

Table. S1 Peak SNP and beneficial allele associated with starch, amylose and AM/AP identified by GWAS

Trait	Marker	Chromosome	Position	$-\log_{10}(p)$	p	Marker R2(%)	Allele	Major allele	Majorallele effect	Minor allele	Minorallele effect	MAF
Starch	rs51073817	1	51,073,817	6.53	2.92E-07	8.018	T,C	T	8.20	C	7.83	0.236
Starch	rs74870574	1	74,870,574	7.63	2.36E-08	8.712	A,G	A	7.50	G	6.93	0.343
Starch	rs577411	3	577,411	7.99	1.03E-08	6.839	T,A	T	6.15	A	6.21	0.203
Starch	rs46965686	4	46,965,686	6.75	1.76E-07	6.419	G,A	G	7.66	A	7.24	0.262
Starch	rs11190345	5	11,190,345	6.48	3.29E-07	6.529	C,T	C	7.83	T	7.42	0.109
Starch	rs12508174	6	12,508,174	6.74	1.83E-07	5.746	T,C	T	-6.09	C	-6.15	0.485
Starch	rs57714612	6	57,714,612	6.47	3.42E-07	5.970	G,A	G	7.90	A	7.76	0.477
Starch	rs57714862	6	57,714,862	6.41	3.85E-07	5.974	G,A	G	7.86	A	7.70	0.471
Starch	rs8773750	9	8,773,750	6.49	3.22E-07	8.157	G,A	G	7.69	A	7.17	0.152
Starch	rs54426145	10	54,426,145	7.25	5.62E-08	6.186	C,A	C	7.30	A	8.06	0.058
Amylose	rs1933441	1	1,933,441	7.06	8.67E-08	5.886	G,T	G	21.50	T	21.57	0.057
Amylose	rs15355871	1	15,355,871	7.47	3.35E-08	6.288	C,A	C	10.60	A	10.55	0.055
Amylose	rs59529621	1	59,529,621	8.77	1.70E-09	7.854	G,A	G	8.57	A	9.59	0.170
Amylose	rs67863947	1	67,863,947	6.53	2.95E-07	6.113	T,C	T	17.05	C	15.96	0.337
Amylose	r78198470	1	78,198,470	7.00	9.89E-08	6.707	G,A	G	21.70	A	21.43	0.064
Amylose	rs78633677	1	78,633,677	6.86	1.37E-07	8.478	C,A	C	21.66	A	21.13	0.170
Amylose	rs2640412	2	2,640,412	7.02	9.57E-08	6.467	T,C	T	21.45	C	21.94	0.113
Amylose	rs3178542	2	3,178,542	6.97	1.08E-07	6.207	A,G	A	21.65	G	21.60	0.108
Amylose	rs8516112	2	8,516,112	6.83	1.48E-07	6.298	A,G	A	21.26	G	21.15	0.227
Amylose	rs14624951	2	14,624,951	6.85	1.41E-07	5.837	G,A	G	10.60	A	10.85	0.274
Amylose	rs44695723	2	44,695,723	6.55	2.79E-07	6.329	A,G	A	13.73	G	12.90	0.065
Amylose	rs55497513	2	55,497,513	7.24	5.70E-08	6.527	G,T	G	21.91	T	22.27	0.060
Amylose	rs64636024	2	64,636,024	6.66	2.17E-07	9.182	A,T	A	21.42	T	20.94	0.108
Amylose	rs11464152	3	11,464,152	6.92	1.19E-07	6.744	G,A	G	22.15	A	21.66	0.129
Amylose	rs60790633	3	60,790,633	10.72	1.91E-11	9.923	T,C	T	10.49	C	7.91	0.097
Amylose	rs60790634	3	60,790,634	10.36	4.34E-11	9.873	A,G	A	10.49	G	8.06	0.097
Amylose	rs10591471	4	10,591,471	7.10	7.88E-08	6.656	C,T	C	21.70	T	22.20	0.449
Amylose	rs25945071	4	25,945,071	7.14	7.18E-08	6.439	T,A	T	21.48	A	21.69	0.147
Amylose	rs25945314	4	25,945,314	7.04	9.19E-08	6.779	G,C	G	21.55	C	21.62	0.152
Amylose	rs60258623	4	60,258,623	7.75	1.79E-08	6.759	C,T	C	21.93	T	20.54	0.164
Amylose	rs60714885	4	60,714,885	7.16	6.92E-08	6.125	T,A	T	21.70	A	21.22	0.161
Amylose	rs61221819	4	61,221,819	7.00	1.01E-07	6.443	T,A	T	21.64	A	21.51	0.417
Amylose	rs61221821	4	61,221,821	6.96	1.09E-07	6.402	T,G	T	21.54	G	21.49	0.421
Amylose	rs63884845	4	63,884,845	7.15	7.12E-08	6.508	T,C	T	21.69	C	21.46	0.063
Amylose	rs5815695	5	5,815,695	7.80	1.58E-08	6.656	G,T	G	22.04	T	20.89	0.091
Amylose	rs14255941	5	14,255,941	7.77	1.71E-08	7.028	A,G	A	21.64	G	22.69	0.068
Amylose	rs56796392	5	56,796,392	8.93	1.17E-09	7.487	C,A	C	12.41	A	7.62	0.068
Amylose	rs60758684	5	60,758,684	6.65	2.21E-07	5.501	C,A	C	3.99	A	6.59	0.051
Amylose	rs54234240	7	54,234,240	6.99	1.03E-07	7.134	A,G	A	20.69	G	21.28	0.475
Amylose	rs54234243	7	54,234,243	6.55	2.82E-07	8.627	G,A	G	21.05	A	20.75	0.435
Amylose	rs57774768	7	57,774,768	6.72	1.90E-07	5.692	G,A	G	7.09	A	5.51	0.174

