Table S1 Summary of 13 representative soybean accessions for deep resequencing

Accession name	Type	Origin	Resequencing depth (×)[a]	Coverage
Sui Nong No.14	Improved cultivar	Heilongjiang, China	20.0	0.97
Enrei	Improved cultivar	Japan	20.8	0.96
Hui Bu Zhi	Landrace	Shanxi, China	15.3	0.95
Jin Dou No.23	Improved cultivar	Shanxi, China	14.0	0.96
1508-101	Improved cultivar	China	23.8	0.97
1508-102	Improved cultivar	China	23.5	0.96
PI 518664	Improved cultivar	Virginia, United States	22.4	0.97
PI 483463	*G. soja*	Shanxi, China	21.5	0.95
Dong Nong No.50	Improved cultivar	Heilongjiang, China	16.8	0.96
PI 548382	Landrace	Liaoning, China	29.0	0.97
Williams 82	Improved cultivar	United States	NA[b]	NA[b]
PI 437654	Landrace	China	14.7	0.96
PI 603336	Landrace	Heilongjiang, China	24.5	0.97

[a]Sequence depth was calculated based on the size of Williams 82 reference genome (Wm82.a2.v1).

[b]Not available

Table S2 Eight soybean RIL populations constructed in our study

No.	Population	Generation	Population type	Female parent	Male parent	Number of lines
1	Sui Nong No.14 × Enrei	F_9	RIL	Sui Nong No.14	Enrei	138
2	Hui Bu Zhi × Jin Dou No.23	F_9	RIL	Hui Bu Zhi	Jin Dou No.23	268
3	1508-101 × 1508-102	F_9	RIL	1508-101	1508-102	88
4	PI 518664 × PI 483463	F_9	RIL	PI 518664	PI 483463	144
5	Dong NongNo.50 × Williams 82	F_9	RIL	Dong Nong No.50	Williams 82	296
6	PI 548382 × Williams 82	F_9	RIL	PI 548382	Williams 82	106
7	PI 437654 × Williams 82	F_9	RIL	PI 437654	Williams 82	89
8	PI 603336 × Williams 82	F_9	RIL	PI 603336	Williams 82	114

Table S4 Summary of genetic maps for eight soybean RIL populations

Populations	Number of SNPs	Number of bin markers	Number of recombination events	Average recombination events per RIL	Linkage distance (cM)	Distance between adjacent bins (cM)	Recombination rate (cM/Mb)
Sui Nong No.14 × Enrei	99023	3847	7259.5	52.6	2554.8	0.7	2.7
Hui Bu Zhi × Jin Dou No.23	142937	4742	13157.5	49.1	2430.2	0.5	2.6
1508-101 × 1508-102	165468	3085	5156.0	58.6	2840.5	0.9	3.0
PI 518664 × PI 483463	198746	5472	7894.0	54.8	2355.5	0.4	2.5
Dong Nong No.50 ×Williams 82	110424	5700	15150.5	51.2	2445.4	0.4	2.6
PI 548382 × Williams 82	119027	3119	5764.5	54.4	2568.9	0.8	2.7
PI 437654 × Williams 82	160193	2625	4311.0	48.4	2212.6	0.8	2.3
PI 603336 × Williams 82	120102	2926	6219.5	54.6	2550.4	0.9	2.7
Average	139490	3940	8114.1	53.0	2494.8	0.7	2.6

Table S5 Summary for non-crossover (NCO) events detected in soybean RIL populations

Population	Total NCO events	NCO per RIL	NCO length (bp)	Supported SNPs
Sui Nong No.14 × Enrei	3132	23	28274	4
Hui Bu Zhi × Jin Dou No.23	5673	21	31472	4
1508-101 × 1508-102	2321	26	28327	5
PI 518664 × PI 483463	4091	28	14157	4
Dong NongNo.50 × Williams 82	7564	26	17613	4
PI 548382 × Williams 82	2508	24	26445	5
PI 437654 × Williams 82	2702	30	21845	4
PI 603336 × Williams 82	2622	23	21128	4

