

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

and

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

RELEASE OF NT13443 Winter Triticale

NT13443 is a new forage triticale (*X Triticosecale* Wittm.) cultivar developed cooperatively by the Nebraska Agricultural Experiment Station and the USDA-ARS and released in 2021 by the developing institutions. NT13443 is a hexaploid triticale ($2n = 6x = 42$, AABBRR). It was released primarily for its superior forage production throughout rainfed production systems in Nebraska. What differentiates it from previous triticale forage cultivar releases from our program is that it has excellent grain yield for seed production. Previous forage or grain triticale cultivar releases had high forage or high grain yield, but not both.

NT13443 was selected from the cross '04TG 112'/'NE422T'=(TRICAL /UB-UW26)//NE03T407) which was made in 2007. The pedigree of N03T407 is Trical102/NT94T416. The pedigree of NT96T416 is 'LT602/81'/OAC-85-16// NT87T148. The F₁ generation was grown in the greenhouse in 2008 and the F₂ to F₃ generations were advanced using the bulk breeding method in the field at Lincoln, NE in 2009 to 2010. In 2011, single F₃-derived F₄ rows were planted for selection at Lincoln. There was no further selection thereafter. The F_{3.5} was evaluated as a single four row plot at Lincoln, NE in 2012. NT13443 was identified in 2013 as the experimental line, NT13443, and selected for further testing in multilocation trials (Lincoln, Mead, and Sidney, NE). Thereafter it was tested in multilocation replicated trials at the same three NE locations.

NT13443 was evaluated in Nebraska replicated yield nurseries starting in 2013 as part of our preliminary yield trial which is grown in an augmented incomplete block design in three locations in Nebraska (Lincoln, Mead [two replications], and Sidney). In 2014 to 2016 and 2018, it was grown in our triticale elite nursery which was grown at the same three locations in a three replicate alpha lattice design and in the triticale forage trial which used four replications and an alpha lattice design. In those trials (Table 1), four cultivars and one experimental line were used for comparison. NT06427 is a short awned triticale which is used for grain or forage production. Short awns or awnless cultivars are preferred for haying triticale lines. NT07403 and NT09423 were released primarily for their superior grain yield. NT14433 is an advanced experimental line that is targeted for forage production. NT441 is our most popular forage triticale cultivar. NT13443 was a medium maturity triticale cultivar (5 days earlier than the popular NT441, similar to NT09423, and 5 days later than NT07403). NT13443 is a tall cultivar similar to NT441 and the experimental line NT14433 and taller than the grain triticale cultivars (NT09423, NT07403, and NT06427). For grain yield, NT13443 was not significantly different from the cultivars specifically released for grain yield (NT09423 and NT07403, and NT06427) and the experimental forage line NT14433, but significantly higher yielding than NT441. For

grain volume weight, NT13443 was similar to most triticale lines and superior to NT06427. For forage yield harvested shortly after flowering, NT13443 was significantly higher yielding than most grain triticale lines, but not significantly different from NT07403 (due to a very high CV in that comparison) or the forage triticale cultivar and experimental lines. What is exceptional about NT13443 is that has a similar forage yield as the popular NT441, but has an almost 50% higher grain yield, hence for seed producers of forage triticale cultivars, this should greatly reduce the cost of seed production and increase their profitability.

NT13443, like most winter triticale cultivars in Nebraska, is moderately resistant to leaf (caused by *Puccinia triticina* Eriks), stem (caused by *P. graminis* Pers.: Pers. f. sp. *tritici* Eriks & E. Henn.), and stripe (caused by *P. striiformis* Westendorp f. sp. *tritici*) rust. The major disease on triticale is bacterial leaf streak (caused by *Xanthomonas campestris* pathovar (pv.) *undulosa*) and NT13443 is similar to the comparative cultivars (moderately susceptible). The other major disease is ergot (caused by *Claviceps purpurea* (Fr.) Tul.) and NT13443, as all Nebraska developed triticale cultivars was selected for low ergot infection rates, hence would be considered moderately resistant. NT13443 has a level of winter hardiness similar to the currently released winter triticale cultivars which is lower than winter hardy wheat and superior to winter hardy barley.

