

Table S4. Candidate genes in the 100kb flanking region of peak SNP.

Peak SNP	Chromosome	Physical position (bp)	Gene	Distance to SNP(Kbp)	Functional annotation
Gm01:4939564	1	4939564	Glyma.01G044800	1.668	basic helix-loop-helix (bHLH) DNA-binding superfamily protein
			Glyma.01G044900	8.899	Cyclophilin-like peptidyl-prolyl cis-trans isomerase family protein
Gm01:28321171	1	28321171	Glyma.01G093200	17.893	Metal-dependent phosphohydrolase
			Glyma.01G093300	2.27	ortholog of human splicing factor SC35
			Glyma.01G093400	3.687	basic helix-loop-helix (bHLH) DNA-binding superfamily protein
			Glyma.01G093500	1.479	Major facilitator superfamily protein
Gm04:1825609	4	1825609	Glyma.04G022100	2.351	Basic-leucine zipper (bZIP) transcription factor family protein
			Glyma.04G022200	3.058	Subtilisin-like serine endopeptidase family protein
			Glyma.04G022300	4.146	Subtilisin-like serine endopeptidase family protein
			Glyma.04G022400	6.947	Subtilisin-like serine endopeptidase family protein
			Glyma.04G022500	3.761	Subtilisin-like serine endopeptidase family protein
			Glyma.04G022600	10.278	Subtilisin-like serine endopeptidase family protein

			Glyma.04G022800	2.14	SGNH hydrolase-type esterase superfamily protein
			Glyma.04G022900	3.9	GDSL-like Lipase/Acylhydrolase superfamily protein
			Glyma.04G023000	1.262	GDSL-like Lipase/Acylhydrolase superfamily protein
			Glyma.04G023100	5.86	RING/FYVE/PHD zinc finger superfamily protein
			Glyma.04G023200	2.6	Glutathione S-transferase family protein
			Glyma.04G023300	3.352	RAC-like 3
			Glyma.04G023400	3.109	RAC-like 3
			Glyma.04G023600	6.609	Transcription elongation factor (TFIIS) family protein
			Glyma.04G023700	3.466	Pathogenesis-related thaumatin superfamily protein
			Glyma.04G023900	3.673	tubulin beta-1 chain
Gm04:50280537	4	50280537	Glyma.04G233400	5.062	Transducin/WD40 repeat-like superfamily protein
			Glyma.04G233500	3.689	Tetratricopeptide repeat (TPR)-like superfamily protein
			Glyma.04G233600	5.305	acyl-CoA binding protein 2
			Glyma.04G233700	4.619	ARM repeat superfamily protein
			Glyma.04G233900	4.002	thylakoid-associated phosphatase 38
			Glyma.04G234000	4.128	plastid transcriptionally active7
			Glyma.04G234100	5.402	RNA-binding KH domain-containing protein

			Glyma.04G234300	5.286	Tetratricopeptide repeat (TPR)-like superfamily protein
			Glyma.04G234500	5.133	ABL interactor-like protein 2
			Glyma.04G234600	1.667	RWP-RK domain-containing protein
			Glyma.04G234800	4.488	Ribonuclease P protein subunit P38-related
			Glyma.04G234900	4.214	2A phosphatase associated protein of 46 kD
			Glyma.04G235100	1.779	SNARE-like superfamily protein
			Glyma.04G235200	8.207	Glycogen/starch synthases, ADP-glucose type
			Glyma.04G235400	4.723	IQ-domain 21
			Glyma.04G235500	5.234	defective in meristem silencing 3
			Glyma.04G235600	5.497	CLP protease regulatory subunit X
			Glyma.04G235700	3.694	Protein with RING/U-box and TRAF-like domains
Gm04:50280919	4	50280919	Glyma.04G233400	5.062	Transducin/WD40 repeat-like superfamily protein
			Glyma.04G233500	3.689	Tetratricopeptide repeat (TPR)-like superfamily protein
			Glyma.04G233600	5.305	acyl-CoA binding protein 2
			Glyma.04G233700	4.619	ARM repeat superfamily protein
			Glyma.04G233900	4.002	thylakoid-associated phosphatase 38
			Glyma.04G234000	4.128	plastid transcriptionally active7

