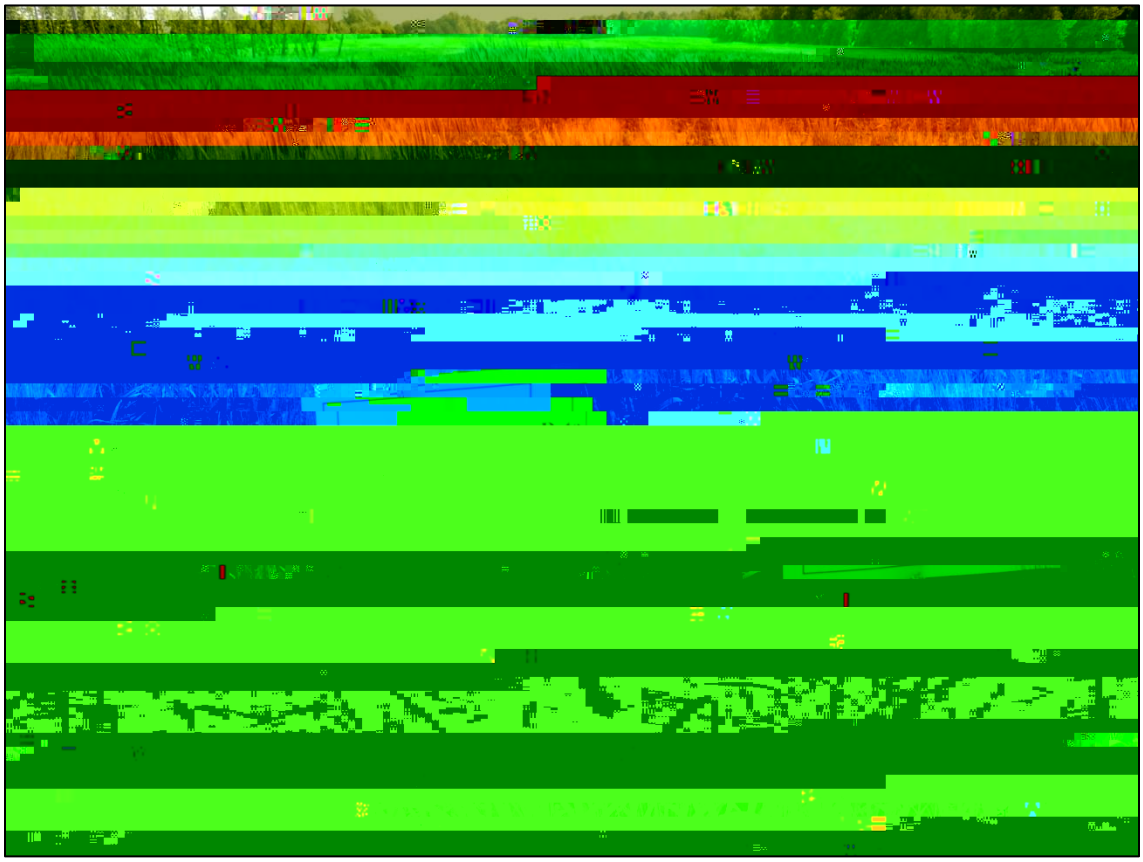
2013 Organic Spring Wheat Planting Date Trial



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Treatments in the main plots were planting date and subplots consisted of varieties. Planting dates started on 23-Apr and continued approximately every week for 5 weeks (Table 3). Planting date, plant emergence, and harvest dates are listed in Table 3.

Table 3. Spring wheat planting, plant emergence, and harvest dates at Borderview Farm in Alburgh, VT.

Planting date	Plant emergence	Harvest date
23-Apr	3-May	6-Aug

RESULTS

Seasonal precipitation and temperatures were recorded using a Davis Instruments Vantage Pro2 weather station at Borderview Research Farm in Alburgh, VT (Table 4). Although April, June and August were slightly cooler than normal (based on 1981-2010 data), May and July were slightly warmer than the historical average. May and June had more precipitation than expected, followed by a drier than average July and August. Overall, there were an accumulated 4510 Growing Degree Days (GDDs) at a base temperature of 32

