

Table 1. Agronomic trait means of the 2014-2015 Winter Malting Barley Trial (WMBT)^a at 15 locations.

Trial location	Winter Survival (%)	Yield (Bu/A)	Heading date (Julian day)	Height (cm)	Lodging degree (0-9)	Lodging incidence (%)	Straw breakage (%)	Test Weight (lb/Bu)	Grain Protein-breeder measure (%)	Plump-breeder measure (%)	Deoxynivalenol content (ppm)	BYDV susceptibility (0-9)	Leaf Scald severity (%)	Leaf Rust susceptibility (0-9)	Leaf Scald reaction (0-9)	Net blotch (net form) reaction (0-9)	Powdery Mildew susceptibility (0-9)	Stripe Rust severity (%)
Aberdeen, ID	90.8	155.5	127.3	85.4	0.4	.	.	52.3	.	.	.	.	.	.	.	.	.	.
Filer, ID	.	138.7	125.7	.	0.5	.	.	55.8	.	.	.	.	.	.	.	.	.	.
Logan County, KY	100.0	50.6	125.8	86.7	3.4	.	.	44.3	.	.	.	.	.	.	.	.	.	.
South Deerfield, MA	89.6	31.5	145.5	52.1	0.7	.	.	.	.	.	.	.	.	.	.	.	.	.
Saint Paul, MN	0.0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mills River, NC	.	98.3	107.6	.	5.3	.	.	49.5	.	.	.	.	.	.	.	.	.	.
Raleigh, NC	.	92.2	105.2	74.6	1.6	.	.	41.6	.	.	.	.	.	.	.	.	.	.
Ithaca, NY	74.0	50.7	152.9	74.1	.	.	.	45.1	.	.	.	.	.	.	.	.	.	.
Wooster, OH	100.0	72.4	.	.	5.2	.	.	.	.	.	0.5	.	.	.	.	.	.	.
Corvallis, OR	100.0	125.7	109.6	100.9	0.2	4.5	10.3	51.4	10.4	73.8	.	.	42.6	.	.	.	.	1.7
Glen Mills, PA	94.7	94.4	130.3	69.7	3.0	.	.	45.6	.	89.9	.	0.0	.	0.2	0.6	0.0	1.4	.
Blacksburg, VA	94.4	92.8	120.1	73.1	4.2	.	.	44.4	.	.	.	1.8	.	4.2	.	0.6	.	.
Warsaw, VA	.	111.5	119.2	81.4	7.2	.	.	42.0	.	.	.	.	.	.	.	2.1	1.6	.
Alma, WI	.	64.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
River Falls, WI	87.2	46.7	152.9	72.6	.	.	.	43.3	.	.	.	.	.	.	.	.	.	.
GRAND MEAN	83.0	87.0	126.8	77.0	2.9	4.5	10.3	46.8	10.4	81.8	0.5	0.9	42.6	2.2	0.6	0.9	1.5	1.7

^a Agronomic data reported for 15 of 20 locations planted

Table 2. Malt quality^a trait means of the 2014-2015 Winter Malting Barley Trial (WMBT)^b at six locations.

Trial location	Kernel weight (mg)	Plump grains (%)	Malt extract (%)	Grain Protein (%)	Wort Protein (%)	S/T (%)	Diastatic Power °ASBC	Alpha Amylase (20°DU)	Beta Glucan (ppm)	Free Amino Nitrogen (ppm)	Grain color (°ASBC)	Wort color (°ASBC)	Wort clarity (1-3)
Aberdeen, ID	35.2	85.0	79.9	11.8	4.6	40.4	146.1	57.5	270.7	194.1	69.3	1.6	1.7
Filer, ID	39.1	91.0	81.6	10.1	4.2	43.7	132.4	60.1	171.7	175.6	69.2	1.8	1.5
Ithaca, NY	36.5	94.5	82.7	8.8	4.5	54.5	97.8	88.4	107.8	240.0	22.8	2.8	1.0
Wooster, OH	32.1	85.1	79.8	12.0	5.6	47.6	115.3	70.1	193.4	238.9	26.3	2.8	2.1
Corvallis, OR	35.5	88.1	80.0	11.2	4.9	46.2	168.2	74.4	148.6	220.0	53.5	2.5	1.1
Glen Mills, PA	33.6	98.2	80.5	8.5	3.9	47.7	69.0	50.7	117.7	163.4	25.9	2.9	2.2
GRAND MEAN	34.6	89.3	80.4	10.6	4.6	45.4	118.7	62.1	183.6	197.2	46.6	2.1	1.8

