

## Supplementary Files

Supplementary Table I: Mean values for agronomic traits measured on the Oregon Promise doubled haploid progeny grown in 2015 at Corvallis, OR, USA.

<b>Genotype</b>	<b>BSR (%)</b>	<b>DTF</b>	<b>HT (cm)</b>	<b>Plump (6/64)</b>	<b>Protein (%)</b>	<b>TWT (g/L)</b>	<b>Yield (Kg/A)</b>
120020	5	133	78	88	10.9	338	4699
120031	0	137	80	87	11	342	4594
120058	10	143	57	82	10.4	340	4291
120089	0	129	77	90	9.9	330	4246
120090	0	135	65	91	11.4	329	4639
120145	5	147	59	77	9.2	335	5400
120156	0	138	70	87	10.2	339	6113
120166	0	135	52	76	9.3	340	4601
120285	0	129	59	86	10.6	333	4560
120314	0	136	60	85	10.8	344	4723
120329	10	130	68	77	9.8	342	6374
120330	15	129	73	88	10.2	328	5256
120331	5	134	60	85	11.5	333	5119
120341	0	139	58	75	9	347	6521
120363	0	129	67	77	9.2	327	6970
120365	10	131	67	79	11.3	342	6014
120366	5	132	71	84	10.2	334	5366
120374	10	133	62	87	10.5	345	6538
120381	25	129	78	81	10.8	337	5592
<i>LSD (0.05)</i>	<i>2.99</i>	<i>1.79</i>	<i>2.42</i>	<i>2.16</i>	<i>0.77</i>	<i>2.27</i>	<i>24.68</i>

BSR = Barley Stripe Rust; DTF = Days-to-flowering (Julian Days); HT = plant height; Plump = kernel plumpness; TWT = test weight.

Supplementary Table I (cont.): Mean values for agronomic traits measured on the Oregon Promise doubled haploid progeny grown in 2015 at Corvallis, OR, USA.

<b>Genotype</b>	<b>BSR (%)</b>	<b>DTF</b>	<b>HT (cm)</b>	<b>Plump (6/64)</b>	<b>Protein (%)</b>	<b>TWT (g/L)</b>	<b>Yield (Kg/A)</b>
120384	5	142	73	72	10.3	344	7411
120510	5	139	68	93	11.4	344	5542
120516	0	139	61	90	10.3	350	6588
120520	0	131	67	83	11.7	332	5736
120521	0	141	55	89	11.8	357	5770
120529	0	129	69	85	12.9	334	4865
120536	0	139	67	88	10.7	336	5508
120543	0	141	58	83	9.8	334	5722
120657	0	141	62	87	9.5	338	5676
120661	5	140	65	80	9.3	347	6823
120671	15	133	68	79	11.9	334	5040
120691	0	139	66	90	11.6	352	4622
120709	0	130	75	78	11.2	341	5443
120715	0	140	65	76	10.1	339	5167
120731	0	130	70	83	10.4	348	4915
Golden Promise	0	137	79	62	9.6	354	4309
Full Pint	5	131	66	84	11.4	359	6487
CDC Copeland	80	135	101	62	9.4	334	6530
<i>LSD (0.05)</i>	<i>2.99</i>	<i>1.79</i>	<i>2.42</i>	<i>2.16</i>	<i>0.77</i>	<i>2.27</i>	<i>24.68</i>

BSR = Barley Stripe Rust; DTF = Days-to-flowering (Julian Days); HT = plant height; Plump = kernel plumpness; TWT = test weight.

Supplementary Table II: Mean values for agronomic traits measured on the Oregon Promise doubled haploid progeny grown in 2015 at Lebanon, OR, USA.

<b>Genotype</b>	<b>BSR (%)</b>	<b>DTF</b>	<b>HT (cm)</b>	<b>Plump (6/64)</b>	<b>Protein (%)</b>	<b>TWT (g/L)</b>	<b>Yield (Kg/A)</b>
120020	0	139	112	93	12.7	352	4174
120031	0	140	111	94	12	346	3757
120058	0	143	83	89	11.5	339	4572
120089	0	140	110	95	9.6	329	3547
120090	0	139	83	94	11.6	343	3447
120145	0	149	75	88	10.1	341	5329
120156	0	137	92	93	9.8	350	4394
120166	0	149	80	86	10.5	327	5201
120285	0	136	88	90	12.1	328	3930
120314	0	139	88	88	11.8	347	4262
120329	0	140	97	80	11.5	332	4440
120330	0	135	107	92	12.5	323	3448
120331	0	138	90	93	12.4	331	4080
120341	0	141	77	82	10.3	336	4205
120363	0	135	87	86	9.4	329	4264
120365	0	136	86	90	12	350	3994
120366	0	140	97	94	9.5	336	4845
120374	0	140	75	89	9.5	347	4136
120381	5	139	92	93	10.3	354	4531
<i>LSD (0.05)</i>	<i>0.73</i>	<i>1.47</i>	<i>2.79</i>	<i>1.58</i>	<i>0.83</i>	<i>2.27</i>	<i>18.71</i>

BSR = Barley Stripe Rust; DTF = Days-to-flowering (Julian Days); HT = plant height; Plump = kernel plumpness; TWT = test weight.

Supplementary Table II (cont.): Mean values for agronomic traits measured on the Oregon Promise doubled haploid progeny grown in 2015 at Lebanon, OR, USA.

<b>Genotype</b>	<b>BSR (%)</b>	<b>DTF</b>	<b>HT (cm)</b>	<b>Plump (6/64)</b>	<b>Protein (%)</b>	<b>TWT (g/L)</b>	<b>Yield (Kg/A)</b>
120384	0	141	86	82	10.7	346	4940
120510	0	143	93	94	11.9	334	4521
120516	0	140	78	88	11.4	333	3529
120520	0	138	84	89	11.6	331	3976
120521	0	134	75	90	13.7	339	3509
120529	0	136	95	94	12.1	333	4017
120536	0	141	87	88	11.2	327	3754
120543	0	143	74	90	10.4	339	4151
120657	0	142	77	90	10.2	333	4363
120661	0	144	76	86	9.6	331	4743
120671	0	137	87	94	11.3	331	3546
120691	0	136	80	95	11.7	340	3386
120709	0	137	92	94	10.4	329	3879
120715	0	138	70	89	11.7	344	3827
120731	0	139	86	91	10.7	335	4908
Golden Promise	0	139	74	85	10.4	340	4342
Full Pint	0	140	80	90	11.5	339	4579
CDC Copeland	0	141	119	92	10.5	341	5336
<i>LSD (0.05)</i>	<i>0.73</i>	<i>1.47</i>	<i>2.79</i>	<i>1.58</i>	<i>0.83</i>	<i>2.27</i>	<i>18.71</i>

BSR = Barley Stripe Rust; DTF = Days-to-flowering (Julian Days); HT = plant height; Plump = kernel plumpness; TWT = test weight.

