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2018 SPELT VARIETY TRIAL

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Spelt (*triticum spelta*) is an ancient grain that is closely related to and possibly an ancestor of modern wheat (*triticum aestivum*). It was one of the earliest domesticated grains. It has become popular as a health food in Europe, where it is also known as dinkel. It is used as a whole grain in many cooked dishes and spelt flour can be substituted for wheat flour in baking. Spelt has a distinctive nutty flavor and is higher in fiber than wheat. Spelt also has a more digestible form of gluten than wheat giving it potential as a flour for gluten-sensitive individuals. Its popularity in Europe and potential dietary benefits are leading to increased interest in using and producing spelt in the US. In 2018, the University of Vermont Extension Northwest Crops and Soils Program evaluated six varieties of spelt in hopes to find a variety well suited for the Northeast climate. The trial was established at the Borderview Research Farm in Alburgh, Vermont.

MATERIALS AND METHODS

The experimental plot design was randomized complete block with four replications (Table 2). Treatments were six spelt varieties, which are listed in Table 1 with seed sources.

Table 1. Six spelt varieties trialed in Alburgh, VT, 2018.

Spring wheat varieties	Seed source
Altgold	USDA Small Grains Collection
Guggisburg	USDA Small Grains Collection
Muri Rutkorn	USDA Small Grains Collection
Pfalzer Dinkle	Gutenberg University in Mainz, Germany
Rothenburger	USDA Small Grains Collection
Rothenburger Rutkorn	USDA Small Grains Collection

The seedbed in Alburgh was prepared by conventional tillage methods. All plots were managed with practices similar to those used by producers in the surrounding areas (Table 2). The previous crop planted at the site was winter barley. The area was disked and spike toothed harrowed to prepare for planting. The plots were seeded with a Great Plains NT60 Cone seeder in the fall of 2017 on 15-Sep at a seeding rate of 100 lbs ac⁻¹ in a plot size of 5' x 20'.

Table 2. General plot management of the spring wheat trial, 2017.

Location:	Borderview Research Farm Alburgh VT
Soil type	Bendon rocky silt loam
Previous crop	Winter Barley
Row spacing (in)	6
Seeding rate (lbs ac⁻¹)	100 lbs ac ⁻¹
Replicates	4
Planting date	15-Sep 2017
Harvest date	30-Jul 2018
Harvest area (ft)	5 x 20
Tillage operations	Fall plow, spring disk & spike tooth harrow

Grain plots were harvested with an Almaco SPC50 plot combine in 2018 on 30-Jul. The harvest area was 5' x 20'. Prior to harvest, plant heights and lodging were measured excluding the awns. The height of three plants were measured in cm per plot. Lodging was measured visually on a scale of 0-9, 0 indicating no lodging, 1 indicating minimal lodging and 9 indicating completely lodged and cannot be harvested. In addition, test weight, and yield were calculated.

Variations in yield and quality can occur because of variations in genetics, soil, weather, and other growing conditions. Statistical analysis makes it possible to determine whether a difference among varieties is real or whether it might have occurred due to other variations in the field. At the bottom of each table a LSD value is presented for each variable (e.g. yield). LSD at the 10% level of probability are shown. Where the difference between two varieties within a column is equal to or greater than the LSD value at the bottom of the column, you can be sure in 9 out of 10 chances that there is a real difference between the two varieties. In the example, variety A is significantly different from variety C, but not from variety B. The difference between A and B is equal to 725, which is less than the LSD value of 889. This means that these varieties did not differ in yield. The difference between A and C is equal to 1454, which is greater than the LSD value of 889. This means that the yields of these varieties were significantly different from one another. The asterisk indicates that variety B was not significantly lower than the top yielding variety shown in bold.

Variety	Yield
A	3161
B	3886*
C	4615*
LSD	889

RESULTS

Seasonal precipitation and temperature recorded at Borderview Research Farm in Alburgh, VT are displayed in Table 3. The growing season this year was marked by higher than average temperatures in

May, July, August, and September and lower than average temperatures in June. Throughout the growing season, there was lower than average rainfall, totaling 5 inches less than normal. There were 4395 growing degree days (GDDs) from May-August in 2018, which is 287 more than the average year.

Table 3. Temperature and precipitation summary for Alburgh, VT, 2018.

Alburgh, VT	May	June	July	August
Average temperature (°F)	59.5	64.4	74.1	72.8
Departure from normal	3.10	-1.38	3.51	3.96
Precipitation (inches)	1.9	3.7	2.4	3.0
Departure from normal	-1.51	0.05	-1.72	-0.95
Growing Degree Days (base 32°F)	853	973	1305	1264
Departure from normal	97	-42	107	125

Weather data was collected from Wunderground.com via the Alburgh weather station.

When daily weather data was unavailable from this weather station, the station at Highgate Center Dam was used. Historical averages are for 30 years of NOAA data (1981-2010) for Enosburg Falls, VT.

During the 2018 growing season, several observation and the measurements were recorded during harvest of the six spelt varieties. There were significant differences in plant height and yield of spelt varieties (Table 4). The tallest variety was Rothenburger at 129 cm and no other variety was similar. The variety that yielded the best was Altgold producing 3026 lbs ac⁻¹, there was no variety statistically similar. All varieties are statistically similar in the parameters lodging and test weight. Very little lodging was observed.

Table 4: Results of the six spelt varieties, Alburgh, VT, 2018.

Variety	Yield @ Harvest moisture	Heights	Test weight	Lodging
	lbs ac ⁻¹	cm	lbs bu ⁻¹	0-9
Altgold	3026	118	30.1	0.00
Guggisburg	1927	116	29.0	0.25
Muri Rutkorn	2277	119	29.1	1.00
Pfalzer Dinkle	2597	114	29.5	0.00
Rothenburger	2383	129	28.3	1.00
Rothenburger Rutkorn	2417	119	28.9	0.25
LSD (0.10)	340	6.93	NS	NS
Trial Mean	2438	119	29.1	0.42

Top performer treatment is shown in **bold**.

NS, No significant difference.

DISCUSSION

It is important to remember that the results only represent one year of data and more research is needed to know which varieties will thrive in the Northeastern climate and fluctuating weather. We did not perform any quality testing on these varieties, which could be important to baking quality and DON levels.

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