2011 WINTER WHEAT VARIETY TRIAL

In 2011, the University of Vermont Extension in collaboration with the University of Maine began the second year of extensive organic variety trials evaluating hard red winter wheat in order to determine which varieties thrive in our northern climate. The trials were established at the Borderview Research Farm in Alburgh, Vermont and at Cornell University's Willsboro Research Farm in Willsboro, New York. This trial is one of several in a USDA Organic Research Education Initiative grant focused on the production of high quality organic bread wheat in New England.

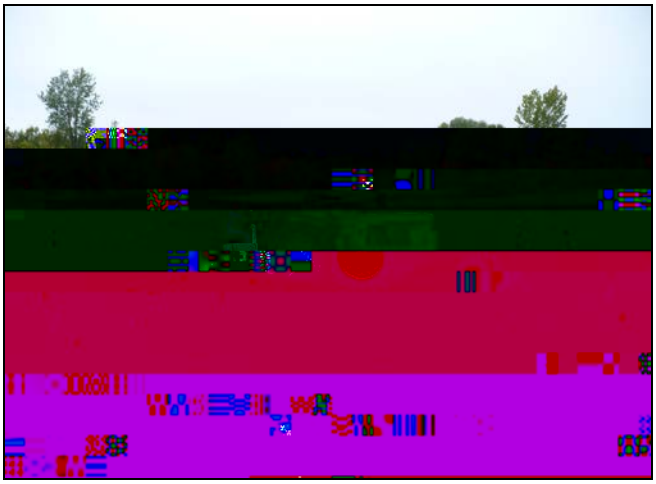
MATERIALS AND METHODS

The experimental plot design at both locations was randomized complete block with four replications. Wheat varieties evaluated are listed in Table 1.

Table 1. Winter wheat varieties planted in Alburgh, VT and Willsboro, NY.

Winter Wheat Varieties	Type†	Origin and Year of Release‡	Seed Source
AC Morley	HR	Canada	Bramhill Seeds, Canada
Alice	HW	SD, 2006	USDA-ARS, SD
Alliance	HR	NE, 1993	USDA-ARS, NE
Anton	HW	NE, 2008	USDA-ARS, NE
Appalachian White	HW	NC, 2009	USDA-ARS, NC
Arapahoe	HR	NE, 1998	Albert Lea Seed House, MN
Borden	MHR	Canada, 1983	Semican, Canada
Camelot	HR	NE, 2008	USDA-ARS, NE
Expedition	HR	SD, 2002	Albert Lea Seed House, MN
Harvard	HR	Canada	Agri-Culver Seeds, NY
Jerry	HR	ND, 2001	North Dakota State Univ.
LP3	HR	WA	Washington State Univ.
Mace	HR	NE, 2008	USDA-ARS, NE
Maxine	HR	Canada, 2001	C&M Seed, Canada
MDM	HW	WA, 2005	Washington State Univ.
Millenium	HR	NE, 1999	USDA-ARS, NE
NE01643	HR	WA	Washington State Univ.
NuEast	HR	NC, 2009	USDA-ARS, NC
Overland	HR	NE, 2006	USDA-ARS, NE
Redeemer	HR	Canada	C&M Seed, Canada
Roughrider	HR	ND, 1975	