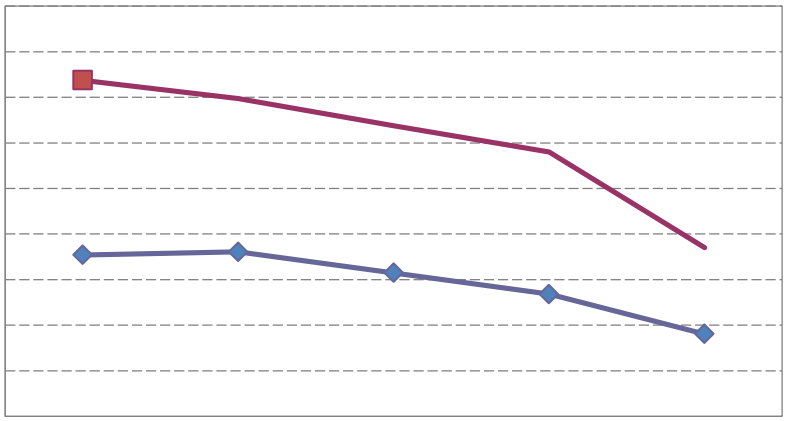

Figure 1. Effect of spring wheat planting date and variety on heights, Alburgh, VT.

The interaction between planting date and variety in regards to falling number was also significant (Figure 2). The falling number for both Ladoga and RB07 increased relatively steadily with later planting dates, with the exception of a drop in falling number for Ladoga on the third planting date (6-May). This irregular decrease in falling number can also be seen on the same planting date for the variety AC Superb . Other than this decrease is relatively stable across planting dates, ranging between 398 and 405 seconds. The observed falling number in the variety McKenzie was also relatively stable across planting dates, ranging between 387 and 410 seconds. Thus, while the falling numbers for RB07 and Ladoga increased with later planting dates, the falling numbers for McKenzie and AC Superb were relatively constant.

Figure 2. Effect of spring wheat planting date and variety on falling number, Alburgh, VT.

Impact of Planting Date

The two earliest planting dates, 23-Apr and 29-Apr, resulted in significantly taller crops across all varieties (Table 5). Later planting dates led to decreased plant height. The latest planting date (28-May) resulted in the least amount of lodging (3.1%). This was statistically similar to the planting date 6-May, but statistically different from the other three planting dates. The planting date that resulted in the greatest yield was the earliest planting date, 23-Apr (1761 lbs per acre) (Figure 3). This was significantly greater than all other planting dates and 715 lbs per acre greater than the trial mean.

Due to the low yields from 28-May planting date, grain moisture and test weight were not recorded for this treatment. Therefore, excluding the last planting date, 6-May had the highest moisture (18.0%). This was a significantly higher moisture level than the three other recorded planting dates. Excluding the last planting date, the two planting date treatments with the greatest test weights were 23-Apr and 13-May (53.9 and 52.8

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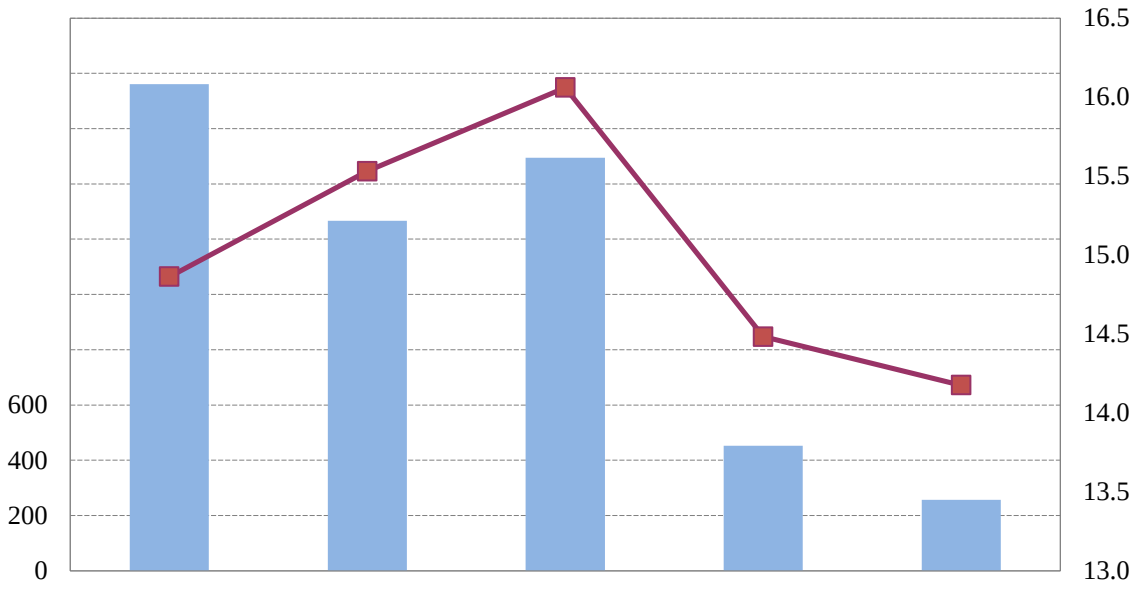

Figure 3. Effect of planting date across all spring wheat varieties on yield and crude protein, Alburgh, VT. Treatments with the same letter did not differ significantly from one another (p=0.10). Compare capital letters for yield and lower-case letters for crude protein.

