



Spring Malting Barley Variety Trial 2018 Results

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Twenty-eight varieties of two- and six-row spring malting barley were trialed at two locations in Maine in 2018 (Table 1). The trials were conducted in collaboration with 9 other institutions as part of the Eastern Spring Barley Nursery project (ESBN), organized by North Dakota State University and funded by the Brewers Association. This is the fourth year of these malt barley variety trials.

Table 1. Spring malting varieties evaluated in Old Town and Westfield, Maine in 2018.

Variety	Type	Years in ME Trials	Developer
AAC Synergy	2-row	4	Agriculture and Agri-Food Canada (Brandon)
Accordine	2-row	1	Ackermann (Germany)
Conlon	2-row	4	North Dakota State University
AAC Connect	2-row	1	Agriculture and Agri-Food Canada (Brandon)
Crescendo	2-row	1	Secobra (France)
Eifel	2-row	1	Secobra (France)
Esma	2-row	2	Ackermann (Germany)
Expo	2-row	1	Secobra (France)
KWS Beckie	2-row	3	KWS (Germany)
KWS Fantex	2-row	3	KWS (Germany)
KWS Tinka	2-row	2	KWS (Germany)
LCS Genie	2-row	3	Limagrain Cereal Seeds
LCS Odyssey	2-row	3	Limagrain Cereal Seeds
ND Genesis	2-row	4	North Dakota State University
Newdale	2-row	4	Agriculture and Agri-Food Canada (Brandon)
Pinnacle	2-row	4	North Dakota State University
Quest	6-row	4	University of Minnesota
Robust	6-row	3	University of Minnesota
Sangria	2-row	2	Ackermann (Germany)
Tradition	6-row	4	Busch Agricultural Resources, LLC
2ND28065	2-row	3	North Dakota State University experimental line
2ND32529	2-row	1	North Dakota State University experimental line
2ND33757	2-row	2	North Dakota State University experimental line
2ND33760	2-row	2	North Dakota State University experimental line
2ND33821	2-row	2	North Dakota State University experimental line
2ND34954	2-row	1	North Dakota State University experimental line
2ND34999	2-row	1	North Dakota State University experimental line
2ND35001	2-row	1	North Dakota State University experimental line

METHODS

The trials were conducted at the University of Maine Rogers Research Farm, in Old Town, and a commercial farm in Westfield. Agronomic practices for both locations are described in Table 2. Agronomic and basic grain quality data were collected by the University of Maine and grain samples were submitted to North Dakota State University for comprehensive grain and malt quality analysis.

Table 2. Agronomic practices in Old Town and Westfield, Maine in 2018.

	Old Town	Westfield
Previous Crop	Oat cover crop	Broccoli
Soil Type	Nicholville very fine sandy loam	Caribou gravelly loam
pH	6.2	6.2
Pre-plant Fertility	23 tons/acre solid dairy manure (approx. 70 units of N per acre)	None
Topdress Nitrogen	July 1, 15 units of N as chilean nitrate	May 28, 75 units of N applied as UAN
Planting Date, Rate	May 2, 1.3 million live seeds/acre	May 16, 1.3 million live seeds/acre
Weed Control	NA	June 2, MCPA Rhomene – 1 pt/acre & Harmony – 3/4 oz/acre
Fungicide	NA	July 5, Prosaro – 6.5 oz/acre
Harvest Date	July 31	August 16

RESULTS

Conditions were very dry in May during emergence and early crop growth, with Old Town and Westfield receiving only 1.2” and 1.9” of rain, respectively (Table 4). Dry conditions persisted throughout the growing season at both locations, however Westfield wasn’t as severe as Old Town. Symptoms of drought stress were observed in the form of delayed and variable emergence, yellowing of leaves and incomplete spike emergence. Incomplete spike emergence is a stress related condition in barley where the spike stops emerging from the stalk at or below the flag leaf. This condition was visually ranked. All varieties at both locations showed this symptom to a varying degree with the exception of Pinnacle and Robust at the Old Town site (Table 3).

Grain yield was lower on average at Old Town (72 bu/acre) versus Westfield (93 bu/acre) (Table 3). There were no significant differences in yield among the varieties in Old Town. In Westfield, Esma yielded the highest (106 bu/acre). Foliar diseases, measured at the Old Town location only, were moderate to low likely due to the dry conditions. Pinnacle, a variety that is highly susceptible to foliar diseases had a ranking of only 4 (Table 3). Grain moisture was measured at harvest and averaged 14.9% at Old Town and 20.8% at Westfield. ND Genesis had the highest grain moisture at Old Town (16.1%) and the experimental variety 2ND33821 was the highest at Westfield at 23.6%. Limited grain quality data is available at this point and is summarized in Table 5. Many varieties had germination energy levels below 95% with site averages of 91% at Old Town and 89% at Westfield.

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Table 3. Agronomic characteristics of malting barley varieties grown in Old Town and Westfield in 2018.

