Supplementary information

List of supplementary figures

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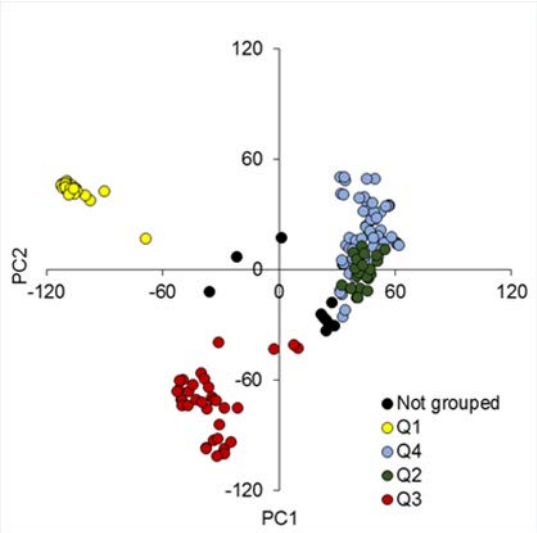


Figure S1 Principal Component (PC) analysis was applied to EcoSeed accessions with a minor allele frequency of >10% (184 accessions). The population were distributed in clusters (Q, Q2; Q3 and Q4). Q1, six-row Ethiopian accessions; Q2, six-row cultivars; Q3, two-row cultivars; Q4, two-row German landraces.

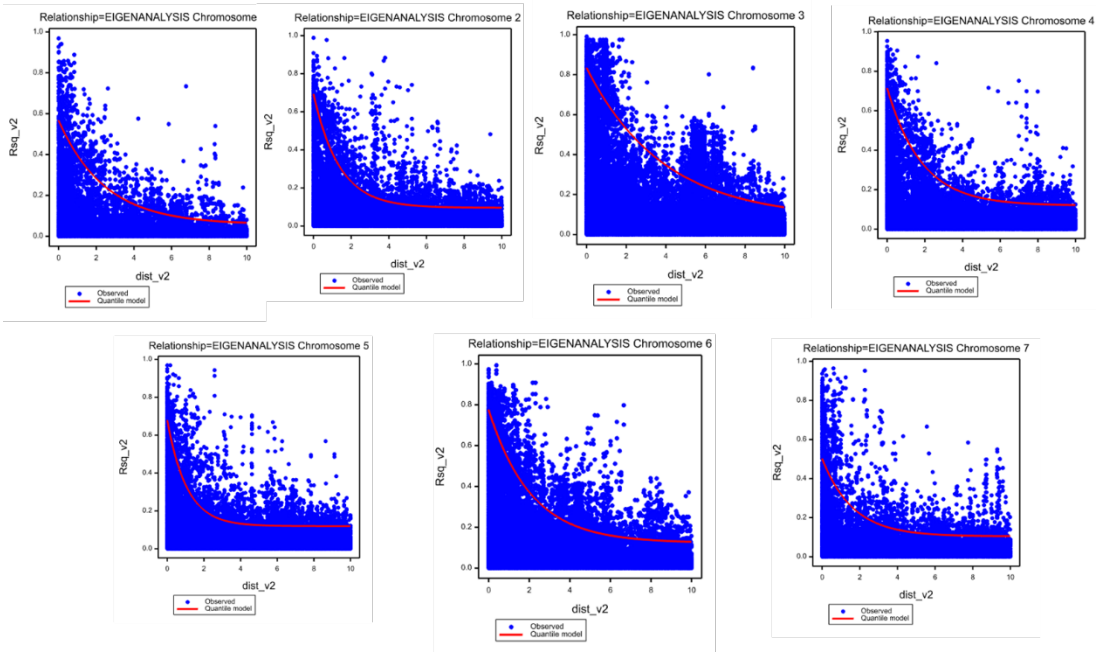
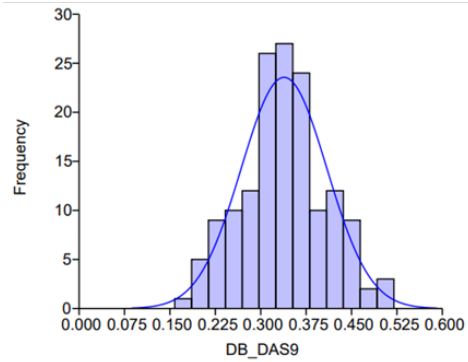


Figure S2 Intra-chromosomal LD (r^2LD) decay of marker pairs. Linkage disequilibrium (LD) was calculated for the seven barley chromosomes (1H to 7H). The red line shows averaged LD decay.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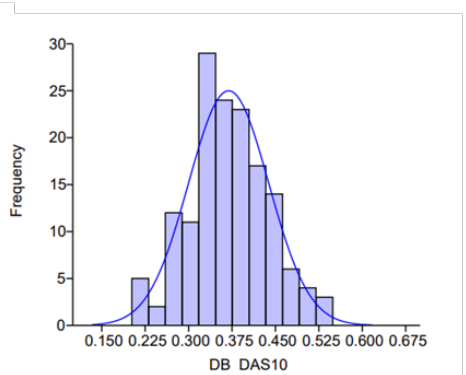
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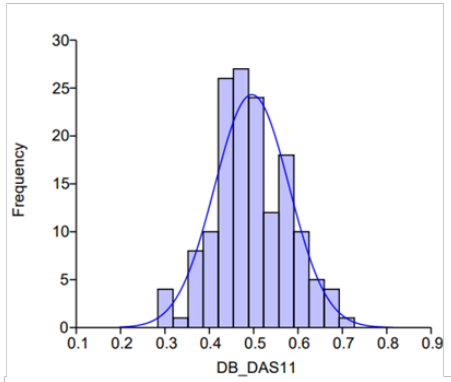
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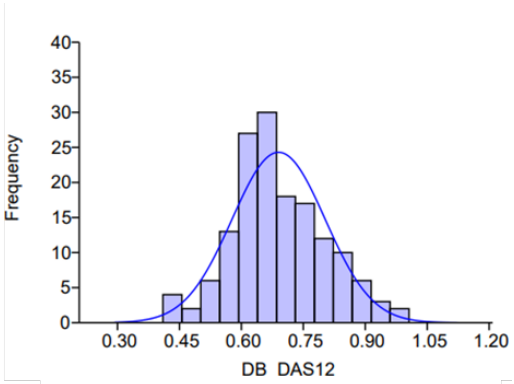
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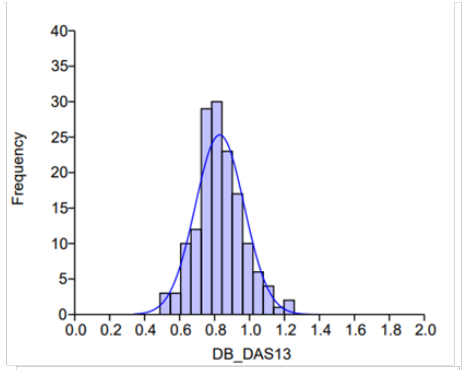
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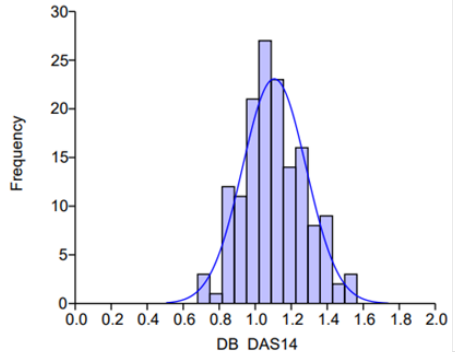
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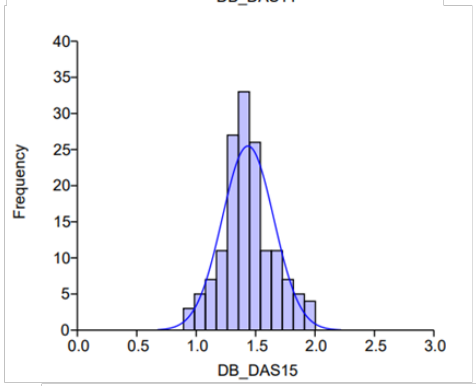
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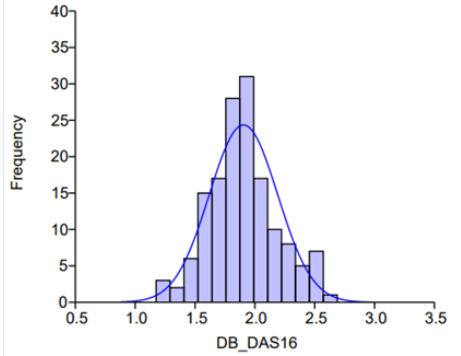
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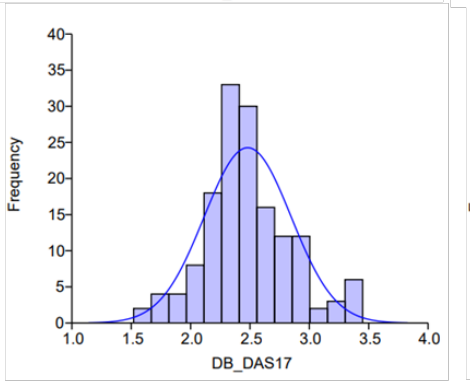
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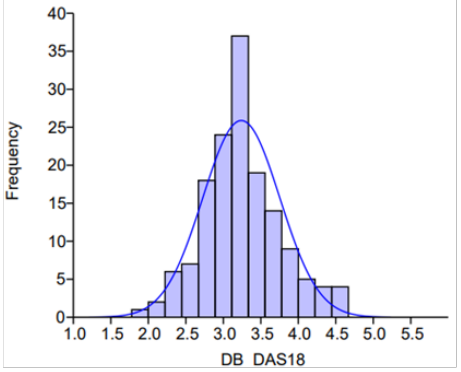
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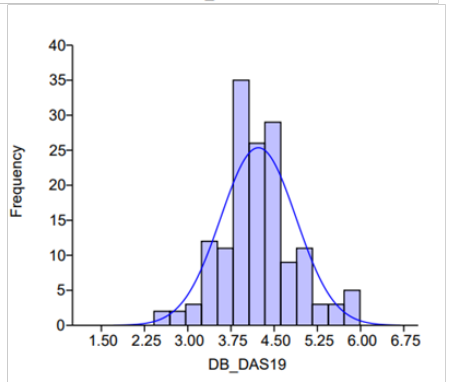
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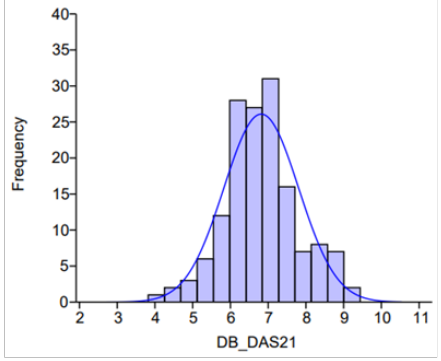
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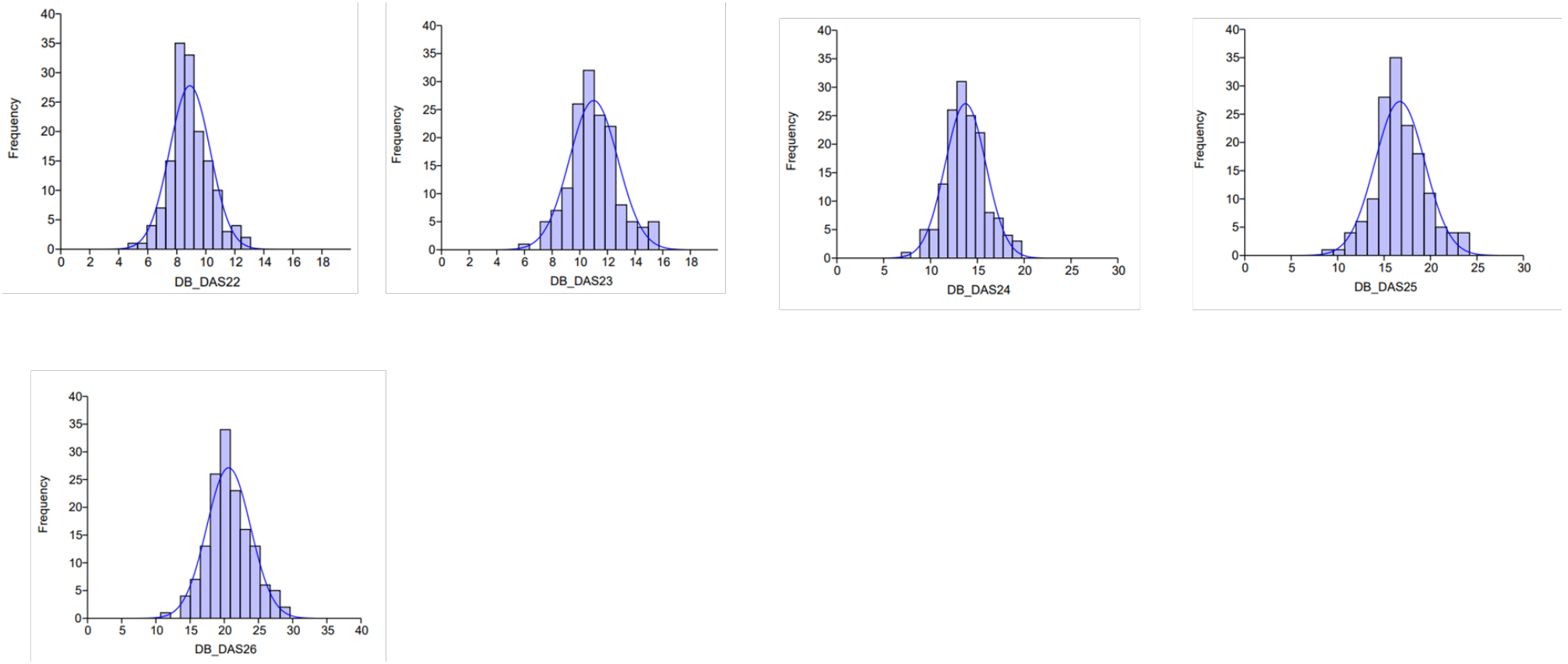
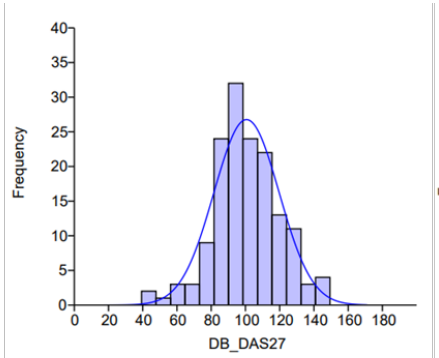


Figure S3 Histogram showing the distribution of digital biomass (DB) at pre-stress phase (PSP) in pre-anthesis drought stress experiment.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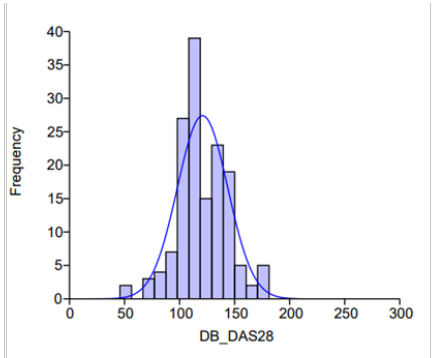
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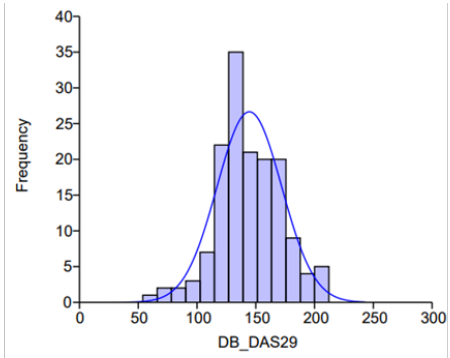
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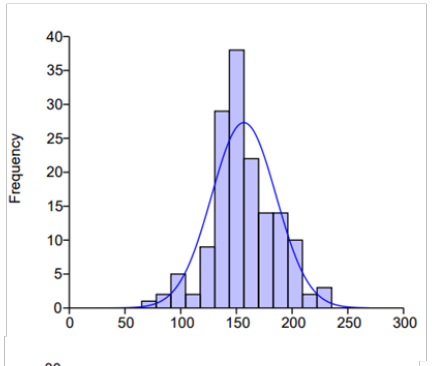
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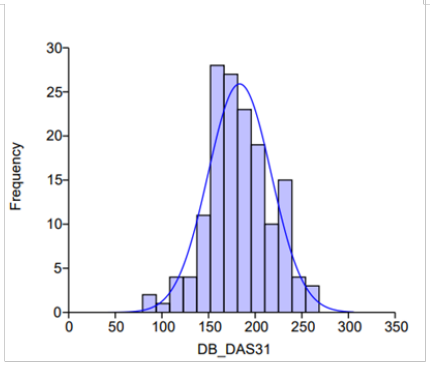
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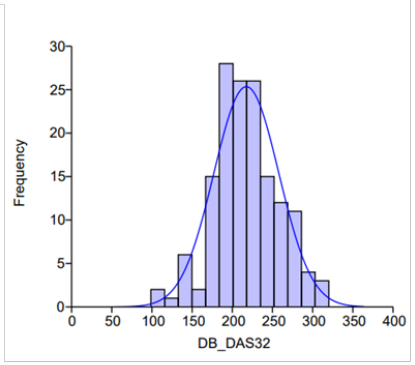
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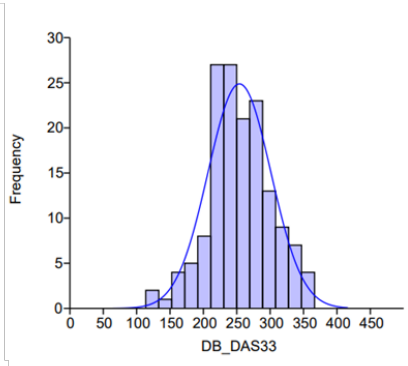
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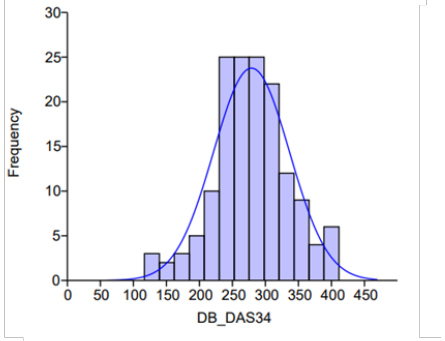
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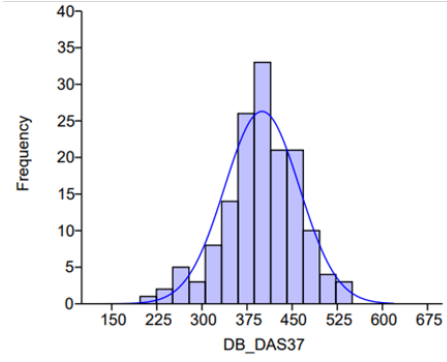
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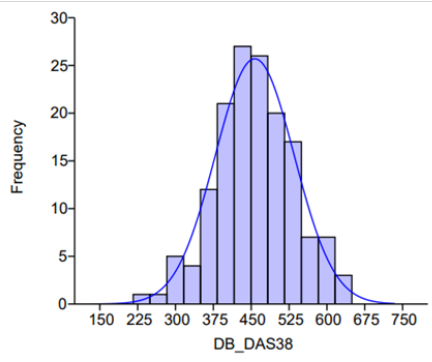
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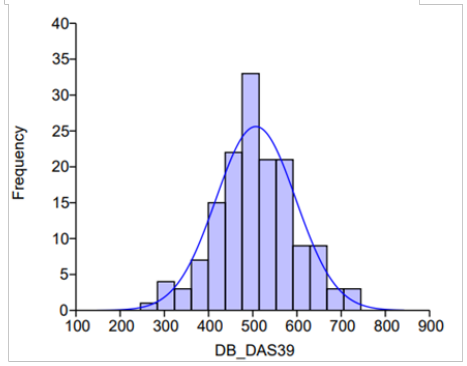
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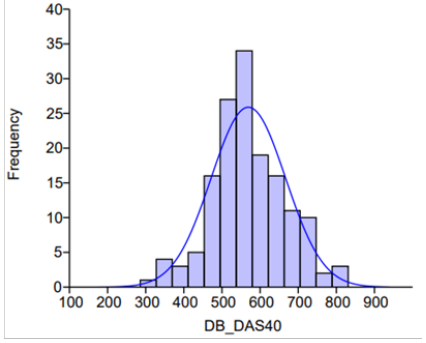
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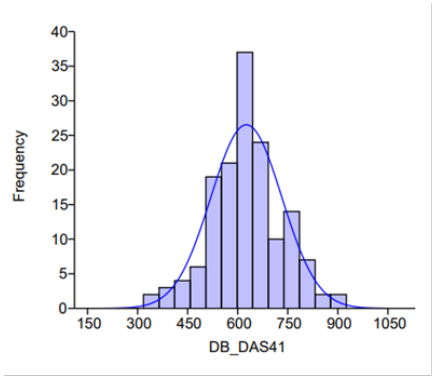
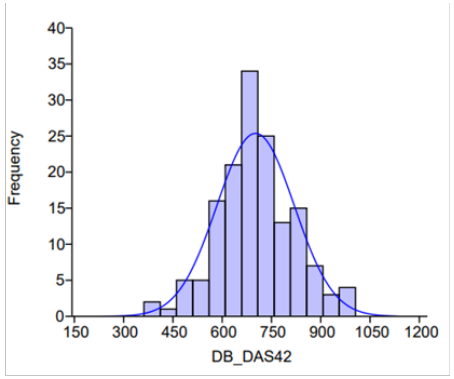
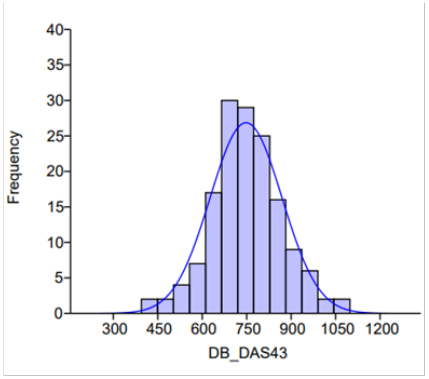
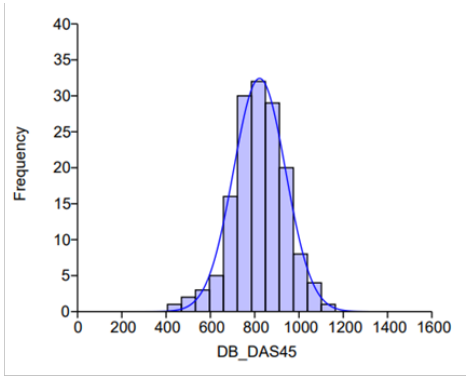
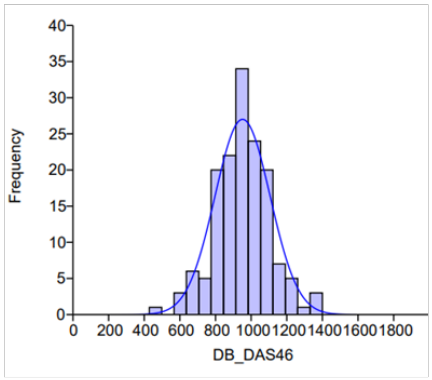










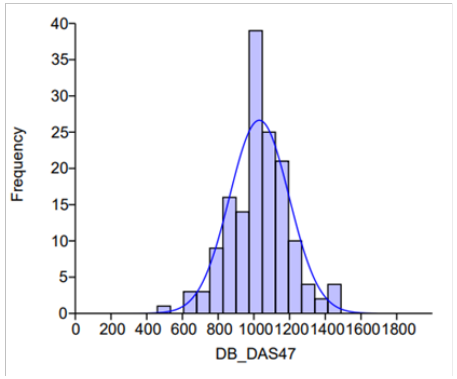
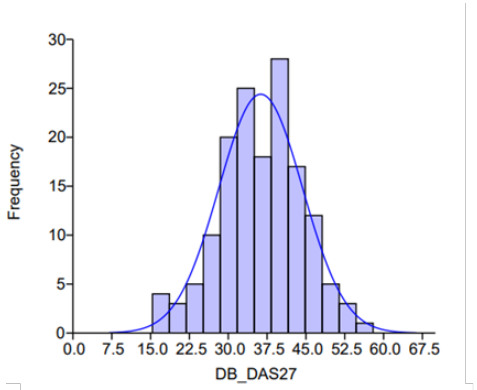


Figure S4 Histogram showing the distribution of the digital biomass (DB) under control treatment in pre-anthesis drought stress experiment.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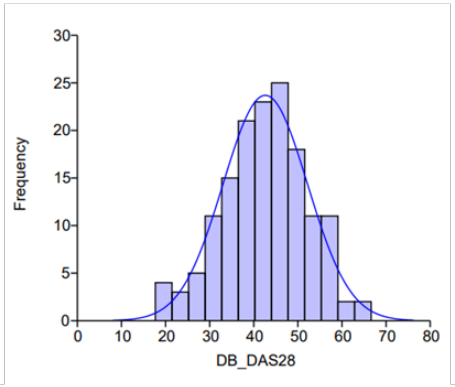
DB_DAS27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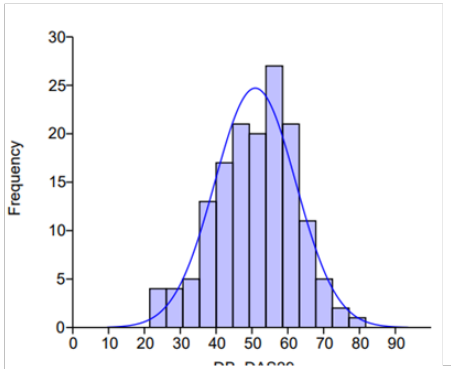
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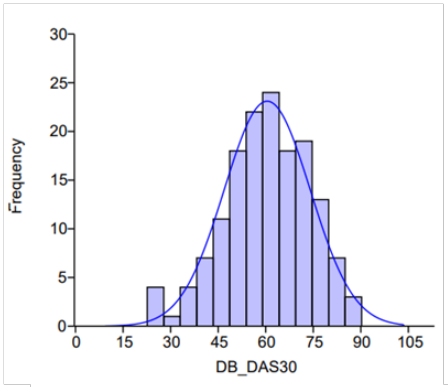
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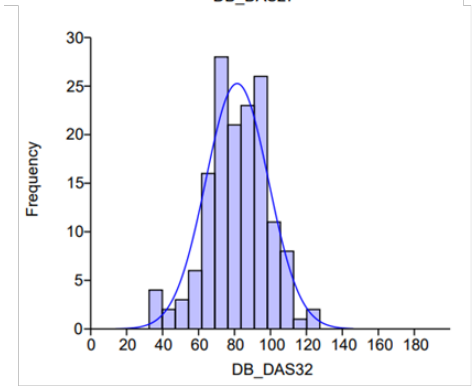
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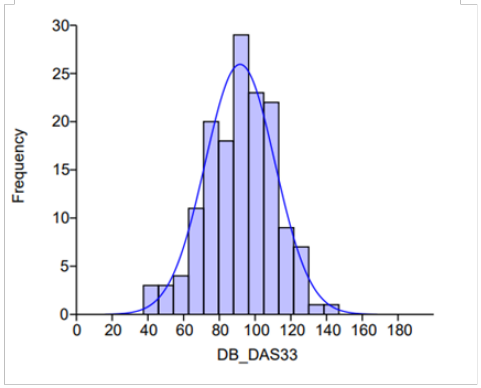
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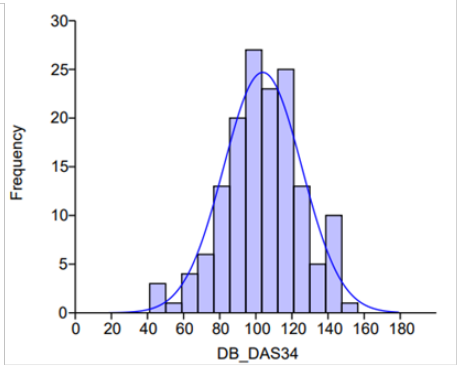
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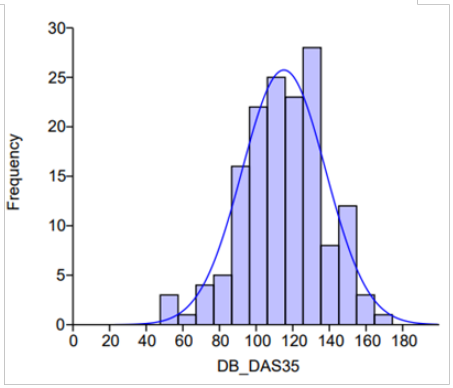
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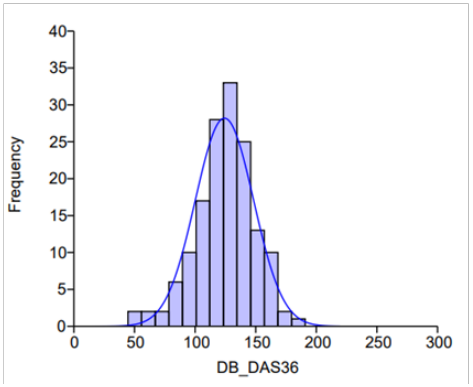
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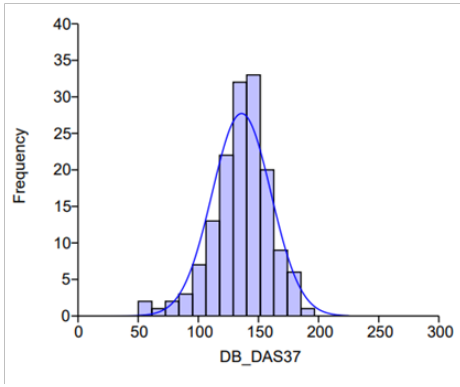
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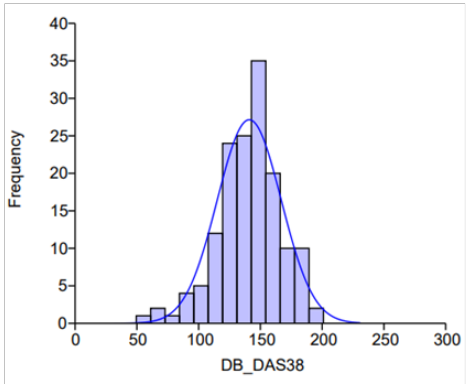
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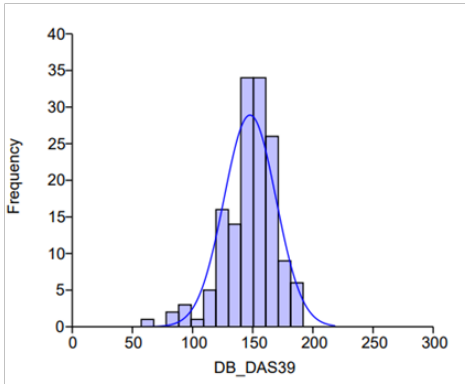
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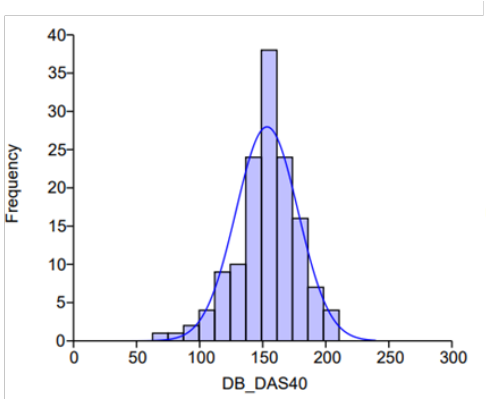
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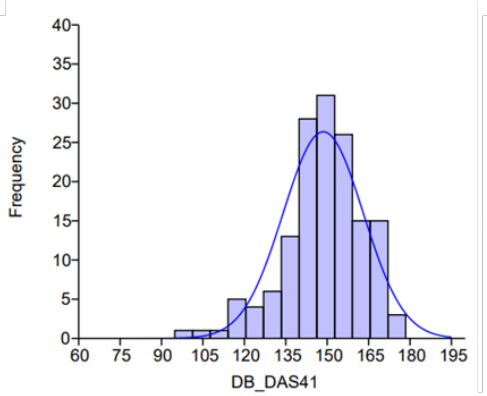
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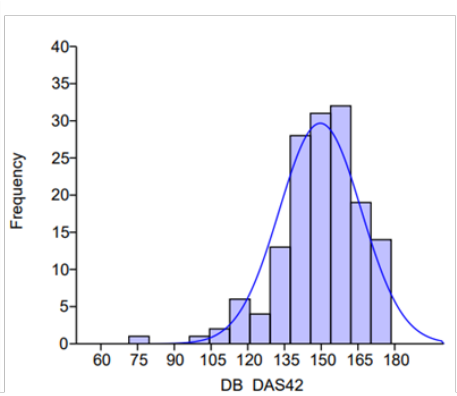
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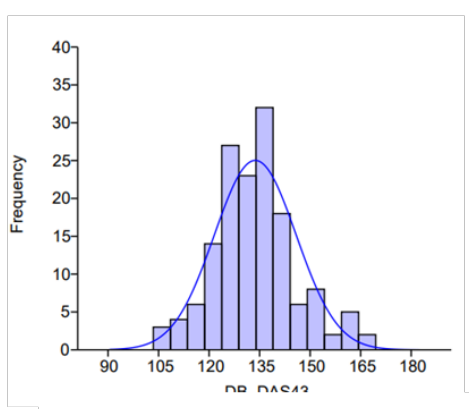
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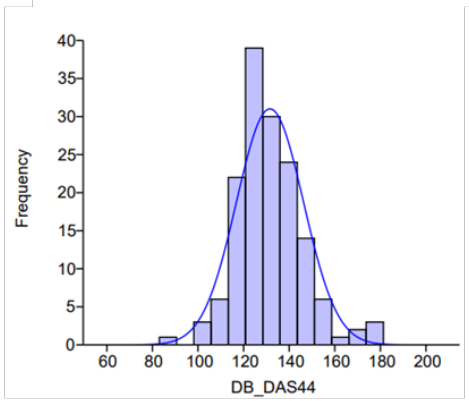
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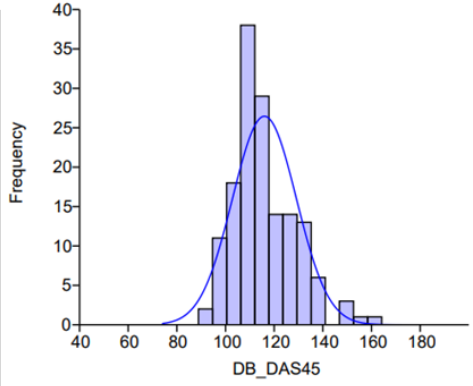
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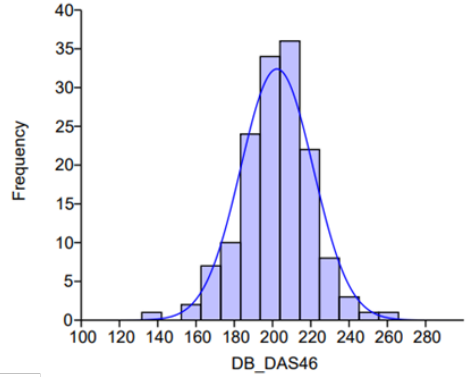
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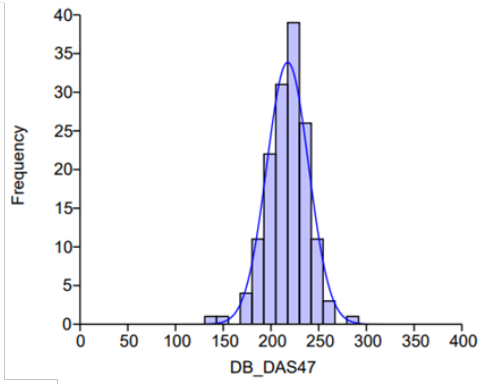
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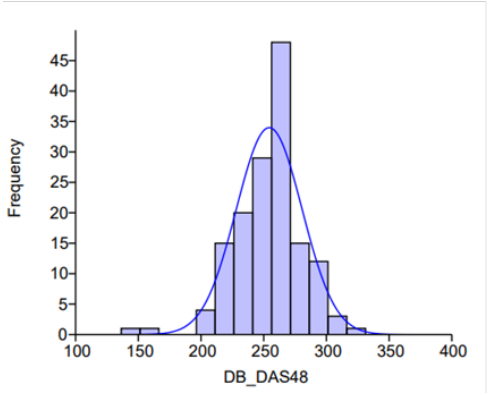
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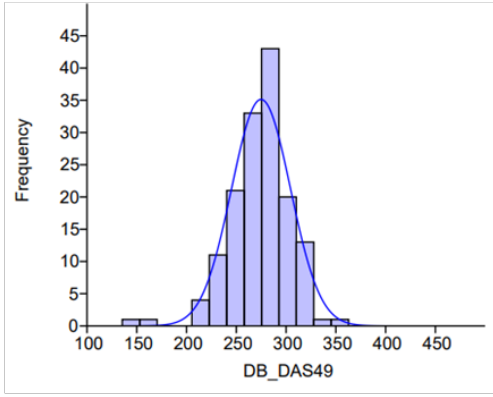
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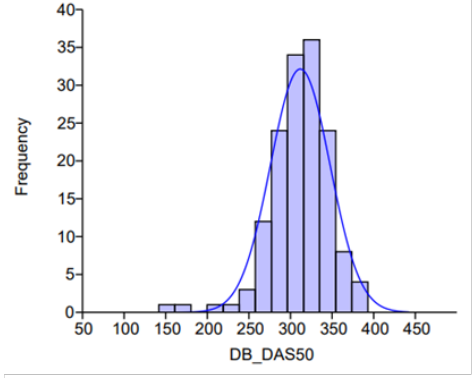
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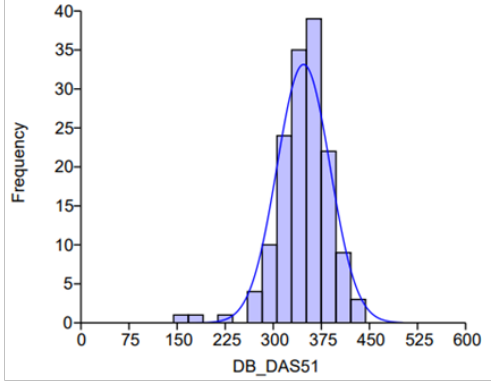
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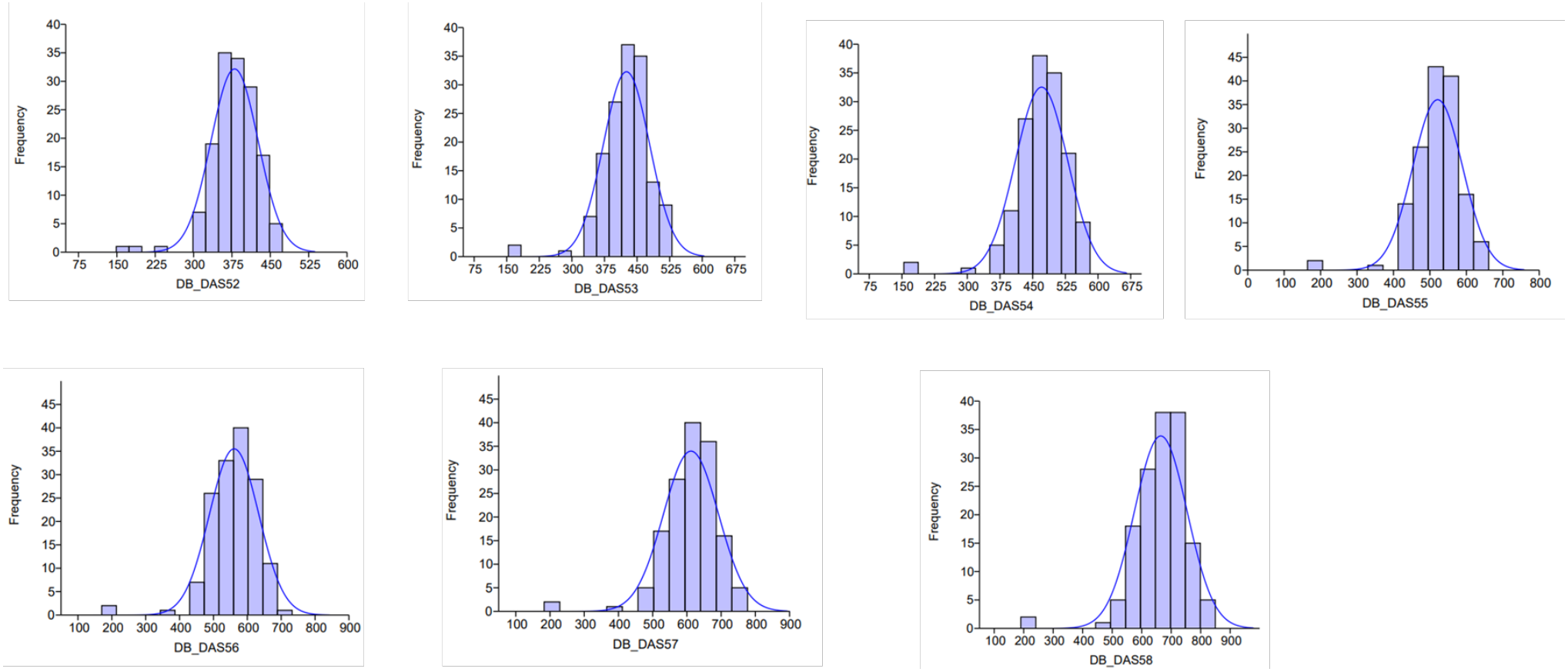


Figure S5 Histogram showing the distribution of the digital biomass (DB) under drought treatment in pre-anthesis drought stress experiment.