Amylose	rs57804840	7	57,804,840	7.37	4.31E-08	6.684	T,C	T	22.23	C	22.20	0.152
Amylose	rs7172543	8	7,172,543	7.15	7.16E-08	7.123	C,T	C	22.10	T	21.80	0.278
Amylose	rs9602168	8	9,602,168	7.26	5.46E-08	6.630	A,T	A	21.95	T	21.90	0.180
Amylose	rs40142993	8	40,142,993	7.09	8.16E-08	6.350	T,C	T	22.07	C	21.60	0.476
Amylose	rs60025445	8	60,025,445	7.08	8.35E-08	6.430	T,C	T	21.74	C	22.11	0.063
Amylose	rs10589789	9	10,589,789	6.74	1.82E-07	7.626	A,G	A	20.98	G	21.24	0.177
Amylose	rs10589804	9	10,589,804	7.11	7.73E-08	8.956	C,T	C	21.68	T	21.04	0.154
Amylose	rs50575066	9	50,575,066	6.89	1.29E-07	5.702	G,T	G	8.04	T	5.92	0.054
Amylose	rs56954563	9	56,954,563	6.89	1.28E-07	6.123	C,A	C	21.36	A	20.70	0.105
Amylose	rs56954573	9	56,954,573	6.89	1.28E-07	6.123	C,T	C	21.36	T	20.70	0.105
Amylose	rs9282554	10	9,282,554	6.80	1.59E-07	5.891	C,A	C	20.68	A	21.26	0.225
Amylose	rs10343046	10	10,343,046	7.28	5.25E-08	6.150	C,T	C	22.15	T	21.60	0.060
Amylose	rs11403867	10	11,403,867	7.56	2.76E-08	6.660	C,T	C	21.65	T	22.87	0.188
Amylose	rs14149713	10	14,149,713	6.90	1.26E-07	6.557	A,C	A	21.50	C	21.84	0.195
Amylose	rs14651581	10	14,651,581	7.01	9.77E-08	6.065	T,G	T	21.22	G	20.08	0.350
Amylose	rs43579722	10	43,579,722	7.04	9.07E-08	10.955	C,T	C	21.73	T	22.02	0.139
Amylose	rs46703006	10	46,703,006	7.28	5.29E-08	6.491	T,C	T	21.85	C	21.24	0.336
Amylose	rs46814761	10	46,814,761	6.97	1.08E-07	7.482	G,A	G	21.45	A	21.75	0.055
Amylose	rs49614380	10	49,614,380	6.56	2.77E-07	6.303	C,T	C	21.88	T	21.52	0.217
Amylose	rs54159231	10	54,159,231	6.95	1.13E-07	6.817	A,G	A	21.29	G	21.66	0.359
AM/AP	rs15355871	1	15,355,871	6.45	3.55E-07	5.397	C,A	C	0.14	A	0.14	0.055
AM/AP	rs59529621	1	59,529,621	7.70	1.98E-08	6.872	G,A	G	0.11	A	0.13	0.170
AM/AP	rs60790633	3	60,790,633	9.69	2.04E-10	9.010	T,C	T	0.14	C	0.10	0.097
AM/AP	rs60790634	3	60,790,634	9.16	6.87E-10	8.732	A,G	A	0.14	G	0.10	0.097
AM/AP	rs60258623	4	60,258,623	6.68	2.08E-07	5.841	C,T	C	0.29	T	0.27	0.164
AM/AP	rs5815695	5	5,815,695	6.61	2.44E-07	5.623	G,T	G	0.29	T	0.27	0.091
AM/AP	rs14255941	5	14,255,941	6.70	2.01E-07	6.106	A,G	A	0.28	G	0.30	0.068
AM/AP	rs56796392	5	56,796,392	7.66	2.21E-08	6.385	C,A	C	0.16	A	0.10	0.068
AM/AP	rs11403867	10	11,403,867	6.38	4.15E-07	5.582	C,T	C	0.28	T	0.30	0.188