

Coker 9663. According to seedling tests conducted by the USDA-ARS Cereal Disease Lab, St. Paul, MN, Pat contains the genes *Lr1*, *Lr3*, *Lr10*, *Lr11*, and *Lr18* plus an unidentified gene(s) for leaf rust resistance. Pat is moderately susceptible to Septoria leaf blotch, similar to Coker 9663 on the basis of a natural infection at Stuttgart, AR, in 2001. Pat is susceptible to powdery mildew (caused by *Blumeria graminis* DC f. sp. *tritici* Ém. Marchal).

Pat is an awned, white-chaffed wheat which is approximately 5 cm taller and 1d later in maturity than 'Sabbe' (Bacon et al., 2002). Pat is most similar in appearance to 'Shelby' (PI 597882). Both Pat and Shelby are approximately 91 cm tall and have a plant color of 147A in the yellow-green group (as referenced by the Royal Horticultural Society Color Chart). Pat has slightly narrower flag leaves than Shelby and Pat heads approximately 5 d later than Shelby in Arkansas. At maturity, Pat has spikes that are awned, mid-dense, fusiform, and nodding at maturity. The white glumes are glabrous, short (9 mm) and midwide with narrow, oblique shoulders and narrow, acuminate beaks. Kernels are red, short to midlong and ovate, with a small germ; the kernel brush is midsized and midlong; the kernel crease is narrow in width and is mid-deep with rounded cheeks. Kernels on average are 6.3 mm long and 3.0 mm wide with a kernel weight of 32 mg.

On the basis of its grain yield and volume weight in experimental tests, Pat has excellent adaptation in Arkansas. Compared with Sabbe in 27 Arkansas Small Grain Cultivar Performance Tests in 2000, 2001, and 2002, Pat (5032 kg ha⁻¹) yielded higher than Sabbe (4808 kg ha⁻¹) and had a heavier grain volume weight of 719 kg m⁻³ compared to 690 kg m⁻³, for Sabbe. Pat has good winter hardiness for its area of adaptation, showing no winter kill in Arkansas trials from 2000 to 2002. On the basis of data from the eight tests in the 2000, 2001, and 2002 Arkansas Small-Grain Cultivar Performance Trials with substantial lodging (>5%), Pat had 2% lodging compared to 26% for Coker 9663.

Pat was tested for end-use quality characteristics at the USDA-ARS Soft Wheat Quality Lab at Wooster, OH. Results from seven southern U.S. locations, indicate Pat has soft wheat quality similar to the quality check cultivar Mason (milling score of 102.3 for Pat compared with 100 for Mason and baking score of 95.2 for Pat compared with 100 for Mason). Individual quality parameters from these tests indicate micro volume weight of 767 kg m⁻³ for Pat and 762 kg m⁻³ for Mason, a softness equivalence of 56.3% for Pat compared with 61.0% for Mason, flour protein content of 9.4% for Pat and 9.3% for Mason, flour yield of 73.2% for Pat and 71.1% for Mason, micro alkaline water retention capacity of 53.7% for Pat and 55.7% for Mason, cookie diameter of 17.6 cm for Pat compared to 17.7 cm for Mason, and a cookie top grain score of 3.0 for Pat compared with 4.0 for Mason.

Original Breeder seed (F_{5.11}) was derived from a 1.5- by 30.5-m increase strip that was rogued three times. Breeder seed will be maintained by rouging and periodically growing headrows. U.S. Plant Variety Protection under Title V of the PVP (#200200274) was issued 24 Apr. 2003. Classes of seed production are limited to Breeder, Foundation, and Certified. Breeder Seed is maintained by the Arkansas Agricultural Experiment Station, Fayetteville, AR 72701. Small quantities of seed for research purposes are available upon request from the corresponding author.

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Registration of 'Deloris' Wheat

'Deloris' hard red winter wheat (*Triticum aestivum* L.) (Reg. no. CV-934, PI 631447) was developed by the Utah Agricultural Experiment Station (UAES) and released in August 2002. Deloris was released to provide a hard red winter wheat with high yield potential, good quality, and resistance to dwarf bunt (caused by *Tilletia controversa* Kühn in Rabenh.) when grown under rainfed conditions of the Intermountain West. Deloris was named in honor of Deloris Stokes, a long-time grower-cooperator of the Utah small grains program and supporter of the UAES.

