

2017

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Heather Darby

University of Vermont, heather.darby@uvm.edu

Erica Cummings

University of Vermont

Hillary Emick

University of Vermont

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2017 Organic Winter Malting Barley Variety Trial



Dr. Heather Darby, UVM Extension Agronomist
Erica Cummings and Hillary Emick
UVM Extension Crops and Soils Coordinators
802-524-6501

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2017 ORGANIC WINTER MALTING BARLEY VARIETY TRIAL

Dr. Heather Darby, University of Vermont Extension
heather.darby[at]uvm.edu

The revival of the small grains industry in the Northeast and the strength of the locavore movement, craft breweries and distilleries have expressed an interest in sourcing local barley for malting. Malting barley must meet specific quality characteristics such as low protein content and high germination. Depending on the variety, barley can be planted in either the spring or fall, and both two- and six-row barley can be used for malting. In the fall 2016, UVM Extension, in collaboration with the Winter Malting Barley Trial (WMBT) testing network, conducted a winter malting barley trial to evaluate yield and quality of thirty varieties.

MATERIALS AND METHODS

In the fall of 2016, a winter malting barley variety trial was established at Borderview Research Farm in Alburgh, VT. The experimental plot design was a randomized complete block with three replications. The treatments were thirty winter malting barley varieties, listed in Table 1.

Table 1. Varietal information for the 30 winter malting barley varieties, 2017.

| Winter barley variety | Type | Seed source |
|-----------------------|-------|-----------------------------------|
| Charles | 2-row | USDA-ARS |
| McGregor | 6-row | 2016 Saved seed |
| Thoroughbred | 6-row | 2016 Saved seed |
| Endeavor | 2-row | USDA-ARS |
| Wintmalt | 2-row | 2016 Saved seed |
| Violetta | 2-row | Limagrain Cereal Seeds |
| Calypso | 2-row | Limagrain Cereal Seeds |
| Puffin | 2-row | Limagrain Cereal Seeds |
| LGBB13-W102 | 6-row | Limagrain Cereal Seeds |
| 05ARS561-208 | 2-row | USDA-ARS |
| 06ARS633-3 | 2-row | USDA-ARS |
| 06ARS617-25 | 2-row | USDA-ARS |
| 07ARS515-7 | 2-row | USDA-ARS |
| DH130004 | 2-row | Oregon State University |
| DH130939 | 2-row | Oregon State University |
| DH130718 | 2-row | Oregon State University |
| DH130910 | 2-row | Oregon State University |
| MW12_4028-007 | 6-row | University of Minnesota |
| MW12_4007-001 | 6-row | University of Minnesota |
| MW13_4159-012 | 6-row | University of Minnesota |
| MW13_4107-010 | 6-row | University of Minnesota |
| 2WI14-7462 | 2-row | Busch Agricultural Resources, LLC |
| 2WI14-7465 | 2-row | Busch Agricultural Resources, LLC |
| 2WI14-7577 | 2-row | Busch Agricultural Resources, LLC |
| 2WI14-7581 | 2-row | Busch Agricultural Resources, LLC |
| Flavia | 2-row | Kilian Hundsrucker |
| SU-Mateo | 2-row | Kilian Hundsrucker |

| | | |
|----------------------|-------|--------------------|
| AC09/327/2 (Lyberac) | 2-row | Kilian Hundsrucker |
| Mission | 2-row | Kilian Hundsrucker |
| Hirondella | 6-row | Kilian Hundsrucker |

All plots were managed with practices similar to those used by producers in the surrounding areas (Table 2). The previous crop planted at the site was winter wheat and rye. In September 2016, the trial area was plowed, disked and spike tooth harrowed to prepare for planting. The plots were seeded with a Great Plains NT60 Cone Seeder on 22-Sep 2016 at a seeding rate of 140 lbs ac⁻¹ into a Benson rocky silt loam. Plot size was 7'x 20' (5'x 20' planted). A visual assessment of populations, winter survival, and vigor was conducted on 11-May.

