**2019 Nebraska Dry Bean Variety Trials**

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In 2019, the PHREC Dry Bean Breeding program conducted six replicated field trials at two locations, the Scottsbluff Ag Lab (Scotts80-Field-1) and the Mitchell Ag lab (Field W2), to evaluate which dry bean entries (varieties/experimental lines) are best suited for western Nebraska. These trials have been ongoing for 38 years as a service to the Nebraska dry bean industry. Information about dry bean variety performance is available on the web at <http://cropwatch.unl./varietytest-Drybeans/2019>. The trials at the Scottsbluff Ag lab were harvested, but the data are not reported because damage from multiple hailstorms [August 15 (golf ball size), 16, and 20] reduced yield by almost 80% and resulted in very poor seed quality. Therefore, we only report results from the Mitchell Ag lab variety trials.

**Locations and Germplasm**

Six replicated trials [one great northern (25 entries), one pinto (50 entries), one light red kidney (LRK, 19 entries), one dark red kidney (DRK, 9 entries), one black (18 entries), and one navy (8 entries) were planted at the Mitchell Ag Lab on June 5.

Soil at the Mitchell site (41◦56.6′ N, 103◦41.9′ W, 1240 m elevation) is a silt loam (Typic Ustorthents).

**Agronomic Management**

The field at the Mitchell Ag Lab was plowed on June 3 and sprayed/roller harrowed with Eptam @ 2.5 pts/acre and Sonalan @ 2 pts/acre on June 4.

The field at the Mitchell Ag Lab had 52# residual N and 83# N manure credit.

It was sprayed with Badge SC @ 1.5 pts/acre on July 9 and with Oxidate on July 25. This site received hail and wind damage on August 15.

The field at the Mitchell Ag Lab was irrigated 10 times (7.4 inches) using sprinkler irrigation. It received an additional 6.12 inches of precipitation.

The entries were assigned to experimental units using a randomized complete block design with four replications. Each plot consisted of four 22-foot rows spaced 22 inches apart. The target plant population was 80,000 plants/acre for all market classes except the LRK/DRK which had a target population of 100,000 plants/acre. The trials were planted with a Hege cone planter. At the end of the growing season, a plot combine (Wintersteiger Classic) was used to harvest 18 feet of the middle two rows of each plot. Variety/line trials at the Mitchell Ag lab were undercut and combined on September 12.

**Response Variables**

Data collected were: yield (lbs/acre adjusted to 14% Moisture), DTF (days to flowering, actual number of days from planting to when 50% of the plants had at least one flower opened), DTM (days to harvest maturity, actual days from planting to when 80% of the plants were ready to be harvested), 100-seed counts (weight of 100 seeds in grams, adjusted to 14% Moisture), and Test Weight (lbs/bushel). Data are presented in Tables 1 to 6.

**Statistical Analysis**

Data were analyzed using PROC MIXED (SAS, 2004). Means were separated using a F-protected LSD. All tests were considered significant at *P* ≤ 0.05.

The, GRAND MEAN (bottom of each table) refers to the mean of the experiment. The Coefficient of Variation, expressed as a percentage (CV %), measures the variability of the experiment; large CVs indicate that a large amount of variation cannot be attributed to differences among entries. The LSD (Least Significance Difference) was used to evaluate differences among entries. If the difference between two entries exceeds the LSD value for a particular response variable, the higher value is significantly greater with 95% probability (0.05 level). If the difference between two entries is less than the LSD value, the values are considered similar.