In positioning NT13443, based on performance data to date, it should be well adapted to rainfed forage and possibly grain triticale production systems where the straw is valued in Nebraska. We have no data on how NT13443 performs under irrigation. NT13433 is genetically complementary to virtually all triticale cultivars grown in Nebraska with the exception of NT441.

NT13443 is an awned, tan-glumed cultivar. After heading, the canopy is moderately closed and the lower leaves are erect. The flag leaf is erect and twisted at the boot stage. The foliage is green with a waxy bloom on the leaf sheath. The auricle is colorless. The peduncle is straight with moderate neck hairiness and no anthocyanin pigmentation. The spike is oblong and mid-dense. The glume is mid-long, mid-wide, and pubescent, and the glume shoulder is wanting with an acuminate beak. Kernels are amber colored, wrinkled, and mainly elliptical in shape. The brush is large and long.

NT13443 has been uniform and stable since 2016. Less than 2.0% of the plants were rogued from the Breeder's seed increase in 2017-20. The rogued variant plants were taller in height (5 - 15 cm). Up to 3% (30:1000) variant plants may be encountered in subsequent generations. The Nebraska Foundation Seed Division, Department of Agronomy and Horticulture, University of Nebraska-Lincoln, Lincoln, NE 68583 had foundation seed available to qualified certified seed enterprises in 2017 with the first sale of certified seed in 2018. The U.S. Department of Agriculture will not have commercial seed for distribution. The seed classes will be Breeder, Foundation, Registered, and Certified. NT13443 has been submitted for plant variety protection under P.L. 10577 with the certification option. Small quantities of seed for research purposes may be obtained from Dr. P. S. Baenziger and the Department of Agronomy and Horticulture, University of Nebraska-Lincoln for at least 5 years from the date of this release. In addition, a seed sample will be deposited in the USDA-ARS National Small Grains Collection, Aberdeen, ID, and this seed is freely available to interested researchers.

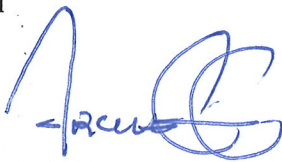
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Approval



Director, Nebraska Agricultural
Experiment Station

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date

For

Administrator, Agricultural Research Service
United States Department of Agriculture
Washington, D. C.

date

Table 1. Head-to-head comparisons of NT13443 to popularly grown or new cultivars from trials in Nebraska beginning in 2014 to 2016 and in 2018. The comparative cultivars NT06427, NT07403, and NT09423 are primarily grain triticale cultivars. NT441 is our most popular forage triticale cultivar. NT14433 is an advanced experimental line targeted for forage production. Data on grain yield, grain volume weight, plant height, and anthesis date were from trials at up to three locations (Mead, Lincoln, and Sidney) in Nebraska in each year (total environments in the comparison is N) and not every cultivar was grown in the same trial across the state. Forage yield trials were at Mead, Nebraska only.

	Anthesis Date		Height		Grain Yield		Grain Volume Weight		Forage Yield											
	D after Jan. 1	NT13443	in	NT13443	lbs/a	NT13443	lbs/bu	NT13443	lbs/a	NT13443										
NT06427	7	144.2	145.5	**	10	46.4	57.1	**	10	2844.6	2938.2	n.s.	4	45.6	49.9	**	4	4990	5880	*
NT07403	7	140.7	145.5	**	10	45.6	57.1	**	10	3030.8	2938.2	n.s.	4	49.2	49.9	n.s.	4	4502	5880	n.s.
NT09423	7	145.4	145.5	n.s.	10	47.7	57.1	**	10	2938.6	2938.2	n.s.	4	48.5	49.9	n.s.	4	5230	5880	*
NT14433	5	143.3	144.0	n.s.	7	57.6	57.5	n.s.	7	2336.0	2727.7	n.s.	4	50.5	49.9	n.s.	3	5377	5483	n.s.
NT441	5	149.2	144.0	**	7	56.8	57.5	n.s.	7	1829.7	2727.7	*	4	47.2	49.9	n.s.	3	5110	5483	n.s.

***, n.s. Significantly different at the P=0.05, P=0.01 probability level or not significantly different, respectively.