Impact of Variety

The variety Ladoga was the tallest at the time of harvest (120.5 cm), and was significantly taller than all other varieties (Table 6). The variety with the least lodging was AC Superb (2.0%). This was statistically similar to the variety RB07, and significantly lower than varieties Ladoga and McKenzie. The trial mean for yield at 13.5% moisture was 1046 lbs per acre. Although none of the varieties varied significantly from one another, the highest yield was 1145 lbs per acre (RB07) (Figure 4). Excluding RB07 (missing data), the greatest moisture level was observed in AC Superb (15.3%). However, this was not significantly different from the other varieties. The variety with the greatest test weight was RB07 (53.5 pounds per bushel). This was statistically similar to varieties Ladoga and AC Superb (53.2 and 51.9 bushels per acre respectively), and statistically different from the variety McKenzie.

AC Superb had significantly greater crude protein (15.6%) than any of the other varieties (Figure 4). AC Superb also had the greatest observed falling number (401 seconds), which was statistically similar to the falling number of McKenzie (399 seconds) and significantly greater than the other two varieties. Ladoga and RB07 had the lowest levels of DON (4.2 and 4.6 ppm respectively). These levels were significantly lower than the varieties AC Superb and McKenzie.

Table 6. Yield and quality characteristics by spring wheat variety across all planting dates, Alburgh, VT.

Variety	Height	Lodging	Moisture	Yield at 13.5% moisture	Test weight	Crude protein at 12% moisture	Falling number	DON
	cm	%	%	lbs ac^{-1}	lbs/bu	%	seconds	ppm
AC Superb	89.6	**2.0***	**15.3**	1023	51.9*	**15.6***	**401***	6.13
Ladoga	**120.5***	28.8	14.9	1130	53.2*	14.7	372	**4.22***
McKenzie	102.8	31.0	14.3	886	51.0	14.9	399*	4.91
RB07	82.1	5.5*	-	**1145**	**53.5***	14.9	366	4.63*
LSD (0.10)	2.5	9.6	-	NS	-	0.5	14	0.66
p-value (<0.10)	<0.0001	<0.0001	0.2050	0.1421	0.0121	0.0124	<0.0001	<0.0001
Trial mean	98.7	16.8	14.9	1046	52.4	15.0	384	4.97

Treatments indicated in **bold** had the top observed performance.

* Treatments indicated with an asterisk did not perform significantly worse than the top-performing treatment in a particular column.

NS No significant difference.

Figure 4. Effect of spring wheat variety across all planting dates on yield and crude protein, Alburgh, VT. Treatments with the same letter did not differ significantly (p=0.10).

DISCUSSION

Overall, 2013 spring wheat yields and quality were not extraordinary. Heavy rainfall likely caused lodging, which was detrimental to the yields of this trial. The mean yield was 1046 lbs per acre, which is lower than average. Heavy precipitation also led to a high moisture level at harvest. The average test weight for this trial was 52.4 pounds per bushel. This is lower than the acceptable test weight for bread wheat (56-

greater than other varieties. AC Superb and McKenzie had statistically significant greater falling numbers than the other two varieties. DON was found to be significantly lower in the varieties Ladoga and RB07, but all varieties showed DONs of higher than 1ppm and therefore were not fit for human consumption.

Based on these results it is critical to plant spring wheat as early as possible in the spring. Quicker canopy closure, taller plants and subsequent reduced weed pressure resulting from earlier planting dates will lead to higher yields. Although it appears that quality levels can be maintained in later planting dates, the increased weed pressure could likely cause staining and off-flavors of the grain. Lastly, severe yield depression would likely not produce an economically viable crop.

It is important to note that these results represent only one year of data at only one location. Consult additional research before making varietal selections or other agronomic decisions.

ACKNOWLEDGEMENTS

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