Variety	Yield†		Grain Moisture at Harvest‡		Foliar Disease Severity		Spike Emergence#		Stem Breakage		Heading date	
	Old Town	Westfield	Old Town	Westfield	Old Town	Westfield ≠	Old Town	Westfield	Old Town	Westfield	Old Town	Westfield ≠
	(bu/acre)		(%)		(1 - 9) §		(1-5)		(1 - 9) §		(days after 5/31)	
AAC Synergy	80	101	14.7	20.5	1.3	-	3.7	2.7	1.3	2.3	23	-
Accordine	87	95	14.5	21.3	1.3	-	4.0	2.7	2.3	1.3	24	-
Conlon	63	74	14.9	18.6	1.3	-	4.0	1.0	2.3	3.3	20	-
ACC Connect	-	81	-	20.1	-	-	-	2.3	-	1.7	-	-
Crescendo	79	102	14.7	19.9	2.0	-	4.3	2.3	1.7	1.0	25	-
Eifel	61	99	15.7	20.3	2.0	-	2.3	3.0	2.3	1.7	26	-
Esma	72	106	15.3	21.4	1.0	-	2.7	3.0	2.0	1.7	22	-
Expo	83	90	14.0	21.8	2.0	-	2.0	3.0	2.0	2.0	25	-
KWS Beckie	75	93	13.7	22.5	1.7	-	2.3	2.3	2.0	1.7	26	-
KWS Fantex	84	100	15.2	20.9	1.0	-	2.7	2.7	1.3	1.0	27	-
KWS Tinka	78	93	14.7	22.2	1.3	-	3.7	2.7	1.3	1.3	23	-
LCS Genie	72	90	14.6	21.7	1.3	-	4.0	3.0	1.3	1.7	26	-
LCS Odyssey	77	104	14.0	21.0	1.7	-	3.7	3.0	2.0	1.7	26	-
ND Genesis	71	85	16.1	22.4	1.7	-	3.3	1.7	1.7	1.3	21	-
Newdale	85	91	13.8	19.7	1.3	-	3.3	2.3	1.7	1.7	23	-
Pinnacle	69	81	15.1	23.3	4.0	-	5.0	1.0	1.7	1.0	21	-
Quest	72	76	13.3	18.2	1.3	-	4.7	1.0	1.3	3.0	21	-
Robust	57	85	15.0	19.3	1.7	-	5.0	1.0	1.0	3.7	21	-
Sangria	62	101	15.2	21.5	2.0	-	3.7	2.3	2.0	2.0	23	-
Tradition	62	82	12.5	18.0	1.7	-	4.3	1.0	1.0	1.0	19	-
2ND28065	78	83	15.0	20.5	2.0	-	3.7	3.0	2.0	1.3	22	-
2ND32529	68	100	15.9	23.0	1.3	-	4.0	2.0	1.0	1.7	21	-
2ND33757	77	92	14.9	20.7	1.0	-	3.7	2.3	1.3	1.7	21	-
2ND33760	62	92	15.4	20.3	2.0	-	2.3	2.0	2.3	1.0	22	-
2ND33821	68	85	15.9	23.6	1.3	-	4.3	1.3	1.0	1.3	20	-
2ND34954	61	91	15.8	19.8	1.7	-	3.0	1.7	1.3	2.0	22	-
2ND34999	64	97	15.8	20.0	1.7	-	3.7	2.0	2.3	1.3	21	-
2ND35001	66	97	15.3	20.0	1.7	-	4.3	2.0	1.7	1.7	23	-
Site average	72	92	14.9	20.8	1.6	-	3.6	2.1	1.7	1.8	23	-
LSD (0.05)	NS	14.3	1.6	1.8	1.2	-	1.1	1.1	NS	1.0	-	-
CV%	20.2	13.3	7.9	8.2	49.4	-	27.5	41.7	42.9	49.0	-	-

† Yield is reported at 13.5% moisture. ‡ Measured at time of harvest. § Scored visually using a scale from 1 = none to 9 = high. Stem breakage was scored at harvest.

Scored visually using a scale from 1 = 0% emerged to 5 = 100% emerged. ≠ Data not collected at this location.

Table 4. Rainfall totals in Old Town and Presque Isle in 2018.

Total Rainfall (inches)				
Month	Old Town		Presque Isle†	
	2018	30-yr avg.	2018	30-yr avg.
April	3.1	3.8	3.9	2.5
May	1.2	3.8	1.9	3.4
June	3.1	4.1	3.0	3.4
July	2.0	3.6	2.6	3.7
August	1.8	3.3	3.3	3.7
Total	11.1	18.6	14.6	16.7

† The weather station in Presque Isle is approximately 8 miles from the Westfield site.

Table 5. Grain quality characteristics of malting barley varieties, 2018.

Variety	Test Wt. (lbs/bu)		TKW† (g)		Germ. Energy‡ (%)	
	Old Town	Westfield	Old Town	Westfield	Old Town	Westfield
AAC Synergy	48	48	47	45	93	90
Accordine	48	48	47	43	80	90
Conlon	48	48	51	48	92	95
ACC Connect	-	45	-	43	-	81
Crescendo	47	46	47	48	89	96
Eifel	46	47	49	48	93	97
Esma	48	47	51	46	93	95
Expo	49	49	49	50	95	91
KWS Beckie	44	45	43	46	91	95
KWS Fantex	47	46	44	41	93	93
KWS Tinka	47	46	49	45	90	91
LCS Genie	49	49	46	46	91	92
LCS Odyssey	48	47	45	45	90	93
ND Genesis	48	48	48	46	88	89
Newdale	49	47	45	40	97	91
Pinnacle	48	45	49	46	80	49
Quest	48	47	40	38	<u>98</u>	96
Robust	48	48	40	40	95	<u>99</u>
Sangria	48	49	44	45	91	94
Tradition	48	47	40	39	97	94
2ND28065	50	49	47	42	97	96
2ND32529	47	44	48	46	81	54
2ND33757	<u>50</u>	49	52	49	95	94
2ND33760	49	49	50	47	93	97
2ND33821	45	43	<u>52</u>	46	76	53
2ND34954	47	47	50	49	86	86
2ND34999	49	49	48	46	97	96
2ND35001	49	49	48	45	96	95
Site average	48	47	47	45	91	89
LSD (0.05)	1.6	1.4	2	2.5	5.1	10.6
CV%	3.3	3.7	8	8.2	6.9	16.1

† Thousand kernel weight.

‡ Germination energy is the percentage of kernels that germinate over 3 days under controlled moisture and temperature conditions. >95% is considered acceptable.