^a Malt quality data courtesy of the USDA-ARS Cereal Crops Research Unit, Madison, WI

^b Malt quality data reported for six of 20 locations planted

Table 3. Winter Survival (%) line means for 2014-2015 Winter Malting Barley Trial (WMBT) entries at 10 locations.

Line	Line Mean	Aberdeen, ID	Logan County, KY	South Deerfield, MA	Saint Paul, MN	Ithaca, NY	Wooster, OH	Corvallis, OR	Glen Mills, PA	Blacksburg, VA	River Falls, WI
CHARLES	81.3	96.7	100	100.0	0	70.0	100	100	94.7	93.3	58.0
STRIDER	84.8	96.0	100	92.9	0	76.7	100	100	94.7	95.0	92.5
MCGREGOR	86.4	97.7	100	98.9	0	90.0	100	100	94.7	99.0	83.3
HIRONDELLA	78.8	87.7	100	47.0	0	60.0	100	100	94.7	99.0	100.0
SU_MATEO	79.3	77.7	100	63.5	0	73.3	100	100	94.7	99.0	85.2
FLAVIA	72.1	53.3	100	52.2	0	46.7	100	100	94.7	99.0	74.6
06OR-09	84.8	97.7	100	99.0	0	93.3	100	100	94.7	88.3	74.4
2011-F5-141-5	86.8	100.0	100	95.0	0	97.7	100	100	94.7	91.7	89.3
10.086	81.9	.	100	74.5	0	70.0	100	100	94.7	97.7	100.0
MAJA	87.5	97.0	100	100.0	0	90.0	100	100	94.7	93.3	100.0
02AB431	82.0	96.0	100	93.8	0	60.0	100	100	94.7	90.0	85.6
02AB669	82.3	93.3	100	96.0	0	60.0	100	100	94.7	93.3	85.2
02AB671	82.0	82.0	100	94.4	0	66.7	100	100	94.7	93.3	88.9
05ARS540-125	81.8	84.3	100	89.2	0	66.7	100	100	94.7	91.7	91.7
04ARS635-89	84.9	97.0	100	100.0	0	70.0	100	100	94.7	95.0	92.1
04ARS640-1	79.7	97.0	100	98.1	0	33.3	100	100	94.7	91.7	82.1
LCS_VIOLETTA	85.2	90.0	100	100.0	0	80.0	100	100	94.7	99.0	88.4
MW11S3029-010	84.2	96.7	100	83.8	0	90.0	100	100	94.7	91.7	85.6
MW11S3034-006	86.0	98.0	100	100.0	0	91.7	100	100	94.7	91.3	84.3
6W11-0003	83.5	93.7	100	98.1	0	70.0	100	100	94.7	89.3	88.9
6W11-0064	86.8	97.0	100	97.6	0	90.0	100	100	94.7	95.0	93.3
6W11-0071	84.3	85.0	100	97.5	0	80.0	100	100	94.7	93.3	92.1
SC85942	81.6	83.3	100	88.7	0	73.3	100	100	94.7	96.3	79.6
LCS_CALYPSO	84.8	91.0	100	89.9	0	76.7	100	100	94.7	99.3	96.7
GRAND MEAN	83.0	90.8	100	89.6	0	74.0	100	100	94.7	94.4	87.2

Table 4. Yield (Bu/A) line means for 2014-2015 Winter Malting Barley Trial (WMBT) entries at 14 locations.

