Spring Malting Barley Variety Trial
2020 Results

Ellen Mallory and Tom Molloy
University of Maine Cooperative Extension

Twenty-six varieties of two- and six-row spring malting barley and one feed barley were trialed at two locations in Maine in 2020 (Table 1). The trials were conducted in collaboration with 5 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 Mapleton, Maine in 2020.

Variety	Type	Years in Maine Trials	Developer
AAC Connect	2-row	2	Agriculture and Agri-Food Canada (Brandon)
AAC Synergy	2-row	6	Agriculture and Agri-Food Canada (Brandon)
Accordine	2-row	3	Ackermann (Germany)
Brunilda	2-row	1	Ackermann (Germany)
Eifel	2-row	1	Secobra (France)
Esma	2-row	4	Ackermann (Germany)
Explorer	2-row	2	Secobra (France)
Focus	2-row	1	Secobra (France)
Klarinette	2-row	2	Secobra (France)
KWS Fantex	2-row	5	KWS (Germany)
KWS Jessie	2-row	1	KWS (Germany)
KWS Willis	2-row	1	KWS (Germany)
LCS Barbarella	2-row	1	Limagrain Cereal Seeds
LCS Genie	2-row	5	Limagrain Cereal Seeds
ND Genesis	2-row	6	North Dakota State University
Pinnacle	2-row	6	North Dakota State University
Sangria	2-row	4	Agriculture and Agri-Food Canada (Brandon)
Tradition	6-row	6	Busch Agricultural Resources, LLC
2ND32184	2-row	1	North Dakota State University
2ND32529	2-row	3	North Dakota State University
2ND36638	2-row	1	North Dakota State University
2ND36642	2-row	1	North Dakota State University
2ND37111	2-row	1	North Dakota State University
2ND37130	2-row	1	North Dakota State University
2ND37568	2-row	1	North Dakota State University
AAC Starbuck	2-row, hulless, feed	2	Agriculture and Agri-Food Canada (ECORC)

METHODS

The trials were conducted at the University of Maine Rogers Research Farm, in Old Town, and Buck Farms in Mapleton. The locations were managed using organic practices in Old Town and conventional practices in Mapleton. 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 quality analysis.

Table 2. Agronomic practices in Old Town and Mapleton, Maine in 2020.

	Old Town	Mapleton
Previous Crop	Oat/mustard cover crop	Sunflowers
Soil Type	Nicholville very fine sandy loam	Caribou gravely loam
pH	6.2	6.0
Pre-plant Fertility	3950/acre pelletized chicken manure (approx. 79 lb/acre nitrogen)	340 lb/acre of 19-0-19 at planting
Planting Date, Rate	May 13, 1.45 million live seeds/acre	May 20, 1.25 million live seeds/acre
Weed Control	May 27, inter-row hoe + tine harrow	June 12, 2-4D (1 pt/acre)
Fungicide	None	July 16, Prosaro (6.5 oz/acre)
Harvest Date	August 3	August 20

RESULTS

Drought conditions during critical early growth stages (Table 3) negatively impacted plant growth, yield, and grain quality at both locations (Table 4 and 5). The Old Town site did not get significant rainfall after June 29 when it received 0.75 inches of rain. The region where the Mapleton site is located suffered historic drought conditions, receiving less then 1” during the month of June.

In Old Town, the average yield was 32 bu/acre, which was considerably lower than the average over the prior 5 years of 83 bu/acre. The site average yield for the Mapleton was 44 bu/acre, also relatively low due to the drought. According to USDA-NASS survey data, the average barley yield in Maine in 2020 was 54 bu/acre, malt and feed barleys combined, as compared 63 bu/acre for the prior 10 years.

The Mapleton location was one of four sites chosen for additional malt quality analysis. Results are pending.

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Table 3. Monthly rainfall totals and average temperatures in Old Town and Caribou in 2020.