The seedbeds



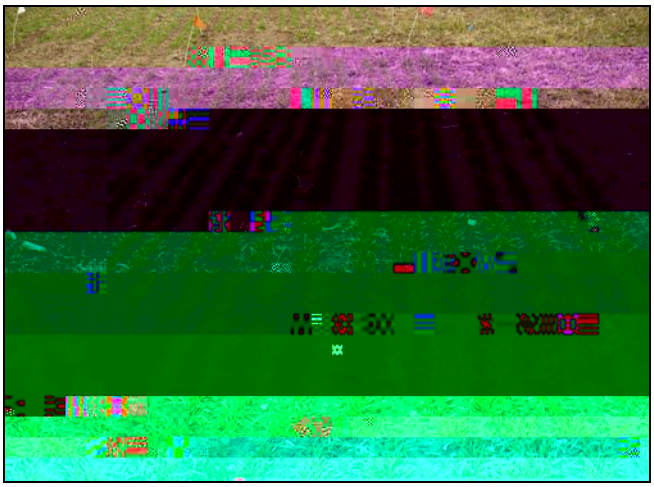
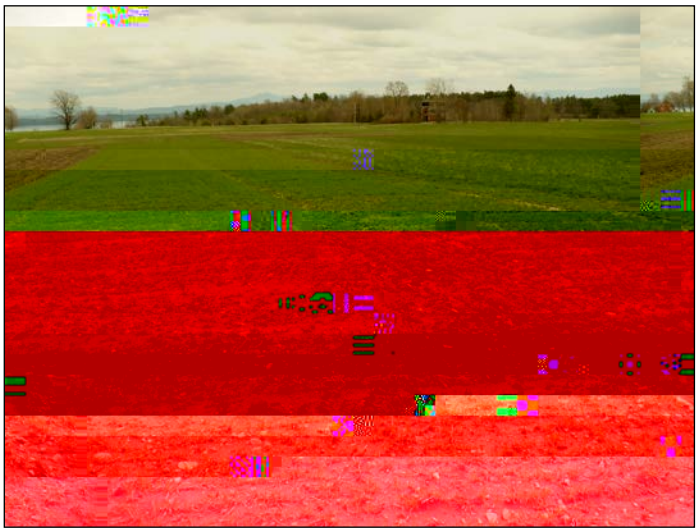
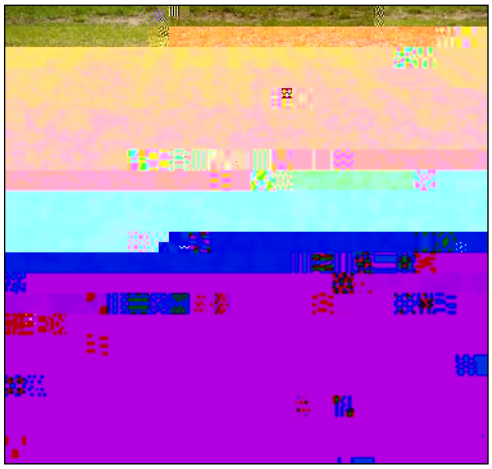


Table 2. General plot management of the 2011 winter wheat trials.

Trial Information	**Winter wheat variety trial**	
Location	Alburgh, VT Borderview Farm	Willsboro, NY Willsboro Research Farm
Soil type	Benson rocky silt loam	Kingsbury silt clay loam



lodging and bird damage was minimal at both locations. Sherman, at the Alburgh location, partially lodged but not so severely that it couldn't be harvested. Loose smut caused by the fungus, *Ust il* , *ago tritici* was observed at both locations. The loose smut fungus is carried as dormant mycelium within healthy-looking seed and is spread by planting infected seed. A smut-infected seed or plant cannot be distinguished from an uninfected one until the head starts to emerge. The



After the wheat reached the soft dough stage, plant heights were measured. Plant height, weed severity, and whole plant wheat biomass are reported in Table 5. Borden, Sherman, AC Morley, and Roughrider were among the tallest varieties for both locations. In general we observed that the shorter and less vigorous varieties had higher weed preassures. The taller, or earlier

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Winter Wheat Yield:

The highest yielding variety at the Alburgh site was AC Morley (5172 lbs ac^{-1}), and Overland (3397 lbs ac^{-1}) in Willsboro (Tables 6, 7 and Figures 1, 2). Varieties that yielded over 2 tons ac^{-1} at the Alburgh site were; Borden Harvard, NEO1643, Redeemer, and Warthog. Harvard, AC Morley, NEO1643 yielded well at both trial locations. Varieties that yielded well at both locations indicate a variety's ability to adapt to various soil and climatic conditions. In Alburgh, the lowest yielding variety was MDM (2138 lbs ac^{-1}) and Warthog (1481 lbs ac^{-1}) was the lowest yielding variety in Willsboro. Interestingly, Warthog was one of the top yielding varieties in Alburgh.

Appalachian White, a hard white winter wheat had the highest test weight in Alburgh (65.8 lbs bu^{-1}). In Willsboro NuEast, a new variety from North Carolina had the highest test weight of 60.4 lbs bu^{-1}. MDM, a Washington State variety, had the lowest test weight at both trial sites. Test weight is the measure of grain density determined by weighing a known volume of grain. Generally, the heavier the wheat is per bushel, the higher baking quality. In general, most varieties reached or exceeded the optimal 56 to 60 lbs bu^{-1} test weight for wheat.

