Pinto Varieties for Direct Harvest

Study ID: 0608013201801
County: Box Butte
Soil Type: Keith loam 0-1% slope
Planting Date: 6/7/18
Harvest Date: 10/3/18
Population: 110,000 target
Row Spacing (in): 7.5
Reps: 4
Previous Crop: Corn
Tillage: Vertical Till, Chisel and 2 Packings
Herbicides: ***Pre:*** 35 oz/ac Gly Star®, 5 oz/ac Glyphosate, 4.5 oz/ac Weather Guard Complete, and 25.6 oz/ac Prime Oil, on 6/8/18 ***Post:*** 21 oz/ac Varisto™, 8 oz/ac Basagran®, 9 oz/ac Section® Three, 9 oz/ac Weather Gard Complete, and 25.6 oz/ac Prime Oil® on 6/29/18
Seed Treatment: Cruiser®
Foliar Insecticides: 1.92 oz/ac Grizzly® Too on 8/4/18
Foliar Fungicides: 4 oz/ac Priaxor® and 1 lb/ac Nu-Cop® on 8/4/18
Fertilizer: 132.6 lb/ac of 30-4-0-5S-1Z dry spread, 64 oz/ac 32% UAN on 6/8/18, and 64 oz/ac 32% UAN on 6/29/18
Irrigation: Pivot, Total: 4.94”
Rainfall (in):

Introduction: The purpose of this study was to compare four different Pinto 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 Radiant, Vibrant, WYO 50, and Sundance. These are all newer, slow darkening varieties of pinto beans that industry desires. The study was planted with a 40-foot air drill. The targeted 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, our actual plant populations determined by early-season stand counts were 104,550 plants/ac for Radiant, 104,332 plants/ac for Vibrant, 112,609 plants/ac for WYO 50, and 107,817 plants/ac for Sundance. Planting populations were assumed to be approximately 10% greater at 115,500 seeds/ac, 114,400 seeds/ac, 124,300 seeds/ac, and 118,800 seeds/ac, respectively. 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 3 with a John Deere 635 flex auger head. The temperature at harvest was 84°F and relative humidity was 19%. Hot and dry weather conditions at harvest generally result in greater harvest loss through pod shattering.

Results:

	Stand Count (plants/ac)	Pods >2" above ground (%)	Harvest Loss (bu/ac)	Small (%)	Split (%)	Foreign Material (%)	Moisture (%)	Density (lb/bu)	Seeds per lb	Yield† (bu/ac)	Marginal Net Return‡ ($/ac)
Radiant	104,550 A*	85 AB	2.2 B	1.2 A	7.2 A	2.0 A	14.2 A	57 C	1,358 A	47 A	529.59 A
Vibrant	104,332 A	90 A	2.7 B	1.4 A	4.2 A	1.0 AB	13.7 AB	59 BC	1,360 A	50 A	569.00 A
WYO 50	112,609 A	66 C	7.9 A	1.3 A	6.2 A	1.4 AB	11.8 B	59 AB	1,283 A	48 A	541.13 A
Sundance	107,817 A	81 B	3.4 B	1.6 A	3.6 A	0.7 B	13.8 AB	60 A	1,368 A	44 A	487.27 A
P-Value	0.208	<0.0001	0.0001	0.889	0.258	0.079	0.058	0.003	0.530	0.286	0.274

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 14% moisture and adjusted for clean yield (% splits, % small, and % foreign material removed).
‡Marginal net return based on $22/cwt ($13.20/bu at 60 lb/bu). The seed cost was $79/100,000 seeds. There was no difference in seed cost for the varieties tested. Actual planted populations were slightly different; therefore, treatment costs were adjusted accordingly. Seed costs for each treatment were: $91.25/ac for Radiant, $90.38/ac for Vibrant, $98.20/ac for WYO 50, and $93.85/ac for Sundance.

Summary:

- There were no significant differences in stand counts among the treatments.
- The percent of pods greater than 2" above the soil differed among the varieties with Vibrant and Radiant having the greatest percentage of pods above 2". WYO 50 had only 66% of the pods 2" above the soil or greater.
- Due to low pod height, harvest loss was greater for WYO 50.
- There were no differences among varieties in percent small beans, percent split beans, or seeds per pound.
- Percent foreign material varied among varieties with Radiant having more foreign material than Sundance.
- Moisture also varied among varieties. WYO 50 was significantly drier than Radiant at the time of harvest due to WYO 50 maturing earlier.
- Differences existed in test weight among the varieties as well.
- Despite harvest loss differences, yields were not significantly different among the four varieties tested. There was also no difference in the net return among the four varieties.
- WYO 50 yielded competitively with the other varieties but based on low pod height and high harvest loss in this year's data, it would not be recommended for direct harvest.

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