Registration of ‘Deliver’ Wheat

‘Deliver’ (Reg. No. CV-995, PI 639232) hard red winter wheat (Triticum aestivum L.) was released to certified seed growers with permission of the Oklahoma Agricultural Experiment Station (AES) and the USDA-ARS in 2004. Deliver, an apically awnletted cultivar, is well suited for a dual-purpose system, a grain-only system, or a hay-production-graze-out system. This range of adaptation gives producers flexibility in their management options that they currently lack with awned grain-type cultivars or awnletted forage-type cultivars. Its targeted production area extends throughout Oklahoma and the southern Great Plains except in areas limited by soil acidity and aluminum toxicity.

Deliver was selected from the single cross, OK91724/‘Karl’, in which Karl (Sears et al., 1991) is a hard red winter (HRW) wheat cultivar developed by the Kansas AES and USDA-ARS and released in 1988. OK91724 is a nonreleased breeding line developed by the Oklahoma AES from the cross, ‘Yantar’/2*‘Chisholm’. Chisholm (Smith et al., 1985) is a HRW cultivar developed by the Oklahoma AES and USDA-ARS and released in 1983. Yantar (PI 565327) is a Bulgarian cultivar with the pedigree, ‘Pervenka’/‘Mironovskaja 808’, and was subsequently characterized for adult-plant leaf rust (Puccinia triticina Eriks.) resistance by Yang et al. (1990).

The F₂ and F₃ generations were advanced as bulk populations in Lahoma and Stillwater, OK. Deliver was selected from a single F₃:₄ head row in 1996 on the basis of plant and head type, maturity, and seed quality at Stillwater, OK. The head-row progeny was evaluated in 1997 in a non-replicated observation nursery at Lahoma, OK and selected on the basis of fall vegetative growth habit, reactions to leaf rust, Barley yellow dwarf virus, and Wheat soilborne mosaic virus, plant height, heading date and maturity, stay-green, spike density, test weight, seed quality, and grain yield. Subsequent generations were advanced by bulk selfing in the field, with roguing of awned variants each year until 2003. Deliver was evaluated as OK98690 in replicated breeder trials from 1998 to 2003, and in the Southern Regional Performance Nursery (SRPN) in 2003. It was subsequently tested in the Oklahoma Wheat Variety Trials (OWVT) from 2003 to 2005.

Deliver is semidwarf and intermediate in plant stature relative to most HRW wheat cultivars. Its mature-plant height (85 cm in Oklahoma) is within 2 cm of ‘Jagger’ (Sears et al., 1997), ‘2174’, and ‘Ok101’ (Carver et al., 2003). Its lodging pattern is similar to Jagger and classified as moderately susceptible. Arrival to first-hollow-stem (FHS) stage is intermediate. From 2003 to 2005 at Stillwater, OK, Deliver reached FHS stage 7 d later than Jagger (early), 2 d later than Ok101 (intermediate), and 7 d earlier than 2174 (late). Heading date of Deliver is also intermediate, or about 2 d later than Ok101 and Jagger but similar to 2174. Befitting to a dual-purpose (grazing-plus-grain) management system, Deliver avoids precocious arrival at FHS stage, while reaching the heading stage at the appropriate time. Other fitness traits of awnleted, tapering, dense, and recurved awns. Kernels are red, hard textured, ovate, and have a shallow crease, rounded cheeks, and small germ.

Disease reactions are summarized based on evaluations under natural infection in Oklahoma (2003–2005) and house observations in Oklahoma (2003–2006), and evaluations in the USDA-ARS regional nursery program (2003). Deliver has adult-plant resistance to races currently present in Oklahoma (May et al., 2004), as well as tolerant to the race-specific gene Lr29 (personal communication, 2004) that results in a moderately susceptible rating to leaf rust in the seedling stage. Recent adult-plant leaf rust ratings were low for Oklahoma sites in 2005. Deliver produced a maximum score of 1 on a 1-to-4 scale, compared with the susceptible check cultivar, Chisholm, with a consistent score of 2. Deliver were rated as moderately resistant to yellow dwarf virus (Puccinia striiformis Westend) in Oklahoma (OK91724/Chisholm) based on a mean score of 1.0 on a scale of 0 to 3.0, which the susceptible check cultivar, ‘Ok102’. During the stripe rust epidemic in 2005, Deliver was classified as moderately resistant based on a mean score of 2 (0 to 4) for Oklahoma sites, in which the susceptible check cultivar, ‘Ok102’, averaged 3.4.

For other known disease reactions in the seedling stage, Deliver is resistant to septoria leaf blotch (caused by Septoria tritici Roberge in Desmaz.), moderately resistant to powdery mildew (caused by Blumeria graminis (DC.) E.O. Speer f. sp. tritici) based on a mean score of 1.3 on a 1-to-4 scale, compared with the susceptible check cultivar, ‘Chisholm’. Deliver is moderately susceptible to tan spot (caused by Puccinia graminis Rondani) and Russian wheat aphid (Diuraphis noxia Mordv.), and moderately resistant to Hessian fly (Diptera spp.) based on a mean score of 2.0 on a 1-to-4 scale, compared with the susceptible check cultivar, ‘Ok102’. Deliver is resistant to wheat leaf rust (caused by Puccinia triticina Eriks.) resistance by Yang et al. (1990).

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