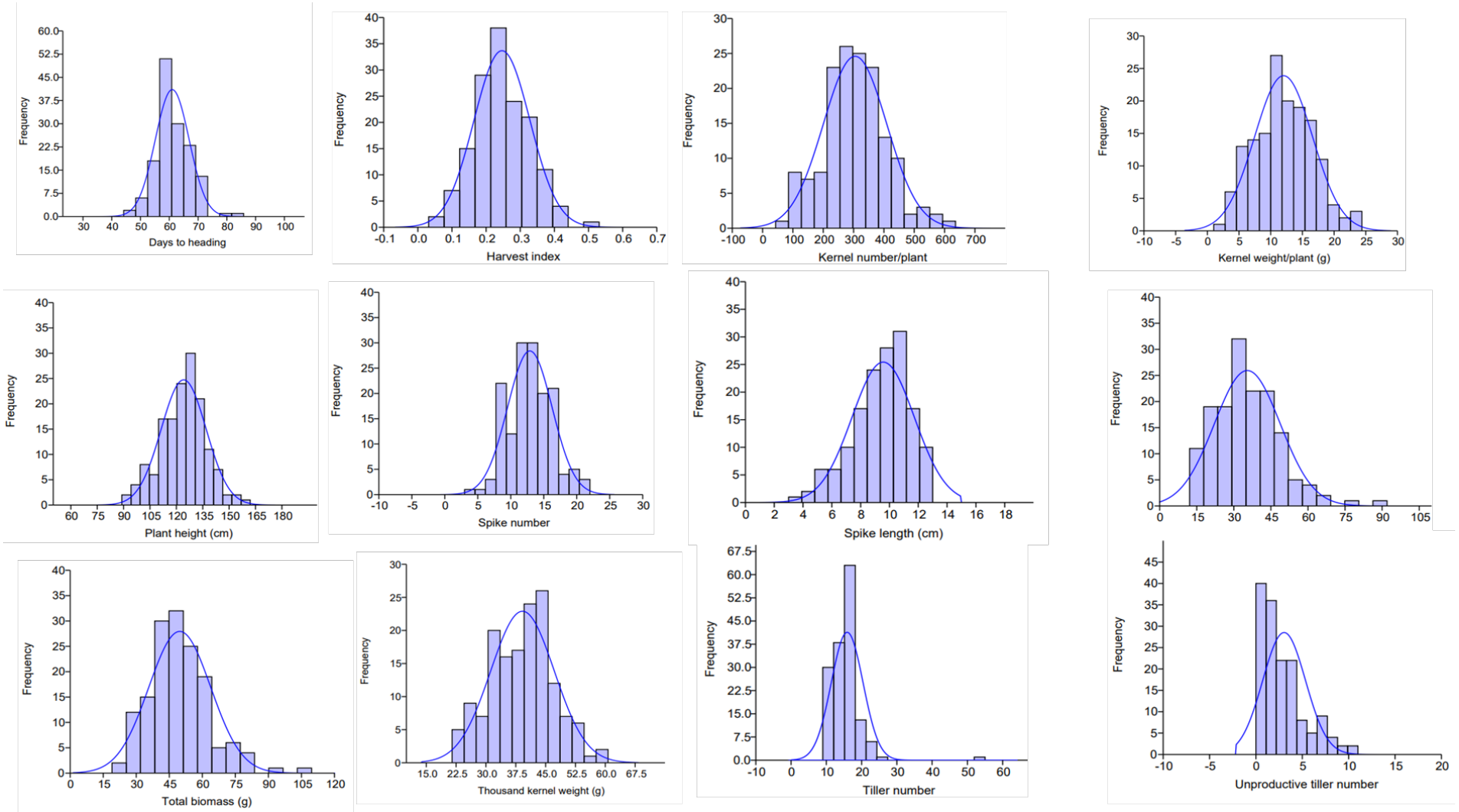


Figure S6 Histograms showing the distribution of traits at maturity under conrol treatment at pre-anthesis drought stress experiment.

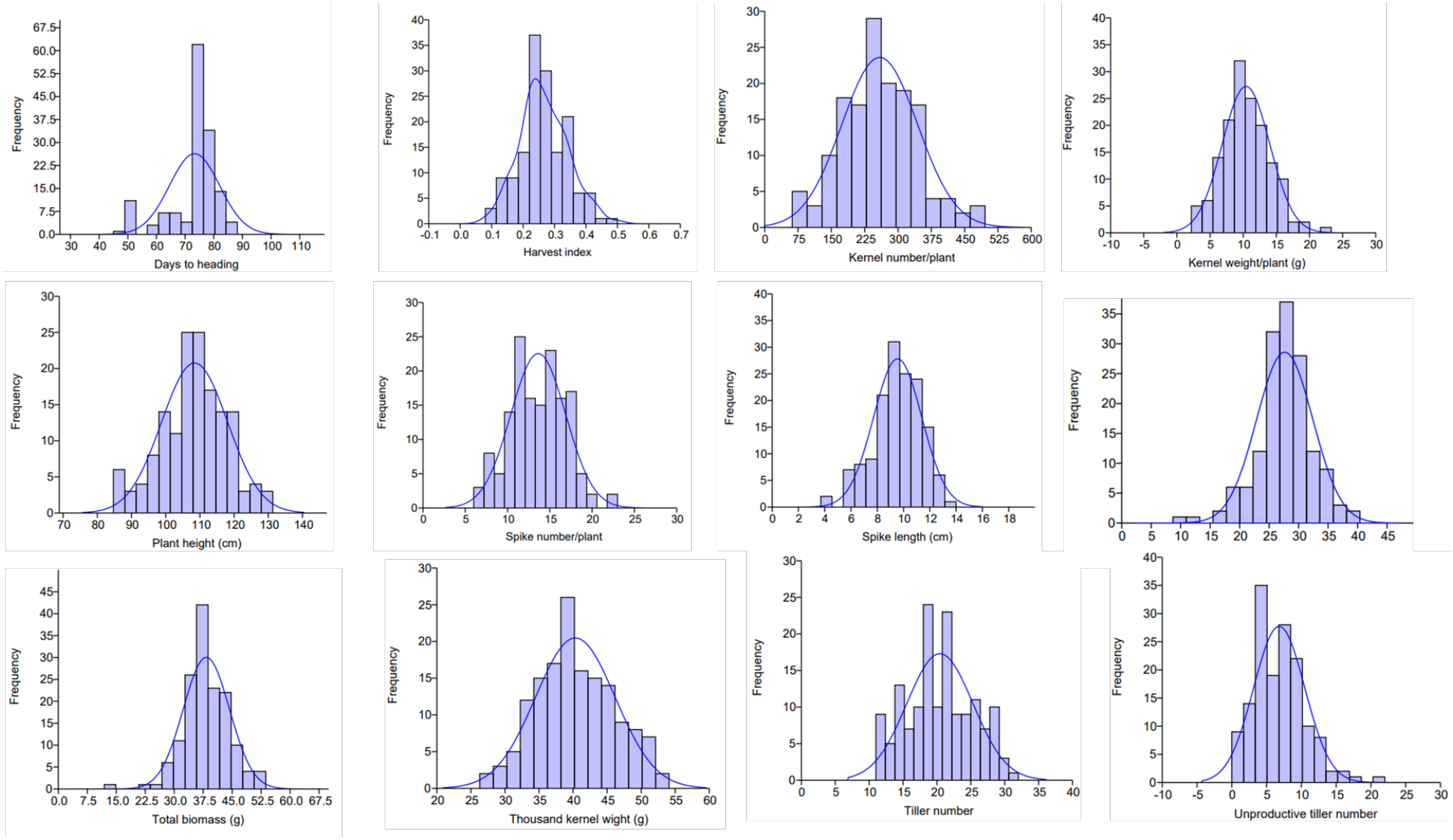
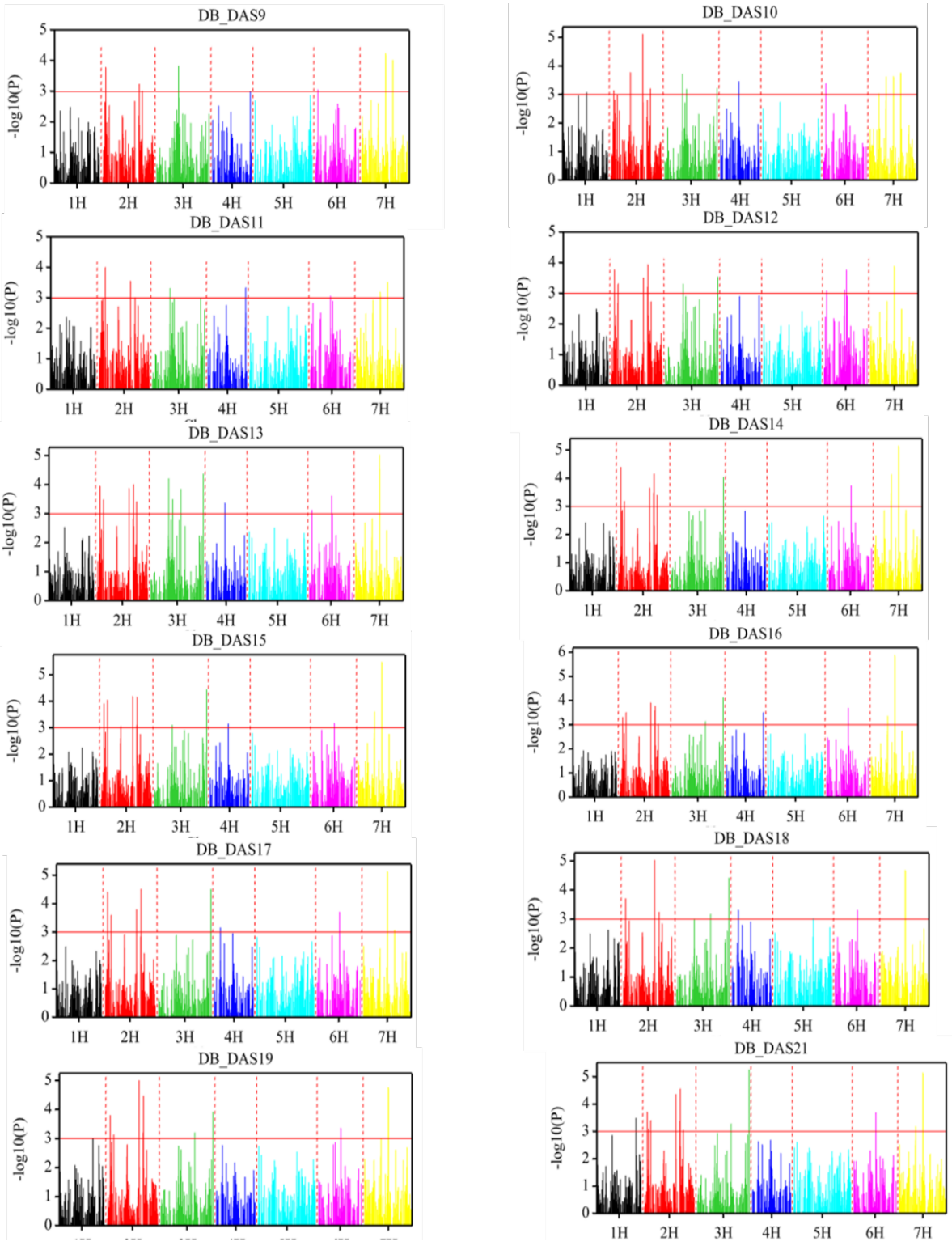


Figure S7 Histograms showing the distribution of traits at maturity under drought treatment at pre-anthesis drought stress experiment.


DB_DAS9
DB_DAS10
DB_DAS11
DB_DAS12
DB_DAS13
DB_DAS14
DB_DAS15
DB_DAS16
DB_DAS17
DB_DAS18
DB_DAS19
DB_DAS21
-log10(P)
1H
2H
3H
4H
5H
6H
7H

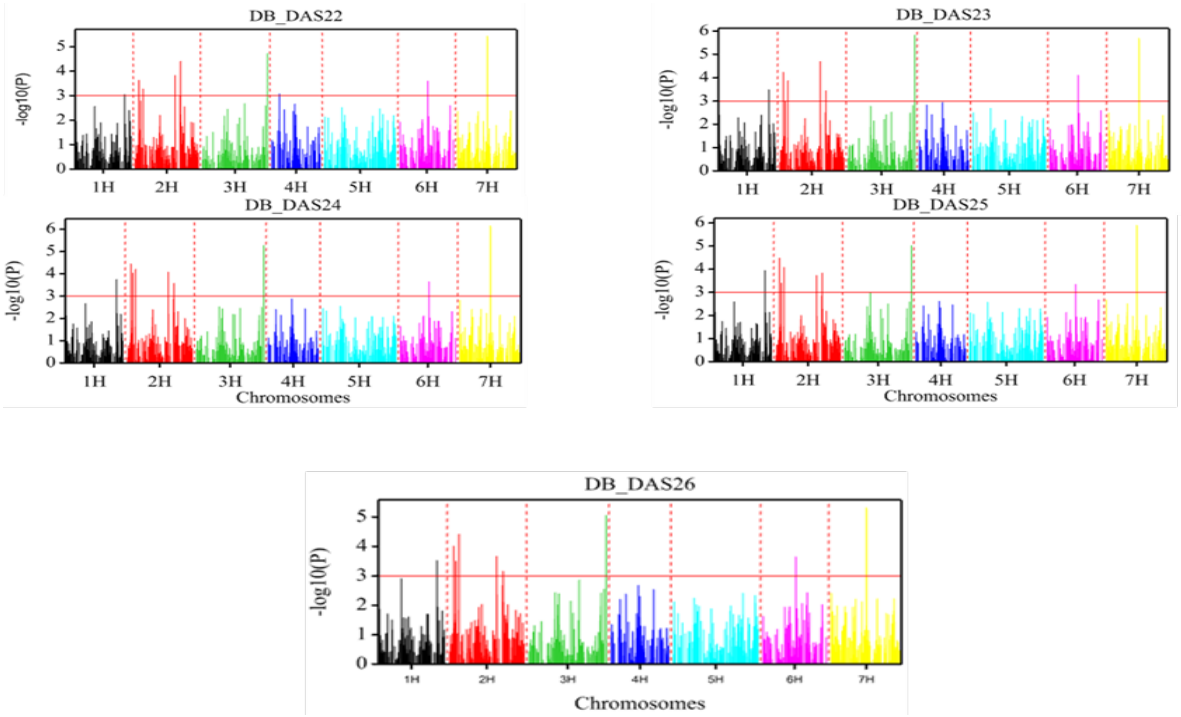


Figure S8 Manhattan plots for the genome-wide association of digital biomass (DB) at each day after sowing (DAS) at pre-stress phase (PSP) in pre-anthesis drought stress experiment. The horizontal red color line indicated the threshold of -log10 (p-value) of 3.

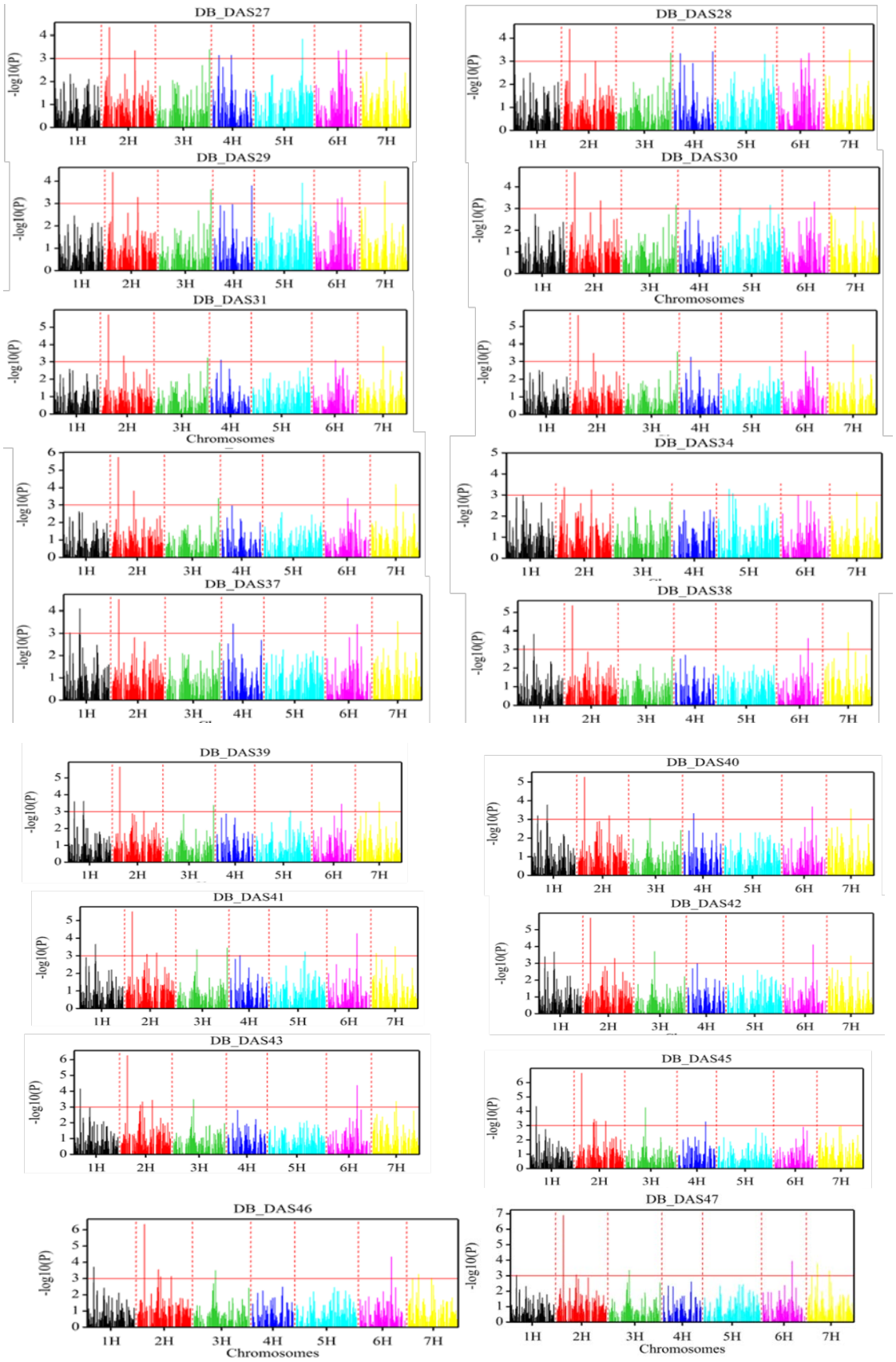
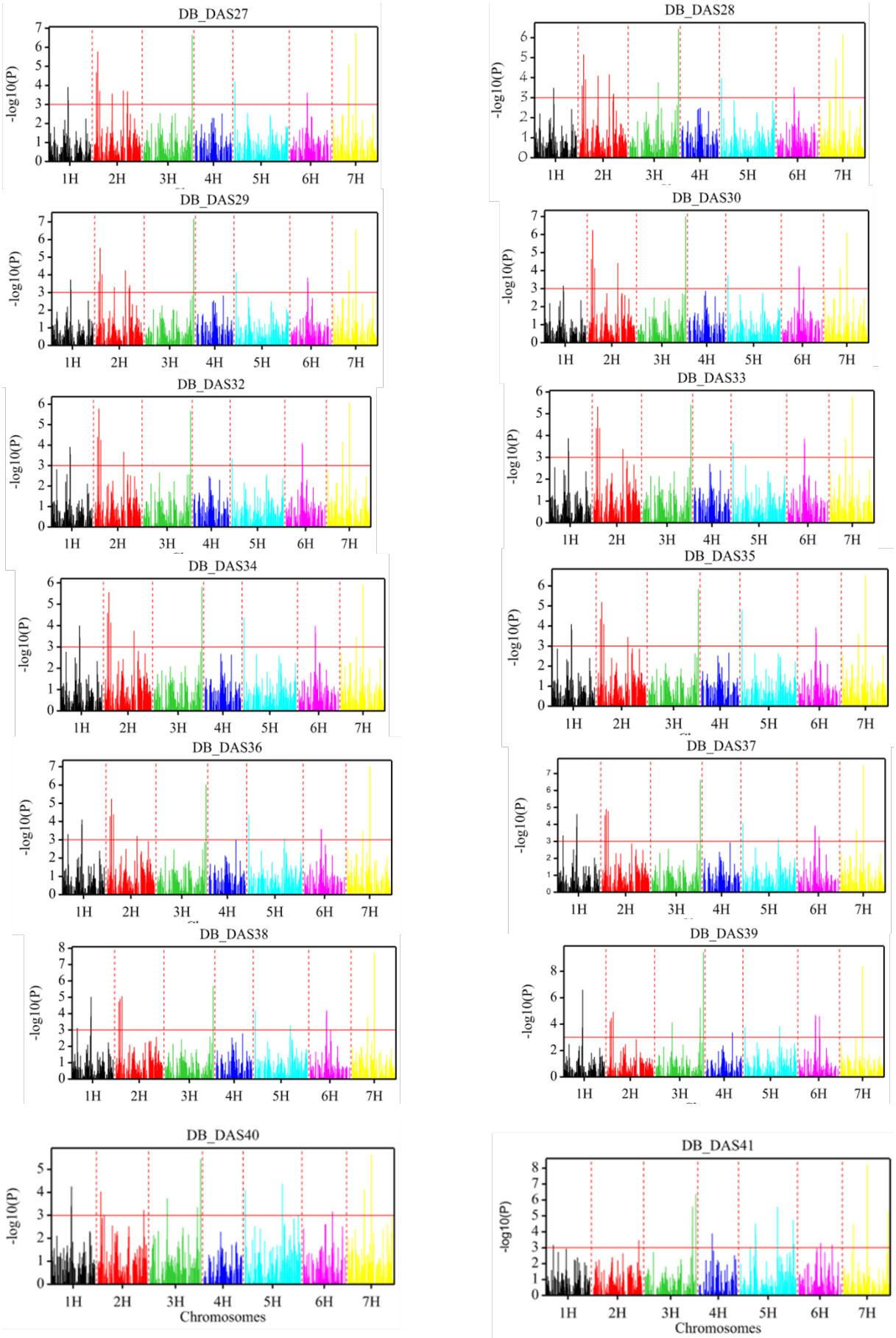
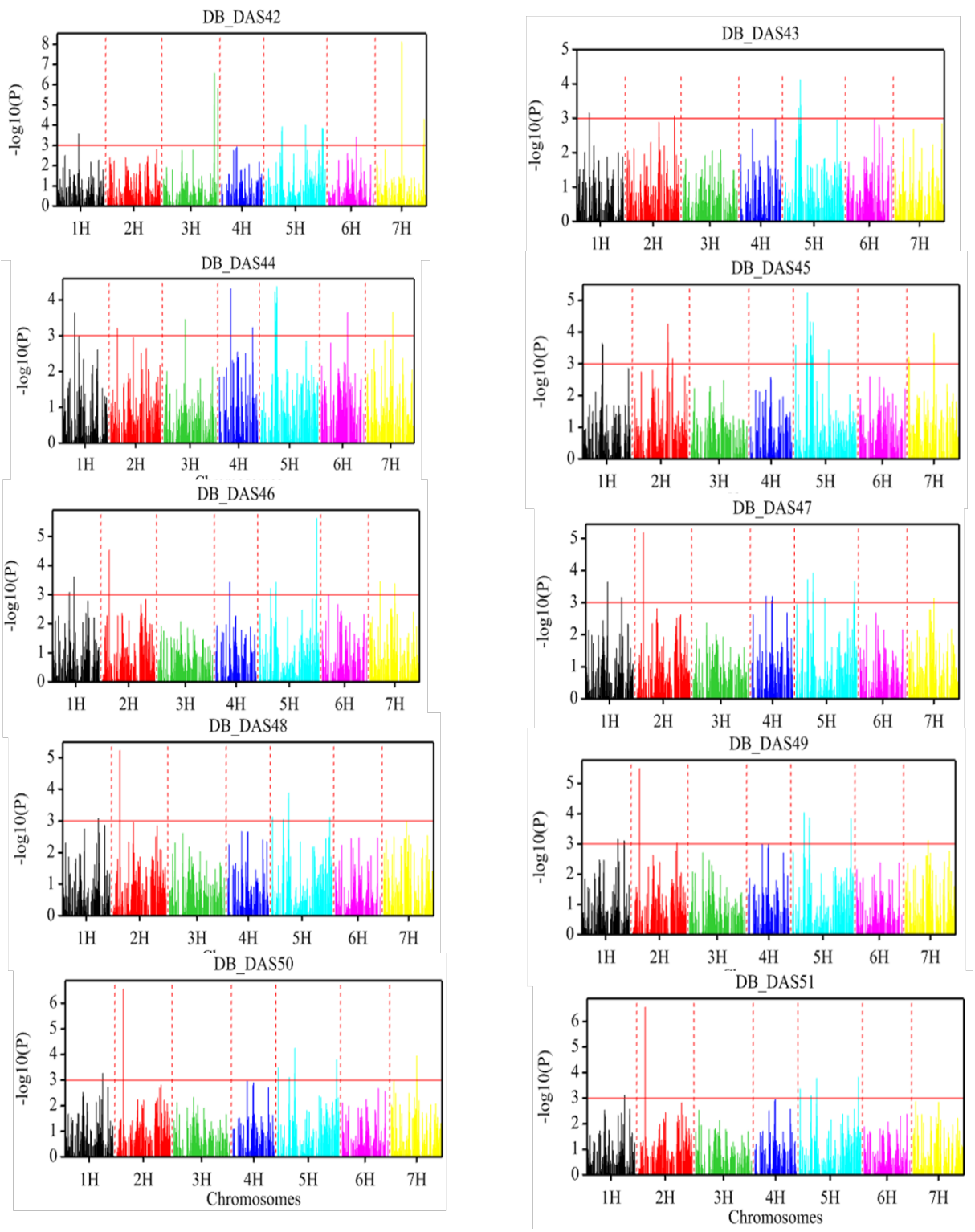


Figure S9 Manhattan plots for the genome-wide association of digital biomass (DB) at each day after sowing (DAS) under control treatment in pre-anthesis drought stress experiment. The horizontal red color line indicated the threshold of -log10 (p-value) of 3.


DB_DAS27
DB_DAS28
DB_DAS29
DB_DAS30
DB_DAS32
DB_DAS33
DB_DAS34
DB_DAS35
DB_DAS36
DB_DAS37
DB_DAS38
DB_DAS39
DB_DAS40
DB_DAS41
-log10(P)
1H
2H
3H
4H
5H
6H
7H
Chromosomes


DB_DAS42
DB_DAS43
DB_DAS44
DB_DAS45
DB_DAS46
DB_DAS47
DB_DAS48
DB_DAS49
DB_DAS50
DB_DAS51
-log10(P)
1H
2H
3H
4H
5H
6H
7H
Chromosomes

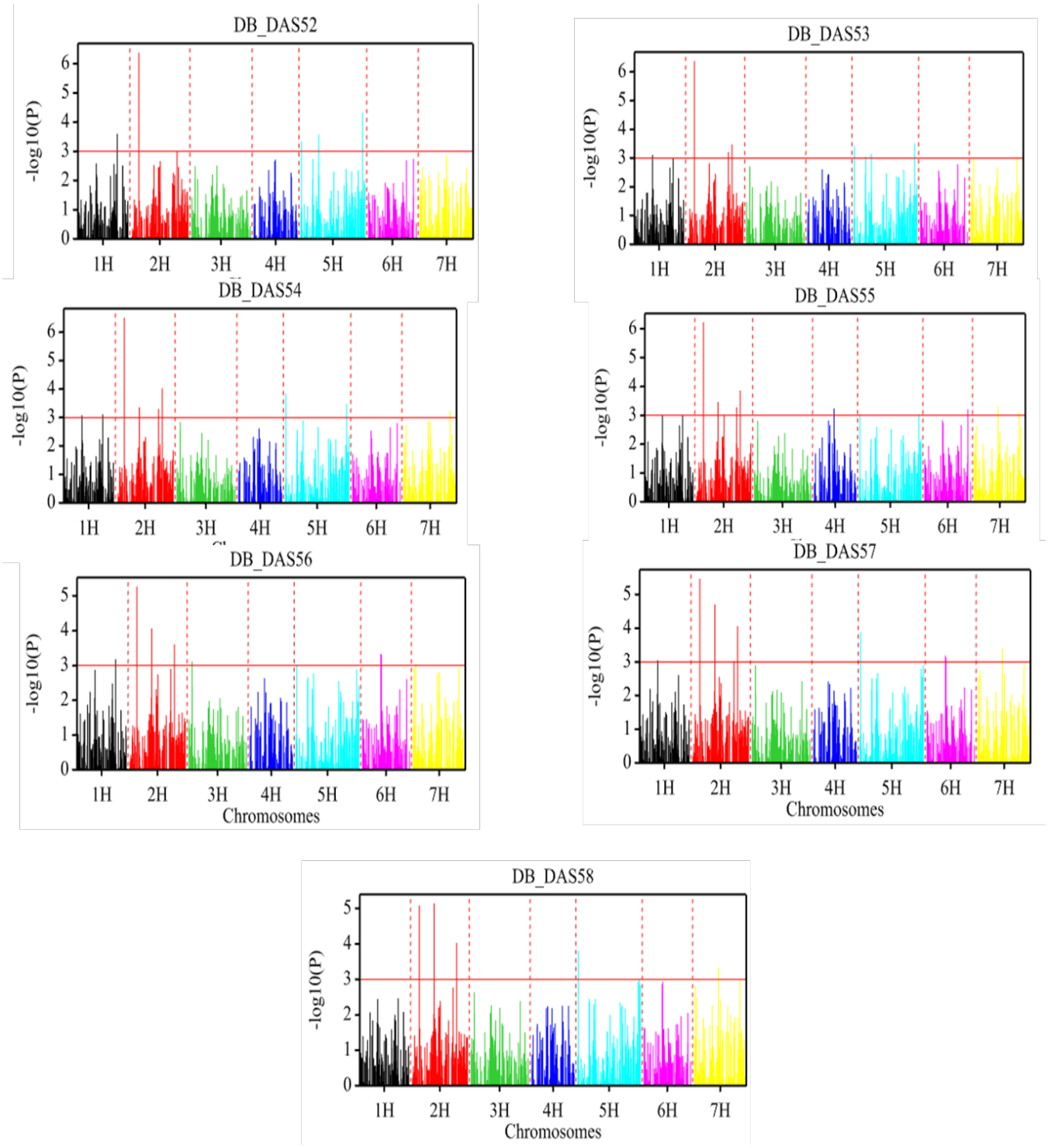


Figure S10 Manhattan plots for the genome-wide association of digital biomass (DB) at each day after sowing (DAS) under drought treatment in pre-anthesis drought stress experiment. The horizontal red color line indicated the threshold of -log10 (p-value) of 3.

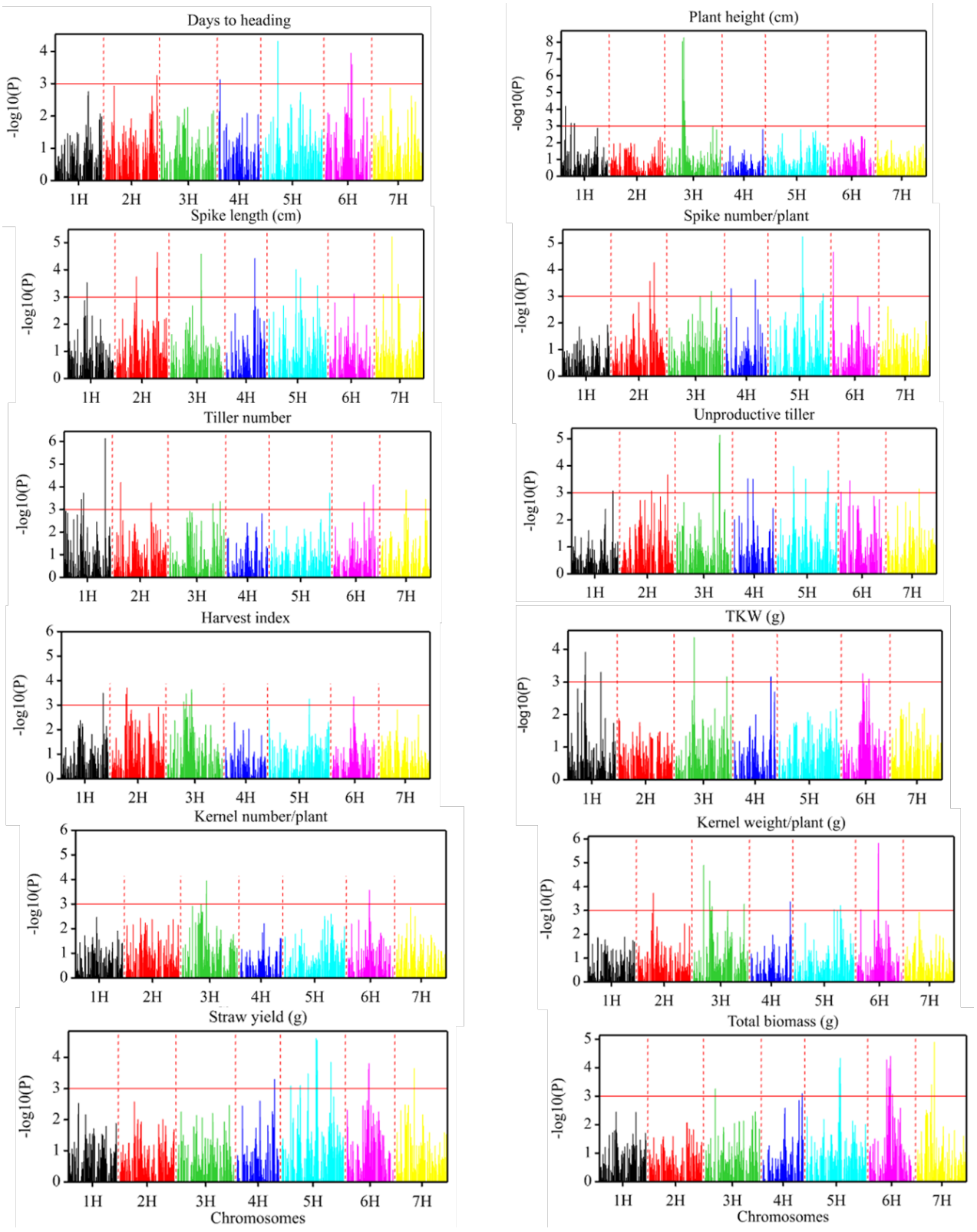


Figure S11 Manhattan plots for the genome-wide association of traits at maturity under control treatment in pre-anthesis drought stress experiment. The horizontal red color line indicated the threshold of -log10 (p-value) of 3.