Table 6. Yield results of 26 winter wheat varieties, Alburgh

Variety	Harvest

Table 7. Yield results of 26 winter wheat varieties, Willsboro

Figure 1. Yield of 26 winter wheat varieties, Alburgh, VT
**Variet ies wit h t he same l et t er did not differ significant l y in y iel d.*

Figure 2. Yield of 26 winter wheat

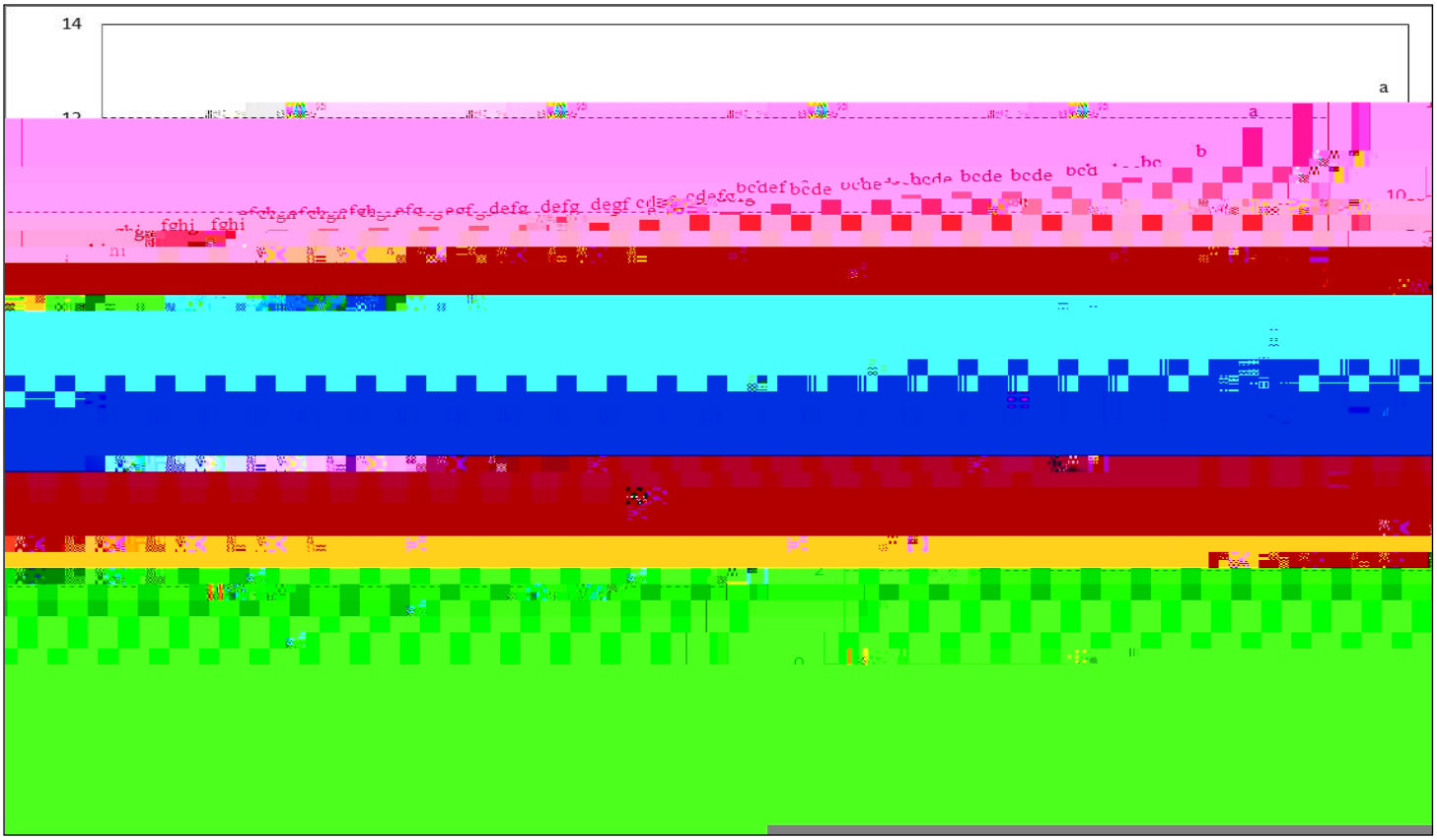

Figure 3. Protein concentration of 26 winter wheat varieties, Alburgh, VT
*Varieties with the same letter did not differ significantly in protein content.

