

The spike of Chisholm is awned, fusiform to oblong, and middense; awns are white and 4 to 7 cm long; glumes are glabrous, white, midlong, and narrow to midwide; the shoulders are narrow and square; beaks are narrow, acuminate, and vary from 3 to 6 mm in length; the kernels are red, midlong, hard, and elliptical to ovate; the germ is midsized; the crease is narrow and shallow; cheeks are rounded; and the brush is midsized and midlong.

The cultivar was evaluated in the Southern Regional Performance Nursery in 1982 and 1983 as OK754615E (composite of early maturing selections). Chisholm has sufficient winterhardiness for Oklahoma and is adapted to all wheat growing areas in the state. The cultivar has an excellent yield record in Oklahoma. In 4 years of state-wide tests (24 environments) during 1980-1983, the average grain yields for Chisholm, 'TAM 105,' 'Vona,' 'TAM W-101,' 'Payne,' 'Newton,' and 'Triumph 64' were, respectively, 4365, 4163, 3989, 3962, 3955, 3861, and 3457 kg ha⁻¹. Chisholm has good milling and baking properties. It has satisfactory grain protein content, satisfactory flour yield, rather strong dough mixing properties and good loaf volume potential. Chisholm has moderate field resistance to leaf rust incited by *Puccinia recondita* Rob. ex Desm. f. sp. *tritici*. It is susceptible to soilborne mosaic virus, wheat streak mosaic virus, and powdery mildew (incited by *Erysiphe graminis* DC. f. sp. *tritici* E. Marchal).

Breeder seed of Chisholm will be maintained by the Oklahoma Agric. Exp. Stn. Foundation seed will be available from the Oklahoma Foundation Seed Stocks, Inc., Dep. of Agronomy, Oklahoma State Univ., Stillwater, OK 74078.

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References and Notes

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REGISTRATION OF FILLMORE WHEAT

'FILLMORE' soft red winter wheat (*Triticum aestivum* L.) (Reg. no. 692) PI 469272 was developed by the Purdue University Agricultural Experiment Station in cooperation with USDA-ARS and released in 1982. Fillmore resulted from the cross P5724B3-5P-8-2*2/'Siete Cerros'. P5724B3-5P-8-2 and 'Benhur' were derived from the same cross (1). Fillmore and 'Caldwell' were selected from progeny of the same backcross F₁ plant.

Following the backcross, Fillmore was developed by the modified pedigree method of breeding with plant selections made in the F₁, F₂, and F₈ generations. In 1978 in the F₁₅ generation of selfing, 98 of 100 individual plant progeny rows, judged uniform and similar, were composited. Breeder seed in 1981 was in the F₁₆ generation of self-pollination.

Fillmore was evaluated as IN65256A1-9-7 for performance in nursery trials for 5 years, 1976 to 1981; in intrastate field plot trials for 3 years, 1979 to 1981; and in the Uniform Eastern Soft Red Winter Wheat Performance Nursery for 2 years, 1980 to 1981. Fillmore appears adapted to the northern half of the eastern soft wheat area. Com-

mercial soft wheat quality was rated good by tests of the Soft Wheat Laboratory, Wooster, OH, 1976 to 1980.

Fillmore is about 6 days later in heading and about 7 cm taller than 'Arthur'. It has a moderate level of winterhardiness like Caldwell. The spike is lax, oblong, apically awnleted, and yellow at maturity. Glumes are midlong and midwide, with rounded shoulders and obtuse beaks. Kernels are red and ovate with a narrow and shallow crease.

Fillmore has adult plant resistance to septoria tritici blotch, incited by *Mycosphaerella graminicola* (Fuckel) Schroeter; to powdery mildew caused by races of *Erysiphe graminis* DC. f. sp. *tritici* E. Marchal occurring in Indiana; to leaf rust caused by *Puccinia recondita* Rob. ex Desm. f. sp. *tritici* naturally occurring in Indiana; and to some races of *Puccinia graminis* Pers. f. sp. *tritici* Eriks. & Henn.

Fillmore is intermediate in reaction to the soil-borne mosaic virus; moderately susceptible to the wheat spindle streak mosaic soil-borne virus; and moderately resistant to the aphid-borne barley yellow dwarf virus in Indiana.

Fillmore has the *H6* gene for resistance to Hessian fly, *Mayetiola destructor* (Say), which provides resistance to biotypes GP, A, and B.

Variety protection was applied for under the Plant Variety Protection Act, Public Law 91-577, in conjunction with Title V of the Federal Seed Act. If granted, the owners further specify that Fillmore may be sold for seed only by variety name. Breeder seed is maintained by the Purdue Univ. Agric. Exp. Stn., West Lafayette, IN 47907.

