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). Least Significant Differences 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.

RESULTS

Seasonal precipitation and temperatures were recorded with a Davis Instruments Vantage Pro2 with Weatherlink data logger on site in Alburgh, VT (Table 3). April weather in Alburgh was warm and wet, promoting good germination and establishment of the trial. The rest of the growing season was colder and wetter than normal. From April to August there was an accumulation of 4440 Growing Degree Days (GDDs) in Alburgh, VT, 51 GDDs lower than the 30 year average.

Table 3. Temperature and precipitation summary for Alburgh, VT, 2017.

Alburgh, VT	Apr	May	Jun	Jul	Aug
Average Temperature (F)					

Wheat Yield and Quality

Plant heights were measured on 3-Aug. Three plants in each plot were measured. The average height was 49.4 inches (Table 4). Taller plants are generally desired for their ability to shade out competing weeds. However, tall wheat may be more prone to lodging depending on many factors such as stalk strength and over-fertilization. A visual estimation of lodging (%) was performed on 3-Aug. Lodging is defined as the collapse of top heavy plants, particularly grain crops because of excess growth or beating by rain. If lodging was present, its severity was recorded based on a 0 to 5 scale with 0 indicating the entire plot could be harvested with the plot combine and 5 signifying that none of the plot could be harvested. Some lodging was observed in almost all plots in the 2017 trial.

Table 4. Growth and harvest characteristics of heirloom spring wheat for Alburgh, VT , 2016.

Variety	Height	Lodging	Yield at 13.5% moisture	Moisture @ harvest	Test weight	Crude protein @ 12% moisture content	DON	Falling number
	in	%	lbs ac^{1}	%	lbs bu^{-1}	%	ppm	seconds
AC Barrie	53.4*	2.67	1108*	14.7*	53.6*	16.1*	5.43	331*
Ceres 05	47.8	2.00*	899	14.5*	52.7	15.9*	5.53	349*
Champlain	49.1	3.33	833	14.2*	52.5	15.3*	4.33*	322
Defiance	52.1*	3.00	1089*	14.5*	52.5	15.6*	5.63	326*
Hope	48.5	nBT/F3						

degree of lodging. Despite being one of the tallest varieties, Reliance had the lowest degree of lodging, with an average score of 1 (less than 20% of the plot was lodged). This was statistically similar to Ceres 05, Komar, Mida 05, and Red Bobs, which all had an average score of 2 or less (less than 40% of each plot was lodged on average).

The average yield at 13.5% moisture for the trial was 1061 lbs per acre. The highest yielding variety was Red Bobs, with a yield of 1331 lbs per acre. Ten other varieties (AC Barrie, Defiance, Hope, Komar, Ladoga, Marquis, Reliance, Scarlett, Supreme and Surprise) were statistically similar with yields over 1000 lbs per acre.

All varieties were above 14% harvest moisture and required drying down for storage. The average harvest moisture was 14.6%. The lowest harvest moisture was Scarlett at 14.1%. This was statistically similar to 15 other varieties with harvest moisture under 14.9%. Test weight is the measure of grain density. It is determined by weighing a known volume of grain. Generally the heavie

Figure 1.

ACKNOWLEDGEMENTS

The UVM Extension Northwest Crops and Soils Program would like to thank Roger Rainville and the staff at Borderview Research Farm for their generous help with this research. This project was funded or partially funded through a USDA OREI grant, award number 2015-5130024153. We would also like to acknowledge Julija Cubins, Kelly Drollette, Freddy Morin, Matt Sanders, and Stuart Wolff-Goodrich for their assistance with data collection and entry. This information is presented with the understanding that no product discrimination is intended and neither endorsement of any product mentioned, nor criticism of unnamed products, is implied.

UVM Extension helps individuals and communities put research-based knowledge to work.