Registration of ‘Lacey’ Barley

‘Lacey’ a six-rowed spring barley (Hordeum vulgare L.) (Reg. no. CV-290, PI 613603), was developed by the Minnesota Agricultural Experiment Station and released in February 2000. It was developed in a program to obtain low soluble protein in a Midwest malting barley. Lacey, whose experimental designation was M98, has the pedigree M44/’Excel’/2/M46/M44/3/M44/’Excel’/2/’Stander’. M44 and M46 were cultivar candidates in the Minnesota barley program. M44 has the pedigree ‘Nordic’/’Manker’/3/’Morex’/Manker/63Ab2987-32, and M46 originated from the cross Nordic/Manker/2.’Robust’. Breeding line 63Ab2987-32 was developed in the USDA-ARS barley breeding program at Aberdeen, ID. The final cross leading to Lacey was made in 1993. Because Lacey’s pedigree is composed primarily of Minnesota germplasm, it is expected to be best adapted to the barley-growing area of the upper Midwest USA and possibly in neighboring regions of Canada.

Lacey was developed using the pedigree method coupled with single-seed descent. It originated from a single plant taken arbitrarily from an F1 line visually selected for desirable height, straw strength, and resistance to leaf diseases. No selection was applied in the F2 through F5 generations with the F6 and F7 generations being advanced in the greenhouse. Replicated agronomic and disease testing began in Minnesota in 1996 and regional testing in 1998. Micro-malting evaluations began in 1996, industry pilot malting and brewing quality evaluations in 1997, and industry plant scale malting and brewing quality evaluations in 1999. Low soluble protein was identified in the first micro-malting evaluation in 1996, and this trait and high grain yield were the primary basis for interest in the line.

Lacey is intended to replace the varieties Robust (Rasmusson and Wilcoxson, 1983) and Stander (Rasmusson et al., 1993) that are currently popular in the Midwest. Robust, released by the Minnesota Agricultural Experiment Station (MAES) in 1983, is currently the six-rowed industry standard for malt quality. Stander, released by the MAES in 1993, has significant yield and lodging improvements over Robust, but has been reported by industry as having a soluble protein level that is too high by current standards. Lacey is similar to both Robust and Stander as it has smooth awns, covered kernels, short rachillas hairs, and white aleurone. The spike is medium-lax, medium-long, and semi-erect. Lacey is about 6 cm shorter than Robust and similar to Robust in heading date and maturity.

Lacey’s malting quality traits, determined in collaboration with the USDA Cereal Crops Research Unit at Madison, WI, and industry testing in cooperation with the American Malting Barley Association, appear to be similar to Robust, the industry six-rowed quality standard. The following quality comparisons are based on data from 13 separate evaluations made from 1996 to 1999. For the malting quality trait of most interest, soluble protein, the values were 5.6, 5.6, and 6.7%, respectively, for Lacey, Robust, and Stander. Diastatic power is similar to Robust, but Lacey is 18% higher in alpha-amylase and yields 0.5% more malt extract. Lacey is currently being evaluated for both malting and brewing quality in industry tests coordinated by the American Malting Barley Association.

Lacey was 16% higher yielding than Robust and 3% higher than Stander in Minnesota (1996–1999). In Midwestern regional trials (1998–1999), Lacey was 12% and 4% higher yielding than Robust and Stander, respectively. Percentage plump kernels of Lacey is similar to Robust and Stander. In seven Minnesota trials where lodging occurred, the respective lodging percentages were 33% for Lacey and 42% for Robust. It is not as resistant to lodging as Stander.

Lacey possesses the “ND B112” gene for resistance to spot blotch [caused by Bipolaris sorokiniana (Sacc.) Shoemaker]. It has the Rpg1 (T) gene for resistance to stem rust [caused by Puccinia graminis (Pers.: Pers.) var. tritici] which conditions resistance to current races of stem rust, except race QCC. It is susceptible to loose smut [caused by Ustilago tritici (Pers.) Rostr.] and Fusarium head blight [caused by Fusarium graminearum Schwabe].

Breeder seed is maintained by the Minnesota Agricultural Experiment Station, St. Paul, MN 55108. U.S. Plant Variety Protection of Lacey is pending (PVP Application no. 200000228). Limited samples of seed for research purposes are available upon request from the corresponding author for at least five years.

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References

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Registration of ‘Peregrine’ Barley

‘Peregrine’, a spring six-rowed hulless feed barley (Hordeum vulgare L.) (Reg. no. CV-284, PI 611140), was released in April 1999 by the Field Crop Development Centre of Alberta Agriculture, Food and Rural Development, Lacombe, Alberta, Canada (Canadian Reg. no. 4912). Peregrine is a semi-dwarf cultivar well adapted to western Canada where lodging is a limiting factor for production.

It was derived from the cross H12-4816/R181/M69.77-SH1.R.KCl.N0.87/CEL-5106 made in 1986. The first two lines are parents of the cultivar Samson (Helm et al., 1986). The second cross was made to a line derived from a barley population (M69.77- SH1.R.KCl.N0.87/CEL 5106) introduced in 1983 from the International Maize and Wheat Improvement Centre (CIMMYT), Mexico. Seed from F1 plants grown at Lacombe, were bulked to form the F2 generation which was grown at Lacombe in 1987. Subsequent generations were advanced using a modified bulk breeding method alternately at El Centro, CA, during the winter and Lacombe, during the summer. Head selections were made subsequently in the F3 generation to produce F5_{head} rows that were grown in 1992 at Lacombe. A single F5_{head} that became Peregrine was selected at Lacombe and was entered in yield trials from 1993 to 1996. Selection was based on grain yield, test weight, protein content, straw strength, threshability, and resistance to foliar diseases. Breeder seed of Peregrine was derived from a bulk of 198 uniform F5_{head} rows selected randomly from a F4_{head} bulk.

Peregrine is a rough awned, semi-dwarf barley, with a green coleoptile color and semi-erect juvenile growth habit. Leaves are wide and long with glabrous green sheaths and blades.