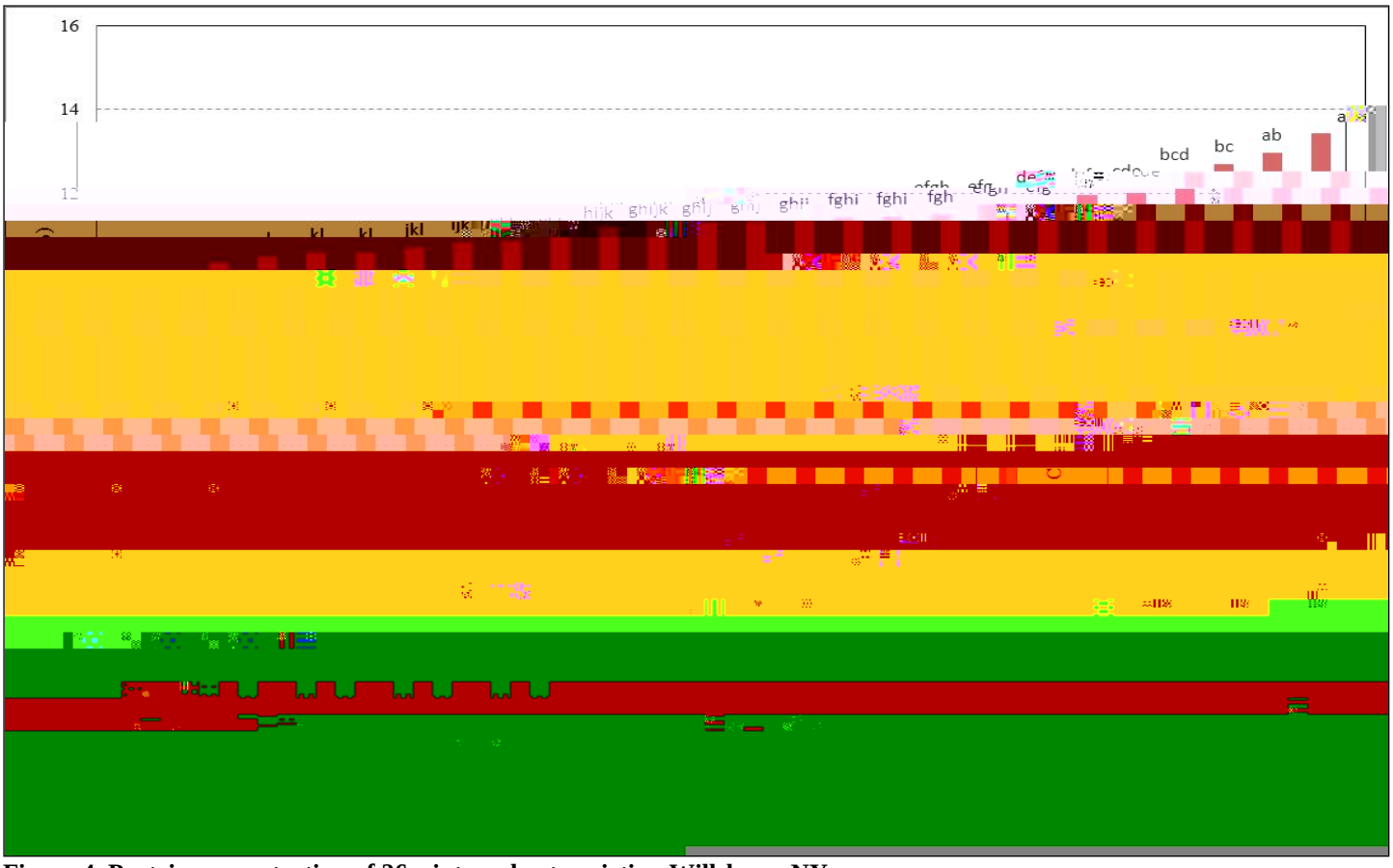

Figure 4. Protein concentration of 26 winter wheat varieties, Willsboro, NY
*Varieties with the same letter did not differ significantly in protein content.