

Registration of 'Goldeneye' Spring Barley

'Goldeneye' spring barley (*Hordeum vulgare* L.) (Reg. no. CV-320, PI 639193) was developed at the Utah Agricultural Experiment Station and released in 2005. Goldeneye has been tested as the breeding line UT95B1216-4087 and is a six-rowed spring feed barley. Its main characteristics are a high yield potential, a low propensity for lodging, and a relatively high test-weight among six-rowed cultivars. Goldeneye was named after two duck species, seen as common migrant and winter residents in the state of Utah.

Goldeneye has the pedigree ID633019/'Woodvale'/'Steptoe'//OR3 (Muir and Nilan, 1973). ID633019, also used in the pedigree of 'Rollo' (Albrechtsen and Hole, 1993), is a six-rowed breeding line from the cross CIho9196/CIho10119/'Traill' (Lambert, 1958). Woodvale is a six-rowed cultivar released in 1972 by the Utah Agricultural Experiment Station (Dewey, 1972). OR3 is a sister line to 'Maranna' (Hayes et al., 1995).

F₁ plants were grown in the greenhouse during the winter of 1990–1991. Segregating generations (F₂–F₅) were grown at Logan, UT, as space-planted modified bulk populations. Desirable plants (for spike size, stiff straw, vigor) were selected each year between 1991 and 1994, and seeds were bulked. Individual spikes from F₅ plants were selected in the summer of 1994 and their seeds were sown as head rows in 1995. Head row number UT95B1216-4087 was selected for vigor, stiff straw, spike appearance, and threshing ability. Seed increase and limited performance trials were performed in 1996 and 1997 at Logan, UT. Goldeneye was further performance-tested annually in three to four Utah locations from 1998 through 2004. It was tested under the same experimental denomination in the Western Regional Irrigated Spring Barley Nursery from 2001 through 2003. In the summer of 2002, 100 spikes were selected among F₅₋₁₁ progenies at Logan, UT. These 100 spikes were grown in a 2002–2003 winter increase at Yuma, AZ, where off types were rogued. Retained rows were harvested in bulk to constitute the Breeder Seed. Foundation Seed was produced at Cache Junction (Utah State University Experimental Farm) in the summer of 2003. Registered Class seed will be produced in 2005 and made available for further commercial increase.

Goldeneye is a six-rowed, erect-growing, early heading spring feed barley. It has a lax head with limited overlapping of upper lateral spikelets. The basal rachis internode has a short straight to curved shape, and the collar is of closed to V-shaped type. The length of the rachis internodes is relatively constant from top to bottom of the spike, and the rachis edges have few hairs. The awns are long and of the semi-smooth type. The glumes are hairy on dorsal surfaces and edges. No hairs are visible on the ventral surface of the glumes. Length of glume awns is more than equal to length of glumes. The seed is covered. Lemma teeth are missing or few and confined to the nerves. The rachilla is of the short haired type. The shape of lemma base is of the transverse crease type. Hulls are slightly wrinkled to semiwrinkled and aleurone color is white.

Goldeneye is recommended for growing under irrigation in the Intermountain region of the USA. For 3 yr (2001–2003, 38 site-years) of Western Regional Irrigated Spring Barley tests, Goldeneye's yield (5913 kg ha⁻¹) was not statistically different ($P \leq 0.05$) from that of Steptoe (5575 kg ha⁻¹) but significantly higher than those of 'Baronesse' (5445 kg ha⁻¹), 'Stander' (5270 kg ha⁻¹) (Rasmusson et al., 1993), 'Harrington' (4997 kg ha⁻¹) (Harvey and Rosnagel, 1984), and 'Morex' (4713 kg ha⁻¹) (Rasmusson and Wilcoxson, 1979). Among six-rowed types, average test weight of Goldeneye for these trials (652.4 kg m⁻³) was higher ($P \leq 0.05$) than that of Steptoe

(631.2 kg m⁻³), similar to that of Morex (648.5 kg m⁻³), but lower than that of Stander (664.4 kg m⁻³). Average heading date (30 site-years) of Goldeneye (178 Julian days) was significantly earlier and later ($P \leq 0.05$) to those of Baronesse (181) and Steptoe (176), respectively. Average percentage of lodged plants for Goldeneye (18 site-years, 16%) was lower than those of Baronesse (34%) and Steptoe (36%). Average height of Goldeneye (74.6 cm) was similar to that of Steptoe (75.4 cm) but significantly greater than that of Baronesse (70.7 cm) ($P \leq 0.05$). In 2002–2003 (6 site-years), average percentage protein of grain for Goldeneye (13.2%) was statistically similar to that of Baronesse (14.1%) but higher than that of Steptoe (11.5%) ($P \leq 0.05$).

Goldeneye has been tested for seven consecutive years (1998–2004) in several locations in the state of Utah (26 site-years). Goldeneye's yield (6447 kg ha⁻¹) is similar to those of Steptoe (5975 kg ha⁻¹) and 'Millennium' (6686 kg ha⁻¹) (Albrechtsen and Hole, 2002), and higher than that of Baronesse (5145 kg ha⁻¹) ($P \leq 0.05$). In these Utah trials, test weight for Goldeneye (681.7 kg m⁻³) is lower than that of Baronesse (691.6 kg m⁻³) and higher than those of Steptoe (662.6 kg m⁻³) and Millennium (667.0 kg m⁻³) ($P \leq 0.05$).

Goldeneye has shown field resistance to barley loose smut [caused by *Ustilago nuda* (Jens.) Rostr.], and covered smut [caused by *Ustilago hordei* (Pers.) Lagerh.]. Preliminary tests have shown Goldeneye to be susceptible to barley stripe rust (caused by *Puccinia striiformis* Westend).

The generation sequence of seed production of Goldeneye is Breeder, Foundation, Registered, and Certified. Breeder seed is maintained by the Utah Agricultural Experiment Station, Department of Plants, Soils, and Biometeorology, Utah State University, Logan, UT 84322-4820. Foundation Seed is available from the Utah Crop Improvement Association, Utah State University Logan, UT 84322-4820. U.S. Plant Variety Protection of Goldeneye has been applied for.

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