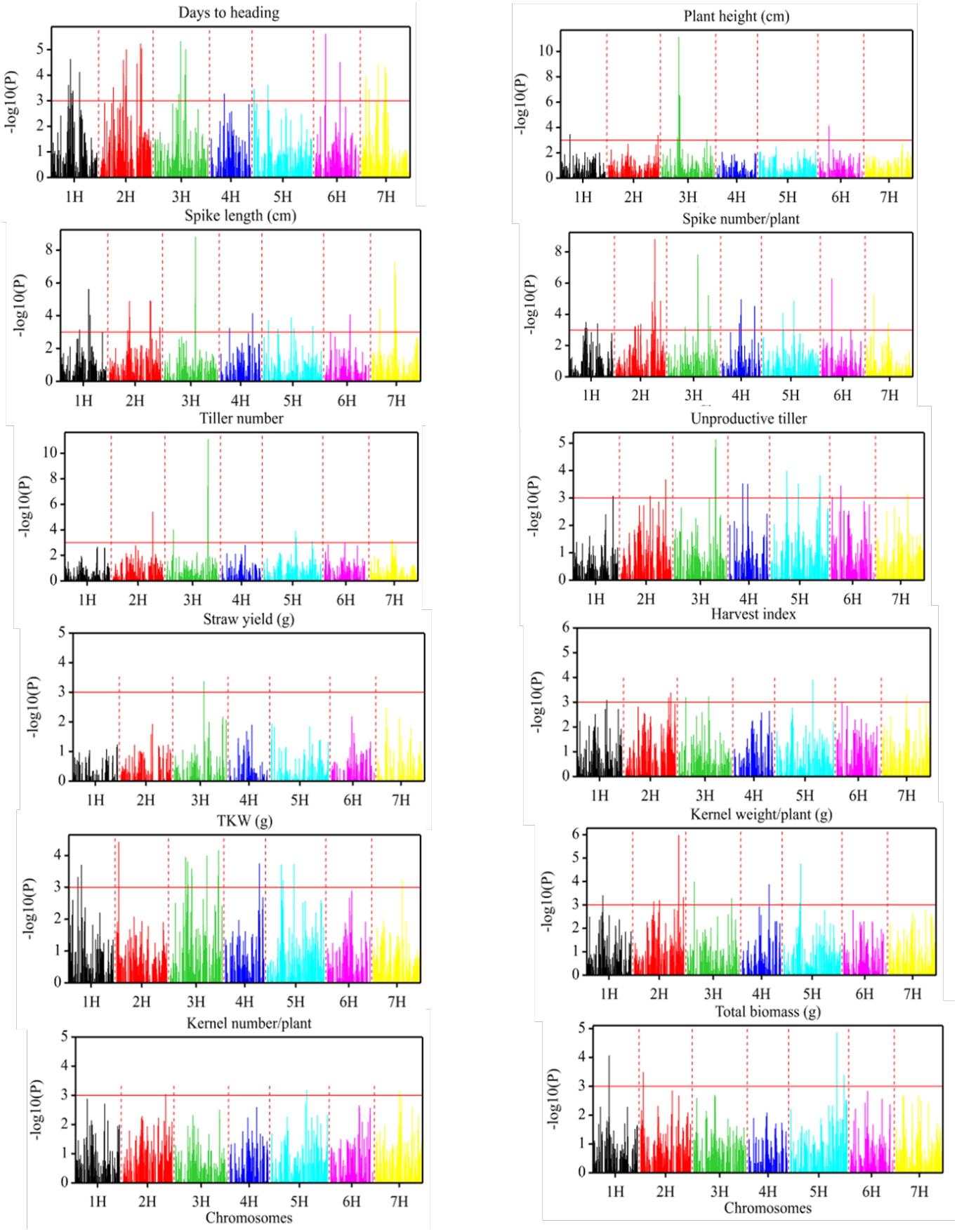


Figure S12 Manhattan plots for the genome-wide association of traits at maturity under drought treatment at pre-anthesis drought experiment. The horizontal red color line indicated the threshold of -log10 (p-value) of 3.

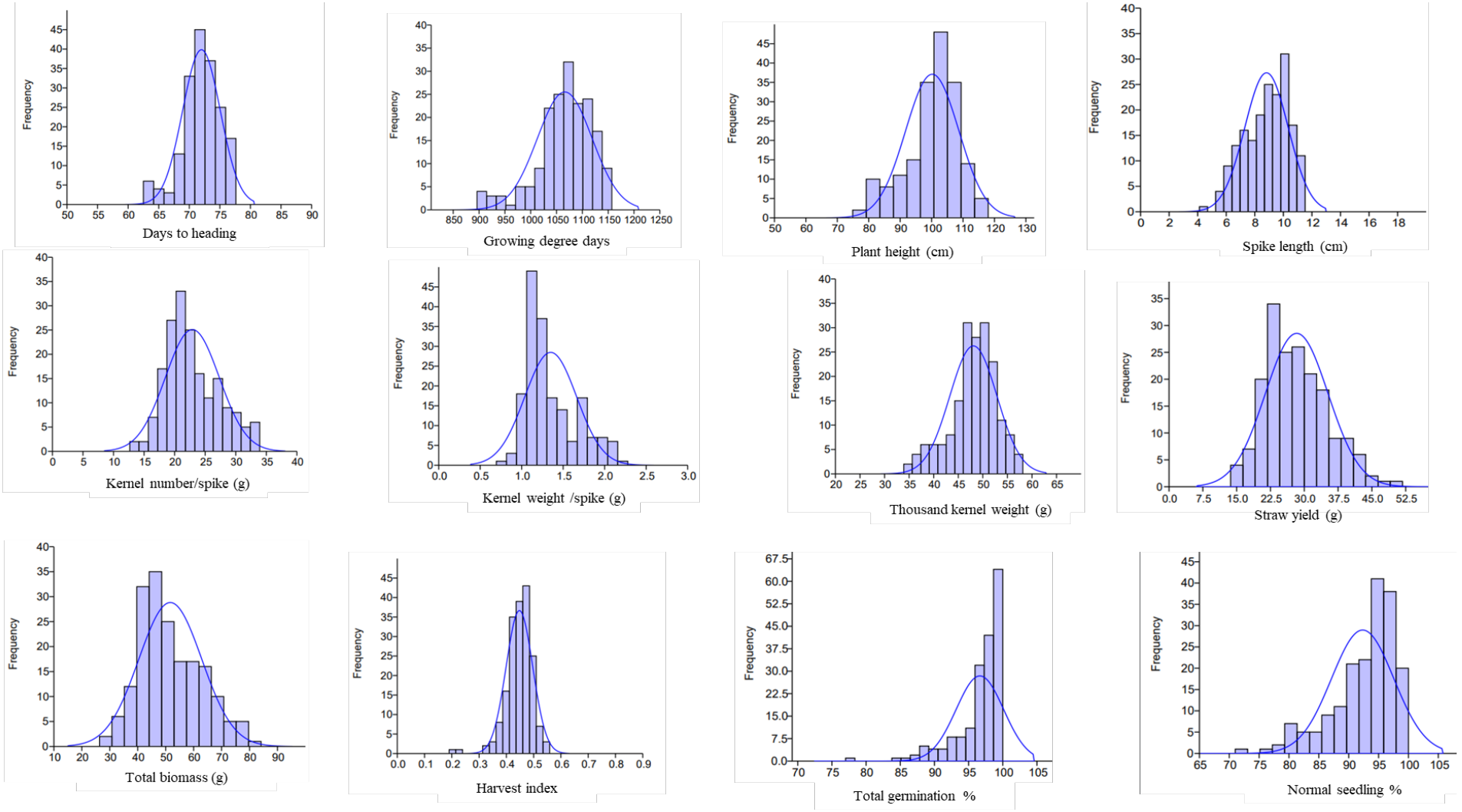


Figure S13 Histograms showing the distribution of the traits under conrol treatment at post-anthesis drought stress experiment.

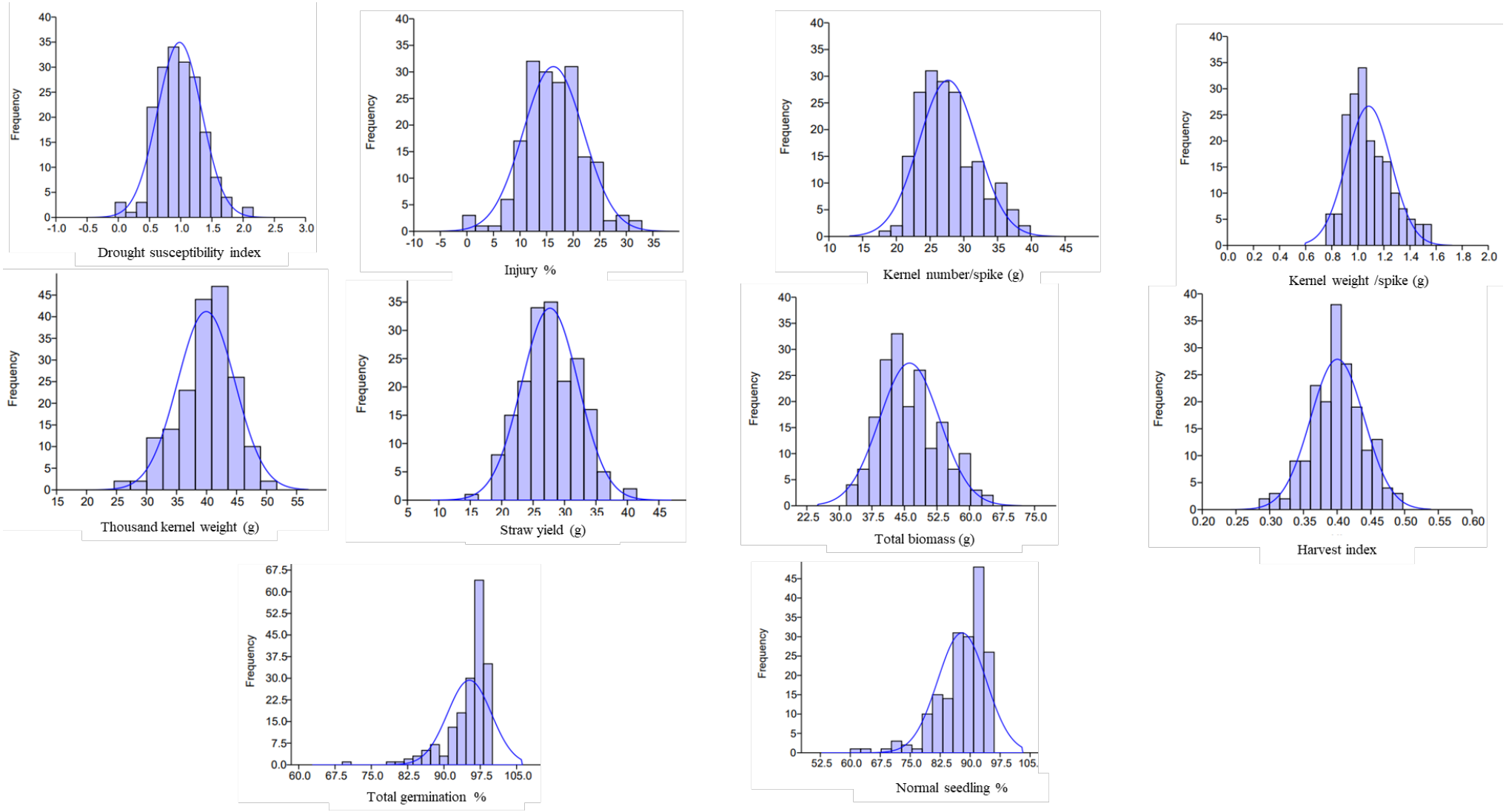


Figure S14 Histograms showing the distribution of the traits under chemical desiccation treatment at post-anthesis drought stress experiment.

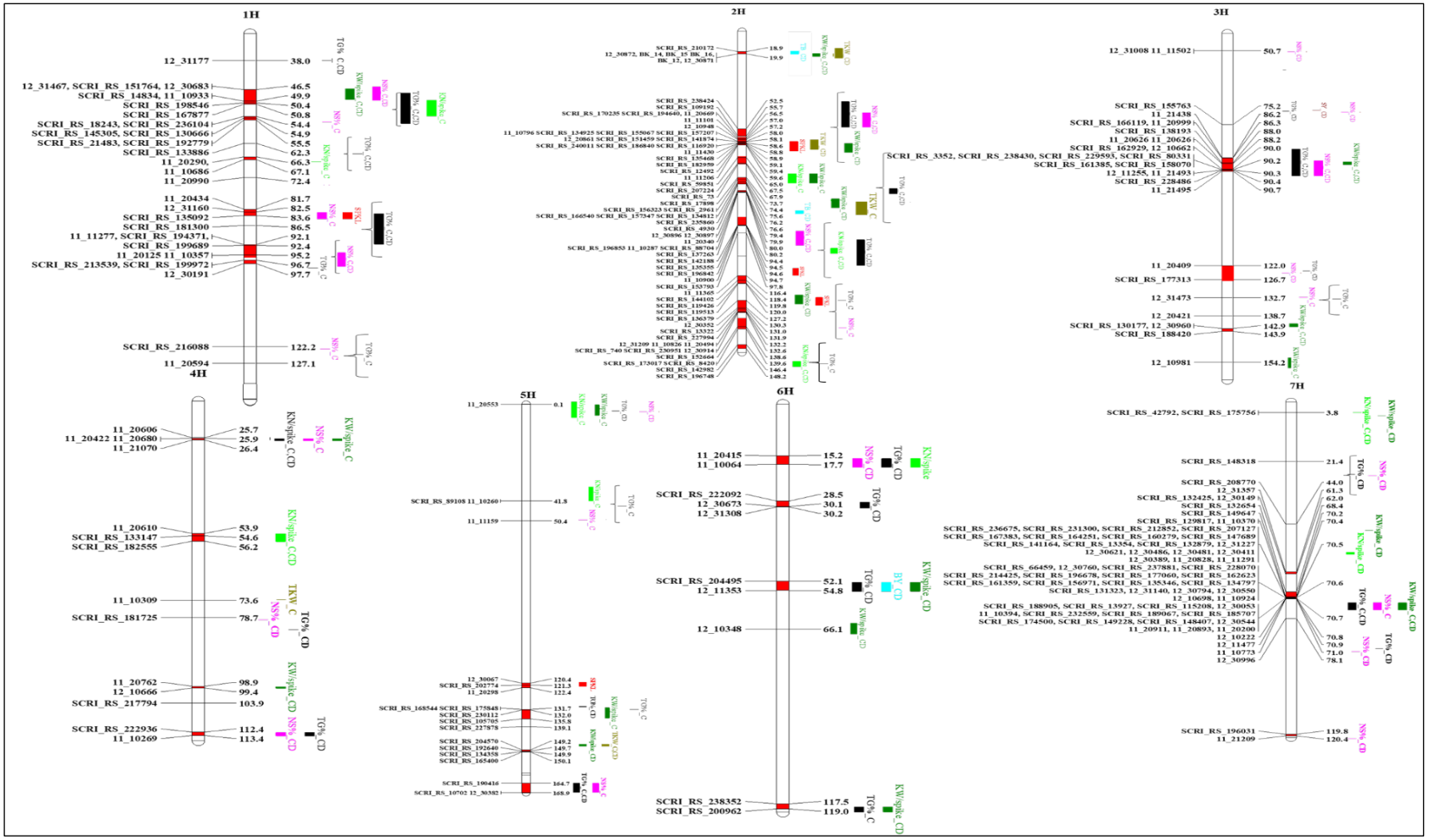


Figure S15 Genetically anchored position of highly significant marker trait associations (MTAs) detected under control and chemical desiccation treatments in the growing season 2016. Red chromosomal interval indicates MTAs (within confidence interval of ±3 cM), each trait was given different color and traits in arrows showed that these traits were located at different position within the interval of the arrows.

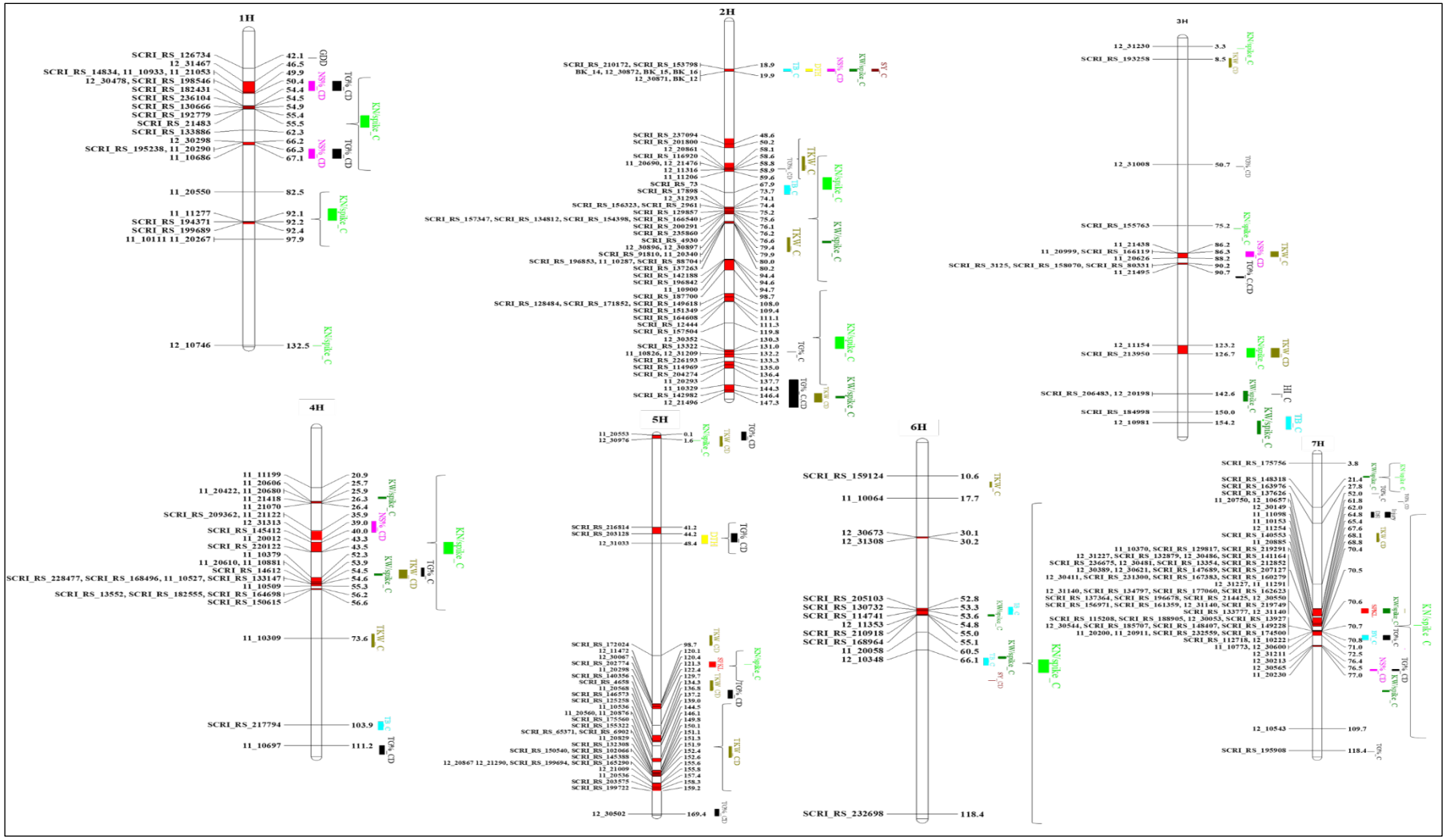


Figure S16 Genetically anchored position of highly significant marker trait associations (MTAs) detected under control and chemical desiccation treatments in the growing season 2017. Red chromosomal interval indicates MTAs (within confidence interval of ±3 cM), each trait was given different color, and traits in arrows showed that these traits were located at different position within the interval of the arrows.

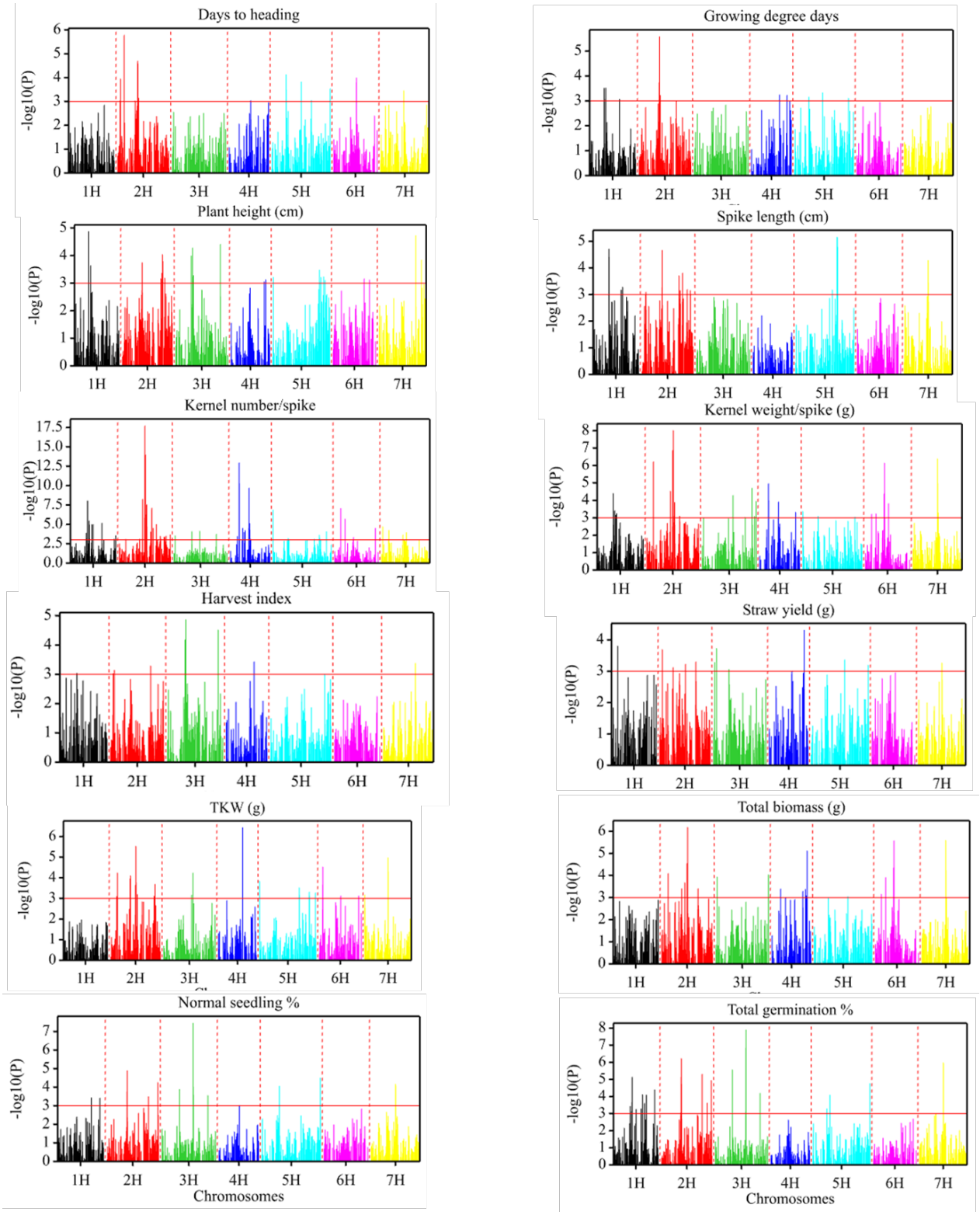


Figure S17 Manhattan plots of traits plots for the genome-wide association of traits (BLUEs) under control treatment at post-anthesis drought stress experiment. The horizontal red color line indicated the threshold of -log10 (p-value) of 3.

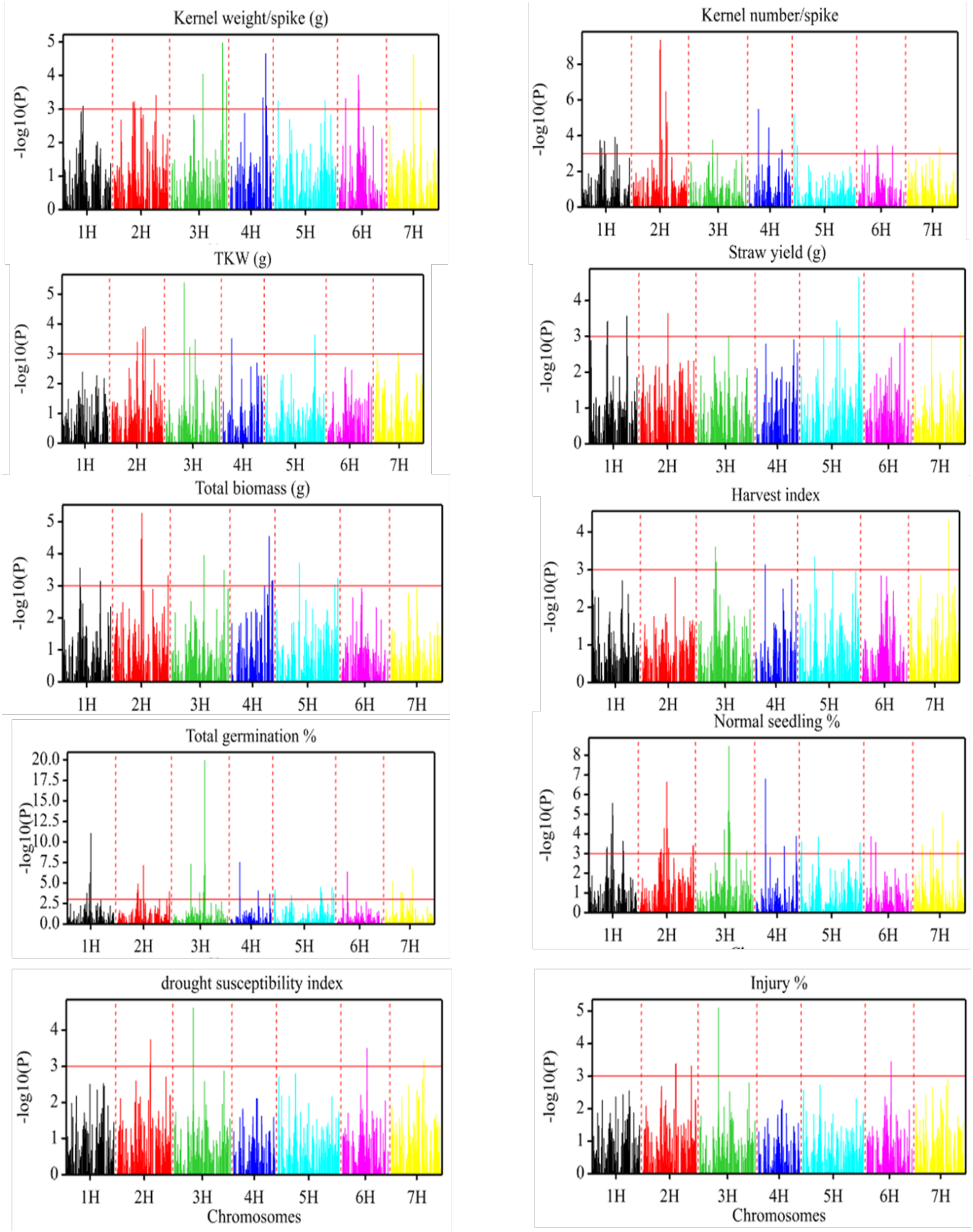


Figure S18 Manhattan plots of traits plots for the genome-wide association of traits (BLUEs) under chemical desiccation treatment at post-anthesis drought stress experiment. The horizontal red color line indicated the threshold of -log10 (p-value) of 3.

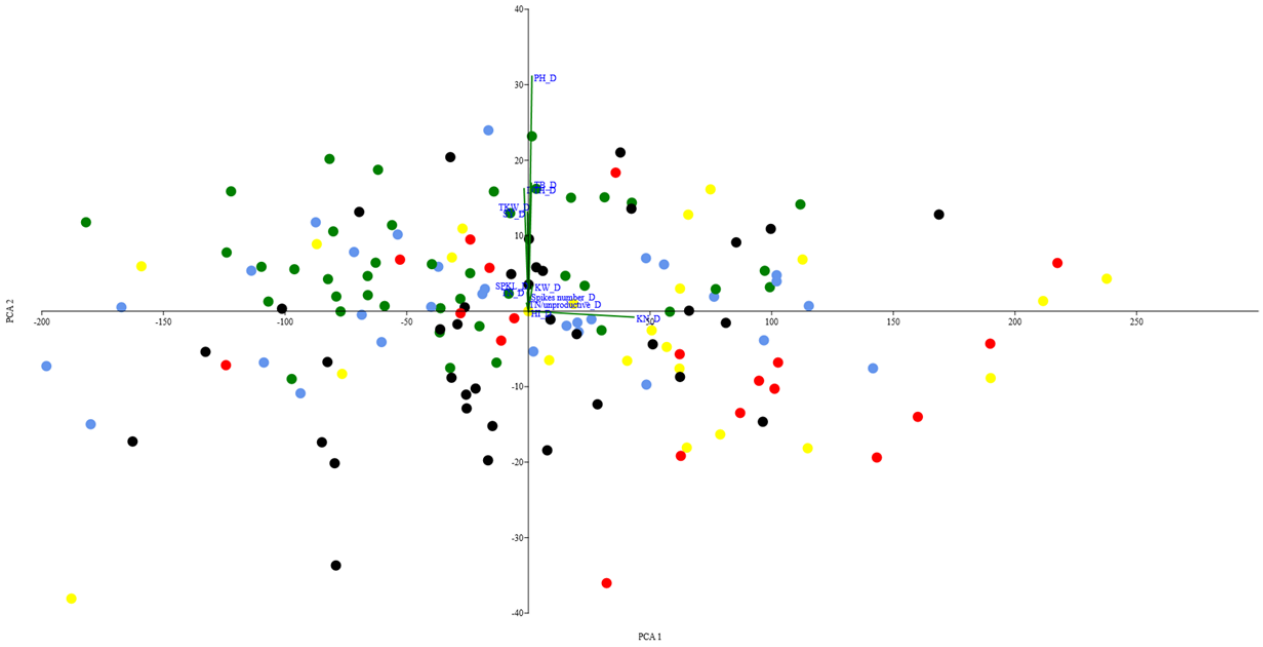


Figure S19 The phenotypic variation of the studied traits related to the population structure under pre-anthesis drought stress. The variation between spike row type and the origin the yellow dots represent the 6-rowed Ethiopian Landraces (Q1), green dots represent green dots represent the 2- rowed German cultivars (Q2), the red dots represent the 6- rowed cultivars (Q3) and the blue dots represent the 2-rowed cultivars (Q4).

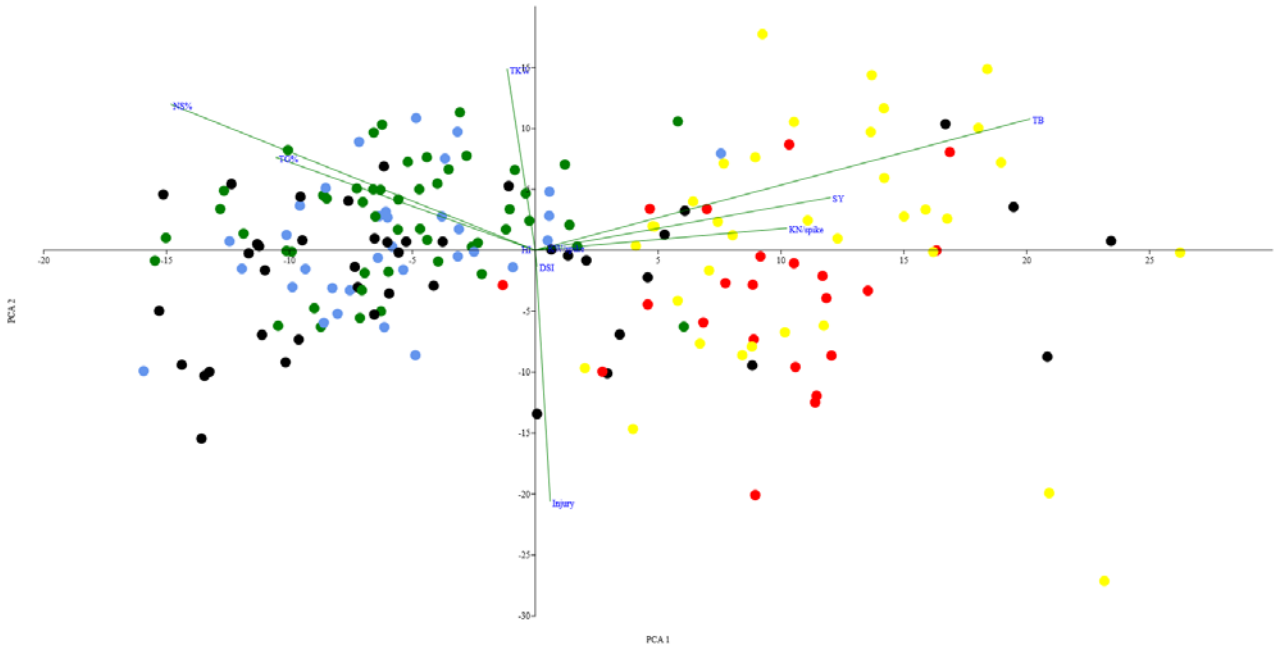
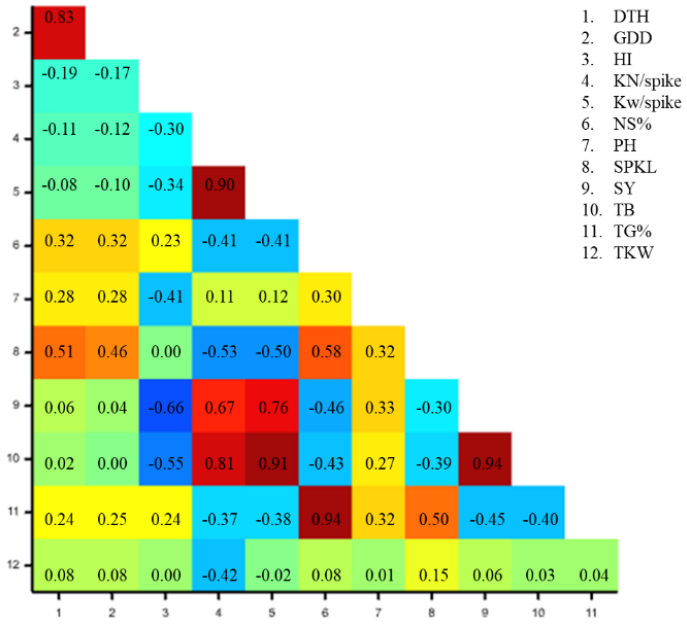


Figure S20 The phenotypic variation of the studied traits related to the population structure under post-anthesis drought stress. The variation between spike row type and the origin the yellow dots represent the 6-rowed Ethiopian Landraces (Q1), green dots represent the 2- rowed German cultivars (Q2), the red dots represent the 6- rowed cultivars (Q3) and the blue dots represent the 2-rowed cultivars (Q4).

a)



b)

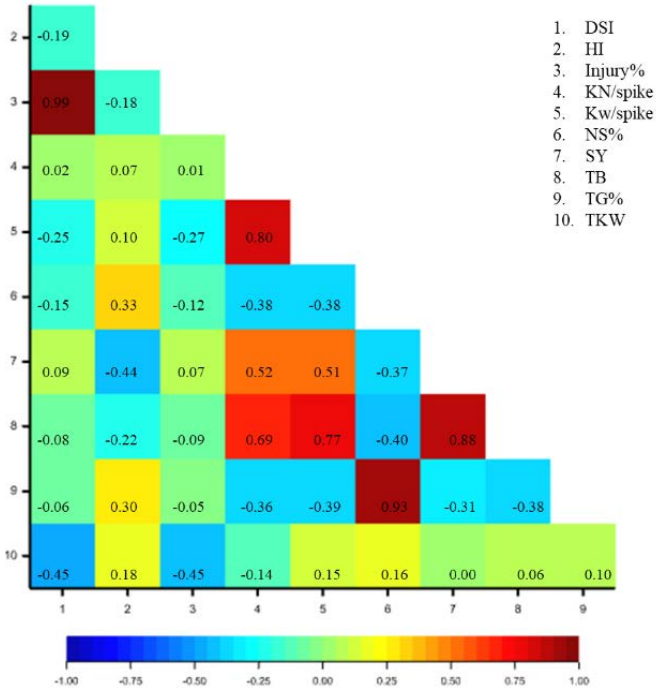


Figure S21 Correlation coefficients of the best linear unbiased estimates values (BLUEs) between the studied traits under a) control and b) chemical desiccation treatments.

Table S1 Detailed information on the EcoSeed spring barley panel. The 184 EcoSeed genotypes with Acc No, accession number; Acc ID, accession identifier; Countries of origin, ISO country codes (UNK, unknown country).

