RELEASE OF PINTO ‘SHOSHONE’ DRY BEAN
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Abstract. Shoshone is a high yielding, broadly adapted, and medium maturing cultivar that has a recessive resistance to BCMV (NY-15, US-6) and BCMNV (NL-3K). Shoshone is also resistant to the race 38 of Uromyces appendiculatus. However, Shoshone exhibits an intermediate reaction or small pustules when exposed to the rust pathogen race 53. Shoshone is moderately tolerant to Fusarium root rot, BCTV, heat and drought. Shoshone has an indeterminate semi-prostrate growth habit Type III with small to medium length vine.

Shoshone was tested in the Idaho Bean Adaptation Nursery (IBAN), Idaho Dry Bean Trial (IDBT), Western Regional Bean Trial (WRBT), and National Cooperative Dry Bean Nursery (CDBN) as UIP15-53G-4G-1, ABL 8, or 0614 from 2003 to 2006.

Pedigree and Breeding History. Shoshone was selected from the multiple-parent population UIP15 = H9657-42-2/3/ ‘Poncho’/G 17341/ ‘Kodiak’/BelDakMi-RMR-14 made in 1999-2000. Breeding line H9657-42-2 with a tall upright growth habit Type II and large pinto seed was developed at the USDA-ARS, Prosser, Washington (P. Miklas, unpublished). Pinto Poncho is a Rogers/Syngenta cultivar with an indeterminate growth habit Type III which is susceptible to BCMV (US-6 strain), BCMNV (NL-3K) and the race 53 (Middle American) of U. appendiculatus. G 17341 was selected at the Centro Internacional de Agricultura Tropical (CIAT), Palmira, Colombia from a population developed at Cornell University by R.E. Wilkinson (unpublished). G 17341 has an intermediate level of resistance to common bacterial blight [caused by Xanthomonas campestris pv. phaseoli (Smith) Dye and X. campestris pv. phaseoli var. fuscans] and a growth habit Type III (Lema et al., 2007). The small semi-shiny pinto seed of G 17341 is variable for a slow darkening trait that allows for improved storage and reduced degradation of color. Stavely et al. (1998) at the USDA-ARS, Beltsville, Maryland, and North Dakota and Michigan Agricultural Experiment Stations cooperatively developed pinto germplasm line BelDakMiRMR-14. BelDakMiRMR-14 has growth habit Type III and pyramided resistance to all known strains of BCMV and BCMNV, and all races of U. appendiculatus in the United States. The Michigan Agricultural Experiment Station released pinto Kodiak (Kelly et al., 1999). Kodiak has an indeterminate upright or erect growth habit Type II with small to medium length vine in southern Idaho. Kodak carries the I gene resistance to the US-6 and NY-15 strains of the BCMV. In addition, Kodiak exhibits local necrosis or pinpoint lesions when inoculated with the NL-3K strain of the BCMNV. Kodiak is resistant (no disease symptoms) to the race 38 (Andean) of U. appendiculatus however exhibits an intermediate reaction or small pustules when inoculated with the race 53 of the pathogen.

The multiple-parent F_1 was screened for the US-6 strain of BCMV in the greenhouse at Kimberly, Idaho. An early maturing BCMV resistant plant with light-colored pinto seed was harvested and the F_1-derived F_2 (F_1:2) progeny-row was planted in the field at Kimberly following the gamete selection procedure (Asensio-S.-Manzanera, 2006). Selection was made for early maturing slow darkening light pinto seed color, and all selected plants were harvested in bulk. Six plants were screened each for BCMV (US-6), BCMNV (NL-3K), and the races 38 and
53 of U. appendiculatus in the greenhouse. An early maturing BCMV and rust resistant plant with light-colored slow darkening pinto seed was harvested. The F₃:₄ plant-to-progeny-row was grown in the field at Parma, Idaho where all early maturing plants with light pinto seed color were harvested in bulk followed by seed increase in the greenhouse and then in the field at Kimberly. Six plants were screened each for BCMV (NY-15, US-6), BCMNV (NL-3K), and the races 38 and 53 of U. appendiculatus.

Maturity. Shoshone is a medium maturing cultivar, taking 89 to 101 days with mean of 94 days compared with a range of 86 to 101 and mean of 95 days for Bill Z in the IDBT in southern Idaho in 2005 and 2006. Its maturity ranged from 86 to 95 days with a mean of 90 days compared with a range of 90 to 95 days and mean of 93 days for Bill Z across four locations in Colorado, Idaho, Nebraska, and Washington in the WRBT in 2006. In the CDBN, maturity of Shoshone across nine locations ranged from 82 to 99 days with a mean of 90 days compared with the respective values of 78 to 98 and 86 days for Othello.

Seed Yield. Average yield of Shoshone was 2132 lbs A⁻¹ compared with 2023 lbs A⁻¹ for Bill Z across 14 environments in the IDBT in Idaho in 2005 and 2006. In the WRBT across five environments, the average yield of Shoshone was 1852 lbs A⁻¹ compared with 1848 lbs A⁻¹ for Bill Z in 2006. In the CDBN across 10 locations in the U.S. and Canada in 2006, Shoshone yielded 2607 lbs A⁻¹ compared with 2439 lbs A⁻¹ of Othello.

Seed Weight. Mean weight of the 100 seeds of Shoshone was 36 g compared with 34 g for Bill Z in the IDBT in Idaho in 2005 and 2006. In the WRBT in 2006, the respective values for Shoshone and Bill Z were 36 g and 35 g. In the CDBN across 10 environments in 2006, 100 seeds of Shoshone weighed 36 g which was similar to that of Othello.

Seed Status. Breeder and Foundation seed of Shoshone will be maintained by the Idaho Foundation Seed Program under the direction of the Idaho Agricultural Experiment Station, University of Idaho, Moscow, ID 83844. However, a small quantity of seed of Shoshone for research purposes is available from S. Singh for the first five years. Appropriate acknowledgement of its developers and the University of Idaho for the use of Shoshone as germplasm would be highly appreciated. The PVP for Shoshone is pending.

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References.