

Overview of Midwest Spring Barley Breeding Programs

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NDSU

Acknowledgements

- Kevin Smith – University of Minnesota
- Gary Hanning – Busch Agricultural Resource
- Paul Schwarz – North Dakota State University
- Al Budde and Mark Schmitt – USDA-ARS
Madison, WI

ANSWERS TO BREEDER SURVEY QUESTIONS

NDSU

Barley Classes Worked On

Class	Busch Agricultural Resources	North Dakota State University	University of Minnesota
	-----%		
Feed	0	10	5
Malt	100	90	95

Test Sites Used Within State/Region

	Busch Agricultural Resources	North Dakota State University	University of Minnesota
	Number of sites		
Within the state/region	4-6	7	5
Outside the state/region*	2-4	1	0

*Outside state/region values do not include Uniform Region Trial locations.

Approximate Amount to be Allocated to Barley Research in 2011

Busch Agricultural Resources	North Dakota State University	University of Minnesota
Not reported	\$750,000	\$400,000

Approximate Number of Yield Trial Plots in 2011

Busch Agricultural Resources	North Dakota State University*	University of Minnesota
8,000	13,000	3,000

*Yield trial allocations are approximately 65% six-rowed and 35% two-rowed.

Recent Variety Releases

Busch Agricultural Resources	North Dakota State University	University of Minnesota
Celebration	Stellar-ND	Rasmusson
Innovation	Pinnacle (two-rowed)	Quest (FHB resistance)

Greatest Challenges Facing Barley Improvement

Busch Agricultural Resources

North Dakota State University

University of Minnesota

- Varieties that incorporate FHB resistance, acceptable agronomic performance and malt quality, and foliar disease resistance.
- Keeping barley competitive with other crops and maintaining acreage.

Best Method of Incorporating FHB Resistance with Acceptable Agronomics, Malt Quality, and Foliar Disease Resistance

Busch Agricultural Resources	North Dakota State University	University of Minnesota
No response	Genomic selection	

Agronomic Performance of Selected Midwest Barley Varieties, 2007-2010.

Variety	Yield	Days to heading	Plant height	Lodging	Stem breakage	DON
	(bu/ac)	(d after 5/31)	(cm)	(1-9) †	(1-5) ‡	(ppm) §
Station years	31	34	34	15	5	8
Lacey	98.3	27.8	79.0	3.1	3.3	32.0
Tradition	96.2	28.6	82.6	3.3	2.7	35.4
Stellar-ND	93.4	28.1	80.1	3.2	3.1	24.8
Rasmusson	103.0	27.9	77.1	3.5	3.3	32.1
Conlon	90.8	25.2	78.0	4.1	3.5	17.8
Pinnacle	104.6	29.1	78.6	2.8	2.2	32.3

†Lodging score of 1=no lodging and 9=severe lodging.

‡Stem breakage score of 1=no stem breakage and 9=severe stem breakage at harvest.

§ DON=deoxynivalenol. Data courtesy of Dr. Paul Schwarz, NDSU.

Malt Quality of Selected Midwest Barley Varieties†

Variety	Barley protein	Plump kernels	Malt extract	Wort protein	S/T	Diastatic power	α -amylase	β -glucan
	(%)	(%)	(%)	(%)	(%)	(°ASBC)	(20° DU)	(ppm)
Station years	11	11	11	11	11	11	11	11
Lacey	13.7	91.0	79.5	43.0	5.68	181	70.3	139
Tradition	13.9	93.8	79.3	39.8	5.29	208	73.1	207
Stellar-ND	13.5	93.0	80.0	44.8	5.77	199	77.1	139
Rasmusson	13.2	92.2	80.4	45.2	5.70	181	75.4	144
Conlon	13.4	96.0	80.5	40.0	5.18	134	77.1	375
Pinnacle	12.2	95.3	81.3	42.8	5.10	111	63.9	221

†Malt data courtesy of the USDA-ARS Cereal Crops Research Unit, Madison, WI.

Agronomic Performance of Entries Added to the AMBA List of Recommended Varieties, 2007-2010

Variety	Yield	Days to heading	Plant height	Lodging	Stem breakage	DON
	(bu/ac)	(d after 5/31)	(cm)	(1-9) †	(1-5) ‡	(ppm) §
Station years	36	39	39	15	11	8
Tradition	94.1	27.5	83.2	3.6	2.8	35.4
Quest	94.7	27.4	83.6	3.5	3.3	22.6
Celebration	96.9	28.2	81.2	3.6	3.8	33.6

†Lodging score of 1=no lodging and 9=severe lodging.

‡Stem breakage score of 1=no stem breakage and 9=severe stem breakage at harvest.

§ DON=deoxynivalenol. Data courtesy of Dr. Paul Schwarz, NDSU.

Malt Quality of Entries Added to the AMBA List of Recommended Varieties, 2007-2010†

Variety	Barley protein	Plump kernels	Malt extract	Wort protein	S/T	Diastatic power	α -amylase	β -glucan
	(%)	(%)	(%)	(%)	(%)	(°ASBC)	(20° DU)	(ppm)
Station years	11	15	11	11	11	11	11	11
Tradition	13.9	92.5	79.2	5.29	39.8	208	73.1	207
Quest	13.5	88.9	79.5	5.67	44.2	170	77.3	239
Celebration	14.2	90.8	79.8	5.97	43.9	208	88.1	130

†Malt data courtesy of the USDA-ARS Cereal Crops Research Unit, Madison, WI.

Agronomic Performance of Entries In AMBA Plant Scale Evaluation, 2007-2010

Variety	Yield	Days to heading	Plant height	Lodging	Stem breakage	DON
	(bu/ac)	(d after 5/31)	(cm)	(1-9) †	(1-5) ‡	(ppm) §
Station years	27	28	28	12	9	4
Tradition	97.8	28.4	83.7	4.0	2.9	36.1
Innovation	100.5	28.0	80.9	3.8	3.2	19.9
ND22421	101.6	27.6	72.9	2.8	2.3	29.4

†Lodging score of 1=no lodging and 9=severe lodging.

‡Stem breakage score of 1=no stem breakage and 9=severe stem breakage at harvest.

§ DON=deoxynivalenol. Data courtesy of Dr. Paul Schwarz, NDSU.

Malt Quality of Midwest Entries In AMBA Plant Scale Evaluation, 2008-2010†

Variety	Barley protein	Plump kernels	Malt extract	Wort protein	S/T	Diastatic power	α -amylase	β -glucan
	(%)	(%)	(%)	(%)	(%)	(°ASBC)	(20° DU)	(ppm)
Station years	6	6	6	6	6	6	6	6
Tradition	13.7	95.0	79.8	40.4	5.29	197	71.0	258
Innovation	13.4	93.9	80.2	46.4	5.95	161	74.1	228
ND22421	13.2	93.9	80.1	47.2	6.00	153	74.5	205

†Malt data courtesy of the USDA-ARS Cereal Crops Research Unit, Madison, WI.

Entries Eligible for AMBA Plant Scale Evaluation in 2011

- M135 – University of Minnesota
- ND23898 – North Dakota State University