

Registration of 'Ponoka' Barley

'Ponoka', a two-rowed, spring feed barley (*Hordeum vulgare* L.) (Reg. no. CV-313, PI 633982), was developed by the Field Crop Development Center (FCDC), Lacombe, AB, Canada. Ponoka has been registered in Canada (Canadian Reg. no. 5668) by the Canadian Food Inspection Agency (CFIA), Ottawa, ON. Ponoka was tested by FCDC as H93003006Z and in the Western Co-operative Two-Row Barley Registration Test as TR01656. Ponoka was selected from the cross H92001F₁/TR229. H92001F₁ was the F₁ generation of the cross 'Harrington'/'Camelot' made at FCDC. Harrington is a two-rowed, malting barley developed at the University of Saskatchewan, Saskatoon, SK, Canada (Harvey and Rosnagel, 1984). Camelot is a two-rowed barley introduced to FCDC as entry no. 19 in the 13th International Barley Yield Trial (IBYT) supplied by the International Center for Agricultural Research in the Dry Areas (ICARDA)/International Wheat and Maize Improvement Center (CIMMYT), Mexico (F. Capet-

tini, personal communication, 2003). TR229 is a two-rowed, malting barley tested in the Western Cooperative Two-Row Barley Registration Test from 1990 to 1992 and granted interim registration in 1993. TR229 was selected by Dick Metcalfe, Agriculture and Agri-Food Canada (AAFC) Cereal Research Center, Winnipeg, MB, Canada and Bill Legge, AAFC Brandon Research Center, Brandon, MB, Canada from a cross of 'AC Oxbow' (TR226)/'Manley' (TR490).

The cross H92001F₁/TR229 was made in the field during the summer of 1993. Two hundred spikes were selected, based on a visual assessment, from the F₂ bulk population and advanced at the Crop Development Center in Saskatoon during the winter of 1994 to 1995 via single seed descent, with no further selection, to the F₅ generation. Two hundred F₅ head-rows were grown out in the field at Lacombe in the summer of 1995 from which the line H93003006Z was selected based on disease resistance to scald [caused by *Rhynchosporium secalis* (Oudem.) J.J. Davis] and smut (caused by *Ustilago* spp.), quality [protein and other traits based on NIRS analyses (Oatway and Helm, 1999)], and agronomic type (straw strength, maturity). Yield, quality, and further disease testing of H93003006Z began in the summer of 1996 at Lacombe. From 1996 to 2002, the line was tested in multilocation field tests throughout western Canada. In these trials, Ponoka yielded 15% higher than 'CDC Dolly', the feed check cultivar (Rosnagel and Harvey, 1994), when site mean yields were greater than 8.0 t ha⁻¹; while under low-yielding conditions (site mean yields less than 4 t ha⁻¹), yields of Ponoka were 1.0% higher than those of CDC Dolly.

In the Western Co-operative Two-Row Barley Registration Test (2001 and 2002), Ponoka had a mean grain yield over 31 sites of 4.72 t ha⁻¹, higher than the mean grain yield of 4.37 t ha⁻¹ for CDC Dolly. Over the 28 sites that maturity was measured, Ponoka reached maturity in approximately 95 d, 3 d later than CDC Dolly. Ponoka was taller at 67 cm than CDC Dolly at 64 cm (32 sites). Ponoka had the same test weight at 66 kg hL⁻¹ as CDC Dolly (31 sites), but its kernel weight was only 46 mg (31 sites) and percentage plump only 87% (18 sites) versus 47 mg and 93% for CDC Dolly.