			Glyma.04G234100	5.402	RNA-binding KH domain-containing protein
			Glyma.04G234300	5.286	Tetratricopeptide repeat (TPR)-like superfamily protein
			Glyma.04G234500	5.133	ABL interactor-like protein 2
			Glyma.04G234600	1.667	RWP-RK domain-containing protein
			Glyma.04G234800	4.488	Ribonuclease P protein subunit P38-related
			Glyma.04G234900	4.214	2A phosphatase associated protein of 46 kD
			Glyma.04G235100	1.779	SNARE-like superfamily protein
			Glyma.04G235200	8.207	Glycogen/starch synthases, ADP-glucose type
			Glyma.04G235400	4.723	IQ-domain 21
			Glyma.04G235500	5.234	defective in meristem silencing 3
			Glyma.04G235600	5.497	CLP protease regulatory subunit X
			Glyma.04G235700	3.694	Protein with RING/U-box and TRAF-like domains
Gm04:50296144	4	50296144	Glyma.04G233400	5.062	Transducin/WD40 repeat-like superfamily protein
			Glyma.04G233500	3.689	Tetratricopeptide repeat (TPR)-like superfamily protein
			Glyma.04G233600	5.305	acyl-CoA binding protein 2
			Glyma.04G233700	4.619	ARM repeat superfamily protein
			Glyma.04G233900	4.002	thylakoid-associated phosphatase 38

			Glyma.04G234000	4.128	plastid transcriptionally active7
			Glyma.04G234100	5.402	RNA-binding KH domain-containing protein
			Glyma.04G234300	5.286	Tetratricopeptide repeat (TPR)-like superfamily protein
			Glyma.04G234500	5.133	ABL interactor-like protein 2
			Glyma.04G234600	1.667	RWP-RK domain-containing protein
			Glyma.04G234800	4.488	Ribonuclease P protein subunit P38-related
			Glyma.04G234900	4.214	2A phosphatase associated protein of 46 kD
			Glyma.04G235100	1.779	SNARE-like superfamily protein
			Glyma.04G235200	8.207	Glycogen/starch synthases, ADP-glucose type
			Glyma.04G235400	4.723	IQ-domain 21
			Glyma.04G235500	5.234	defective in meristem silencing 3
			Glyma.04G235600	5.497	CLP protease regulatory subunit X
			Glyma.04G235700	3.694	Protein with RING/U-box and TRAF-like domains
			Glyma.04G235800	2.902	Pentatricopeptide repeat (PPR) superfamily protein
Gm06:4218717	6	4218717	Glyma.06G054400	3.407	S-adenosyl-L-methionine-dependent methyltransferases superfamily protein
			Glyma.06G054500	0.87	WRKY DNA-binding protein 50
			Glyma. 06G054600	4. 786	S-adenosyl-L-methionine-dependent

		methyltransferases superfamily protein
Glyma.06G054700	0.917	17.6 kDa class II heat shock protein
Glyma.06G054800	1.667	Mitochondrial substrate carrier family protein
Glyma.06G054900	2.323	NIN like protein 7
Glyma.06G055100	5.518	Nitrilase/cyanide hydratase and apolipoprotein N-acyltransferase family protein
Glyma.06G055300	2.488	ACT-like protein tyrosine kinase family protein
Glyma.06G055400	4.319	mechanosensitive channel of small conductance-like 10
Glyma.06G055500	0.908	photosystem II subunit X
Glyma.06G055600	1.359	Chaperone DnaJ-domain superfamily protein
Glyma.06G055700	1.595	Duplicated homeodomain-like superfamily protein
Glyma.06G055800	5.98	F-box family protein
Glyma.06G056000	2.945	ferredoxin-related
Glyma.06G056200	1.957	YGGT family protein
Glyma.06G056300	8.817	P-type ATPase of Arabidopsis 2
Glyma.06G056400	7.933	Leucine-rich receptor-like protein kinase family protein
Glyma.06G056500	21.07	myosin, putative
Glyma.06G056700	2.773	glycosyl hydrolase 9A4

			Glyma.06G056900	2.979	glycosyl hydrolase 9A4
			Glyma.06G057000	6.112	G protein alpha subunit 1
Gm07:5196991	7	5196991	Glyma.07G057400	2.948	WRKY family transcription factor
			Glyma.07G057600	3.77	TRICHOME BIREFRINGENCE-LIKE 25
			Glyma.07G057900	4.881	Auxin-responsive GH3 family protein
			Glyma.07G058100	5.688	adenine nucleotide transporter 1
			Glyma.07G058200	7.286	SPA (suppressor of phyA-105) protein family
			Glyma.07G058300	2.776	Protein kinase family protein
			Glyma.07G058400	4.22	formin homology 1
			Glyma.07G058800	1.619	serine acetyltransferase 1;1
			Glyma.07G058900	3.887	NRAMP metal ion transporter 2
			Glyma.07G059000	1.945	Pyridoxal phosphate (PLP)-dependent transferases superfamily protein
			Glyma.07G059200	8.355	Cytochrome b561/ferric reductase transmembrane with DOMON related domain
Gm07:15774606	7	15774606	Glyma.07G132600	4.188	Barwin-like endoglucanases superfamily protein
			Glyma.07G132800	3.215	RHOMBOID-like 1
			Glyma.07G132900	4.534	Oxysterol-binding family protein