Previous designations for Deloris were UT2030-32 and UT203032. Deloris is derived from the 1987 cross 'Arbon'/'Hansel'//PI 470329/3/'Weston'/NE7060 (Dewey, 1975; Sunderman and Jennings, 1977; Sunderman et al., 1980). PI 470329 is a 1979 accession from Bitlis, Turkey, with moderate resistance to a composite of races of dwarf bunt (USDA-ARS, National Genetic Resources Program; see <http://www.ars-grin.gov/cgi-bin/npgs/html/obs.pl?1365265>; verified 21 October 2003). NE7060 has the pedigree 'Favorit'/'5'/'Cirpiz'/'4'/'Jang Kwang'/'2'/'Atlas 66'/'Comanche'/'3'/'Velvet' (Clark, 1943; Harlan, 1950; Heyne, 1958). The F₂ through F₅ generations were grown at the Greenville Experimental Farm, North Logan, UT, as bulk populations with selection for desirable height, maturity, vigor, and resistance to common bunt [caused by *Tilletia tritici* (Bjerk.) G. Wint. in Rabenh.]. In each generation, heads from desirable plants were harvested from within the population and seed from harvested heads was bulked. A sample of the bulked seed was planted for the next generation. Plants from the F₅ population were selected based on visual evaluation for desired height, maturity, resistance to common bunt, vigor, and spike characteristics. Two heads were collected from each selected plant. In 1993, an individual F_{5.6} head was grown at the Greenville Experimental Farm and inoculated with a race composite of dwarf bunt in the fall and subsequently evaluated for dwarf bunt resistance. A second individual F_{5.6} head from the same plant selection was grown at the Bluecreek rainfed experimental farm, Bluecreek, UT. Headrows at Bluecreek were selected for rapid emergence, plant uniformity, and desirable tillering, height, heading date, head shape, and kernel plumpness. Headrows at Bluecreek were then evaluated for dwarf bunt resistance on the equivalent headrow at Greenville, and resistant headrows were harvested from the Greenville nursery. The resulting F_{5.7} lines were evaluated for yield and the previously described agronomic traits in an unreplicated plot nursery at Bluecreek in 1994, and in a replicated yield trial at Bluecreek in 1995. From 1996 through 2001, Deloris was tested for yield, maturity, volume weight, lodging, winter survival, protein content, and bread quality in replicated nurseries at six rainfed locations throughout Utah and for reaction to dwarf bunt at Greenville. Deloris was also evaluated in the Western Regional Hard Winter Wheat Nursery from 1996 through 1999. In 1999, 250 heads were selected from F₁₁ plants and were grown as head rows at Greenville. After roguing to remove off-type rows,

approximately 200 F_{5:12} lines were harvested and bulked as Breeder seed in 2000.

The juvenile growth habit of Deloris is semi-erect and coleoptile anthocyanin is absent. Heading date is 2 d earlier (day 155) than 'Utah-100' (day 157) at Greenville (Hole et al., 1997). The flag leaf is lax and flat. Stems are hollow, and the mature plant, at an average height in Utah of 78 cm (36 site years), is 3 cm taller than Utah-100. Deloris is more susceptible to lodging (6-yr average of 33% lodging at Greenville) than Utah-100 (0%) when grown under irrigated conditions, but lodging in Deloris has not been observed under rainfed conditions. Deloris has awned, tan-chaffed (0.6Y/6/3.6 Munsell), oblong, mid-dense, and inclined spike characteristics. The kernel is elliptical, has angular cheeks, with a narrow, mid-deep seed crease, and a medium length brush that is not collared. The kernel phenol reaction is brown.

In the dwarf bunt evaluation nurseries mentioned previously, 'Wanser' (Nelson and Nagamitsu, 1972) was grown as a susceptible check and generally averaged over 85% infection while Deloris exhibited no detectable infection. Resistance to dwarf bunt exhibited by Deloris derives from PI 178383, one of the parents of Hansel (Dewey, 1975), Arbon (Sunderman et al., 1980), and Weston (Sunderman and Jennings, 1977), which contains *Bt-8*, *Bt-9*, *Bt-10*, and an unidentified factor (Goates, 1996). Resistance may also come from PI 470329, which also contains *Bt-8* (Blair Goates, personal communication). The specific resistance genes contained by Deloris have not been determined.

In USDA-ARS greenhouse seedling tests with stripe rust (caused by *Puccinia striiformis* Westend.), Deloris is susceptible both as a seedling and adult plant to races PST-17, PST-37, PST-43, PST-45, and PST-78. In the field, Deloris averaged 30% infection while the susceptible check WB470 averaged 45% infection in tests in 2001 at Mt. Vernon and Pullman, WA.