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**Acknowledgments**

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| **Table 1. 2019 Great Northern Dry Bean Variety Trial - Mitchell Ag Lab.** | | | | | | | | |
| **Entry** | **ID** | **Yield** | **Days to Flowering** | **Days to Maturity** | **100-SeedWeight** | **Moisture** | **Test Weight** | **Owner** |
| **no** | **lbs/A** | **days** | **days** | **gr** | **%** | **lbs/bu** |  |
|  |  |  |  |  |  |  |  |  |
| 11 | 15215 | 2563 | 47 | 90 | 34.1 | 10.2 | 61.6 | Kelley Bean/ADM |
| 9 | 14164 | 2473 | 46 | 85 | 37.4 | 10.1 | 59.3 | Kelley Bean/ADM |
| 14 | NE1-17-9 | 2355 | 47 | 87 | 34.5 | 10.0 | 60.1 | UNL |
| 5 | Andromeda (13151) | 2320 | 45 | 84 | 39.5 | 10.2 | 60.5 | Kelley Bean/ADM |
| 17 | NE1-17-29 | 2307 | 47 | 86 | 34.9 | 9.7 | 59.8 | UNL |
| 19 | NE1-17-10 | 2299 | 47 | 87 | 32.9 | 9.7 | 60.5 | UNL |
| 24 | NE1-17-31 | 2201 | 47 | 90 | 36.8 | 9.9 | 57.9 | UNL |
| 6 | Virgo (13172) | 2177 | 47 | 90 | 33.1 | 9.9 | 60.8 | Kelley Bean/ADM |
| 20 | NE1-17-36 | 2172 | 47 | 90 | 36.2 | 10.1 | 60.2 | UNL |
| 18 | NE1-17-45 | 2082 | 47 | 89 | 36.9 | 10.3 | 61.6 | UNL |
| 7 | 12134 | 2065 | 46 | 90 | 34.5 | 9.9 | 59.3 | Kelley Bean/ADM |
| 4 | Draco | 2043 | 48 | 89 | 31.0 | 10.0 | 60.9 | Kelley Bean |
| 16 | NE1-17-27 | 2024 | 46 | 90 | 37.6 | 10.2 | 60.4 | UNL |
| 10 | 14172 | 2003 | 47 | 89 | 33.5 | 9.7 | 60.6 | Kelley Bean/ADM |
| 21 | NE1-17-41 | 1938 | 45 | 89 | 36.4 | 10.2 | 61.5 | UNL |
| 2 | Aries | 1925 | 47 | 86 | 31.9 | 10.0 | 61.4 | Kelley Bean |
| 8 | 13150 | 1914 | 47 | 91 | 34.2 | 10.1 | 62.0 | Kelley Bean/ADM |
| 12 | Powderhorn | 1894 | 46 | 88 | 33.8 | 9.9 | 60.9 | MSU |
| 25 | NE3-17-18 | 1824 | 48 | 90 | 36.2 | 10.1 | 60.6 | UNL |
| 15 | NE1-17-19 | 1796 | 46 | 92 | 37.2 | 10.3 | 60.0 | UNL |
| 3 | Hydra | 1768 | 47 | 86 | 36.9 | 9.9 | 60.9 | Kelley Bean |
| 13 | Panhandle Pride | 1718 | 45 | 87 | 33.0 | 10.1 | 62.6 | UNL |
| 1 | Taurus | 1656 | 49 | 91 | 33.2 | 9.9 | 62.6 | Kelley Bean |
| 22 | NE1-17-43 | 1441 | 45 | 90 | 36.7 | 10.1 | 61.1 | UNL |
| 23 | NE1-17-22 | 1362 | 45 | 90 | 37.3 | 9.7 | 61.4 | UNL |
|  | **MEAN** | 2013 | 47 | 89 | 35.2 | 10.0 | 60.7 |  |
|  | **LSD 0.05** | 399 | 1 | 2 | 2.2 | 0.3 | 0.7 |  |
|  | **CV %** | 9.9 | 1.4 | 1.1 | 3.1 | 1.7 | 0.6 |  |