Table S6 Recombination hotspots identified in 8 soybean RIL populations

Chr.	Start (Mb)	End (Mb)	Numbers of populations	Populations
Chr01	1	2	1	Sui Nong No.14 × Enrei
Chr01	2	3	4	Sui Nong No.14 × Enrei|1508-101 × 1508-102|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23
Chr01	3	4	6	Sui Nong No.14 × Enrei|1508-101 × 1508-102|PI 603336 × Williams 82|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23|PI 518664 × PI 483463
Chr01	4	5	5	1508-101 × 1508-102|PI 603336 × Williams 82|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23|PI 518664 × PI 483463
Chr01	49	50	2	Hui Bu Zhi × Jin Dou No.23|PI 548382 × Williams 82
Chr01	50	52	6	Sui Nong No.14 × Enrei|Dong Nong No.50 × Williams 82|PI 603336 × Williams 82|Hui Bu Zhi × Jin Dou No.23|PI 518664 × PI 483463|PI 548382 × Williams 82
Chr01	52	53	1	Sui Nong No.14 × Enrei
Chr02	14	16	6	Sui Nong No.14 × Enrei|Dong Nong No.50 × Williams 82|1508-101 × 1508-102|PI 437654 × Williams 82|PI 518664 × PI 483463|PI 548382 × Williams 82
Chr02	28	31	1	Hui Bu Zhi × Jin Dou No.23
Chr02	40	42	1	Dong Nong No.50 × Williams 82
Chr02	42	43	3	Dong Nong No.50 × Williams 82|1508-101 × 1508-102|PI 437654 × Williams 82
Chr02	43	45	2	1508-101 × 1508-102|PI 437654 × Williams 82
Chr02	45	47	1	PI 437654 × Williams 82
Chr03	0	2	3	1508-101 × 1508-102|PI 437654 × Williams 82|PI 518664 × PI 483463
Chr03	2	3	1	PI 437654 × Williams 82
Chr03	14	16	1	Hui Bu Zhi × Jin Dou No.23
Chr03	33	34	2	1508-101 × 1508-102|PI 437654 × Williams 82
Chr03	34	35	3	1508-101 × 1508-102|PI 437654 × Williams 82|PI 518664 × PI 483463
Chr03	35	36	1	PI 518664 × PI 483463
Chr03	40	42	1	PI 603336 × Williams 82

Table S6. Continued

Chr04	3	4	1	PI 603336 × Williams 82
Chr04	4	5	3	PI 603336 × Williams 82|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23
Chr04	5	6	4	1508-101 × 1508-102|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23|PI 548382 × Williams 82
Chr04	6	7	3	1508-101 × 1508-102|PI 437654 × Williams 82|PI 548382 × Williams 82
Chr04	7	8	1	1508-101 × 1508-102
Chr04	47	49	4	Sui Nong No.14 × Enrei|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23|PI 548382 × Williams 82
Chr04	49	50	2	Hui Bu Zhi × Jin Dou No.23|PI 548382 × Williams 82
Chr05	1	2	4	1508-101 × 1508-102|Hui Bu Zhi × Jin Dou No.23|PI 518664 × PI 483463|PI 548382 × Williams 82
Chr05	2	3	5	1508-101 × 1508-102|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23|PI 518664 × PI 483463|PI 548382 × Williams 82
Chr05	3	4	5	1508-101 × 1508-102|PI 603336 × Williams 82|PI 437654 × Williams 82|PI 518664 × PI 483463|PI 548382 × Williams 82
Chr05	4	5	4	PI 603336 × Williams 82|PI 437654 × Williams 82|PI 518664 × PI 483463|PI 548382 × Williams 82
Chr05	5	6	2	PI 603336 × Williams 82|PI 437654 × Williams 82
Chr05	33	35	1	PI 548382 × Williams 82
Chr05	38	41	1	1508-101 × 1508-102
Chr06	2	4	2	1508-101 × 1508-102|PI 548382 × Williams 82
Chr06	4	5	1	PI 548382 × Williams 82
Chr06	11	13	1	Dong Nong No.50 × Williams 82
Chr06	13	14	2	Dong Nong No.50 × Williams 82|PI 518664 × PI 483463
Chr06	14	16	1	PI 518664 × PI 483463
Chr06	16	20	1	PI 437654 × Williams 82
Chr06	48	49	2	PI 603336 × Williams 82|Hui Bu Zhi × Jin Dou No.23
Chr06	49	50	3	1508-101 × 1508-102|PI 603336 × Williams 82|Hui Bu Zhi × Jin Dou No.23
Chr06	50	51.4	1	1508-101 × 1508-102
Chr07	3	4	1	Sui Nong No.14 × Enrei
Chr07	4	5	2	Sui Nong No.14 × Enrei|PI 603336 × Williams 82
Chr07	5	6	1	PI 603336 × Williams 82

