



## **2016 ORGANIC WINTER WHEAT VARIETY TRIAL**

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In 2016, the University of Vermont Extension Northwest Crops and Soils Program evaluated 14 modern hard red winter wheat varieties to determine which varieties thrive in organic production systems. The trial was established at the Borderview Research Farm in Alburgh, Vermont. Several varieties that did not perform well in previous trial years were eliminated from the 2016 variety trial. Newly released varieties were also sought for evaluation.

### **MATERIALS AND METHODS**

In the fall of 2016, a winter wheat variety trial was initiated at Borderview Research Farm in Alburgh. General plot management is listed in Table 1. The experimental design was a randomized complete block with three replicates. Treatments were 14 winter wheat varieties (Table 2). Plots were managed with practices similar to those used by producers in the surrounding area. The previous crop was corn. The field was disked and spike tooth harrowed prior to planting. Plots were seeded with a Great Plains Cone Seeder on 25-Sep 2015 at a seeding rate of 125 lbs ac<sup>-1</sup>.

During the 2016 growing season, many observations and measurements were recorded on winter wheat development, including winter survival, flowering date, height, lodging and pest and disease prevalence. The flowering date was recorded when at least 50% of the plot was in bloom. Heights and lodging were measured on 19-Jul 2016 before the wheat was harvested. Heights were determined by taking three measurements per plot with a meter stick. Lodging was measured just prior to harvest and was recorded as a percent of plot lodged.



**Table 3. Seasonal weather data collected in Alburgh, VT, 2015 and 2016.**



**Table 5. Disease and pest damage in winter wheat varieties, 2016**



The spores are usually transported by air currents and can infect plants at flowering through grain fill. Eating contaminated grain greater than 1ppm poses a health risk to both humans and livestock. In the 2016 trial, seven of the 14 varieties (Brome, Byrd, Expedition, Fredrick, Overland, Redfield, and Wolf) displayed bleached grain heads which are associated with the presence of *Fusarium* head blight. Byrd, Expedition, and Wolf displayed bleached heads in two out of three replicates (bleaching was only observed in one plot out of the three replicates in the other four varieties.) However, DON levels (Table 6) for all wheat plots were far below the 1 ppm threshold for human consumption.

Loose smut was observed in all plots of Fredrick wheat but in no other winter wheat varieties. Loose smut in wheat is caused by *Ustilago tritici* and can destroy large portions of grain crops. Loose smut replaces grain heads with masses of spores (smut) which infect the open flowers of healthy plants and grow into the seed. Seeds appear healthy and only when they reach maturity the following season is it clear that they were infected.

**Table 6. Yield and quality of winter wh**



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