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Registration of 'NE422T' Winter Triticale

NE422T triticale ($\times$ *Triticosecale* Wittmack) (Reg. no CV-27, PI 629028) was developed cooperatively by the Nebraska Agricultural Experiment Station and the USDA-ARS. It was jointly released in 2001 by the developing institutions. NE422T was selected from the cross 'Trical'/'UB-UW26' where Trical is most likely 'Trical 100' (a forage triticale developed by Resource Seed Inc., a subsidiary of Goldsmith Seed Company, Gilroy, CA) and UB-UW26 is an unknown winter triticale germplasm line given to the breeding program in the 1980s. The cross was made in 1990. The F_1 generation was grown in the greenhouse in 1990-1991. The F_2 and F_3 generations were grown in bulk at the Agronomy Farm at Lincoln, NE, 1992 and 1993, respectively. Random heads were chosen from the F_3 bulk and planted as head rows, which were harvested in 1994. NE422T is an F_3 -derived line that was visually selected in the F_4 generation on the basis of its forage potential. The F_3 -derived F_5 family was harvested as a single observation plot in 1995. NE422T was identified as NE96T422 and was grown at three unreplicated locations in 1996 and in replicated trials thereafter. NE422T was released primarily for its superior forage production in rainfed winter cereal production systems in Nebraska and similar areas in adjacent states.

NE422T is an awned, white-glumed cultivar whose primary use will be as an annual forage crop. Its field appearance is most similar to Trical 100. Kernels are red colored, elliptical, large, and slightly wrinkled. After heading, the canopy is moderately closed and upright. The flag leaf is recurved and not twisted at the boot stage. The foliage is green with a waxy bloom at anthesis. The peduncle is glabrous. The spike is oblong in shape and middense. The glume is pubescent, tan, narrow, and midlong and the glume shoulder is wanting. The beak has an acuminate tip. The spike is usually nodding at maturity. Based on plump kernels, the kernel has no collar, a large brush of long length, rounded cheeks, large germ, and a narrow and deep crease.

NE422T was performance tested as NE96T422 in Nebraska

grain yield nurseries starting in 1997 and in forage yield trials in 1997 and 1998. In 2 yr of fall seeded forage testing in Nebraska cultivar performance trials, NE422T has performed extremely well throughout most of Nebraska in rainfed production systems. The average Nebraska rainfed forage yield cut at the R2 (fully headed but the peduncle not fully emerged) to R4 (anthesis, Nebraska scale; Moore et al., 1991) of NE422T (6 environments) was 9070 kg ha⁻¹ dry matter; with an average in vitro dry matter digestibility of 63.9% and an average protein content of 90 g kg⁻¹. These data compare favorably with Newcale (a grain triticale: 8730 kg ha⁻¹, 67.9%, and 85 g kg⁻¹) and Trical 100 (8530 kg ha⁻¹, 63.5%, and 90 g kg⁻¹). For further comparison, the forage yields of NE422T were higher than two commonly grown wheat (*Triticum aestivum* L.) cultivars Arapahoe (7200 kg ha⁻¹, 67.7%, 85 g kg⁻¹) and Pronghorn (7930 kg ha⁻¹, 67.0%, 86 g kg⁻¹). The wheat cultivars are earlier than NE422T and were cut at the R4 to S0 (caryopsis visible, Nebraska scale). NE422T grain yield over 10 environments were 2790 kg ha⁻¹. The grain yield was higher than Trical 100 (2040 kg ha⁻¹), but lower than grain triticale cultivars (Presto, 3620 kg ha⁻¹; Newcale, 3120 kg ha⁻¹). For comparison, the grain yield of Arapahoe was 3050 kg ha⁻¹, which is lower than the grain triticale yields and might be explained by triticale yield nurseries generally being planted near, but earlier than the wheat yield trials. The main advantages of NE422T when compared with most other forage triticale cultivars, within its area of adaptation, is its high forage yield coupled with a good grain yield and its broad adaptation in rainfed production systems.

Other measurements of performance from comparison trials show that NE422T is late in maturity: about 7 d later than Newcale, 6 d later than Presto, 5 d later than Arapahoe, and 1 d earlier than Trical 100. NE422T is a tall triticale (148 cm) that is 7.5 cm taller than Trical 100, 31 cm taller than Presto and Newcale, and 49 cm taller than Arapahoe. It has moderate straw strength for a tall, forage triticale. NE422T is slightly better lodging ratings than Trical 100, but worse than Presto, Newcale, and Arapahoe. The winter hardiness of NE422T is comparable to an average winter wheat cultivar and similar to Trical 100, which is one of the most winter hardy triticale cultivars currently available to growers.

On the basis of field observations, NE422T is moderately resistant to the currently prevalent races of stem rust (caused by *Puccinia graminis* Pers.: Pers. f. sp. *tritici* Eriks & E. Henn; most likely containing *Sr31*) and leaf rust (caused by *P. tritici* Eriks.). Like most rye (*Secale cereale* L.) and triticale cultivars, NE422T is moderately resistant to *Wheat streak mosaic virus* (WSMV). Ergot [caused by *Claviceps purpurea* (Fr:Fr) Tul.] has not been found in the cultivar when the disease was present in the other triticales under similar growing conditions. NE422T has an average grain volume weight for triticale.

NE422T should be well adapted to most rainfed winter annual forage production systems, with high forage yield potential in Nebraska. It should also perform well as a second crop in irrigated production systems, where NE422T is planted following a harvested summer annual crop and the forage is harvested the following year before planting another annual summer crop. In these cropping systems, water would not be limiting and three crops could be harvested in 2 yr.

NE422T has been uniform and stable since 1999. Less than 0.5% of the plants were rogued from the Breeder's seed increase in 1999. The rogued variant plants were taller in height (10–20 cm, 1:10,000 plants), or were shorter in height (25–30 cm) and later in maturity (3–4 d later, 1:8000 plants). Up to 1% (10:1000) variant plants may be encountered in subsequent generations.

The Nebraska Foundation Seed Division, Dep. of Agronomy and Horticulture, University of Nebraska-Lincoln, Lincoln, NE 68583 had NE422T Foundation seed available to qualified certified seed enterprises (members of NuPride Genetics Network, part of the Nebraska Crop Improvement Association) in 2000 for seed increase. The first commercial sale of NE422T was made in August, 2001. 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. NE422T will be submitted for registration and U.S. Plant Variety Protection under P.L. 10577 with the certification option. A research and development fee will be assessed on all certified seed sales. Seed of NE422T is available for research purposes and as a parent for breeding.

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