Table S6. Continued

Chr07	35	37	1	PI 603336 × Williams 82
Chr07	37	39	2	PI 603336 × Williams 82|PI 437654 × Williams 82
Chr07	42	44.6	1	1508-101 × 1508-102
Chr08	3	5	1	Hui Bu Zhi × Jin Dou No.23
Chr08	5	7	1	PI 603336 × Williams 82
Chr08	44	45	2	PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23
Chr08	45	47	3	PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23|PI 518664 × PI 483463
Chr08	47	47.8	2	PI 603336 × Williams 82|PI 518664 × PI 483463
Chr09	0	1	1	Dong Nong No.50 × Williams 82
Chr09	1	2	2	Sui Nong No.14 × Enrei|Dong Nong No.50 × Williams 82
Chr09	2	4	3	Sui Nong No.14 × Enrei|Dong Nong No.50 × Williams 82|PI 548382 × Williams 82
Chr09	4	5	1	Dong Nong No.50 × Williams 82
Chr09	11	14	1	PI 548382 × Williams 82
Chr10	0	2	1	PI 437654 × Williams 82
Chr10	2	3	2	PI 518664 × PI 483463|PI 548382 × Williams 82
Chr10	3	5	5	Sui Nong No.14 × Enrei|PI 603336 × Williams 82|PI 437654 × Williams 82|PI 518664 × PI 483463|PI 548382 × Williams 82
Chr10	5	6	1	PI 548382 × Williams 82
Chr10	38	39	1	Sui Nong No.14 × Enrei
Chr10	39	40	2	Sui Nong No.14 × Enrei|PI 437654 × Williams 82
Chr10	40	41	1	PI 437654 × Williams 82
Chr10	44	46	1	PI 437654 × Williams 82
Chr11	8	9	3	Dong Nong No.50 × Williams 82|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23
Chr11	9	10	5	Dong Nong No.50 × Williams 82|PI 603336 × Williams 82|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23|PI 548382 × Williams 82
Chr11	10	12	8	Sui Nong No.14 × Enrei|Dong Nong No.50 × Williams 82|1508-101 × 1508-102|PI 603336 × Williams 82|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23|PI 518664 × PI 483463|PI 548382 × Williams 82

Table S6. Continued

Chr11	12	13	1	PI 518664 × PI 483463
Chr11	24	26	2	1508-101 × 1508-102|PI 437654 × Williams 82
Chr11	26	27	3	1508-101 × 1508-102|PI 437654 × Williams 82|PI 548382 × Williams 82
Chr11	27	28	2	PI 437654 × Williams 82|PI 548382 × Williams 82
Chr11	30	31	1	PI 437654 × Williams 82
Chr11	31	32	3	Sui Nong No.14 × Enrei|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23
Chr11	32	33	5	Sui Nong No.14 × Enrei|Dong Nong No.50 × Williams 82|PI 603336 × Williams 82|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23
Chr11	33	34	4	Sui Nong No.14 × Enrei|Dong Nong No.50 × Williams 82|PI 603336 × Williams 82|PI 437654 × Williams 82
Chr11	34	34.8	3	Sui Nong No.14 × Enrei|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23
Chr12	2	4	2	PI 437654 × Williams 82|PI 548382 × Williams 82
Chr12	4	5	2	Dong Nong No.50 × Williams 82|PI 437654 × Williams 82
Chr12	5	6	1	Dong Nong No.50 × Williams 82
Chr12	6	8	1	1508-101 × 1508-102
Chr12	32	35	1	Hui Bu Zhi × Jin Dou No.23
Chr12	36	37	2	PI 603336 × Williams 82|PI 437654 × Williams 82
Chr12	37	38	3	PI 603336 × Williams 82|PI 437654 × Williams 82|PI 518664 × PI 483463
Chr12	38	39	1	PI 518664 × PI 483463
Chr13	20	21	1	PI 603336 × Williams 82
Chr13	21	22	3	Dong Nong No.50 × Williams 82|PI 603336 × Williams 82|PI 437654 × Williams 82
Chr13	22	23	2	Dong Nong No.50 × Williams 82|PI 437654 × Williams 82
Chr13	23	24	1	PI 437654 × Williams 82
Chr13	25	28	1	PI 603336 × Williams 82
Chr13	35	37	1	1508-101 × 1508-102
Chr14	6	7	3	PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23|PI 518664 × PI 483463
Chr14	7	8	4	PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23|PI 518664 × PI 483463|PI 548382 × Williams 82

