Table S3 The genotype and RSA related traits for the 149 wheat accessions by developed KASP markers

Name	Origin	RL (cm)	RS (mm^2)	RW (g)	*KASP-RL-1DL*	*KASP-RS-1D*	*KASP-RS-2DL*	*KASP-RW-2AS*	*KASP-RW-2DL*
CHANG6990	Cultivar	67.6	7.8	0.039	CC	CC	AA	AA	GG
CUNMAI218	Cultivar	143.8	16.2	0.039	CC	AA	GG	AA	GG
CUNMAI25	Cultivar	44.8	9.9	0.037	CC	CC	AA	AA	GG
FANMAI26	Cultivar	70.8	10.6	0.023	TC	CC	GG	GG	AA
FANMAI28	Cultivar	52.4	14.2	0.030	TC	AA	GG	GG	GG
FANMAI30	Cultivar	132.5	15.0	0.046	CC	AA	GG	AA	GG
FANMAI31	Cultivar	161.4	15.0	0.036	CC	AA	GG	AA	GG
HANGMAI106	Cultivar	119.6	17.6	0.039	CC	AA	GG	AA	AA
HANGMAI917	Cultivar	101.8	12.2	0.028	TT	AA	GG	AA	GG
HUAIHE15076	Cultivar	62.3	12.3	0.040	CC	AA	GG	AA	GG
HUAIHE15173	Cultivar	90.8	11.7	0.041	CC	CC	GG	AA	GG
HUAIHE16174	Cultivar	47.6	9.3	0.048	TT	AA	AA	AA	AA
HUAIHE19108	Cultivar	72.0	9.6	0.037	TT	CC	AA	AA	GG
HUAIHE20224	Cultivar	47.0	9.4	0.034	TT	TC	GG	AA	GG

HUAIHE21126	Cultivar	95.8	13.2	0.034	TC	CC	GG	AA	GG
HUAIMAI2118	Cultivar	125.5	16.0	0.037	TT	AA	GG	GG	AA
HUAIMAI33	Cultivar	132.0	18.6	0.037	CC	AA	AA	AA	AA
HUAIMAI404	Cultivar	89.4	8.2	0.040	CC	CC	AA	AA	AA
HUAIMAI606	Cultivar	95.3	11.4	0.035	CC	CC	GG	AA	AA
HUAIMAI701	Cultivar	79.3	11.7	0.024	CC	CC	AA	AA	GG
WP-072	Cultivar	27.8	7.4	0.021	CC	CC	AA	GG	GG
JIMAI40	Cultivar	68.8	9.9	0.026	CC	AA	AA	AA	GG
JIMAI44	Cultivar	84.1	14.6	0.026	CC	AA	GG	AA	GG
JIMAI55	Cultivar	66.8	13.1	0.024	TT	AA	AA	GG	GG
KENONG2009	Cultivar	61.5	9.7	0.034	TT	CC	GG	GG	AA
LANTIAN15	Cultivar	51.8	7.6	0.028	CC	AA	GG	AA	GG
LANTIAN26	Cultivar	63.7	8.8	0.038	CC	CC	GG	GG	GG
LIANGXING66	Cultivar	72.1	11.7	0.046	CC	CC	AA	AA	AA
LIANGXING99	Cultivar	67.6	9.6	0.034	CC	AA	GG	GG	AA
LONGJIAN115	Cultivar	104.2	11.7	0.025	CC	CC	AA	GG	GG
LONGJIAN386	Cultivar	121.8	13.8	0.034	CC	CC	GG	AA	GG