	Total Rainfall (inches)				Temperature (F)			
	Old Town		Caribou†		Old Town		Caribou†	
Month	2020	30-yr avg.	2020	30-yr avg.	2020	30-yr avg.	2020	30-yr avg.
April	4.7	3.8	2.8	2.5	39	41	37	39
May	2.4	3.8	2.4	3.4	52	53	51	52
June	1.5	4.1	0.9	3.4	63	62	64	61
July	3.5	3.6	3.0	3.7	70	67	70	66
August	3.7	3.3	2.2	3.7	67	66	66	64
Total	15.8	18.6	11.4	16.7	-	-	-	-

† The weather station in Caribou is approximately 20 miles from the Mapleton site. 30-year norms are from 1981 to 2010.

Table 4. Agronomic characteristics of malting barley varieties grown in Old Town and Mapleton in 2020.

	Yield† (bu/acre)		Grain Moisture‡ (%)		Spike Emergence (1-5) #		Stand Count ≠ (#/ft²)		Heading date (days after 5/31)	
Variety	**Old Town**	**Mapleton**	**Old Town**	**Mapleton**	**Old Town**	**Mapleton**	**Old Town**	**Mapleton**	**Old Town**	**Mapleton**
AAC CONNECT	29	**48**	-	13.3	4.1	4.3	32	21	**32**	-
AAC SYNERGY	33	**47**	-	14.3	4.1	4.0	30	25	31	-
ACCORDINE	32	37	-	15.5	4.0	4.7	24	15	31	-
BRUNILDA	35	**42**	-	17.9	4.0	3.7	26	19	31	-
EIFEL	35	**46**	-	13.8	4.3	4.7	21	17	31	-
ESMA	22	**42**	-	14.4	3.4	4.3	31	21	**32**	-
EXPLORER	30	**46**	-	14.1	3.3	4.7	27	23	30	-
FOCUS	31	**48**	-	14.7	4.0	4.7	22	15	30	-
KLARINETTE	31	**42**	-	15.2	3.7	4.3	28	20	29	-
KWS FANTEX	26	**48**	-	15.0	4.3	4.0	28	21	31	-
KWS JESSIE	34	**44**	-	14.4	4.3	4.7	28	21	27	-
KWS WILLIS	31	41	-	17.0	4.0	4.3	26	22	30	-
BARBARELLA	34	36	-	18.1	3.0	4.7	28	22	27	-
LCS GENIE	19	**49**	-	13.8	4.3	3.7	31	**32**	**34**	-
ND GENESIS	27	**43**	-	14.9	3.3	4.0	**34**	23	30	-
PINNACLE	30	40	-	15.5	4.3	4.0	33	25	30	-
Robust	28	32	-	16.6	4.3	4.3	21	16	31	-
SANGRIA	36	36	-	14.5	3.7	4.3	30	21	28	-
TRADITION	33	29	-	12.7	3.7	4.7	**39**	**32**	28	-
2ND32184	41	41	-	13.8	4.0	4.3	31	25	30	-
2ND32529	33	**43**	-	13.9	4.7	4.0	33	25	28	-
2ND36638	24	40	-	13.4	4.0	4.3	30	**28**	29	-
2ND36642	35	39	-	14.5	3.7	4.3	25	26	28	-
2ND37111	34	40	-	16.7	3.3	4.3	23	22	30	-
2ND37130	33	37	-	16.2	4.7	3.7	30	25	**32**	-
2ND37568	28	38	-	15.8	3.7	4.3	24	21	**32**	-
AAC Starbuck	22	36	-	16.1	3.7	4.7	21	18	31	-
Site average	32	41	-	15.0	3.9	4.3	28	22	30	-
LSD (0.05)	NS	6.9	-	-	NS	NS	5.9	4.5	2.3	-
CV%	22	20	-	-	16	15	20	22	7	-

† Yield is reported at 13.5% moisture. ‡ Measured at harvest from only one rep. § 1 = none to 9 = high. # on a scale from 1 = 0% emerged to 5 = 100% emerged.
≠Target populations were 33 and 29 plants/ft² in Old Town and Mapleton, respectively.