Table S6. Continued

Chr14	8	9	3	PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23|PI 548382 × Williams 82
Chr14	40	42	1	PI 437654 × Williams 82
Chr14	44	45	2	PI 518664 × PI 483463|PI 548382 × Williams 82
Chr14	45	46	3	Hui Bu Zhi × Jin Dou No.23|PI 518664 × PI 483463|PI 548382 × Williams 82
Chr14	46	49.0	3	1508-101 × 1508-102|Hui Bu Zhi × Jin Dou No.23|PI 518664 × PI 483463
Chr15	3	5	1	Dong Nong No.50 × Williams 82
Chr15	9	12	1	PI 437654 × Williams 82
Chr15	49	51.8	1	PI 518664 × PI 483463
Chr16	2	3	1	Hui Bu Zhi × Jin Dou No.23
Chr16	3	5	2	Dong Nong No.50 × Williams 82|Hui Bu Zhi × Jin Dou No.23
Chr16	5	6	2	Dong Nong No.50 × Williams 82|PI 437654 × Williams 82
Chr16	6	8	1	PI 437654 × Williams 82
Chr16	30	32	1	PI 518664 × PI 483463
Chr16	35	37.9	1	Hui Bu Zhi × Jin Dou No.23
Chr17	6	8	1	1508-101 × 1508-102
Chr17	8	9	2	Dong Nong No.50 × Williams 82|1508-101 × 1508-102
Chr17	9	10	3	Dong Nong No.50 × Williams 82|1508-101 × 1508-102|PI 437654 × Williams 82
Chr17	10	11	2	PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23
Chr17	11	12	1	Hui Bu Zhi × Jin Dou No.23
Chr17	37	38	1	PI 437654 × Williams 82
Chr17	38	40	6	Sui Nong No.14 × Enrei|Dong Nong No.50 × Williams 82|PI 603336 × Williams 82|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23|PI 548382 × Williams 82
Chr17	40	41	5	Sui Nong No.14 × Enrei|Dong Nong No.50 × Williams 82|PI 603336 × Williams 82|PI 437654 × Williams 82|PI 548382 × Williams 82
Chr17	41	41.6	4	Sui Nong No.14 × Enrei|Dong Nong No.50 × Williams 82|PI 603336 × Williams 82|PI 548382 × Williams 82
Chr18	3	5	2	PI 603336 × Williams 82|PI 437654 × Williams 82

Table S6. Continued

Chr18	5	6	1	PI 603336 × Williams 82
Chr18	54	56	1	1508-101 × 1508-102
Chr19	0	2	2	1508-101 × 1508-102|Hui Bu Zhi × Jin Dou No.23
Chr19	2	3	1	1508-101 × 1508-102
Chr19	39	40	1	PI 518664 × PI 483463
Chr19	40	41	2	PI 437654 × Williams 82|PI 518664 × PI 483463
Chr19	41	42	1	PI 437654 × Williams 82
Chr19	42	43	2	PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23
Chr19	43	46	2	Dong Nong No.50 × Williams 82|Hui Bu Zhi × Jin Dou No.23
Chr20	0	2	8	Sui Nong No.14 × Enrei|Dong Nong No.50 × Williams 82|1508-101 × 1508-102|PI 603336 × Williams 82|PI 437654 × Williams 82|Hui Bu Zhi × Jin Dou No.23|PI 518664 × PI 483463|PI 548382 × Williams 82
Chr20	2	3	1	Sui Nong No.14 × Enrei
Chr20	34	36	1	PI 437654 × Williams 82
Chr20	36	40	1	Dong Nong No.50 × Williams 82

