REGISTRATIONS OF CULTIVARS

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’ (Cfr 17717)*2/CO725052 and was released by the Oklahoma Agric. Exp. Stn. in 1990. Ok102 traces to the bulk progeny of a single F₃, head row harvested in 1995. The F₂ and F₃ 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 the coleoptile is determined in replicated variety trials in 2001 and 2002. Across seven environments, fall forage yield (measured by hand clipping at the soil surface, Fekes stages 2–4) averaged 2610 kg ha⁻¹ compared with 2710 kg ha⁻¹ for Ok101, 2790 kg ha⁻¹ for Ok102, and 2770 kg ha⁻¹ for Jagger. Across 40 site-year trials, mostly grain-only trials, grain yield of these four cultivars was 3000 kg ha⁻¹ (Ok102), 2990 kg ha⁻¹ (Ok101), 768 kg m⁻³ (2174), and 748 kg m⁻³ for Jagger.

In greenhouse tests, juvenile plants of Ok102 were susceptible to leaf rust comprised ofuredinospores collected from wheat fields in spring 1999 and 2000. From 1999 to 2002, Ok102 consistently shown a resistant reaction to leaf rust tests conducted in Texas and Oklahoma, having a rating of 1 (resistant) on a 1 (resistant)-to-9 (susceptible) scale. Hence, Ok102 has adult-plant resistance to the races currently present in Oklahoma. On the basis of field tests conducted by the USDA-ARS Cereal Breeding Laboratory, St. Paul, MN, Ok102 is postulated to have adult-plant resistance to leaf rust. Their tests also indicate that seedlings of Ok102 have an intermediate level of resistance to Al, or have an intermediate level of resistance to seven (2000 tests) races of stem rust [caused by Puccinia graminis f. sp. tritici (Pers.:Pers.)], and are more or less susceptible to stem rust in the field. Field trials in Oklahoma and Kansas indicate Ok102 is susceptible to wheat soilborne mosaic virus (1 on a 1-to-9 scale). Ok102 exhibits an intermediate reaction to barley yellow dwarf in the field, similar to the reaction of one of its parents, 2174. On the basis of seedling responses in the greenhouse, Ok102 shows an intermediate to tan spot [caused by Septoria tritici (Pers.:Pers.) Drechs.] and resistant to powdery mildew [caused by Blumeria graminis (DC.) E.O. Speer f. sp. tritici Em.]. Ok102 produces a heterogeneous response to the round type of Hessian fly (Mayetiola destructor Say), susceptible to Russian wheat aphid (Diuraphia noxia (Rondani)). Ok102 shows an intermediate to resistant reaction to leaf rust (caused by Pyrenophora tritici-repentis (DC.) E.O. Speer f. sp. tritici (Pers.:Pers.)), and is susceptible or resistant to leaf rust comprised ofuredinospores collected from wheat fields in spring 1999 and 2000. Ok102 produces a heterogeneous response to the round type of Hessian fly (Mayetiola destructor Say), susceptible to Russian wheat aphid (Diuraphia noxia (Rondani)) and is susceptible or resistant to leaf rust (caused by Pyrenophora tritici-repentis (DC.) E.O. Speer f. sp. tritici (Pers.:Pers.)). 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 the coleoptile is...