Supplementary Table III: Mean values for agronomic traits measured on the Oregon Promise doubled haploid progeny grown in 2015 at Madras, OR, USA.

<b>Genotype</b>	<b>HT (cm)</b>	<b>Lodging (%)</b>	<b>Plump (6/64)</b>	<b>Protein (%)</b>	<b>TWT (g/L)</b>	<b>Yield (Kg/A)</b>
120020	92	45	94	13.4	352	4537
120031	88	60	92	13.9	344	4604
120058	75	80	62	11.7	330	4692
120089	85	85	93	13	332	4214
120090	74	0	98	14.2	347	5086
120145	73	85	45	11.9	310	4113
120156	75	90	85	13.3	334	4707
120166	77	80	61	12.4	306	4180
120285	71	10	93	12.7	341	5605
120314	72	0	91	12.7	350	5633
120329	76	90	77	12.3	346	3877
120330	87	70	91	14.1	335	4392
120331	80	30	96	13.9	353	5515
120341	63	0	74	12.1	339	4527
120363	70	5	62	13.1	322	3711
120365	72	0	92	13.7	343	3727
120366	70	10	81	13	329	4095
120374	68	0	84	12.8	329	4261
120381	77	0	89	13.1	345	4431
<i>LSD (0.05)</i>	<i>2.27</i>	<i>4.90</i>	<i>3.15</i>	<i>0.67</i>	<i>2.84</i>	<i>18.64</i>

BSR = Barley Stripe Rust; DTF = Days-to-flowering (Julian Days); HT = plant height; Plump = kernel plumpness; TWT = test weight.

Supplementary Table III (cont.): Mean values for agronomic traits measured on the Oregon Promise doubled haploid progeny grown in 2015 at Madras, OR, USA.

<b>Genotype</b>	<b>HT (cm)</b>	<b>Lodging (%)</b>	<b>Plump (6/64)</b>	<b>Protein (%)</b>	<b>TWT (g/L)</b>	<b>Yield (Kg/A)</b>
120384	68	10	42	13	317	3918
120510	71	0	84	13.7	337	4014
120516	63	0	71	13.5	323	4121
120520	70	0	83	13.8	335	3939
120521	65	0	60	13.3	334	4051
120529	70	0	84	14.7	338	3899
120536	65	15	89	13.5	327	4190
120543	66	85	56	12.8	303	3471
120657	68	20	78	12.8	312	4908
120661	66	30	57	12.3	323	4630
120671	67	75	91	14.2	343	4770
120691	68	25	90	13.5	331	4905
120709	78	75	83	14.1	328	4177
120715	69	80	65	12.8	325	4539
120731	72	90	97	12.5	330	4812
Golden Promise	71	90	66	12.8	327	4345
Full Pint	75	0	88	12.8	343	5156
CDC Copeland	97	30	92	12.8	328	3778
<i>LSD (0.05)</i>	<i>2.27</i>	<i>4.90</i>	<i>3.15</i>	<i>0.67</i>	<i>2.84</i>	<i>18.64</i>

BSR = Barley Stripe Rust; DTF = Days-to-flowering (Julian Days); HT = plant height; Plump = kernel plumpness; TWT = test weight.

Supplementary Table IV: Crop management and climatic information for the three locations in Oregon, USA (COR = Corvallis, LEB = Lebanon, MAD = Madras) where the Oregon Promise experiments were grown in 2015.

Loc	Environment & Climate				Crop Management					
	Soil Type	Temp (°C)	Percip (mm)	Day LG (hrs)	Planting Date	Seeding Rate (g/m)	Fertilizer Rate (Kg N/ha)	Irrigation	Weed Control	Harvest Date
COR	Woodburn silt loam	13.4-28.1	1086	>15	1-31-2015	11	81	No	Glyphosate	7-6-2015
LEB	Malabon silty clay loam	14.2-29.3	1178	>15	2-17-2015	11	44	No	Glyphosate, 2, 4-D	7-7-2015
MAD	Madras loam	12.3-29.7	309	>14	4-9-2015	11	65	Yes	Glyphosate	8-3-2015

Loc = Location; Temp = temperature minima and maxima; Percip = precipitation; Day LG = day length.

Supplementary Table V: Malting quality of Oregon Promise doubled haploid progeny grown in 2015 at Corvallis OR, USA.

<b>Genotype</b>	<b>AA</b>	<b>BG</b>	<b>DP</b>	<b>FAN</b>	<b>MC</b>	<b>ME</b>	<b>SP</b>	<b>S/T</b>	<b>TP</b>	<b>VC</b>
120020	48.7	428	93	114	1.66	77.73	3.61	33.62	10.73	1.59
120031	70.1	189	126	187	1.71	78.42	4.57	44.04	10.37	1.54
120058	52.1	97	109	124	1.47	77.83	3.85	36.36	10.58	1.55
120089	64.7	99	100	188	1.85	79.67	4.26	46.08	9.25	1.5
120090	54.9	199	132	143	1.15	75.22	3.66	32.37	11.29	1.62
120145	44.6	91	76	103	1.6	77.95	3.27	36.45	8.98	1.51
120156	41.8	286	71	97	1.56	77.11	2.97	31.36	9.47	1.69
120166	52.5	150	96	128	1.2	76.43	3.07	34.52	8.89	1.56
120285	76.2	110	141	190	1.38	77.52	4.24	43.07	9.84	1.54
120314	84.3	124	111	197	1.64	77.99	4.42	41.91	10.55	1.51
120329	37.4	411	75	84	1.69	77.65	2.37	24.11	9.82	1.75
120330	44.5	239	112	121	1.22	75.98	3.28	32.24	10.17	1.6
120331	44.6	194	132	123	1.13	75.01	3.2	28.32	11.29	1.6
120341	77	115	105	165	1.77	80.36	3.77	41.89	8.99	1.55
120363	71.1	57	105	194	1.83	80.17	4.02	43.1	9.32	1.49
120365	47.2	354	128	151	1.28	75	3.91	34.67	11.29	1.66
120366	64.3	62	113	179	1.87	78.89	4.24	42.69	9.94	1.5
120374	67.4	440	133	147	1.21	78.51	3.81	36.08	10.57	1.74
120381	57.6	420	105	146	1.48	78.25	4.25	40.12	10.58	1.85

AA: alpha-amylase; BG: beta-glucan; DP: diastatic power; MC: malt color; ME: malt extract; SP: soluble protein; S/T: Kolbach Index; TP: total protein; FAN: free amino nitrogen; VC: viscosity



Supplementary Table V (cont.): Malting quality of Oregon Promise doubled haploid progeny grown in 2015 at Corvallis OR, USA.

