

**Supplement Table S1** Comparison of 23 QTNs with QTLs reported in previous studies

QTNs found in this study			QTL/QTN has been discovered by predecessors		
Name <sup>a</sup>	Position <sup>b</sup> (bp)	Marker Associated <sup>c</sup>	Position <sup>d</sup> (bp)	Linkage group	Reference <sup>e</sup>
<b>qHSW-2-1</b>	<b>Gm02_4453462</b>	<i>BARC-018187-02537</i>	Gm02:4396906	D1b	Hu, 2013; Chen, 2023
qHSW-2-2	Gm02_5698517	<i>Glyma.02g059400</i>	Gm02:5350425-5351746	D1b	Karikari, 2020; Assefa T, 2019
<b>qHSW-3-1</b>	<b>Gm03_3724705</b>	<i>qSLW-3-2</i>	Gm03:1509548-6780840	N	Elattar, 2021
<b>qHSW-4-1</b>	<b>Gm04_5395873</b>	<i>qHSW-4-3</i>	Gm04:5600501 -8116383	C1	Elattar, 2021
<b>qHSW-4-2</b>	<b>Gm04_36981242</b>	<i>qHSW-4-5</i>	Gm04:18566056-38979735	C1	Elattar, 2021
<b>qHSW-5-1</b>	<b>Gm05_37024496</b>	<i>Glyma05g32030</i>	Gm05:37026301-37031440	A1	Elattar, 2021
qHSW-6-1	Gm06_13909376	<i>BARC-014305-01310</i>	Gm06:14467413	C2.2	Karikari, 2020; Assefa T, 2019
qHSW-6-3	Gm06_48581982	<i>BARC-028445-05875</i>	Gm06:48467115	C2	Teng, 2009; Zhang X, 2021
<b>qHSW-8-1</b>	<b>Gm08_4692303</b>	<i>Gm08_4692303</i>	Gm08:4692303	A2	Karikari, 2020
<b>qHSW-8-2</b>	<b>Gm08_14545190</b>	<i>qHSW-8-3</i>	Gm08:13630881 -14853570	A2	Elattar, 2021
<b>qHSW-9-1</b>	<b>Gm09_4376323</b>	<i>qPW9-1 / qPW9-4</i>	Gm09:4444061- 4546963	K	Chen, 2023
qHSW-10-1	Gm10_3962423	<i>Satt653</i>	Gm10:4621018	O	Kato, 2014; Chen, 2023
qHSW-11-1	Gm11_10506624	<i>BARC-028289-05814</i>	Gm11:10206223	B1	Liang, 2010
qHSW-13-1	Gm13_26750464	<i>BARC-044797-08809</i>	Gm13:25473455	F	Karikari, 2020; Assefa T,2019
qHSW-13-3	Gm13_43480280	<i>BARC-018741-02997</i>	Gm13:43325422	F	Kulkarni, 2017; Karikari, 2020; Chen, 2023
<b>qHSW-14-1</b>	<b>Gm14_9347269</b>	<i>BARC-014309-01312</i>	Gm14:9434565	P	Wang, 2022

Supplement Table S1 (Continued)

QTNs found in this study			QTL/QTN has been discovered by predecessors		
Name <sup>a</sup>	Position <sup>b</sup> (bp)	Marker Associated <sup>c</sup>	Position <sup>d</sup> (bp)	Linkage group	Reference <sup>e</sup>
<b>qHSW-14-2</b>	<b>Gm14_40721910</b>	<i>Gm14_40721910</i>	Gm14:40721910	B2	Karikari, 2020
<b>qHSW-15-1</b>	<b>Gm15_47035163</b>	<i>Gm15_47035163</i>	Gm15:47035163	E	Karikari, 2020
qHSW-17-1	Gm17_13658864	<i>Satt389</i>	Gm17:13771477	D2	Kuroda, 2013; Chen, 2023
<b>qHSW-18-1</b>	<b>Gm18_496658</b>	<i>qPW18-1</i>	Gm18:443148-549035	G	Chen, 2023; Orf, 1999
qHSW-18-2	Gm18_55491235	<i>BARC-010491-00654</i>	Gm18:55007329	G	Mian, 1996
qHSW-19-1	Gm19_34854234	<i>Satt613</i>	Gm19:35280772	L	Csanádi, 2001; Elattar, 2021
qHSW-20-1	Gm20_34264812	<i>BARC-020713-04700</i>	Gm20:34052339	I	Kato, 2014; Chen, 2023

Note: The bold QTNs is located less than 100kb from the physical positions of previously discovered marker. <sup>a</sup>: QTNs detected in the study following the nomenclature of McCouch et al. (1997). <sup>b</sup>: Including Glycine max (Gm), chromosome number, underscore and the position of the QTN. <sup>c</sup>: The name of marker/QTN discovered by predecessors. <sup>d</sup>: the position of marker/QTN discovered by predecessors. <sup>e</sup>: The references fromt SoyBase (www.soybase.org) and other GWAS-related studies.

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