

2022 Triticale Variety Trial

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NT13416
Short Beard Thunder
Tulus
UCT3131

USDA-University of Nebraska
USDA-University of Nebraska
Albert Lea Seed

All varieties grew to statistically similar heights at the time of harvest, with the mean height being approximately 115 cm (Table 4). There was very little lodging across all triticale varieties tested. Two days before harvest there was on average only 2.1% lodging, and a third of the varieties showed no lodging at all (Fredro, Short Beard Thunder, and Tulus).

This was the first year of winter triticale variety evaluation. Therefore, we cannot draw conclusions about relative success. However, on average, 2022 winter triticale resulted in higher yields than the 2022 winter wheat variety trial, but less than the 2022 winter rye variety trial adjusted at 13.5% moisture (triticale average yield 5713 lbs ac⁻¹, wheat 4599 lbs ac⁻¹, rye 6749 lbs ac⁻¹). NT12404-1 was the variety with the highest yield (6506 lbs ac⁻¹) and was statistically similar to varieties Fredro (5899 lbs ac⁻¹), NT09423 (6027 lbs ac⁻¹), Tulus (6500 lbs ac⁻¹), and UCT3131 (5800 lbs ac⁻¹); NT13416 resulted in the lowest yields (4234 lbs ac⁻¹) (Table 4).

Harvest moisture below 14% is necessary for grain storage. Grain above this moisture content has to be dried down after harvest, adding time and cost to farmers. All triticale varieties had moistures exceeding 14%, on average 16% moisture at harvest, and required drying before storage (Table 4).

Test weight is the measure of grain density, which is determined by weighing a known volume of grain. The trial average test weight this year was 48.3 lbs bu⁻¹ (Table 4). NT09423 had the highest test weight (50.9 lbs bu⁻¹) and was statistically similar to Fredro, NE426GT, NT12404-1, and Tulus; Short Beard Thunder had the lowest test weight at 44.4 lbs bu⁻¹ (Table 4).

The average triticale crude protein in this trial was 12.5% (Table 4), which exceeded the trial average of percent crude protein in the 2022 winter wheat and rye variety trials (10% and 7.8%, respectively). This result was expected, as triticale is understood to have higher protein contents than other grain types. Wheat with 12-15% crude protein is generally considered ideal for baking bread. However, even though triticale typically meets or exceeds these preferred protein levels, compared to wheat flour, triticale has significantly less gluten, which yields very dense and undesirable bread made from 100% triticale flour. It therefore is often mixed with other flour types for baking. The majority of triticale produced is used in animal feed, as its relatively high protein content, nutrient composition, and digestibility are advantageous in swine, poultry, and forage feed.

Falling number is a laboratory test that measures the viscosity of flour. There are well established ranges for falling number as an indicator of baking and malting quality in wheat and barley, but the ideal range for triticale is not yet clearly documented. The ideal falling number range for wheat and barley is 250-350 seconds, however lower falling numbers around 150 seconds are acceptable and may be preferable to bakers using rye flours. The average triticale falling number in this study was 97 seconds, with the highest falling number at 156 seconds (NT09423) and the lowest at 64 seconds (UCT3131) (Table 4). Although there is little data available about ideal falling numbers for triticale, this trial provides preliminary data in the efforts to establish these standard quality parameters for triticale flour.

Each of the nine triticale varieties were tested for deoxynivalenol (DON) vomitoxin, four of which exceeded the FDA threshold for DON levels considered safe for human consumption (1 ppm) (Table 4). NT13416 had the highest DON levels at 3.8 ppm, followed by Short Beard Thunder at 1.9 ppm, Tulus at

1.3 ppm, and Fredro at 1.2 ppm. Out of all of the winter grain variety trials conducted in 2022 by the University of Vermont Extension Northwest Crops and Soils (NWCS) Program at Borderview Farm (triticale, rye, wheat, spelt, and barley), triticale was the only grain that resulted in DON levels greater than 1 ppm. Contamination of wheat with DON is directly related to the incidence of Fusarium head blight and strongly associated with relative moisture and timing of rainfall at flowering. More data is necessary before drawing conclusions about the susceptibility of triticale to Fusarium and DON contamination.

DISCUSSION

Interestingly, despite the majority of Vermont experiencing drought conditions, the 2022 growing season at Borderview farm (Alburgh, VT) had over twice the precipitation than the growing season in 2021. This may in part explain the elevated DON levels observed. This study provides foundational data examining the relative successes, agronomic, yield, and quality characteristics