Table S7 QTL mapping for recombination hotspot usage

QTLs	Trait	Chr.	Peak position (cM)	LOD	R^2 (%)[a]	Additive[b]	Range (cM)[c]	Populations
qHU2	Hotspot usage	Chr02	118	2.8	5.7	-0.01	115.5-120.5	PI 548382 × Williams 82
qHU4-1	Hotspot usage	Chr04	59	2.9	5.9	-0.01	56.5-60.5	PI 548382 × Williams 82
qHU4-2	Hotspot usage	Chr04	70	2.7	5.7	-0.01	65.5-74.5	PI 548382 × Williams 82
qHU8	Hotspot usage	Chr08	138	2.5	8.3	-0.01	131.5-140.5	PI 518664 × PI 483463
qHU10-1	Hotspot usage	Chr10	9	3.1	10.3	0.03	5.5-14.5	PI 437654 × Williams 82
qHU10-2	Hotspot usage	Chr10	110	2.8	5.8	-0.01	107.5-112.5	PI 548382 × Williams 82
	Hotspot usage	Chr10	119	2.8	15.5	-0.02	116.5-119.5	1508-101 × 1508-102
qHU13-1	Hotspot usage	Chr13	20	2.7	15.6	-0.02	18.5-25.5	1508-101 × 1508-102
qHU13-2	Hotspot usage	Chr13	78	2.7	9.1	-0.03	75.5-78.5	PI 437654 × Williams 82
qHU14	Hotspot usage	Chr14	55	3.5	5.8	-0.01	52.5-56.5	Hui Bu Zhi × Jin Dou No.23
qHU18	Hotspot usage	Chr18	1	2.6	10.6	-0.02	0-1.5	PI 603336 × Williams 82
qHU19	Hotspot usage	Chr19	75	3.2	9.8	-0.02	74.5-76.5	PI 518664 × PI 483463

[a]Percentage of phenotypic variation explained by the identified QTL

[b]Additive effect of QTL from female parent

[c]Confidence interval calculated by one-LOD drop.

Table S8 QTL mapping for the total number of recombination events for each RIL in soybean RIL populations

QTLs	Trait	Chr.	Peak position (cM)	LOD	R^2 (%)[a]	Additive effect[b]	Range (cM)[c]	Populations
qRE1	Recombination event	Chr01	100	3.1	8.1	-2.6	98.5-100.5	PI 603336 × Williams 82
qRE3.1	Recombination event	Chr03	13	3.3	8.2	2.4	10.5-15.5	Sui Nong No.14 × Enrei
qRE3.2	Recombination event	Chr03	44	3.3	8.7	2.5	41.5-44.5	Sui Nong No.14 × Enrei
qRE5	Recombination event	Chr05	24	3.4	5.7	1.7	21.5-24.5	Hui Bu Zhi × Jin Dou No.2
qRE7	Recombination event	Chr07	12	2.8	7.0	-2.2	10.5-15.5	Sui Nong No.14 × Enrei
qRE10	Recombination event	Chr10	124	3.0	10.4	-5.3	121.5-125.5	1508-101 × 1508-102
qRE11.1	Recombination event	Chr11	13	2.9	10.2	5.3	10.5-18.5	1508-101 × 1508-102
qRE11.2	Recombination event	Chr11	84	2.6	7.0	2.4	80.5-97.5	PI 603336 × Williams 82
qRE11.3	Recombination event	Chr11	126	3.0	8.2	2.6	119.5-130.5	PI 603336 × Williams 82
qRE12	Recombination event	Chr12	11	2.7	8.2	-3.0	10.5-13.5	PI 518664 × PI 483463
qRE13	Recombination event	Chr13	111	2.7	14.8	2.4	110.5-112.5	PI 437654 × Williams 82
qRE18.1	Recombination event	Chr18	67	3.6	12.9	-5.9	65.5-67.5	1508-101 × 1508-102
qRE18.2	Recombination event	Chr18	71	3.8	13.1	-6.0	69.5-72.5	1508-101 × 1508-102

[a]Percentage of phenotypic variation explained by the identified QTL.