Table 2. General plot management, 2017.

| Trial information | Alburgh, VT | |
|---------------------------------------|--------------------------------------|--|
| | Borderview Research Farm | |
| Soil type | Benson rocky silt loam | |
| Previous crop | Winter wheat and rye | |
| Tillage operations | Fall plow, disk & spike tooth harrow | |
| Seeding Rates (lbs ac ⁻¹) | 140 | |
| Row spacing (in) | 6 | |
| Replicates | 3 | |
| Planting date | 22-Sep 2016 | |
| Planted area (ft) | 5 x 20 | |
| Harvest date | N/A | |

RESULTS AND DISCUSSION

Seasonal precipitation and temperature recorded at a weather station in Alburgh, VT are shown in Table 3. Average precipitation and above average temperatures for the fall of 2016 lead to good establishment. Most of the winter months, except for March, were warmer and drier than the 30-year average. Overall, temperatures were very mild however, the lack of precipitation during the winter months resulted in no protective snow cover at the trial location in Alburgh.

Table 3. Seasonal weather data collected in Alburgh, VT, 2016 and 2017.

| Alburgh, VT | Sep 2016 | Oct 2016 | Nov 2016 | Mar 2017 | Apr 2017 | May 2017 |
|---------------------------------|----------|----------|----------|----------|----------|----------|
| Average temperature (°F) | 63.6 | 50.0 | 40.0 | 25.1 | 47.2 | 55.7 |
| Departure from normal | 3.03 | 1.80 | 1.82 | -6.05 | 2.37 | -0.75 |
| Precipitation (inches) | 2.50 | 5.00 | 3.00 | 1.60 | 5.20 | 4.10 |
| Departure from normal | -1.17 | 1.39 | -0.13 | -0.63 | 2.40 | 0.68 |
| Growing Degree Days (base 32°F) | 949 | 559 | 270 | 98 | 459 | 733 |
| Departure from normal | 91 | 57 | 85 | -26 | 71 | -20 |

Based on weather data from a Davis Instruments Vantage Pro2 with WeatherLink data logger. Historical averages are for 30 years of NOAA data (1981-2010) from Burlington, VT.

Many of the varieties in the trial were developed in environments much different from New England. Hence, it is important to evaluate the varieties for tolerance to our climate. The winter survival of the malting barley plots were assessed on 11-May 2017 (Table 4). There was severe winterkill in most of the plots and therefore, the trial was terminated.

Table 4. Populations, vigor, and winter survival of the 30 winter barley varieties.

| Variety | Population | Vigor | Survival |
|----------------------|----------------|--------------|--------------|
| | m ² | Scale (0-9) | % |
| 05ARS561-208 | 10 | 1.33 | 10.7 |
| 06ARS617-25 | 0 | 0.00 | 0.00 |
| 06ARS633-3 | 2 | 0.00 | 1.00 |
| 07ARS515-7 | 2 | 0.67 | 2.00 |
| 2WI14-7462 | 10 | 0.33 | 1.67 |
| 2WI14-7465 | 0 | 0.00 | 0.00 |
| 2WI14-7577 | 0 | 0.00 | 0.00 |
| 2WI14-7581 | 2 | 0.00 | 0.33 |
| AC09/327/2 (Lyberac) | 7 | 2.00 | 15.0 |
| Calypso | 31 | 2.00 | 18.3 |
| Charles | 0 | 0.67 | 5.33 |
| DH130004 | 0 | 0.00 | 0.00 |
| DH130718 | 2 | 0.00 | 0.00 |
| DH130910 | 7 | 3.33 | 13.3 |
| DH130939 | 5 | 0.67 | 3.67 |
| Endeavor | 2 | 0.33 | 1.67 |
| Flavia | 88* | 5.67 | 50.0 |
| Hirondella | 26 | 1.00 | 14.0 |
| LGBB13-W102 | 77 | 7.67* | 58.3 |
| McGregor | 26 | 5.67 | 41.7 |
| Mission | 22 | 1.00 | 10.3 |
| MW12_4007-001 | 127* | 4.00 | 83.3* |
| MW12_4028-007 | 5 | 3.00 | 7.33 |
| MW13_4107-010 | 12 | 3.33 | 20.0 |
| MW13_4159-012 | 31 | 4.33 | 36.7 |
| Puffin | 10 | 0.33 | 4.33 |
| SU-Mateo | 36 | 5.33 | 33.3 |
| Thoroughbred | 103* | 8.00* | 66.7 |
| Violetta | 74 | 7.00* | 58.3 |
| Wintmalt | 22 | 5.00 | 31.7 |
| <i>LSD (0.10)</i> | 43 | 2.22 | 16.4 |
| <i>Trial Mean</i> | 25 | 2.42 | 19.6 |

Values shown in **bold** are of the highest value or top performing.

* Barley varieties that are not significantly different than the top performing variety in a column are indicated with an asterisk.

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