LUMAI23	Cultivar	44.7	6.9	0.029	CC	CC	GG	GG	GG
LUMAI6HAO	Cultivar	149.7	18.7	0.051	CC	AA	GG	AA	AA
LUMAI7HAO	Cultivar	106.5	10.2	0.042	TT	AA	AA	AA	AA
LUNXUAN136	Cultivar	79.5	8.8	0.038	CC	CC	GG	AA	GG
LUNXUAN139	Cultivar	73.5	10.4	0.024	TT	TC	GG	GG	AA
LUNXUAN147	Cultivar	130.9	15.1	0.034	CC	AA	GG	AA	GG
LUNXUAN67	Cultivar	38.5	6.7	0.036	TT	CC	AA	GG	AG
LUOFENG2419	Cultivar	97.1	11.6	0.038	CC	CC	AA	GG	GG
LUOFENG7011	Cultivar	80.4	14.3	0.044	TT	AA	GG	AA	GG
LUOHAN2HAO	Cultivar	52.1	11.6	0.025	TT	CC	GG	GG	GG
LUOMAI1137	Cultivar	46.0	10.6	0.033	CC	CC	GG	GG	GG
LUOMAI27	Cultivar	64.1	9.6	0.027	CC	AA	GG	GG	GG
LUOMAI33	Cultivar	79.2	12.4	0.027	TT	CC	AA	GG	GG
LUOMAI38	Cultivar	41.8	4.5	0.033	CC	CC	GG	AA	GG
LUOMAI42	Cultivar	93.2	16.8	0.039	CC	AA	GG	AA	AG
LUOMAI49	Cultivar	98.3	9.8	0.042	TT	CC	GG	GG	AA
LUOMAI56	Cultivar	74.6	10.6	0.029	CC	CC	AA	AA	GG

LUOMAI69	Cultivar	106.7	13.3	0.037	TT	AA	AG	GG	AA
LUOMAI896	Cultivar	131.1	16.7	0.033	CC	AA	GG	GG	GG
LUYAN148	Cultivar	71.2	11.5	0.031	TT	CC	GG	AA	GG
LUYAN987	Cultivar	68.6	9.5	0.029	TT	CC	AA	GG	GG
LUYUAN502	Cultivar	50.3	10.7	0.041	TT	CC	AA	AA	GG
MALAN1	Cultivar	100.0	15.9	0.031	TT	CC	AA	GG	GG
NONGDA759	Cultivar	126.0	12.1	0.025	CC	TC	GG	AA	AA
PUBING01	Cultivar	122.8	16.3	0.036	CC	CC	AA	GG	GG
PUBING03	Cultivar	37.4	9.9	0.042	NN	CC	AG	GG	AG
PUBING300	Cultivar	98.2	16.0	0.038	CC	CC	GG	AA	GG
SHANGMAI178	Cultivar	113.9	14.6	0.041	TT	AA	GG	AA	AA
SHANGMAI187	Cultivar	91.1	13.8	0.037	CC	AA	AA	GG	GG
SHANGMAI189	Cultivar	123.6	13.1	0.044	TT	AA	GG	AA	AA
SHANGMAI206	Cultivar	101.0	19.5	0.037	TT	AA	NN	GG	GG
SHANNONG24	Cultivar	66.1	10.8	0.033	CC	CC	AA	AA	AA
SHI4185	Cultivar	48.2	9.2	0.034	TT	AA	GG	AA	GG
WANKE2809	Cultivar	91.6	13.3	0.027	CC	CC	GG	GG	GG

