2011VERMONT HEIRLOOM SPRING WHEAT VARIETY TRIAL

INTRODUCTION

UVM Extension began evaluating heirloom spring wheat varieties in 2007 in order to determine whether heirloom varieties developed before 1950 (World War II) might be ultimately more productive than modern varieties. Currently many consumers are interested in heirloom wheat based on the perception that it has better flavor, while many farmers are also interested in heirloom wheat based on the perception that they may have superior

This trial evaluated spring wheat based on standard testing parameters used by commercial mills. Yield, moisture, and test weight (a measure of grain density) were recorded at the time of harvest. Following harvest, samples were cleaned with a Clipper M2B seed cleaner. A one-pound subsample was dried at 40° C and ground with a Perten LM3100 Laboratory Mill. Protein content was determined using a Perten Inframatic 8600 Flour Analyzer. Protein content is an indicator of gluten strength and bread quality. Commercial mills aim to purchase hard wheat with 13.5% protein. Falling Number was determined with a Perten NF 1500 Falling Number Machine. Falling number indicates the level of sprout damage in the grain. It measures the time it takes, in seconds, for a stirrer to fall through a slurry of flour and water to the bottom of the tube. Falling numbers greater than 350 indicate low enzymatic activity and sound quality wheat. A falling number below 200 seconds indicates high enzymatic activity and poor quality wheat. Deoxynivalenol (DON) analysis was done using Veratox DON 5/5 Quantitaive test from the NEOGEN Corp. (Lansing, MI). This test has a detection range of 0.5 to 5 ppm. DON values greater than 1 ppm are considered unsuitable for human consumption (FDA, 1993). Grain with DON levels greater than 1 ppm is not suitable for human consumption. Data from the Westfield site was statistically analyzed with PROC MIXED procedure in SAS using a Tukey-Kramer pairwise comparison. Statistical analysis could not be conducted on vigor, test weight, or harvest moisture due to high levels of missing data. Some plots yielded so low there wasn't enough seed to collect these measurements. Levels of significance are reported when the p-value is less than 0.10.

Table 2: General plot management for trials.

	Borderview Farm Alburgh, VT	Butterworks Farm Westfield, VT
Soil type	Benson rocky silt loam	Dixfield sandy loam
Previous crop	organic corn	grass sod
Row spacing (in.)	6	6
Seeding rate		

RESULTS AND DISCUSSION

Seasonal precipitation and temperatures recorded at weather stations in close proximity to Alburgh and Westfield are shown in Table 3. Excessive spring rains prohibited a timely planting at both locations, but planting was extremely delayed until June 3rd in Westfield. Severe weather conditions continued throughout the season impacted yield and quality of the wheat crop. We intended to plant the spring wheat mid-April. From planting to harvest, there was an accumulation of approximately 4,349 Growing Degree Days (GDD) in Alburgh. This was 335 GDDs more than the 30-year average. In Westfield, there were approximately 4,004 GDD from planting to harvest, 152 GDD less than the 30-year average.

Table 3: Temperature and precipitation summary for Alburgh and Westfield, VT, 2011.

South Hero (Alburgh)	April	May	June	July	August
Average Temperature (F)	46.6	58.7	67.1	74.4	70.4
Departure from Normal	3.1	2.1	1.3	3.3	1.6

Table 4: Spring wheat populations, early season plant vigor, yield at 12% moisture, harvest moisture, test weight, crude protein

Table 5: Spring wheat populations, early season plant vigor, crude protein at 12% moisture, falling number and deoxynivalenol (DON) concentrations of heirloom spring wheat varieties grown in Alburgh, VT, 2011.

Wheat Variety	Population plants ft^{-2}	Vigor (1-5)	Protein %	Falling number seconds	DON ppm
AC Barrie	21	5	14.7	384	0.0
Ceres 05	23	3	14.3	347	0.2
Champlain	15	4	14.7	242	0.3
Defiance	17	4	13.4	268	0.2
Hope	21	4	13.5	335	0.3
Komar	14	5	14.2	300	0.2
Ladoga	21	4	12.0	347	0.3
Marquis	8	2	13.8	327	0.2
Mida 05	26	4	14.9	259	0.1
Mida 06	13	4	14.9	254	0.1
Red Bobs	20	4	14.7	345	0.3
Reliance	13	4	13.9	273	0.3
Scarlet	18	2	12.6	294	0.2
Spinkcota	11	3	15.2	266	0.3
Supreme	30	3	13.1	345	0.0
Surprise	21	3	12.6	331	0.3
Thatcher	15				