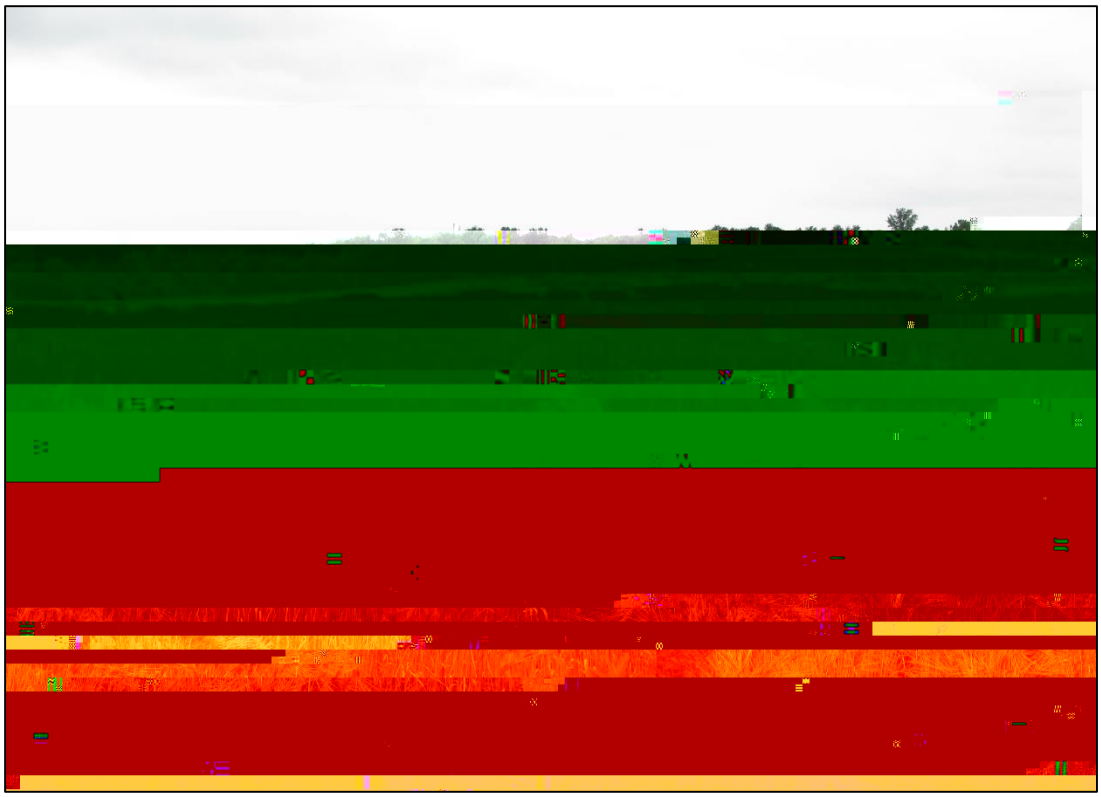
2019 Organic Winter Wheat Variety Trial



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2019 ORGANIC WINTER WHEAT VARIETY TRIAL

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In 2019, the University of Vermont Extensionôs Northwest Crops and Soils Program evaluated 30 winter wheat varieties to determine those that perform best in organic production systems in northern Vermont. The trial was established at the Borderview Research Farm in Alburgh, Vermont.

MATERIALS AND METHODS

The winter wheat variety trial was initiated at Borderview Research Farm in Alburgh in the fall of 2018. Plots were managed with practices similar to those used by producers in the surrounding area. Agronomic information is displayed in Table 1. The experimental design was a randomized complete block with four replicates and the previous crop was corn. The field was disked and spike tooth harrowed prior to planting. Plots were seeded in 5ô x 20ô plots with a Great Plains Cone Seeder on 22-Sep 2018 at a seeding rate of 350 live seeds m^{-2}. Thirty varieties were planted (22 modern varieties and 8 heirloom varieties, displayed in Tables 2 and 3), and all but one, Pride of Genesee, survived the winter. Field season data were collected on the 29 surviving varieties. On the 6-May 2019, winter survival was visually assessed on a scale of 0-5 where 0 was complete survival and 5 was complete death. Heights were determined on 30-Jul by taking three measurements per plot with a meter stick.