<b>Genotype</b>	<b>AA</b>	<b>BG</b>	<b>DP</b>	<b>FAN</b>	<b>MC</b>	<b>ME</b>	<b>SP</b>	<b>S/T</b>	<b>TP</b>	<b>VC</b>
120384	39.3	836	69	84	1.76	77.14	2.74	27.23	10.06	2
120510	39	532	93	110	1.52	76.52	3.15	29.21	10.78	1.82
120516	46.4	336	135	117	1.07	77.29	3.25	32.26	10.09	1.66
120520	82.3	80	155	259	1.81	76.16	6.11	51.64	11.82	1.52
120521	42.5	719	77	108	1.55	75.95	3.12	26.63	11.7	1.82
120529	84.9	118	177	230	1.74	75.97	5.15	42.17	12.21	1.49
120536	47.1	200	100	101	1.41	77.52	3.28	29.04	11.29	1.59
120543	38.9	347	75	111	1.25	76.99	1.65	16.13	10.22	1.71
120657	81	101	67	214	1.83	79.35	3.95	45.58	8.68	1.53
120661	47.4	523	89	109	1.3	77.74	1.69	19.02	8.9	1.82
120671	57.9	119	154	191	1.4	74.46	3.46	29.06	11.89	1.57
120691	64.8	556	107	192	1.61	77.38	4.3	39.52	10.88	1.68
120709	46.5	607	109	151	1.47	75.2	2.78	24.6	11.31	1.78
120715	46.3	356	107	127	1.23	76.57	2.25	21.76	10.32	1.65
120731	47.6	206	90	118	1.63	77.96	3.63	34.93	10.38	1.61
Golden Promise	46.5	372	106	123	1.46	77.49	3.44	35.03	9.83	1.64
Full Pint	92.7	293	148	191	1.72	78.78	4.75	42.33	11.23	1.62
CDC Copeland	76.2	59	114	198	1.73	79.76	4.6	46.39	9.91	1.45

AA: alpha-amylase; BG: beta-glucan; DP: diastatic power; MC: malt color; ME: malt extract; SP: soluble protein; S/T: Kolbach Index; TP: total protein; FAN: free amino nitrogen; VC: viscosity

Supplementary Table VI: Malting quality of Oregon Promise doubled haploid progeny grown in 2015 at Lebanon OR, USA.

<b>Genotype</b>	<b>AA</b>	<b>BG</b>	<b>DP</b>	<b>FAN</b>	<b>MC</b>	<b>ME</b>	<b>SP</b>	<b>S/T</b>	<b>TP</b>	<b>VC</b>
120020	46.6	896	111	115	1.29	73.99	1.91	15.6	12.25	1.78
120031	63.4	269	144	171	1.27	76.08	4.3	35.62	12.07	1.61
120058	44.8	333	96	128	1.3	76.04	3.47	34.28	10.11	1.7
120089	35.9	617	105	101	1.28	78.66	3.15	27.99	11.26	1.83
120090	53.9	236	112	146	1.22	77.72	3.64	36.07	10.09	1.62
120145	34	832	113	95	1.57	75.66	2.91	25.61	11.38	1.99
120156	51.8	310	160	117	1.16	77.08	3.71	31.7	11.69	1.65
120166	47.7	175	146	191	1.11	75.45	3.55	30.97	11.47	1.58
120285	58.6	383	140	167	1.31	77.41	4.53	40.85	11.09	1.63
120314	45.4	230	123	111	1.3	79.08	3.71	34.08	10.87	1.63
120329	61.5	106	116	148	1.84	81.14	4.63	47.78	9.69	1.48
120330	48.7	151	120	143	1.29	77.57	3.49	32.83	10.63	1.57
120331	39.2	340	80	116	1.69	77.53	2.98	29.94	9.96	1.72
120341	36.5	471	85	126	1.63	78.74	2.78	29.56	9.42	1.83
120363	68.3	136	180	190	1.75	78.86	4.73	40.67	11.64	1.51
120365	75.6	293	131	125	1.64	78.35	4.67	42.29	11.05	1.59
120366	44.3	264	130	121	1.26	75.34	3.53	27.46	12.87	1.57
120374	36.7	518	95	123	1.31	75.96	2.91	25.01	11.63	1.7
120381	61.9	341	111	232	1.33	80.21	3.71	36.43	10.18	1.65

AA: alpha-amylase; BG: beta-glucan; DP: diastatic power; MC: malt color; ME: malt extract; SP: soluble protein; S/T: Kolbach Index; TP: total protein; FAN: free amino nitrogen; VC: viscosity

Supplementary Table VI (cont.): Malting quality of Oregon Promise doubled haploid progeny grown in 2015 at Lebanon OR, USA.

<b>Genotype</b>	<b>AA</b>	<b>BG</b>	<b>DP</b>	<b>FAN</b>	<b>MC</b>	<b>ME</b>	<b>SP</b>	<b>S/T</b>	<b>TP</b>	<b>VC</b>
120384	56.2	170	109	105	1.59	80.68	4.16	41.6	9.99	1.54
120510	43.1	385	113	151	1.37	76.92	3.86	32.84	11.76	1.65
120516	55.9	123	115	169	1.61	80.91	4.19	43.52	9.62	1.52
120520	59.9	443	112	111	1.36	80.86	3.95	40.46	9.76	1.74
120521	32.2	965	70	127	2.16	77.39	3.01	28.02	10.74	2.23
120529	59	151	146	259	1.52	78.14	4.69	42.81	10.95	1.52
120536	38.6	842	91	103	1.4	75.09	3.56	26.21	13.59	1.81
120543	72.3	100	177	241	1.65	77.55	5.07	42.51	11.91	1.5
120657	36.7	371	112	109	1.54	78.2	3.35	28.8	11.64	1.68
120661	35.6	293	73	111	1.63	78.56	3.22	31.02	10.37	1.67
120671	65	280	103	214	1.64	79.78	4.54	49.22	9.23	1.78
120691	43.6	470	87	107	1.36	78.26	3.04	33.06	9.19	1.65
120709	44.7	711	88	151	1.49	76.77	3.15	29.6	10.65	1.61
120715	40.1	432	97	127	1.61	77.43	3.17	28.85	10.98	1.53
120731	41.7	320	85	147	1.55	78.85	3.17	31.36	10.11	1.64
Golden Promise	37.9	599	89	102	1.77	77.76	2.88	27.91	10.34	1.62
Full Pint	79.5	370	150	137	1.42	79.1	4.44	39.05	11.37	1.45
CDC Copeland	53.9	280	105	193	1.15	79.97	4.04	38.28	10.54	1.49

AA: alpha-amylase; BG: beta-glucan; DP: diastatic power; MC: malt color; ME: malt extract; SP: soluble protein; S/T: Kolbach Index; TP: total protein; FAN: free amino nitrogen; VC: viscosity

Supplementary Table VII: Malting quality of Oregon Promise doubled haploid progeny grown in 2015 at Madras OR, USA.