Line	Line Mean	Aberdeen, ID	Filer, ID	Logan County, KY	South Deerfield, MA	Mills River, NC	Raleigh, NC	Ithaca, NY	Wooster, OH	Corvallis, OR	Glen Mills, PA	Blacksburg, VA	Warsaw, VA	Alma, WI	River Falls, WI
CHARLES	76.7	161.3	123.0	50.2	40.6	75.0	84.0	39.4	37.6	116.9	79.6	78.2	91.7	71.1	24.8
STRIDER	91.3	178.4	160.3	49.0	28.2	85.5	58.1	54.2	69.9	129.5	107.0	85.2	125.8	76.1	71.0
MCGREGOR	98.3	145.4	127.1	47.0	35.6	113.4	106.9	58.3	54.5	216.7	107.8	128.2	131.8	54.5	49.2
HIRONDELLA	102.6	144.9	165.1	65.4	13.9	102.4	98.1	40.0	96.1	249.7	74.2	127.6	118.9	66.6	73.6
SU_MATEO	91.7	144.7	121.3	64.1	28.0	90.7	86.3	41.1	81.4	119.7	98.1	114.5	132.5	109.1	51.6
FLAVIA	88.1	126.3	96.5	68.5	17.7	113.6	95.5	41.4	77.5	107.0	111.4	118.9	134.9	84.2	39.6
06OR-09	88.6	161.2	153.3	54.7	31.7	113.5	89.4	65.0	82.8	62.7	92.5	91.0	122.0	60.4	59.9
2011-F5-141-5 10.086	90.0 59.6	166.9	135.8	70.0 23.4	28.8 25.6	117.3	73.4	66.1	94.9	102.1	96.2	90.2	125.7	47.8	45.3 52.8
MAJA	86.7	160.4	142.7	46.9	33.5	119.3	88.8	55.3	75.9	129.8	84.4	86.2	105.7	43.5	41.4
02AB431	81.0	165.5	137.6	42.0	31.6	77.1	92.7	42.7	55.1	112.2	93.5	74.5	94.4	65.1	50.4
02AB669	85.1	172.6	141.0	51.1	31.0	95.2	103.7	41.9	70.9	126.9	82.9	83.5	104.8	45.2	40.6
02AB671	80.4	145.9	119.6	62.0	25.3	97.5	99.9	44.8	70.7	128.6	75.9	74.2	93.5	45.1	42.1
05ARS540-125	84.0	168.2	144.4	34.7	38.2	94.3	119.4	50.3	45.5	82.7	100.1	77.1	99.3	79.3	42.6
04ARS635-89	77.2	164.2	146.4	20.5	36.8	75.5	75.3	42.4	56.8	116.6	80.0	77.4	89.1	54.8	44.3
04ARS640-1	91.4	153.4	130.5	71.8	46.1	110.9	126.6	39.0	57.4	117.0	103.4	95.0	110.6	80.2	37.8
LCS_VIOLETTA	92.9	158.5	118.5	73.2	28.7	92.4	80.9	44.4	91.4	110.2	112.0	115.2	120.3	103.5	51.1
MW11S3029-010	85.3	127.2	138.1	51.9	28.5	92.4	113.0	60.5	59.5	145.0	95.8	78.9	115.9	42.6	44.6
MW11S3034-006	80.9	139.9	149.5	40.0	32.2	88.3	99.9	62.9	79.1	104.3	90.8	76.1	100.4	40.3	29.5
6W11-0003	101.5	153.6	166.5	33.2	34.9	132.1	95.5	60.4	87.8	244.8	99.3	107.9	109.5	54.1	41.6
6W11-0064	84.9	156.6	143.1	47.8	40.8	98.4	51.7	63.8	87.7	93.1	92.8	89.9	111.5	59.1	52.1
6W11-0071	86.3	163.0	159.5	53.2	30.8	88.6	85.8	62.8	79.7	124.5	85.1	90.3	101.1	33.4	50.2
SC85942	88.3	162.6	124.7	50.2	32.7	92.8	99.2	46.9	97.1	121.5	101.2	63.9	120.2	91.5	31.2
LCS_CALYPSO	94.9	154.9	145.2	42.8	36.0	101.8	103.8	47.0	87.2	102.5	108.4	114.9	135.2	95.4	54.0
GRAND MEAN	87.0	155.5	138.7	50.6	31.5	98.3	92.2	50.7	72.4	125.7	94.4	92.8	111.5	64.1	46.7

Table 5. Agronomic trait line means for 2014-2015 Winter Malting Barley Trial (WMBT) entries.

