



Spring Malting Barley Variety Trial 2017 Results

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Twenty five varieties of two- and six-row spring malting barley were trialed at two locations in Maine in 2017 (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 in part by the Brewers Association.

Table 1. Spring malting varieties evaluated in Old Town and Presque Isle, Maine in 2016.

Variety	Type	Developer
AAC Synergy	2-row	Agriculture and Agri-Food Canada (Brandon)
Acorn	2-row	Ackermann (Germany)
Bettina	2-row	Secobra (France)
Conlon	2-row	North Dakota State University
Esma	2-row	Ackermann (Germany)
Explorer	2-row	Secobra (France)
KWS Beckie	2-row	KWS (Germany)
KWS Fantex	2-row	KWS (Germany)
KWS Josie	2-row	KWS (Germany)
KWS Tinka	2-row	KWS (Germany)
LCS Genie	2-row	Limagrain Cereal Seeds
LCS Odyssey	2-row	Limagrain Cereal Seeds
Manta	2-row	Ackermann (Germany)
ND Genesis	2-row	North Dakota State University
Newdale	2-row	Agriculture and Agri-Food Canada (Brandon)
Pinnacle	2-row	North Dakota State University
Quest	6-row	University of Minnesota
Sangria	2-row	Ackermann (Germany)
SY Sirish	2-row	Syngenta
Tradition	6-row	Busch Agricultural Resources, LLC
2ND28065	2-row	North Dakota State University experimental line
2ND33710	2-row	North Dakota State University experimental line
2ND33757	2-row	North Dakota State University experimental line
2ND33760	2-row	North Dakota State University experimental line
2ND33821	2-row	North Dakota State University experimental line

METHODS

The trials were conducted at the University of Maine Rogers Research Farm, in Old Town, and the Aroostook Research Farm, in Presque Isle. 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 Presque Isle, Maine in 2017.

	Old Town	Presque Isle
Previous Crop	Pea cover crop	Potato
Soil Type	Nicholville very fine sandy loam	Caribou gravelly loam
Fertility	20 tons/acre solid dairy manure (approx. 60 lb available N per acre)	200 lb/acre of 32-0-0 topdressed on July 11
Planting Date, Rate	April 30, 1.3 million live seeds/acre	June 6 at 1.3 million live seeds/acre
Weed Control	Tine harrow, May 25	MCPA Rhomene – 0.75 pt/acre & Harmony – 1 oz/acre, July 14
Harvest Date	August 3	September 15

RESULTS

Yields were lower in 2017 than in the previous two years of the Maine EBSN trials. Site averages were 75 bu/acre in Old Town and 67 bu/acre in Presque Isle (Table 3), as compared with 109 and 95 bu/acre in 2016, respectively. Wet weather during emergence in Old Town and delayed planting in Presque Isle contributed to lower yields. The highest yielding varieties at both locations were KWS Tinka, Esma, AAC Synergy, and Explorer, while the lowest yielding variety was Pinnacle, which experienced early and severe foliar disease pressure.

Grain moisture at the Old Town location (Table 3) averaged 14.1% and was uniform across varieties with the exception of 2ND33821 which was at 19.3%. Foliar diseases were moderate at both locations with the exception of Pinnacle.

Grain quality data is summarized in Table 4. Of note:

- DON levels were low for all varieties at both sites this year.
- Sprout damage, as measured using RVA, was minimal with only three varieties, LCS Odyssey, KWS Tinka and AAC Synergy showing moderate sprout damage.
- Germination energy (GE) was high at the Old Town location, averaging 97%, but a few varieties still had GEs below the 95% optimal level. In contrast, in Presque Isle site, where average GE was 87%, many varieties had good GEs. Newdale performed poorly at this site.
- Protein levels in Old Town were low, averaging 8.3%, and have been consistently low in prior years. At this site, manure is applied at a rate to supply approximated 60 pounds of available N per acre. In the future, we plan to either increase the manure rate or topdress additional N.

