

# 2016 Barley Field Crop Trials Results



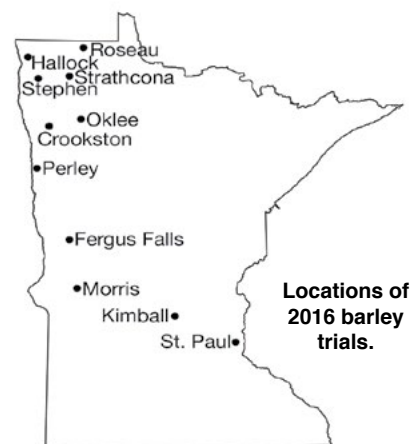
## Minnesota Agricultural Experiment Station and the College of Food, Agricultural and Natural Resource Sciences

Spring barley varieties are compared in replicated trials at Crookston, Morris, St. Paul, Stephen and Roseau and in on-farm trials at Fergus Falls, Perley, Oklee, Strathcona, Kimball and Hallock. Data collected from these trials should be used to make comparisons only among those varieties included in the trials. Yield is reported both for 2016 and a multi-year average as percent of the mean of the trial. In 2016, the lowest yielding trial was at Roseau and the highest yielding at Crookston. LSD numbers beneath the yield columns indicate whether the difference between yields is due to genetics or to other factors, such as variations in environment. If yield difference between two entries

equals or exceeds the LSD value the higher-yielding entry probably was superior in yield. A difference less than the LSD value was probably due to environmental factors.

### Variety Selection Criteria

Most barley producers in the region grow barley for malt and select varieties approved by the American Malting Barley Association (AMBA). The most important industry specifications for making malting grade are low grain protein (11.5% - 13.5%), kernel plumpness (>80%) and low deoxynivalenol or DON content (<2 ppm). DON is the toxin produced by the Fusarium Head Blight (FHB) pathogen. Please consult the AMBA recom-



mended varieties for the most current information about industry acceptance of malting barley varieties at [www.ambainc.org](http://www.ambainc.org). Variety selection will also be influenced by contracts made

**Relative grain yield (percent of the mean of the trial) of barley varieties at several locations in Minnesota in single-year (2016) and multiple-year comparisons (2014-2016).**

Entry	Crookston		Morris		Stephen	St. Paul		Roseau		State Mean		
	2016	2-Year <sup>1</sup>	2016	3-Year	2-Year <sup>2</sup>	2016	2-Year <sup>3</sup>	2016	3-Year	2016	3-Year	
<b>6-row types</b>												
Robust	98	98	96	93	85	76	85	98	101	92	93	
Lacey	105	106	119	110	105	83	89	97	99	101	102	
Rasmusson	106	108	90	102	116	101	103	109	104	101	106	
Quest	104	104	87	99	92	93	101	95	98	95	99	
Tradition	102	99	101	101	95	93	93	104	98	100	97	
Celebration	97	97	101	100	100	79	91	92	93	92	97	
Innovation	106	108	104	100	103	103	116	119	106	108	106	
<b>2-row types</b>												
ABI Balster	90	93	103	102	105	125	125	109	110	107	105	
ABI Growler	103	98	84	84	94	121	121	118	105	107	99	
ND Genesis	104	101	108	105	106	132	110	104	108	112	106	
Conlon	106	99	109	98	99	93	89	98	90	102	95	
Pinnacle	79	89	97	101	99	101	99	57	93	84	96	
<b>LSD 0.05</b>	<b>8</b>	<b>6</b>	<b>14</b>	<b>8</b>	<b>13</b>	<b>8</b>	<b>11</b>	<b>23</b>	<b>9</b>	<b>6</b>	<b>4</b>	
<b>Mean, Bu/A</b>	<b>138</b>	<b>121</b>	<b>77</b>	<b>88</b>	<b>95</b>	<b>99</b>	<b>107</b>	<b>66</b>	<b>120</b>	<b>95</b>	<b>105</b>	

<sup>1</sup>Only two years of data, 2015 and 2016.

<sup>2</sup>Only two years of data, 2014 and 2015.

<sup>3</sup>Only two years of data, 2014 and 2016.

available by malting and brewing companies and these vary from year to year.

In addition to yield and acceptable malt quality, disease resistance plays an important role in variety selection. Disease evaluations are carried out in inoculated field and/or greenhouse experiments. Disease ratings are based on the results of two or more experiments and are scored on a 1–9 scale where 1 = most resistant and 9 = most susceptible. For most producers the disease FHB and the presence of DON in harvested grain are the two most important factors limiting production of malting barley in the region. The two-rowed variety Conlon and the six-rowed variety Quest have a lower disease score for FHB and typically have lower DON compared to the other varieties grown in the region.