Line	Winter Survival (%)	Yield (Bu/A)	Heading date (Julian day)	Height (cm)	Lodging degree (0-9)	Lodging incidence (%)	Straw breakage (%)	Test weight (lb/Bu)	Grain Protein-breeder measure (%)	Plump-breeder measure (%)	Deoxynivalenol content (ppm)	BYDV susceptibility (0-9)	Leaf Scald severity (%)	Leaf Rust susceptibility (0-9)	Leaf Scald reaction (0-9)	Net blotch (net form) reaction (0-9)	Powdery Mildew susceptibility (0-9)	Stripe Rust severity (%)
CHARLES	81.3	76.7	124.6	66.4	3.7	5.0	40.0	43.2	10.2	88.7	0.06	1.8	93.3	3.2	1.7	0.3	0.0	0.0
STRIDER	84.8	91.3	126.8	81.2	2.2	0.0	0.0	46.1	10.9	78.3	0.73	0.5	8.3	2.2	0.0	1.2	0.2	0.0
MCGREGOR	86.4	98.3	125.8	82.0	2.5	1.7	0.0	46.6	9.4	93.2	0.21	0.0	8.3	1.5	0.0	0.9	0.8	8.3
HIRONDELLA	78.8	102.6	128.7	78.6	1.1	0.0	3.3	47.9	11.4	97.7	1.40	0.0	5.0	0.3	0.0	0.4	0.0	0.7
SU_MATEO	79.3	91.7	129.7	82.1	2.2	0.0	3.3	48.4	10.4	89.3	0.60	0.3	13.3	0.5	0.0	0.4	0.0	0.0
FLAVIA	72.1	88.1	127.2	67.3	1.2	0.0	0.0	48.0	11.3	81.6	0.14	0.2	46.7	0.7	0.0	0.7	0.3	2.7
06OR-09	84.8	88.6	129.9	85.8	2.4	0.0	0.0	45.4	11.1	83.5	0.27	0.7	56.7	2.5	1.0	2.2	1.7	0.0
2011-F5-141-5	86.8	90.0	128.8	69.6	1.5	0.0	0.0	47.2	9.5	82.2	0.32	1.2	5.0	1.8	0.0	0.6	0.5	0.0
10.086	81.9	59.6	125.1	62.4	4.3	0.0	6.7	43.8	11.7	87.1	0.08	0.7	93.3	1.5	3.7	5.3	0.0	0.0
MAJA	87.5	86.7	126.2	79.1	4.5	0.0	3.3	47.2	10.5	68.6	0.47	1.2	41.7	3.7	0.3	0.6	4.7	0.0
02AB431	82.0	81.0	126.9	77.7	4.5	33.3	10.0	46.3	9.6	83.1	0.67	1.7	80.0	2.5	1.7	0.9	2.5	0.0