<b>Genotype</b>	<b>AA</b>	<b>BG</b>	<b>DP</b>	<b>FAN</b>	<b>MC</b>	<b>ME</b>	<b>S/T</b>	<b>SP</b>	<b>TP</b>	<b>VC</b>
120020	41	1244	120	99	1.33	74.87	31.66	4.21	13.31	2.22
120031	55	713	186	171	1.33	75.89	33.76	4.93	14.6	1.77
120058	46	288	133	113	1.17	75.99	36.49	4.49	12.31	1.64
120089	57	288	141	161	1.32	77.61	40.78	5.2	12.75	1.56
120090	43	659	149	126	1.83	74.68	30.57	4.29	14.04	1.84
120145	48	189	143	116	1.15	72.74	37.21	4.37	11.74	1.72
120156	36	875	123	100	1.12	74.26	28.59	3.67	12.83	1.83
120166	40	248	120	111	1.27	72.5	31.92	3.89	12.2	1.51
120285	60	338	178	180	1.37	77.94	37.05	4.72	12.74	1.59
120314	66	456	129	166	1.4	77.16	39.16	4.95	12.64	1.83
120329	35	686	100	101	1.61	75.62	27.33	3.41	12.46	1.57
120330	37	555	150	105	1.16	73.61	30.04	4.47	14.88	1.66
120331	31	799	112	90	1	75.25	28.29	3.79	13.38	1.94
120341	57	482	113	179	1.24	77.52	37.47	4.46	11.91	1.79
120363	68	127	156	100	1.37	75.93	37.76	5.29	14	1.54
120365	39	895	107	149	1.34	74.78	33.12	4.52	13.64	1.94
120366	52	206	156	124	1.57	77.08	38.34	5.12	13.35	1.61
120374	58	620	134	137	1.24	76.52	36.15	4.47	12.35	1.79
120381	46	444	127	109	1.18	75.23	29.89	4.27	14.29	1.7

AA: alpha-amylase; BG: beta-glucan; DP: diastatic power; MC: malt color; ME: malt extract; SP: soluble protein; S/T: Kolbach Index; TP: total protein; FAN: free amino nitrogen; VC: viscosity

Supplementary Table VII (cont.): Malting quality of Oregon Promise doubled haploid progeny grown in 2015 at Madras OR, USA.

<b>Genotype</b>	<b>AA</b>	<b>BG</b>	<b>DP</b>	<b>FAN</b>	<b>MC</b>	<b>ME</b>	<b>S/T</b>	<b>SP</b>	<b>TP</b>	<b>VC</b>
120384	39	533	100	95	1.4	73.21	30.74	4.01	13.05	1.74
120510	30	884	114	125	1.08	73.3	29.77	4.04	13.57	1.98
120516	39	484	121	180	1.16	73.82	32.01	4.26	13.3	1.81
120520	54	305	148	103	1.47	74.92	36.41	5.18	14.22	1.69
120521	35	945	90	205	1.21	72.96	29.35	3.89	13.24	2.1
120529	74	184	213	98	1.51	74.71	38	5.25	13.82	1.66
120536	33	555	136	112	1.51	74.98	27.91	3.96	14.19	1.78
120543	39	279	126	200	1.17	73.92	31.11	4.07	13.08	1.71
120657	63	259	128	103	1.61	76.56	40.52	5.27	13	1.71
120661	37	618	116	133	1.2	74.28	32.21	4	12.42	1.86
120671	49	114	172	167	1.35	74.75	30.95	4.37	14.12	1.73
120691	51	974	134	129	1.24	74.89	34.81	4.69	13.47	2.05
120709	43	881	132	110	1.32	73.27	29.34	4.39	14.95	1.94
120715	37	736	133	117	1.54	74.79	32.06	4.08	12.71	1.75
120731	40	381	129	211	1.2	75.89	30.52	4.11	13.45	1.66
Golden Promise	44	491	162	122	1.26	74.69	32.44	4.24	13.06	1.71
Full Pint	78	402	170	175	1.23	77.34	40.96	4.79	11.7	1.64
CDC Copeland	61	253	138	179	1.17	77.71	36.2	4.94	13.64	1.57

AA: alpha-amylase; BG: beta-glucan; DP: diastatic power; ME: MC: malt color; malt extract; SP: soluble protein; S/T: Kolbach Index; TP: total protein; FAN: free amino nitrogen; VC: viscosity

Supplementary Table VIII. Free-choice sensory descriptions, malting quality, and agronomic data for selected Oregon Promise doubled haploids grown in 2014 Corvallis, OR, malted at the USD-CCRU, and nano-brewed at New Glarus Brewing.

Genotype	Rank <sup>1</sup>	Sensory Description	TKW <sup>2</sup>	Plump <sup>3</sup>	ME <sup>4</sup>	WC <sup>5</sup>	S/T <sup>6</sup>	DP <sup>7</sup>	FAN <sup>8</sup>	Yield <sup>9</sup>	HD <sup>10</sup>	DG <sup>11</sup>	BSR <sup>12</sup>	LR <sup>13</sup>
120020	4	Flour, Slight Bitter, Dry, Thin	53	98	78	2.00	34	137	179	4680	142	t	13	0
120031	1	Full, Malty, Smooth, Rich, Nice! - Best "Euro" Type	51	97	80	3.00	41	120	240	4337	142	p	20	0
120058	1	Nice Foam, Clean, Smooth - Best "American" Type	46	97	81	2.00	43	133	190	4737	146	p	0	3
120089	4	Darkest, Malty, Bready, Very Nice but Slight Grainy	47	98	82	2.00	51	93	246	4402	146	t	10	20
120090	2	Best Foam, Sweet, Clean, Mild	43	97	78	2.00	31	143	180	4702	140	e	13	8
120145	2	Balanced Malty and Hoppy, Clean, Sweet	46	97	80	2.00	41	101	177	5672	151	p	0	0
120156	5	Thin, Weak, Astringent	43	97	79	1.56	32	93	142	6111	145	e	8	0
120166	3	Middle of the Road	46	97	80	2.00	41	104	181	5228	153	p	0	3
120285	2	Sweet, full, very clean, bread, malt	49	97	80	2.00	48	160	267	4580	146	p	0	5
120314	4	Sulfur, soap, bitter, thin	44	96	80	3.00	50	96	253	4248	138	e	25	8
120329	4	Light, clean, slight sweet, neutral	41	95	80	2.00	33	88	137	6656	141	e	5	8
120330	3	Malty, middle of the road, slight fruity	48	99	79	2.00	34	120	146	5054	143	t	3	3
120331	1	Light, clean, malty, sulfur, Euro, juicy, nice	43	98	80	2.00	31	104	135	5323	138	e	13	3
120341	2	Sweet, full, biter after taste, malty, clean	47	98	83	2.00	46	88	228	6257	145	p	0	3
120363	5	Middle of the Road, grainy, malty	47	98	82	2.30	51	100	240	6624	148	p	0	0
120365	5	Middle of the Road, neutral, sweet, slight harsh	41	96	79	1.62	36	139	185	5600	138	e	20	10
120366	3	Malty, sulfur, neutral, slight harsh	42	96	81	2.11	45	115	217	4940	144	e	10	5
120374	5	Neutral, grainy	47	98	82	2.12	49	114	214	6222	146	p	18	8

