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Cougar (Reg. no. CV-900, PI 613098) is a hard red winter wheat (*Triticum aestivum* L.) cultivar developed cooperatively by the Nebraska Agricultural Experiment Station and the USDA-ARS and released in 2000. Cougar was selected from the cross NE85707/'Thunderbird' which was made in 1987. The pedigree of NE85707 is 'Warrior'*5/'Agent'//'Kavkaz'/4/NE63218/'Kenya 58'/3/'Newthatch'/2* CTMH//'Ponca'/*2 'Cheyenne'. The pedigree of CTMH is Cheyenne-'Tenmarq'-'Mediterranean'-'Hope', where the order of the crosses is unknown. The pedigree of NE63218 is believed to be CI 12500//'Red Chief'/Ponca/3/Cheyenne. The pedigree of CI 12500 is 'Nebraska No. 60'//Mediterranean/Hope. The F1 to F3 generations were advanced using the bulk breeding method. Cougar is an F3-derived line that was selected in the F4 generation. Cougar was released primarily for its very long coleoptile (116 mm, similar to 'Scout 66') with exceptional straw strength (superior to '2137' and 'Wesley'), traits which have value in southern Nebraska.

Cougar is an awned, white-glumed cultivar. Its field appearance is most similar to Thunderbird and 'Big Dawg'. After heading, the canopy is open and upright. The flag leaf is erect and twisted at the boot stage. The foliage is green with a slight blue cast and a waxy bloom at anthesis. The leaves are glabrous. The spike is tapering in shape, moderately long to long, and middense. The glume is short and wide, and the glume shoulder is square. The beak is moderately short in length with an acuminate tip. The spike is usually erect to inclined at maturity. Kernels are red colored, hard textured, midlong, and elliptical to ovate in shape. The kernel has no collar, a midsize to large brush of medium length, rounded cheeks, midsize germ, and a midwide and shallow crease.

Cougar was tested as NE93496 in Nebraska yield nurseries starting in 1994, in the USDA-ARS Southern Regional Performance Nursery in 1997 and 1998, and in Nebraska cultivar performance trials in 1998 and 1999. In 2 yr of testing in Nebraska cultivar performance trials, it has performed

competitively in southeast, southcentral, and southwestern Nebraska, areas where historically Thunderbird also performed well. In this region (17 environments), Cougar had a yield of 4100 kg ha^{-1}, which was lower than Wesley (4700 kg ha^{-1}) and 2137 (4630 kg ha^{-1}) but superior to 'Pronghorn' (3820 kg ha^{-1}), the only other modern, long coleoptile wheat in the trial. Cougar was ranked 38 out of 45 lines tested in the Southern Regional Performance Nursery in 1997 (36 environments), and 42 out of 45 lines tested in 1998 (35 environments). The main advantages Cougar has when compared with most other available wheat cultivars, within its area of adaptation, is its long coleoptile, exceptional straw strength, good grain volume weight, and kernel size.

Other measurements of performance from comparison trials show that Cougar (Day of Year 139) is medium early in maturity, about 1 d earlier flowering than 'Arapahoe', similar to 'Alliance', and 1 d later than Pronghorn. It has a long coleoptile, similar to Scout 66 and Pronghorn, and longer than Arapahoe, Alliance, and Wesley. The mature plant height of Cougar (90 cm) is 3 cm taller than Arapahoe and 7 cm shorter than Pronghorn. Cougar is very strong strawed, equal to or better than the strongest strawed cultivars currently grown in Nebraska. For example, in irrigated trials in 1998 and 1999 (3 environments), Cougar had 0% lodging, compared with 2% for Wesley, 6% for 2137, and 32% for Arapahoe. The winterhardiness of Cougar is good to very good and comparable to other winter wheat cultivars adapted and commonly grown in Nebraska.