02AB669	82.3	85.1	128.1	78.8	3.2	5.0	18.3	46.6	9.4	79.0	0.92	1.5	75.0	3.3	1.7	0.6	4.7	2.3
02AB671	82.0	80.4	129.3	77.4	2.7	3.3	26.7	46.4	9.4	86.8	2.30	1.7	71.7	2.8	1.3	0.6	4.5	0.0
05ARS540-125	81.8	84.0	127.3	71.4	3.4	21.7	18.3	47.6	11.2	70.5	0.16	1.7	91.7	2.8	0.7	0.6	0.0	0.0
04ARS635-89	84.9	77.2	131.1	79.7	4.7	23.3	33.3	44.7	8.9	70.9	1.00	1.2	63.3	3.8	0.3	0.4	0.0	0.0
04ARS640-1	79.7	91.4	124.4	73.5	1.8	10.0	21.7	49.6	10.3	86.9	0.40	1.3	76.7	1.2	0.0	0.3	0.5	0.0
LCS_VIOLETTA	85.2	92.9	124.0	75.5	1.8	0.0	1.7	49.0	12.0	92.8	.	0.5	5.0	0.5	0.0	0.7	0.0	0.0
MW11S3029-010	84.2	85.3	122.5	85.6	4.3	3.3	23.3	46.9	9.0	66.9	0.45	0.7	28.3	4.4	0.0	0.4	4.3	5.0
MW11S3034-006	86.0	80.9	121.6	81.8	4.2	0.0	18.3	47.2	10.3	78.1	0.08	0.8	20.0	3.8	0.3	0.4	5.8	6.7
6W11-0003	83.5	101.5	126.9	82.8	3.2	0.0	6.7	46.5	8.6	69.2	0.66	0.0	6.7	2.7	0.3	1.8	0.3	5.0
6W11-0064	86.8	84.9	127.5	80.0	2.1	0.0	1.7	46.1	11.0	78.1	0.42	0.3	28.3	1.7	0.0	0.7	2.5	0.0
6W11-0071	84.3	86.3	126.2	78.8	4.6	1.7	10.0	45.2	11.1	72.3	0.33	0.0	53.3	3.5	0.0	1.2	2.2	5.0
SC85942	81.6	88.3	128.3	69.4	1.7	0.0	0.0	48.2	10.4	89.1	0.13	3.2	46.7	1.0	0.3	0.4	0.0	0.0
LCS_CALYPSO	84.8	94.9	126.8	80.5	2.4	0.0	1.7	48.1	11.6	90.7	0.19	0.5	5.0	0.5	0.0	0.8	0.0	4.0
GRAND MEAN	83.0	87.0	126.8	77.0	2.9	4.5	10.3	46.8	10.4	81.8	0.52	0.9	42.6	2.2	0.6	0.9	1.5	1.7
# of Env.	10	14	12	10	11	1	1	11	1	2	1	2	1	2	1	3	2	1

