Registration of ‘Okfield’ Wheat


‘Okfield’ (Reg. No. CV-1019, PI 643087) is a hard red winter (HRW) wheat (Triticum aestivum L.) cultivar developed and released cooperatively by the Oklahoma Agricultural Experiment Station (AES) and the USDA-ARS in 2005. It is recommended for dryland wheat production using either grain-only or dual-purpose management systems in the west-central Great Plains. Reasons for its release include tolerance to imazamox herbicide, improved winter dormancy retention relative to other imazamox-tolerant cultivars, and good stay-green capacity of the flag leaf.

Okfield resulted from a single cross between an imazamox-tolerant BC$_3$F$_2$ plant with the pedigree TXGH12588-120*4/FS4, and the HRW experimental line HBZ374C, eventually released as ‘2174’ by the Oklahoma AES and the USDA-ARS in 1997. 2174 has the pedigree IL71-5662/’PL145’ (PI 600840)//’2165’. TXGH12588-120 is a nonreleased sister line of the HRW wheat cultivar ‘TAM 110’ (Lazar et al., 1997), and FS4 was derived by sodium azide-induced mutagenesis of the cultivar Fidel. The BC$_3$F$_2$ population was provided by American Cyanamid Company. Ownership of the gene mutation was subsequently transferred to BASF Corporation.

The F$_1$ plant generation was produced in the greenhouse in 1998, and the F$_2$ generation was advanced at Stillwater, OK, the following year. Single heads were collected from plants that survived 36 g ai ha$^{-1}$ imazamox in February 1999. Okfield is derived from a single F$_{2,3}$ head row selected at Stillwater in 2000 on the basis of tolerance to 36 g ai ha$^{-1}$ imazamox, plant and head type, maturity, kernel size, and field-sprouting tolerance. The F$_{2,4}$ head row progeny was evaluated in an augmented experimental design in 2001 at Stillwater and Lahoma, OK, and treated with 18 g ai ha$^{-1}$ imazamox in March. Comparisons of nontreated check plots of 2174 for tillering capacity, density, grain yield, kernel size, grain volume index, and wheat protein content.

After compositing the seed from a single field in 2001, Okfield was tested as OK02909C in replicated breeder trials from 2002 through 2004 representing 49 sites in Kansas, and Colorado. Bulk seed increases occurred each year with a March application of 18 g ai ha$^{-1}$ imazamox, and testing was provided in the USDA-ARS Regional Germplasm Observation Nursery (RGON, entry 47) and Evaluation Nursery (RGON, entry 47) and Evaluation Nursery (RGON, entry 47) and Evaluation Nursery (RGON, entry 47) and Evaluation Nursery (RGON, entry 47) and Evaluation Nursery (RGON, entry 47). Okfield was included in the Oklahoma State University Wheat Variety Trials (OWVT) beginning in 2004. End-use quality testing was provided in the USDA-ARS Hard Winter Wheat Quality Laboratory (Manhattan, KS), ConAgra, Inc. (Omaha, NE), and the Wheat Milling and Baking Evaluation Program (Wheat Quality Council. Breeder seed was produced in 2004. Okfield is an F$_2$-derived line currently in development (2006–2007 crop season).

Okfield is a moderately tall, semidwarf wheat with immediate maturity based on arrival to first-headstage and heading date. Averaged across 3 years, Okfield reached the FHS stage in central Oklahoma 2 d ahead of ‘AP502CL’ and ‘Jagger’ (Sears et al., 1997) and the late FHS-stage cultivar 2174. The genetic difference among current cultivars is highly consistent for Okfield, with a range of 4 d (same as 2174), compared with a range of 14 d among cultivars tested. The heading date for Okfield is 4 d later than AP502CL, a highly consistent heading cultivar, and 2 d earlier than the intermediate cultivar 2174. Okfield exhibits high-temperature (35°C) sensitivity during germination, similar to 2174. Its dwarf virus (PI 632635), another descendent of 2174. It's


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