WANKE421	Cultivar	45.2	7.1	0.028	CC	AA	GG	GG	GG
WANKE505	Cultivar	31.9	10.0	0.036	TT	CC	GG	AA	GG
WANKE800	Cultivar	62.9	13.0	0.037	TT	AA	GG	GG	GG
WANMAI38	Cultivar	64.3	9.8	0.027	CC	CC	GG	GG	GG
WEILONG169	Cultivar	33.1	6.9	0.027	CC	CC	AA	AA	GG
XINDONG52	Cultivar	162.7	13.0	0.036	TT	AA	AA	GG	AA
XINMAI26	Cultivar	138.6	12.6	0.037	TC	CC	GG	GG	AG
XINMAI38	Cultivar	113.7	12.5	0.040	CC	CC	GG	AG	AA
XINMAI45	Cultivar	87.0	18.5	0.031	TT	AA	GG	AA	GG
XINONG1155	Cultivar	59.6	10.1	0.024	CC	TC	GG	GG	GG
XINONG135	Cultivar	47.7	9.4	0.034	TT	CC	AG	GG	GG
XINONG1522	Cultivar	78.1	10.7	0.040	CC	AA	GG	GG	GG
XINONG1668	Cultivar	106.0	13.9	0.032	CC	AA	GG	GG	GG
XINONG20	Cultivar	105.7	9.7	0.036	CC	CC	AA	AA	AA
XINONG222	Cultivar	60.9	7.5	0.022	NN	CC	AA	GG	GG
XINONG306	Cultivar	98.8	13.1	0.028	TT	CC	GG	GG	GG
XINONG362	Cultivar	69.9	8.5	0.029	TT	CC	AA	GG	AA

XINONG511	Cultivar	136.3	13.1	0.034	CC	AA	GG	GG	GG
XINONG66	Cultivar	54.7	10.5	0.022	CC	CC	AA	GG	GG
XINONG733	Cultivar	75.7	8.9	0.040	CC	AA	AA	GG	AA
XINONG840	Cultivar	45.0	11.6	0.024	TT	AA	GG	GG	GG
XINONG969	Cultivar	85.8	15.0	0.035	TC	CC	AA	AA	GG
XINONG979	Cultivar	75.8	12.5	0.032	CC	CC	AA	AA	GG
XUMAI15019	Cultivar	70.7	8.9	0.039	TT	CC	AA	AA	GG
XUMAI15194	Cultivar	89.9	11.6	0.037	CC	CC	AA	AA	AA
XUMAI36	Cultivar	106.3	11.0	0.030	TT	CC	GG	GG	GG
YANGMAI25	Cultivar	63.0	15.8	0.047	CC	TC	GG	GG	GG
YANNONG1212	Cultivar	105.8	12.7	0.044	CC	AA	AA	AA	GG
YANNONG15	Cultivar	116.6	18.4	0.031	CC	AA	GG	GG	AA
YANNONG187	Cultivar	106.7	13.7	0.045	TT	CC	AA	AA	GG
YANNONG999	Cultivar	38.7	7.3	0.031	TT	AA	GG	GG	GG
YUMAI18	Cultivar	151.9	13.5	0.042	CC	CC	GG	AA	GG
YUMAI34	Cultivar	64.0	11.4	0.034	TT	CC	GG	GG	GG
YUMAI49	Cultivar	59.4	9.9	0.037	TC	AA	AA	GG	GG

YUNONG168	Cultivar	54.6	12.9	0.030	TT	CC	AG	GG	AA
YUNONG188	Cultivar	74.9	8.4	0.030	CC	CC	AA	AG	GG
YUNONG612	Cultivar	48.1	8.5	0.049	TT	CC	AA	AA	GG
YUNONG903	Cultivar	74.1	12.4	0.046	NN	CC	AA	AA	GG
ZHENGMAI161	Cultivar	154.3	18.9	0.044	CC	CC	GG	AA	GG
ZHENGMAI1921	Cultivar	51.1	7.0	0.022	TC	CC	AA	GG	GG
ZHENGMAI20	Cultivar	79.4	12.3	0.046	TT	CC	GG	GG	AA
ZHENGMAI201	Cultivar	66.6	9.9	0.030	TT	CC	GG	GG	AG
ZHENGMAI216	Cultivar	128.0	15.2	0.032	TT	CC	GG	GG	AA
ZHENGMAI22	Cultivar	109.8	12.5	0.026	TT	CC	GG	GG	GG
ZHENGMAI33	Cultivar	149.3	19.6	0.039	CC	CC	GG	GG	GG
ZHENGMAI366	Cultivar	77.8	13.5	0.035	CC	AA	GG	GG	GG
ZHENGMAI369	Cultivar	64.7	11.3	0.027	CC	CC	GG	GG	AA
ZHENGMAI379	Cultivar	32.2	8.0	0.031	CC	TC	AA	AA	GG
ZHENGMAI63	Cultivar	83.8	12.6	0.037	TC	CC	AA	GG	GG
ZHENGMAI65	Cultivar	91.7	17.2	0.040	TT	CC	GG	AA	AA
ZHONG892	Cultivar	71.8	12.5	0.030	CC	CC	AA	GG	GG