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| **Table 2. 2019 Pinto Dry Bean Variety Trial - Mitchell Ag Lab.** | | | | | | | | |
| **Entry** | **ID** | **Yield** | **Days to Flowering** | **Days to Maturity** | **100-SeedWeight** | **Moisture** | **Test Weight** | **Owner** |
| **no** | **lbs/A** | **days** | **days** | **gr** | **%** | **lbs/bu** |  |
|  |  |  |  |  |  |  |  |  |
| 12 | 18-376 | 2547 | 47 | 89 | 35.2 | 10.4 | 62.8 | ADM |
| 14 | Windbreaker | 2414 | 47 | 85 | 37.2 | 9.9 | 58.2 | Seminis |
| 8 | Cowboy (11278) | 2372 | 48 | 85 | 33.9 | 10.0 | 60.2 | ADM |
| 13 | 18-589 | 2337 | 51 | 90 | 33.7 | 9.6 | 61.2 | ADM |
| 6 | Vibrant | 2291 | 47 | 87 | 33.5 | 10.1 | 61.0 | ADM |
| 15 | SV6139GR | 2211 | 47 | 85 | 31.9 | 9.7 | 61.1 | Seminis |
| 5 | Torreon | 2207 | 48 | 86 | 34.5 | 10.3 | 61.1 | ADM |
| 7 | Radiant (12324) | 2180 | 47 | 88 | 34.1 | 9.3 | 60.4 | ADM |
| 11 | Gleam (14455) | 2180 | 49 | 88 | 29.1 | 10.2 | 62.6 | ADM |
| 1 | La Paz | 2175 | 48 | 89 | 31.1 | 9.9 | 61.6 | ADM |
| 21 | 41767-15 | 2137 | 44 | 87 | 41.4 | 9.8 | 61.8 | TVS |
| 33 | Montrose | 2131 | 46 | 83 | 34.4 | 9.6 | 60.0 | CSU |
| 3 | Monterrey | 2127 | 50 | 88 | 32.4 | 10.1 | 61.3 | ADM |
| 27 | 52646-14 | 2125 | 46 | 84 | 36.8 | 10.1 | 58.5 | TVS |
| 16 | SV6533GR | 2122 | 46 | 83 | 37.3 | 10.0 | 60.7 | Seminis |
| 4 | Santa Cruz | 2113 | 48 | 88 | 31.6 | 10.1 | 60.8 | ADM |
| 47 | NE4-18-45 | 2061 | 47 | 90 | 38.8 | 9.6 | 58.9 | UNL |
| 10 | Lumen (14451) | 2028 | 47 | 90 | 31.5 | 10.1 | 63.7 | ADM |
| 18 | GTS-907 | 2017 | 46 | 85 | 34.5 | 9.6 | 58.7 | Gentec |
| 20 | Palomino | 2012 | 45 | 85 | 37.4 | 9.6 | 59.9 | NDSU |
| 2 | Sinaloa | 1994 | 48 | 87 | 33.7 | 10.0 | 60.3 | ADM |
| 45 | NE4-17-6 | 1985 | 45 | 89 | 38.9 | 9.8 | 58.8 | UNL |
| 49 | NE4-18-40 | 1962 | 45 | 91 | 38.6 | 9.3 | 58.4 | UNL |
| 38 | NE2-17-20 | 1946 | 47 | 88 | 34.1 | 9.6 | 59.0 | UNL |
| 9 | 18-283 | 1945 | 50 | 88 | 38.5 | 9.8 | 59.0 | ADM |
| 17 | GTS-904 | 1936 | 48 | 90 | 37.0 | 9.8 | 58.8 | Gentec |
| 22 | 30903-6 | 1890 | 45 | 83 | 33.7 | 9.7 | 60.3 | TVS |
| 44 | NE4-17-10 | 1836 | 44 | 85 | 38.9 | 9.6 | 56.0 | UNL |
| 26 | 32330-14 | 1822 | 49 | 91 | 36.7 | 9.6 | 58.6 | TVS |
| 50 | NE2-17-44 | 1800 | 43 | 89 | 38.9 | 9.5 | 57.1 | UNL |
| 43 | NE2-17-41 | 1792 | 45 | 88 | 37.7 | 9.7 | 56.7 | UNL |
| 40 | NE2-17-38 | 1734 | 42 | 86 | 34.6 | 9.7 | 58.4 | UNL |
| 28 | 42732-15 | 1719 | 49 | 92 | 36.9 | 10.0 | 60.3 | TVS |
| 46 | NE4-18-6 | 1693 | 47 | 90 | 39.7 | 9.8 | 59.9 | UNL |
| 19 | Staybright | 1670 | 45 | 91 | 35.7 | 10.0 | 58.6 | TVS |
| 29 | 43732-1 | 1654 | 48 | 91 | 36.6 | 9.8 | 60.9 | TVS |
| 39 | NE2-17-37 | 1654 | 45 | 90 | 32.9 | 9.8 | 58.9 | UNL |
| 24 | 33503-5 | 1649 | 48 | 90 | 37.9 | 9.6 | 59.5 | TVS |
| 32 | Croissant | 1632 | 46 | 87 | 32.5 | 9.3 | 60.5 | CSU |
| 37 | NE2-17-18 | 1630 | 47 | 91 | 40.0 | 9.6 | 59.9 | UNL |
| 25 | 34628-5 | 1590 | 49 | 91 | 35.8 | 9.9 | 60.5 | TVS |
| 23 | 30993-27 | 1552 | 49 | 91 | 33.4 | 9.8 | 62.0 | TVS |
| 42 | NE2-17-40 | 1542 | 47 | 90 | 34.6 | 9.9 | 60.7 | UNL |
| 48 | NE4-18-55 | 1459 | 47 | 92 | 45.0 | 10.3 | 59.5 | UNL |
| 36 | Centennial | 1459 | 48 | 92 | 34.6 | 10.0 | 61.4 | CSU |
| 41 | NE2-17-39 | 1458 | 41 | 85 | 36.0 | 9.6 | 58.4 | UNL |
| 31 | Bill Z | 1432 | 46 | 84 | 31.9 | 9.7 | 59.1 | CSU |
| 30 | 53676-3 | 1375 | 51 | 92 | 34.7 | 9.7 | 57.2 | TVS |
| 35 | Long's Peak | 1323 | 49 | 91 | 35.2 | 9.7 | 59.4 | CSU |
| 34 | DR Wood | 1303 | 49 | 93 | 34.4 | 9.7 | 60.8 | CSU |
|  | **MEAN** | 1884 | 47 | 88 | 35.6 | 9.8 | 59.9 |  |
|  | **LSD 0.05** | 345 | 2 | 2 | 2.3 | 0.4 | 0.9 |  |
|  | **CV %** | 9.3 | 2.0 | 1.1 | 3.3 | 1.9 | 0.8 |  |

