

is similar to that of other released cultivars of intermediate wheatgrass. Haymaker is recommended for dryland hay production in the central and northern Great Plains, USA in USDA Plant Hardiness Zones 3, 4, and 5 (Cathey, 1990).

Haymaker has an erect growth habit and has rhizomes typical of intermediate wheatgrass. Its culms and leaves are glabrous and non-glaucous, and leaf margins are smooth. Leaves are green-yellow or Munsell 5GY 5/4 (Munsell Color, 1977). Sheaths have ligules, auricles are usually absent, and sheath margins are smooth. Spikes are oblong, erect, and have green, lanceolate glumes. Spike density is lax. Anthers are yellow. At 41° N lat. in the central Great Plains, Haymaker has anthesis the last week of June. The spike height of Haymaker varies with environment but is typically taller than other intermediate wheatgrasses and has a wider flag leaf.

Breeder seed will be jointly maintained and produced as needed by USDA-ARS and the University of Nebraska-Lincoln with random-mated isolations based on the Syn 2 seed used in evaluation trials. Foundation seed production of Haymaker will be managed by the Nebraska Foundation Seed Division, University of Nebraska-Lincoln, Lincoln, NE 68583. Foundation seed will be made available for Certified seed production on a non-exclusive basis to seed producers who contractually agree to produce and market the seed only as Certified seed using the cultivar name Haymaker. A technology development and transfer fee will be assessed by the University of Nebraska.

Limited amounts of seed for research purposes will be provided upon written request to the corresponding author. Recipients are asked to recognize the source if it contributes to the development of a cultivar or germplasm or is used for other research purposes. U.S. Plant Variety Protection will be sought for Haymaker.

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Registration of 'NU-ARS AC2' Crested Wheatgrass

'NU-ARS AC2' crested wheatgrass [*Agropyron cristatum* (L.) Gaertn.—*A. cristatum* var. *pectinatum* (M. Bieb.) Tzvelev] (Reg. no. CV-28, PI 634507) is a broadly adapted, complex composite population produced by allowing selected plants from fairway-type germplasm accessions to randomly intermate. It originates from collections made by Douglas Dewey, USDA-ARS Plant Geneticist, in the former USSR in 1977. It was released in September 2002 by USDA-ARS; Agricultural Research Division, Institute of Agricultural and Natural Resources, University of Nebraska-Lincoln; and the USDA-NRCS. NU-ARS AC2 was tested under the experimental designation NE AC2.

Seed of fairway-type crested wheatgrass accessions obtained from Dewey's collections were used to establish evaluation trials at Mead and Alliance, NE. Accessions were evaluated during the period 1979-1983 in space-transplanted evaluation trials. Four accessions with high forage yields, high in vitro dry matter digestibility (IVDMD), and overall superior forage evaluation ratings were identified. Superior plants of these accessions were visually selected in the evaluation nursery at Mead, NE, in 1985 prior to anthesis. All non-selected plants in the evaluation nursery were mowed prior to anthesis and seed was harvested and bulked from the selected plants. The Dewey accessions and the numbers of plants selected from each accession to form NU-ARS AC-2 were as follows: D-1458 (18), D-1462 (6), D-1610 (13), and D-1654 (9). The Dewey accessions have been entered into the USDA Plant Germplasm System. D-1458 was a single plant collection (D.R. Dewey, personal communication, 1980) which was combined with D-1457 to form PI 440062. D-1462 was a bulk collection and assigned PI 439922. Both PI 440062 and PI 439922 are fairway-like in appearance and were collected from a site 52 km southeast of Stavropol, Russia. PI 440062 has subsequently been classified as *A. cristatum* var. *pectinatum* and is a tetraploid. D-1610 was assigned PI 439926 and D-1654 was assigned PI 439929. PI 439926 and PI 439929 were classified as *A. cristatum*. PI 439926 was collected on a seeded site near Stavropol, Russia and believed to be the cultivar Krasnokovskii 305 (D.R. Dewey, personal communication, 1980). PI 439929, a diploid, was collected about 50 km southeast of Svetlograd, Russia. Bulk seed from selected plants was used to establish an increase nursery in the fall of 1985 at Mead, NE. Seed harvested from the increase nursery (Syn 2 generation) produced the synthesized population, NE AC2, which was used to plant evaluation trials.

NU-ARS AC2 was tested across several eco-regions (Bailey, 1995) in the Central and Northern Great Plains at the following sites; Prairie (Mead, NE), Steppe (Hays, KS; Ft. Pierre, SD), Dry Steppe (Sidney, NE; Cheyenne, WY; Hettinger, ND) during the period 1990-1997. In both the Central and Northern Plains locations, NU-ARS AC2 had greater average forage yields than the other fairway-type crested wheatgrass entries and was equivalent to the best standard crested wheatgrass cultivars. The in vitro dry matter digestibility (IVDMD) and protein content of NU-ARS AC2 was similar to that of the other strains and cultivars evaluated. Seed yields were 200 and 260 kg ha⁻¹ in 2000 and 2001, respectively, under rainfed conditions at Mead, NE.