ZHONGMAI166	Cultivar	67.0	11.8	0.041	NN	CC	AA	AA	AA
ZHONGMAI255	Cultivar	86.8	12.9	0.021	CC	CC	GG	AA	AA
ZHONGMAI29	Cultivar	57.1	8.1	0.031	CC	AA	GG	AA	GG
ZHONGMAI36	Cultivar	41.1	6.2	0.029	TT	CC	GG	GG	GG
ZHONGZHIMAI16	Cultivar	50.3	12.6	0.037	CC	AA	GG	AA	GG
ZHONGZHIMAI22	Cultivar	58.1	8.5	0.046	TT	AA	GG	AA	AA
ZHOUMAI16	Cultivar	68.7	9.6	0.038	CC	AA	GG	AA	AA
ZHOUMAI22	Cultivar	66.2	8.4	0.037	CC	AA	AA	GG	GG
ZHOUMAI36	Cultivar	30.3	6.6	0.027	TT	CC	GG	AA	GG
ZHOUMAI37	Cultivar	70.4	9.4	0.042	TT	AA	AA	AA	GG
ZHOUMAI38	Cultivar	40.2	7.8	0.031	CC	AA	AA	AA	GG
ZHOUMAI49	Cultivar	87.7	8.3	0.029	TT	CC	GG	GG	AA
ZONGXINMAI998	Cultivar	79.1	12.1	0.033	CC	CC	GG	AG	GG
WP-001	Advanced lines	75.1	8.3	0.036	TT	CC	GG	GG	GG
WP-002	Advanced lines	85.0	10.9	0.035	CC	TC	GG	GG	AA
WP-003	Advanced lines	137.5	13.4	0.030	TC	AA	AA	GG	GG
WP-004	Advanced lines	75.7	13.0	0.028	CC	CC	GG	GG	GG

WP-005	Advanced lines	73.5	12.8	0.033	CC	CC	GG	AA	GG
WP-006	Advanced lines	123.8	15.7	0.031	TT	TC	GG	AG	GG
WP-007	Advanced lines	69.4	9.8	0.022	TT	TC	GG	AA	GG
WP-008	Advanced lines	60.2	8.3	0.036	CC	AA	GG	GG	GG
WP-012	Advanced lines	130.9	11.9	0.034	CC	AA	AA	GG	AG
WP-013	Advanced lines	73.8	10.1	0.037	TT	AA	GG	AA	GG
WP-014	Advanced lines	154.8	16.5	0.034	NN	CC	AG	GG	GG
WP-015	Advanced lines	141.4	17.7	0.048	TC	CC	GG	GG	AA
WP-016	Advanced lines	123.7	14.3	0.032	CC	AA	AG	GG	GG
WP-023	Advanced lines	86.6	12.6	0.025	TC	CC	GG	GG	GG
WP-024	Advanced lines	70.8	7.9	0.028	TT	CC	AA	GG	GG
WP-025	Advanced lines	66.5	8.9	0.039	TT	AA	GG	GG	AA
WP-026	Advanced lines	54.6	9.2	0.023	TT	CC	AA	GG	GG
WP-036	Advanced lines	87.7	9.3	0.027	TT	CC	GG	GG	GG
WP-037	Advanced lines	102.8	13.1	0.035	CC	AA	GG	GG	AA
WP-038	Advanced lines	143.5	12.7	0.040	CC	CC	AA	GG	AA

RL: root length; RA: root surface area; RV: root volume; RT: root tips; RW: root dry weight.