			Glyma.07G133000	5.413	TRF-like 2
			Glyma.07G133100	3.76	GRAS family transcription factor
			Glyma.07G133200	5.948	NAD(P)-binding Rossmann-fold superfamily protein
			Glyma.07G133300	2.48	hAT dimerisation domain-containing protein
			Glyma.07G133400	5.33	Ankyrin repeat family protein
			Glyma.07G133500	3.506	Haloacid dehalogenase-like hydrolase (HAD) superfamily protein
			Glyma.07G133700	3.434	WRKY DNA-binding protein 49
			Glyma.07G133900	4.318	laccase 17
Gm16:33856661	16	33856661	Glyma.16G176400	4.412	disease resistance family protein / LRR family protein
			Glyma.16G176500	1.312	P-loop containing nucleoside triphosphate hydrolases superfamily protein
			Glyma.16G176600	4.399	disease resistance family protein / LRR family protein
			Glyma.16G176700	1.748	WRKY DNA-binding protein 27
			Glyma.16G176800	4.159	disease resistance family protein / LRR family protein
			Glyma.16G176900	6.523	disease resistance family protein / LRR family protein
			Glyma.16G177000	1.916	WRKY family transcription factor
			Glyma.16G177100	6.475	Tic22-like family protein

			Glyma.16G177300	3.055	Pentatricopeptide repeat (PPR) superfamily protein
			Glyma.16G177400	7.2	Pentatricopeptide repeat (PPR) superfamily protein
			Glyma.16G177700	2.704	F-box/RNI-like/FBD-like domains-containing protein
			Glyma.16G177900	1.361	Heavy metal transport/detoxification superfamily protein
			Glyma.16G178000	1.153	Heavy metal transport/detoxification superfamily protein
			Glyma.16G178100	1.022	Heavy metal transport/detoxification superfamily protein
			Glyma.16G178200	1.127	Heavy metal transport/detoxification superfamily protein
			Glyma.16G178300	1.492	Heavy metal transport/detoxification superfamily protein
			Glyma.16G178400	1.085	Heavy metal transport/detoxification superfamily protein
			Glyma.16G178500	0.988	Heavy metal transport/detoxification superfamily protein
			Glyma.16G178700	7.158	Homeodomain-like superfamily protein
			Glyma.16G178800	3.965	heat shock protein 90.1
Gm16:33856677	16	33856677	Glyma.16G176400	4.412	disease resistance family protein / LRR family protein
			Glyma.16G176500	1.312	P-loop containing nucleoside triphosphate hydrolases superfamily protein
			Glyma.16G176600	4.399	disease resistance family protein / LRR family protein
			Glyma.16G176700	1.748	WRKY DNA-binding protein 27
			Glyma.16G176800	4.159	disease resistance family protein / LRR family protein

			Glyma.16G176900	6.523	disease resistance family protein / LRR family protein
			Glyma.16G177000	1.916	WRKY family transcription factor
			Glyma.16G177100	6.475	Tic22-like family protein
			Glyma.16G177300	3.055	Pentatricopeptide repeat (PPR) superfamily protein
			Glyma.16G177400	7.2	Pentatricopeptide repeat (PPR) superfamily protein
			Glyma.16G177700	2.704	F-box/RNI-like/FBD-like domains-containing protein
			Glyma.16G177900	1.361	Heavy metal transport/detoxification superfamily protein
			Glyma.16G178000	1.153	Heavy metal transport/detoxification superfamily protein
			Glyma.16G178100	1.022	Heavy metal transport/detoxification superfamily protein
			Glyma.16G178200	1.127	Heavy metal transport/detoxification superfamily protein
			Glyma.16G178300	1.492	Heavy metal transport/detoxification superfamily protein
			Glyma.16G178400	1.085	Heavy metal transport/detoxification superfamily protein
			Glyma.16G178500	0.988	Heavy metal transport/detoxification superfamily protein
			Glyma.16G178700	7.158	Homeodomain-like superfamily protein
			Glyma.16G178800	3.965	heat shock protein 90.1
Gm16:34281457	16	34281457	Glyma.16G181000	7.98	Protein kinase superfamily protein
			Glyma.16G181100	10.246	NAD(P)-binding Rossmann-fold superfamily protein