The other diseases listed in the disease reactions table are leaf diseases that can be a problem in Minnesota. The two-rowed varieties Conlon and Pinnacle tend to be a little more susceptible to spot blotch. Celebration and Conlon are the most resistant to net blotch. Septoria speckled leaf blotch is a disease that has not been seen at any economically important level in Minnesota for more than 10 years. These leaf diseases can be controlled effectively with the use of a fungicide. FHB severity and DON can be reduced with fungicides, but they are not always effective.

Bacterial leaf streak disease has become more prominent in the past few years and tends to become more severe following heavy rain events. This disease cannot be controlled with fungicides. The bacterial leaf streak

ratings presented are based on three years of data and at this point show only small differences among varieties for resistance.

For detailed variety descriptions and other University of Minnesota barley information please visit: <http://smithlab.cfans.umn.edu>.

### **PVP Status**

All varieties shown in tables except Robust are covered by the Plant Variety Protection Act, PVP (94). Growers can save seed of these varieties for their own planting only; it cannot be sold to anyone else, not even a relative or a neighbor without specific permission of the applicant for protection.

### **Project Leaders**

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### **Test Plot Managers**

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### ***Agronomic characteristics of barley varieties, 2014-2016.***

Entry	Type	Use	Heading (DAP)	Height (inches)	Lodging (1-9)	Plump (%)	Protein (%)
Robust	6-row	Malt	63	37	5.6	94	14.1
Lacey	6-row	Malt	62	33	5.0	94	13.8
Rasmusson	6-row	Malt	61	32	5.0	93	12.8
Quest	6-row	Malt	62	35	6.0	93	13.3
Tradition	6-row	Malt	62	35	4.0	94	13.9
Celebration	6-row	Malt	62	37	6.5	92	13.3
Innovation	6-row	Malt	61	33	4.3	94	13.6
ND Genesis	2-row	Malt	63	35	4.2	96	11.1
Conlon	2-row	Malt	60	33	3.7	97	13.2
Pinnacle	2-row	Malt	62	34	5.0	95	12.2
<b>No. Environments</b>			<b>9</b>	<b>9</b>	<b>5</b>	<b>5</b>	<b>5</b>

### ***Disease reactions of barley varieties in multiple year comparisons<sup>1</sup>.***

Entry	Fusarium Head Blight	Net Blotch	Speckled Leaf Blotch	Spot Blotch	Stem Rust <sup>2</sup>	Bacterial Leaf Streak
Robust	8	5	9	2	1	6
Lacey	8	6	9	2	1	6
Rasmusson	9	5	9	2	1	6
Quest	5	5	9	3	1	6
Tradition	8	4	9	2	1	7
Celebration	7	3	9	4	1	5
Innovation	8	4	9	2	1	6
Conlon	6	3	9	5	1	5
ND Genesis	8	5	9	2	1	4
Pinnacle	9	6	9	4	1	6

<sup>1</sup>1-9 scale where 1=most resistant, 9=most susceptible.

<sup>2</sup>Reaction to the dominant strain of the stem rust pathogen.

*Relative grain yield (percent of the mean of the trial) of barley varieties in on-farm trials at Fergus Falls, Hallock, Oklee, Perley, Kimball and Strathcona.*

Entry	2016	2014-2016 <sup>1</sup>
<b>6-row types</b>		
Robust	93	91
Lacey	105	105
Rasmusson	109	110
Quest	101	99
Tradition	103	101
Celebration	102	101
Innovation	108	102
<b>2-row types</b>		
ABI Balster <sup>2</sup>	96	—
ABI Growler <sup>2</sup>	88	—
ND Genesis	99	100
Conlon	95	92
Pinnacle	102	101
<b>LSD 0.05</b>	<b>9</b>	<b>5</b>
<b>Mean, Bu/A</b>	<b>118</b>	<b>124</b>

<sup>1</sup>Missing data from Fergus Falls and Hallock (2014); Hallock and Kimball (2015); Fergus Falls, Perley and Strathcona (2016).

<sup>2</sup>2016 data only

**Barley**

**Planting Rate and Date**

Bushel Weight, Pounds.....48

Seeds/Pound.....14,300

Planting Rate, Pounds/Acre.....85

Planting Rate, Seeds/Sq. Ft.....28

Planting Date.....Early Spring