SUPPLEMENTARY TABLE I

Significant marker–trait associations identified in both the Barley Coordinated Agricultural Program (CAP) and Malt panels. Table lists the respective traits (Trait), the chromosome (Chr), the position, as measured in cM, along the chromosome (Pos), most significant SNP marker (SNP), the minor allele frequency (MAF), the allele effect with respect to the minor allele (Allele effect), the percent phenotypic variation explained by the association (r^2), the false discovery rate *P* value (FDR *P* value), the panel in which the significant association was identified in (Panel), and the reference information for those QTL previously reported (Reference). Trait abbreviations can be found in text.

Trait	Chr	Pos	SNP	MAF	Allele effect	r^2	FDR *P* value	Panel	Reference
AA	5H	169.72	12_30656	0.422	5.326	2.14	0.00137	CAP	
	5H	189.22	12_10322	0.418	17.062	8.25	5.43E-35	Both	(66)
BG	2H	68.07	11_20032	0.165	-0.202	1.13	0.00431	Malt	(26, 66)
	5H	83.17	11_11290	0.052	-0.364	3.40	0.00073	CAP	
	5H	165.28	11_10869	0.178	-0.150	1.04	0.00599	Malt	(47, 66)
	5H	189.22	12_10322	0.418	-0.240	2.46	1.20E-6	Malt	(47, 66)
	7H	54.37	11_20074	0.282	0.113	0.77	0.03910	Malt	
DP									
	1H	4.71	12_31144	0.100	-15.056	1.57	4.11E-6	Malt	(31, 66)
	2H	113.53	11_10398	0.391	-8.832	0.60	0.03400	Malt	
	4H	130.81	11_10387	0.164	-22.172	4.85	1.39E-18	Malt	(16, 52, 66)
FAN									
	2H	68.07	11_20032	0.165	13.664	0.68	0.00467	Malt	
	4H	56.22	12_30605	0.180	-9.592	0.51	0.02418	Malt	
	5H	25.42	11_21324	0.145	-10.706	0.55	0.01646	Malt	
	5H	189.89	12_31123	0.422	36.987	7.40	1.01E-31	Malt	(10, 66)
ME									
	2H	44.04	12_30432	0.488	0.567	1.58	0.02229	CAP	(52, 66)
	2H	68.07	11_20032	0.165	0.588	0.85	0.01744	Malt	
	4H	0	12_30764	0.071	0.582	1.42	0.03802	CAP	
	5H	189.89	12_31123	0.422	0.833	2.57	1.60E-7	Both	(66)
	6H	52.19	12_30658	0.428	.485	1.04	0.00667	Malt	
	7H	84.3	11_10673	0.057	1.090	2.27	0.00319	CAP	
PRO									
	3H	145.84	11_11127	0.061	-0.456	0.93	0.03321	CAP	(38, 66)
	6H	52.19	12_30658	0.428	-0.448	4.83	3.85E-9	Malt	(63)
	7H	97.65	12_11044	0.052	0.576	0.98	0.03321	CAP	
ST									
	2H	67.63	12_10474	0.172	1.802	0.81	0.00098	Malt	
	5H	25.42	11_21324	0.145	-1.253	0.52	0.01416	Malt	
	5H	189.89	12_31123	0.422	4.180	6.47	2.46E-29	Both	(47, 66)
	6H	52.19	12_30658	0.428	1.176	0.62	0.00474	Malt	
WP									
	2H	68.07	11_20032	0.165	0.193	0.55	0.00793	Malt	
	4H	56.22	12_30605	0.180	-0.156	0.55	0.00793	Malt	
	5H	189.22	12_10322	0.418	0.546	6.69	1.21E-33	Both	
HDT									
	2H	68.07	11_20032	0.165	-0.904	1.84	2.25E-7	Malt	(45)
	4H	56.22	12_30605	0.180	-0.380	0.50	0.04601	Malt	(39)
	7H	31.35	12_30893	0.375	-0.875	3.76	9.90E-15	Malt	(8)
KW									
	2H	68.07	11_20032	0.165	1.258	1.54	0.00150	Malt	
	2H	147.37	11_20215	0.052	-2.748	2.33	0.00683	CAP	(9, 66)
	7H	32.13	12_10218	0.302	0.807	1.02	0.02031	Malt	(5, 66)
	7H	125.16	11_20354	0.088	-0.893	0.94	0.02545	Malt	(47, 66, 68)
PLT									
	2H	67.63	11_20039	0.174	-3.187	2.24	2.82E-5	Malt	(45)
	5H	4.15	12_31023	0.182	1.444	1.02	0.01691	Malt	(65, 68)
	5H	188.04	12_30382	0.485	-1.664	1.15	0.00970	Malt	(5)
	7H	32.13	12_10218	0.302	-3.105	3.48	9.03E-8	Malt	
PLP									
	1H	140.69	11_20840	0.495	0.039	1.14	0.02753	Malt	
	2H	68.07	11_20032	0.165	0.079	2.07	1.23E-5	Malt	
	4H	139.97	11_10610	0.360	-0.04	0.76	0.03385	Malt	
	5H	24.76	11_11048	0.114	0.052	2.15	0.03419	CAP	
	5H	143.29	11_21077	0.184	-0.048	1.25	0.00243	Malt	(45, 66)
	7H	32.01	11_10838	0.345	0.024	1.01	0.04414	Both	(5, 66)
TW									
	1H	134.96	11_20383	0.457	-0.328	1.42	0.00135	Malt	
	2H	68.07	11_20032	0.165	0.534	1.43	0.00135	Malt	
	4H	111.81	12_30990	0.281	-0.287	0.87	0.01974	Malt	
	7H	32.13	12_10218	0.302	0.409	1.35	0.00135	Malt	(66, 68)
	7H	125.16	11_20354	0.088	-0.372	0.85	0.01982	Malt	
YLD									
	5H	55.44	12_30745	0.300	-178.08	2.04	0.01362	Malt	
	5H	143.29	11_21077	0.184	-199.30	1.91	0.01362	Malt	

AA = α-amylase activity, BG = β-glucan content, DP = diastatic power, ME = malt extract, PLP = kernel plumpness, FAN = free amino nitrogen, KW = kernel weight, PRO = grain protein content, ST = ratio of soluble to total protein, WP = wort protein, HDT = heading date, PLT = plant height, TW = grain test weight, and YLD = grain yield.