



## Dry Bean Direct Harvest Variety Study

**Study ID:** 152013201601

**County:** Box Butte

**Soil Type:** Alliance loam; Keith loam

**Planting Date:** 6/7/16

**Harvest Date:** 9/16/16

**Population:** ~120,000

**Row Spacing (in):** 15

**Hybrid:** Being Tested

**Reps:** 4

**Previous Crop:** Corn

**Tillage:** Disked once and rolled before planting

**Herbicides: Pre:** 30 oz/acre Prowl®, 15 oz/acre Outlook®, and 30 oz/acre Roundup® on 6/4/16

**Post:** 4 oz/acre Raptor®, 25 oz/acre Basagran®, and 10 oz/acre Select® on 6/28/16;

Desicant/harvest aid: 35 oz/acre Roundup®, 2 oz/acre Sharpen®, and 10 gallons 32% N on 9/6/16

**Seed Treatment:** Apron XL®, Maxim®, Rancona®, Dynasty®

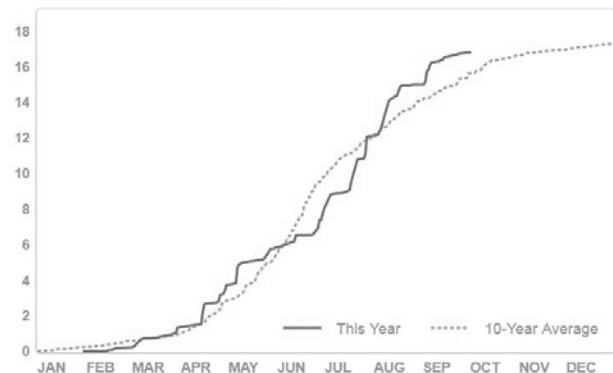
**Foliar Insecticides:** None

**Foliar Fungicides:** None

**Fertilizer:** 35 lb/acre nitrogen

**Irrigation:** Pivot, Total: 8"

**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.

This study evaluated four Pinto bean varieties all suitable for direct harvest. The varieties: Sinaloa, Torreon, LaPaz and Monterrey were replicated four times in plots 525 feet by 30 feet. The plots were planted in a randomized complete block design on June 7 with a Case IH 5400 Soybean Drill. Row spacing was 15 inches and seed was planted 1.5 inches deep. Stand counts were taken on June 21 when beans were approximately three inches tall. The plots were fertilized, sprinkler irrigated and treated identically. Pod height measurements to determine the percent of pods above two inches were taken on Sept 14. Low hanging pods are a major cause of harvest loss in the direct harvest process.

The plots were harvested on Sept. 16 using a Case IH 7088 combine equipped with a MacDon FD70, 30 foot flex draper head. The center 30 feet of the 40 foot plot was harvested. The harvested plot area was 0.362 acres per treatment per rep. The beans from each plot were weighed using a Par-Kan weigh wagon with a Weigh-Tronix scale. Nine square foot counts along the plot area were taken the day of harvest to estimate harvest loss during combining. A sample of beans was taken from each plot and analyzed for quality by Kelley Bean Company in Scottsbluff. All bean samples graded USDA #1, and the moistures were between 13.8 and 14.9%. The dry beans direct harvested in the surrounding field were Pinto variety Sinaloa with an average yield of 39.8 bu/acre.

## Results:

	Early Season Stand Count	Pods >2" above ground (%)	Harvest Loss (bu/ac)	Small (%)	Moisture (%)	Density (lb/bu)	Seeds per lb	Yield (bu/ac) †	Marginal Net Return‡ (\$/ac)
LaPaz	119,797 A*	85 A	2.5 B	4.8 B	14.9 A	61.4 A	1,590 A	43 A	693.00
Monterrey	116,893 AB	83 A	2.4 B	4.1 B	14.6 A	61.2 A	1,560 AB	43 A	695.03
Sinaloa	98,887 C	85 A	2.6 B	7.1 A	13.9 B	61.1 A	1,505 B	44 A	724.50
Torreón	106,002 BC	85 A	3.6 A	3.3 B	13.8 B	61.2 A	1,349 C	45 A	737.76
P-Value	0.005	0.462	0.018	0.001	0.0003	0.646	<0.0001	0.2817	-

\*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 \$30/cwt (\$18/bu at 60lb/bu). Seed cost was the same for all varieties planted, however seed size varies, such that the same drill setting results in different seeding rates. To account for this, seed costs were adjusted for actual stands. Torreón cost \$72.24/ac, Monterrey cost \$78.97/ac, LaPaz cost \$81.00/ac, and Sinaloa cost \$67.50/ac.

**Summary:** Torreón, Monterrey, La Paz and Sinaloa are all Pinto dry bean varieties with upright characteristics suitable for direct harvest. There were no significant yield differences between treatments with yields ranging from 43 to 45 bu/acre. These yields are good but not exceptional for Western Nebraska.

The stand counts are significantly different between varieties due to seed size and seed movement through the drill. Adjustments to the drill were not made between varieties. It is interesting to note that varieties with significantly lower populations yielded similarly to those at higher populations. More studies are needed to evaluate the relationship between seeding rate and yield. Dry beans have the capacity to compensate under reduced plant stands. The results also showed a significant difference in harvest loss ranging from 2.4 to 3.6 bu/acre. Greater losses in Torreón may be due to a drier pod and a slightly higher yield. Harvest losses are well within the acceptable range of 2 to 4 bu/acre. A hail event on August 11 created a fair amount of damage and affected the yield. The hail was partially responsible for pod heights being in the 80's instead of the 90's when looking at percent of pods two inches or more above the soil. Good pod height is very important in minimizing direct harvest loss.

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