Table 6. Malt quality^a trait line means for 2014-2015 Winter Malting Barley Trial (WMBT) entries at six locations.

Line	Kernel weight (mg)	Plump grains (%)	Malt extract (%)	Grain Protein (%)	Wort Protein (%)	S/T (%)	Diastatic Power °ASBC	Alpha Amylase (20°DU)	Beta Glucan (ppm)	Free Amino Nitrogen (ppm)	Grain color (°ASBC)	Wort color (°ASBC)	Wort clarity (1-3)
CHARLES	34.2	92.2	81.8	11.0	5.6	53.2	117.8	89.2	122.2	282.8	41.7	2.5	1.7
STRIDER	33.0	84.3	78.0	10.6	3.7	36.5	54.0	42.6	667.5	138.0	47.3	0.0	3.0
MCGREGOR	34.0	87.6	78.3	10.2	3.7	37.5	58.3	44.7	433.0	140.5	44.8	2.6	1.8
HIRONDELLA	39.1	94.7	80.1	11.2	4.2	39.1	136.2	50.9	259.4	166.8	53.6	2.5	1.4
SU_MATEO	39.8	95.0	79.8	10.7	4.0	40.0	133.2	41.8	251.2	145.6	50.4	1.0	2.8
FLAVIA	42.7	96.9	81.2	10.2	3.9	40.6	108.6	44.5	105.2	165.0	42.2	1.7	2.4
06OR-09	35.0	92.1	79.2	10.7	3.8	37.0	107.0	54.7	255.8	141.2	63.4	2.5	1.0
2011-F5-141-5	31.3	92.2	79.5	10.7	4.0	39.2	97.8	51.8	306.8	178.3	58.5	2.4	1.5
10.086	31.8	91.3	81.4	10.1	5.5	57.4	99.3	79.0	98.3	276.7	37.3	3.1	2.0
MAJA	29.4	85.7	80.7	10.2	4.4	45.6	117.5	57.6	149.0	191.8	51.5	1.0	2.5
02AB431	35.6	93.0	82.1	10.3	5.5	56.2	90.8	81.2	116.2	270.2	37.8	2.9	1.4
02AB669	35.4	93.4	82.2	9.6	5.2	56.2	86.8	79.2	70.8	250.8	37.2	2.7	1.4
02AB671	33.9	91.7	82.7	9.8	5.3	56.5	104.3	89.1	63.8	247.3	42.0	2.4	1.3
05ARS540-125	32.7	90.2	80.6	11.2	5.7	52.6	116.8	68.4	76.8	247.8	44.8	2.1	2.0
04ARS635-89	31.5	84.5	81.0	10.1	4.8	49.1	143.0	72.6	173.8	201.8	47.0	2.9	1.5
04ARS640-1	33.5	90.2	81.2	10.9	5.5	53.2	130.8	76.8	140.6	229.0	42.0	2.1	1.8
LCS_VIOLETTA	40.5	94.1	80.1	11.8	4.8	41.3	187.6	56.0	130.4	198.2	43.6	2.2	1.0
MW11S3029-010	29.9	80.7	80.7	10.3	4.4	44.6	121.5	59.2	136.8	177.0	54.8	2.2	1.0
MW11S3034-006	30.8	85.3	79.2	11.3	4.6	42.9	158.2	56.4	187.4	195.8	48.6	2.3	1.0
6W11-0003	31.9	80.9	80.6	10.2	4.2	43.4	147.8	67.1	108.5	195.0	49.5	2.5	1.8
6W11-0064	30.1	84.6	79.1	10.2	4.1	42.6	144.8	55.2	76.8	168.0	50.8	1.0	2.8
6W11-0071	29.2	76.7	80.3	10.6	4.6	45.0	116.0	75.1	126.3	200.3	44.0	1.6	2.3
SC85942	42.4	93.3	80.2	10.5	4.1	41.5	112.2	53.3	255.0	165.4	37.0	2.7	1.4
LCS_CALYPSO	43.8	93.4	80.5	11.4	4.0	37.3	159.2	44.4	95.4	159.8	50.0	1.7	1.8
GRAND MEAN	34.6	89.3	80.4	10.6	4.6	45.4	118.7	62.1	183.6	197.2	46.6	2.1	1.8

^a Malt quality data courtesy of the USDA-ARS Cereal Crops Research Unit, Madison, WI

Table 7. Line entry details available for submissions to the 2014-2015 Winter Malting Barley Trial (WMBT).

Entry	Line	Row type	Submitter
1	CHARLES	2	
2	STRIDER	6	
3	MCGREGOR	6	
4	HIRONDELLA	6	Ackermann Saatzucht GmbH
5	SU_MATEO	2	Ackermann Saatzucht GmbH
6	FLAVIA	2	Ackermann Saatzucht GmbH
7	06OR-09	6	Oregon State U
8	2011-F5-141-5	6	Oregon State U
9	10.086	2	Oregon State U
10	MAJA	6	Oregon State U
11	02AB431	2	USDA-ARS Aberdeen
12	02AB669	2	USDA-ARS Aberdeen
13	02AB671	2	USDA-ARS Aberdeen
14	05ARS540-125	2	USDA-ARS Aberdeen
15	04ARS635-89	2	USDA-ARS Aberdeen
16	04ARS640-1	2	USDA-ARS Aberdeen
17	LCS_VIOLETTA	2	Limagrain
18	MW11S3029-010	6	U of Minnesota
19	MW11S3034-006	6	U of Minnesota
20	6W11-0003	6	BARI
21	6W11-0064	6	BARI
22	6W11-0071	6	BARI
23	SC85942		Secobra
24	LCS_CALYPSO	2	Limagrain