

Origin and Breeding History of W91-233-21 **(COLUMBIA 1)**

W91-233 was an F3 derived single plant selection from the cross Era / Tobar 66 // Lovrin 11 /3/ Oligoculm /4/ Archer /5/ 86PYI042-192. 86PYI042-192 is the Agripro experimental designation for an F6, single plant selection from a bulk population constituted at Berthoud, Colorado in 1981 on the basis of large spike size. The original bulk was made by combining three F2 populations with the following pedigrees: Plainsman V / Oligoculm // TX71A562-6; Plainsman V / Oligoculm // Sage; and Plainsman V / Oligoculm // Baca. This bulk was grown in Nardin, Oklahoma in 1982, 1983 and 1984 and in Berthoud, Colorado in 1985. The plant selection, made in Berthoud, Colorado in 1985, was based upon head size, plant height, fertility, and the absence of leaf rust. The final cross for W91-233 was made in 1986 and the plant selection based upon plant height, fertility and the absence of leaf rust was made in Berthoud, Colorado in 1989. The resulting F4 plant row was tested in preliminary yield trials in 1990 and advanced on the basis of uniform plant height and the absence of soilborne mosaic virus symptoms and leaf rust resistance. The line was given the experimental designation, W91-233, and was tested as a pure-line in replicated trials in 1991 and 1992.

In 1992, 48 head-rows were grown in Berthoud, Colorado and evaluated for phenotypic similarity. One unique head-row was selected on the basis of plant height, maturity and straw strength. Seed from the selected head-row (designated W91-233-21) was planted as a progeny plot in 1993. The remaining seed from this head row was used as the trial seed source for replicated trials in 1993. Seed from the 1993 progeny plot was used for additional replicated trialing in 1994 and an initial seed increase in 1996. The replicated trials represent a broad geographic area in the Hard Winter Wheat region and in the Pacific Northwest. In 1997 a 0.4 acre Breeders seed increase was grown in Colorado. In 1998 a 20 acre Breeders seed increase was grown in Washington and partially abandoned. In 1999 a 43 acre

Breeders seed increase was grown in Washington. There are 192 acres of foundation seed production being grown in Washington and Idaho in 2000.

W91-233-21 has been uniform and stable since 1995. About 0.7% of the plants were rogued from the Breeders seed increase in 1998. Approximately 70% of the rogued variant plants were taller height wheat plants (5 to 15 cm.), 8% were awnletted wheat plants, and 4% were bronze chaff. A white seeded awnless club wheat variant of 0.05% has also been identified in the Breeders seed production plots. Up to 1.5% variant plants may be encountered in subsequent generations.