

winter of 1989–1990. Segregating generations (F_2 – F_5) were space-planted at Logan, UT, and advanced by a modified bulk method wherein agronomically desirable plants were selected each year from 1990 through 1993. Individual spikes from 265 F_5 plants were selected in 1993 on the basis of agronomic appearance, and were evaluated as F_6 head rows in 1994. The F_5 -derived line from which Millennium originated was yield-tested under irrigation at Logan, UT, in 1995, and annually thereafter at four irrigated sites and two non-irrigated sites in Utah, where it was identified as UT94B1058-4603. It was evaluated in the Western Regional Spring Barley Nursery and the Western Regional Dryland Spring Barley Nursery (1997 and 1998) as UT004603. Breeder seed was produced at Logan, UT, in 1998 from 400 F_9 -derived head rows selected in 1997. Rows questionable for trueness to type were rogued, and remaining rows were harvested in bulk. Foundation seed was produced at Logan, UT, in 1999.

Millennium is a six-rowed, midseason, erect-growing, semi-dwarf spring feed barley. It has a tapering, erect (lax-to-dense) spike, with some overlap of lateral kernels at the tip of the head, and rachis edges covered with hairs. Leaves and spikes are waxy. It has long glumes, with extremely long, rough glume awns. The glumes are completely covered with long hairs. It has erect (non-flaring), long, rough lemma awns. Stigmas are heavily feathered. The seed is covered, midlong, semi-wrinkled, with long rachilla hairs, and a depression at the base. Aleurone color is white and 1000-kernel weight averages 39 g. Most stems have a straight neck and most spikes are marked by a closed collar at the base.

Millennium is recommended for growing primarily under irrigation or where annual precipitation is 400 mm or more. Its relatively short, stiff straw makes it well suited for production under sprinkler or surface irrigation. In Utah irrigated tests (44 site years), average yield of Millennium (7567 kg ha^{-1}) exceeded ($P < 0.05$) that of Steptoe (6680 kg ha^{-1}), 'Brigham' (7104 kg ha^{-1}), 'Century' (7287 kg ha^{-1}), 'Statehood' (7225 kg ha^{-1}), 'Rollo' (6948 kg ha^{-1}), 'Walker' (6749 kg ha^{-1}), and 'Bracken' (6288 kg ha^{-1}). In two years (1997, $n = 12$ and 1998, $n = 11$) of Western Regional Spring Barley tests, Millennium ranked second in grain yield in 1997, and first in 1998. Yield of Millennium exceeded ($P < 0.05$) that of Steptoe by 11.5% (5502 kg ha^{-1} vs. 4935 kg ha^{-1}) in 1997, and by 15.4% (6424 kg ha^{-1} vs. 5568 kg ha^{-1}) in 1998 and was not significantly different from that of Brigham (5522 kg ha^{-1}) in 1997. Millennium headed the same time as Steptoe (169 d after 1 January in Utah tests, and 175 d in Western Regional tests); it headed 3 d earlier ($P < 0.05$) than Rollo (169 vs. 172 d) in Utah tests and its heading date was not significantly different from Brigham, Century, Statehood, Walker, or Bracken in these tests. In Utah irrigated tests (44 site years), Millennium (88 cm) was shorter ($P < 0.05$) than Steptoe (93 cm), Century (94 cm), Rollo (91 cm), Walker (99 cm), and Bracken (92 cm); it was taller than Brigham (86 cm), and was not significantly different from Statehood (88 cm). In the same tests, Millennium's lodging percentage (2%) was lower ($P < 0.05$) than Steptoe (54%), Century (19%), Statehood (15%), Rollo (35%), Walker (14%), and Bracken (34%) and was not significantly different from Brigham (4%). In Utah tests (12 site years), average test weight for Millennium (667 kg m^{-3}) was significantly ($P < 0.05$) higher than that of Rollo (642 kg m^{-3}), but was not significantly different from that of Steptoe, Brigham, Century, Statehood, Walker, or Bracken. The test weight of Millennium was significantly ($P < 0.05$) higher than that of Steptoe (630 vs. 605 kg m^{-3}) in Regional Barley tests (21 site years). In Utah tests (12 site years), average percent protein for Millennium (132 g kg^{-1}) was lower ($P < 0.05$) than that of Century (140 g kg^{-1}), Statehood (138 g kg^{-1}),

Registration of 'Millennium' Barley

'Millennium' spring barley (*Hordeum vulgare* L.) (Reg. no. CV-292, PI 614659) was developed by the Utah Agricultural Experiment Station (UAES) and released in 2000. It was initially selected at Logan, UT, in 1994 as an F_6 line derived from a single F_5 spike selected in 1993 from a cross of UT87B603-1266/UT Short #2 made in 1989. UT87B603-1266 is a six-rowed breeding line from the cross WA6415-66 /UT Short #2. WA6415-66 (a sib to 'Steptoe') is a six-rowed breeding line derived from the cross WA Sel. 3564/'Unitan'. UT Short #2 is a six-rowed, semidwarf breeding line selected at Logan, UT, from the cross S.D.S.S. (a South Dakota breeding line)/'Primus', made by Dr. Phil B. Price at South Dakota State University. F_1 plants were grown in the greenhouse during the

and Bracken (145 g kg⁻¹); it was higher than that of Rollo (119 g kg⁻¹), and was not significantly different from that of Steptoe (126 g kg⁻¹), Brigham (129 g kg⁻¹), or Walker (133 g kg⁻¹).

Millennium has shown resistance to barley loose smut [caused by *Ustilago nuda* (Jens.) Rostr.] and covered smut [caused by *Ustilago hordei* (Pers.) Lagerh.] and moderate resistance to powdery mildew (caused by *Blumeria graminis* DC. f. sp. *hordei* Ém. Marchal) under natural infection conditions. Preliminary tests have shown Millennium to be moderately susceptible to barley stripe rust (caused by *Puccinia striiformis* Westend). Its reaction to other diseases is not known.

The generation sequence of seed production of Millennium is Breeder, Foundation, Registered, and Certified. Millennium is protected under the U.S. Plant Variety Protection Act (including Title 5 option), Certificate No. 200000169. Breeder seed is maintained by the UAES, Utah State University, Logan, UT 84322-4810. Foundation seed is available from the Utah Crop Improvement Association, Utah State University, Logan, UT 84322-4855.

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