EcoSeed Genotype	Accession No	Accession ID	Biostatus	Row Type	Country of Origin	Genus	Species	Species Authors	Subtaxa	Subtaxa Author	Accession Name
1	HOR 786	17010	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare var. hybernum*	Viborg	
2	HOR 861	17080	Landrace	Six	GRC	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
3	HOR 1129	17330	Landrace	Six	GRC	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
4	HOR 1153	17353	Landrace	Six	GRC	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
5	HOR 1241	17436	Landrace	Six	GRC	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
6	HOR 1255	17449	Landrace	Six	GRC	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
7	HOR 1256	17450	Landrace	Six	GRC	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
8	HOR 1684	17824	Landrace	Six	IND	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
9	HOR 1736	17875	Cultivar	Six	USA	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	Peruviana
10	HOR 2049	18161	Cultivar	Two	AUT	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *erectum*	(Rode) Alef.	Ennstaler (Kunagrüner) Imperial
11	HOR 2071	18183	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Weihenstephaner Hilfe
12	HOR 2081	18189	Cultivar	Six	SWE	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	Svalöfs Brio
13	HOR 2082	18190	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Schlötenitzer
14	HOR 2085	18193	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Seelowitzer Gloria
15	HOR 2087	18195	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Schneiders Eckersdorfer Hanna
16	HOR 2091	18198	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Dippes Hanna
17	HOR 2094	18201	Cultivar	Two	SWE	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Weibulls Pukekorn
18	HOR 2095	18202	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Wallwitzer Perl I
19	HOR 2098	18204	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Nekladener
20	HOR 2099	18205	Cultivar	Six	POL	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	Podhorecky

21	HOR 2100	18206	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *erectum*	(Rode) Alef.	Stieglers Kaisergerste Imperial
22	HOR 2101	18207	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Seelowitzer Triumph
23	HOR 2102	18208	Cultivar	Two	SWE	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *erectum*	(Rode) Alef.	Svalöfs Primus Imperial
24	HOR 2103	18209	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Eglfinger Monachia
25	HOR 2105	18211	Cultivar	Six	POL	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	Wanda Dluzewska
26	HOR 2106	18212	Breeding Line	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Schirmers Franken St. 22
27	HOR 2107	18213	Breeding Line	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Oberglogauer A 5
28	HOR 2108	18214	Cultivar	Two	POL	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Hanna Borzymowicki
29	HOR 2109	18215	Cultivar	Two	POL	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Hanna Skrzeszowicki
30	HOR 2110	18216	Breeding line	Two	AUT	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Hanna * Moravia
31	HOR 2111	18217	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Gabelstorfer Bardengerste
32	HOR 2112	18218	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Breuns Heinrich
33	HOR 2117	18222	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Fischers Wirchenblatter VI
34	HOR 2118	18223	Cultivar	Two	AUT	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *erectum*	(Rode) Alef.	Fisser Imperial (Tiroler)
35	HOR 2119	18224	Cultivar	Two	POL	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Hanna Gambrinus Ryxa
36	HOR 2120	18225	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Francks Pfälzer
37	HOR 2122	18226	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Tepler Hochland 401
38	HOR 2123	18227	Cultivar	Two	AUT	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Adlicker 9
39	HOR 2125	18229	Cultivar	Six	GER	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	Rotenburger Sand Vierzeilig
40	HOR 2126	18230	Cultivar	Two	DNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode)	Abed Archer

										Alef.	
41	HOR 2127	18231	Cultivar	Two	POL	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Kutnowski
42	HOR 2128	18232	Cultivar	Two	POL	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Kujanowiak
43	HOR 2130	18233	Cultivar	Six	GER	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	Bannerts Vierzeilige
44	HOR 2131	18234	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Löws Angern 3
45	HOR 2132	18235	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Wikinger
46	HOR 2135	18236	Cultivar	Two	HUN	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Tuktaharkany
47	HOR 2136	18237	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Hohenauer (Pommers)
48	HOR 2137	18238	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Schickerts Pfälzer
49	HOR 2138	18239	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Hennersdorfer K. 64
50	HOR 2143	18244	Breeding Line	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Fuchs St. II 2
51	HOR 2147	18248	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Heines Olympia
52	HOR 2149	18250	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Holzapfels Frühgerste
53	HOR 2157	18258	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Wadsacks Thüringer
54	HOR 2159	18260	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Pflugs Intensiv
55	HOR 2160	18261	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *erectum*	(Rode) Alef.	Saxonia Malz Imperial
56	HOR 2162	18262	Breeding Line	Two	HUN	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Hatvani 129/1
57	HOR 2163	18263	Breeding Line	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Kaschitzer St. 91
58	HOR 2164	18264	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Bannerts Rote Radsteiner
59	HOR 2167	18267	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Gödinger Bräu

60	HOR 2168	18268	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Gomers W 9
61	HOR 2171	18270	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Rastatter Neuzucht
62	HOR 2173	18272	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Hildebrands Olympia
63	HOR 2174	18273	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Katterbacher
64	HOR 2175	18274	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Frainspitzer Frühgerste
65	HOR 2177	18276	Cultivar	Six	GER	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	Kaufbeurener Vierzeilige
66	HOR 2181	18280	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Stauffers Obersülzer Frühe
67	HOR 2182	18281	Breeding Line	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Mooser St. 73
68	HOR 2183	18282	Cultivar	Six	POL	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	Sobieszynski
69	HOR 2184	18283	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Nitschkes Riesengebirgsgerste
70	HOR 2185	18284	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Osterpeys Frankenthaler
71	HOR 2186	18285	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Schweigers Moosburger Rhaetia
72	HOR 2189	18287	Cultivar	Two	AUT	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Probstdorfer Vollkorn
73	HOR 2190	18288	Cultivar	Two	AUT	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Immendorfer
74	HOR 2192	18289	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Hanna Goli
75	HOR 2193	18290	Cultivar	Two	CSK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Proskowetzer Hanna Pedigree
76	HOR 2195	18292	Landrace	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Lüttichaus Landgerste
77	HOR 2198	18293	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Krapphauser
78	HOR 2200	18295	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Dahmer Hanna
79	HOR 2202	18297	Landrace	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode)	Jassener Landgerste

										Alef.	
80	HOR 2204	18299	Breeding line	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Hanna * Chevalier
81	HOR 2205	18300	Cultivar	Two	DNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Dänische Sterlinggerste
82	HOR 2206	18301	Cultivar	Two	AUT	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Marienhofer
83	HOR 2207	18302	Cultivar	Six	GER	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	Sorg. Neuschlosser Vierzeilig
84	HOR 2208	18303	Cultivar	Two	POL	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Przeworski
85	HOR 2212	18306	Landrace	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Guttentager Landgerste
86	HOR 2215	18309	Cultivar	Six	GER	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	Harbers Vierzeilige
87	HOR 2216	18310	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Herdas Hanna
88	HOR 2220	18314	Cultivar	Two	CSK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Dümkruter Proskowetzer Hanna
89	HOR 2221	18315	Cultivar	Two	HUN	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Mesterhazi 210
90	HOR 2222	18316	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Schwarzenberggerste 21
91	HOR 2223	18317	Cultivar	Two	AUT	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Elscher
92	HOR 2225	18319	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Drossenfelder Frankonia
93	HOR 2226	18320	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Krecks Sommergerste
94	HOR 2228	18321	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *erectum*	(Rode) Alef.	Lonauer Imperial
95	HOR 2229	18322	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Köstlins Rotgrannige
96	HOR 2230	18323	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Stauffers Obersülzer Mittelfrühe
97	HOR 2328	18397	Breeding Line	Two	HUN	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Hatvani 1108
98	HOR 2330	18398	Breeding Line	Two	HUN	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Martonvasari F.B. 102

99	HOR 2333	18400	Cultivar	Two	HUN	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Lovaszpatonai Universal
100	HOR 2334	18401	Cultivar	Two	HUN	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Martonvasari Korai Tavaszi Takarmany Arpa
101	HOR 2335	18402	Cultivar	Two	HUN	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Mesterhazi
102	HOR 2336	18403	Cultivar	Two	HUN	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Peresztegi
103	HOR 2338	18405	Cultivar	Two	DDR	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Elsa
104	HOR 2340	18407	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *erectum*	(Rode) Alef.	Goldthorpe Silesia
105	HOR 2347	18412	Landrace	Two	UNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *erectum*	(Rode) Alef.	
106	HOR 2391	18454	Cultivar	Two	GER	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *erectum*	(Rode) Alef.	Müllers Messdorfer Goldthorpe
107	HOR 2401	18462	Cultivar	Six	USA	*Hordeum*	*vulgare*	L.	convar. vulgare var. *parallelum*	Körn.	Cruzat
108	HOR 2402	18463	Cultivar	Six	CAN	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *rikotense*	Regel	Byng
109	HOR 2410	18466	Cultivar	Six	PRT	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *nigrum*	(Willd.) Link	Cevada Preta
110	HOR 2419	18476	Landrace	Two	SUN	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
111	HOR 2441	18483	Cultivar	Two	DDR	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Saale
112	HOR 2487	18523	Cultivar	Two	POL	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Hanna Gambrinus
113	HOR 2488	18524	Cultivar	Two	POL	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Hanna Kleszczowski
114	HOR 2490	18526	Cultivar	Two	SWE	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Balder
115	HOR 2491	18527	Cultivar	Two	NLD	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Agio
116	HOR 2492	18528	Cultivar	Two	NLD	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Minerva
117	HOR 2493	18529	Cultivar	Six	GER	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	Breustedts Frisia
118	HOR 2496	18532	Cultivar	Two	SWE	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Svalöfs Bonus

119	HOR 2497	18533	Cultivar	Two	DNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Carlsberg II
120	HOR 2544	18576	Landrace	Two	ETH	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
121	HOR 2555	18587	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *rikotense*	Regel	
122	HOR 2571	18603	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
123	HOR 2749	18777	Cultivar	Six	USA	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *rikotense*	Regel	Custer
124	HOR 2752	18780	Cultivar	Six	USA	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *parallelum*	Körn.	Frontier
125	HOR 2754	18782	Cultivar	Six	USA	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *rikotense*	Regel	Hiland
126	HOR 2758	18786	Cultivar	Six	UKR	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	Odessa
127	HOR 2764	18792	Cultivar	Six	USA	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *rikotense*	Regel	Tregal
128	HOR 2765	18793	Breeding line	Two	GBR	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	HB 248/11/4 (Proctor * C 177)
129	HOR 2838	18865	Landrace	Two	IRN	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
130	HOR 2858	18885	Landrace	Two	IRN	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
131	HOR 2901	18928	Landrace	Six	SLV	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
132	HOR 2905	18931	Landrace	Six	AFG	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
133	HOR 3021	19039	Cultivar	Six	GER	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. hybernum	Viborg	Berendstets
134	HOR 3524	19522	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. vulgare var. *hybernum*	Viborg	
135	HOR 4252	20222	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
136	HOR 4519	20482	Cultivar	Six	ERI	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	Dabat
137	HOR 4571	20533	Cultivar	Two	BEL	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Lilly
138	HOR 4703	94157	Landrace	Two	UNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
139	HOR 4704	94158	Landrace	Two	UNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
140	HOR 4705	94159	Landrace	Two	UNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
141	HOR 4706	94160	Landrace	Two	UNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
142	HOR 4707	94161	Landrace	Two	UNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	

143	HOR 4708	94162	Landrace	Two	UNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
144	HOR 4709	94163	Landrace	Two	UNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
145	HOR 4710	94164	Landrace	Two	UNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
146	HOR 4714	94169	Landrace	Two	UNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
147	HOR 4715	94170	Landrace	Two	UNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
148	HOR 5304	21214	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *nigripallidum*	Regel	
149	HOR 5362	21272	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
150	HOR 5410	21320	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
151	HOR 5584	21494	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
152	HOR 5608	21518	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
153	HOR 5664	21574	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
154	HOR 5671	21581	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
155	HOR 5674	21584	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *parallelum*	Körn.	
156	HOR 5677	21587	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
157	HOR 5681	21591	Cultivar	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	Watcho
158	HOR 5701	21611	Landrace	Two	ETH	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
159	HOR 5722	21632	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
160	HOR 5780	21690	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *coerulescens*	Sér.	
161	HOR 5851	21761	Breeding Line	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *parallelum*	Körn.	S-44
162	HOR 5879	21789	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *nigrum*	(Willd.) Link	No. 130
163	HOR 5970	21880	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	H-2241
164	HOR 6118	22028	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *coerulescens*	Sér.	
165	HOR 6125	22035	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
166	HOR 6193	22103	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *subviolaceum*	Körn.	
167	HOR 6313	22223	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
168	HOR 6343	22253	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *coerulescens*	Sér.	

169	HOR 6382	22292	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *nigripallidum*	Regel	
170	HOR 6385	22295	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
171	HOR 6475	22385	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
172	HOR 6489	22399	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
173	HOR 6560	22469	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *coerulescens*	Sér.	
174	HOR 6573	22482	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *subviolaceum*	Körn.	
175	HOR 6575	22484	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *subviolaceum*	Körn.	
176	HOR 6606	22515	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
177	HOR 6658	22567	Landrace	Two	ETH	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	
178	HOR 6674	22583	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. vulgare var. *coerulescens*	Sér.	
179	HOR 6735	22644	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
180	HOR 6742	22651	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
181	HOR 6788	22696	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
182	HOR 6838	22745	Landrace	Six	ETH	*Hordeum*	*vulgare*	L.	convar. *vulgare* var. *hybernum*	Viborg	
183	HOR 6971	94176	Breeding Line	Two	UNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *erectum*	(Rode) Alef.	Sv. 66367 [breeder's line]
184	HOR 6974	94179	Breeding Line	Two	UNK	*Hordeum*	*vulgare*	L.	convar. *distichon* var. *nutans*	(Rode) Alef.	Sv. K 68241 (Stamm) [breeder's line]

Table S2 Descriptive statistics of the digital biomass trait at the experiment time points from day after sowing (DAS9) until (DAS58) under pre-stress, control (C) and drought (D) treatments across the best linear unbiased estimates (BLUEs), including the Min: minimum, Max: maximum, SD: standard deviation, coefficient of variation (CV) and Repeatability (R^2).

Trait	Treatment	Min	Max	Mean	SD	CV	R^2
DB.DAS9	PSP	0.127	0.52	0.332	0.076	22.986	0.633
DB.DAS10	PSP	0.028	0.549	0.361	0.081	22.406	0.625
DB.DAS11	PSP	-0.028	0.727	0.484	0.103	21.33	0.619
DB.DAS12	PSP	0.164	1.006	0.674	0.131	19.414	0.642
DB.DAS13	PSP	0.259	1.256	0.812	0.157	19.304	0.637
DB.DAS14	PSP	0.275	1.565	1.081	0.2	18.497	0.607
DB.DAS15	PSP	0.286	2.003	1.403	0.248	17.701	0.61
DB.DAS16	PSP	0.26	2.688	1.863	0.332	17.829	0.638
DB.DAS17	PSP	0.345	3.449	2.416	0.435	18.01	0.658
DB.DAS18	PSP	0.48	4.668	3.151	0.617	19.578	0.666
DB.DAS19	PSP	0.303	5.989	4.117	0.778	18.907	0.648
DB.DAS21	PSP	0.380	9.438	6.623	1.241	18.741	0.649
DB.DAS22	PSP	-0.122	13.081	8.622	1.718	19.928	0.681
DB.DAS23	PSP	0.190	15.736	10.643	2.193	20.608	0.7
DB.DAS24	PSP	0.159	19.737	13.279	2.722	20.499	0.712
DB.DAS25	PSP	0.515	24.202	16.148	3.347	20.724	0.719
DB.DAS26	PSP	-0.456	29.619	19.974	4.09	20.477	0.703
DB.DAS27	C	39.295	149.437	98.171	21.32	21.717	0.702
DB.DAS28	C	45.855	181.302	117.618	25.787	21.925	0.726
DB.DAS29	C	53.868	212.157	140.552	30.978	22.04	0.721
DB.DAS30	C	64.973	235.456	152.612	32.724	21.443	0.718
DB.DAS31	C	78.983	268.46	178.281	38.541	21.618	0.74
DB.DAS32	C	95.962	322.699	211.506	46.083	21.788	0.756
DB.DAS33	C	74.497	366.483	246.759	54.262	21.99	0.753
DB.DAS34	C	73.237	411.268	271.14	63.086	23.267	0.602
DB.DAS37	C	184.838	549.756	389.26	72.375	18.593	0.792
DB.DAS38	C	205.919	721.064	446.369	91.702	20.544	0.79
DB.DAS39	C	231.712	744.421	494.008	100.638	20.372	0.815
DB.DAS40	C	274.897	830.94	554.886	109.554	19.743	0.806
DB.DAS41	C	304.65	925.428	610.694	119.496	19.567	0.831
DB.DAS42	C	341.501	1005.673	684.27	133.384	19.493	0.843
DB.DAS43	C	371.911	1098.372	729.553	137.283	18.817	0.835
DB.DAS45	C	406.314	1164.175	805.542	136.068	16.892	0.818
DB.DAS46	C	428.416	1400.005	930.297	171.226	18.406	0.841
DB.DAS47	C	459.362	1488.115	1007.349	184.453	18.311	0.844
DB.DAS27	D	7.011	57.974	35.316	8.639	24.461	0.664
DB.DAS28	D	8.915	66.616	41.446	10.235	24.694	0.652
DB.DAS29	D	12.343	81.715	49.61	12.072	24.333	0.644
DB.DAS30	D	13.778	90.251	58.853	14.465	24.579	0.681
DB.DAS32	D	21.418	127.463	79.394	18.614	23.445	0.694
DB.DAS33	D	25.341	146.874	89.23	20.885	23.406	0.705

DB.DAS34	D	31.122	156.514	101.109	23.25	22.995	0.718
DB.DAS35	D	40.029	174.381	112.244	24.531	21.855	0.711
DB.DAS36	D	42.266	190.815	121.183	25.811	21.299	0.738
DB.DAS37	D	50.084	196.582	132.934	26.479	19.919	0.731
DB.DAS38	D	49.488	201.023	137.661	28.013	20.349	0.737
DB.DAS39	D	57.364	191.893	144.788	24.122	16.66	0.733
DB.DAS40	D	59.555	210.559	151.566	26.89	17.742	0.8
DB.DAS41	D	88.78	182.656	146.981	16.752	11.398	0.564
DB.DAS42	D	71.458	198.968	148.078	19.168	12.945	0.624
DB.DAS43	D	98.624	170.565	133.08	13.369	10.046	0.432
DB.DAS44	D	83.046	181.873	131.799	15.625	11.855	0.468
DB.DAS45	D	88.863	166.782	116.667	13.435	11.516	0.6
DB.DAS46	D	131.661	265.834	200.312	21.299	10.633	0.679
DB.DAS47	D	130.635	291.786	215.334	24.602	11.425	0.69
DB.DAS48	D	135.079	331.186	251.981	29.548	11.726	0.762
DB.DAS49	D	133.956	362.811	271.98	33.811	12.431	0.786
DB.DAS50	D	135.233	399.395	308.471	40.249	13.048	0.81
DB.DAS51	D	141.289	443.886	343.691	45.733	13.306	0.828
DB.DAS52	D	145.974	478.335	376.375	51.088	13.574	0.843
DB.DAS53	D	152.077	534.65	421.889	58.771	13.931	0.839
DB.DAS54	D	154.056	581.64	466.258	66.13	14.183	0.856
DB.DAS55	D	162.984	661.188	516.474	75.066	14.534	0.859
DB.DAS56	D	165.663	732.203	556.699	79.71	14.318	0.858
DB.DAS57	D	178.388	777.244	607.377	87.884	14.469	0.85
DB.DAS58	D	186.814	849.584	660.134	97.31	14.741	0.866

Table S3 Analysis of variance of the pre-anthesis drought stress experiment (traits at maturity) df: degrees of freedom, s.s: sum of squares, m.s: mean square, Fpr: F-probabilities, s.e.d: standard error of the difference between means, l.s.d: least significant differences at P<0.05.

Days to heading

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	151		47482.82	314.46	27.76	<.001	2.17	4.27
Treatment	1		38696.24	38696.24	3415.96	<.001	0.22	0.44
Genotype.Treatment	139	-12	7936.54	57.1	5.04	<.001	3.89	7.64
Residual	474	-122	5369.51	11.33				
Total	765	-134	77172.87					

Plant height

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	151		103494.2	685.39	10.19	<.001	5.29	10.4
Treatment	1		56093.72	56093.72	833.87	<.001	0.55	1.07
Genotype.Treatment	150	-1	12352.01	82.35	1.22	0.053	9.47	18.6
Residual	575	-21	38679.87	67.27				
Total	877	-22	207421.4					

Spike length

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	151		3172.232	21.0082	26.6	<.001	0.57	1.13
Treatment	1		0.2333	0.2333	0.3	0.587	0.06	0.12
Genotype.Treatment	148	-3	302.181	2.0418	2.58	<.001	1.03	2.02
Residual	528	-68	417.0652	0.7899				
Total	828	-71	3600.64					

Kernel number/plant

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	151		6541311	43320	6.36	<.001	53.28	104.63
Treatment	1		477884	477884	70.15	<.001	5.5	10.81
Genotype.Treatment	150	-1	1603555	10690	1.57	<.001	95.3	187.17
Residual	592	-4	4032780	6812				
Total	894	-5	12581656					

Kernel weight/plant

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	151		11282.58	74.72	5.32	<.001	2.42	4.75
Treatment	1		587.53	587.53	41.86	<.001	0.25	0.49
Genotype.Treatment	150	-1	3842.56	25.62	1.83	<.001	4.33	8.5
Residual	590	-6	8281.58	14.04				
Total	892	-7	23758.2					

Thousand kernel weight

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	151		35342.79	234.06	7.75	<.001	3.547	6.966
Treatment	1		275.12	275.12	9.11	0.003	0.366	0.719
Genotype.Treatment	150	-1	8553.65	57.02	1.89	<.001	6.345	12.461
Residual	590	-6	17813.01	30.19				
Total	892	-7	61797.37					

Straw yield

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	151		54924.3	363.7	2.67	<.001	7.538	14.803
Treatment	1		14262	14262	104.6	<.001	0.779	1.529
Genotype.Treatment	150	-1	33407.6	222.7	1.63	<.001	13.484	26.481
Residual	593	-3	80857.7	136.4				
Total	895	-4	183322.9					

Spike number/plant

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	151		7245.52	47.98	4.66	<.001	2.072	4.07
Treatment	1		210.38	210.38	20.41	<.001	0.214	0.42
Genotype.Treatment	150	-1	1816.49	12.11	1.17	0.098	3.707	7.281
Residual	588	-8	6060.68	10.31				
Total	890	-9	15233.18					

Total biomass

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	151		69625.9	461.1	3.95	<.001	7	13.7
Treatment	1		29019.2	29019.2	248.53	<.001	0.7	1.4
Genotype.Treatment	150	-1	35784.1	238.6	2.04	<.001	12.5	24.5
Residual	571	-25	66671.8	116.8				
Total	873	-26	196046.6					

Harvest index

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	151		4.662036	0.030874	6.89	<.001	0.043	0.085
Treatment	1		0.086998	0.086998	19.42	<.001	0.004	0.009
Genotype.Treat	150	-1	1.011245	0.006742	1.5	<.001	0.077	0.152
Residual	570	-26	2.553837	0.00448				
Total	872	-27	8.049429					

Table S4 Significant marker trait associations passed FDR level P ≤ 0.05 for digital biomass trait (DB) under pre-stress phase (PSP), control phase (CP), D phase (DP) and recovery phase (RP). Numbers of significant single MTAs are shown above false-discovery rate (FDR) for each chromosome and most significant markers are shown in Table S11**.**

Trait	Treatment	Marker name	Chromosome	Position	Log	Allel 1	Allel 2	Freq	Freq	Effect	Effect
DB_DAS41	DP	11_21354	1H	0.21	4	C	G	0.894	0.106	-8.219	2.118
DB_DAS42	DP	11_21354	1H	0.21	4.7	C	G	0.894	0.106	-10.271	2.396
DB_DAS37	DP	SCRI_RS_130592	1H	17.28	3.3	A	G	0.565	0.435	7.796	2.225
DB_DAS38	DP	12_31464	1H	60.84	3.8	T	A	0.795	0.205	14.911	3.952
DB_DAS37	DP	12_31464	1H	60.84	3.9	T	A	0.795	0.205	14.304	3.757
DB_DAS35	DP	12_31464	1H	60.84	4.1	T	A	0.795	0.205	14.153	3.596
DB_DAS36	DP	12_31464	1H	60.84	3.8	T	A	0.795	0.205	14.093	3.721
DB_DAS34	DP	12_31464	1H	60.84	4	T	A	0.795	0.205	13.459	3.469
DB_DAS39	DP	12_31464	1H	60.84	3.7	T	A	0.795	0.205	12.17	3.253
DB_DAS33	DP	12_31464	1H	60.84	3.9	T	A	0.795	0.205	11.952	3.136
DB_DAS32	DP	12_31464	1H	60.84	3.9	T	A	0.795	0.205	10.714	2.792
DB_DAS29	DP	12_31464	1H	60.84	3.7	T	A	0.795	0.205	6.937	1.86
DB_DAS28	DP	12_31464	1H	60.84	3.5	T	A	0.795	0.205	5.68	1.582
DB_DAS27	DP	12_31464	1H	60.84	3.9	T	A	0.795	0.205	5.123	1.334
DB_DAS40	DP	SCRI_RS_120605	1H	61.47	4.2	T	C	0.748	0.252	16.725	4.157
DB_DAS38	DP	SCRI_RS_120605	1H	61.47	5	T	C	0.748	0.252	16.635	3.761
DB_DAS39	DP	SCRI_RS_120605	1H	61.47	6.6	T	C	0.748	0.252	15.951	3.094
DB_DAS37	DP	SCRI_RS_120605	1H	61.47	4.6	T	C	0.748	0.252	15.099	3.586
DB_DAS36	DP	SCRI_RS_120605	1H	61.47	4.1	T	C	0.748	0.252	14.062	3.565
DB_DAS35	DP	SCRI_RS_120605	1H	61.47	3.8	T	C	0.748	0.252	13.058	3.456
DB_DAS34	DP	SCRI_RS_120605	1H	61.47	3.4	T	C	0.748	0.252	11.852	3.328
DB_DAS32	DP	SCRI_RS_120605	1H	61.47	3.5	T	C	0.748	0.252	9.746	2.688
DB_DAS42	DP	SCRI_RS_120605	1H	61.47	3.6	T	C	0.748	0.252	9.448	2.592
DB_DAS24	PSP	12_21522	1H	117.49	3.7	G	A	0.887	0.113	-2.052	0.548
DB_DAS25	PSP	12_21522	1H	117.49	3.9	G	A	0.887	0.113	-2.55	0.661

DB_DAS27	DP	SCRI_RS_193452	2H	8.57	4.7	T	A	0.7	0.3	-3.288	0.773
DB_DAS28	DP	SCRI_RS_193452	2H	8.57	3.6	T	A	0.7	0.3	-3.437	0.94
DB_DAS29	DP	SCRI_RS_193452	2H	8.57	3.6	T	A	0.7	0.3	-4.093	1.116
DB_DAS30	DP	SCRI_RS_193452	2H	8.57	4.6	T	A	0.7	0.3	-5.507	1.303
DB_DAS32	DP	SCRI_RS_193452	2H	8.57	4.4	T	A	0.7	0.3	-6.837	1.668
DB_DAS33	DP	SCRI_RS_193452	2H	8.57	4.3	T	A	0.7	0.3	-7.546	1.853
DB_DAS39	DP	SCRI_RS_193452	2H	8.57	4.2	T	A	0.7	0.3	-8.207	2.047
DB_DAS34	DP	SCRI_RS_193452	2H	8.57	4.6	T	A	0.7	0.3	-8.566	2.038
DB_DAS35	DP	SCRI_RS_193452	2H	8.57	4.4	T	A	0.7	0.3	-8.737	2.14
DB_DAS36	DP	SCRI_RS_193452	2H	8.57	4.3	T	A	0.7	0.3	-9.033	2.232
DB_DAS40	DP	SCRI_RS_193452	2H	8.57	4	T	A	0.7	0.3	-9.396	2.408
DB_DAS37	DP	SCRI_RS_193452	2H	8.57	4.5	T	A	0.7	0.3	-9.513	2.277
DB_DAS38	DP	SCRI_RS_193452	2H	8.57	4.7	T	A	0.7	0.3	-10.198	2.388
DB_DAS14	PSP	SCRI_RS_193452	2H	8.57	4.4	T	A	0.7	0.3	-0.073	0.018
DB_DAS15	PSP	SCRI_RS_193452	2H	8.57	3.9	T	A	0.7	0.3	-0.083	0.022
DB_DAS17	PSP	SCRI_RS_193452	2H	8.57	4.4	T	A	0.7	0.3	-0.146	0.035
DB_DAS22	PSP	SCRI_RS_193452	2H	8.57	3.6	T	A	0.7	0.3	-0.508	0.138
DB_DAS23	PSP	SCRI_RS_193452	2H	8.57	4.2	T	A	0.7	0.3	-0.697	0.173
DB_DAS24	PSP	SCRI_RS_193452	2H	8.57	4.4	T	A	0.7	0.3	-0.891	0.216
DB_DAS25	PSP	SCRI_RS_193452	2H	8.57	4.5	T	A	0.7	0.3	-1.083	0.261
DB_DAS26	PSP	SCRI_RS_193452	2H	8.57	4	T	A	0.7	0.3	-1.226	0.314
DB_DAS27	DP	SCRI_RS_152744	2H	12.75	5.8	A	C	0.705	0.295	-3.81	0.796
DB_DAS28	DP	SCRI_RS_152744	2H	12.75	5.1	A	C	0.705	0.295	-4.303	0.958
DB_DAS29	DP	SCRI_RS_152744	2H	12.75	5.5	A	C	0.705	0.295	-5.25	1.125
DB_DAS30	DP	SCRI_RS_152744	2H	12.75	6.2	A	C	0.705	0.295	-6.602	1.321
DB_DAS32	DP	SCRI_RS_152744	2H	12.75	5.8	A	C	0.705	0.295	-8.058	1.683
DB_DAS39	DP	SCRI_RS_152744	2H	12.75	4.5	A	C	0.705	0.295	-8.487	2.051
DB_DAS33	DP	SCRI_RS_152744	2H	12.75	5.3	A	C	0.705	0.295	-8.606	1.881
DB_DAS34	DP	SCRI_RS_152744	2H	12.75	5.6	A	C	0.705	0.295	-9.706	2.072

DB_DAS35	DP	SCRI_RS_152744	2H	12.75	5.2	A	C	0.705	0.295	-9.828	2.182
DB_DAS37	DP	SCRI_RS_152744	2H	12.75	4.9	A	C	0.705	0.295	-10.068	2.305
DB_DAS36	DP	SCRI_RS_152744	2H	12.75	5.2	A	C	0.705	0.295	-10.233	2.259
DB_DAS38	DP	SCRI_RS_152744	2H	12.75	4.9	A	C	0.705	0.295	-10.548	2.417
DB_DAS24	PSP	SCRI_RS_152744	2H	12.75	4	A	C	0.705	0.295	-0.897	0.229
DB_DAS31	CP	SCRI_RS_233272	2H	18.90	5.7	G	T	0.777	0.223	-17.784	3.737
DB_DAS32	CP	SCRI_RS_233272	2H	18.90	5.6	G	T	0.777	0.223	-21.528	4.559
DB_DAS33	CP	SCRI_RS_233272	2H	18.90	5.7	G	T	0.777	0.223	-25.195	5.278
DB_DAS38	CP	SCRI_RS_233272	2H	18.90	5.3	G	T	0.777	0.223	-41.33	9.01
DB_DAS39	CP	SCRI_RS_233272	2H	18.90	5.7	G	T	0.777	0.223	-49.838	10.533
DB_DAS40	CP	SCRI_RS_233272	2H	18.90	5.3	G	T	0.777	0.223	-51.76	11.38
DB_DAS41	CP	SCRI_RS_233272	2H	18.90	5.5	G	T	0.777	0.223	-58.324	12.507
DB_DAS42	CP	SCRI_RS_233272	2H	18.90	5.7	G	T	0.777	0.223	-65.453	13.769
DB_DAS45	CP	SCRI_RS_233272	2H	18.90	6	G	T	0.777	0.223	-69.171	14.146
DB_DAS43	CP	SCRI_RS_233272	2H	18.90	5.9	G	T	0.777	0.223	-69.74	14.395
DB_DAS46	CP	SCRI_RS_233272	2H	18.90	5.9	G	T	0.777	0.223	-91.504	18.914
DB_DAS47	CP	SCRI_RS_233272	2H	18.90	6.4	G	T	0.777	0.223	-102.218	20.173
DB_DAS33	CP	SCRI_RS_153798	2H	18.90	4.1	A	T	0.789	0.211	-20.922	5.319
DB_DAS47	CP	SCRI_RS_153798	2H	18.90	5	A	T	0.789	0.211	-87.295	19.872
DB_DAS33	CP	SCRI_RS_210172	2H	18.90	4.4	T	C	0.887	0.113	-27.187	6.576
DB_DAS38	CP	SCRI_RS_210172	2H	18.90	5.3	T	C	0.887	0.113	-49.243	10.834
DB_DAS39	CP	SCRI_RS_210172	2H	18.90	5.2	T	C	0.887	0.113	-57.008	12.678
DB_DAS40	CP	SCRI_RS_210172	2H	18.90	4.8	T	C	0.887	0.113	-58.618	13.63
DB_DAS41	CP	SCRI_RS_210172	2H	18.90	5	T	C	0.887	0.113	-66.121	14.891
DB_DAS42	CP	SCRI_RS_210172	2H	18.90	5.3	T	C	0.887	0.113	-74.387	16.306
DB_DAS45	CP	SCRI_RS_210172	2H	18.90	6.7	T	C	0.887	0.113	-82.727	15.963
DB_DAS43	CP	SCRI_RS_210172	2H	18.90	6.3	T	C	0.887	0.113	-83.01	16.571
DB_DAS46	CP	SCRI_RS_210172	2H	18.90	6.3	T	C	0.887	0.113	-106.729	21.168
DB_DAS47	CP	SCRI_RS_210172	2H	18.90	6.9	T	C	0.887	0.113	-119.26	22.563

DB_DAS27	DP	SCRI_RS_233272	2H	18.90	3.7	G	T	0.777	0.223	-3.603	0.97
DB_DAS28	DP	SCRI_RS_233272	2H	18.90	3.9	G	T	0.777	0.223	-4.359	1.135
DB_DAS29	DP	SCRI_RS_233272	2H	18.90	4	G	T	0.777	0.223	-5.271	1.35
DB_DAS30	DP	SCRI_RS_233272	2H	18.90	4.1	G	T	0.777	0.223	-6.415	1.617
DB_DAS32	DP	SCRI_RS_233272	2H	18.90	4.2	G	T	0.777	0.223	-8.256	2.053
DB_DAS33	DP	SCRI_RS_233272	2H	18.90	4.3	G	T	0.777	0.223	-9.268	2.274
DB_DAS34	DP	SCRI_RS_233272	2H	18.90	4.1	G	T	0.777	0.223	-9.99	2.52
DB_DAS46	DP	SCRI_RS_233272	2H	18.90	4.5	G	T	0.777	0.223	-10.026	2.398
DB_DAS35	DP	SCRI_RS_233272	2H	18.90	4.1	G	T	0.777	0.223	-10.414	2.642
DB_DAS39	DP	SCRI_RS_233272	2H	18.90	4.9	G	T	0.777	0.223	-10.624	2.436
DB_DAS36	DP	SCRI_RS_233272	2H	18.90	4.4	G	T	0.777	0.223	-11.243	2.738
DB_DAS37	DP	SCRI_RS_233272	2H	18.90	4.8	G	T	0.777	0.223	-11.899	2.765
DB_DAS47	DP	SCRI_RS_233272	2H	18.90	5.2	G	T	0.777	0.223	-12.466	2.766
DB_DAS38	DP	SCRI_RS_233272	2H	18.90	5.1	G	T	0.777	0.223	-12.907	2.902
DB_DAS48	DP	SCRI_RS_233272	2H	18.90	5.2	G	T	0.777	0.223	-15.092	3.33
DB_DAS49	DP	SCRI_RS_233272	2H	18.90	5.5	G	T	0.777	0.223	-17.548	3.764
DB_DAS39	DP	SCRI_RS_153798	2H	18.90	3.9	A	T	0.789	0.211	-9.156	2.389
DB_DAS46	DP	SCRI_RS_153798	2H	18.90	4.4	A	T	0.789	0.211	-9.469	2.317
DB_DAS36	DP	SCRI_RS_153798	2H	18.90	3.4	A	T	0.789	0.211	-9.507	2.692
DB_DAS37	DP	SCRI_RS_153798	2H	18.90	3.5	A	T	0.789	0.211	-9.841	2.726
DB_DAS38	DP	SCRI_RS_153798	2H	18.90	3.9	A	T	0.789	0.211	-10.889	2.859
DB_DAS47	DP	SCRI_RS_153798	2H	18.90	5	A	T	0.789	0.211	-11.782	2.656
DB_DAS23	PSP	SCRI_RS_233272	2H	18.90	3.9	G	T	0.777	0.223	-0.823	0.215
DB_DAS24	PSP	SCRI_RS_233272	2H	18.90	4.2	G	T	0.777	0.223	-1.071	0.267
DB_DAS25	PSP	SCRI_RS_233272	2H	18.90	4.1	G	T	0.777	0.223	-1.282	0.326
DB_DAS26	PSP	SCRI_RS_233272	2H	18.90	4.4	G	T	0.777	0.223	-1.59	0.386
DB_DAS15	PSP	SCRI_RS_210172	2H	18.90	4.1	T	C	0.887	0.113	-0.118	0.03
DB_DAS24	PSP	SCRI_RS_210172	2H	18.90	3.7	T	C	0.887	0.113	-1.168	0.316
DB_DAS25	PSP	SCRI_RS_210172	2H	18.90	3.9	T	C	0.887	0.113	-1.481	0.384