Ponoka is resistant to the surface-borne smuts and true loose smut [caused by *U. nuda* (Jens.) Kellerman & Swingle]. Ponoka is moderately susceptible to the spot form of net blotch (caused by *Pyrenophora teres* Dreschs. f. *maculata* Smedeg.) but is moderately resistant to the net form (*P. teres* forma *teres*). Ponoka has a moderately susceptible seedling reaction to Race 1493C of scald [caused by *Rhynchosporium secalis* (Oudem.) J.J. Davis]; but as an adult plant in field tests at Lacombe and Edmonton, AB, it was moderately resistant to scald. Ponoka had ratings to Fusarium head blight (scab) {predominantly caused by *Fusarium graminearum* Schwabe [teleomorph *Gibberella zeae* (Schwein.) Petch]} of 2.3 and 2.5 (0–5 scale) in two years of testing at Brandon, MB, similar to CDC Dolly and Harrington. In two years of testing at Lacombe, AB, for reaction to common root rot, Ponoka had a moderately resistant reaction in one year (lower percentage infection than CDC Dolly and Harrington) and moderately susceptible reaction the next (higher percentage infection than either CDC Dolly and Harrington). Ponoka is moderately susceptible to spot blotch [caused by *Cochliobolus sativus* (Ito and Kuribayashi) Dreschs. ex Dastur]. Ponoka is susceptible to stem rust (caused by *Puccinia graminis* Pers. f.sp. *tritici* Eriks. and Henn.), Septoria speckled leaf blotch (caused by *Septoria passerinii* Sacc.) and Barley yellow dwarf virus.

Ponoka has a green coleoptile with medium elongation. Its early growth habit is intermediate between prostrate and

upright. The lower leaves have glabrous green sheaths and blades. At the boot stage, leaves have a slight waxy bloom and glabrous sheaths. The flag leaf of Ponoka is long, medium in width, with an upright attitude, purple auricles, glabrous auricle margins and blade, and a waxy sheath. The spike of Ponoka tends to have only slight (0–3 cm) exertion. The stem has five elongated nodes, medium thickness, a medium green color, and a waxy bloom. The collar is V-shaped and the neck is slightly curved. The spike has a strap (parallel) shape with medium density, semi-erect attitude, and slight waxy bloom. The glumes are midlong with a purplish tip, covered with long hairs, and have rough awns equal in length to the glumes. The lemma awns are long and rough with a purplish color and a few barbs on the lateral veins. The kernels have colorless aleurones, long rachillas with long rachilla hairs, clasping lodicules, and incomplete horseshoe basal markings.

From the F_7 to F_9 generations, increase plots were grown from which spikes were selected to grow F_{10} prebreeders rows. One hundred and ninety-five F_{11} breeder rows and plots were grown from selected uniform F_{10} rows. Seed from these rows and plots were bulked to form the Breeder seed. Breeder seed will be maintained by FCDC, Lacombe, AB, Canada. For research purposes, small quantities of seed are available from FCDC or USDA-ARS National Seed Storage Laboratory, 1111 South Mason Street, Fort Collins, CO 80521-4500. Commercial seed of Ponoka will be distributed through SeCan Association, 201-52 Antares Drive, Ottawa, ON, Canada, K2E 7Z1; email, seed@secan.com; and website, <http://www.secan.com>. Application has been made in Canada for plant breeders' rights (Appl. no. 03-3570).

P.E. JUSKIW,* J.H. HELM, J. NYACHIRO,
M. CORTEZ, M. ORO, AND D.F. SALMON

Acknowledgments

Our thanks to Dr. Kequan Xi for his pathology expertise and to John Bowness, Tim Duggan, Dave Dyson, Lori Oatway, and Donna Westling for their excellent technical support.

References

- Harvey, B.L., and B.G. Rosnagel. 1984. 'Harrington' barley. *Can. J. Plant Sci.* 64:193–194.
- Oatway, L., and J.H. Helm. 1999. The use of near infrared reflectance spectroscopy to determine quality characteristics in whole grain barley. p. 70–72. *In* 16th American Barley Researchers Workshop, Idaho Falls, ID, 11–15 July 1999.
- Rosnagel, B.G., and B.L. Harvey. 1994. CDC Dolly two-row feed barley. 38:109. *In* R.D. Horsley (ed.) Barley Newsletter. American Malting Barley Association, Inc., Milwaukee, WI.

Field Crop Development Centre, Alberta Agriculture, Food and Rural Development, 5030-50th Street, Lacombe, AB, Canada T4L 1W8. Registration by CSSA. Accepted 31 Aug. 2004. *Corresponding author (patricia.juskiw@gov.ab.ca).

Published in *Crop Sci.* 45:787–788 (2005).