<sup>1</sup>Rank (1=Excellent; 2=Good; 3=Fair; 4=Poor; 5=Bad), <sup>2</sup>Thousand Kernel Weight (mg), <sup>3</sup>Plump (6/64"), <sup>4</sup>Malt Extract (%), <sup>5</sup>Wort Color (°L), <sup>6</sup>Kolbach Index (%), <sup>7</sup>Diastatic Power (°ASBC), <sup>8</sup>FAN (ppm), <sup>9</sup>Grain Yield (Kg/Ha), <sup>10</sup>Heading Date (Julian Days), <sup>11</sup>Dwarfing Genes, <sup>12</sup>Barley Stripe Rust, <sup>13</sup>Leaf Rust

Supplementary Table VIII (cont.) Free-choice sensory descriptions, malting quality, and agronomic data for selected Oregon Promise doubled haploids grown in 2014 Corvallis, OR, malted at the USD-CCRU, and nano-brewed at New Glarus Brewing.

Genotype	<sup>1</sup> Rank	Sensory Description	<sup>2</sup> TKW	<sup>3</sup> Plump	<sup>4</sup> ME	<sup>5</sup> WC	<sup>6</sup> S/T	<sup>7</sup> DP	<sup>8</sup> FAN	<sup>9</sup> Yield	<sup>10</sup> HD	<sup>11</sup> DG	<sup>12</sup> BSR	<sup>13</sup> LR
120381	5	Sulfur, neutral, harsh	45	97	80	2.01	44	120	191	5933	141	e	25	5
120384	4	Biscuit, sulfur, sweet, clean but slight bite	45	97	80	1.65	33	91	131	7184	148	p	3	3
120510	5	Clean, sweet, malty	53	99	79	1.73	36	115	169	6023	149	p	8	3
120516	5	Grainy, husky, biscuit, honey	45	96	80	1.84	37	162	195	6276	147	p	23	0
120520	5	Malty, sweet	42	93	80	2.10	44	128	243	6141	139	e	3	15
120521	5	Neutral, bland	47	96	77	1.73	33	104	165	5652	147	p	0	8
120529	5	Clean but bitter	46	98	80	2.18	44	178	228	4970	140	e	10	13
120536	5	Crisp bitterness then sweet	49	98	81	1.54	37	138	140	6077	144	p	0	3
120543	5	Harsh	45	97	81	1.59	33	87	146	5548	152	?	0	0
120657	5	Malty, clean and mild	45	94	81	2.37	50	81	202	5515	149	p	8	5
120661	5	Bitter, malty	45	97	81	1.69	42	113	127	7126	146	p	10	5
120671	5	Bitter, malty	44	94	79	1.81	34	148	158	5411	141	e	15	8
120691	5	Malty but too sweet	51	98	79	2.13	43	116	205	4787	146	p	0	3
120709	5	Too mild	43	95	78	1.83	35	109	156	5821	141	t	0	20
120715	5	Flour, cereal	43	94	81	1.53	34	103	124	5858	148	p	10	0
120731	3	Smooth, hoppy, American, sweet	41	93	81	1.63	37	99	155	5613	143	?	3	5
Full Pint Golden Promise	1	Full, malty, European	36	88	80	1.58	35	83	128	6533	143	p	8	0
	5	Harsh bitterness	49	98	81	2.55	47	146	220	6937	143	e	3	23

<sup>1</sup>Rank (1=Excellent; 2=Good; 3=Fair; 4=Poor; 5=Bad), <sup>2</sup>Thousand Kernel Weight (mg), <sup>3</sup>Plump (6/64"), <sup>4</sup>Malt Extract (%), <sup>5</sup>Wort Color (°L), <sup>6</sup>Kolbach Index (%), <sup>7</sup>Diastatic Power (°ASBC), <sup>8</sup>FAN (ppm), <sup>9</sup>Grain Yield (Kg/Ha), <sup>10</sup>Heading Date (Julian Days), <sup>11</sup>Dwarfing Genes, <sup>12</sup>Barley Stripe Rust, <sup>13</sup>Leaf Rust

Supplementary Table IX: Best linear unbiased predictors (BLUPs) for selected Oregon Promise doubled haploids grown at Corvallis, OR in 2015.

<b>Genotype</b>	<b>BT</b>	<b>CH</b>	<b>CL</b>	<b>FL</b>	<b>FR</b>	<b>GR</b>	<b>GS</b>	<b>HN</b>	<b>MT</b>	<b>RO</b>	<b>SF</b>	<b>ST</b>	<b>TD</b>	<b>TF</b>
120020	3.9	4.4	4.8	4.9	4.7	4.8	4.5	3.6	3.5	3	3.9	3.1	4.2	2.6
120031	4.1	4.4	4.8	4.4	4.3	4.8	4.5	3.6	4.5	3.2	4.3	4	4.4	3.3
120058	3.9	4.4	4.8	4.2	3.4	4.8	4.5	3.9	5.3	3.6	4.6	3.9	5.2	4.1
120089	3.9	4.4	5.1	4.3	2.8	4.8	4.5	3.6	5.1	3.2	4.3	4.3	5.2	3.7
120090	4.2	4.4	4.5	4.6	4.9	4.8	4.5	3.5	3.2	3	4.5	3.5	3.2	2.6
120145	3.8	4.4	4.8	5	5.2	4.8	4.7	3.6	4.8	3.4	3.9	3.8	4.6	3.6
120156	4.3	4.4	5	4.3	2.8	4.8	4.7	3.8	5.9	4.2	3.5	4.4	5.6	5.9
120166	4.1	4.4	4.7	4.6	3.9	4.8	4.6	3.6	2.9	3	4.2	3.8	3.2	2.9
120285	4.3	4.3	4.1	4.6	4.1	4.8	4.4	3.1	4.8	2.9	4.5	4.1	4.3	3.2
120314	3.9	4.3	4.2	4.3	3.2	4.8	4.5	3.5	5.4	3.2	4.2	4.4	5.3	4.9
120329	4.1	4.3	4.4	3.9	3.9	4.8	4.5	3.2	3.6	2.8	4.5	3.9	3.9	3.3
120330	4.1	4.3	4.1	4.3	3.8	4.8	4.5	3.2	5.1	2.7	4.3	4.4	4.7	4.1
120331	4.1	4.3	3.9	4.4	4.6	4.7	4.5	3.1	2.8	2.4	4.3	3.6	2.9	2.2
120341	4	4.3	4.2	4.1	3.2	4.8	4.5	3.3	5.2	3.1	4	4	4.8	4
120363	3.6	4.3	4.2	4	3.2	4.7	4.3	4.2	5.4	3.7	4.8	4.8	4.5	4.3
120365	4	4.3	3.9	4.1	4.2	4.7	4.2	4	4.8	3	5.1	4.8	3.7	3.1
120366	3.8	4.3	4.3	3.9	3.3	4.7	4.2	4.2	4.8	3.9	4.7	4.6	4.7	4.4
120374	4.1	4.3	3.7	4.5	4.7	4.7	4.1	4.1	2.4	2.8	4.4	4.2	2.8	3.1
120381	4	4.3	3.9	4.4	5.1	4.7	4.3	4	2.9	3	4.7	4.6	3.2	3.1
<i>LSD (0.05)</i>	<i>0.4</i>	<i>0.3</i>	<i>0.5</i>	<i>0.6</i>	<i>0.7</i>	<i>0.2</i>	<i>0.4</i>	<i>0.6</i>	<i>0.9</i>	<i>0.6</i>	<i>0.5</i>	<i>0.8</i>	<i>0.7</i>	<i>0.8</i>

