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