DB_DAS50	RP	SCRI_RS_233272	2H	18.90	6.6	G	T	0.777	0.223	-23.108	4.496
DB_DAS51	RP	SCRI_RS_233272	2H	18.90	6.6	G	T	0.777	0.223	-26.759	5.204
DB_DAS52	RP	SCRI_RS_233272	2H	18.90	6.4	G	T	0.777	0.223	-30.33	5.996
DB_DAS53	RP	SCRI_RS_233272	2H	18.90	6.4	G	T	0.777	0.223	-35.564	7.035
DB_DAS54	RP	SCRI_RS_233272	2H	18.90	6.5	G	T	0.777	0.223	-40.753	7.971
DB_DAS56	RP	SCRI_RS_233272	2H	18.90	5.3	G	T	0.777	0.223	-44.117	9.702
DB_DAS55	RP	SCRI_RS_233272	2H	18.90	6.2	G	T	0.777	0.223	-45.228	9.065
DB_DAS57	RP	SCRI_RS_233272	2H	18.90	5.5	G	T	0.777	0.223	-49.516	10.663
DB_DAS58	RP	SCRI_RS_233272	2H	18.90	5.1	G	T	0.777	0.223	-53.841	12.081
DB_DAS48	RP	SCRI_RS_153798	2H	18.90	5.1	A	T	0.789	0.211	-14.219	3.189
DB_DAS49	RP	SCRI_RS_153798	2H	18.90	5.1	A	T	0.789	0.211	-16.22	3.614
DB_DAS50	RP	SCRI_RS_153798	2H	18.90	6.1	A	T	0.789	0.211	-21.336	4.317
DB_DAS50	RP	SCRI_RS_153798	2H	18.90	5.9	A	T	0.789	0.211	-24.333	5.013
DB_DAS52	RP	SCRI_RS_153798	2H	18.90	5.6	A	T	0.789	0.211	-27.246	5.771
DB_DAS53	RP	SCRI_RS_153798	2H	18.90	5.6	A	T	0.789	0.211	-31.883	6.802
DB_DAS54	RP	SCRI_RS_153798	2H	18.90	5.6	A	T	0.789	0.211	-36.212	7.707
DB_DAS55	RP	SCRI_RS_153798	2H	18.90	5.4	A	T	0.789	0.211	-40.511	8.74
DB_DAS56	RP	SCRI_RS_153798	2H	18.90	4.9	A	T	0.789	0.211	-40.623	9.293
DB_DAS57	RP	SCRI_RS_153798	2H	18.90	5.2	A	T	0.789	0.211	-46.114	10.224
DB_DAS58	RP	SCRI_RS_153798	2H	18.90	4.8	A	T	0.789	0.211	-50.021	11.57
DB_DAS55	RP	SCRI_RS_210172	2H	18.90	4.5	T	C	0.887	0.113	-42.537	10.193
DB_DAS27	DP	SCRI_RS_186840	2H	58.64	3.6	G	A	0.832	0.168	-4.331	1.192
DB_DAS28	DP	SCRI_RS_186840	2H	58.64	4.1	G	A	0.832	0.168	-5.485	1.394
DB_DAS58	RP	11_21110	2H	59.07	5.1	C	G	0.803	0.197	56.541	12.601
DB_DAS57	RP	11_21110	2H	59.07	4.7	C	G	0.803	0.197	48.69	11.414
DB_DAS27	DP	SCRI_RS_157097	2H	94.41	3.7	T	C	0.907	0.093	-4.47	1.198
DB_DAS28	DP	SCRI_RS_157097	2H	94.41	4.2	T	C	0.907	0.093	-5.633	1.417
DB_DAS29	DP	SCRI_RS_157097	2H	94.41	4.2	T	C	0.907	0.093	-6.659	1.654
DB_DAS30	DP	SCRI_RS_157097	2H	94.41	4.4	T	C	0.907	0.093	-8.013	1.948

DB_DAS32	DP	SCRI_RS_157097	2H	94.41	3.7	T	C	0.907	0.093	-9.301	2.516
DB_DAS33	DP	SCRI_RS_157097	2H	94.41	3.4	T	C	0.907	0.093	-9.954	2.823
DB_DAS35	DP	SCRI_RS_157097	2H	94.41	3.4	T	C	0.907	0.093	-11.606	3.258
DB_DAS34	DP	SCRI_RS_157097	2H	94.41	3.8	T	C	0.907	0.093	-11.66	3.11
DB_DAS10	PSP	SCRI_RS_157097	2H	94.41	5.1	T	C	0.907	0.093	-0.049	0.011
DB_DAS14	PSP	SCRI_RS_157097	2H	94.41	3.7	T	C	0.907	0.093	-0.102	0.028
DB_DAS15	PSP	SCRI_RS_157097	2H	94.41	4.2	T	C	0.907	0.093	-0.132	0.033
DB_DAS16	PSP	SCRI_RS_157097	2H	94.41	3.9	T	C	0.907	0.093	-0.167	0.044
DB_DAS18	PSP	SCRI_RS_157097	2H	94.41	5	T	C	0.907	0.093	-0.348	0.078
DB_DAS19	PSP	SCRI_RS_157097	2H	94.41	5	T	C	0.907	0.093	-0.432	0.098
DB_DAS21	PSP	SCRI_RS_157097	2H	94.41	4.4	T	C	0.907	0.093	-0.621	0.152
DB_DAS22	PSP	SCRI_RS_157097	2H	94.41	3.8	T	C	0.907	0.093	-0.82	0.216
DB_DAS23	PSP	SCRI_RS_157097	2H	94.41	4.7	T	C	0.907	0.093	-1.16	0.272
DB_DAS24	PSP	SCRI_RS_157097	2H	94.41	4.1	T	C	0.907	0.093	-1.325	0.337
DB_DAS25	PSP	SCRI_RS_157097	2H	94.41	3.7	T	C	0.907	0.093	-1.546	0.414
DB_DAS16	PSP	11_10429	2H	106.4	3.6	G	A	0.728	0.272	0.128	0.035
DB_DAS27	DP	SCRI_RS_190073	2H	107.37	3.7	C	T	0.714	0.286	3.227	0.871
DB_DAS25	PSP	SCRI_RS_190073	2H	107.37	3.8	C	T	0.714	0.286	1.007	0.265
DB_DAS24	PSP	SCRI_RS_190073	2H	107.37	3.6	C	T	0.714	0.286	0.804	0.22
DB_DAS22	PSP	SCRI_RS_190073	2H	107.37	4.4	C	T	0.714	0.286	0.551	0.134
DB_DAS21	PSP	SCRI_RS_190073	2H	107.37	4.6	C	T	0.714	0.286	0.383	0.091
DB_DAS19	PSP	SCRI_RS_190073	2H	107.37	4.5	C	T	0.714	0.286	0.254	0.061
DB_DAS17	PSP	SCRI_RS_190073	2H	107.37	4.5	C	T	0.714	0.286	0.143	0.034
DB_DAS16	PSP	SCRI_RS_190073	2H	107.37	3.8	C	T	0.714	0.286	0.1	0.027
DB_DAS15	PSP	SCRI_RS_190073	2H	107.37	4.2	C	T	0.714	0.286	0.082	0.021
DB_DAS14	PSP	SCRI_RS_190073	2H	107.37	4.2	C	T	0.714	0.286	0.067	0.017
DB_DAS29	DP	SCRI_RS_149618	2H	108	3.4	C	T	0.705	0.295	4.581	1.291
DB_DAS41	DP	SCRI_RS_173017	2H	139.59	3.5	G	A	0.893	0.107	-8.964	2.508
DB_DAS41	DP	SCRI_RS_8420	2H	139.59	3.5	A	G	0.893	0.107	-8.964	2.508

DB_DAS39	DP	12_20591	3H	52.03	4.1	A	C	0.946	0.054	16.373	4.139
DB_DAS13	PSP	12_20591	3H	52.03	4.2	A	C	0.946	0.054	0.119	0.03
DB_DAS28	DP	SCRI_RS_158070	3H	90.23	3.8	T	C	0.737	0.263	-3.896	1.038
DB_DAS41	DP	SCRI_RS_188420	3H	143.9	4.3	G	T	0.947	0.053	-11.779	2.918
DB_DAS42	DP	SCRI_RS_188420	3H	143.9	5	G	T	0.947	0.053	-14.079	3.18
DB_DAS39	DP	SCRI_RS_188420	3H	143.9	3.7	G	T	0.947	0.053	-14.948	4.008
DB_DAS41	DP	SCRI_RS_229623	3H	144.1	5.6	A	C	0.947	0.053	-13.499	2.875
DB_DAS42	DP	SCRI_RS_229623	3H	144.1	6.6	A	C	0.947	0.053	-16.121	3.135
DB_DAS39	DP	SCRI_RS_229623	3H	144.1	5.2	A	C	0.947	0.053	-17.979	3.967
DB_DAS27	DP	12_10981	3H	154.15	6.6	A	C	0.934	0.066	-7.314	1.413
DB_DAS28	DP	12_10981	3H	154.15	6.4	A	C	0.934	0.066	-8.495	1.672
DB_DAS29	DP	12_10981	3H	154.15	7.2	A	C	0.934	0.066	-10.527	1.949
DB_DAS30	DP	12_10981	3H	154.15	7	A	C	0.934	0.066	-12.429	2.335
DB_DAS41	DP	12_10981	3H	154.15	6.4	A	C	0.934	0.066	-12.722	2.516
DB_DAS42	DP	12_10981	3H	154.15	5.8	A	C	0.934	0.066	-13.671	2.84
DB_DAS32	DP	12_10981	3H	154.15	5.7	A	C	0.934	0.066	-14.389	3.037
DB_DAS33	DP	12_10981	3H	154.15	5.4	A	C	0.934	0.066	-15.692	3.398
DB_DAS34	DP	12_10981	3H	154.15	5.8	A	C	0.934	0.066	-17.998	3.746
DB_DAS35	DP	12_10981	3H	154.15	5.8	A	C	0.934	0.066	-18.808	3.905
DB_DAS36	DP	12_10981	3H	154.15	6	A	C	0.934	0.066	-19.85	4.053
DB_DAS38	DP	12_10981	3H	154.15	5.7	A	C	0.934	0.066	-20.639	4.353
DB_DAS40	DP	12_10981	3H	154.15	5.4	A	C	0.934	0.066	-20.744	4.478
DB_DAS37	DP	12_10981	3H	154.15	6.6	A	C	0.934	0.066	-21.023	4.073
DB_DAS39	DP	12_10981	3H	154.15	9.4	A	C	0.934	0.066	-21.689	3.458
DB_DAS13	PSP	12_10981	3H	154.15	4.4	A	C	0.934	0.066	-0.109	0.027
DB_DAS14	PSP	12_10981	3H	154.15	4	A	C	0.934	0.066	-0.133	0.034
DB_DAS15	PSP	12_10981	3H	154.15	4.4	A	C	0.934	0.066	-0.168	0.041
DB_DAS16	PSP	12_10981	3H	154.15	4.1	A	C	0.934	0.066	-0.211	0.053
DB_DAS17	PSP	12_10981	3H	154.15	4.5	A	C	0.934	0.066	-0.29	0.07

DB_DAS18	PSP	12_10981	3H	154.15	4.4	A	C	0.934	0.066	-0.4	0.097
DB_DAS21	PSP	12_10981	3H	154.15	5.3	A	C	0.934	0.066	-0.826	0.182
DB_DAS22	PSP	12_10981	3H	154.15	4.7	A	C	0.934	0.066	-1.125	0.263
DB_DAS23	PSP	12_10981	3H	154.15	5.8	A	C	0.934	0.066	-1.58	0.328
DB_DAS24	PSP	12_10981	3H	154.15	5.3	A	C	0.934	0.066	-1.86	0.409
DB_DAS25	PSP	12_10981	3H	154.15	5	A	C	0.934	0.066	-2.212	0.5
DB_DAS26	PSP	12_10981	3H	154.15	5.1	A	C	0.934	0.066	-2.661	0.598
DB_DAS41	DP	12_10860	4H	39.80	3.9	G	A	0.745	0.255	6.027	1.579
DB_DAS39	DP	11_20765	4H	85.34	3.4	C	A	0.683	0.317	8.041	2.29
DB_DAS27	DP	SCRI_RS_147811	5H	1.32	3.7	A	G	0.865	0.135	-4.809	1.297
DB_DAS28	DP	SCRI_RS_147811	5H	1.32	3.6	A	G	0.865	0.135	-5.692	1.56
DB_DAS29	DP	SCRI_RS_147811	5H	1.32	3.5	A	G	0.865	0.135	-6.656	1.863
DB_DAS38	DP	12_30975	5H	1.60	4.2	C	A	0.743	0.257	10.779	2.706
DB_DAS36	DP	12_30975	5H	1.60	4.2	C	A	0.743	0.257	10.1	2.533
DB_DAS37	DP	12_30975	5H	1.60	3.8	C	A	0.743	0.257	9.804	2.589
DB_DAS35	DP	12_30975	5H	1.60	3.4	C	A	0.743	0.257	8.755	2.456
DB_DAS34	DP	12_30975	5H	1.60	3.6	C	A	0.743	0.257	8.645	2.348
DB_DAS39	DP	12_30975	5H	1.60	3.8	C	A	0.743	0.257	8.59	2.289
DB_DAS27	DP	12_30976	5H	1.60	4.2	G	A	0.847	0.153	-4.466	1.117
DB_DAS28	DP	12_30976	5H	1.60	4	G	A	0.847	0.153	-5.125	1.324
DB_DAS29	DP	12_30976	5H	1.60	4.1	G	A	0.847	0.153	-6.241	1.576
DB_DAS30	DP	12_30976	5H	1.60	3.7	G	A	0.847	0.153	-7.123	1.902
DB_DAS32	DP	12_30976	5H	1.60	3.3	G	A	0.847	0.153	-8.495	2.423
DB_DAS33	DP	12_30976	5H	1.60	3.7	G	A	0.847	0.153	-9.904	2.672
DB_DAS39	DP	12_30976	5H	1.60	3.4	G	A	0.847	0.153	-10.336	2.911
DB_DAS34	DP	12_30976	5H	1.60	4.4	G	A	0.847	0.153	-11.997	2.935
DB_DAS38	DP	12_30976	5H	1.60	3.5	G	A	0.847	0.153	-12.484	3.473
DB_DAS37	DP	12_30976	5H	1.60	4.1	G	A	0.847	0.153	-12.811	3.262
DB_DAS35	DP	12_30976	5H	1.60	4.8	G	A	0.847	0.153	-13.057	3.021

DB_DAS36	DP	12_30976	5H	1.60	4.4	G	A	0.847	0.153	-13.075	3.198
DB_DAS40	DP	12_30976	5H	1.60	4.1	G	A	0.847	0.153	-13.098	3.323
DB_DAS45	DP	11_20980	5H	34.1	5.2	C	G	0.685	0.315	6.939	1.53
DB_DAS42	DP	SCRI_RS_160506	5H	46.46	3.7	G	A	0.549	0.451	5.762	1.549
DB_DAS41	DP	SCRI_RS_160506	5H	46.46	4.5	G	A	0.549	0.451	5.547	1.333
DB_DAS41	DP	SCRI_RS_75826	5H	46.7	4	A	C	0.664	0.336	5.663	1.463
DB_DAS42	DP	SCRI_RS_133042	5H	47.15	3.9	G	A	0.676	0.324	6.791	1.764
DB_DAS41	DP	SCRI_RS_133042	5H	47.15	3.8	G	A	0.676	0.324	5.677	1.512
DB_DAS42	DP	SCRI_RS_156454	5H	113.89	4	T	G	0.9	0.1	-9.804	2.521
DB_DAS41	DP	SCRI_RS_156454	5H	113.89	5.6	T	G	0.9	0.1	-10.086	2.149
DB_DAS40	DP	SCRI_RS_4611	5H	114.77	4.4	T	G	0.782	0.218	15.204	3.716
DB_DAS40	DP	SCRI_RS_153247	5H	114.77	4.4	G	A	0.782	0.218	15.204	3.716
DB_DAS39	DP	SCRI_RS_153247	5H	114.77	3.8	G	A	0.782	0.218	11.758	3.113
DB_DAS39	DP	SCRI_RS_4611	5H	114.77	3.8	T	G	0.782	0.218	11.758	3.113
DB_DAS41	DP	SCRI_RS_207299	5H	161.39	4.7	T	C	0.65	0.35	-5.579	1.301
DB_DAS42	DP	SCRI_RS_207299	5H	161.39	3.9	T	C	0.65	0.35	-5.831	1.529
DB_DAS46	DP	SCRI_RS_145394	5H	163.6	5.6	C	T	0.841	0.159	10.113	2.143
DB_DAS42	DP	SCRI_RS_145394	5H	163.6	3.8	C	T	0.841	0.159	7.462	1.964
DB_DAS41	DP	SCRI_RS_145394	5H	163.6	3.2	C	T	0.841	0.159	5.853	1.704
DB_DAS42	DP	SCRI_RS_153933	5H	163.7	3.6	C	T	0.848	0.152	7.295	1.984
DB_DAS46	RP	SCRI_RS_153933	5H	163.7	5.3	C	T	0.848	0.152	9.934	2.175
DB_DAS27	DP	SCRI_RS_161167	6H	52.50	3.6	A	G	0.671	0.329	-3.816	1.042
DB_DAS28	DP	SCRI_RS_161167	6H	52.50	3.5	A	G	0.671	0.329	-4.456	1.234
DB_DAS29	DP	SCRI_RS_161167	6H	52.50	3.8	A	G	0.671	0.329	-5.573	1.469
DB_DAS30	DP	SCRI_RS_161167	6H	52.50	4.2	A	G	0.671	0.329	-6.865	1.708
DB_DAS32	DP	SCRI_RS_161167	6H	52.50	4.1	A	G	0.671	0.329	-8.518	2.165
DB_DAS33	DP	SCRI_RS_161167	6H	52.50	3.8	A	G	0.671	0.329	-9.186	2.414
DB_DAS39	DP	SCRI_RS_161167	6H	52.50	4.2	A	G	0.671	0.329	-10.39	2.598
DB_DAS34	DP	SCRI_RS_161167	6H	52.50	4	A	G	0.671	0.329	-10.425	2.693

DB_DAS36	DP	SCRI_RS_161167	6H	52.50	3.6	A	G	0.671	0.329	-10.789	2.963
DB_DAS35	DP	SCRI_RS_161167	6H	52.50	3.9	A	G	0.671	0.329	-10.813	2.812
DB_DAS37	DP	SCRI_RS_161167	6H	52.50	3.8	A	G	0.671	0.329	-11.282	2.988
DB_DAS38	DP	SCRI_RS_161167	6H	52.50	3.8	A	G	0.671	0.329	-11.786	3.11
DB_DAS27	DP	SCRI_RS_130605	6H	52.62	3.6	G	A	0.671	0.329	-3.816	1.042
DB_DAS27	DP	SCRI_RS_169728	6H	52.62	3.6	T	C	0.671	0.329	-3.816	1.042
DB_DAS28	DP	SCRI_RS_130605	6H	52.62	3.5	G	A	0.671	0.329	-4.456	1.234
DB_DAS28	DP	SCRI_RS_169728	6H	52.62	3.5	T	C	0.671	0.329	-4.456	1.234
DB_DAS29	DP	SCRI_RS_169728	6H	52.62	3.8	T	C	0.671	0.329	-5.573	1.469
DB_DAS29	DP	SCRI_RS_130605	6H	52.62	3.8	G	A	0.671	0.329	-5.573	1.469
DB_DAS30	DP	SCRI_RS_130605	6H	52.62	4.2	G	A	0.671	0.329	-6.865	1.708
DB_DAS30	DP	SCRI_RS_169728	6H	52.62	4.2	T	C	0.671	0.329	-6.865	1.708
DB_DAS32	DP	SCRI_RS_130605	6H	52.62	4.1	G	A	0.671	0.329	-8.518	2.165
DB_DAS32	DP	SCRI_RS_169728	6H	52.62	4.1	T	C	0.671	0.329	-8.518	2.165
DB_DAS33	DP	SCRI_RS_169728	6H	52.62	3.8	T	C	0.671	0.329	-9.186	2.414
DB_DAS33	DP	SCRI_RS_130605	6H	52.62	3.8	G	A	0.671	0.329	-9.186	2.414
DB_DAS39	DP	SCRI_RS_169728	6H	52.62	4.2	T	C	0.671	0.329	-10.39	2.598
DB_DAS39	DP	SCRI_RS_130605	6H	52.62	4.2	G	A	0.671	0.329	-10.39	2.598
DB_DAS34	DP	SCRI_RS_130605	6H	52.62	4	G	A	0.671	0.329	-10.425	2.693
DB_DAS34	DP	SCRI_RS_169728	6H	52.62	4	T	C	0.671	0.329	-10.425	2.693
DB_DAS36	DP	SCRI_RS_169728	6H	52.62	3.6	T	C	0.671	0.329	-10.789	2.963
DB_DAS36	DP	SCRI_RS_130605	6H	52.62	3.6	G	A	0.671	0.329	-10.789	2.963
DB_DAS35	DP	SCRI_RS_130605	6H	52.62	3.9	G	A	0.671	0.329	-10.813	2.812
DB_DAS35	DP	SCRI_RS_169728	6H	52.62	3.9	T	C	0.671	0.329	-10.813	2.812
DB_DAS37	DP	SCRI_RS_169728	6H	52.62	3.8	T	C	0.671	0.329	-11.282	2.988
DB_DAS37	DP	SCRI_RS_130605	6H	52.62	3.8	G	A	0.671	0.329	-11.282	2.988
DB_DAS38	DP	SCRI_RS_130605	6H	52.62	3.8	G	A	0.671	0.329	-11.786	3.11
DB_DAS38	DP	SCRI_RS_169728	6H	52.62	3.8	T	C	0.671	0.329	-11.786	3.11
DB_DAS29	DP	11_21473	6H	52.76	3.6	A	T	0.685	0.315	-5.367	1.473

DB_DAS30	DP	11_21473	6H	52.76	4.1	A	T	0.685	0.315	-6.77	1.711
DB_DAS32	DP	11_21473	6H	52.76	4	A	T	0.685	0.315	-8.47	2.177
DB_DAS33	DP	11_21473	6H	52.76	3.6	A	T	0.685	0.315	-8.924	2.422
DB_DAS34	DP	11_21473	6H	52.76	3.6	A	T	0.685	0.315	-9.974	2.707
DB_DAS35	DP	11_21473	6H	52.76	3.6	A	T	0.685	0.315	-10.421	2.827
DB_DAS36	DP	11_21473	6H	52.76	3.6	A	T	0.685	0.315	-10.86	2.979
DB_DAS39	DP	11_21473	6H	52.76	4.6	A	T	0.685	0.315	-11.064	2.616
DB_DAS37	DP	11_21473	6H	52.76	3.9	A	T	0.685	0.315	-11.539	3.007
DB_DAS38	DP	11_21473	6H	52.76	4.2	A	T	0.685	0.315	-12.432	3.115
DB_DAS30	DP	SCRI_RS_182195	6H	52.80	3.8	C	A	0.683	0.317	-6.627	1.741
DB_DAS32	DP	SCRI_RS_182195	6H	52.80	3.8	C	A	0.683	0.317	-8.392	2.222
DB_DAS33	DP	SCRI_RS_182195	6H	52.80	3.5	C	A	0.683	0.317	-8.808	2.465
DB_DAS34	DP	SCRI_RS_182195	6H	52.80	3.4	C	A	0.683	0.317	-9.786	2.756
DB_DAS35	DP	SCRI_RS_182195	6H	52.80	3.5	C	A	0.683	0.317	-10.303	2.882
DB_DAS36	DP	SCRI_RS_182195	6H	52.80	3.5	C	A	0.683	0.317	-10.934	3.038
DB_DAS39	DP	SCRI_RS_182195	6H	52.80	4.7	C	A	0.683	0.317	-11.393	2.678
DB_DAS37	DP	SCRI_RS_182195	6H	52.80	3.8	C	A	0.683	0.317	-11.637	3.072
DB_DAS38	DP	SCRI_RS_182195	6H	52.80	4.1	C	A	0.683	0.317	-12.516	3.181
DB_DAS29	DP	12_30441	6H	52.80	3.5	G	A	0.689	0.311	-5.232	1.451
DB_DAS30	DP	12_30441	6H	52.80	3.9	G	A	0.689	0.311	-6.506	1.686
DB_DAS32	DP	12_30441	6H	52.80	3.8	G	A	0.689	0.311	-8.123	2.149
DB_DAS33	DP	12_30441	6H	52.80	3.4	G	A	0.689	0.311	-8.514	2.387
DB_DAS34	DP	12_30441	6H	52.80	3.5	G	A	0.689	0.311	-9.571	2.669
DB_DAS35	DP	12_30441	6H	52.80	3.5	G	A	0.689	0.311	-10.123	2.793
DB_DAS36	DP	12_30441	6H	52.80	3.5	G	A	0.689	0.311	-10.657	2.937
DB_DAS39	DP	12_30441	6H	52.80	4.7	G	A	0.689	0.311	-11.056	2.594
DB_DAS37	DP	12_30441	6H	52.80	3.8	G	A	0.689	0.311	-11.312	2.973
DB_DAS38	DP	12_30441	6H	52.80	4.1	G	A	0.689	0.311	-12.233	3.083
DB_DAS29	DP	SCRI_RS_159136	6H	52.83	3.5	C	T	0.687	0.313	-5.311	1.464

DB_DAS30	DP	SCRI_RS_159136	6H	52.83	4	C	T	0.687	0.313	-6.59	1.7
DB_DAS32	DP	SCRI_RS_159136	6H	52.83	3.8	C	T	0.687	0.313	-8.155	2.162
DB_DAS33	DP	SCRI_RS_159136	6H	52.83	3.5	C	T	0.687	0.313	-8.614	2.406
DB_DAS34	DP	SCRI_RS_159136	6H	52.83	3.5	C	T	0.687	0.313	-9.664	2.689
DB_DAS35	DP	SCRI_RS_159136	6H	52.83	3.5	C	T	0.687	0.313	-10.146	2.808
DB_DAS36	DP	SCRI_RS_159136	6H	52.83	3.5	C	T	0.687	0.313	-10.682	2.955
DB_DAS39	DP	SCRI_RS_159136	6H	52.83	4.6	C	T	0.687	0.313	-10.947	2.6
DB_DAS37	DP	SCRI_RS_159136	6H	52.83	3.8	C	T	0.687	0.313	-11.237	2.986
DB_DAS38	DP	SCRI_RS_159136	6H	52.83	4.1	C	T	0.687	0.313	-12.13	3.095
DB_DAS30	DP	SCRI_RS_136897	6H	52.90	3.8	A	G	0.678	0.322	-6.509	1.718
DB_DAS32	DP	SCRI_RS_136897	6H	52.90	3.7	A	G	0.678	0.322	-8.084	2.187
DB_DAS33	DP	SCRI_RS_136897	6H	52.90	3.4	A	G	0.678	0.322	-8.6	2.432
DB_DAS34	DP	SCRI_RS_136897	6H	52.90	3.4	A	G	0.678	0.322	-9.618	2.722
DB_DAS35	DP	SCRI_RS_136897	6H	52.90	3.4	A	G	0.678	0.322	-10.047	2.844
DB_DAS36	DP	SCRI_RS_136897	6H	52.90	3.4	A	G	0.678	0.322	-10.537	2.994
DB_DAS39	DP	SCRI_RS_136897	6H	52.90	4.4	A	G	0.678	0.322	-10.818	2.634
DB_DAS37	DP	SCRI_RS_136897	6H	52.90	3.6	A	G	0.678	0.322	-11.124	3.027
DB_DAS38	DP	SCRI_RS_136897	6H	52.90	3.9	A	G	0.678	0.322	-11.988	3.138
DB_DAS29	DP	SCRI_RS_170058	6H	53.33	3.6	G	A	0.685	0.315	-5.367	1.473
DB_DAS30	DP	SCRI_RS_170058	6H	53.33	4.1	G	A	0.685	0.315	-6.77	1.711
DB_DAS32	DP	SCRI_RS_170058	6H	53.33	4	G	A	0.685	0.315	-8.47	2.177
DB_DAS33	DP	SCRI_RS_170058	6H	53.33	3.6	G	A	0.685	0.315	-8.924	2.422
DB_DAS34	DP	SCRI_RS_170058	6H	53.33	3.6	G	A	0.685	0.315	-9.974	2.707
DB_DAS35	DP	SCRI_RS_170058	6H	53.33	3.6	G	A	0.685	0.315	-10.421	2.827
DB_DAS36	DP	SCRI_RS_170058	6H	53.33	3.6	G	A	0.685	0.315	-10.86	2.979
DB_DAS39	DP	SCRI_RS_170058	6H	53.33	4.6	G	A	0.685	0.315	-11.064	2.616
DB_DAS37	DP	SCRI_RS_170058	6H	53.33	3.9	G	A	0.685	0.315	-11.539	3.007
DB_DAS38	DP	SCRI_RS_170058	6H	53.33	4.2	G	A	0.685	0.315	-12.432	3.115
DB_DAS41	DP	11_20468	6H	65.93	3.3	G	A	0.676	0.324	-5.514	1.591

DB_DAS39	DP	11_20468	6H	65.93	4.6	G	A	0.676	0.324	-10.109	2.407
DB_DAS14	PSP	11_20468	6H	65.93	3.7	G	A	0.676	0.324	-0.069	0.019
DB_DAS16	PSP	11_20468	6H	65.93	3.7	G	A	0.676	0.324	-0.107	0.029
DB_DAS22	PSP	11_20468	6H	65.93	3.6	G	A	0.676	0.324	-0.574	0.157
DB_DAS23	PSP	11_20468	6H	65.93	4.1	G	A	0.676	0.324	-0.763	0.193
DB_DAS24	PSP	11_20468	6H	65.93	3.6	G	A	0.676	0.324	-0.914	0.248
DB_DAS42	DP	11_11147	6H	78.4	3.4	T	A	0.757	0.243	6.272	1.761
DB_DAS41	DP	SCRI_RS_3070	6H	100.8	3.2	C	T	0.777	0.223	5.544	1.631
DB_DAS41	DP	12_20803	7H	28.98	4.5	A	G	0.919	0.081	-11.009	2.661
DB_DAS27	DP	SCRI_RS_150016	7H	48.30	3.5	C	T	0.805	0.195	-3.233	0.891
DB_DAS27	DP	SCRI_RS_234502	7H	48.30	4.6	C	T	0.764	0.236	-3.692	0.875
DB_DAS28	DP	SCRI_RS_234502	7H	48.30	4.7	C	T	0.764	0.236	-4.433	1.041
DB_DAS29	DP	SCRI_RS_234502	7H	48.30	3.9	C	T	0.764	0.236	-4.748	1.236
DB_DAS30	DP	SCRI_RS_234502	7H	48.30	3.8	C	T	0.764	0.236	-5.519	1.472
DB_DAS32	DP	SCRI_RS_234502	7H	48.30	3.8	C	T	0.764	0.236	-7.075	1.875
DB_DAS33	DP	SCRI_RS_234502	7H	48.30	3.5	C	T	0.764	0.236	-7.482	2.086
DB_DAS27	DP	SCRI_RS_150783	7H	48.73	4.9	G	A	0.762	0.238	-3.848	0.881
DB_DAS28	DP	SCRI_RS_150783	7H	48.73	5	G	A	0.762	0.238	-4.603	1.048
DB_DAS29	DP	SCRI_RS_150783	7H	48.73	4.2	G	A	0.762	0.238	-4.995	1.244
DB_DAS30	DP	SCRI_RS_150783	7H	48.73	4.1	G	A	0.762	0.238	-5.858	1.484
DB_DAS32	DP	SCRI_RS_150783	7H	48.73	3.9	G	A	0.762	0.238	-7.251	1.894
DB_DAS33	DP	SCRI_RS_150783	7H	48.73	3.7	G	A	0.762	0.238	-7.844	2.106
DB_DAS37	DP	SCRI_RS_150783	7H	48.73	3.3	G	A	0.762	0.238	-9.088	2.598
DB_DAS38	DP	SCRI_RS_150783	7H	48.73	3.4	G	A	0.762	0.238	-9.578	2.722
DB_DAS14	PSP	SCRI_RS_150783	7H	48.73	3.9	G	A	0.762	0.238	-0.076	0.02
DB_DAS27	DP	12_30545	7H	48.94	5.1	G	A	0.748	0.252	-3.857	0.862
DB_DAS28	DP	12_30545	7H	48.94	4.9	G	A	0.748	0.252	-4.53	1.032
DB_DAS29	DP	12_30545	7H	48.94	4.3	G	A	0.748	0.252	-4.94	1.223
DB_DAS30	DP	12_30545	7H	48.94	4.1	G	A	0.748	0.252	-5.782	1.457

DB_DAS32	DP	12_30545	7H	48.94	4.2	G	A	0.748	0.252	-7.393	1.855
DB_DAS33	DP	12_30545	7H	48.94	3.8	G	A	0.748	0.252	-7.849	2.063
DB_DAS34	DP	12_30545	7H	48.94	3.5	G	A	0.748	0.252	-8.199	2.286
DB_DAS35	DP	12_30545	7H	48.94	3.6	G	A	0.748	0.252	-8.744	2.393
DB_DAS36	DP	12_30545	7H	48.94	3.5	G	A	0.748	0.252	-8.945	2.498
DB_DAS37	DP	12_30545	7H	48.94	3.7	G	A	0.748	0.252	-9.433	2.537
DB_DAS38	DP	12_30545	7H	48.94	3.8	G	A	0.748	0.252	-10.016	2.657
DB_DAS40	DP	12_30545	7H	48.94	4.1	G	A	0.748	0.252	-10.58	2.669
DB_DAS14	PSP	12_30545	7H	48.94	4.1	G	A	0.748	0.252	-0.077	0.019
DB_DAS15	PSP	12_30545	7H	48.94	3.6	G	A	0.748	0.252	-0.085	0.023
DB_DAS38	DP	SCRI_RS_219291	7H	70.40	5.6	A	G	0.763	0.237	19.806	4.213
DB_DAS37	DP	SCRI_RS_219291	7H	70.40	5.3	A	G	0.763	0.237	18.279	4.02
DB_DAS36	DP	SCRI_RS_219291	7H	70.40	5.1	A	G	0.763	0.237	17.682	3.968
DB_DAS35	DP	SCRI_RS_219291	7H	70.40	4.6	A	G	0.763	0.237	15.989	3.815
DB_DAS39	DP	SCRI_RS_219291	7H	70.40	4.8	A	G	0.763	0.237	15.371	3.567
DB_DAS34	DP	SCRI_RS_219291	7H	70.40	4.4	A	G	0.763	0.237	14.969	3.66
DB_DAS33	DP	SCRI_RS_219291	7H	70.40	4.2	A	G	0.763	0.237	13.238	3.297
DB_DAS32	DP	SCRI_RS_219291	7H	70.40	4.7	A	G	0.763	0.237	12.592	2.954
DB_DAS30	DP	SCRI_RS_219291	7H	70.40	4.5	A	G	0.763	0.237	9.546	2.294
DB_DAS41	DP	SCRI_RS_219291	7H	70.40	3.2	A	G	0.763	0.237	8.556	2.493
DB_DAS29	DP	SCRI_RS_219291	7H	70.40	4.7	A	G	0.763	0.237	8.277	1.93
DB_DAS28	DP	SCRI_RS_219291	7H	70.40	4.2	A	G	0.763	0.237	6.576	1.645
DB_DAS27	DP	SCRI_RS_219291	7H	70.40	4.8	A	G	0.763	0.237	5.92	1.379
DB_DAS25	PSP	SCRI_RS_219291	7H	70.40	3.9	A	G	0.763	0.237	1.784	0.466
DB_DAS24	PSP	SCRI_RS_219291	7H	70.40	4.1	A	G	0.763	0.237	1.513	0.383
DB_DAS23	PSP	SCRI_RS_219291	7H	70.40	3.9	A	G	0.763	0.237	1.165	0.305
DB_DAS22	PSP	SCRI_RS_219291	7H	70.40	3.9	A	G	0.763	0.237	0.938	0.244
DB_DAS16	PSP	SCRI_RS_219291	7H	70.40	4	A	G	0.763	0.237	0.193	0.05
DB_DAS15	PSP	SCRI_RS_219291	7H	70.40	3.9	A	G	0.763	0.237	0.147	0.038

DB_DAS14	PSP	SCRI_RS_219291	7H	70.40	3.7	A	G	0.763	0.237	0.117	0.031
DB_DAS33	CP	SCRI_RS_164251	7H	70.54	4.1	A	G	0.769	0.231	-27.039	6.889
DB_DAS41	DP	12_31227	7H	70.54	3.4	A	C	0.712	0.288	-8.27	2.35
DB_DAS42	DP	12_31227	7H	70.54	3.5	A	C	0.712	0.288	-9.819	2.726
DB_DAS41	DP	SCRI_RS_141164	7H	70.54	3.8	C	A	0.726	0.274	-8.992	2.38
DB_DAS42	DP	SCRI_RS_141164	7H	70.54	4.2	C	A	0.726	0.274	-11.01	2.746
DB_DAS41	DP	SCRI_RS_132879	7H	70.54	3.7	T	C	0.728	0.272	-8.88	2.389
DB_DAS41	DP	12_30486	7H	70.54	3.7	G	A	0.728	0.272	-8.88	2.389
DB_DAS42	DP	12_30486	7H	70.54	4.2	G	A	0.728	0.272	-10.915	2.745
DB_DAS42	DP	SCRI_RS_132879	7H	70.54	4.2	T	C	0.728	0.272	-10.915	2.745
DB_DAS27	DP	SCRI_RS_164251	7H	70.54	4.2	A	G	0.769	0.231	-4.776	1.189
DB_DAS28	DP	SCRI_RS_164251	7H	70.54	3.7	A	G	0.769	0.231	-5.318	1.425
DB_DAS29	DP	SCRI_RS_164251	7H	70.54	3.8	A	G	0.769	0.231	-6.452	1.713
DB_DAS41	DP	SCRI_RS_164251	7H	70.54	4.2	A	G	0.769	0.231	-8.55	2.136
DB_DAS32	DP	SCRI_RS_164251	7H	70.54	4	A	G	0.769	0.231	-9.952	2.566
DB_DAS33	DP	SCRI_RS_164251	7H	70.54	3.9	A	G	0.769	0.231	-10.791	2.821
DB_DAS34	DP	SCRI_RS_164251	7H	70.54	4	A	G	0.769	0.231	-12.159	3.11
DB_DAS39	DP	SCRI_RS_164251	7H	70.54	4.4	A	G	0.769	0.231	-12.95	3.141
DB_DAS35	DP	SCRI_RS_164251	7H	70.54	4.1	A	G	0.769	0.231	-13.006	3.279
DB_DAS36	DP	SCRI_RS_164251	7H	70.54	4.3	A	G	0.769	0.231	-13.897	3.45
DB_DAS37	DP	SCRI_RS_164251	7H	70.54	4.5	A	G	0.769	0.231	-14.695	3.51
DB_DAS38	DP	SCRI_RS_164251	7H	70.54	4.6	A	G	0.769	0.231	-15.483	3.671
DB_DAS38	DP	11_10055	7H	70.54	6	C	G	0.777	0.223	20.293	4.147
DB_DAS38	DP	SCRI_RS_237304	7H	70.54	6	G	A	0.777	0.223	20.293	4.147
DB_DAS38	DP	SCRI_RS_10407	7H	70.54	6	G	A	0.777	0.223	20.293	4.147
DB_DAS38	DP	SCRI_RS_165137	7H	70.54	6	C	A	0.777	0.223	20.293	4.147
DB_DAS38	DP	SCRI_RS_173914	7H	70.54	6	C	T	0.777	0.223	20.293	4.147
DB_DAS37	DP	11_10055	7H	70.54	5.6	C	G	0.777	0.223	18.672	3.966
DB_DAS37	DP	SCRI_RS_10407	7H	70.54	5.6	G	A	0.777	0.223	18.672	3.966