BT=bitter; CH=chemical; CL=cereal; FL=floral; FR=fruit; GR=grain; GS=grass; HN=honey; MT=malt; RO=roasted; SF=sulfur; ST=sweet; TD=toasted; TF=toffee



Supplementary Table IX (cont.): Best linear unbiased predictors (BLUPs) for selected Oregon Promise doubled haploids grown at Corvallis, OR in 2015.

<b>Genotype</b>	<b>BT</b>	<b>CH</b>	<b>CL</b>	<b>FL</b>	<b>FR</b>	<b>GR</b>	<b>GS</b>	<b>HN</b>	<b>MT</b>	<b>RO</b>	<b>SF</b>	<b>ST</b>	<b>TD</b>	<b>TF</b>
120384	3.6	4.4	4.3	3.9	5.1	4.8	3.9	3.8	2.9	3.5	4.7	4.6	3.6	3.6
120510	3.5	4.4	4.3	4.3	5.1	4.7	4.2	3.9	5.3	3.9	4.5	4.4	5	4.7
120516	3.7	4.4	4	3.6	5.2	4.7	4.1	3.7	4.5	3.3	5	4.1	3.5	2.9
120520	3.5	4.4	3.9	5.2	5.3	4.7	4.1	3.6	5.3	3.6	4.5	4	4.7	4.4
120521	3.6	4.4	4.3	5	5.3	4.7	4.1	3.8	3.1	3.8	4.9	4.7	4.4	2.4
120529	3.7	4.4	4	4.4	5.1	4.7	4.1	3.7	3.3	3.6	5.1	4.1	3.2	2.9
120536	3.6	4.4	4.3	4.2	5.1	4.7	4.2	3.7	3	3.4	5.4	4.4	3.9	2.8
120543	3.9	4.4	4	4.4	5.1	4.7	4.1	3.9	2.9	3.1	4.7	4.3	3.7	3.1
120657	3.9	4.1	3.6	3.5	4.7	4.6	4.8	4.4	3.6	3.5	4.8	2.6	3.7	3.6
120661	3.9	4.1	3.6	4.6	4.9	4.6	4.7	4.5	2.7	3.7	4.7	2.2	3.2	3.6
120671	3.9	4.1	3.9	3.4	4	4.6	4.7	4.4	4.8	3.8	4.7	2.6	3.8	3.8
120691	3.7	4.1	3.8	3.4	2.9	4.6	4.7	4.5	5.6	4	5.4	2.8	5.1	5.1
120709	3.9	4.1	3.5	3.6	4.8	4.6	4.6	4.3	2.7	3.5	4.7	2.2	3.3	3.1
120715	4	4.2	3.8	4.9	5.1	4.6	4.8	4.4	3.3	3.4	4.4	2.5	3.2	2.8
120731	3.8	4.1	3.8	3.7	3.8	4.6	4.7	4.5	4.8	3.8	5	2.8	4.3	3.8
Golden Promise	4	4.1	3.6	4.7	5.2	4.6	4.7	4.5	3.4	3.9	5	3.6	4.1	3.1
Full Pint	3.7	4.1	4	3.7	3.2	4.6	4.8	4.5	5.1	3.8	5.3	4.3	4.6	4.8
CDC Copeland	4	4.1	3.7	4	4.8	4.6	4.7	4.5	3	3.8	5.2	2.7	3.2	3.6
<i>LSD (0.05)</i>	<i>0.4</i>	<i>0.3</i>	<i>0.5</i>	<i>0.6</i>	<i>0.7</i>	<i>0.2</i>	<i>0.4</i>	<i>0.6</i>	<i>0.9</i>	<i>0.6</i>	<i>0.5</i>	<i>0.8</i>	<i>0.7</i>	<i>0.8</i>

BT=bitter; CH=chemical; CL=cereal; FL=floral; FR=fruit; GR=grain; GS=grass; HN=honey; MT=malt; RO=roasted; SF=sulfur; ST=sweet; TD=toasted; TF=toffee

Supplementary Table X: Best linear unbiased predictors (BLUPs) for selected Oregon Promise doubled haploids grown at Lebanon, OR in 2015.

<b>Genotype</b>	<b>BT</b>	<b>CH</b>	<b>CL</b>	<b>FL</b>	<b>FR</b>	<b>GR</b>	<b>GS</b>	<b>HN</b>	<b>MT</b>	<b>RO</b>	<b>SF</b>	<b>ST</b>	<b>TD</b>	<b>TF</b>
120020	4	4.3	3.5	4.3	4.7	4.5	4.6	3.9	2.8	3.2	3.5	3.8	3.4	3.2
120031	4	4.1	3.6	4.3	4.8	4.6	4.4	3.9	3.4	3.2	4.1	3.5	4	3.1
120058	4	4.8	3.4	4.3	4.9	4.2	4.2	3.9	3.1	3.3	4.4	3.6	3.8	3.3
120089	3.9	4.3	3.7	4.3	4.2	4.4	4.5	3.8	5.3	3.2	4.4	4.7	4.5	4.9
120090	4	4.5	3.7	4.2	4	4.8	4.4	3.9	5.5	3.3	4.2	4.3	4.2	4.5
120145	3.7	4.6	3.5	4.3	4.6	4.7	4.3	4	3.8	3.3	4.4	3.7	3.8	3
120156	3.7	4.8	3.5	4.3	4.8	4.5	4.5	3.9	3.3	3.3	4.7	3.9	3.5	3.1
120166	3.9	4.3	3.4	4.3	4.8	4.4	4.6	3.8	2.8	3.2	4.3	3.7	3.5	3.1
120285	4	4.4	3.5	4.3	4.8	4.6	4.4	3.8	4.1	3.3	4.5	4.4	3.8	3.4
120314	3.9	4.3	3.5	4.2	3.5	4.4	4.2	3.7	5.5	3.2	4	4.9	4.3	4.6
120329	4.1	4.7	3.4	4.3	4.9	4.5	4.5	4	3	3.3	4.7	3.6	3.5	2.9
120330	3.8	4.7	3.5	4.2	4.6	4.4	4.3	3.9	4.1	3.2	3.9	3.8	3.9	3.1
120331	3.9	4.3	3.5	4.3	4.8	4.4	4.6	3.8	3.3	3.2	4.3	4.4	3.6	3.8
120341	3.8	4.5	3.4	4.3	4.9	4.4	4.4	3.9	5.1	3.2	4.4	4.6	4	3.5
120363	3.5	4.6	3.4	4.1	5.3	4.5	4.7	3.8	2.7	3.2	3.9	3.5	3.3	3
120365	3.5	4.6	3.8	4.2	3.4	4.3	4.5	3.8	5.2	3.2	3.8	4.6	4.3	4.5
120366	3.5	4.6	3.7	4.2	3.7	4.3	4.5	3.8	5.2	3.2	3.5	4.6	4.2	4.8
120374	3.4	4.4	3.9	4.2	4.5	4.5	4.4	3.9	3.2	3.2	3.4	4.2	3.9	3.2
120381	3.5	4.4	3.6	4.1	3.5	4.5	4.4	3.9	3	3.2	4	3.8	3.4	2.9
<i>LSD (0.05)</i>	<i>0.5</i>	<i>0.3</i>	<i>0.4</i>	<i>0.3</i>	<i>0.6</i>	<i>0.3</i>	<i>0.3</i>	<i>0.2</i>	<i>0.8</i>	<i>0.1</i>	<i>0.6</i>	<i>0.6</i>	<i>0.5</i>	<i>0.7</i>

