

2017 Barley Field Crop Trials Results



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

Spring barley varieties were evaluated in 2017 in replicated trials at Crookston, Morris, St. Paul, Stephen, Roseau, Fergus Falls, Perley, Oklee, and Strathcona. Data collected from these trials should be used to make comparisons only among those varieties included in the trials. Yield is reported for 2017, a 2-year, and a 3-year average as percent of the mean of the trial. In 2017, the lowest yielding trial was at Morris 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 recommended varieties for the most current



information about industry acceptance of malting barley varieties at www.ambainc.org. Variety selection will also be influenced by contracts made 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.

Table 1. Origin and agronomic characteristics of barley varieties in multiple-year comparisons.

Entry	Origin	Year of Release	PVP Status	Use	Days to Heading (Days)	Plant Height (Inch)	Straw Strength (1-9)	Plump (%)	Protein (%)
2-row									
ABI Balster	ABI	2015	—	Malt	62	33	5	90	13.5
ABI Growler	ABI	2015	—	Malt	62	33	5	93	13.2
Conlon	NDSU	1996	Yes	Malt	57	33	2	97	13.5
ND Genesis	NDSU	2015	Yes	Malt	61	35	4	97	11.5
Pinnacle	NDSU	2007	Yes	Malt	61	34	5	94	12.1
LCS Genie*	Limagrain	NA	Yes	Malt	64	30	2	82	13.4
LCS Odyssey*	Limagrain	NA	No	Malt	62	29	3	83	13.1
6-row									
Celebration	ABI	2008	Yes	Malt	60	37	6	90	14.2
Innovation	ABI	2010	Yes	Malt	59	34	4	89	14.1
Lacey	UM	2000	Yes	Malt	59	34	4	92	13.9
Quest	UM	2010	Yes	Malt	59	36	5	90	13.7
Rasmusson	UM	2008	Yes	Malt	59	33	4	92	12.7
Robust	UM	1983	No	Malt	60	37	6	90	13.8
Tradition	ABI	2003	Yes	Malt	60	36	3	93	14.3
No. Environments					11	10	5	6	6

*Variety tested only in 2017 and 2016.

The other diseases listed in the disease reactions table are leaf diseases that can be a problem in Minnesota. The two-rowed varieties in general, with the exception of ND Genesis, tend to be 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.

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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

Table 2. Disease reactions of barley varieties in multiple year comparisons¹.

Entry	Fusarium Head Blight	Net Blotch	Spot Blotch	Stem Rust ²	Bacterial Leaf Streak
2-row					
ABI Balster	6	NA	5	1	4
ABI Growler	6	NA	5	1	4
Conlon	6	3	5	1	4
ND Genesis	8	5	2	1	3
Pinnacle	9	6	4	1	4
LCS Genie*	9	NA	7	4	NA
LCS Odyssey*	9	NA	7	3	NA
6-row					
Celebration	7	3	4	1	4
Innovation	8	4	2	1	5
Lacey	8	6	2	1	5
Quest	5	5	3	1	5
Rasmusson	9	5	2	1	5
Robust	8	5	2	1	5
Tradition	8	4	2	1	5

¹1-9 scale where 1 = most resistant, 9 = most susceptible, NA = not available.

²Reaction to the dominant strain of the stem rust pathogen.

*Variety tested only in 2017 and 2016.

Table 3. Relative grain yield (percent of the mean of the trial) of barley varieties at several locations in Minnesota in single-year (2017) and multiple-year comparisons (2015-2017).

Entry	Crookston			Morris			Stephen		St. Paul		Roseau			Fergus Falls		Perley		Oklee			Strathcona		State		
	2017	2 Yr	3 Yr	2017	2 Yr	3 Yr	2017	2 Yr ¹	2017	2 Yr ²	2017	2 Yr	3 Yr	2017	2 Yr ²	2017	2 Yr ¹	2017	2 Yr	3 Yr	2017	2 Yr ¹	2017	2 Yr	3 Yr
	% of mean			% of mean			% of mean		% of mean		% of mean			% of mean		% of mean			% of mean		% of mean				
2-row																									
ABI Balster	87	89	91	114	109	106	87	96	101	113	105	107	108	102	86	109	—	112	98	91	96	—	99	101	103
ABI Growler	85	94	94	99	92	89	82	88	98	110	107	113	106	105	94	103	—	111	96	89	96	—	94	101	97
Conlon	94	100	98	79	94	92	98	93	77	85	83	91	92	93	93	79	87	67	82	85	89	96	86	93	92
ND Genesis	99	102	100	103	106	104	95	103	120	126	82	93	100	93	102	100	99	105	101	100	99	103	100	105	105
Pinnacle	81	80	86	101	99	102	75	89	102	102	111	84	93	100	89	101	103	106	106	105	105	110	94	91	94
LCS Genie*	79	92	—	79	82	—	—	—	88	99	104	105	—	90	85	99	—	105	103	—	89	—	88	95	—
LCS Odyssey*	68	85	—	110	108	—	—	—	109	116	113	119	—	97	94	96	—	115	99	—	101	—	96	105	—
6-row																									
Celebration	101	99	98	89	95	93	99	96	94	87	105	99	94	114	106	108	103	104	104	104	101	91	98	96	94
Innovation	112	109	109	121	113	110	109	110	99	101	102	111	109	101	102	109	107	87	95	96	106	99	109	108	108
Lacey	110	108	107	103	111	111	119	115	113	98	96	97	96	93	103	104	109	92	99	100	112	105	108	103	105
Quest	110	107	106	92	90	96	106	100	90	92	97	96	95	99	99	90	90	90	94	95	99	103	99	98	98
Rasmusson	114	110	110	119	105	105	110	116	110	106	120	115	112	119	114	112	114	106	106	106	111	110	115	109	110
Robust	99	99	99	90	93	93	113	92	97	87	96	97	97	99	94	93	86	95	95	95	107	97	99	95	94
Tradition	106	104	101	96	99	100	109	103	98	96	102	103	100	100	101	106	100	101	100	100	98	95	102	101	100
Mean (Bu/Acre)	154	146	131	73	75	80	108	117	96	98	123	95	112	153	154	140	143	95	119	127	92	115	111	103	108
LSD (0.05)	12	10	6	18	16	9	11	12	19	14	20	22	10	13	12	11	14	11	13	14	12	13	7	6	4

¹Only two years of data, 2015 and 2017.²Only two years of data, 2016 and 2017.

*Variety tested only in 2017 and 2016.