Registration of 'AC Harper' Barley

'AC Harper' (Reg. no. CV-269, PI 595895) is a six-rowed spring barley (Hordeum vulgare L.) cultivar developed at the Agriculture and Agri-Food Canada (AAFC) Research Centre, Lethbridge, AB, Canada, which was registered on 9 Aug. 1996 by the Food Production and Inspection Branch, Agriculture and Agri-Food Canada. AC Harper was tested at Lethbridge and in the Western Co-operative Six-Row Barley Registration Test (1993-1995) under the experimental numbers 187-016 and BT704, respectively. AC Harper was selected from the cross 49-125/BT364. Line 49-125, which originated from the cross 'Osiris'/6*'Galt'/BT201/6*Galt, incorporated scald [caused by Rhynchosporium secalis (Oudem.) J.J. Davis] resistance from Osiris into a Galt background. BT364, from the Brandon (AAFC) barley breeding program, was included for its high yield and stiff straw characteristics.

The hybrid population (Lethbridge no. 187) was developed by hand crossing in controlled environment facilities at the Lethbridge Research Centre, AAFC in 1983. Approximately 30 F1 plants were grown in a growth room to produce seed for 1500 plants which were grown at high plant density for the F2 and $\text{F}_3$ using a single seed descent procedure. The F3 plants were inoculated with a strain of R secalis (S78-135.2), originally collected from a commercial field of barley near Strathmore, AB. One hundred and eighty single-plant selections were made from a space-planted F4 population in the field in 1988 based upon visual appearance and the number of selections was further reduced based upon seed size. Approximately 60 F5 selections were evaluated in single plant progeny rows in 1989, and 45 lines were selected based upon visual appearance (187-01 to 187-45). Selection criteria used included maturity, plant height, resistance to lodging, grain yield, test weight, kernel weight, disease resistance, and feed quality parameters. Agronomic and yield tests were conducted at Lethbridge in 1990 and 1991, at six locations in Alberta and Saskatchewan in 1992, and in the Western Co-operative Six-Row Barley Registration Test (18-20 locations in western Canada) in 1993-1995.

Over 3 yr of evaluation in the Western Co-operative Six-Row Barley Registration Test, AC Harper yielded similar to Brier (the feed check cultivar) in the western black soil zone, and 2% higher in the grey wooded zone. In the brown soil zone, AC Harper yielded 7% higher than Brier in irrigated tests at Lethbridge; however, it was less competitive in the absence of irrigation. AC Harper also outyielded Brier from 1 to 10% in the black soils of western Manitoba and eastern Saskatchewan and in the soils at Brandon and Glenlea, MB. Kernel weights are similar to Brier.

AC Harper heads 1 to 2 d later than Brier and matures <1 d later. It has superior resistance to lodging (rated 4.9 for Brier, on a scale of 1 = upright to 9 = lodged), and is shorter than Brier. AC Harper is six-rowed, with nearly erect heads and smooth lemma awns. The midsize kernel aleurone and midlong rachilla, with long hairs and few barbs.

AC Harper has excellent feed quality characteristics and has a superior level of kernel plumpness (77.3 vs. 71.3% over a 2.4- by 19-mm sieve), protein content (12.9 vs. 12.3% NIR determination), and kernel color (13.0 vs. 15.3, NIR determination), as well as favorable levels of true metabolizable energy, acid-detergent fiber, and β-glucan content compared with Brier.

AC Harper is resistant to scald, moderately resistant to moderately susceptible to common root rot [caused by Puccinia graminis f. sp. tritici Eriks. & E. Henn.], moderately susceptible to surface-borne smuts [caused by Ustilago hordei (Pers.) Rostr., syn. U. avenae (Pers.) Rostr., and by U. avanea (Pers.) Rostr., syn. U. nigra Tapke], and both the net and spot form of net blotch (caused by Pyrenophora teres Drechs.). It is susceptible to loose smut [caused by U. tritici (Pers.) Rostr., syn. U. nuda (C.N. Jensen) Rostr.] and septoria blotch (caused by Septoria passerinii Sacc.).

Seed from more than 100 uniform head rows were bulked to constitute the breeder seed of AC Harper. Breeder seed is being maintained by AAFC at the Indian Head Experimental Farm, Indian Head, SK. The Canadian distributor for AC Harper is the SeCan Association, 200-57 Auriga Dr., Nepean, ON K2E 8B2.