BT=bitter; CH=chemical; CL=cereal; FL=floral; FR=fruit; GR=grain; GS=grass; HN=honey; MT=malt; RO=roasted; SF=sulfur; ST=sweet; TD=toasted; TF=toffee

Supplementary Table X (cont.): Best linear unbiased predictors (BLUPs) for selected Oregon Promise doubled haploids grown at Lebanon, OR in 2015.

<b>Genotype</b>	<b>BT</b>	<b>CH</b>	<b>CL</b>	<b>FL</b>	<b>FR</b>	<b>GR</b>	<b>GS</b>	<b>HN</b>	<b>MT</b>	<b>RO</b>	<b>SF</b>	<b>ST</b>	<b>TD</b>	<b>TF</b>
120384	3.6	4.6	3.4	4.3	3.8	4.4	4.6	3.9	2.2	3.2	3.4	3.1	3.3	2.8
120510	3.8	4.4	3.9	4.2	4.6	4.6	4.4	3.8	4.3	3.2	3.4	3.5	4	3.4
120516	3.7	4.6	3.6	4.1	4.3	4.4	4.4	3.9	3.5	3.2	3.9	3.7	3.4	2.9
120520	3.6	4.4	3.7	4.3	4.7	4.2	4.3	3.9	3.3	3.2	3.4	4.6	3.5	3.4
120521	3.5	4.2	3.6	4.2	4.6	4.7	4.5	3.9	3.3	3.2	3	4.3	3.9	3.3
120529	3.5	4.4	3.8	4.3	5.1	4.4	4.3	3.8	3.4	3.2	2.8	5	3.7	4.2
120536	3.5	4.4	3.5	4.2	4.6	4.4	4.6	3.9	3.3	3.2	4.5	4.1	3.3	3
120543	3.6	4.4	3.6	4.2	4.8	4.6	4.7	3.8	2.8	3.2	2.7	4.2	3.5	3.7
120657	3.9	4.4	3.7	4.2	4.8	4.6	4.5	3.8	4.9	3.2	3.5	4.7	3.8	3.7
120661	3.8	4.5	3.4	4.2	4.5	4.5	4.6	3.9	3.7	3.2	4.6	3.6	4.1	3
120671	4	4.5	3.5	4.2	4.5	4.4	4.5	3.9	4.1	3.2	3.9	3.9	3.6	3
120691	4.1	4.2	3.6	4.3	4.8	4.4	4.5	3.9	4.3	3.2	3.7	3.4	3.6	2.9
120709	3.8	4.2	3.6	4.3	4.7	4.4	4.5	3.8	3.1	3.2	4	4.9	3.9	3
120715	3.8	4.5	3.5	4.3	4.6	4.6	4.6	3.8	4.3	3.2	4.5	3.9	3.7	3
120731	3.9	4.4	3.9	4.2	3.4	4.5	4.4	3.8	5.8	3.2	4.2	5	4.5	4.9
Golden Promise	4.8	4.1	3.8	4.2	4.9	4.4	4.4	3.8	3.3	3.2	4.1	5	3.8	3.7
Full Pint	4.9	4.1	3.8	3.3	3.2	4.4	4.4	3.9	5.2	3.2	4.3	5	4.2	4.7
CDC Copeland	3.8	4.4	3.5	4.3	4.8	4.3	4.4	3.9	4	3.2	4.3	4.4	3.9	3.5
<i>LSD (0.05)</i>	<i>0.5</i>	<i>0.3</i>	<i>0.4</i>	<i>0.3</i>	<i>0.6</i>	<i>0.3</i>	<i>0.3</i>	<i>0.2</i>	<i>0.8</i>	<i>0.1</i>	<i>0.6</i>	<i>0.6</i>	<i>0.5</i>	<i>0.7</i>

BT=bitter; CH=chemical; CL=cereal; FL=floral; FR=fruit; GR=grain; GS=grass; HN=honey; MT=malt; RO=roasted; SF=sulfur; ST=sweet; TD=toasted; TF=toffee

Supplementary Table XI: Best linear unbiased predictors (BLUPs) for selected Oregon Promise doubled haploids grown at Madras, OR in 2015.