			Glyma.16G181200	5.337	NAD(P)-binding Rossmann-fold superfamily protein
			Glyma.16G181300	8.02	NAD(P)-binding Rossmann-fold superfamily protein
			Glyma.16G181400	6.246	NAD(P)-binding Rossmann-fold superfamily protein
			Glyma.16G181500	7.783	SKP1-like 21
			Glyma.16G181700	8.989	C2H2-like zinc finger protein
			Glyma.16G181900	5.503	ATP binding microtubule motor family protein
			Glyma.16G182000	4.026	Oxoglutarate/iron-dependent oxygenase
			Glyma.16G182100	5.395	alpha/beta-Hydrolases superfamily protein
			Glyma.16G182300	15.483	cleavage and polyadenylation specificity factor 100
			Glyma.16G182400	4.713	Plant regulator RWP-RK family protein
			Glyma.16G182500	19.961	tripeptidyl peptidase ii
			Glyma.16G182600	3.728	cytochrome P450, family 715, subfamily A, polypeptide 1
Gm16:36297567	16	36297567	Glyma.16G200800	1.365	gibberellin 20 oxidase 2
			Glyma.16G200900	2.013	carboxyesterase 20
			Glyma.16G201000	3.365	carboxyesterase 20
			Glyma.16G201100	4.962	Protein kinase superfamily protein
			Glyma.16G201200	3.341	Protein kinase superfamily protein

			Glyma.16G201300	8.043	basic helix-loop-helix (bHLH) DNA-binding superfamily protein
			Glyma.16G201400	1.91	basic helix-loop-helix (bHLH) DNA-binding superfamily protein
			Glyma.16G201500	2.678	Protein kinase superfamily protein
			Glyma.16G201600	5.189	Nucleotide-diphospho-sugar transferases superfamily protein
			Glyma.16G201700	2.345	subtilase 1.3
			Glyma.16G201800	3.169	HXXXD-type acyl-transferase family protein
			Glyma.16G201900	4.989	cysteine-rich RLK (RECEPTOR-like protein kinase) 25
			Glyma.16G202000	1.364	Embryo-specific protein 3, (ATS3)
			Glyma.16G202100	1.406	cysteine-rich RLK (RECEPTOR-like protein kinase) 25
			Glyma.16G202200	5.288	cysteine-rich RLK (RECEPTOR-like protein kinase) 25
			Glyma.16G202300	4.161	HXXXD-type acyl-transferase family protein
			Glyma.16G202400	4.791	cysteine-rich RLK (RECEPTOR-like protein kinase) 23
			Glyma.16G202500	2.097	Embryo-specific protein 3, (ATS3)
			Glyma.16G202600	1.118	F-box family protein
Gm16:36346596	16	36346596	Glyma.16G201100	4.962	Protein kinase superfamily protein
			Glyma.16G201200	3.341	Protein kinase superfamily protein

Glyma.16G201300	8.043	basic helix-loop-helix (bHLH) DNA-binding superfamily protein
Glyma.16G201400	1.91	basic helix-loop-helix (bHLH) DNA-binding superfamily protein
Glyma.16G201500	2.678	Protein kinase superfamily protein
Glyma.16G201600	5.189	Nucleotide-diphospho-sugar transferases superfamily protein
Glyma.16G201700	2.345	subtilase 1.3
Glyma.16G201800	3.169	HXXXD-type acyl-transferase family protein
Glyma.16G201900	4.989	cysteine-rich RLK (RECEPTOR-like protein kinase) 25
Glyma.16G202000	1.364	Embryo-specific protein 3, (ATS3)
Glyma.16G202100	1.406	cysteine-rich RLK (RECEPTOR-like protein kinase) 25
Glyma.16G202200	5.288	cysteine-rich RLK (RECEPTOR-like protein kinase) 25
Glyma.16G202300	4.161	HXXXD-type acyl-transferase family protein
Glyma.16G202400	4.791	cysteine-rich RLK (RECEPTOR-like protein kinase) 23
Glyma.16G202500	2.097	Embryo-specific protein 3, (ATS3)
Glyma.16G202600	1.118	F-box family protein
Glyma.16G202700	2.287	Ribosomal L18p/L5e family protein
Glyma.16G202800	1.079	F-box family protein

			Glyma.16G202900	1.1	F-box family protein
			Glyma.16G203000	1.094	F-box family protein
			Glyma.16G203100	1.695	2 iron, 2 sulfur cluster binding
			Glyma.16G203200	12.509	K ⁺ efflux antiporter 5
			Glyma.16G203300	7.801	ERECTA-like 1
Gm19:33085197	19	33085197	Glyma.19G093600	1.27	photosystem II subunit QA
