

Supplementary Table 1. Grain properties of 41 Korean wheat cultivars over 4 years.

Cultivar	Thousand kernels Wt. (g)	Test Wt (g)	Grain			
			Length (mm)	Width (mm)	Thickness (mm)	Roundness
OI	37.4	799	6.19	3.38	2.84	1.74
Geuru	48.4	814	6.95	3.54	2.97	1.84
Dahong	31.8	817	5.89	3.13	2.68	1.76
Chunggye	35.5	828	5.99	3.25	2.75	1.75
Eunpa	36.8	846	5.99	3.29	2.79	1.72
Tapdong	38.0	836	6.06	3.33	2.81	1.73
Namhae	36.1	803	6.16	3.41	2.90	1.71
Uri	40.3	820	6.56	3.22	2.70	1.90
Olgeuru	43.2	811	6.59	3.40	2.92	1.90
Alchan	35.9	834	5.87	3.23	2.72	1.73
Gobun	39.7	833	6.36	3.22	2.80	1.82
Keumkang	47.3	832	6.74	3.51	2.96	1.91
Seodun	38.3	831	6.02	3.31	2.82	1.76
Saeol	38.3	816	6.77	3.18	2.71	1.95
Jinpoom	37.7	834	6.12	3.26	2.79	1.75
Milsung	34.2	821	5.93	3.16	2.71	1.75
Joeun	37.0	823	6.15	3.23	2.81	1.76
Anbaek	45.9	825	6.40	3.63	2.91	1.75
Jopoom	37.2	814	6.83	3.14	2.63	2.00
Shinmichal	37.9	810	6.42	3.23	2.71	1.86
Jonong	42.4	821	6.32	3.39	2.86	1.85
Jokyung	47.9	823	7.00	3.47	2.82	1.87
Younbaek	42.5	817	6.62	3.39	2.89	1.82
Shinmichal1	34.1	828	6.10	3.16	2.69	1.80
Dabun	39.2	801	6.59	3.29	2.87	1.83
Baekjoong	40.7	812	6.58	3.32	2.84	1.84
Jeokjoong	41.8	803	6.65	3.33	2.87	2.04
Sukang	39.8	832	6.35	3.30	2.83	1.80
Hanbaek	51.0	792	7.17	3.55	3.09	2.00
Suan	46.1	841	6.82	3.43	2.84	2.04
Dajoong	33.3	805	6.64	2.97	2.47	2.06
Goso	44.4	822	6.63	3.41	2.94	1.95
Joa	43.6	789	6.67	3.41	2.96	1.93
Hojoong	42.4	824	6.71	3.35	2.80	2.03
Baekchal	37.8	819	6.24	3.36	2.73	1.84
Jojoong	35.0	814	6.38	3.22	2.73	1.84
Baekgang	49.4	828	6.99	3.50	2.99	1.84
Saekeumkang	45.4	815	6.80	3.28	2.90	1.85
Taejoong	56.0	787	6.83	3.74	3.22	1.71
Johan	39.5	828	6.32	3.28	2.87	1.77
Joongmo2008	45.1	818	7.21	3.27	2.89	2.01
Lsd ^z	3.57	19.3	0.184	0.1122	0.1051	0.18
Max	56.0	846	7.21	3.74	3.22	2.06
Min	31.8	787	5.87	2.97	2.47	1.71
Avg	40.8	819	6.48	3.33	2.83	1.85

^zLeast significant difference ($p < 0.05$).

Supplementary Table 2. Allelic compositions associated with grain properties of 41 Korean wheat cultivars.