Cougar is moderately resistant to stem rust (caused by *Puccinia graminis* Pers.: Pers. f. sp. tritici Eriks. & E. Henn); contains Sr31 and possibly Sr24 (McVey, 1997–1998, unpublished data); is moderately susceptible to leaf rust (caused by *P. triticina* Eriks.); contains Lr26 and possibly LR24 (McVey, 1997–1998, unpublished data); and is susceptible to wheat soilborne mosaic virus, Hessian fly (Mayetiola destructor Say) (Hatchett, USDA, and Kansas State University, 1997–1998, unpublished data), barley yellow dwarf virus, and wheat streak mosaic virus (Uniform Winter Wheat Southern Regional Performance Nursery, 1997–1998, personal communication; also noted in field observations in Nebraska by G. Hein, 1998–1999, personal communication). Cougar has excellent grain volume weight (77.9 kg hL^{-1}), higher than Alliance, Arapahoe, 'Niobrara', and Pronghorn. The milling and baking properties of Cougar were determined for 5 yr by the Nebraska Wheat Quality Laboratory. In these tests, Arapahoe and Scout 66 were used as check cultivars. The average wheat protein content of Cougar (133 g kg^{-1}) was higher than Arapahoe (128 g kg^{-1}) and Scout 66 (125 g kg^{-1}). The average flour extraction on the Buhler Laboratory Mill for Cougar (718 g kg^{-1}) was similar to Arapahoe (717 g kg^{-1}) but less than Scout 66 (732 g kg^{-1}). The flour ash content was slightly higher than the check cultivars. The average flour protein content (121 g kg^{-1}) was higher than the check cultivars. Dough mixing properties, determined using the Mixograph (National Manufacturing, Lincoln, NE), were weaker with Cougar than Arapahoe, and stronger than Scout 66. Average baking absorption (608 mL H_2O kg^{-1} flour) was less than the check cultivars. The average loaf volume of Cougar (918 cm^3) was greater than Arapahoe (893 cm^3) and Scout 66 (895 cm^3). The scores for the internal crumb grain and texture were generally good, though slightly more variable, and were slightly less than Arapahoe and Scout 66. The slightly higher variability in crumb grain and texture in Cougar is most likely due to its being homogeneous for the 1B.1R translocation. Despite the presence of the 1B.1R translocation, the overall end-use quality characteristics for Cougar should be acceptable to the milling and baking industries. On the basis of performance data to date, Cougar should be well adapted to most rainfed wheat production systems where a dry seedbed requires planting deep to moisture, and to conditions of high fertility and productivity which require superior straw strength.

With its lower yield potential, it will not be recommended as being broadly adapted, but rather is viewed as a niche wheat with unique attributes. Its performance is best in southern Nebraska and similar growing areas in adjacent states. In these areas, it is a modern Thunderbird type, and can be grown wherever Thunderbird has been previously grown. It is genetically complementary to 2137, Alliance, Arapahoe, 'Culver', 'Jagger', Niobrara, Pronghorn, 'Vista', and 'Windstar'.

Cougar has been uniform and stable since 1998. Less than 0.5% of the plants were rogued from the Breeder seed increase in 1998. All of the rogued variant plants were taller in height (10–25 cm) or had red chaff. Up to 1% (10:1000) taller or red chaff variant plants may be encountered in subsequent generations. The Nebraska Crop Improvement Association provided technical assistance in describing the cultivar characteristics and accomplishing technology transfer. The Nebraska Foundation Seed Division, Department of Agronomy, University of Nebraska–Lincoln, Lincoln, NE 68583 had foundation seed available to qualified certified seed enterprises in 1999. The U.S. Department of Agriculture will not have seed for distribution. The seed classes will be Breeder, Foundation, Registered, and Certified. The Registered seed class will be a nonsalable seed class. Small quantities of seed for research purposes may be obtained from the corresponding author and the Department of Agronomy, University of Nebraska, for at least 5 yr from the date of this publication.

Footnotes

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