In replicated field trials conducted in Utah from 1996 to 2001, the grain yield of Deloris averaged 2845 kg ha⁻¹ (36 site years) compared with 2751 kg ha⁻¹ for 'Utah-100' (significantly different at $\alpha = 0.05$). From 1997 through 2000 (38 site years), Deloris had a grain yield average of 4916 kg ha⁻¹ in the Western Regional Hard Winter Wheat Nursery compared with 4318 kg ha⁻¹ for Wanser and a nursery mean of 5076 kg ha⁻¹. Average volume weight for Deloris in the same nurseries was equal to the nursery average (77.7 kg hL⁻¹) and slightly lower than Wanser (78.0 kg hL⁻¹).

The USDA-ARS Western Wheat Quality Laboratory (WWQL) in Pullman, WA, has evaluated Deloris for milling and bread quality attributes each year since 1994. Average volume weight measured by the WWQL (8 site years) is 79.7 kg hL⁻¹. This is about 2 kg hL⁻¹ higher than Utah-100 and 2 kg hL⁻¹ lower than Weston. Deloris grain protein (132 g kg⁻¹) is similar to Utah-100 (129 g kg⁻¹) and Weston (131 g kg⁻¹). Deloris has the same mixograph peak time (3.3 min) as Utah-100 and is longer than Weston (2.0 min; significant at $\alpha = 0.05$). Loaf volume is similar to Utah-100 (998 and 989 mL respectively) and Weston (999 mL) with higher flour yield (708 g kg⁻¹) than Utah-100 (683 g kg⁻¹) or Weston (684 g kg⁻¹).

The Utah Crop Improvement Association will maintain Foundation seed of Deloris. U.S. Plant Variety Protection will not be applied for. Recognized seed classes include Foundation, Registered, and Certified. Small amounts of seed for research purposes may be obtained by contacting the corresponding author.

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Registration of 'AC Andrew' Wheat

'AC Andrew' soft white spring wheat (*Triticum aestivum* L.) (Reg. no. CV-936, PI 632907) was developed by the Lethbridge Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB. It was granted a regional (Manitoba, Saskatchewan, Alberta, and British Columbia) interim registration (no. I-278) on 20 April 2001 by the Variety Registration Office, Plant Health and Production Division, Canadian Food Inspection Agency, Government of Canada. AC Andrew is a bearded, soft white spring wheat adapted to irrigated regions of southern Alberta and southern Saskatchewan.

AC Andrew is an anther-derived doubled haploid line developed from an F_{2:6} line of the cross 'Dirkwin'/SC8021V2// 'Treasure'/'Blanca' made in 1990. Dirkwin (Sunderman et al., 1980), Treasure (Sunderman and O'Connell, 1988), and Blanca (Sunderman et al., 1988) are soft white spring wheat cultivars developed by USDA-ARS and the Idaho Agriculture Experimental Station. SC8021V2 is a sprouting-tolerant white-kernelled germplasm line released by Agriculture and Agri-Food Canada, Swift Current, SK (DePauw et al., 1992).

The F_{2:6} line, used to produce the doubled haploid, was derived via head selection and the bulk method. Single head selections were made in the F₂ population, and the F₃ head rows were grown in a winter nursery near Brawley, CA. Promising F₃ head rows were identified based on plant height, maturity, and resistance to lodging and shattering. Within each of these F₃ head rows, single heads were selected and threshed in bulk. This seed was used to grow the F₄ population at Lethbridge. The process of head selection and bulking was followed until the F₆ generation. Doubled haploids were then produced from one of the F₆ lines (B799) by the anther culture technique (Orshinsky and Sadasivaiah, 1994).

Twenty-six anther-derived doubled haploid lines were evaluated in a preliminary yield test in 1996. From 1997 to 1999, one of the lines, designated 96DH-812, was evaluated as SWS-241 in the Western Soft White Spring Wheat Cooperative Tests conducted at four locations (Lethbridge, Iron Springs, Vauxhall, and Bow Island) in southern Alberta and two locations (Saskatoon and Outlook) in southern Saskatchewan. The widely grown cultivars AC Reed (Sadasivaiah et al., 1993), AC Phil (Sadasivaiah et al., 2000), and AC Nanda (Sadasivaiah et al., 2000) were used as checks.