Cultivar	TaCwi-A1	TaCWI-4A	TaCWI-5D	TaGW2-6A	TaTGW6-A1	TaTGW-7A	TaGS1a	TaSus1-7A	TaSus1-7B	TaSus2-2B	TaCKX6-D1	TaCKX6a02-D1a	TaSnRk2.3
Ol	TaCwi-A1b	Hap-4A-C	Hap-5D-G	Hap-6A-A	TaTGW6-A1a	TaTGW-7Aa	Hap 1	Hap-1	Hap-C	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Dahong	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-G	TaTGW6-A1ab	TaTGW-7Aa	Hap 1/2	Hap-1	Hap-T	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Geuru	TaCwi-A1b	Hap-4A-T	Hap-5D-G	Hap-6A-G	TaTGW6-A1ab	TaTGW-7Aa	Hap 1/2	Hap-1	Hap-C	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Chunggye	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1ab	TaTGW-7Aa	Hap 1/2	Hap-1	Hap-C	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Eunpa	TaCwi-A1a	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1a	TaTGW-7Aa	Hap 2	Hap-1	Hap-T	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Tapdong	TaCwi-A1a	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1ab	TaTGW-7Aa	Hap 1/2	Hap-1	nz	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Namhae	TaCwi-A1b	Hap-4A-C	Hap-5D-G	Hap-6A-A	TaTGW6-A1ab	TaTGW-7Aa	Hap 1	Hap-1/2	nd	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Uri	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1ab	TaTGW-7Aa	Hap 1/2	Hap-1	Hap-T	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Olgeuru	TaCwi-A1b	Hap-4A-C	Hap-5D-C	Hap-6A-A	TaTGW6-A1ab	TaTGW-7Aa	Hap 1/2	Hap-1	nd	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Alchan	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1ab	TaTGW-7Aa	Hap 1/2	Hap-1	nd	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Gobun	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1a	TaTGW-7Aa	Hap 1/2	Hap-1	nd	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Keumkang	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-G	TaTGW6-A1a	TaTGW-7Aa	Hap 1/2	Hap-1	Hap-C	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Seodun	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1a	TaTGW-7Aa	Hap 1/2	Hap-1	Hap-C	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Sacol	TaCwi-A1a	Hap-4A-T	Hap-5D-G	Hap-6A-A	TaTGW6-A1ab	TaTGW-7Aa	Hap 1	Hap-1	nd	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Jinpoom	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1a	TaTGW-7Aa	Hap 1/2	Hap-1	Hap-C	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Milsung	TaCwi-A1a	Hap-4A-T	Hap-5D-G	Hap-6A-A	TaTGW6-A1b	TaTGW-7Aa	Hap 1	Hap-1	Hap-C	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Joeun	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1a	TaTGW-7Aa	Hap 1/2	Hap-1	nd	Hap-L	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Anbaek	TaCwi-A1a	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1a	TaTGW-7Aa	Hap 1/2	Hap-1	Hap-C	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Jopoom	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1ab	TaTGW-7Aa	Hap 1	Hap-1	Hap-T	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Shimichal	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1b	TaTGW-7Aa	Hap 1/2	Hap-1	Hap-C	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Jonong	TaCwi-A1b	Hap-4A-T	Hap-5D-G	Hap-6A-A	TaTGW6-A1b	TaTGW-7Aa	Hap 1/2	Hap-1	Hap-T	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Jokyung	TaCwi-A1a	Hap-4A-T/C	Hap-5D-C	Hap-6A-G	TaTGW6-A1a	TaTGW-7Aa	Hap 1/2	Hap-1	Hap-C	Hap-L	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Younbaek	TaCwi-A1b	Hap-4A-T/C	Hap-5D-C	Hap-6A-G	TaTGW6-A1ab	TaTGW-7Aa	Hap 1	Hap-1	nd	Hap-L	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Shinnichal1	TaCwi-A1b	Hap-4A-C	Hap-5D-C	Hap-6A-A	TaTGW6-A1b	TaTGW-7Aa	Hap 1	Hap-1	nd	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Dabun	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-G	TaTGW6-A1b	TaTGW-7Aa	Hap 1	Hap-1	nd	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Baekjoong	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1ab	TaTGW-7Aa	Hap 1	Hap-1	nd	Hap-L	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Jeokjoong	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1ab	TaTGW-7Aa	Hap 1	Hap-1	Hap-C	Hap-L	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Sukang	TaCwi-A1a	Hap-4A-T	Hap-5D-C	Hap-6A-G	TaTGW6-A1a	TaTGW-7Aa	Hap 1/2	Hap-1	nd	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Hanbaek	TaCwi-A1a	Hap-4A-T/C	Hap-5D-C	Hap-6A-G	TaTGW6-A1a	TaTGW-7Aa	Hap 1	Hap-1	nd	Hap-L	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Suan	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1ab	TaTGW-7Aa	Hap 1	Hap-1	Hap-T	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Dajjoong	TaCwi-A1b	Hap-4A-T/C	Hap-5D-C	Hap-6A-A	TaTGW6-A1a	TaTGW-7Aa	Hap 1	Hap-1	nd	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Goso	TaCwi-A1b	Hap-4A-C	Hap-5D-C	Hap-6A-A	TaTGW6-A1ab	TaTGW-7Aa	Hap 2	Hap-1	Hap-C	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Joa	TaCwi-A1b	Hap-4A-C	Hap-5D-C	Hap-6A-A	TaTGW6-A1b	TaTGW-7Aa	Hap 1	Hap-1	Hap-C	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Hojjoong	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1a	TaTGW-7Aa	Hap 1/2	Hap-1	Hap-C	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Baekchal	TaCwi-A1a	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1a	TaTGW-7Aa	Hap 1/2	Hap-1	nd	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Jojoong	TaCwi-A1a	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1b	TaTGW-7Aa	Hap 1	Hap-1	nd	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Baekgang	TaCwi-A1a	Hap-4A-T	Hap-5D-C	Hap-6A-G	TaTGW6-A1a	TaTGW-7Aa	Hap 2	Hap-1	Hap-T	Hap-L	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Saekumkang	TaCwi-A1b	Hap-4A-C	Hap-5D-C	Hap-6A-G	TaTGW6-A1a	TaTGW-7Aa	Hap 2	Hap-1	Hap-C	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Taejoong	TaCwi-A1b	Hap-4A-C	Hap-5D-C	Hap-6A-G	TaTGW6-A1ab	TaTGW-7Aa	Hap 1/2	Hap-1	nd	Hap-L	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Johan	TaCwi-A1b	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1a	TaTGW-7Aa	Hap 1	Hap-1	nd	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2
Joongmo2008	TaCwi-A1a	Hap-4A-T	Hap-5D-C	Hap-6A-A	TaTGW6-A1a	TaTGW-7Aa	Hap 1/2	Hap-1	nd	Hap-H	TaCKX6-D1a	TaCKX6a02-D1a	Hap-1A-2

¹nd = not detected PCR product.