Table 1. Trial agronomic information, Alburgh, VT 2018-2019.

Table 2. Winter wheat varietal information.

Variety	Market class	Seed source
112313W	HRWW	Pioneer Seeds, IA
AC Benefit	HRWW	

Emerson	HRWW	Albert Lea Seed House, MN
Expedition	HRWW	Albert Lea Seed House, MN
Grainfield	HRWW	Arrow Seeds, NE
LSC Chrome	HRWW	Limagrain Cereal Seeds, CO
LSC Mint	HRWW	Limagrain Cereal Seeds, CO
LSC Pistol	HRWW	Limagrain Cereal Seeds, CO
LSC T158	HRWW	Limagrain Cereal Seeds, CO
LSC Wizard	HRWW	Limagrain Cereal Seeds, CO
Marker	SRWW	Bramhill Seeds, Ontario CA
Overland	HRWW	Arrow Seeds, NE
Redeemer	HRWW	Semican, Quebec CA
Redfield	HRWW	Albert Lea Seed House, MN
Sy Sunrise	HRWW	Arrow Seeds, NE
Sy Wolf	HRWW	Arrow Seeds, NE
Warthog	HRWW	Semican, Quebec CA
Winterhawk	HRWW	Arrow Seeds, NE

HRWW-Hard Red Winter Wheat, **SRWW**-Soft Red Winter Wheat.

Table 3. Heirloom winter wheat varietal information.

Variety	Market class	Year	Origin
Blackhull	HRWW	1917	Kansas
Blue Jacket	HRWW	1946	Kansas
Forward	SRWW	1920	New York
Honor	SWWW	1920	New York
Pride of Genesee	SRWW	1893	New York
Red Chief	SRWW	1901	

An BT /F2n BTfeplion.11.04lam Tf .04 T subs 6 am Bo (A)5e 4a0 0 s cG* n F2 11.04l15(h161 c0 g d 0 g o de1.0t15(h11e oe BT /F2 1n) gu(r)aw)-12uyhy11.0442770.13 Tm 0 g 0 G [(A)5uR

using Veratox DON 5/5 Quantitative test from the NEOGEN Corp. This test has a detection range of 0.5 to 5 ppm. One sample of each surviving variety was run. Samples with DON values greater than 1 ppm are considered unsuitable for human consumption.

Variations in yield and quality can occur because of variations in genetics, soil, weather, and other growing conditions. Statistical analysis makes it possible to determine whether a difference among varieties is real or whether it might have occurred due to other variations in the field. Winter survival data were analyzed using a general linear model procedure of SAS (SAS Institute, 2008). Replications were

Table 5. Winter survival by variety, Alburgh, VT, 2019.

Variety	Survival* (0-5)
112313W	2.50
AC Benefit	2.00
AC Morley	3.50
Black Hul	3.00
Blue Jacket	3.75
Brome	

Table T

Chief, Blue Jacket, and Emerson all had test weights below 56 lbs bu^{-1}. Emerson, at 27.6 lbs bu^{-1}, was the only variety to have a test weight below 40 lbs bu^{-1}.

Figure 1. Yield and crude protein of winter wheat varieties, Alburgh, VT, 2019.

Average CP concentration for the trial was 9.9%. None of the varieties had crude protein levels above the industry minimum of 14% (Figure 1). Falling numbers for all varieties, except Redeemer, were above 300 seconds, and all varieties met or surpassed the standard of 200 seconds which indicates sound wheat quality (Table 6). Winterhawk had the highest falling number; 400 seconds. One replicate per variety was tested for deoxynivalenol (DON) vomitoxin, and all were below the FDA threshold of 1 ppm which is considered safe for human consumption (data not shown).

ACKNOWLEDGEMENTS