Registration of ‘Ok102’ Wheat

‘Ok102’ (Reg. no. CV-941, PI 632635) is a hard red winter wheat (*Triticum aestivum* L.) developed cooperatively by the Oklahoma Agric. Exp. Stn. and the USDA-ARS. Ok102 was released in March 2002, primarily on the basis of its resistance to several foliar diseases, excellent milling quality, and desirable dough strength for leavened bread products.

Ok102 was derived from the cross ‘2174’/Cimarron (PI 536993), performed in 1991. 2174 has the pedigree IL71-5662/PL145 (PI 600840)/‘2165’ and was released by the Oklahoma Agric. Exp. Stn. in 1997. Cimarron has the pedigree ‘Payne’ (Clt 17717)*2/C0725052 and was released by the Oklahoma Agric. Exp. Stn. in 1990. Ok102 traces to the bulk progeny of a single F$_3$, head row harvested in 1995. The F$_3$ and F$_4$ generations were evaluated and harvested as bulk populations in Stillwater, OK. The head row progeny was selected in 1996 from a non-replicated nursery at Lahoma, OK, for its acceptable winterhardiness, plant and head type, heading and maturity date, leaf rust (caused by *Puccinia triticina* Eriks.) resistance, lodging resistance, grain yield, volume weight, kernel plumpness, and mixograph properties. Subsequent generations were advanced by bulk selfing in the field, with roguing of taller variants each year until 2002. Ok102 was evaluated as OK97508 in replicated Oklahoma performance trials from 1997 to 2001, and in the Southern Regional Performance Nursery (SRPN) in 2000 and 2001.

Ok102 is semidwarf but shorter than most HRW wheat cultivars currently in production. Its mature-plant height (77 cm) is 8 cm shorter than 2174 and ‘Ok101’ (Carver et al., 2003) and 7 cm shorter than ‘Jagger’ (Sears et al., 1997). Lodging resistance on a scale of 1 (highest) to 5 (lowest) is about 2 for Ok102, compared with values of 1 for 2174, 3 for Ok101, and 4 for Jagger. Ok102 shows an intermediate reaction to acidic, aluminum-toxic soil. With a tolerance rating of 3.2 on a scale of 1 (most tolerant) to 5 (most susceptible), Ok102 is more sensitive to Al toxicity than Ok101 (1.3) and Jagger (1.6), but similar to 2174 (3.0). Ok102 breaks winter dormancy relatively late, but its heading date (123 d) is intermediate among current cultivars. Comparative placement of cultivars for date of first-hollow-stem stage is Jagger < Ok101 < 2174 and Ok102. Precise differences are highly year-dependent. Heading date of Ok102 is 2 d later than Ok101 and Jagger, the same as 2174, and 2 d earlier than ‘2137’. This phenological pattern makes Ok102 well suited for winter grazing and grain production in a dual-purpose (graze-plus-grain) management system. Another characteristic that lends Ok102 to dual-purpose production is coleoptile elongation, or the ability to emerge from deeper seed placement. When grown at 15°C in a growth chamber until 10 cm of coleoptile had emerged, Ok102 was 3.2 cm longer than 2174 (moderately long), and 0.4 cm shorter than Jagger (moderately long). Ok102 has a relatively high degree of dormancy and germinated at 24/35°C at 4 to 12 wk post-harvest for seed stored at ambient temperatures.

Ok102 is 2.1 cm longer than Ok101 (short coleoptile), 2.0 cm longer than Jagger (moderately long), and 0.4 cm shorter than ‘2137’. Spikes are white-chaffed, awned, tapering, middense, and indistinctly divided. Heading date of Ok102 is 2 d later than Ok101 of Ok102 at the boot stage are blue-green, erect, and twisted. Ok102 has greater dough strength than 2174 on the basis of SKCS parameters. From 28 site-years in the greenhouse tests conducted by the USDA-ARS Cereal Plant Genetics Laboratory, St. Paul, MN, Ok102 is postulated to have greater dough strength than 2174 but more erect than Ok101 and Jagger. Flag leaves of Ok102 are plump, more erect than Ok101 and Jagger. Forage yield, grain yield, and grain volume weight were measured at 15°C in a growth chamber, coleoptile length of (SKCS) data recorded from 16 breeder trials from 1999 to 2002. Across seven environments, fall forage yield (measured by hand clipping at the soil surface, Feekes stages 2–4) averaged 2610 kg ha$^{-1}$ and 2710 kg ha$^{-1}$ for Ok101, 2790 kg ha$^{-1}$ and 2770 kg ha$^{-1}$ for Jagger. Across 40 site-years, mostly grain-only trials, grain yield of these four cultivars was 3000 kg ha$^{-1}$ (Ok102), 2990 kg ha$^{-1}$ (Ok101), 2790 kg ha$^{-1}$ (Ok102), and 3020 kg ha$^{-1}$ (Jagger). From the same trials, grain yield averaged 763 kg m$^{-3}$ (Ok102), 768 kg m$^{-3}$ (Ok101), 768 kg m$^{-3}$ (2174), and 748 kg m$^{-3}$ (Jagger).

In greenhouse tests, juvenile plants of Ok102 exhibited a susceptible reaction to leaf rust comprised of aurediniospores collected from wheat fields in spring 1999 and 2000. From 1999 to 2002, Ok102 consistently shown a resistant reaction to leaf rust races currently present in Oklahoma. On the basis of seedling responses in the greenhouse tests conducted by the USDA-ARS Cereal Plant Genetics Laboratory, St. Paul, MN, Ok102 is postulated to have greater resistance to leaf rust races currently present in Oklahoma. Ok102 has adult-plant resistance to seven (2000 tests) races of stem rust [*Puccinia graminis* f. sp. *triticum* (Pers.:Pers.)], and are more or less susceptible to stem rust in the field. trials in Oklahoma and Kansas indicate Ok102 is moderately resistant to wheat soilborne mosaic virus (1 on a 1-to-9 scale). Ok102 exhibits an intermediate reaction to barley yellow dwarf virus (1 for Jagger). Ok102 has greater dough strength than 2174 on the basis of SKCS parameters. In greenhouse tests, juvenile plants of Ok102 responded with 2710 kg ha$^{-1}$ of Jagger. Ok102 was derived from the cross ‘2174’/Cimarron (PI 632635) is a hard red winter wheat (*T. aestivum*) developed cooperatively by the Oklahoma Agric. Exp. Stn. and the USDA-ARS. Ok102 was released in March 2002, primarily on the basis of its resistance to several foliar diseases, excellent milling quality, and desirable dough strength for leavened bread products.

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