Table 5. Grain quality characteristics of malting barley varieties grown in Old Town and Mapleton in 2020.

	Test Wt. (lbs/bu)		TKW† (g)		DON‡ (ppm)		Protein§ (%)		Plump Kernels≠ (%)		RVA# (stirring number)		Germ. Energy¥ (%)	
Variety	**Old Town**	**Mapleton**	**Old Town**	**Mapleton**	**Old Town**	**Mapleton**	**Old Town**	**Mapleton**	**Old Town**	**Mapleton**	**Old Town**	**Mapleton**	**Old Town**	**Mapleton**
AAC CONNECT	40	49	37	49	0.0	0	13.7	13.4	46	91	90	153	**95**	**97**
AAC SYNERGY	42	50	37	50	1.5	0	13.6	13.4	56	94	90	171	**96**	**98**
ACCORDINE	40	50	38	48	0.0	0	13.6	14.5	68	95	20	87	**85**	**93**
BRUNILDA	38	48	34	50	0.0	0	14.2	14.1	59	94	7	32	82	**92**
EIFEL	40	49	36	48	0.3	0	14.3	14.1	60	95	110	192	**89**	**96**
ESMA	41	49	37	49	0.0	0	13.6	14.3	62	94	72	57	**88**	**93**
EXPLORER	41	47	**40**	47	0.0	0	14.8	14.4	73	94	73	157	84	**94**
FOCUS	40	48	38	51	0.0	0	13.9	13.7	60	93	40	118	84	**95**
KLARINETTE	38	49	31	46	0.0	0	13.8	14.1	55	92	108	185	81	**97**
KWS FANTEX	37	49	31	50	0.0	0	14.4	13.5	49	95	126	206	**93**	**97**
KWS JESSIE	41	50	34	48	0.0	0	12.8	13.8	69	95	36	148	**87**	**97**
KWS WILLIS	37	48	32	51	0.0	0	13.7	13.9	66	96	87	169	**87**	**98**
BARBARELLA	39	48	33	48	0.0	0	13.8	14.1	68	92	75	146	**90**	**95**
LCS GENIE	38	51	29	47	0.1	0	14.0	13.5	41	96	127	178	**90**	**98**
ND GENESIS	40	48	38	48	0.0	0	12.5	12.6	60	93	106	168	**86**	**96**
PINNACLE	40	48	32	48	0.0	0	12.8	12.1	59	94	145	171	**92**	**96**
Robust	38	50	32	44	-	-	-	-	-	-	-	-	-	-
SANGRIA	41	49	33	49	0.0	0	13.6	14.3	67	95	12	81	82	**97**
TRADITION	42	45	35	38	0.0	0	13.7	15.4	71	89	159	177	**93**	**93**
2ND32184	43	49	**40**	46	0.0	0	12.0	13.8	66	93	32	98	**90**	**94**
2ND32529	42	47	**41**	49	0.0	0	12.3	13	75	95	25	130	84	86
2ND36638	40	49	**40**	**52**	0.0	0	12.9	12.5	71	96	88	154	79	91
2ND36642	40	49	**44**	**54**	0.0	0	12.5	13	71	96	52	95	**86**	**95**
2ND37111	38	47	38	**53**	0.0	0	12.8	12.7	62	93	138	163	**90**	**94**
2ND37130	38	46	37	**52**	0.0	0	12.3	12.7	57	95	142	180	**93**	**96**
2ND37568	37	48	34	46	0.0	0	12.9	12.1	58	94	87	172	**96**	**95**
AAC Starbuck	**47**	**56**	36	50	-	-	-	-	-	-	-	-	-	-
Site average	40	49	36	48	0.1	0.0	13.5	13.6	61	94	81	145	88	92
LSD (0.05)	2.3	2.9	4.0	2.9	-	-	-	-	-	-	-	-	11	6
CV%	7	4	12	7	-	-	-	-	-	-	-	-	7.8	3.6

† 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