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| **Table 3. 2019 Light Red Kidney Dry Bean Variety Trial - Mitchell Ag Lab.** | | | | | | | | |
| **Entry** | **ID** | **Yield** | **Days to Flowering** | **Days to Maturity** | **100-SeedWeight** | **Moisture** | **Test Weight** | **Owner** |
| **no** | **lbs/A** | **days** | **days** | **gr** | **%** | **lbs/bu** |  |
|  |  |  |  |  |  |  |  |  |
| 9 | 15916 | 1478 | 39 | 82 | 43.3 | 10.1 | 57.2 | TVS |
| 11 | Pink Panther | 1434 | 39 | 83 | 46.6 | 10.2 | 54.8 | Seminis |
| 4 | Red Dawn (09363) | 1422 | 39 | 76 | 47.5 | 11.1 | 53.7 | TVS |
| 1 | Big Red | 1388 | 38 | 84 | 44.0 | 10.1 | 56.8 | TVS |
| 14 | Closseau | 1272 | 39 | 81 | 45.3 | 10.4 | 54.4 | Seminis |
| 19 | NE10-18-7 | 1117 | 37 | 86 | 42.7 | 10.0 | 55.5 | UNL |
| 3 | Ronnie's Red | 1111 | 42 | 90 | 45.6 | 9.2 | 56.5 | TVS |
| 13 | Panhandle Red | 992 | 39 | 87 | 42.2 | 9.4 | 57.3 | Jack's Bean |
| 8 | 15907 | 987 | 45 | 90 | 43.2 | 9.2 | 55.6 | TVS |
| 12 | CELRK | 937 | 37 | 76 | 43.8 | 10.2 | 55.4 |  |
| 2 | Red Zone | 924 | 45 | 90 | 41.2 | 9.2 | 56.6 | TVS |
| 18 | NE10-18-2 | 779 | 38 | 78 | 39.1 | 10.2 | 57.2 | UNL |
| 7 | 15898 | 731 | 46 | 89 | 36.4 | 9.0 | 55.0 | TVS |
| 10 | 15926 | 696 | 44 | 87 | 42.1 | 9.1 | 54.9 | TVS |
| 17 | NE10-18-1 | 656 | 38 | 84 | 38.4 | 9.8 | 55.4 | UNL |
| 6 | 15897 | 631 | 48 | 90 | 38.7 | 9.0 | 55.0 | TVS |
| 5 | 15892 | 609 | 45 | 86 | 37.5 | 9.8 | 56.3 | TVS |
|  | **GRAND MEAN** | 1010 | 41 | 84 | 42.2 | 9.8 | 55.7 |  |
|  | **LSD 0.05** | 315 | 3 | 2 | 3.1 | 0.7 | 1.8 |  |
|  | **CV %** | 15.5 | 3.2 | 1.4 | 3.7 | 3.5 | 1.6 |  |

