used by Jacklin Seed Company to establish spaced-plant breeder seed nurseries in Oregon and northern Idaho. These spaced-plant breeder blocks were screened for dark green color, fine leaves, high shoot density, reduced vertical growth rate, uniformity, and high seed yield. A cold, open winter allowed further screening of these plants for winterhardiness.

Ten of the parental clones of Wrangler trace maternally to plants selected from T-6 tall fescue. Two parental clones were selected from maternal progenies of plants obtained from old turfs in New Jersey, and one each from maternal progenies of plants found in North Carolina and Alabama. LB-1 was the experimental designation of Wrangler. The first certified seed of Wrangler was produced in western Oregon in 1987.

Wrangler is a leafy, persistent, turf-type tall fescue capable of producing a medium-low growing turf of medium-fine leaf texture, medium-high density, and an attractive medium-dark green color. In turf trials Wrangler has shown good summer stress tolerance, winterhardiness, and tolerance of medium-close mowing. It has good wear tolerance (as well-established turf), good cool-temperature color retention, medium-early spring greenup, and good shade tolerance. Wrangler has shown moderate resistance to the netblotch disease caused by *Drechslera cydoides* (Drechs.) Shoemaker and the large brown patch disease incited by *Rhizoctonia solani* Kühn. It is of medium late reproduction maturity and capable of producing high seed yields. Wrangler, given a low to moderate level of maintenance, should give good turf performance in regions where tall fescue is well adapted. It is recommended for use on home lawns, parks, athletic fields, roadsides, institutional grounds, and school play areas.

Breeder seed of Wrangler will be produced and maintained by Jacklin Seed Company. Seed increase will be restricted to three generations of increase from breeder seed: namely, foundation, registered, and certified.

United States Plant Variety Protection Certificate no. 8800083 has been issued to protect Wrangler tall fescue.

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**References and Notes**

1. L.A. Brilman, Seed Research of Oregon, Inc., P.O. Box 1416, Corvallis, OR 97330 (now, Jacklin Seed Co.; A.D. Brede, Jacklin Seed Co., West 5300 Riverbend Ave., Port Falls, ID 83854-9499; M.L. Kemp, R.W. Duelle, and C.R. Funk, Crop Science Dep., New Jersey Agric. Exp. Stat., Cook College, Rutgers Univ., New Brunswick, NJ 08903. Publication no. DI1566-4-90, New Jersey Agric. Exp. Stat. Some of this work was conducted as part of NJAES Project no. 15166, supported by New Jersey Agric. Exp. Stat. funds, other grants, and gifts. Additional support was received from the U.S. Golf Assn. Green Section Res. and Educ. Fund, Inc., and from New Jersey Turfgrass Assn. Special appreciation is expressed to all participants of the National Turfgrass Evaluation Program for their assistance in the evaluation of Wrangler. Registration by CSSA: Accepted 31 July 1990. *Corresponding author.*


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**REGISTRATION OF ‘CRYSTAL’ BARLEY**

‘Crystal’ spring barley (*Hordeum vulgare L.*) (Reg. no. CV-225, PI 531249) was developed cooperatively by the USDA-ARS and the Idaho Agricultural Experiment Station. It was released in 1989 by these agencies and the Oregon Agricultural Experiment Station.

Crystal was selected from a cross of ‘Columba’ x ‘Klages’. The F<sub>2</sub> selection from which Crystal originated was made at Aberdeen, ID, in 1978 and designated 78Ab6871. Crystal is a white-aleurone, two-rowed spring barley that is midseason in maturity with lax, midlong to long spikes, rough awns, and long rachilla hairs.

Crystal’s testing in replicated trials began at Aberdeen in 1979. It has been tested widely in irrigated and dryland trials in Idaho since that time. It was tested in the Preliminary Western Spring Barley Nursery in 1981 and in the regional Western Spring Barley Nursery from 1982 to 1984. In 30 station-yr of testing in irrigated trials at five Idaho locations from 1981 to 1987, Crystal’s yield averaged 105% of Klages. Crystal and Klages were similar in height and heading date in these trials, but Crystal was superior to Klages in test weight, kernel plumpness, and lodging resistance. Crystal averaged 6 percentage points higher than Klages in kernel plumpness. In 57 station-yr of testing in the Western Spring Barley Nursery, Crystal’s yield averaged 106% of Klages. As in the Idaho trials, Crystal and Klages were similar in height and heading date, but Crystal again was superior to Klages in test weight, kernel plumpness, and lodging resistance. In Idaho dryland trials conducted at the Tetonia Research and Extension Center from 1982 to 1988, Crystal’s yield averaged 102% of ‘Piroline’, 98% of ‘Clark’, and 94% of ‘Hector’.

Crystal and Klages were very similar in malting quality comparisons based on data involving 33 Idaho trials grown from 1979 to 1987. The two cultivars were virtually identical in barley protein percent, malt extract percent, and α-amylase activity. Crystal averaged slightly higher than Klages in malt fine-coarse difference and ratio of wort N to malt N, and 7 percentage points higher than Klages in kernel plumpness. Crystal and Klages were also similar in malting quality characteristics in 20 station-yr of testing from 1982 to 1984 in the Western Spring Barley Nursery.

The USDA-ARS Cereal Crops Research Unit, Madison, WI; Great Western Malting Company, Vancouver, WA; Anheuser-Busch Companies, St. Louis, MO; and Adolph Coors Company, Golden, CO, cooperated in the early testing of malting and brewing quality. Crystal was first submitted for American Malting Barley Association (AMBA) pilot-scale evaluations of malting and brewing quality in 1982. Industry plant-scale evaluations of malting and brewing quality were initiated in 1985 under the auspices of the American Malting Barley Association and in cooperation with Great Western Malting Company. Crystal was recommended by the AMBA for malting and brewing in mid-1989.

Crystal maintains good kernel color or brightness, as evidenced by relatively high Agtron reflectance readings vs. other barley cultivars, averaging 4 to 6 points higher than Klages on a 0 to 100 scale in Idaho and regional trials. Crystal also has good field tolerance to kernel blight (caused by *Pseudomonas syringae pv. syringae*), with an average incidence of 0.2% infected kernels vs. 2.8% for Klages in irrigated trials near Idaho Falls from 1981 to 1983.

Breeder and foundation seed of Crystal will be maintained by the University of Idaho, Tetonia Research and Extension Center, P.O. Box 123, Star Route, New sin, ID 83436. Seed is also available for research purposes from the USDA-ARS National Small Grains Collection, P.O. Box 307, Aberdeen, ID 83210.

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**References and Notes**

1. D.M. Wesenberg and D.E. Burrup, USDA-ARS, Univ. of Idaho Aberdeen Res. & Ext. Ctr., USDA-ARS Natl. Small Grains Germplasm Res. Facility, P.O. Box 307, Aberdeen, ID 83210; B.L. Jones and G.S. Robbins, USDA-