[b]Additive effect of QTL from female parent.

[c]Confidence interval calculated by one-LOD drop.

Table S9 Sequencing information in this study

Soybean accession	Replicates	Tissues	Library type	Raw reads pairs	Read length	Raw bases	Depth (×)[a]	Trimmed bases
Williams 82	replicate1	2-4mm flower bud	ATAC-seq	21,654,294	150	6,496,288,200	6.6	1,263,078,361
Williams 82	replicate2	2-4mm flower bud	ATAC-seq	31,536,075	150	9,460,822,500	9.7	1,785,633,953
Williams 82	replicate1	2-4mm flower bud	CUT&Tag for H3K4me3	19,776,880	150	5,933,064,000	6.1	1,267,286,083
Williams 82	replicate2	2-4mm flower bud	CUT&Tag for H3K4me3	14,543,956	150	4,363,186,800	4.5	884,925,991
Williams 82	replicate1	2-4mm flower bud	CUT&Tag for H3K9me3	24,244,421	150	7,273,326,300	7.4	2,541,680,042
Williams 82	replicate2	2-4mm flower bud	CUT&Tag for H3K9me3	23,931,132	150	7,179,339,600	7.3	2,599,161,787
Williams 82	replicate1	2-4mm flower bud	Bisulfite sequencing	256,382,787	150	76,914,836,100	78.6	69,691,179,252
Williams 82	replicate2	2-4mm flower bud	Bisulfite sequencing	211,021,959	150	63,306,587,700	64.7	56,504,189,523

[a]Sequence depth was calculated based on the size of Williams 82 reference genome (Wm82.a2.v1).

Table S10 Summary of long non-coding RNAs (lncRNAs) overlapping intergenic recombination sites