Malt quality results are forthcoming.

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Table 3. Agronomic characteristics of malting barley varieties grown in Old Town and Presque Isle in 2017.

Variety	Yield†		Grain Moisture at Harvest‡		Foliar Disease Severity		Height		Stem Breakage		Heading date	
	(bu/acre)	(bu/acre)	(%)	(%)	(1 - 9) §	(1 - 9) §	(in)	(in)	(1 - 9) §	(1 - 9) §	(days after 5/31)	(days after 5/31)
	Old Town	Presque Isle	Old Town	Presque Isle≠	Old Town	Presque Isle	Old Town	Presque Isle≠	Old Town	Presque Isle	Old Town	Presque Isle≠
AAC Synergy	89	74	14.1	-	1.7	3.3	31.2	-	1.0	1.3	29	-
Acorn	83	67	13.8	-	2.0	1.7	26.3	-	1.7	1.0	27	-
Bettina	70	60	14.2	-	2.7	3.0	24.9	-	1.3	1.0	27	-
Conlon	76	58	13.6	-	2.0	2.3	30.4	-	2.7	2.0	23	-
Esma	92	81	13.6	-	2.0	2.7	23.5	-	2.0	1.3	27	-
Explorer	87	79	13.4	-	2.0	2.3	24.1	-	2.3	1.0	24	-
KWS Beckie	76	56	13.7	-	3.0	4.3	22.5	-	1.7	1.0	27	-
KWS Fantex	83	73	13.7	-	2.3	2.0	23.2	-	1.3	1.0	30	-
KWS Josie	81	58	14.4	-	2.7	4.0	23.5	-	1.3	1.0	29	-
KWS Tinka	98	75	14.2	-	1.7	3.0	26.9	-	1.7	1.0	27	-
LCS Genie	60	59	14.6	-	4.0	4.7	25.4	-	1.0	1.0	27	-
LCS Odyssey	65	68	13.8	-	3.3	3.7	26.0	-	1.3	1.0	27	-
Manta	80	68	14.5	-	2.7	2.7	25.9	-	2.7	1.3	25	-
ND Genesis	78	79	14.3	-	2.7	3.7	31.5	-	1.0	1.0	22	-
Newdale	75	65	13.7	-	2.0	2.7	27.7	-	1.0	1.0	27	-
Pinnacle	25	40	14.2	-	9.0	9.0	28.5	-	5.0	5.0	25	-
Quest	81	75	13.1	-	1.7	2.3	34.8	-	1.0	1.3	26	-
Sangria	80	59	14.0	-	2.7	2.0	24.7	-	1.3	1.0	29	-
SY Sirish	56	63	13.6	-	3.0	2.0	23.2	-	2.7	1.0	29	-
Tradition	75	75	13.5	-	3.3	4.0	31.6	-	1.0	1.0	25	-
2ND28065	69	73	14.3	-	2.7	2.7	32.4	-	2.3	1.3	26	-
2ND33710	70	66	14.0	-	2.0	1.0	32.1	-	2.0	1.0	24	-
2ND33757	67	64	13.7	-	3.4	3.0	32.4	-	2.7	1.0	23	-
2ND33760	81	74	13.3	-	2.7	3.7	34.0	-	2.3	1.0	26	-
2ND33821	77	60	19.3	-	1.3	1.0	34.2	-	1.0	1.0	26	-
Site average	75	67	14.1	-	2.7	3.1	28.0	-	1.8	1.3	26	-
LSD (0.05)	11.1	11.1	0.9	-	1.3	1.2	2.0	-	1.0	0.2	--	-
CV%	20.2	17.1	9.08	-	58	54.2	14.7	-	57.8	67.9	--	-

† Yield is reported at 13.5% moisture. ‡ Measured at time of harvest.

§ Scored visually using a scale from 1 = none to 9 = high. Disease pressure was scored on June 26 in Old Town and Aug 8 in Presque Isle. Stem breakage was scored at harvest.

