Registration of ‘Endurance’ Wheat

‘Endurance’ (Reg. No. CV-994, PI 639233) hard red winter wheat (*Triticum aestivum* L.) was released to certified seed growers with permission of the Oklahoma Agricultural Experiment Station and the USDA-ARS in 2004. Its name derives from the unique ability to endure and recover from extended and intensive grazing in a dual-purpose management system common to Oklahoma and surrounding states. Endurance is positioned for irrigated and dryland production areas throughout the southern Great Plains.

Endurance originated in the former hard red winter (HRW) wheat breeding program of Pioneer Hi-Bred International, Inc. from the three-way cross HBY756A/‘Siouxland’/‘2180’. HBY756A and the HRW cultivar, 2180 (PI 532912), were both developed within the Pioneer program. HBY756A is an unreleased germplasm with the pedigree, ‘TAM 105’/‘W6465/‘Bobito’ sib (B. Laskar, personal communication, 2006). Siouxland was developed and released by the University of Nebraska-Lincoln (Schmidt et al., 1985).

The F1 and subsequent bulk generations were evaluated within the Pioneer program (J. Baker, personal communication, 2004). The line from which Endurance is derived originated as an F4:F5 head row selected at Manhattan, KS in 1990 and grown in the “Pioneer Short Rows-1” nursery at Manhattan and Hutchinson, KS in 1991 (A. K. Fritz, personal communication, 2004). It was then entered in the 1992 Pioneer Observation Nursery, submitted to cooperating breeding programs in the Great Plains in the fall of 1991 by Dr. R. G. Sears. This nursery contained 140 early-generation lines derived from Pioneer HRW wheat populations. From one of two sister lines both named HBG0624, the line OK94P549 was selected and named in 1994. After 3 yr of multi-environment testing in Oklahoma, 200 heads were selected from a breeder-seed increase plot of OK94P549 in 1996 to identify and re-select lines with improved phenotypic uniformity. OK94P549–11, subsequently released as Endurance, was selected as an F11-derived line that traces to a single head row in 1997. It was evaluated in Oklahoma State Univ. breeder nurseries from 1999 to 2003 and in the Southern Regional Performance Nursery (SRPN) in 2003. OK94P549–11 was named Endurance in 2004 and tested in the Oklahoma Wheat Variety Trials (OWVT) from 2003 to 2005.

Endurance is a moderately tall semidwarf wheat with late arrival to first-hollow-stem (FHS) stage and intermediate maturity. From 2003 to 2005 at Stillwater, OK, Endurance reached FHS stage (1.5 cm hollow stem) 7 d later than ‘Ok101’ (Carver et al., 2003) and 15 d later than ‘Jagger’ (Sears et al., 1997). These comparisons corresponded to dates on which Endurance had shorter hollow stem (*P* < 0.05) than Ok101 or Jagger in a given year. Heading date of Endurance, however, is only 2 d later than Ok101 and 3 d later than Jagger. This combination of late FHS stage and intermediate heading date provides a crucial fitness trait for maximizing economic returns from grazing and grain production in a dual-purpose management system.

Flag leaves of Endurance at the boot stage are green, recurved at harvest-maturity, and red, hard textured, ovate, and they have a mid wide, mid deep, narrow and short leaf blade, and above-average fall forage production in a dual-purpose management system. Lodging resistance of Endurance is intermediate (score of 2.6, compared with 0 m for Ok101 and 2174) and 53% reductions in relative growth. Endurance showed 29 and 53% reductions in relative growth at the FHS stage (1.5 cm hollow stem) 7 d later than ‘Ok101’ (Carver et al., 2004) and 3 d later than Jagger. This combination of late FHS stage and intermediate heading date provides a crucial fitness trait for maximizing economic returns from grazing and grain production in a dual-purpose management system.

Endurance is moderately resistant to 5 Lr (LSD 1 = resistant to 5 = highly susceptible) and 763 kg m for kernel hardness index. Values for Ok101, 2004 and tested in the Oklahoma Wheat Variety Trials (OWVT) from 2003 to 2005.

Based on single-kernel characterization system (SKCS) and grain yield comparisons at the Expanded Wheat Nursery (EWN) in 2003 and USDA-ARS regional nursery program (2003–2005), Endurance has shown 29 and 53% reductions in relative growth. Endurance showed 29 and 53% reductions in relative growth at the FHS stage (1.5 cm hollow stem) 7 d later than ‘Ok101’ (Carver et al., 2004) and 3 d later than Jagger. This combination of late FHS stage and intermediate heading date provides a crucial fitness trait for maximizing economic returns from grazing and grain production in a dual-purpose management system.

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