Chr.	Start	End	Strand	LncRNA ID	LncRNA transcript ID	Source
Chr01	942147	994455	+	Gmax_MSTRG.222	Gmax_MSTRG.222.1	Lin *et al*., 2020
Chr01	3032528	3033873	.	NC_GMAXST00000319	NC_GMAXST00000319.1	Golicz *et al*., 2018
Chr01	43900766	43900988	.	NC_GMAXST00001442	NC_GMAXST00001442.1	Golicz et al., 2018
Chr02	7097196	7157917	-	Gmax_MSTRG.6263	Gmax_MSTRG.6263.1	Lin *et al*., 2020
Chr02	41411598	41497734	+	Gmax_MSTRG.9167	Gmax_MSTRG.9167.1	Lin *et al*., 2020
Chr03	34483718	34484048	-	Gmax_MSTRG.12912	Gmax_MSTRG.12912.1	Lin *et al*., 2020
Chr03	41616443	41651413	+	Gmax_MSTRG.14471	Gmax_MSTRG.14471.1	Lin *et al*., 2020
Chr04	885448	1014561	+	Gmax_MSTRG.15820	Gmax_MSTRG.15820.1	Lin *et al*., 2020
Chr04	5850910	5853410	-	Gmax_MSTRG.17023	Gmax_MSTRG.17023.1	Lin *et al*., 2020
Chr04	47024030	47024273	.	NC_GMAXST00011015	NC_GMAXST00011015.1	Golicz *et al*., 2018
Chr04	49828027	49852984	-	Gmax_MSTRG.20084	Gmax_MSTRG.20084.1	Lin *et al*., 2020
Chr04	50770063	50772962	-	Gmax_MSTRG.20314	Gmax_MSTRG.20314.1	Lin *et al*., 2020
Chr05	3311169	3367762	-	Gmax_MSTRG.21489	Gmax_MSTRG.21489.1	Lin *et al*., 2020
Chr06	694842	695283	-	Gmax_MSTRG.25700	Gmax_MSTRG.25700.1	Lin *et al*., 2020
Chr06	694874	695281	.	NC_GMAXST00014431	NC_GMAXST00014431.1	Golicz *et al*., 2018
Chr06	10149689	10151316	+	Gmax_MSTRG.28045	Gmax_MSTRG.28045.1	Lin *et al*., 2020
Chr06	42499379	42881041	-	Gmax_MSTRG.30507	Gmax_MSTRG.30507.1	Lin *et al*., 2020
Chr06	49838839	49839433	+	NC_GMAXST00017627	NC_GMAXST00017627.1	Golicz *et al*., 2018
Chr07	1144935	1205598	-	Gmax_MSTRG.32113	Gmax_MSTRG.32113.1	Lin *et al*., 2020
Chr07	1145112	1206743	-	Gmax_MSTRG.32113	Gmax_MSTRG.32113.7	Lin *et al*., 2020
Chr07	1145117	1193145	-	Gmax_MSTRG.32113	Gmax_MSTRG.32113.8	Lin *et al*., 2020
Chr07	1145750	1221355	-	Gmax_MSTRG.32113	Gmax_MSTRG.32113.10	Lin *et al*., 2020
Chr07	1145793	1239368	-	Gmax_MSTRG.32113	Gmax_MSTRG.32113.11	Lin *et al*., 2020
Chr07	3250450	3257112	-	Gmax_MSTRG.32602	Gmax_MSTRG.32602.5	Lin *et al*., 2020
Chr07	3255079	3257105	+	Gmax_MSTRG.32610	Gmax_MSTRG.32610.1	Lin *et al*., 2020
Chr07	6547979	6620892	-	Gmax_MSTRG.33219	Gmax_MSTRG.33219.1	Lin *et al*., 2020
Chr07	10431645	10432723	+	NC_GMAXPA00046228	NC_GMAXPA00046228.1	Golicz *et al*., 2018
Chr07	15001933	15020877	+	Gmax_MSTRG.34317	Gmax_MSTRG.34317.1	Lin *et al*., 2020
Chr07	35711715	35744038	+	Gmax_MSTRG.35449	Gmax_MSTRG.35449.2	Lin *et al*., 2020
Chr07	42426584	42427478	+	Gmax_MSTRG.36603	Gmax_MSTRG.36603.1	Lin *et al*., 2020
Chr08	47369605	47437747	-	Gmax_MSTRG.44220	Gmax_MSTRG.44220.3	Lin *et al*., 2020
Chr08	47392691	47454291	-	Gmax_MSTRG.44220	Gmax_MSTRG.44220.11	Lin *et al*., 2020
Chr09	5344391	5345353	+	Gmax_MSTRG.45495	Gmax_MSTRG.45495.2	Lin *et al*., 2020
Chr09	44951381	44977945	+	Gmax_MSTRG.48657	Gmax_MSTRG.48657.1	Lin *et al*., 2020
Chr10	9269326	9269886	.	NC_GMAXST00028626	NC_GMAXST00028626.1	Golicz *et al*., 2018