≠ Data not collected at this location

Table 4. Grain quality characteristics of malting barley varieties grown in Old Town and Presque Isle in 2017.

Variety	Test Wt.		TKW†		DON‡		Protein§		Plump Kernels≠		RVA#		Germ. Energy¥	
	(lbs/bu)		(g)		(ppm)		(%)		(%)		(stirring number)		(%)	
	Old Town	Presque Isle	Old Town	Presque Isle	Old Town	Presque Isle	Old Town	Presque Isle	Old Town	Presque Isle	Old Town	Presque Isle	Old Town	Presque Isle
AAC Synergy	50	49	41	44	0.0	--	7.9	--	97	--	117	--	99	73
Acorn	47	48	41	39	0.0	--	7.8	--	95	--	134	--	97	94
Bettina	49	48	45	41	0.0	--	7.6	--	95	--	136	--	97	85
Conlon	52	49	47	45	0.0	--	9.8	--	98	--	164	--	99	85
Esma	50	49	46	45	0.0	--	7.4	--	96	--	190	--	97	88
Explorer	49	48	47	44	0.0	--	7.5	--	97	--	140	--	99	94
KWS Beckie	45	46	38	38	0.0	--	7.6	--	92	--	134	--	98	83
KWS Fantex	48	48	40	41	0.1	--	7.6	--	92	--	164	--	98	83
KWS Josie	48	48	42	40	0.0	--	8.2	--	93	--	148	--	99	92
KWS Tinka	49	48	48	46	0.0	--	7.9	--	95	--	112	--	96	79
LCS Genie	50	49	42	39	0.1	--	9.2	--	95	--	183	--	94	86
LCS Odyssey	46	49	38	42	0.0	--	8.1	--	90	--	106	--	94	95
Manta	50	49	40	41	0.0	--	7.5	--	89	--	163	--	98	86
ND Genesis	51	48	46	43	0.0	--	8.5	--	96	--	154	--	97	83
Newdale	50	48	41	41	0.0	--	7.6	--	87	--	182	--	99	69
Pinnacle	46	47	37	40	0.0	--	9.8	--	69	--	207	--	98	92
Quest	50	49	37	37	0.0	--	9.7	--	89	--	190	--	99	95
Sangria	50	49	40	44	0.0	--	7.7	--	90	--	142	--	98	89
SY Sirish	47	49	37	41	0.0	--	7.8	--	92	--	173	--	98	91
Tradition	50	49	39	41	0.0	--	9.3	--	94	--	194	--	98	94
2ND28065	52	49	41	43	0.0	--	8.9	--	93	--	170	--	99	91
2ND33710	51	49	44	43	0.0	--	8.7	--	94	--	180	--	99	91
2ND33757	51	49	42	44	0.0	--	8.9	--	89	--	170	--	99	83
2ND33760	52	49	45	47	0.0	--	8.2	--	94	--	170	--	99	82
2ND33821	49	48	48	48	0.0	--	8.6	--	98	--	149	--	78	85
Site average	49	48	41	42	0.0	--	8.3	--	92	--	159	--	97	87
LSD (0.05)	1.3	1.7	2.4	3.5	--	--	--	--	--	--	--	--	2.9	8.1
CV%	4.1	2.5	9.1	8.2	--	--	--	--	--	--	--	--	3.9	8.9

† Thousand kernel weight. ‡ Deoxynivalenol (DON) is a mycotoxin caused by *Fusarium* head blight. § Protein is reported on a dry matter basis. Acceptable range is 9.5-12.5%.

≠ Kernel plumpness is measured as the percentage of barley that remains on top of a 6/64" by 3/4" slotted sieve after shaking.

Rapid Visco-Analyzer (RVA) indicator pre-harvest sprout damage. Samples with RVA>120 are considered sound with high probability of maintaining germination energy in storage. Values below this level indicate sprout damage with severity increasing as values decrease.

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