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| **Table 4. 2019 Dark Red Kidney Dry Bean Variety Trial - Mitchell Ag Lab.** | | | | | | | | |
| **Entry** | **ID** | **Yield** | **Days to Flowering** | **Days to Maturity** | **100-SeedWeight** | **Moisture** | **Test Weight** | **Owner** |
| **no.** | **lbs/A** | **days** | **days** | **gr** | **%** | **lbs/bu** |  |
|  |  |  |  |  |  |  |  |  |
| 3 | Spire (09431) | 1696 | 43 | 92 | 42.0 | 9.3 | 58.7 | Trinity Genetics |
| 7 | 151011 | 1673 | 40 | 89 | 37.2 | 9.6 | 58.7 | Trinity Genetics |
| 8 | Montcalm | 1520 | 41 | 92 | 45.9 | 9.4 | 57.6 | MSU |
| 5 | 15978 | 1399 | 45 | 91 | 39.6 | 9.3 | 59.2 | Trinity Genetics |
| 2 | Epic (09430) | 1379 | 42 | 91 | 47.0 | 9.2 | 58.4 | Trinity Genetics |
| 4 | Rampart (09434) | 1332 | 42 | 89 | 40.7 | 9.4 | 58.5 | Trinity Genetics |
| 1 | Chaparral (07323) | 1310 | 42 | 91 | 37.7 | 9.2 | 57.2 | Trinity Genetics |
| 9 | Red Hawk | 1262 | 41 | 89 | 38.4 | 9.1 | 56.2 | MSU |
| 6 | 15981 | 829 | 45 | 90 | 46.1 | 8.9 | 54.1 | Trinity Genetics |
|  | **MEAN** | 1378 | 42 | 90 | 41.6 | 9.2 | 57.6 |  |
|  | **LSD 0.05** | 256 | 2 | 3 | 2.6 | 0.3 | 1.1 |  |
|  | **CV %** | 9.0 | 2.6 | 1.7 | 3.0 | 1.6 | 0.9 |  |