DB_DAS37	DP	SCRI_RS_165137	7H	70.54	5.6	C	A	0.777	0.223	18.672	3.966
DB_DAS37	DP	SCRI_RS_173914	7H	70.54	5.6	C	T	0.777	0.223	18.672	3.966
DB_DAS37	DP	SCRI_RS_237304	7H	70.54	5.6	G	A	0.777	0.223	18.672	3.966
DB_DAS36	DP	11_10055	7H	70.54	5.4	C	G	0.777	0.223	18.066	3.913
DB_DAS36	DP	SCRI_RS_237304	7H	70.54	5.4	G	A	0.777	0.223	18.066	3.913
DB_DAS36	DP	SCRI_RS_10407	7H	70.54	5.4	G	A	0.777	0.223	18.066	3.913
DB_DAS36	DP	SCRI_RS_165137	7H	70.54	5.4	C	A	0.777	0.223	18.066	3.913
DB_DAS36	DP	SCRI_RS_173914	7H	70.54	5.4	C	T	0.777	0.223	18.066	3.913
DB_DAS35	DP	11_10055	7H	70.54	4.8	C	G	0.777	0.223	16.349	3.779
DB_DAS35	DP	SCRI_RS_10407	7H	70.54	4.8	G	A	0.777	0.223	16.349	3.779
DB_DAS35	DP	SCRI_RS_173914	7H	70.54	4.8	C	T	0.777	0.223	16.349	3.779
DB_DAS35	DP	SCRI_RS_165137	7H	70.54	4.8	C	A	0.777	0.223	16.349	3.779
DB_DAS35	DP	SCRI_RS_237304	7H	70.54	4.8	G	A	0.777	0.223	16.349	3.779
DB_DAS39	DP	11_10055	7H	70.54	5.1	C	G	0.777	0.223	15.738	3.512
DB_DAS39	DP	SCRI_RS_237304	7H	70.54	5.1	G	A	0.777	0.223	15.738	3.512
DB_DAS39	DP	SCRI_RS_10407	7H	70.54	5.1	G	A	0.777	0.223	15.738	3.512
DB_DAS39	DP	SCRI_RS_165137	7H	70.54	5.1	C	A	0.777	0.223	15.738	3.512
DB_DAS39	DP	SCRI_RS_173914	7H	70.54	5.1	C	T	0.777	0.223	15.738	3.512
DB_DAS34	DP	11_10055	7H	70.54	4.6	C	G	0.777	0.223	15.265	3.632
DB_DAS34	DP	SCRI_RS_10407	7H	70.54	4.6	G	A	0.777	0.223	15.265	3.632
DB_DAS34	DP	SCRI_RS_173914	7H	70.54	4.6	C	T	0.777	0.223	15.265	3.632
DB_DAS34	DP	SCRI_RS_165137	7H	70.54	4.6	C	A	0.777	0.223	15.265	3.632
DB_DAS34	DP	SCRI_RS_237304	7H	70.54	4.6	G	A	0.777	0.223	15.265	3.632
DB_DAS33	DP	SCRI_RS_165137	7H	70.54	4.4	C	A	0.777	0.223	13.499	3.28
DB_DAS33	DP	SCRI_RS_237304	7H	70.54	4.4	G	A	0.777	0.223	13.499	3.28
DB_DAS33	DP	11_10055	7H	70.54	4.4	C	G	0.777	0.223	13.499	3.28
DB_DAS33	DP	SCRI_RS_10407	7H	70.54	4.4	G	A	0.777	0.223	13.499	3.28
DB_DAS33	DP	SCRI_RS_173914	7H	70.54	4.4	C	T	0.777	0.223	13.499	3.28
DB_DAS32	DP	11_10055	7H	70.54	4.9	C	G	0.777	0.223	12.793	2.933

DB_DAS32	DP	SCRI_RS_10407	7H	70.54	4.9	G	A	0.777	0.223	12.793	2.933
DB_DAS32	DP	SCRI_RS_165137	7H	70.54	4.9	C	A	0.777	0.223	12.793	2.933
DB_DAS32	DP	SCRI_RS_173914	7H	70.54	4.9	C	T	0.777	0.223	12.793	2.933
DB_DAS32	DP	SCRI_RS_237304	7H	70.54	4.9	G	A	0.777	0.223	12.793	2.933
DB_DAS30	DP	11_10055	7H	70.54	4.7	C	G	0.777	0.223	9.734	2.295
DB_DAS30	DP	SCRI_RS_173914	7H	70.54	4.7	C	T	0.777	0.223	9.734	2.295
DB_DAS30	DP	SCRI_RS_10407	7H	70.54	4.7	G	A	0.777	0.223	9.734	2.295
DB_DAS30	DP	SCRI_RS_165137	7H	70.54	4.7	C	A	0.777	0.223	9.734	2.295
DB_DAS30	DP	SCRI_RS_237304	7H	70.54	4.7	G	A	0.777	0.223	9.734	2.295
DB_DAS41	DP	11_10055	7H	70.54	3.4	C	G	0.777	0.223	8.619	2.414
DB_DAS41	DP	SCRI_RS_10407	7H	70.54	3.4	G	A	0.777	0.223	8.619	2.414
DB_DAS41	DP	SCRI_RS_237304	7H	70.54	3.4	G	A	0.777	0.223	8.619	2.414
DB_DAS41	DP	SCRI_RS_165137	7H	70.54	3.4	C	A	0.777	0.223	8.619	2.414
DB_DAS41	DP	SCRI_RS_173914	7H	70.54	3.4	C	T	0.777	0.223	8.619	2.414
DB_DAS29	DP	11_10055	7H	70.54	4.9	C	G	0.777	0.223	8.404	1.928
DB_DAS29	DP	SCRI_RS_237304	7H	70.54	4.9	G	A	0.777	0.223	8.404	1.928
DB_DAS29	DP	SCRI_RS_10407	7H	70.54	4.9	G	A	0.777	0.223	8.404	1.928
DB_DAS29	DP	SCRI_RS_165137	7H	70.54	4.9	C	A	0.777	0.223	8.404	1.928
DB_DAS29	DP	SCRI_RS_173914	7H	70.54	4.9	C	T	0.777	0.223	8.404	1.928
DB_DAS28	DP	SCRI_RS_165137	7H	70.54	4.3	C	A	0.777	0.223	6.672	1.642
DB_DAS28	DP	SCRI_RS_173914	7H	70.54	4.3	C	T	0.777	0.223	6.672	1.642
DB_DAS28	DP	11_10055	7H	70.54	4.3	C	G	0.777	0.223	6.672	1.642
DB_DAS28	DP	SCRI_RS_10407	7H	70.54	4.3	G	A	0.777	0.223	6.672	1.642
DB_DAS28	DP	SCRI_RS_237304	7H	70.54	4.3	G	A	0.777	0.223	6.672	1.642
DB_DAS27	DP	SCRI_RS_10407	7H	70.54	4.9	G	A	0.777	0.223	6.042	1.376
DB_DAS27	DP	SCRI_RS_237304	7H	70.54	4.9	G	A	0.777	0.223	6.042	1.376
DB_DAS27	DP	11_10055	7H	70.54	4.9	C	G	0.777	0.223	6.042	1.376
DB_DAS27	DP	SCRI_RS_165137	7H	70.54	4.9	C	A	0.777	0.223	6.042	1.376
DB_DAS27	DP	SCRI_RS_173914	7H	70.54	4.9	C	T	0.777	0.223	6.042	1.376

DB_DAS27	DP	12_31000	7H	70.54	6.7	C	A	0.918	0.082	-7.243	1.396
DB_DAS28	DP	12_31000	7H	70.54	6.1	C	A	0.918	0.082	-8.222	1.665
DB_DAS29	DP	12_31000	7H	70.54	6.5	C	A	0.918	0.082	-9.986	1.953
DB_DAS30	DP	12_31000	7H	70.54	6	C	A	0.918	0.082	-11.526	2.351
DB_DAS41	DP	12_31000	7H	70.54	8.1	C	A	0.918	0.082	-13.573	2.354
DB_DAS32	DP	12_31000	7H	70.54	6	C	A	0.918	0.082	-14.757	3.022
DB_DAS42	DP	12_31000	7H	70.54	8	C	A	0.918	0.082	-15.273	2.664
DB_DAS33	DP	12_31000	7H	70.54	5.7	C	A	0.918	0.082	-15.969	3.365
DB_DAS34	DP	12_31000	7H	70.54	5.8	C	A	0.918	0.082	-17.887	3.718
DB_DAS35	DP	12_31000	7H	70.54	6.4	C	A	0.918	0.082	-19.501	3.835
DB_DAS39	DP	12_31000	7H	70.54	8.3	C	A	0.918	0.082	-20.337	3.472
DB_DAS40	DP	12_31000	7H	70.54	5.6	C	A	0.918	0.082	-20.915	4.424
DB_DAS36	DP	12_31000	7H	70.54	6.9	C	A	0.918	0.082	-21.138	3.992
DB_DAS37	DP	12_31000	7H	70.54	7.4	C	A	0.918	0.082	-22.131	4.024
DB_DAS38	DP	12_31000	7H	70.54	7.6	C	A	0.918	0.082	-23.522	4.223
DB_DAS27	DP	12_11536	7H	70.54	6.7	G	A	0.919	0.081	-7.29	1.397
DB_DAS28	DP	12_11536	7H	70.54	6.2	G	A	0.919	0.081	-8.265	1.664
DB_DAS29	DP	12_11536	7H	70.54	6.6	G	A	0.919	0.081	-10.037	1.952
DB_DAS30	DP	12_11536	7H	70.54	6.1	G	A	0.919	0.081	-11.628	2.355
DB_DAS41	DP	12_11536	7H	70.54	8.2	G	A	0.919	0.081	-13.602	2.342
DB_DAS32	DP	12_11536	7H	70.54	6.1	G	A	0.919	0.081	-14.829	3.014
DB_DAS42	DP	12_11536	7H	70.54	8.1	G	A	0.919	0.081	-15.312	2.649
DB_DAS33	DP	12_11536	7H	70.54	5.8	G	A	0.919	0.081	-16.099	3.362
DB_DAS34	DP	12_11536	7H	70.54	5.9	G	A	0.919	0.081	-18.001	3.712
DB_DAS35	DP	12_11536	7H	70.54	6.5	G	A	0.919	0.081	-19.62	3.831
DB_DAS39	DP	12_11536	7H	70.54	8.4	G	A	0.919	0.081	-20.335	3.457
DB_DAS40	DP	12_11536	7H	70.54	5.5	G	A	0.919	0.081	-20.756	4.434
DB_DAS36	DP	12_11536	7H	70.54	7	G	A	0.919	0.081	-21.197	3.979
DB_DAS37	DP	12_11536	7H	70.54	7.5	G	A	0.919	0.081	-22.192	4.009

DB_DAS38	DP	12_11536	7H	70.54	7.7	G	A	0.919	0.081	-23.635	4.211
DB_DAS16	PSP	SCRI_RS_164251	7H	70.54	4.2	A	G	0.769	0.231	-0.169	0.043
DB_DAS23	PSP	SCRI_RS_164251	7H	70.54	3.6	A	G	0.769	0.231	-1.01	0.276
DB_DAS24	PSP	SCRI_RS_164251	7H	70.54	4.1	A	G	0.769	0.231	-1.342	0.341
DB_DAS25	PSP	SCRI_RS_164251	7H	70.54	4.1	A	G	0.769	0.231	-1.621	0.412
DB_DAS25	PSP	11_10055	7H	70.54	4	C	G	0.777	0.223	1.797	0.465
DB_DAS25	PSP	SCRI_RS_165137	7H	70.54	4	C	A	0.777	0.223	1.797	0.465
DB_DAS25	PSP	SCRI_RS_173914	7H	70.54	4	C	T	0.777	0.223	1.797	0.465
DB_DAS25	PSP	SCRI_RS_10407	7H	70.54	4	G	A	0.777	0.223	1.797	0.465
DB_DAS25	PSP	SCRI_RS_237304	7H	70.54	4	G	A	0.777	0.223	1.797	0.465
DB_DAS24	PSP	11_10055	7H	70.54	4.2	C	G	0.777	0.223	1.518	0.381
DB_DAS24	PSP	SCRI_RS_165137	7H	70.54	4.2	C	A	0.777	0.223	1.518	0.381
DB_DAS24	PSP	SCRI_RS_237304	7H	70.54	4.2	G	A	0.777	0.223	1.518	0.381
DB_DAS24	PSP	SCRI_RS_10407	7H	70.54	4.2	G	A	0.777	0.223	1.518	0.381
DB_DAS24	PSP	SCRI_RS_173914	7H	70.54	4.2	C	T	0.777	0.223	1.518	0.381
DB_DAS23	PSP	SCRI_RS_173914	7H	70.54	3.9	C	T	0.777	0.223	1.166	0.305
DB_DAS23	PSP	11_10055	7H	70.54	3.9	C	G	0.777	0.223	1.166	0.305
DB_DAS23	PSP	SCRI_RS_10407	7H	70.54	3.9	G	A	0.777	0.223	1.166	0.305
DB_DAS23	PSP	SCRI_RS_165137	7H	70.54	3.9	C	A	0.777	0.223	1.166	0.305
DB_DAS23	PSP	SCRI_RS_237304	7H	70.54	3.9	G	A	0.777	0.223	1.166	0.305
DB_DAS22	PSP	SCRI_RS_237304	7H	70.54	3.9	G	A	0.777	0.223	0.933	0.244
DB_DAS22	PSP	11_10055	7H	70.54	3.9	C	G	0.777	0.223	0.933	0.244
DB_DAS22	PSP	SCRI_RS_10407	7H	70.54	3.9	G	A	0.777	0.223	0.933	0.244
DB_DAS22	PSP	SCRI_RS_165137	7H	70.54	3.9	C	A	0.777	0.223	0.933	0.244
DB_DAS22	PSP	SCRI_RS_173914	7H	70.54	3.9	C	T	0.777	0.223	0.933	0.244
DB_DAS16	PSP	11_10055	7H	70.54	3.9	C	G	0.777	0.223	0.19	0.049
DB_DAS16	PSP	SCRI_RS_10407	7H	70.54	3.9	G	A	0.777	0.223	0.19	0.049
DB_DAS16	PSP	SCRI_RS_173914	7H	70.54	3.9	C	T	0.777	0.223	0.19	0.049
DB_DAS16	PSP	SCRI_RS_237304	7H	70.54	3.9	G	A	0.777	0.223	0.19	0.049

DB_DAS16	PSP	SCRI_RS_165137	7H	70.54	3.9	C	A	0.777	0.223	0.19	0.049
DB_DAS15	PSP	SCRI_RS_165137	7H	70.54	4	C	A	0.777	0.223	0.146	0.038
DB_DAS15	PSP	SCRI_RS_237304	7H	70.54	4	G	A	0.777	0.223	0.146	0.038
DB_DAS15	PSP	11_10055	7H	70.54	4	C	G	0.777	0.223	0.146	0.038
DB_DAS15	PSP	SCRI_RS_10407	7H	70.54	4	G	A	0.777	0.223	0.146	0.038
DB_DAS15	PSP	SCRI_RS_173914	7H	70.54	4	C	T	0.777	0.223	0.146	0.038
DB_DAS14	PSP	SCRI_RS_10407	7H	70.54	3.7	G	A	0.777	0.223	0.115	0.031
DB_DAS14	PSP	SCRI_RS_173914	7H	70.54	3.7	C	T	0.777	0.223	0.115	0.031
DB_DAS14	PSP	SCRI_RS_237304	7H	70.54	3.7	G	A	0.777	0.223	0.115	0.031
DB_DAS14	PSP	11_10055	7H	70.54	3.7	C	G	0.777	0.223	0.115	0.031
DB_DAS14	PSP	SCRI_RS_165137	7H	70.54	3.7	C	A	0.777	0.223	0.115	0.031
DB_DAS13	PSP	12_31000	7H	70.54	4.5	C	A	0.918	0.082	-0.109	0.026
DB_DAS14	PSP	12_31000	7H	70.54	5.1	C	A	0.918	0.082	-0.149	0.033
DB_DAS15	PSP	12_31000	7H	70.54	5.4	C	A	0.918	0.082	-0.186	0.04
DB_DAS16	PSP	12_31000	7H	70.54	5.8	C	A	0.918	0.082	-0.254	0.053
DB_DAS17	PSP	12_31000	7H	70.54	5.1	C	A	0.918	0.082	-0.306	0.069
DB_DAS18	PSP	12_31000	7H	70.54	4.6	C	A	0.918	0.082	-0.406	0.096
DB_DAS19	PSP	12_31000	7H	70.54	4.7	C	A	0.918	0.082	-0.509	0.119
DB_DAS21	PSP	12_31000	7H	70.54	5.1	C	A	0.918	0.082	-0.809	0.181
DB_DAS22	PSP	12_31000	7H	70.54	5.4	C	A	0.918	0.082	-1.196	0.261
DB_DAS23	PSP	12_31000	7H	70.54	5.6	C	A	0.918	0.082	-1.539	0.326
DB_DAS24	PSP	12_31000	7H	70.54	6.1	C	A	0.918	0.082	-1.982	0.403
DB_DAS25	PSP	12_31000	7H	70.54	5.8	C	A	0.918	0.082	-2.372	0.492
DB_DAS26	PSP	12_31000	7H	70.54	5.2	C	A	0.918	0.082	-2.69	0.593
DB_DAS13	PSP	12_11536	7H	70.54	4.6	G	A	0.919	0.081	-0.11	0.026
DB_DAS14	PSP	12_11536	7H	70.54	5.2	G	A	0.919	0.081	-0.149	0.033
DB_DAS15	PSP	12_11536	7H	70.54	5.5	G	A	0.919	0.081	-0.186	0.04
DB_DAS16	PSP	12_11536	7H	70.54	5.9	G	A	0.919	0.081	-0.255	0.053
DB_DAS17	PSP	12_11536	7H	70.54	5.1	G	A	0.919	0.081	-0.306	0.068

DB_DAS18	PSP	12_11536	7H	70.54	4.7	G	A	0.919	0.081	-0.407	0.096
DB_DAS19	PSP	12_11536	7H	70.54	4.8	G	A	0.919	0.081	-0.511	0.119
DB_DAS21	PSP	12_11536	7H	70.54	5.1	G	A	0.919	0.081	-0.81	0.181
DB_DAS22	PSP	12_11536	7H	70.54	5.4	G	A	0.919	0.081	-1.201	0.259
DB_DAS23	PSP	12_11536	7H	70.54	5.7	G	A	0.919	0.081	-1.544	0.325
DB_DAS24	PSP	12_11536	7H	70.54	6.2	G	A	0.919	0.081	-1.99	0.401
DB_DAS25	PSP	12_11536	7H	70.54	5.9	G	A	0.919	0.081	-2.374	0.49
DB_DAS26	PSP	12_11536	7H	70.54	5.3	G	A	0.919	0.081	-2.701	0.59
DB_DAS41	DP	SCRI_RS_66459	7H	70.57	3.4	C	T	0.712	0.288	-8.27	2.35
DB_DAS42	DP	SCRI_RS_66459	7H	70.57	3.5	C	T	0.712	0.288	-9.819	2.726
DB_DAS33	CP	12_30794	7H	70.61	4.2	A	G	0.764	0.236	-27.316	6.846
DB_DAS33	CP	SCRI_RS_135346	7H	70.61	4.2	T	C	0.764	0.236	-27.316	6.846
DB_DAS33	CP	11_10924	7H	70.61	4.1	G	A	0.769	0.231	-27.039	6.889
DB_DAS41	DP	SCRI_RS_177060	7H	70.61	3.8	G	A	0.726	0.274	-8.992	2.38
DB_DAS42	DP	SCRI_RS_177060	7H	70.61	4.2	G	A	0.726	0.274	-11.01	2.746
DB_DAS41	DP	SCRI_RS_228070	7H	70.61	3.7	T	C	0.728	0.272	-8.88	2.389
DB_DAS41	DP	SCRI_RS_237881	7H	70.61	3.7	C	T	0.728	0.272	-8.88	2.389
DB_DAS41	DP	SCRI_RS_134797	7H	70.61	3.7	G	A	0.728	0.272	-8.88	2.389
DB_DAS42	DP	SCRI_RS_228070	7H	70.61	4.2	T	C	0.728	0.272	-10.915	2.745
DB_DAS42	DP	SCRI_RS_237881	7H	70.61	4.2	C	T	0.728	0.272	-10.915	2.745
DB_DAS42	DP	SCRI_RS_134797	7H	70.61	4.2	G	A	0.728	0.272	-10.915	2.745
DB_DAS38	DP	12_30004	7H	70.61	6.8	G	A	0.759	0.241	21.186	4.057
DB_DAS37	DP	12_30004	7H	70.61	6.3	G	A	0.759	0.241	19.415	3.863
DB_DAS36	DP	12_30004	7H	70.61	6.1	G	A	0.759	0.241	18.917	3.834
DB_DAS39	DP	12_30004	7H	70.61	6.8	G	A	0.759	0.241	17.707	3.39
DB_DAS35	DP	12_30004	7H	70.61	5.2	G	A	0.759	0.241	16.793	3.72
DB_DAS34	DP	12_30004	7H	70.61	5.1	G	A	0.759	0.241	16.034	3.584
DB_DAS33	DP	12_30004	7H	70.61	5	G	A	0.759	0.241	14.222	3.234
DB_DAS32	DP	12_30004	7H	70.61	5.6	G	A	0.759	0.241	13.45	2.871

DB_DAS30	DP	12_30004	7H	70.61	5.1	G	A	0.759	0.241	10.063	2.259
DB_DAS29	DP	12_30004	7H	70.61	5	G	A	0.759	0.241	8.434	1.913
DB_DAS28	DP	12_30004	7H	70.61	4.6	G	A	0.759	0.241	6.861	1.633
DB_DAS27	DP	12_30004	7H	70.61	5.3	G	A	0.759	0.241	6.243	1.369
DB_DAS27	DP	SCRI_RS_135346	7H	70.61	4.2	T	C	0.764	0.236	-4.687	1.175
DB_DAS27	DP	12_30794	7H	70.61	4.2	A	G	0.764	0.236	-4.687	1.175
DB_DAS28	DP	12_30794	7H	70.61	3.7	A	G	0.764	0.236	-5.288	1.414
DB_DAS28	DP	SCRI_RS_135346	7H	70.61	3.7	T	C	0.764	0.236	-5.288	1.414
DB_DAS29	DP	SCRI_RS_135346	7H	70.61	3.8	T	C	0.764	0.236	-6.409	1.699
DB_DAS29	DP	12_30794	7H	70.61	3.8	A	G	0.764	0.236	-6.409	1.699
DB_DAS41	DP	SCRI_RS_135346	7H	70.61	3.7	T	C	0.764	0.236	-7.873	2.104
DB_DAS41	DP	12_30794	7H	70.61	3.7	A	G	0.764	0.236	-7.873	2.104
DB_DAS32	DP	12_30794	7H	70.61	3.9	A	G	0.764	0.236	-9.752	2.537
DB_DAS32	DP	SCRI_RS_135346	7H	70.61	3.9	T	C	0.764	0.236	-9.752	2.537
DB_DAS33	DP	12_30794	7H	70.61	3.9	A	G	0.764	0.236	-10.662	2.794
DB_DAS33	DP	SCRI_RS_135346	7H	70.61	3.9	T	C	0.764	0.236	-10.662	2.794
DB_DAS34	DP	12_30794	7H	70.61	4	A	G	0.764	0.236	-12.062	3.084
DB_DAS34	DP	SCRI_RS_135346	7H	70.61	4	T	C	0.764	0.236	-12.062	3.084
DB_DAS39	DP	SCRI_RS_135346	7H	70.61	4.3	T	C	0.764	0.236	-12.533	3.102
DB_DAS39	DP	12_30794	7H	70.61	4.3	A	G	0.764	0.236	-12.533	3.102
DB_DAS35	DP	SCRI_RS_135346	7H	70.61	4.1	T	C	0.764	0.236	-12.829	3.248
DB_DAS35	DP	12_30794	7H	70.61	4.1	A	G	0.764	0.236	-12.829	3.248
DB_DAS36	DP	SCRI_RS_135346	7H	70.61	4.2	T	C	0.764	0.236	-13.627	3.413
DB_DAS36	DP	12_30794	7H	70.61	4.2	A	G	0.764	0.236	-13.627	3.413
DB_DAS37	DP	SCRI_RS_135346	7H	70.61	4.4	T	C	0.764	0.236	-14.327	3.471
DB_DAS37	DP	12_30794	7H	70.61	4.4	A	G	0.764	0.236	-14.327	3.471
DB_DAS38	DP	12_30794	7H	70.61	4.5	A	G	0.764	0.236	-15.087	3.635
DB_DAS38	DP	SCRI_RS_135346	7H	70.61	4.5	T	C	0.764	0.236	-15.087	3.635
DB_DAS27	DP	11_10924	7H	70.61	4.2	G	A	0.769	0.231	-4.776	1.189

DB_DAS28	DP	11_10924	7H	70.61	3.7	G	A	0.769	0.231	-5.318	1.425
DB_DAS29	DP	11_10924	7H	70.61	3.8	G	A	0.769	0.231	-6.452	1.713
DB_DAS41	DP	11_10924	7H	70.61	4.2	G	A	0.769	0.231	-8.55	2.136
DB_DAS32	DP	11_10924	7H	70.61	4	G	A	0.769	0.231	-9.952	2.566
DB_DAS33	DP	11_10924	7H	70.61	3.9	G	A	0.769	0.231	-10.791	2.821
DB_DAS34	DP	11_10924	7H	70.61	4	G	A	0.769	0.231	-12.159	3.11
DB_DAS39	DP	11_10924	7H	70.61	4.4	G	A	0.769	0.231	-12.95	3.141
DB_DAS35	DP	11_10924	7H	70.61	4.1	G	A	0.769	0.231	-13.006	3.279
DB_DAS36	DP	11_10924	7H	70.61	4.3	G	A	0.769	0.231	-13.897	3.45
DB_DAS37	DP	11_10924	7H	70.61	4.5	G	A	0.769	0.231	-14.695	3.51
DB_DAS38	DP	11_10924	7H	70.61	4.6	G	A	0.769	0.231	-15.483	3.671
DB_DAS38	DP	SCRI_RS_154541	7H	70.61	5.7	T	C	0.772	0.228	19.917	4.173
DB_DAS38	DP	SCRI_RS_219749	7H	70.61	5.7	C	T	0.772	0.228	19.917	4.173
DB_DAS37	DP	SCRI_RS_154541	7H	70.61	5.4	T	C	0.772	0.228	18.316	3.989
DB_DAS37	DP	SCRI_RS_219749	7H	70.61	5.4	C	T	0.772	0.228	18.316	3.989
DB_DAS36	DP	SCRI_RS_154541	7H	70.61	5.2	T	C	0.772	0.228	17.725	3.936
DB_DAS36	DP	SCRI_RS_219749	7H	70.61	5.2	C	T	0.772	0.228	17.725	3.936
DB_DAS35	DP	SCRI_RS_219749	7H	70.61	4.6	C	T	0.772	0.228	16.008	3.802
DB_DAS35	DP	SCRI_RS_154541	7H	70.61	4.6	T	C	0.772	0.228	16.008	3.802
DB_DAS39	DP	SCRI_RS_154541	7H	70.61	4.9	T	C	0.772	0.228	15.441	3.53
DB_DAS39	DP	SCRI_RS_219749	7H	70.61	4.9	C	T	0.772	0.228	15.441	3.53
DB_DAS34	DP	SCRI_RS_219749	7H	70.61	4.4	C	T	0.772	0.228	15.021	3.658
DB_DAS34	DP	SCRI_RS_154541	7H	70.61	4.4	T	C	0.772	0.228	15.021	3.658
DB_DAS33	DP	SCRI_RS_219749	7H	70.61	4.2	C	T	0.772	0.228	13.249	3.304
DB_DAS33	DP	SCRI_RS_154541	7H	70.61	4.2	T	C	0.772	0.228	13.249	3.304
DB_DAS32	DP	SCRI_RS_219749	7H	70.61	4.7	C	T	0.772	0.228	12.565	2.95
DB_DAS32	DP	SCRI_RS_154541	7H	70.61	4.7	T	C	0.772	0.228	12.565	2.95
DB_DAS30	DP	SCRI_RS_219749	7H	70.61	4.5	C	T	0.772	0.228	9.564	2.31
DB_DAS30	DP	SCRI_RS_154541	7H	70.61	4.5	T	C	0.772	0.228	9.564	2.31

DB_DAS41	DP	SCRI_RS_154541	7H	70.61	3.3	T	C	0.772	0.228	8.427	2.423
DB_DAS41	DP	SCRI_RS_219749	7H	70.61	3.3	C	T	0.772	0.228	8.427	2.423
DB_DAS29	DP	SCRI_RS_154541	7H	70.61	4.7	T	C	0.772	0.228	8.228	1.936
DB_DAS29	DP	SCRI_RS_219749	7H	70.61	4.7	C	T	0.772	0.228	8.228	1.936
DB_DAS28	DP	SCRI_RS_219749	7H	70.61	4.1	C	T	0.772	0.228	6.536	1.652
DB_DAS28	DP	SCRI_RS_154541	7H	70.61	4.1	T	C	0.772	0.228	6.536	1.652
DB_DAS27	DP	SCRI_RS_154541	7H	70.61	4.7	T	C	0.772	0.228	5.901	1.38
DB_DAS27	DP	SCRI_RS_219749	7H	70.61	4.7	C	T	0.772	0.228	5.901	1.38
DB_DAS38	DP	SCRI_RS_102957	7H	70.61	5.9	C	T	0.776	0.224	20.119	4.148
DB_DAS37	DP	SCRI_RS_102957	7H	70.61	5.5	C	T	0.776	0.224	18.518	3.968
DB_DAS36	DP	SCRI_RS_102957	7H	70.61	5.3	C	T	0.776	0.224	17.885	3.911
DB_DAS35	DP	SCRI_RS_102957	7H	70.61	4.7	C	T	0.776	0.224	16.193	3.778
DB_DAS39	DP	SCRI_RS_102957	7H	70.61	5.1	C	T	0.776	0.224	15.617	3.512
DB_DAS34	DP	SCRI_RS_102957	7H	70.61	4.5	C	T	0.776	0.224	15.156	3.635
DB_DAS33	DP	SCRI_RS_102957	7H	70.61	4.3	C	T	0.776	0.224	13.363	3.277
DB_DAS32	DP	SCRI_RS_102957	7H	70.61	4.8	C	T	0.776	0.224	12.661	2.929
DB_DAS30	DP	SCRI_RS_102957	7H	70.61	4.6	C	T	0.776	0.224	9.666	2.294
DB_DAS41	DP	SCRI_RS_102957	7H	70.61	3.4	C	T	0.776	0.224	8.474	2.403
DB_DAS29	DP	SCRI_RS_102957	7H	70.61	4.8	C	T	0.776	0.224	8.319	1.924
DB_DAS28	DP	SCRI_RS_102957	7H	70.61	4.3	C	T	0.776	0.224	6.6	1.638
DB_DAS27	DP	SCRI_RS_102957	7H	70.61	4.9	C	T	0.776	0.224	5.97	1.371
DB_DAS38	DP	12_30563	7H	70.61	6	C	A	0.777	0.223	20.293	4.147
DB_DAS37	DP	12_30563	7H	70.61	5.6	C	A	0.777	0.223	18.672	3.966
DB_DAS36	DP	12_30563	7H	70.61	5.4	C	A	0.777	0.223	18.066	3.913
DB_DAS35	DP	12_30563	7H	70.61	4.8	C	A	0.777	0.223	16.349	3.779
DB_DAS39	DP	12_30563	7H	70.61	5.1	C	A	0.777	0.223	15.738	3.512
DB_DAS34	DP	12_30563	7H	70.61	4.6	C	A	0.777	0.223	15.265	3.632
DB_DAS33	DP	12_30563	7H	70.61	4.4	C	A	0.777	0.223	13.499	3.28
DB_DAS32	DP	12_30563	7H	70.61	4.9	C	A	0.777	0.223	12.793	2.933

DB_DAS30	DP	12_30563	7H	70.61	4.7	C	A	0.777	0.223	9.734	2.295
DB_DAS41	DP	12_30563	7H	70.61	3.4	C	A	0.777	0.223	8.619	2.414
DB_DAS29	DP	12_30563	7H	70.61	4.9	C	A	0.777	0.223	8.404	1.928
DB_DAS28	DP	12_30563	7H	70.61	4.3	C	A	0.777	0.223	6.672	1.642
DB_DAS27	DP	12_30563	7H	70.61	4.9	C	A	0.777	0.223	6.042	1.376
DB_DAS26	PSP	12_30004	7H	70.61	4.3	G	A	0.759	0.241	2.304	0.566
DB_DAS25	PSP	12_30004	7H	70.61	4.9	G	A	0.759	0.241	2.047	0.469
DB_DAS24	PSP	12_30004	7H	70.61	5	G	A	0.759	0.241	1.703	0.385
DB_DAS23	PSP	12_30004	7H	70.61	4.9	G	A	0.759	0.241	1.352	0.311
DB_DAS22	PSP	12_30004	7H	70.61	4.7	G	A	0.759	0.241	1.066	0.248
DB_DAS21	PSP	12_30004	7H	70.61	4.4	G	A	0.759	0.241	0.725	0.175
DB_DAS19	PSP	12_30004	7H	70.61	4.3	G	A	0.759	0.241	0.465	0.115
DB_DAS17	PSP	12_30004	7H	70.61	4.4	G	A	0.759	0.241	0.27	0.066
DB_DAS16	PSP	12_30004	7H	70.61	3.9	G	A	0.759	0.241	0.195	0.05
DB_DAS15	PSP	12_30004	7H	70.61	4.9	G	A	0.759	0.241	0.17	0.039
DB_DAS14	PSP	12_30004	7H	70.61	5	G	A	0.759	0.241	0.138	0.031
DB_DAS13	PSP	12_30004	7H	70.61	5	G	A	0.759	0.241	0.11	0.025
DB_DAS16	PSP	12_30794	7H	70.61	4.1	A	G	0.764	0.236	-0.166	0.042
DB_DAS16	PSP	SCRI_RS_135346	7H	70.61	4.1	T	C	0.764	0.236	-0.166	0.042
DB_DAS23	PSP	12_30794	7H	70.61	3.5	A	G	0.764	0.236	-0.985	0.273
DB_DAS23	PSP	SCRI_RS_135346	7H	70.61	3.5	T	C	0.764	0.236	-0.985	0.273
DB_DAS24	PSP	SCRI_RS_135346	7H	70.61	4	T	C	0.764	0.236	-1.312	0.337
DB_DAS24	PSP	12_30794	7H	70.61	4	A	G	0.764	0.236	-1.312	0.337
DB_DAS25	PSP	12_30794	7H	70.61	4	A	G	0.764	0.236	-1.584	0.408
DB_DAS25	PSP	SCRI_RS_135346	7H	70.61	4	T	C	0.764	0.236	-1.584	0.408
DB_DAS16	PSP	11_10924	7H	70.61	4.2	G	A	0.769	0.231	-0.169	0.043
DB_DAS23	PSP	11_10924	7H	70.61	3.6	G	A	0.769	0.231	-1.01	0.276
DB_DAS24	PSP	11_10924	7H	70.61	4.1	G	A	0.769	0.231	-1.342	0.341
DB_DAS25	PSP	11_10924	7H	70.61	4.1	G	A	0.769	0.231	-1.621	0.412

