

**NEBRASKA AGRICULTURAL EXPERIMENT STATION  
UNIVERSITY OF NEBRASKA-LINCOLN  
DEPARTMENT OF AGRONOMY**

**and**

**UNITED STATES DEPARTMENT OF AGRICULTURE  
AGRICULTURAL RESEARCH SERVICE  
WASHINGTON, D. C.**

**RELEASE OF COUGAR HARD RED WINTER WHEAT**

Cougar is a hard red winter wheat (*Triticum aestivum* L.) cultivar developed cooperatively and jointly released by the Nebraska Agricultural Experiment Station and the USDA-ARS. Cougar was selected from the cross NE85707/Thunderbird. The pedigree of NE85707 is Wrr\*5/Agent//Kavkaz/4/NE63218/KY58/3/ NTH/2\*CTMH//PNC/\*2 CNN. Cougar was released primarily for its having a very long coleoptile (similar to Scout 66) with exceptional straw strength (superior to 2137 and Wesley). It has excellent test weight and kernel size. Similar to Thunderbird its yield level is lower except where its coleoptile length and standability are needed.

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 and in the Southern Regional Performance Nursery in 1997 and 1998, and in Nebraska cultivar performance trials in 1998 and 1999. In two years of testing in Nebraska cultivar performance trials, it has performed competitively in the southeast, southcentral, and southwestern Nebraska, areas where historically Thunderbird also performed well. In this region (17 environments), Cougar had a yield of 61.0 bu/a (4100 kg/ha) which was lower than Wesley (69.9 bu/a, 4700 kg/ha) and 2137 (68.9 bu/a, 4630 kg/ha) but superior to Pronghorn (56.8 bu/a, 3820 kg/ha), the only other modern, long coleoptile wheat in the trial. Cougar was ranked 38<sup>th</sup> of 45 lines tested in the Southern Regional Performance Nursery in 1997 (36 environments) and 42<sup>nd</sup> of 45 lines tested in 1998 (35 environments). The main advantage Cougar has when compared to most other available wheat cultivars, within its area of adaptation, is its long coleoptile, exceptional straw strength, good grain volume weight and kernel size, and competitive grain yields.

Other measurements of performance from comparison trials show that Cougar 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 (35.5 in, 90 cm) is one inch (3 cm) taller than Arapahoe, but 3 in (7 cm) shorter than Pronghorn. Cougar is very strong strawed, equal to or better than the strongest strawed cultivars currently grown in Nebraska. 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.*; contains *Sr31* and possibly *Sr24*), moderately susceptible to leaf rust (caused by *P. triticina* Erikss.; contains *Lr26* and possibly *LR24*), and susceptible to wheat soilborne mosaic virus, Hessian fly (*Mayetiola destructor* Say), barley yellow dwarf virus, and wheat streak mosaic virus. Cougar has excellent grain volume weight (60.5 lbs/bu, 77.9 kg/hl), higher than Alliance, Arapahoe, Niobrara, and Pronghorn. The milling and baking properties of Cougar (NE93496) were determined for five years 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 (13.3%) was high than Arapahoe (12.8%) and Scout 66 (12.5%). The average flour extraction on the Buhler Laboratory Mill for Cougar (71.8%) was similar to Arapahoe, but less than Scout 66. The flour ash content was slightly higher than the check varieties. The average flour protein content (12.1%) was higher than the check varieties. Dough mixing properties of Cougar were less than Arapahoe and stronger than Scout 66. Average baking absorption (60.8%) was less than the check varieties. The average loaf volume of Cougar was greater than the check cultivars. 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.

In positioning Cougar, based on performance data to date, it should be well adapted to most dryland wheat production systems where a dry seed bed requires planting to moisture and to conditions of high fertility or moisture 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's 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 1998. 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. Culver will be submitted for registration and plant variety protection under P. L. 10577 with the certification option.

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**Approval**

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Experiment Station

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