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| **Table 5. 2019 Small Blacks Dry Bean Variety Trial - Mitchell Ag Lab.** | | | | | | | | |
| **Entry** | **ID** | **Yield** | **Days to Flowering** | **Days to Maturity** | **100-SeedWeight** | **Moisture** | **Test Weight** | **Owner** |
| **no** | **lbs/A** | **days** | **days** | **gr** | **%** | **lbs/bu** |  |
|  |  |  |  |  |  |  |  |  |
| 14 | NE14-18-3 | 2002 | 47 | 90 | 19.9 | 9.3 | 62.0 | UNL |
| 15 | NE14-18-4 | 1690 | 47 | 84 | 20.9 | 9.3 | 61.0 | UNL |
| 10 | Ace | 1578 | 51 | 88 | 15.8 | 9.0 | 63.2 | ADM |
| 5 | Black Tails (13489) | 1561 | 51 | 89 | 15.5 | 9.0 | 63.9 | Coop. Elevator |
| 4 | Black Bear (12576) | 1554 | 51 | 90 | 14.2 | 9.4 | 64.0 | Coop. Elevator |
| 16 | NE14-18-7 | 1475 | 50 | 91 | 20.4 | 8.6 | 62.6 | UNL |
| 3 | Eclipse | 1466 | 51 | 90 | 15.4 | 8.9 | 63.3 | NDSU |
| 12 | B13SR1-1 | 1441 | 50 | 88 | 16.8 | 8.9 | 62.1 | Gentec |
| 13 | NE14-18-2 | 1426 | 49 | 89 | 18.6 | 9.4 | 61.7 | UNL |
| 1 | Loreto | 1398 | 51 | 90 | 16.0 | 8.6 | 63.4 | ADM |
| 2 | Black Cat | 1340 | 51 | 89 | 14.5 | 9.2 | 62.7 | ADM |
| 7 | 13505 | 1272 | 51 | 89 | 14.0 | 8.9 | 62.4 | Coop. Elevator |
| 11 | GTS-1103 | 1222 | 51 | 91 | 16.1 | 8.8 | 64.1 | Gentec |
| 8 | BlackBeard (14506) | 1161 | 51 | 91 | 17.0 | 9.0 | 63.7 | Coop. Elevator |
| 6 | Spectre (14497) | 1112 | 51 | 89 | 15.2 | 8.9 | 64.6 | Coop. Elevator |
| 9 | 14500 | 1091 | 51 | 91 | 16.3 | 8.5 | 64.1 | Coop. Elevator |
| 18 | Zenith | 1053 | 48 | 90 | 15.7 | 8.8 | 63.1 | MSU |
| 17 | Zorro | 964 | 51 | 89 | 15.8 | 8.9 | 63.3 | MSU |
|  | **MEAN** | 1378 | 50 | 89 | 16.6 | 9.0 | 63.1 |  |
|  | **LSD 0.05** | 212 | 1 | 2 | 0.8 | 0.5 | 0.5 |  |
|  | **CV %** | 7.7 | 1.0 | 1.0 | 2.3 | 2.5 | 0.4 |  |

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| **Table 6. 2019 Navies Dry Bean Variety Trial - Mitchell Ag Lab.** | | | | | | | | |
| **Entry** | **ID** | **Yield** | **Days to Flowering** | **Days to Maturity** | **100-SeedWeight** | **Moisture** | **Test Weight** | **Owner** |
| **no** | **lbs/A** | **days** | **days** | **gr** | **%** | **lbs/bu** |  |
|  |  |  |  |  |  |  |  |  |
| 8 | Apex | 1867 | 47 | 91 | 19.4 | 9.7 | 63.5 | TVS |
| 3 | Blizzard (08072) | 1448 | 50 | 90 | 15.4 | 9.5 | 62.4 | Coop. Elevator |
| 5 | 13068 | 1349 | 51 | 91 | 17.0 | 9.4 | 61.8 | ADM |
| 1 | HMS Medalist | 1315 | 51 | 90 | 14.6 | 9.3 | 62.8 | ADM |
| 7 | 15095 | 1280 | 51 | 91 | 16.2 | 9.6 | 63.5 | ADM |
| 6 | 15094 | 1260 | 51 | 89 | 15.9 | 9.4 | 62.7 | ADM |
| 2 | Merlin | 1086 | 50 | 91 | 14.3 | 9.5 | 64.1 | Coop. Elevator |
| 4 | 12047 | 851 | 50 | 92 | 13.6 | 9.6 | 63.8 | ADM |
|  | **MEAN** | 1307 | 50 | 90 | 15.8 | 9.5 | 63.1 |  |
|  | **LSD 0.05** | 204 | 1 | 1 | 1.1 | 0.3 | 0.4 |  |
|  | **CV %** | 7.6 | 0.9 | 0.6 | 3.3 | 1.3 | 0.3 |  |