NU-ARS AC2 has an erect, caespitose growth habit typical of crested wheatgrasses. Its culms and leaves are glabrous and non-glaucous, and leaf margins are smooth. Leaves are green-

yellow or Munsell 5GY 4/4 (Munsell Color, 1977). Sheaths have ligules, sheath margins are smooth, and auricles are absent. Spikes are dense, tapering, erect, and have green, lanceolate, awned glumes. At 41° N lat. in the central Great Plains, NU-ARS AC2 heads the last 10 d of May. Approximately 95% of the plants in a population of NU-ARS AC2 are diploids, the remainder are tetraploids. No triploids were identified in almost 100 seedlings produced from Breeder seed. Although NU-ARS AC2 is genetically heterogeneous, it is similar in phenotypic uniformity to other fairway-type crested wheatgrasses. It is typically about 3–5 cm taller in height than *A. cristatum* cultivars such as Fairway or Parkway and 10 to 12 cm in height shorter than *A. desertorum* or standard crested wheatgrass cultivars such as HyCrest and Nordan. Spike length is shorter and spike width is greater than standard crested wheatgrass cultivars. NU-ARS AC-2 is adapted to USDA Plant Hardiness Zones 3, 4, and 5 (Cathey, 1990).

Breeder seed will be jointly maintained and produced as needed by USDA-ARS and the University of Nebraska-Lincoln with random mated isolations based on the Syn 2 Breeder seed. Foundation seed production of NU-ARS AC2 will be managed by the Nebraska Foundation Seed Division, University of Nebraska-Lincoln, Lincoln, NE 68583. Foundation seed will be made available for Certified seed production on a non-exclusive basis to seed producers who contractually agree to produce and market the seed only as Certified seed using cultivar name NU-ARS AC2. A fee for technology development and transfer will be assessed by the University of Nebraska. Limited amounts of seed for research purposes will be provided upon written request to the corresponding author. Recipients are asked to recognize the source if it contributes to the development of a cultivar or germplasm or is used for other research purposes. U.S. Plant Variety Protection will be sought for NU-ARS AC2.

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Registration of 'McCormick' Wheat

'McCormick' (Reg. no. CV-959, PI 632691) is a soft red winter wheat (*Triticum aestivum* L.) developed and released May 2002 by the Virginia Agricultural Experiment Station. McCormick wheat was named in tribute of Robert Hall of Walnut Grove in Rockbridge County, VA, and his sons, including Cyrus Hall McCormick, William Sanderson McCormick, and Leander James McCormick. Their inventing, perfecting, manufacturing, and marketing of the mechanical grain reaper ushered in the era of modern agriculture and wrought one of the greatest advancements in agricultural history. McCormick wheat is broadly adapted and has performed well over most of the soft red winter wheat production region. In addition to high grain yield and volume weight, McCormick provides the wheat industry with a good pastry-quality cultivar that has resistance to most disease and insect pests prevalent in the region.

McCormick was derived from the cross VA92-51-39/AL870365. The parentage of VA92-51-39 is IN71761A4-31-5-48//VA71-54-147 (Citr 17449)/'McNair 1813' (Citr 15289). Wheat line IN71761A4-31-5-48 was developed by Purdue University and has the pedigree 'Benhur' (Citr 14054)/3/'Arthur' (Citr 14425)/'Knox' (Citr 12798) type line/4/'Beau' (Citr 17420)*2/3/'Arthur'*2/'Riley' (Citr 13702)/'Bulgaria 88' (PI 94407). The Knox type line has gene *H5* for Hessian fly [*Mayetiola destructor* (Say)] resistance. The parental line AL870365 was derived from the cross 'Coker 747' (Citr 17923)*2/'Amigo' (PI 578213) by the Coker Breeding Program now a part of Syngenta and was selected as a parent from the 1990–1991 USDA-ARS Uniform Eastern Soft Red Winter Wheat Nursery. McCormick possesses the 1AL.1RS translocation derived from AL870365, which inherited it from Amigo (Sebesta et al., 1995). The cross from which McCormick originated was made in spring 1992, and the F₁ generation was grown in the field at Warsaw, VA, as a single 1.2-m headrow in 1993 to produce F₂ seed. The population was advanced from the F₂ to F₄ generation using a modified bulk breeding method. Wheat spikes were selected from the population in each segregating generation (F₂–F₃) on the basis of disease resistance, early maturity, short straw, and desirable head shape and size. Selected spikes were threshed in bulk, and the seed was planted in a 20.8-m² block in the fall of each year. Spikes selected from the F₄ bulk were threshed individually and planted in separate 1.2-m headrows at Warsaw, VA. McCormick was derived as a bulk of one of these F_{5,6} headrows selected in 1997 on the basis of earliness of head emergence, short plant height, and resistance to powdery mildew [caused by *Erysiphe graminis* DC. f. sp. *tritici* Ém. Marchal; syn. *Blumeria graminis* (DC) E.O. Speer] and leaf rust (caused by *Puccinia triticina* Eriks.). Before its release, McCormick was evaluated as VA98W-591 in Virginia's official variety trials and throughout the soft red winter wheat region in the USDA-ARS Uniform Southern and Uniform Eastern Soft Red Winter Wheat Nurseries in 2001 and 2002.

Coleoptiles of McCormick are red. Juvenile plants exhibit a prostrate growth habit. Plant color at boot stage is green and a waxy bloom is present on the stem and flag leaf sheath. Plants grown in greenhouse have yellow anther color, while those grown under field conditions often have reddish-purple anther color. Straw color is reddish purple at physiological maturity. Spikes are tapering, middense, and awnleted. Glumes are short and midwide, and have rounded shoulders with acute beaks. Kernels are red, soft, and ovate with a narrow and shallow crease, rounded cheeks, and a short non-collared brush. The phenol reaction is brown.

Head emergence of McCormick is 1 to 3 d later than 'AGS 2000' and 1 to 2 d earlier than 'Roane'. Average plant height of McCormick (79 cm) is similar to that of 'Coker 9835' and