<b>Genotype</b>	<b>BT</b>	<b>CH</b>	<b>CL</b>	<b>FL</b>	<b>FR</b>	<b>GR</b>	<b>GS</b>	<b>HN</b>	<b>MT</b>	<b>RO</b>	<b>SF</b>	<b>ST</b>	<b>TD</b>	<b>TF</b>
120020	3.7	4.5	3.6	4.4	4.6	4.5	4.6	4	4.8	3.5	4.1	4.2	4.7	4.4
120031	3.5	4.2	3.9	4.4	4.8	4.7	4.6	3.9	3.6	3.5	4	4.4	3.7	3.5
120058	3.5	4.3	3.2	4.2	4.5	4.3	4.6	3.9	3.5	3.5	3.9	3.7	3.2	3
120089	4.2	4.2	3.7	4.3	4.3	4.2	4.6	3.3	3.9	3.5	4.2	4.3	3.3	3.4
120090	4.2	4.2	3.4	4.3	3.6	4.6	4.6	3.4	4.5	3.4	4.2	4.1	2.7	3.1
120145	4.3	3.5	3.6	4.4	4.5	4.5	4.6	3.4	3.9	3.5	3.9	4.8	3.3	3.8
120156	4.1	4	3.6	4.4	3.5	4.5	4.6	3.3	4.5	3.5	4	4.4	3.1	3.6
120166	4	3.9	4	4.3	4.4	4.4	4.6	3.4	3.6	3.5	4.2	4.6	3.9	4.6
120285	4.1	4.2	3.8	4.4	4.7	4.5	4.6	3.3	3.6	3.5	4	4.3	3.4	3.4
120314	4.1	4.2	3.9	4.3	3.2	4.3	4.6	3.4	4.5	3.5	4.1	3.9	3.6	3.2
120329	4.2	4	3.6	4.2	4.3	4.6	4.6	3.3	5.4	3.5	3.9	4.5	4.1	4.6
120330	4.2	4.1	3.8	4.4	4.3	4.2	4.6	3.3	4.4	3.5	4.1	3.9	3.6	3.4
120331	4.1	4.1	3.4	4.4	4.8	4.5	4.6	3.2	2.9	3.5	3.9	3.6	2.6	2.8
120341	4	4.2	3.8	4.2	3.4	4.6	4.6	3.4	5.4	3.5	4.1	4.3	4.4	4.9
120363	4.2	4.4	3.6	4.1	4.1	4.3	4.6	3.3	3.5	3.5	3.8	3.7	3.4	3.7
120365	4.1	4.1	4.1	4.3	4.6	4.3	4.6	3.4	4.9	3.5	3.8	4.7	3.9	4.6
120366	3.2	4.5	3.9	4.2	3.7	4.1	4.6	4.6	5.2	3.5	4	4.8	5.4	5
120374	3.2	4.8	3.6	4.2	3.8	4.2	4.6	4.6	5.5	3.5	4.3	4.2	5.3	5.3
120381	3	4.6	3.2	4.3	4.8	4	4.6	4.5	2.9	3.5	4.2	3.7	3.9	3.3
<i>LSD (0.05)</i>	<i>0.6</i>	<i>0.5</i>	<i>0.5</i>	<i>0.4</i>	<i>0.7</i>	<i>0.4</i>	<i>0</i>	<i>0.6</i>	<i>0.8</i>	<i>0.1</i>	<i>0.4</i>	<i>0.5</i>	<i>0.7</i>	<i>0.7</i>

BT=bitter; CH=chemical; CL=cereal; FL=floral; FR=fruit; GR=grain; GS=grass; HN=honey; MT=malt; RO=roasted; SF=sulfur; ST=sweet; TD=toasted; TF=toffee

Supplementary Table XI (cont.): Best linear unbiased predictors (BLUPs) for selected Oregon Promise doubled haploids grown at Madras, OR in 2015.

<b>Genotype</b>	<b>BT</b>	<b>CH</b>	<b>CL</b>	<b>FL</b>	<b>FR</b>	<b>GR</b>	<b>GS</b>	<b>HN</b>	<b>MT</b>	<b>RO</b>	<b>SF</b>	<b>ST</b>	<b>TD</b>	<b>TF</b>
120384	3	4.3	3.5	4.4	4.9	4.3	4.6	4.6	3.2	3.5	3.8	4.2	4.1	3.6
120510	3.4	4.9	3.5	4.2	3	4.3	4.6	4.6	3.5	3.5	4.4	3.7	4.6	3.6
120516	3.2	4.9	3.2	4.4	3.2	4	4.6	4.4	3.1	3.5	3.8	3.2	3.5	3
120520	3.3	4.4	3.3	4.4	2.9	4	4.6	4.5	3.7	3.5	3.5	4.4	4	3.6
120521	3.3	4.9	3	4.2	4.8	4.3	4.6	4.4	2.5	3.4	4.1	3.8	3.7	3
120529	3.1	4.7	3.2	4.4	4.2	3.9	4.6	4.5	3.8	3.5	3.7	4.1	4.7	3.5
120536	3.2	4.9	3.1	4.3	4.2	4.1	4.6	4.7	3.5	3.5	3.8	3.9	4.4	3.5
120543	3.4	4.8	3.2	4.3	4.8	4.4	4.6	4.5	3.2	3.4	4	4.2	4.2	3.4
120657	3.4	4.7	3.6	4.2	3.8	4.4	4.6	4.7	5.8	3.5	3.8	4.9	5.3	4.9
120661	3.7	5.4	3.1	4.2	5.1	3.8	4.6	4.4	2.8	3.4	4	3.3	3.9	3.1
120671	3.4	4.4	3.7	4.4	5	4.5	4.6	3.8	4.4	3.5	3.8	4.6	3.8	3.6
120691	3.3	3.9	3.9	4.3	3.9	4.8	4.6	3.9	5.5	3.5	3.9	4	5	4.8
120709	3.3	4.6	3.5	4.3	4.8	4.2	4.6	3.9	2.8	3.4	3.8	3.7	3.2	3.1
120715	3.6	4.2	4.1	4.3	4.8	4.6	4.6	4	3.6	3.5	4.3	3.9	4	3.8
120731	3.5	4.6	3.4	4.3	4.5	4.5	4.6	3.9	4.9	3.4	4	4.2	3.2	3
Golden Promise	3.5	4	3.9	4.5	5	4.4	4.6	3	3.5	3.5	4.1	4.2	3.3	2.6
Full Pint	3.3	4.1	5	3.2	3.1	4.5	4.6	3.8	5.5	3.5	4.1	4.8	4	3.8
CDC Copeland	3.5	4.5	3.5	4.3	4.6	4.2	4.6	3.9	3.8	3.5	4.2	3.9	3.9	4
<i>LSD (0.05)</i>	<i>0.6</i>	<i>0.5</i>	<i>0.5</i>	<i>0.4</i>	<i>0.7</i>	<i>0.4</i>	<i>0</i>	<i>0.6</i>	<i>0.8</i>	<i>0.1</i>	<i>0.4</i>	<i>0.5</i>	<i>0.7</i>	<i>0.7</i>

BT=bitter; CH=chemical; CL=cereal; FL=floral; FR=fruit; GR=grain; GS=grass; HN=honey; MT=malt; RO=roasted; SF=sulfur; ST=sweet; TD=toasted; TF=toffee

Name: \_\_\_\_\_

Oregon Promise

Date: \_\_\_\_\_

Sample #:

*Instructions:* Look at, smell and then taste each beer sample.

Evaluate each beer sample in the order provided, and indicate the magnitude of flavor difference of samples from reference beer for the following descriptors. No significant difference can be indicated with a mark in the reference box.

COLOR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	LIGHTER				REFERENCE				DARKER
GRAINY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
CEREAL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
MALTY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
TOASTED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
TOFFEE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
HONEY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
ROASTED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
FRUIT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
FLORAL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
GRASS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
VEGETABLE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
CHEMICAL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
SWEETNESS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
BITTERNESS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
ASTRINGENT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WEAKER				REFERENCE				STRONGER
BODY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	THIN				REFERENCE				FULL

Supplementary Figure 1: Ballot design and sensory 17 attributes used for sensory assessment of the Oregon Promise doubled haploids across all three Oregon locations (Corvallis; Lebanon; Madras) in 2015.