DB_DAS25	PSP	SCRI_RS_154541	7H	70.61	3.9	T	C	0.772	0.228	1.775	0.466
DB_DAS25	PSP	SCRI_RS_219749	7H	70.61	3.9	C	T	0.772	0.228	1.775	0.466
DB_DAS24	PSP	SCRI_RS_219749	7H	70.61	4.1	C	T	0.772	0.228	1.503	0.382
DB_DAS24	PSP	SCRI_RS_154541	7H	70.61	4.1	T	C	0.772	0.228	1.503	0.382
DB_DAS23	PSP	SCRI_RS_154541	7H	70.61	3.8	T	C	0.772	0.228	1.152	0.306
DB_DAS23	PSP	SCRI_RS_219749	7H	70.61	3.8	C	T	0.772	0.228	1.152	0.306
DB_DAS22	PSP	SCRI_RS_219749	7H	70.61	3.8	C	T	0.772	0.228	0.924	0.245
DB_DAS22	PSP	SCRI_RS_154541	7H	70.61	3.8	T	C	0.772	0.228	0.924	0.245
DB_DAS16	PSP	SCRI_RS_154541	7H	70.61	3.9	T	C	0.772	0.228	0.189	0.049
DB_DAS16	PSP	SCRI_RS_219749	7H	70.61	3.9	C	T	0.772	0.228	0.189	0.049
DB_DAS15	PSP	SCRI_RS_219749	7H	70.61	3.9	C	T	0.772	0.228	0.145	0.038
DB_DAS15	PSP	SCRI_RS_154541	7H	70.61	3.9	T	C	0.772	0.228	0.145	0.038
DB_DAS14	PSP	SCRI_RS_219749	7H	70.61	3.7	C	T	0.772	0.228	0.115	0.031
DB_DAS14	PSP	SCRI_RS_154541	7H	70.61	3.7	T	C	0.772	0.228	0.115	0.031
DB_DAS25	PSP	SCRI_RS_102957	7H	70.61	3.9	C	T	0.776	0.224	1.785	0.465
DB_DAS24	PSP	SCRI_RS_102957	7H	70.61	4.1	C	T	0.776	0.224	1.51	0.382
DB_DAS23	PSP	SCRI_RS_102957	7H	70.61	3.8	C	T	0.776	0.224	1.16	0.305
DB_DAS22	PSP	SCRI_RS_102957	7H	70.61	3.8	C	T	0.776	0.224	0.929	0.244
DB_DAS16	PSP	SCRI_RS_102957	7H	70.61	3.9	C	T	0.776	0.224	0.189	0.049
DB_DAS15	PSP	SCRI_RS_102957	7H	70.61	3.9	C	T	0.776	0.224	0.145	0.038
DB_DAS14	PSP	SCRI_RS_102957	7H	70.61	3.6	C	T	0.776	0.224	0.114	0.031
DB_DAS25	PSP	12_30563	7H	70.61	4	C	A	0.777	0.223	1.797	0.465
DB_DAS24	PSP	12_30563	7H	70.61	4.2	C	A	0.777	0.223	1.518	0.381
DB_DAS23	PSP	12_30563	7H	70.61	3.9	C	A	0.777	0.223	1.166	0.305
DB_DAS22	PSP	12_30563	7H	70.61	3.9	C	A	0.777	0.223	0.933	0.244
DB_DAS16	PSP	12_30563	7H	70.61	3.9	C	A	0.777	0.223	0.19	0.049
DB_DAS15	PSP	12_30563	7H	70.61	4	C	A	0.777	0.223	0.146	0.038
DB_DAS14	PSP	12_30563	7H	70.61	3.7	C	A	0.777	0.223	0.115	0.031
DB_DAS41	DP	SCRI_RS_13927	7H	70.68	3.7	A	C	0.723	0.277	-8.869	2.377

DB_DAS42	DP	SCRI_RS_13927	7H	70.68	4.2	A	C	0.723	0.277	-10.938	2.743
DB_DAS41	DP	SCRI_RS_188905	7H	70.68	3.8	C	T	0.724	0.276	-8.973	2.385
DB_DAS41	DP	SCRI_RS_115208	7H	70.68	3.8	G	A	0.724	0.276	-8.973	2.385
DB_DAS42	DP	SCRI_RS_115208	7H	70.68	4.2	G	A	0.724	0.276	-10.975	2.75
DB_DAS42	DP	SCRI_RS_188905	7H	70.68	4.2	C	T	0.724	0.276	-10.975	2.75
DB_DAS41	DP	12_30053	7H	70.68	3.7	G	A	0.728	0.272	-8.88	2.389
DB_DAS42	DP	12_30053	7H	70.68	4.2	G	A	0.728	0.272	-10.915	2.745
DB_DAS41	DP	11_10394	7H	70.68	3.2	G	C	0.732	0.268	-7.578	2.204
DB_DAS42	DP	11_10394	7H	70.68	3.9	G	C	0.732	0.268	-9.741	2.537
DB_DAS41	DP	SCRI_RS_148407	7H	70.70	3.8	T	C	0.726	0.274	-8.992	2.38
DB_DAS42	DP	SCRI_RS_148407	7H	70.7	4.2	T	C	0.726	0.274	-11.01	2.746
DB_DAS41	DP	SCRI_RS_185707	7H	70.70	3.7	A	G	0.728	0.272	-8.88	2.389
DB_DAS41	DP	12_30544	7H	70.70	3.7	G	A	0.728	0.272	-8.88	2.389
DB_DAS42	DP	12_30544	7H	70.70	4.2	G	A	0.728	0.272	-10.915	2.745
DB_DAS42	DP	SCRI_RS_185707	7H	70.70	4.2	A	G	0.728	0.272	-10.915	2.745
DB_DAS41	DP	SCRI_RS_189067	7H	70.70	3.2	G	A	0.73	0.27	-7.558	2.211
DB_DAS42	DP	SCRI_RS_189067	7H	70.70	3.9	G	A	0.73	0.27	-9.717	2.545
DB_DAS38	DP	11_21302	7H	70.70	6	C	G	0.777	0.223	20.293	4.147
DB_DAS37	DP	11_21302	7H	70.70	5.6	C	G	0.777	0.223	18.672	3.966
DB_DAS36	DP	11_21302	7H	70.70	5.4	C	G	0.777	0.223	18.066	3.913
DB_DAS35	DP	11_21302	7H	70.70	4.8	C	G	0.777	0.223	16.349	3.779
DB_DAS39	DP	11_21302	7H	70.70	5.1	C	G	0.777	0.223	15.738	3.512
DB_DAS34	DP	11_21302	7H	70.70	4.6	C	G	0.777	0.223	15.265	3.632
DB_DAS33	DP	11_21302	7H	70.70	4.4	C	G	0.777	0.223	13.499	3.28
DB_DAS32	DP	11_21302	7H	70.70	4.9	C	G	0.777	0.223	12.793	2.933
DB_DAS30	DP	11_21302	7H	70.70	4.7	C	G	0.777	0.223	9.734	2.295
DB_DAS41	DP	11_21302	7H	70.70	3.4	C	G	0.777	0.223	8.619	2.414
DB_DAS29	DP	11_21302	7H	70.70	4.9	C	G	0.777	0.223	8.404	1.928
DB_DAS28	DP	11_21302	7H	70.70	4.3	C	G	0.777	0.223	6.672	1.642

DB_DAS27	DP	11_21302	7H	70.70	4.9	C	G	0.777	0.223	6.042	1.376
DB_DAS25	PSP	11_21302	7H	70.70	4	C	G	0.777	0.223	1.797	0.465
DB_DAS24	PSP	11_21302	7H	70.70	4.2	C	G	0.777	0.223	1.518	0.381
DB_DAS23	PSP	11_21302	7H	70.70	3.9	C	G	0.777	0.223	1.166	0.305
DB_DAS22	PSP	11_21302	7H	70.70	3.9	C	G	0.777	0.223	0.933	0.244
DB_DAS16	PSP	11_21302	7H	70.70	3.9	C	G	0.777	0.223	0.19	0.049
DB_DAS15	PSP	11_21302	7H	70.70	4	C	G	0.777	0.223	0.146	0.038
DB_DAS14	PSP	11_21302	7H	70.70	3.7	C	G	0.777	0.223	0.115	0.031
DB_DAS27	DP	12_31002	7H	70.80	6.3	A	T	0.906	0.094	-6.828	1.356
DB_DAS28	DP	12_31002	7H	70.80	6	A	T	0.906	0.094	-7.883	1.618
DB_DAS29	DP	12_31002	7H	70.80	6.4	A	T	0.906	0.094	-9.597	1.898
DB_DAS30	DP	12_31002	7H	70.80	5.8	A	T	0.906	0.094	-11.001	2.287
DB_DAS41	DP	12_31002	7H	70.80	7.1	A	T	0.906	0.094	-12.118	2.255
DB_DAS42	DP	12_31002	7H	70.80	6.8	A	T	0.906	0.094	-13.33	2.539
DB_DAS32	DP	12_31002	7H	70.80	5.5	A	T	0.906	0.094	-13.701	2.944
DB_DAS33	DP	12_31002	7H	70.80	5.3	A	T	0.906	0.094	-15.007	3.276
DB_DAS34	DP	12_31002	7H	70.80	5.6	A	T	0.906	0.094	-16.96	3.619
DB_DAS35	DP	12_31002	7H	70.80	6	A	T	0.906	0.094	-18.354	3.735
DB_DAS40	DP	12_31002	7H	70.80	5.1	A	T	0.906	0.094	-18.364	4.11
DB_DAS39	DP	12_31002	7H	70.80	7.7	A	T	0.906	0.094	-18.892	3.368
DB_DAS36	DP	12_31002	7H	70.80	6.4	A	T	0.906	0.094	-19.743	3.891
DB_DAS37	DP	12_31002	7H	70.80	6.8	A	T	0.906	0.094	-20.513	3.927
DB_DAS38	DP	12_31002	7H	70.80	6.7	A	T	0.906	0.094	-21.6	4.139
DB_DAS13	PSP	12_31002	7H	70.80	4.1	A	T	0.906	0.094	-0.102	0.026
DB_DAS14	PSP	12_31002	7H	70.80	4.6	A	T	0.906	0.094	-0.137	0.033
DB_DAS15	PSP	12_31002	7H	70.80	5	A	T	0.906	0.094	-0.173	0.039
DB_DAS16	PSP	12_31002	7H	70.80	5.5	A	T	0.906	0.094	-0.24	0.051
DB_DAS17	PSP	12_31002	7H	70.80	4.7	A	T	0.906	0.094	-0.286	0.067
DB_DAS18	PSP	12_31002	7H	70.80	4.3	A	T	0.906	0.094	-0.378	0.094

DB_DAS19	PSP	12_31002	7H	70.80	4.3	A	T	0.906	0.094	-0.473	0.116
DB_DAS21	PSP	12_31002	7H	70.80	4.8	A	T	0.906	0.094	-0.764	0.176
DB_DAS22	PSP	12_31002	7H	70.80	5	A	T	0.906	0.094	-1.118	0.254
DB_DAS23	PSP	12_31002	7H	70.80	5.4	A	T	0.906	0.094	-1.466	0.317
DB_DAS24	PSP	12_31002	7H	70.80	5.7	A	T	0.906	0.094	-1.867	0.392
DB_DAS25	PSP	12_31002	7H	70.80	5.5	A	T	0.906	0.094	-2.238	0.479
DB_DAS26	PSP	12_31002	7H	70.80	5.1	A	T	0.906	0.094	-2.566	0.577
DB_DAS41	DP	12_10222	7H	70.82	3.7	C	G	0.728	0.272	-8.88	2.389
DB_DAS42	DP	12_10222	7H	70.82	4.2	C	G	0.728	0.272	-10.915	2.745
DB_DAS27	DP	12_11477	7H	70.89	6.7	A	G	0.918	0.082	-7.243	1.396
DB_DAS28	DP	12_11477	7H	70.89	6.1	A	G	0.918	0.082	-8.222	1.665
DB_DAS29	DP	12_11477	7H	70.89	6.5	A	G	0.918	0.082	-9.986	1.953
DB_DAS30	DP	12_11477	7H	70.89	6	A	G	0.918	0.082	-11.526	2.351
DB_DAS41	DP	12_11477	7H	70.89	8.1	A	G	0.918	0.082	-13.573	2.354
DB_DAS32	DP	12_11477	7H	70.89	6	A	G	0.918	0.082	-14.757	3.022
DB_DAS42	DP	12_11477	7H	70.89	8	A	G	0.918	0.082	-15.273	2.664
DB_DAS33	DP	12_11477	7H	70.89	5.7	A	G	0.918	0.082	-15.969	3.365
DB_DAS34	DP	12_11477	7H	70.89	5.8	A	G	0.918	0.082	-17.887	3.718
DB_DAS35	DP	12_11477	7H	70.89	6.4	A	G	0.918	0.082	-19.501	3.835
DB_DAS39	DP	12_11477	7H	70.89	8.3	A	G	0.918	0.082	-20.337	3.472
DB_DAS40	DP	12_11477	7H	70.89	5.6	A	G	0.918	0.082	-20.915	4.424
DB_DAS36	DP	12_11477	7H	70.89	6.9	A	G	0.918	0.082	-21.138	3.992
DB_DAS37	DP	12_11477	7H	70.89	7.4	A	G	0.918	0.082	-22.131	4.024
DB_DAS38	DP	12_11477	7H	70.89	7.6	A	G	0.918	0.082	-23.522	4.223
DB_DAS13	PSP	12_11477	7H	70.89	4.5	A	G	0.918	0.082	-0.109	0.026
DB_DAS14	PSP	12_11477	7H	70.89	5.1	A	G	0.918	0.082	-0.149	0.033
DB_DAS15	PSP	12_11477	7H	70.89	5.4	A	G	0.918	0.082	-0.186	0.04
DB_DAS16	PSP	12_11477	7H	70.89	5.8	A	G	0.918	0.082	-0.254	0.053
DB_DAS17	PSP	12_11477	7H	70.89	5.1	A	G	0.918	0.082	-0.306	0.069

DB_DAS18	PSP	12_11477	7H	70.89	4.6	A	G	0.918	0.082	-0.406	0.096
DB_DAS19	PSP	12_11477	7H	70.89	4.7	A	G	0.918	0.082	-0.509	0.119
DB_DAS21	PSP	12_11477	7H	70.89	5.1	A	G	0.918	0.082	-0.809	0.181
DB_DAS22	PSP	12_11477	7H	70.89	5.4	A	G	0.918	0.082	-1.196	0.261
DB_DAS23	PSP	12_11477	7H	70.89	5.6	A	G	0.918	0.082	-1.539	0.326
DB_DAS24	PSP	12_11477	7H	70.89	6.1	A	G	0.918	0.082	-1.982	0.403
DB_DAS25	PSP	12_11477	7H	70.89	5.8	A	G	0.918	0.082	-2.372	0.492
DB_DAS26	PSP	12_11477	7H	70.89	5.2	A	G	0.918	0.082	-2.69	0.593
DB_DAS39	DP	11_10115	7H	71.00	3.4	C	A	0.728	0.272	10.202	2.869
DB_DAS41	DP	SCRI_RS_121057	7H	133.92	4.2	A	G	0.879	0.121	-9.136	2.286
DB_DAS42	DP	SCRI_RS_121057	7H	133.92	4.1	A	G	0.879	0.121	-11.315	2.878
DB_DAS41	DP	SCRI_RS_198005	7H	133.92	5.3	C	T	0.918	0.082	-11.222	2.471
DB_DAS42	DP	SCRI_RS_198005	7H	133.92	4.3	C	T	0.918	0.082	-11.668	2.88

Table S5 Significant marker trait associations passed FDR level P ≤ 0.05 for traits at maturity under control treatment experiment (C) and drought treatment experiment (D). Numbers of significant single MTAs are shown above false-discovery rate (FDR) for each chromosome and most significant markers are shown in Table S12.

Trait	Treatmnet	Marker name	Chromosome	Position	Log	Allel 1	Allel 2	Freq	Freq	Effect	Effect
PH	C	12_30952	1H	12.4	4.2	A	T	0.899	0.101	-7.300	1.828
DTH	D	11_21053	1H	49.8	3.6	G	A	0.750	0.250	-3.283	0.895
SN	D	SCRI_RS_167877	1H	50.8	3.5	A	G	0.638	0.362	-1.274	0.354
DTH	D	SCRI_RS_21483	1H	55.5	4.6	C	A	0.735	0.265	-3.419	0.809
DTH	D	11_21431	1H	59.1	3.3	T	A	0.834	0.166	-3.742	1.076
DTH	D	SCRI_RS_157039	1H	62.8	3.4	A	G	0.628	0.372	-2.831	0.802
SPKL	D	11_20434	1H	81.7	5.6	T	A	0.673	0.327	-0.816	0.173
SY	D	11_20434	1H	81.7	5.6	T	A	0.673	0.327	-0.816	0.173
SPKL	D	12_31160	1H	82.5	5.6	G	A	0.673	0.327	-0.816	0.173
SY	D	12_31160	1H	82.5	5.6	G	A	0.673	0.327	-0.816	0.173
DTH	D	11_10830	1H	82.6	4.1	A	C	0.626	0.374	-3.012	0.761
SPKL	D	SCRI_RS_195200	1H	86.5	4.0	C	T	0.845	0.155	-0.868	0.222
SY	D	SCRI_RS_195200	1H	86.5	4.0	C	T	0.845	0.155	-0.868	0.222
SN	D	SCRI_RS_181300	1H	86.5	3.4	A	G	0.717	0.283	-1.343	0.380
TN	C	12_21522	1H	117.4	6.1	G	A	0.888	0.112	5.558	1.122
DTH	D	11_10987	2H	38.2	3.5	G	A	0.528	0.472	3.147	0.870
SPKL	D	SCRI_RS_153174	2H	58.0	4.9	A	C	0.799	0.201	-0.984	0.225
SY	D	SCRI_RS_153174	2H	58.0	4.9	A	C	0.799	0.201	-0.984	0.225
SPKL	D	SCRI_RS_162700	2H	59.0	3.9	G	A	0.818	0.182	-0.973	0.253
SY	D	SCRI_RS_162700	2H	59.0	3.9	G	A	0.818	0.182	-0.973	0.253
DTH	D	11_21078	2H	67.35	4.6	G	C	0.568	0.432	-3.299	0.783
DTH	D	SCRI_RS_221992	2H	67.9	4.1	C	T	0.576	0.424	-3.128	0.795
DTH	D	SCRI_RS_17898	2H	73.7	3.3	T	C	0.767	0.233	-3.969	1.134
DTH	D	12_31293	2H	74.0	3.6	T	A	0.715	0.285	-3.208	0.879
SN	D	SCRI_RS_129857	2H	75.2	3.4	G	A	0.570	0.430	-1.164	0.330
DTH	D	SCRI_RS_235860	2H	76.2	5.0	G	A	0.713	0.287	-3.216	0.727

DTH	D	SCRI_RS_162690	2H	107.2	4.5	C	T	0.658	0.342	-3.064	0.741
SN	D	SCRI_RS_154176	2H	110.2	4.8	G	A	0.617	0.383	-1.260	0.292
SN	D	SCRI_RS_164608	2H	111.1	4.2	A	G	0.603	0.397	-1.275	0.320
SN	D	SCRI_RS_12444	2H	111.3	4.2	T	C	0.603	0.397	-1.275	0.320
DTH	D	SCRI_RS_200949	2H	118.0	5.2	A	G	0.743	0.257	-3.633	0.802
SN	D	SCRI_RS_200949	2H	118.0	6.1	A	G	0.743	0.257	-1.457	0.295
DTH	D	SCRI_RS_144102	2H	118.4	4.0	T	G	0.587	0.413	-3.154	0.806
SPKL	D	SCRI_RS_144102	2H	118.4	4.9	T	G	0.587	0.413	-0.847	0.193
SY	D	SCRI_RS_144102	2H	118.4	4.9	T	G	0.587	0.413	-0.847	0.193
SN	D	SCRI_RS_144102	2H	118.4	8.8	T	G	0.587	0.413	-1.439	0.238
TN	D	SCRI_RS_144102	2H	118.4	5.4	T	G	0.587	0.413	-2.200	0.477
SN	D	11_21088	2H	119.8	3.4	A	G	0.682	0.318	-1.123	0.318
SPKL	C	SCRI_RS_119513	2H	120.0	4.6	T	C	0.779	0.221	-1.114	0.263
SPKL	D	SCRI_RS_119513	2H	120.0	4.9	T	C	0.779	0.221	-0.874	0.201
SY	D	SCRI_RS_119513	2H	120.0	4.9	T	C	0.779	0.221	-0.874	0.201
SN	D	11_10656	2H	120.0	3.9	A	G	0.664	0.336	-1.196	0.314
SN	D	SCRI_RS_165373	2H	120.0	3.6	A	G	0.671	0.329	-1.169	0.320
SN	D	SCRI_RS_239674	2H	120.0	3.5	T	C	0.667	0.333	-1.152	0.318
DTH	D	SCRI_RS_194202	2H	120.7	5.0	G	A	0.736	0.264	-3.515	0.792
KW	D	SCRI_RS_226193	2H	133.3	6.0	C	T	0.725	0.275	1.797	0.368
SN	D	SCRI_RS_114673	2H	135.8	4.9	T	G	0.760	0.240	-1.457	0.335
KW	C	SCRI_RS_204148	3H	28.3	4.9	C	T	0.578	0.422	-1.894	0.434
KW	C	11_10601	3H	45.8	4.2	C	A	0.850	0.150	-2.146	0.534
PH	C	SCRI_RS_178915	3H	45.8	8.0	T	C	0.859	0.141	-8.696	1.512
PH	C	11_10601	3H	45.8	7.7	C	A	0.850	0.150	-8.325	1.488
PH	C	SCRI_RS_185596	3H	46.0	6.2	A	C	0.839	0.161	-7.203	1.448
PH	C	SCRI_RS_110693	3H	46.0	4.1	A	C	0.826	0.174	-5.920	1.491
PH	C	SCRI_RS_141081	3H	46.2	7.9	C	A	0.846	0.154	-7.984	1.399
PH	C	SCRI_RS_166122	3H	46.2	7.9	G	T	0.846	0.154	-7.984	1.399

PH	C	SCRI_RS_149207	3H	46.2	6.2	C	T	0.839	0.161	-7.203	1.448
PH	C	SCRI_RS_230096	3H	46.2	6.2	T	C	0.839	0.161	-7.203	1.448
PH	C	SCRI_RS_886	3H	46.2	5.7	G	A	0.832	0.168	-6.803	1.435
PH	C	SCRI_RS_218235	3H	46.2	4.6	A	G	0.828	0.172	-6.185	1.466
PH	C	SCRI_RS_182479	3H	46.2	4.1	G	A	0.826	0.174	-5.920	1.491
PH	C	SCRI_RS_13433	3H	46.2	4.1	T	G	0.826	0.174	-5.920	1.491
PH	C	12_31122	3H	46.3	5.8	A	G	0.834	0.166	-6.995	1.459
PH	C	SCRI_RS_204057	3H	49.3	4.5	T	C	0.796	0.204	-5.974	1.435
PH	C	11_21197	3H	49.7	8.3	G	A	0.869	0.131	-8.694	1.490
PH	D	11_21197	3H	49.7	11.1	G	A	0.869	0.131	-7.019	1.024
PH	C	11_21129	3H	51.6	4.5	A	G	0.626	0.374	-5.075	1.223
PH	D	SCRI_RS_237716	3H	51.6	6.5	C	A	0.810	0.190	-4.883	0.953
PH	D	11_21129	3H	51.6	5.9	A	G	0.626	0.374	-4.362	0.904
PH	D	SCRI_RS_132190	3H	51.8	4.7	T	C	0.828	0.172	-4.629	1.090
PH	D	11_20288	3H	52.6	6.5	G	A	0.810	0.190	-4.883	0.953
PH	D	11_10005	3H	53.3	6.4	A	G	0.739	0.261	-4.579	0.905
DTH	D	SCRI_RS_223097	3H	70.2	3.3	T	C	0.573	0.427	-2.809	0.812
DTH	D	SCRI_RS_155763	3H	75.2	5.3	A	G	0.709	0.291	-3.443	0.752
DTH	D	11_20626	3H	88.2	4.0	A	G	0.933	0.067	-6.028	1.547
DTH	D	SCRI_RS_231007	3H	88.8	4.0	G	A	0.527	0.473	-2.958	0.762
DTH	D	12_10662	3H	90.0	3.4	T	A	0.715	0.285	-3.151	0.891
SN	D	12_10662	3H	90.0	6.5	T	A	0.715	0.285	-1.413	0.277
SPKL	C	SCRI_RS_3125	3H	90.2	4.6	A	G	0.730	0.270	-1.103	0.262
DTH	D	SCRI_RS_170206	3H	90.2	3.9	G	A	0.748	0.252	-3.545	0.922
DTH	D	SCRI_RS_3125	3H	90.2	3.8	A	G	0.730	0.270	-3.392	0.897
DTH	D	SCRI_RS_3352	3H	90.2	3.4	G	A	0.715	0.285	-3.151	0.891
DTH	D	SCRI_RS_238430	3H	90.2	3.4	T	C	0.713	0.287	-3.152	0.894
DTH	D	SCRI_RS_229593	3H	90.2	3.2	G	A	0.702	0.298	-2.990	0.874
SPKL	D	SCRI_RS_229593	3H	90.2	4.7	G	A	0.702	0.298	-0.777	0.182

SY	D	SCRI_RS_229593	3H	90.2	4.7	G	A	0.702	0.298	-0.777	0.182
SN	D	SCRI_RS_170206	3H	90.2	7.8	G	A	0.748	0.252	-1.589	0.281
SN	D	SCRI_RS_3352	3H	90.2	6.5	G	A	0.715	0.285	-1.413	0.277
SN	D	SCRI_RS_238430	3H	90.2	6.3	T	C	0.713	0.287	-1.394	0.277
SN	D	SCRI_RS_3125	3H	90.2	3.4	A	G	0.730	0.270	-1.290	0.362
SPKL	D	SCRI_RS_80331	3H	90.2	5.2	C	T	0.763	0.237	-0.896	0.199
SY	D	SCRI_RS_80331	3H	90.2	5.2	C	T	0.763	0.237	-0.896	0.199
SN	D	SCRI_RS_115925	3H	90.2	7.1	A	G	0.616	0.384	-1.341	0.249
SN	D	SCRI_RS_80331	3H	90.2	4.7	C	T	0.763	0.237	-1.450	0.340
SN	D	SCRI_RS_158070	3H	90.2	4.5	T	C	0.739	0.261	-1.478	0.355
DTH	D	11_21493	3H	90.3	5.0	A	G	0.781	0.219	-4.199	0.949
SN	D	SCRI_RS_228486	3H	90.4	6.1	A	G	0.753	0.247	-1.507	0.307
SPKL	D	11_21495	3H	90.7	8.8	T	A	0.755	0.245	-0.929	0.154
SY	D	11_21495	3H	90.7	8.8	T	A	0.755	0.245	-0.929	0.154
SN	D	11_21495	3H	90.7	3.5	T	A	0.755	0.245	-1.289	0.360
UTN	D	11_21428	3H	122.0	4.8	C	A	0.534	0.466	-1.259	0.291
UTN	D	11_20409	3H	122.0	4.7	A	C	0.534	0.466	-1.309	0.307
SN	D	12_31251	3H	122.6	5.2	A	G	0.755	0.245	-1.466	0.324
TN	D	SCRI_RS_208297	3H	122.6	7.4	T	G	0.571	0.429	-2.243	0.408
TN	D	SCRI_RS_202428	3H	123.2	11.1	A	C	0.537	0.463	-2.343	0.343
TN	D	12_11154	3H	123.2	7.5	A	G	0.597	0.403	-2.288	0.412
UTN	D	SCRI_RS_202428	3H	123.2	5.1	A	C	0.537	0.463	-1.219	0.272
DTH	D	12_31313	4H	39.0	3.3	A	G	0.862	0.138	-3.920	1.131
SN	D	11_11114	4H	52.4	3.4	G	A	0.702	0.298	-1.170	0.330
SN	D	SCRI_RS_189180	4H	56.6	3.9	C	T	0.705	0.295	-1.230	0.318
SN	D	SCRI_RS_207394	4H	58.1	5.0	C	T	0.745	0.255	-1.382	0.314
SN	D	11_20723	4H	58.1	4.9	C	A	0.725	0.275	-1.352	0.310
SN	D	SCRI_RS_109600	4H	58.4	5.0	G	A	0.745	0.255	-1.382	0.314
SPKL	C	SCRI_RS_138835	4H	83.6	4.4	A	G	0.586	0.414	-0.908	0.220
SPKL	D	SCRI_RS_121084	4H	92.9	4.1	T	G	0.760	0.240	-0.847	0.213

SY	D	SCRI_RS_121084	4H	92.9	4.1	T	G	0.760	0.240	-0.847	0.213
SN	D	11_20762	4H	98.9	4.5	C	G	0.684	0.316	-1.297	0.311
SN	D	12_10666	4H	99.4	4.5	G	A	0.684	0.316	-1.297	0.311
DTH	D	SCRI_RS_179411	5H	1.0	3.5	T	C	0.575	0.425	-2.937	0.822
DTH	D	SCRI_RS_109375	5H	1.5	3.5	T	C	0.568	0.432	-2.913	0.812
SPKL	D	SCRI_RS_149877	5H	14.2	3.7	T	C	0.862	0.138	-0.889	0.238
SY	D	SCRI_RS_149877	5H	14.2	3.7	T	C	0.862	0.138	-0.889	0.238
DTH	D	11_10260	5H	41.8	3.6	C	G	0.868	0.132	-4.053	1.106
KW	D	11_11159	5H	50.4	4.8	A	G	0.796	0.204	1.581	0.368
SN	D	11_21001	5H	60.5	4.1	G	A	0.765	0.235	-1.423	0.362
SPKL	D	12_30182	5H	80.8	3.9	A	G	0.795	0.205	-0.934	0.244
SY	D	12_30182	5H	80.8	3.9	A	G	0.795	0.205	-0.934	0.244
TB	C	12_31417	5H	93.4	4.0	G	C	0.772	0.228	5.580	1.433
TB	C	SCRI_RS_1619	5H	93.4	4.0	G	A	0.772	0.228	5.580	1.433
SY	C	12_31417	5H	93.4	4.6	G	C	0.772	0.228	5.275	1.250
SY	C	SCRI_RS_1619	5H	93.4	4.6	G	A	0.772	0.228	5.275	1.250
SN	C	SCRI_RS_143508	5H	93.4	5.2	A	G	0.726	0.274	1.549	0.341
SN	D	SCRI_RS_143514	5H	93.4	4.9	G	T	0.807	0.193	1.597	0.368
SN	D	SCRI_RS_3280	5H	93.4	4.4	T	C	0.821	0.179	1.576	0.383
SN	D	12_31417	5H	93.4	3.6	G	C	0.772	0.228	1.258	0.343
SN	D	SCRI_RS_1619	5H	93.4	3.6	G	A	0.772	0.228	1.258	0.343
TB	C	SCRI_RS_174177	5H	96.6	4.3	G	A	0.597	0.403	5.830	1.431
SY	C	SCRI_RS_174177	5H	96.6	4.6	G	A	0.597	0.403	5.597	1.336
SN	C	SCRI_RS_167505	6H	1.8	4.7	A	G	0.829	0.171	1.607	0.378
PH	D	SCRI_RS_189878	6H	28.5	4.1	T	C	0.901	0.099	-5.129	1.298
DTH	D	12_30697	6H	30.0	5.6	A	C	0.830	0.170	-4.729	1.002
SN	D	12_30673	6H	30.1	6.3	A	G	0.738	0.262	-1.534	0.306
SN	D	12_31308	6H	30.2	5.7	G	C	0.753	0.247	-1.454	0.307
TB	C	SCRI_RS_234724	6H	49.8	4.3	A	G	0.587	0.413	-4.846	1.199

TB	C	SCRI_RS_138001	6H	55.4	4.0	G	A	0.808	0.192	6.300	1.625
TB	C	12_30804	6H	59.9	4.1	G	A	0.718	0.282	5.596	1.414
TB	C	12_31444	6H	60.1	4.4	C	A	0.717	0.283	5.751	1.399
TB	C	12_10758	6H	60.3	4.1	A	G	0.715	0.285	5.732	1.457
TB	C	11_20058	6H	60.5	4.3	A	G	0.562	0.438	-6.218	1.543
KW	C	12_30346	6H	60.5	5.4	C	G	0.638	0.362	-2.010	0.436
KW	C	11_20058	6H	60.5	4.7	A	G	0.562	0.438	-1.666	0.389
TB	C	11_21310	6H	60.6	4.0	G	A	0.555	0.445	-5.855	1.514
TB	C	11_10189	6H	60.6	3.9	A	G	0.562	0.438	-5.874	1.525
KW	C	11_10189	6H	60.6	5.8	A	G	0.562	0.438	-1.830	0.380
KW	C	11_21310	6H	60.6	5.5	G	A	0.555	0.445	-1.769	0.380
KW	C	11_10635	6H	60.9	4.3	A	G	0.575	0.425	-1.601	0.392
SPKL	D	SCRI_RS_231790	6H	71.7	3.6	A	G	0.548	0.452	-0.677	0.184
SY	D	SCRI_RS_231790	6H	71.7	3.6	A	G	0.548	0.452	-0.677	0.184
DTH	D	11_20969	6H	72.2	4.5	A	G	0.868	0.132	-4.656	1.118
SPKL	D	11_20969	6H	72.2	4.1	A	G	0.868	0.132	-0.901	0.229
SY	D	11_20969	6H	72.2	4.1	A	G	0.868	0.132	-0.901	0.229
DTH	D	SCRI_RS_111979	7H	11.1	3.7	A	C	0.821	0.179	-3.857	1.034
DTH	D	SCRI_RS_152860	7H	11.5	4.0	C	T	0.725	0.275	-3.333	0.861
DTH	D	SCRI_RS_166520	7H	20.8	3.2	A	G	0.796	0.204	-3.850	1.119
DTH	D	SCRI_RS_145415	7H	20.9	3.5	A	G	0.842	0.158	-4.093	1.143
SPKL	D	SCRI_RS_148318	7H	21.4	4.4	G	A	0.680	0.320	-0.793	0.192
SY	D	SCRI_RS_148318	7H	21.4	4.4	G	A	0.680	0.320	-0.793	0.192
SN	D	SCRI_RS_148318	7H	21.4	5.3	G	A	0.680	0.320	-1.557	0.342
SPKL	C	SCRI_RS_188133	7H	47.3	5.2	C	A	0.765	0.235	-1.098	0.242
DTH	D	SCRI_RS_188133	7H	47.3	4.4	C	A	0.765	0.235	-3.585	0.870
TB	C	12_30752	7H	48.9	4.9	C	A	0.579	0.421	-5.315	1.217
TB	C	SCRI_RS_172335	7H	48.9	4.9	A	G	0.579	0.421	-5.315	1.217
SPKL	D	11_10153	7H	65.4	7.3	A	G	0.642	0.358	-0.910	0.167

SY	D	11_10153	7H	65.4	7.3	A	G	0.642	0.358	-0.910	0.167
SN	D	11_10153	7H	65.4	3.4	A	G	0.642	0.358	-1.167	0.329
DTH	D	SCRI_RS_192587	7H	67.9	4.3	A	G	0.673	0.327	-2.977	0.731
DTH	D	SCRI_RS_171786	7H	67.9	4.3	A	C	0.669	0.331	-2.934	0.725
DTH	D	SCRI_RS_207354	7H	67.9	4.3	G	T	0.669	0.331	-2.934	0.725
DTH	D	SCRI_RS_127040	7H	67.9	4.3	T	C	0.669	0.331	-2.934	0.725
SPKL	D	SCRI_RS_192587	7H	67.9	6.5	A	G	0.673	0.327	-0.823	0.161
SPKL	D	SCRI_RS_171786	7H	67.9	4.4	A	C	0.669	0.331	-0.776	0.189
SPKL	D	SCRI_RS_207354	7H	67.9	4.4	G	T	0.669	0.331	-0.776	0.189
SPKL	D	SCRI_RS_127040	7H	67.9	4.4	T	C	0.669	0.331	-0.776	0.189
SY	D	SCRI_RS_192587	7H	67.9	6.5	A	G	0.673	0.327	-0.823	0.161
SY	D	SCRI_RS_171786	7H	67.9	4.4	A	C	0.669	0.331	-0.776	0.189
SY	D	SCRI_RS_207354	7H	67.9	4.4	G	T	0.669	0.331	-0.776	0.189
SY	D	SCRI_RS_127040	7H	67.9	4.4	T	C	0.669	0.331	-0.776	0.189
DTH	D	SCRI_RS_158234	7H	68.0	4.3	T	C	0.669	0.331	-2.934	0.725
SPKL	D	SCRI_RS_158234	7H	68.0	4.4	T	C	0.669	0.331	-0.776	0.189
SY	D	SCRI_RS_158234	7H	68.0	4.4	T	C	0.669	0.331	-0.776	0.189
DTH	D	SCRI_RS_219291	7H	70.4	3.9	A	G	0.764	0.236	-3.940	1.025
DTH	D	SCRI_RS_10407	7H	70.5	4.1	G	A	0.779	0.221	-3.848	0.982
DTH	D	SCRI_RS_165137	7H	70.5	4.1	C	A	0.779	0.221	-3.848	0.982
DTH	D	11_10055	7H	70.5	4.1	C	G	0.779	0.221	-3.848	0.982
DTH	D	SCRI_RS_173914	7H	70.5	4.1	C	T	0.779	0.221	-3.848	0.982
DTH	D	SCRI_RS_237304	7H	70.5	4.1	G	A	0.779	0.221	-3.848	0.982
DTH	D	SCRI_RS_219749	7H	70.6	4.1	C	T	0.774	0.226	-3.939	1.002
DTH	D	SCRI_RS_154541	7H	70.6	4.1	T	C	0.774	0.226	-3.939	1.002
DTH	D	12_30563	7H	70.6	4.1	C	A	0.779	0.221	-3.848	0.982
DTH	D	SCRI_RS_102957	7H	70.6	4.0	C	T	0.777	0.223	-3.848	0.983
DTH	D	12_30004	7H	70.6	3.9	G	A	0.760	0.240	-3.679	0.956
DTH	D	11_21302	7H	70.7	4.1	C	G	0.779	0.221	-3.848	0.982

Table S6 Co-localized candidate genes with significant marker-trait associations for DB at different time points under drought phase (DP). SNPs were located within the physical position of the candidate genes.

Trait	Chr	Locus Name	Position (cM)	iSelect Marker	Gene Name	Locus Length (bp)	SNP Position (AGP)	AGP Start	AGP End	Confidence	Annotation
DAS27_39	1H	12_31464	60.84	BOPA2_12_31464	HORVU1Hr1G064200.1	121	459030191	459029724	459034750	HC_G	RNA-binding KH domain-containing protein
DAS32_42	1H	SCRI_RS_120605	61.47	SCRI_RS_120605	HORVU1Hr1G064020.1	121	458110754	458109639	458113226	HC_G	GDSL esterase/lipase
DAS28	3H	SCRI_RS_158070	90.23	SCRI_RS_158070	HORVU3Hr1G085290.1	121	611854023	611847518	611855185	HC_G	ARID/BRIGHT DNA-binding domain;ELM2 domain protein
DAS27_39	5H	12_30976	1.6	BOPA2_12_30976	HORVU5Hr1G111120.2	121	2570921	635474978	635476854	HC_G	Remorin family protein
DAS41	5H	SCRI_RS_75826	46.7	SCRI_RS_75826	HORVU5Hr1G050160.1	111	388731481	388730361	388736731	HC_G	Asparagine--tRNA ligase
DAS41_42	5H	SCRI_RS_133042	47.15	SCRI_RS_133042	HORVU5Hr1G050570.2	121	394033818	394033709	394037099	HC_G	Cystathionine beta-synthase (CBS) family protein
DAS42	6H	11_11147	78.4	BOPA1_ABC06682-1-1-311	HORVU6Hr1G079150.1	241	536786820	536783966	536788366	HC_G	Adenine nucleotide alpha hydrolases-like superfamily protein
DAS41_42	7H	12_30486	70.54	BOPA2_12_30486	HORVU7Hr1G107760.1	121	235388310	623887563	623890605	HC_G	Pentatricopeptide repeat-containing protein
DAS41_42	7H	SCRI_RS_134797	70.61	SCRI_RS_134797	HORVU7Hr1G056490.1	121	236134087	236127458	236134353	HC_G	Basic-leucine zipper (bZIP) transcription factor family protein

Table S7 Co-localized candidate genes with significant marker-trait associations for traits at maturity under drought (D) in pre-anthesis drought stress experiment. SNPs were located within the physical position of the candidate genes.