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References and Notes

1. Patterson, F.L., J.F. Schafer, R.L. Gallun, and J.J. Roberts. 1978. Registration of Benhur wheat. *Crop Sci.* 18:527-528.
2. F.L.P., Lynn distinguished professor emeritus of agronomy; H.W.O., professor of agronomy; G.E.S., professor of plant pathology; R.E.F., former research associate of plant pathology; R.L.G., research entomologist (retired) USDA-ARS and professor of entomology; J.J.R., research agronomist USDA-ARS and assistant professor of agronomy; and J.E.F., research entomologist USDA-ARS and associate professor of entomology; all at Purdue Univ., West Lafayette, Ind. 47907. Cooperative investigations of the Purdue Univ. Agric. Exp. Stn. and USDA-ARS. The breeding of Fillmore was supported in part by grants from the Indiana Crop Improvement Assoc. Registration by the Crop Sci. Soc. of Am. Purdue Univ. Agric. Exp. Stn. Journal Paper no. 9847. Accepted 7 Sept. 1984.

REGISTRATION OF 'HYCREST' CRESTED WHEATGRASS

'HYCREST' (Reg. no. 16) was released by the USDA-Agricultural Research Service in cooperation with the Utah Agricultural Experiment Station and the USDA-Soil Conservation Service on 18 Apr. 1984.

The parental germplasm was generated by crossing induced tetraploid *Agropyron cristatum* (L.) Gaertn. with natural tetraploid *A. desertorum* (Fisch. ex Link) Schult. Initial crosses were made between 1962 and 1967 (1). The genetic base of the hybrid population was established with seven clones each of induced tetraploid *A. cristatum* and *A. desertorum*. Reciprocal crosses were made to insure that cytoplasm of both species were represented in the breeding population.

In 1974, open pollination progenies of 295 F₃ hybrid clones were established in a 7000-plant source nursery on a range site in northwest Utah. After a 2-year evaluation

period, 103 clones were selected on the basis of general vigor, leafiness, resistance to insects and diseases, and seed yield potential. Selected clones and their OP progenies were included in replicated tests at two field locations where they were evaluated for seed and forage yield, seedling vigor, and other characteristics previously studied in the source nurseries. On the basis of these data, 18 clones were isolated in a crossing block to develop the first generation of the synthetic strain.

Hycrest, the first interspecific hybrid of crested wheatgrass to be released, tends to be larger and more robust than the two parental species. In trials on five range sites in Utah and Idaho, it established better stands and produced significantly more forage than 'Nordan' or 'Fairway,' particularly during the first 2 years after seeding. In spaced-plant trials, the hybrid produced about 20% more seed than Nordan and Fairway. Hycrest also established significantly better than the cultivars Fairway and Nordan in the field and showed superior root development, emergence from deep plantings, and subsequent seedling vigor in the laboratory. Preliminary observations indicated that its forage is as palatable to grazing cattle during the mid-summer as presently available cultivars. Although the cultivar is well adapted to sagebrush (*Artemisia* spp.) and juniper (*Juniperus* spp.) vegetation sites, it also established good to excellent stands on shadscale [*Atriplex confertifolia* (Torr. & Frem.) S. Wats], greasewood [*Sarcobatus vermiculatus* (Hook.) Torr.],

and Indian ricegrass [*Sorghastrum nutans* (L.) Nash] sites where annual precipitation is less than 25 cm.

At 100% purity, there were 335 000 seeds kg^{-1} . Recommended seeding rate for seed production is 2.5 kg ha^{-1} in rows approximately 1 m apart. When drilling on rangeland, 7 kg ha^{-1} is recommended.

Breeder, foundation, and certified seed classes will be recognized. Breeder seed will be maintained by the USDA-ARS Crops Research Laboratory at Logan, UT. Foundation seed will be produced from breeder's seed by the USDA-SCS. For information regarding supplies of Foundation seed, contact local soil conservation districts and crop improvement associations of the state where the seed is to be planted.

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References and Notes

1. Dewey, D.R., and P.C. Pendse. 1968. Hybrids between *Agropyron desertorum* and induced-tetraploid *Agropyron cristatum*. *Crop Sci.* 8:607-611.
2. Research geneticists, range scientist, and plant physiologist, USDA-ARS, Crops Res. Lab., Utah State Univ., Logan, UT, 84322; and plant materials specialist, USDA-SCS, Western Tech. Serv. Ctr., Portland, OR 97209. Registration by the Crop Sci. Soc. of Am. Contribution from cooperative investigations by USDA-ARS, Utah Agric. Exp. Stn. Accepted 27 Sept. 1984.