

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

**RELEASE OF NE97638 HARD RED WINTER WHEAT**

NE97638 is a hard red winter wheat (*Triticum aestivum* L.) cultivar developed by the Nebraska Agricultural Experiment Station and released for licensing 2002. NE97638 was recommended for licensing primarily for its superior adaptation to rainfed and irrigated wheat production systems in southern Nebraska.

NE97638 was selected from the cross NE90614/NE87612 which was made in 1991. The pedigree of NE90614 is Brule/4/Parker\*4/Agent//Beloterkovskaia 198/Lancer /3/Newton/Brule. The pedigree of NE87612 is Newton//Warrior\*5/Agent/3/Agate sib. The parentage of NE97638 is the same as Harry hard red winter wheat. The F<sub>1</sub> to F<sub>3</sub> generations were advanced using the bulk breeding method. NE97638 is an F<sub>3</sub>-derived line that was selected in the F<sub>4</sub> generation.

NE97638 was evaluated in Nebraska yield nurseries starting in 1998, in the Northern Regional Performance Nursery in 2000 and 2001, and in Nebraska cultivar performance trials in 2001 to 2002. In the Nebraska cultivar performance trials, it has performed well throughout most of Nebraska but is best adapted to western Nebraska. The average Nebraska rainfed yield of NE97638 of 3330 kg ha<sup>-1</sup> (28 environments from 2001 to 2002) was similar to Harry (3310 kg ha<sup>-1</sup>), greater than the yields of Wesley (3160 kg ha<sup>-1</sup>), and Culver (3230 kg ha<sup>-1</sup>), but was lower than Millennium (3440 kg ha<sup>-1</sup>), Wahoo (3430 kg ha<sup>-1</sup>), and Alliance (3380 kg ha<sup>-1</sup>). NE97638 was tested in the Northern Regional Performance Nursery in 2000 and 2001. It ranked second of 33 entries in 2000 (12 environments) and first of 30 entries in 2001 (12 environments). NE97638 has performed under irrigation.

Other measurements of performance from comparison trials show that NE97638 is late in maturity (146 d after Jan.1, data from observations in NE), about 1 d and 2 d later flowering than Arapahoe and 'Wesley', respectively. NE97638 is a semi-dwarf wheat cultivar and has a short coleoptile (39 mm) similar to Arapahoe (45 mm), Millennium (44 mm), and Wahoo (47 mm); but shorter than Cougar (67 mm), a semi-dwarf line with a different semi-dwarfing gene that does not affect coleoptile length, and Pronghorn (64 mm), a conventional height wheat cultivar. The mature plant height of NE97426 (90 cm) is 3 cm shorter than Arapahoe and 9 cm taller than Wesley. NE97638 has moderate straw strength (17% lodged), better than Harry and Arapahoe (25% lodged), but poorer than Wesley (2% lodged). The winter hardiness of NE97638 is good to very good, similar to Abilene and comparable to other winter wheat cultivars adapted and commonly grown in Nebraska.

NE97638 is moderately resistant to stem rust (caused by *Puccinia graminis Pers.: Pers. f. sp. tritici* Eriks & E. Henn; most likely containing *Sr6*, *Sr17*, and *Sr24*). It is also moderately resistant to leaf rust (caused by *P. triticina* Eriks.), and Hessian fly (*Mayetiola destructor* Say, similar to Arapahoe, and most likely contains the Marquillo-Kawvale genes for resistance). It is susceptible to wheat soilborne mosaic virus and wheat streak mosaic virus, but may contain a low level of tolerance to barley yellow dwarf virus (data obtained from the Uniform Winter Wheat Northern Regional Performance Nursery, 2000-2001 and field observations in NE).

NE97638 is a genetically lower in grain volume weight, lower than Arapahoe and Wesley, Culver, Millennium, and Alliance. The milling and baking properties of NE97638 were determined for six years by the Nebraska Wheat Quality Laboratory. In these tests, the overall end-use quality characteristics for NE97638 should be acceptable to the milling and baking industries.

In positioning NE97638, based on performance data to date, it should be well adapted to most rainfed wheat production systems in southern Nebraska and in adjacent states with similar growing seasons. Where it is adapted, NE97638 should be a good replacement for Arapahoe, Windstar, and 2137 as it has a higher yield potential and similar or superior disease and insect resistances. NE97638 has performed well under irrigation and would be a replacement for 2137 in irrigated production in southern Nebraska. NE97638 is genetically complementary to 2137, Alliance, Buckskin, Jagger, Pronghorn, Windstar. It is non-complementary to Arapahoe, Culver, Millennium, Niobrara, and Vista.

NE97638 has been uniform and stable since 2000. The Nebraska Foundation Seed Division, Department of Agronomy and Horticulture, University of Nebraska-Lincoln, Lincoln, NE 68583 had foundation seed available to qualified licensees in 2002. The seed classes will be Breeder, Foundation, Registered, and Certified. A research and development fee will be assessed on all certified seed sales. Small quantities of seed for research purposes may be obtained from the corresponding author and the Department of Agronomy and Horticulture, University of Nebraska-Lincoln for at least 5 yr from the date of this release. NE97638 was developed with partial financial support from the Nebraska Wheat Development, Utilization, and Marketing Board.

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### **Approval**

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