Chr10	45626964	45696773	+	Gmax_MSTRG.54428	Gmax_MSTRG.54428.3	Lin *et al*., 2020
Chr12	6935711	6960635	-	Gmax_MSTRG.62552	Gmax_MSTRG.62552.1	Lin *et al*., 2020
Chr12	8075526	8075884	.	NC_GMAXPA00084507	NC_GMAXPA00084507.1	Golicz *et al*., 2018
Chr12	36246700	36247415	+	Gmax_MSTRG.64671	Gmax_MSTRG.64671.1	Lin *et al*., 2020
Chr12	38511442	38549605	+	Gmax_MSTRG.65157	Gmax_MSTRG.65157.3	Lin *et al*., 2020
Chr12	38511645	38566222	+	Gmax_MSTRG.65157	Gmax_MSTRG.65157.7	Lin *et al*., 2020
Chr13	32536741	32538511	+	Gmax_MSTRG.69682	Gmax_MSTRG.69682.1	Lin *et al*., 2020
Chr14	2235059	2682643	-	Gmax_MSTRG.73449	Gmax_MSTRG.73449.1	Lin *et al*., 2020
Chr14	2506570	2570344	-	Gmax_MSTRG.73499	Gmax_MSTRG.73499.1	Lin *et al*., 2020
Chr14	3838479	3916937	-	Gmax_MSTRG.73740	Gmax_MSTRG.73740.1	Lin *et al*., 2020
Chr14	3839510	3879064	-	Gmax_MSTRG.73742	Gmax_MSTRG.73742.1	Lin *et al*., 2020
Chr14	6289470	6302241	+	Gmax_MSTRG.74277	Gmax_MSTRG.74277.1	Lin *et al*., 2020
Chr15	9680485	9682383	-	Gmax_MSTRG.79564	Gmax_MSTRG.79564.1	Lin *et al*., 2020
Chr15	49154781	49183060	-	Gmax_MSTRG.82061	Gmax_MSTRG.82061.1	Lin *et al*., 2020
Chr16	698732	704975	-	Gmax_MSTRG.82577	Gmax_MSTRG.82577.1	Lin *et al*., 2020
Chr16	5389112	5391419	-	NC_GMAXPA00113021	NC_GMAXPA00113021.1	Golicz *et al*., 2018
Chr17	3540624	3541002	.	NC_GMAXST00048916	NC_GMAXST00048916.1	Golicz *et al*., 2018
Chr17	41069090	41151977	-	Gmax_MSTRG.91318	Gmax_MSTRG.91318.1	Lin *et al*., 2020
Chr18	6121687	6151337	-	Gmax_MSTRG.92737	Gmax_MSTRG.92737.1	Lin *et al*., 2020
Chr18	8556025	8830977	-	Gmax_MSTRG.93052	Gmax_MSTRG.93052.1	Lin *et al*., 2020
Chr18	8597961	8830977	-	Gmax_MSTRG.93052	Gmax_MSTRG.93052.2	Lin *et al*., 2020
Chr18	52454256	52543468	+	Gmax_MSTRG.95620	Gmax_MSTRG.95620.1	Lin *et al*., 2020
Chr18	53083249	53153852	-	Gmax_MSTRG.95751	Gmax_MSTRG.95751.1	Lin *et al*., 2020
Chr18	55976420	55977114	.	NC_GMAXST00054137	NC_GMAXST00054137.1	Golicz *et al*., 2018
Chr18	56153467	56155241	+	NC_GMAXPA00131685	NC_GMAXPA00131685.1	Golicz *et al*., 2018
Chr18	56153467	56156205	+	NC_GMAXPA00131685	NC_GMAXPA00131685.2	Golicz *et al*., 2018
Chr19	36950619	37039372	+	Gmax_MSTRG.98896	Gmax_MSTRG.98896.1	Lin *et al*., 2020
Chr19	47666942	47744262	+	Gmax_MSTRG.101163	Gmax_MSTRG.101163.1	Lin *et al*., 2020
Chr19	48279095	48279470	.	NC_GMAXST00056954	NC_GMAXST00056954.1	Golicz *et al*., 2018
Chr20	4670821	4671895	.	NC_GMAXST00057639	NC_GMAXST00057639.1	Golicz *et al*., 2018
Chr20	4670856	4671895	+	Gmax_MSTRG.102599	Gmax_MSTRG.102599.2	Lin *et al*., 2020
Chr20	4670856	4672034	+	Gmax_MSTRG.102599	Gmax_MSTRG.102599.1	Lin *et al*., 2020

Table S10. Continued

Chr20	4670888	4671746	+	NC_GMAXST00057639	NC_GMAXST00057639.2	Golicz *et al*., 2018
Chr20	46522021	46525230	.	NC_GMAXST00059854	NC_GMAXST00059854.1	Golicz *et al*., 2018
Chr20	46523333	46677135	-	Gmax_MSTRG.106443	Gmax_MSTRG.106443.1	Lin *et al*., 2020