

# 2016 Organic Heirloom Spring Wheat Variety Trial

Dr. Heather Darby, UVM Extension Agronomist  
Nate Brigham, Erica Cummings, Hillary Emick, Abha Gupta, Julian Post, and Sara Ziegler  
UVM Extension Crops and Soils Technicians  
(802) 524-6501

Visit us on the web: <http://www.uvm.edu/extension/cropsoil>

**2016 ORGANIC HEIRLOOM SPRING WHEAT VARIETY TRIAL**





## Wheat Yield and Quality

During the 2016 growing season, many observations and measurements were recorded on heirloom spring wheat development. The flowering date was recorded when at least 50% of the plot was in bloom for each of the varieties (Table 4). Six of the eighteen heirloom spring wheat varieties were flowering by 23-Jun and all varieties were flowering by 28-Jun.

Plant heights were measured on 3-Aug just prior to harvest. The average height was 36.2 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 1 to 5 scale with 1 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 the 2016 trial. Eight varieties (Champlain, Hope, Komar, Ladoga, Red Bobs, Reliance, Spinkcota, and

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

Variety	Flowering date	Height	Lodging	Yield at 13.5% moisture
---------	----------------	--------	---------	-------------------------

Thatcher) exhibited a minimal degree of lodging. Of those, Ladoga exhibited the most severe lodging, 1.33 on a scale to 5. Overall, the severity of lodging was considered low.

There was no significant difference in yield among heirloom varieties (Figure 1). The average yield at 13.5% moisture for the trial was 1596 lbs per acre. The average harvest moisture was 11.3%. The highest test weights were in the varieties Hope and Komar (58.0 lbs per bushel). Test weight is the measure of grain density. It is determined by weighing a known volume of grain. Generally the heavier the wheat is per bushel, the higher baking quality. The acceptable test weight for bread wheat is 56-60 lbs per bushel. Red Fife and Mida 06 were the only varieties below the ideal test weight of 56-60 lbs per bushel.

Insect and disease scouting was conducted on 7-Jul. Research technicians looked for the presence of a variety of foliar diseases, including loose smut, powdery mildew, and *Fusarium* head blight (FHB), as well as the presence of mites or thrips and evidence of insect damage. Five plants in each plot were examined for disease and insect damage, shown as the average percent of each leaf that was affected by either insect damage or foliar disease (Table 4).

Overall insect and disease damage was low. The variety Scarlett had the least foliar disease and Surprise had the least insect damage, however, the difference was not significant between varieties (Table 4).

**Table 5:**

Thrips are small insects with fringed wings that feed on a variety of plants by puncturing the cells and sucking up the contents. Damage caused by thrips includes discoloration and leaf scarring, reduced growth of the plant, and they can also act as a disease vector. Thrips were prevalent and observed on all varieties (Table 5).

Mites were also prevalent and observed on all varieties (Table 5). Mites are very small arthropods that

**Table 6: Quality of heirloom spring wheat for Alburgh, VT, 2016.**

<b>Variety</b>	<b>Crude protein at</b>	<b>Crude protein</b>	<b>Falling</b>	<b>DON</b>
	<b>12% moisture</b>	<b>at 14%</b>		
	<b>%</b>	<b>%</b>	<b>sec</b>	<b>ppm</b>
AC Barrie	15.9*	15.6*	284*	0.17
Ceres 05	16.4*			



**Figure 1. Yield and protein of heirloom spring wheat varieties grown in Alburgh, VT, 2016. Treatments that share a letter did not differ significantly by variety (p=0.10.)**

## **DISCUSSION**

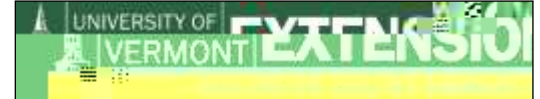
Warmer temperatures and low precipitation encountered during 2016 contributed to higher yield and quality than in many previous years of heirloom spring wheat trials.

There is generally an inverse relationship between yield and protein. As yield increases, protein levels generally decrease, and when yields are low, protein levels are generally high. However, this was not always the case with the heirloom wheat. Champlain, Marquis, and Ladoga were high yielding heirlooms, with crude protein content statistically similar to the top performer. This may be evidence that some heirloom varieties are able to outpe

## ACKNOWLEDGEMENTS

The UVM Extension Northwest Crops and Soils Program would like to thank the USDA OREI grant program for funding this research. Special thanks to Roger Rainville and the staff at Borderview Research Farm for their help with these trials. We would also like to acknowledge Julija Cubins, Kelly Drollette, Lindsey Ruhl 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.*



Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. University of Vermont Extension, Burlington, Vermont, University of Vermont Extension, and U.S. Department of Agriculture, cooperating, offer education and employment to everyone without regard to race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or familial status.