Trait	Chr.	Locus Name	Position (cM)	iSelect Marker	Gene	Locus Length (bp)	SNP Position (AGP)	AGP Start	AGP End	Confidence	Annotation
SN_D	1H	SCRI_RS_167877	61	SCRI_RS_167877	HORVU1Hr1G052890.4	111	391319382	391316412	391319763	HC_G	sterol C4-methyl oxidase 1-2
DTH_D	1H	SCRI_RS_21483	61	SCRI_RS_21483	HORVU1Hr1G058500.1	83	427145216	427144050	427145261	HC_G	Histone H2B.1
DTH_D	1H	SCRI_RS_157039	61	SCRI_RS_157039	HORVU1Hr1G064950.1	121	464421881	464420461	464423230	HC_G	Two-component response regulator ORR21
SY, SPKL_D	1H	11_20434	121	BOPA1_2881-935	HORVU1Hr1G072490.2	207	497940358	497889581	497943853	HC_G	ATP-dependent zinc metalloprotease FtsH
DTH_D	1H	11_10830	147	BOPA1_6250-1056	HORVU1Hr1G072810.2	255	499157309	499154869	499157373	HC_G	Transcription factor ILR3
SY, SPKL_D	1H	SCRI_RS_195200	43	SCRI_RS_195200	HORVU1Hr1G074410.4	103	507977141	507969937	507977951	HC_U	Protein of unknown function (DUF668)
DTH_D	2H	SCRI_RS_17898	61	SCRI_RS_17898	HORVU2Hr1G089970.3	121	640849650	640848843	640849695	HC_G	Aquaporin-like superfamily protein
DTH_D	2H	12_31293	61	BOPA2_12_31293	HORVU2Hr1G090010.1	121	641328117	641327675	641328747	HC_G	Defensin-2
SPKL_C_D, SY_D	2H	SCRI_RS_119513	61	SCRI_RS_119513	HORVU2Hr1G111050.1	121	721944874	721834222	722001010	HC_G	Protein kinase superfamily protein
PH_D	3H	11_20288	121	BOPA1_2027-1307	HORVU3Hr1G051000.1	241	367111723	367108887	367113432	HC_G	HSP20-like chaperones
PH_D	3H	SCRI_RS_132190	61	SCRI_RS_132190	HORVU3Hr1G053760.3	121	396190351	396186345	396190640	HC_G	GDSL esterase/lipase
SN, SY, SPKL_D,	3H	SCRI_RS_80331	61	SCRI_RS_80331	HORVU3Hr1G085270.8	121	611856132	611856101	611858894	HC_G	Fructose-1,6-bisphosphatase class 1
SN_D	3H	SCRI_RS_158070	61	SCRI_RS_158070	HORVU3Hr1G085290.1	121	654554805	611847518	611855185	HC_G	ARID/BRIGHT DNA-binding domain;ELM2 domain protein

TN_D	4H	12_11154	61	BOPA2_12_11154	HORVU3Hr1G096830.4	121	620025304	654554173	654558826	HC_G	Carboxypeptidase Y homolog A
SN_D	5H	SCRI_RS_189180	25	SCRI_RS_189180	HORVU4Hr1G063980.6	86	2261856	535568819	535576822	HC_G	Senescence/dehydration-associated protein-related
SN_D	6H	12_10666	61	BOPA2_12_10666	HORVU4Hr1G081670.1	120	22810044	620019029	620025685	HC_G	respiratory burst oxidase homologue D
SN_D	6H	12_31308	61	BOPA2_12_31308	HORVU6Hr1G012040.1	121	654554805	22807700	22812234	HC_G	Pentatricopeptide repeat-containing protein
DTH_D	7H	SCRI_RS_179411	61	SCRI_RS_179411	HORVU5Hr1G000590.2	121	23795915	2257401	2264720	HC_G	Ethylene receptor 1
SY, SN, SPKL_D	7H	SCRI_RS_148318	61	SCRI_RS_148318	HORVU7Hr1G018230.3	121	23795915	23792583	23796646	HC_U	Protein of unknown function (DUF630 and DUF632)

Table S8 Analysis of variance of the post-anthesis drought stress experiment. df: degrees of freedom; s.s: sum of squares, m.s: mean square, Fpr: F-probabilities, s.e.d: standard error of the difference between means, l.s.d: least significant differences.

Days to heading

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	182	-1	27650.65	151.927	30.99	<.001	2.2824	4.4786
Year	1	-1	126002	126002	25698.42	<.001	2.2151	4.3464
Genotype.Year	182		3250.59	17.86	3.64	<.001	2.3486	4.6084
Residual	1065	-1497	5221.803	4.903				
Total	1430	-1498	81978.88					

Plant height

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	182	-1	207479.2	1140	32.56	<.001	6.099	11.968
Year	1	-1	16586	16586	473.72	<.001	5.919	11.615
Genotype.Year	182		16250.44	89.29	2.55	<.001	6.276	12.315
Residual	1060	-1502	37113.14	35.01				
Total	1425	-1503	153279.7					

Spike length

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	182	-1	6768.671	37.19	33.93	<.001	1.0792	2.1176
Year	1	-1	636.153	636.153	580.35	<.001	1.0473	2.0551
Genotype.Year	182		500.565	2.75	2.51	<.001	1.1105	2.179
Residual	1070	-1492	1172.882	1.096				
Total	1435	-1493	4992.508					

Kernel number/spike

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	182		190439.6	1046.37	77.31	<.001	2.55	1.3
Year	1		517.74	517.74	38.25	<.001	0.27	0.14
Treatment	1		258.56	258.56	19.1	<.001	0.27	0.14
Genotype.Year	182		9658.58	53.07	3.92	<.001	3.61	1.84
Genotype.Treatment	182		2808.75	15.43	1.14	0.105	3.61	1.84
Year.Treatment	1		590.61	590.61	43.64	<.001	0.38	0.19
Genotype.Year. Treatment	181	-1	1939.95	10.72	0.79	0.979	5.1	2.6
Residual	2177	-16	29464.16	13.53				
Total	2907	-17	226376.8					

Thousand kernel weight

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	182	-1	35206.74	193.44	8.52	<.001	4.911	9.6308
Treatment	1	-1	45531.45	45531.45	2005.85	<.001	4.766	9.3465
Year	1	-1	950.08	950.08	41.85	<.001	4.766	9.3465
Genotype.Treatment	182		11698.17	64.28	2.83	<.001	5.0534	9.9101
Genotype.Year	182		11434.2	62.83	2.77	<.001	5.0534	9.9101
Genotype.Treatment.Year	364		22019.15	60.49	2.66	<.001	5.3267	10.4461
Residual	2147	-49	48735.51	22.7				
Total	3059	-52	175575.3					

Straw yield

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	182	-1	85453.66	469.53	10.39	<.001	6.928	13.586
Treatment	1	-1	137.81	137.81	3.05	0.081	6.723	13.185
Year	1	-1	22751.15	22751.15	503.68	<.001	6.723	13.185
Genotype.Treatment	182		15569.25	85.55	1.89	<.001	7.129	13.98
Genotype.Year	181		47101.54	260.23	5.76	<.001	7.129	13.98
Genotype.Treatment.Year	363	-1	28910.92	79.64	1.76	<.001	7.514	14.736
Residual	2028	-168	91604.35	45.17				
Total	2938	-172	291528.7					

Total biomass

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	182	-1	227966.7	1252.56	14.72	<.001	9.507	18.644
Treatment	1	-1	21630.64	21630.64	254.28	<.001	9.226	18.094
Year	1	-1	34211.71	34211.71	402.19	<.001	9.226	18.094
Genotype.Treatment	182		32204.05	176.95	2.08	<.001	9.783	19.185
Genotype.Year	182		70901.23	389.57	4.58	<.001	9.783	19.185
Genotype.Treatment.Year	363	-1	63115.88	173.87	2.04	<.001	10.312	20.222
Residual	2078	-118	176764.2	85.06				
Total	2989	-122	626794.4					

Harvest index

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	182	-1	6.750753	0.037092	7.56	<.001	0.07219	0.14161
Treatment	1	-1	2.463759	2.463759	502.27	<.001	0.07006	0.13743
Year	1	-1	0.209477	0.209477	42.7	<.001	0.07006	0.13743
Genotype.Treatment	182		1.595079	0.008764	1.79	<.001	0.07429	0.14572
Genotype.Year	181		3.696774	0.020424	4.16	<.001	0.07429	0.14572
Genotype.Treatment.Year	181	-183	0.685261	0.003786	0.77	0.987	0.0783	0.1536
Residual	1496	-700	7.338319	0.004905				
Total	2224	-886	22.73942					

Total germination %

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	182	-1	41030.93	225.44	7.67	<.001	3.8	7.5
Treatment	1		1470.49	1470.49	50.04	<.001	2.3	4.6
Year	1		242.29	242.29	8.24	0.004	0.2	0.4
Genotype.Treatment	182	-1	5948.16	32.68	1.11	0.154	0.2	0.4
Genotype.Year	182		10200.42	56.05	1.91	<.001	3.3	6.5
Treatment.Year	1		466.55	466.55	15.87	<.001	1.9	3.8
Genotype.Treatment.Year	182		3353.38	18.43	0.63	1	2.7	5.3

Residual	2193	-6	64450.21	29.39				
Total	2924	-8	127162.4					

Normal seedling%

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	182	-1	79937.54	439.22	6.26	<.001	5.9	11.6
Treatment	1		13713.44	13713.44	195.45	<.001	3.6	7.1
Year	1		643.08	643.08	9.17	0.002	0.3	0.6
Genotype.Treatment	182	-1	13133.2	72.16	1.03	0.386	0.3	0.6
Genotype.Year	182		16924.61	92.99	1.33	0.003	5.1	10.1
Treatment.Year	1		172.5	172.5	2.46	0.117	3	5.8
Genotype.Treatment.Year	182		8731.8	47.98	0.68	0.999	4.2	8.2
Residual	2193	-6	153868.8	70.16				
Total	2924	-8	287125					

Groweing degree days

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	182	1036250	5693.7			*	*
Year	1	1822846	1822846			*	*
Genotype.Year	182	173648.4	954.1			*	*
Total	365	3032744					

Drought Sensetivity Index

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	182	-1	349.7733	1.9218	3.61	<.001	0.752	1.4755
Year	1	-1	0.1407	0.1407	0.26	0.607	0.7298	1.4319
Genotype.Year	181		289.1068	1.5973	3	<.001	0.7738	1.5183
Residual	1056	-1506	561.9865	0.5322				
Total	1420	-1508	872.0559					

Injury %

Source of variation	d.f.	(m.v.)	s.s.	m.s.	v.r.	F pr.	s.e.d.	l.s.d.
Genotype	182	-1	90642.4	498	3.54	<.001	12.221	23.979
Year	1	-1	13482.3	13482.3	95.92	<.001	11.86	23.271
Genotype.Year	181		74834.8	413.5	2.94	<.001	12.575	24.675
Residual	1056	-1506	148430.1	140.6				
Total	1420	-1508	235229.6					

Table S9 Significant marker trait associations passed FDR level P ≤ 0.05 for the studied trais under control treatment (C) and chemical treatment experiment (D). Numbers of significant single MTAs are shown above false-discovery rate (FDR) for each chromosome and most significant markers are shown in Table S13.

Trait	Treat	Marker	Chromosome	Position	Log	Allel 1	Allel 2	Freq	Freq	Effect	Effect
PH	C	SCRI_RS_126734	1H	42.1	4.9	T	C	0.762	0.238	-2.492	0.572
KN/spike	C	12_31467	1H	46.5	3.9	G	A	0.724	0.276	1.818	0.475
KN/spike	C	SCRI_RS_151764	1H	46.5	3.0	T	C	0.729	0.271	1.684	0.510
KW/spike	C	12_31467	1H	46.5	4.4	G	A	0.724	0.276	0.091	0.022
SPKL	C	SCRI_RS_151764	1H	46.5	4.7	T	C	0.729	0.271	-0.458	0.107
KN/spike	C	12_30683	1H	46.6	3.1	A	G	0.736	0.264	1.789	0.531
SPKL	C	12_30683	1H	46.6	4.4	A	G	0.736	0.264	-0.452	0.110
KN/spike	C	11_10933	1H	49.9	8.0	C	G	0.630	0.370	6.128	1.067
KN/spike	CD	11_10933	1H	49.9	3.7	C	G	0.630	0.370	2.598	0.699
TG%	C	SCRI_RS_14834	1H	49.9	3.4	A	T	0.695	0.305	-1.399	0.395
KN/spike	C	12_30478	1H	50.4	3.4	G	A	0.592	0.408	2.927	0.829
KN/spike	C	SCRI_RS_198546	1H	50.42	8.0	C	A	0.626	0.374	6.188	1.082
KN/spike	CD	SCRI_RS_198546	1H	50.42	3.8	C	A	0.626	0.374	2.647	0.706
KN/spike	C	SCRI_RS_167877	1H	50.8	3.1	A	G	0.580	0.420	3.045	0.913
NS%	CD	SCRI_RS_167877	1H	50.8	3.3	A	G	0.580	0.420	-2.660	0.761
KN/spike	C	SCRI_RS_182431	1H	54.4	4.6	G	A	0.614	0.386	3.927	0.928
KN/spike	C	SCRI_RS_236104	1H	54.5	5.4	G	A	0.623	0.377	4.266	0.920
KN/spike	C	SCRI_RS_130666	1H	54.9	4.6	C	A	0.614	0.386	3.927	0.928
TG%	C	SCRI_RS_145305	1H	54.9	3.7	C	A	0.557	0.443	-0.966	0.260
KN/spike	C	SCRI_RS_192779	1H	55.4	4.6	A	G	0.614	0.386	3.927	0.928
KN/spike	C	SCRI_RS_21483	1H	55.5	5.0	C	A	0.691	0.309	4.592	1.045
TG%	C	SCRI_RS_21483	1H	55.5	5.1	C	A	0.691	0.309	-1.789	0.401
TG%	CD	SCRI_RS_21483	1H	55.5	3.8	C	A	0.691	0.309	-2.076	0.549
KN/spike	C	11_20095	1H	55.9	3.1	G	A	0.756	0.244	1.668	0.498

KN/spike	C	SCRI_RS_133886	1H	62.3	5.0	C	T	0.625	0.375	4.394	0.996
KN/spike	CD	SCRI_RS_133886	1H	62.3	3.7	C	T	0.625	0.375	2.387	0.642
TG%	CD	SCRI_RS_133886	1H	62.3	4.9	C	T	0.625	0.375	-2.486	0.567
NS%	CD	SCRI_RS_133886	1H	62.3	4.0	C	T	0.625	0.375	-3.420	0.878
KN/spike	C	12_30298	1H	66.2	4.1	G	A	0.830	0.170	4.468	1.131
NS%	CD	12_30298	1H	66.2	3.3	G	A	0.830	0.170	-3.359	0.957
KN/spike	C	SCRI_RS_195238	1H	66.3	3.4	T	C	0.813	0.187	4.240	1.202
NS%	CD	SCRI_RS_195238	1H	66.3	4.0	T	C	0.813	0.187	-3.986	1.025
KN/spike	C	11_20290	1H	66.3	5.0	A	G	0.625	0.375	4.726	1.074
TG%	CD	11_20290	1H	66.3	6.3	A	G	0.625	0.375	-2.799	0.555
NS%	CD	11_20290	1H	66.3	5.6	A	G	0.625	0.375	-4.183	0.892
TG%	C	11_10686	1H	67.1	3.2	A	G	0.707	0.293	-1.378	0.401
TG%	CD	11_10686	1H	67.1	11.1	A	G	0.707	0.293	-2.872	0.421
NS%	CD	11_10686	1H	67.1	5.0	A	G	0.707	0.293	-3.136	0.714
TG%	C	11_20434	1H	81.7	3.3	T	A	0.615	0.385	-1.655	0.479
TG%	C	12_31160	1H	82.5	3.3	G	A	0.615	0.385	-1.655	0.479
TG%	C	SCRI_RS_181300	1H	86.5	4.1	A	G	0.661	0.339	-1.607	0.408
TG%	C	11_11277	1H	92.1	3.6	G	A	0.628	0.372	-1.706	0.466
KN/spike	C	SCRI_RS_194371	1H	92.2	5.2	C	T	0.650	0.350	4.580	1.019
KN/spike	CD	SCRI_RS_194371	1H	92.2	3.9	C	T	0.650	0.350	2.458	0.639
TG%	C	SCRI_RS_199689	1H	92.4	3.6	T	C	0.628	0.372	-1.706	0.466
NS%	CD	11_20153	1H	95.2	3.6	G	A	0.533	0.467	-2.269	0.616
NS%	CD	11_20125	1H	95.2	3.6	G	C	0.536	0.464	-2.272	0.620
TG%	C	12_30191	1H	97.7	4.1	A	G	0.764	0.236	-1.828	0.465
NS%	C	12_30191	1H	97.7	3.4	A	G	0.764	0.236	-2.552	0.717
KN/spike	C	11_10111	1H	97.9	3.0	A	G	0.890	0.110	3.737	1.132
TG%	C	SCRI_RS_216088	1H	122.2	4.4	T	C	0.709	0.291	-1.392	0.339
NS%	C	SCRI_RS_216088	1H	122.2	3.4	T	C	0.709	0.291	-1.746	0.492

KN/spike	C	SCRI_RS_130891	1H	128.2	3.1	T	C	0.880	0.120	2.999	0.897
KN/spike	C	12_10746	1H	132.5	3.6	G	A	0.772	0.228	4.298	1.182
TB	C	SCRI_RS_210172	2H	18.9	4.1	T	C	0.863	0.137	3.880	0.984
KN/spike	C	SCRI_RS_210172	2H	18.9	3.1	T	C	0.863	0.137	1.991	0.595
DTH	C	SCRI_RS_210172	2H	18.9	5.8	T	C	0.863	0.137	1.426	0.298
KW/spike	C	SCRI_RS_210172	2H	18.9	6.2	T	C	0.863	0.137	0.134	0.027
TKW	C	12_30871	2H	19.9	4.2	A	G	0.882	0.118	2.831	0.705
TKW	C	BK_12	2H	19.9	4.2	A	C	0.872	0.128	2.820	0.702
TKW	C	BK_16	2H	19.9	4.1	G	C	0.876	0.124	2.800	0.709
TKW	C	12_30872	2H	19.9	4.1	G	A	0.877	0.123	2.794	0.706
TKW	C	BK_14	2H	19.9	4.1	A	G	0.877	0.123	2.794	0.706
TKW	C	BK_15	2H	19.9	4.1	A	G	0.877	0.123	2.794	0.706
TG%	CD	SCRI_RS_170235	2H	56.2	3.8	A	G	0.750	0.250	-2.193	0.583
TG%	CD	SCRI_RS_194640	2H	56.5	3.5	T	A	0.753	0.247	-2.186	0.604
TG%	CD	11_20669	2H	56.5	3.6	G	A	0.751	0.249	-2.196	0.603
TG%	C	SCRI_RS_155067	2H	58.0	3.3	A	G	0.757	0.243	-1.617	0.465
TG%	C	SCRI_RS_134925	2H	58.0	5.2	T	C	0.753	0.247	-2.033	0.453
TG%	CD	SCRI_RS_157207	2H	58.0	3.3	G	T	0.749	0.251	-2.073	0.600
TG%	CD	SCRI_RS_155067	2H	58.0	4.1	A	G	0.757	0.243	-2.377	0.604
TG%	CD	SCRI_RS_134925	2H	58.0	4.0	T	C	0.753	0.247	-2.450	0.629
NS%	C	SCRI_RS_134925	2H	58.0	3.8	T	C	0.753	0.247	-2.794	0.743
TKW	C	12_20861	2H	58.1	4.0	A	G	0.885	0.115	2.501	0.647
TG%	CD	12_20861	2H	58.1	4.3	A	G	0.885	0.115	-2.032	0.501
TG%	C	SCRI_RS_151459	2H	58.1	3.6	A	G	0.750	0.250	-1.339	0.368
DTH	C	11_10191	2H	58.1	4.7	A	C	0.727	0.273	-2.200	0.516
TG%	C	SCRI_RS_186840	2H	58.6	6.1	G	A	0.772	0.228	-1.859	0.376
TG%	CD	SCRI_RS_240011	2H	58.6	3.2	C	A	0.739	0.261	-1.988	0.585
TG%	C	SCRI_RS_116920	2H	58.6	6.2	G	A	0.754	0.246	-2.153	0.432

NS%	C	SCRI_RS_186840	2H	58.6	3.9	G	A	0.772	0.228	-2.182	0.572
TG%	CD	SCRI_RS_116920	2H	58.6	4.9	G	A	0.754	0.246	-2.620	0.601
NS%	C	SCRI_RS_116920	2H	58.6	4.9	G	A	0.754	0.246	-3.079	0.706
KN/spike	C	12_21476	2H	58.8	3.1	C	A	0.830	0.170	8.076	2.404
SPKL	C	11_11430	2H	58.8	4.7	A	G	0.749	0.251	-0.835	0.197
TG%	C	11_11430	2H	58.8	4.7	A	G	0.749	0.251	-1.794	0.419
KN/spike	C	12_11316	2H	58.9	3.1	G	A	0.830	0.170	8.076	2.404
TG%	CD	SCRI_RS_135468	2H	58.9	3.5	A	C	0.753	0.247	-2.186	0.604
DTH	C	SCRI_RS_162700	2H	59.1	4.6	G	A	0.754	0.246	-1.881	0.447
TG%	CD	SCRI_RS_182959	2H	59.1	3.8	T	C	0.749	0.251	-2.202	0.582
GDD	C	SCRI_RS_162700	2H	59.1	5.6	G	A	0.754	0.246	-37.342	7.954
TG%	CD	SCRI_RS_12492	2H	59.4	3.1	A	G	0.724	0.276	-1.978	0.586
TKW	C	11_11206	2H	59.6	4.1	A	C	0.880	0.120	2.539	0.644
TG%	CD	11_11206	2H	59.6	4.0	A	C	0.880	0.120	-1.955	0.500
KN/spike	C	11_21078	2H	67.4	3.2	G	C	0.528	0.472	2.673	0.779
NS%	CD	SCRI_RS_207224	2H	67.5	4.3	T	C	0.739	0.261	-1.977	0.488
KN/spike	C	SCRI_RS_73	2H	67.9	8.2	A	G	0.627	0.373	5.468	0.939
KN/spike	C	SCRI_RS_221992	2H	67.9	3.4	C	T	0.536	0.464	2.698	0.768
KW/spike	C	SCRI_RS_73	2H	67.9	4.5	A	G	0.627	0.373	0.190	0.046
KN/spike	C	SCRI_RS_17898	2H	73.7	5.8	T	C	0.778	0.222	4.373	0.912
KN/spike	C	12_31293	2H	74.1	4.9	T	A	0.654	0.346	3.177	0.730
KN/spike	CD	12_31293	2H	74.1	3.7	T	A	0.654	0.346	1.580	0.426
KN/spike	C	SCRI_RS_156323	2H	74.4	6.5	C	G	0.563	0.437	3.754	0.734
TKW	C	SCRI_RS_156323	2H	74.4	3.6	C	G	0.563	0.437	-2.419	0.656
KN/spike	C	SCRI_RS_2961	2H	74.4	17.7	C	T	0.687	0.313	8.559	0.977
TB	C	SCRI_RS_2961	2H	74.4	4.5	C	T	0.687	0.313	8.415	2.011
TB	CD	SCRI_RS_2961	2H	74.4	4.5	C	T	0.687	0.313	4.281	1.033
KN/spike	CD	SCRI_RS_2961	2H	74.4	8.8	C	T	0.687	0.313	3.244	0.537

KW/spike	C	SCRI_RS_2961	2H	74.4	6.9	C	T	0.687	0.313	0.283	0.054
TG%	CD	SCRI_RS_2961	2H	74.4	7.2	C	T	0.687	0.313	-2.800	0.519
NS%	CD	SCRI_RS_2961	2H	74.4	6.6	C	T	0.687	0.313	-3.703	0.715
KN/spike	C	SCRI_RS_129857	2H	75.2	3.2	G	A	0.516	0.484	2.843	0.837
KN/spike	C	SCRI_RS_166540	2H	75.6	12.2	G	A	0.656	0.344	5.618	0.780
KN/spike	C	SCRI_RS_154398	2H	75.6	5.6	T	C	0.565	0.435	4.205	0.890
KN/spike	CD	SCRI_RS_166540	2H	75.6	9.4	G	A	0.656	0.344	2.812	0.451
KN/spike	C	SCRI_RS_134812	2H	75.6	3.6	A	G	0.744	0.256	2.059	0.561
TKW	C	SCRI_RS_157347	2H	75.6	3.6	C	G	0.779	0.221	-2.091	0.567
NS%	CD	SCRI_RS_157347	2H	75.6	4.3	C	G	0.779	0.221	-2.421	0.600
TKW	C	SCRI_RS_166540	2H	75.6	5.5	G	A	0.656	0.344	-3.596	0.770
KN/spike	C	SCRI_RS_200291	2H	76.1	5.0	A	G	0.576	0.424	3.703	0.837
TKW	C	SCRI_RS_200291	2H	76.1	3.8	A	G	0.576	0.424	-2.808	0.747
TB	C	SCRI_RS_235860	2H	76.2	6.2	G	A	0.657	0.343	6.912	1.391
KN/spike	C	SCRI_RS_235860	2H	76.2	14.0	G	A	0.657	0.343	5.743	0.743
TB	CD	SCRI_RS_235860	2H	76.2	5.3	G	A	0.657	0.343	3.873	0.851
KN/spike	CD	SCRI_RS_235860	2H	76.2	9.3	G	A	0.657	0.343	3.056	0.491
KW/spike	C	SCRI_RS_235860	2H	76.2	8.0	G	A	0.657	0.343	0.211	0.037
KN/spike	C	SCRI_RS_4930	2H	76.6	6.3	C	T	0.757	0.243	4.108	0.821
KN/spike	C	12_30897	2H	79.4	7.4	A	G	0.667	0.333	4.564	0.830
KN/spike	C	12_30896	2H	79.4	4.3	G	A	0.693	0.307	3.969	0.975
KN/spike	C	11_20340	2H	79.9	5.9	C	A	0.694	0.306	4.471	0.925
KN/spike	C	SCRI_RS_91810	2H	79.9	3.8	T	C	0.525	0.475	2.791	0.744
KN/spike	C	SCRI_RS_196853	2H	80.0	7.4	T	A	0.667	0.333	4.564	0.830
KN/spike	C	SCRI_RS_88704	2H	80.0	7.5	T	C	0.672	0.328	4.509	0.813
KN/spike	C	11_10287	2H	80.0	4.7	G	A	0.531	0.469	3.125	0.735
KN/spike	CD	11_10287	2H	80.0	3.8	G	A	0.531	0.469	1.737	0.462
KW/spike	C	SCRI_RS_88704	2H	80.0	3.9	T	C	0.672	0.328	0.148	0.039

KN/spike	C	SCRI_RS_137263	2H	80.2	4.7	A	G	0.531	0.469	3.125	0.735
KN/spike	CD	SCRI_RS_137263	2H	80.2	3.8	A	G	0.531	0.469	1.737	0.462
KN/spike	CD	11_11307	2H	91.0	6.5	A	G	0.641	0.359	2.213	0.433
KN/spike	C	11_10398	2H	91.2	4.0	A	C	0.869	0.131	3.692	0.944
KN/spike	C	SCRI_RS_142188	2H	94.4	6.8	A	G	0.636	0.364	4.785	0.909
KN/spike	CD	SCRI_RS_142188	2H	94.4	4.5	A	G	0.636	0.364	2.277	0.549
KN/spike	C	SCRI_RS_135355	2H	94.5	4.7	A	C	0.637	0.363	2.963	0.694
KN/spike	C	SCRI_RS_196842	2H	94.6	7.1	A	G	0.641	0.359	4.726	0.879
KN/spike	CD	SCRI_RS_196842	2H	94.6	4.8	A	G	0.641	0.359	2.300	0.536
KN/spike	C	11_10900	2H	94.7	5.2	A	G	0.720	0.280	3.781	0.839
KN/spike	C	SCRI_RS_187700	2H	98.7	4.5	T	C	0.896	0.104	3.816	0.916
KN/spike	C	SCRI_RS_128484	2H	108.0	5.0	T	C	0.593	0.407	3.642	0.825
KN/spike	C	SCRI_RS_164608	2H	111.1	3.0	A	G	0.541	0.459	2.871	0.872
KN/spike	C	SCRI_RS_12444	2H	111.3	3.0	T	C	0.541	0.459	2.871	0.872
KN/spike	C	SCRI_RS_157504	2H	119.8	3.5	C	T	0.672	0.328	3.517	0.982
KN/spike	C	SCRI_RS_119426	2H	119.8	3.0	T	C	0.678	0.322	2.546	0.773
TG%	C	SCRI_RS_119513	2H	120.0	5.3	T	C	0.728	0.272	-1.742	0.382
NS%	C	SCRI_RS_119513	2H	120.0	3.5	T	C	0.728	0.272	-2.257	0.627
KN/spike	C	SCRI_RS_194202	2H	120.7	3.1	G	A	0.687	0.313	2.899	0.860
KN/spike	C	12_30352	2H	130.3	3.4	A	G	0.676	0.324	2.932	0.835
KN/spike	C	SCRI_RS_13322	2H	131.0	3.3	T	C	0.680	0.320	2.930	0.837
KN/spike	C	11_10826	2H	132.2	3.4	A	C	0.676	0.324	2.932	0.835
KN/spike	C	12_31209	2H	132.2	3.4	A	G	0.676	0.324	2.932	0.835
KN/spike	C	SCRI_RS_230951	2H	132.6	3.2	T	C	0.657	0.343	2.715	0.792
KN/spike	C	SCRI_RS_740	2H	132.6	3.2	C	T	0.657	0.343	2.715	0.792
TKW	C	SCRI_RS_226193	2H	133.3	3.7	C	T	0.678	0.322	-2.200	0.593
TG%	C	SCRI_RS_114969	2H	135.0	3.6	T	C	0.742	0.258	-1.508	0.411
KN/spike	C	SCRI_RS_204274	2H	136.4	3.5	T	C	0.717	0.283	2.159	0.602

TG%	C	12_21496	2H	147.3	4.9	A	G	0.856	0.144	-1.442	0.329
NS%	C	12_21496	2H	147.3	4.2	A	G	0.856	0.144	-1.830	0.455
NS%	CD	12_21496	2H	147.3	3.4	A	G	0.856	0.144	-2.040	0.575
NS%	CD	SCRI_RS_13386	2H	148.2	3.4	C	T	0.740	0.260	1.616	0.456
KN/spike	C	SCRI_RS_196748	2H	148.2	3.7	C	T	0.651	0.349	1.565	0.424
TG%	CD	SCRI_RS_13386	2H	148.2	4.0	C	T	0.740	0.260	1.341	0.345
KN/spike	C	12_31230	3H	3.3	3.5	G	A	0.703	0.297	-1.940	0.536
TB	C	12_31230	3H	3.3	3.9	G	A	0.703	0.297	-3.472	0.903
TG%	C	11_11502	3H	50.7	5.2	C	A	0.676	0.324	-1.706	0.377
TG%	C	12_31008	3H	50.7	5.5	C	A	0.740	0.260	-1.778	0.380
NS%	C	11_11502	3H	50.7	3.9	C	A	0.676	0.324	-2.356	0.615
TG%	CD	12_31008	3H	50.7	7.3	C	A	0.740	0.260	-2.620	0.481
KN/spike	C	12_30002	3H	51.8	4.1	A	C	0.718	0.282	3.494	0.890
HI	CD	SCRI_RS_150883	3H	51.8	5.1	T	C	0.876	0.124	3.080	0.690
TKW	CD	12_30002	3H	51.8	5.4	A	C	0.718	0.282	-3.107	0.674
KN/spike	CD	12_30754	3H	62.3	3.8	G	A	0.644	0.356	1.540	0.410
KN/spike	C	SCRI_RS_155763	3H	75.2	4.1	A	G	0.654	0.346	3.171	0.800
TG%	CD	SCRI_RS_155763	3H	75.2	3.8	A	G	0.654	0.346	-1.875	0.494
NS%	CD	SCRI_RS_155763	3H	75.2	4.2	A	G	0.654	0.346	-2.701	0.672
TG%	CD	11_21438	3H	86.2	3.9	G	C	0.682	0.318	-1.859	0.488
NS%	CD	11_21438	3H	86.2	5.1	G	C	0.682	0.318	-2.990	0.667
TG%	CD	11_20999	3H	86.3	3.5	A	G	0.680	0.320	-1.716	0.476
TG%	CD	SCRI_RS_166119	3H	86.3	3.5	C	T	0.680	0.320	-1.716	0.476
NS%	CD	11_20999	3H	86.3	5.2	A	G	0.680	0.320	-2.854	0.635
NS%	CD	SCRI_RS_166119	3H	86.3	5.2	C	T	0.680	0.320	-2.854	0.635
KW/spike	CD	11_20626	3H	88.2	4.0	A	G	0.878	0.122	-0.078	0.020
KW/spike	C	11_20626	3H	88.2	4.3	A	G	0.878	0.122	-0.132	0.033
TKW	C	11_20626	3H	88.2	4.2	A	G	0.878	0.122	-2.518	0.626

TG%	CD	11_20626	3H	88.2	6.0	A	G	0.878	0.122	-2.538	0.521
NS%	CD	11_20626	3H	88.2	8.5	A	G	0.878	0.122	-3.909	0.661
TG%	CD	SCRI_RS_162929	3H	90.0	3.5	T	C	0.621	0.379	-1.711	0.473
TG%	CD	SCRI_RS_229593	3H	90.2	3.8	G	A	0.645	0.355	-1.756	0.468
TG%	CD	SCRI_RS_3125	3H	90.2	19.9	A	G	0.670	0.330	-3.201	0.343
NS%	CD	SCRI_RS_3125	3H	90.2	7.5	A	G	0.670	0.330	-3.257	0.591
NS%	CD	SCRI_RS_3125	3H	90.2	4.6	A	G	0.670	0.330	-3.279	0.778
TG%	C	SCRI_RS_80331	3H	90.2	4.5	C	T	0.707	0.293	-1.592	0.382
TG%	CD	SCRI_RS_161385	3H	90.2	3.7	T	C	0.617	0.383	-1.834	0.491
TG%	C	SCRI_RS_158070	3H	90.2	6.8	T	C	0.680	0.320	-1.926	0.366
NS%	C	SCRI_RS_158070	3H	90.2	4.0	T	C	0.680	0.320	-2.426	0.623
TG%	CD	SCRI_RS_80331	3H	90.2	7.0	C	T	0.707	0.293	-2.528	0.474
TG%	CD	SCRI_RS_158070	3H	90.2	7.5	T	C	0.680	0.320	-2.677	0.485
NS%	CD	SCRI_RS_80331	3H	90.2	4.3	C	T	0.707	0.293	-3.027	0.744
NS%	CD	SCRI_RS_158070	3H	90.2	4.0	T	C	0.680	0.320	-3.119	0.800
TG%	CD	11_21493	3H	90.3	3.7	A	G	0.721	0.279	-1.880	0.505
TG%	CD	SCRI_RS_228486	3H	90.4	4.1	A	G	0.698	0.302	-1.985	0.506
TG%	C	11_21495	3H	90.7	7.9	T	A	0.699	0.301	-1.979	0.348
NS%	C	11_21495	3H	90.7	3.6	T	A	0.699	0.301	-2.298	0.628
TG%	CD	11_21495	3H	90.7	7.1	T	A	0.699	0.301	-2.580	0.480
NS%	CD	11_21495	3H	90.7	4.1	T	A	0.699	0.301	-3.116	0.793
KN/spike	C	12_11154	3H	123.2	3.7	A	G	0.551	0.449	3.099	0.829
TG%	C	12_31473	3H	132.7	4.2	G	A	0.798	0.202	-1.770	0.443
NS%	C	12_31473	3H	132.7	3.6	G	A	0.798	0.202	-2.308	0.635
KW/spike	C	SCRI_RS_206483	3H	142.6	4.7	T	C	0.863	0.137	-0.163	0.038
KW/spike	CD	12_30960	3H	142.9	5.0	G	A	0.688	0.312	-0.062	0.014
KW/spike	CD	SCRI_RS_130177	3H	142.9	5.0	G	A	0.688	0.312	-0.062	0.014
KW/spike	CD	SCRI_RS_188420	3H	143.9	4.2	G	T	0.891	0.109	0.083	0.021

TB	C	12_10981	3H	154.2	4.0	A	C	0.880	0.120	5.315	1.360
KW/spike	C	12_10981	3H	154.2	4.0	A	C	0.880	0.120	0.143	0.037
KW/spike	CD	12_10981	3H	154.2	3.8	A	C	0.880	0.120	0.082	0.022
KN/spike	C	11_11199	4H	20.9	3.5	A	G	0.824	0.176	9.454	2.644
KN/spike	C	11_20606	4H	25.7	12.9	C	G	0.621	0.379	7.563	1.019
KN/spike	CD	11_20606	4H	25.7	5.5	C	G	0.621	0.379	3.002	0.645
KW/spike	C	11_20606	4H	25.7	5.0	C	G	0.621	0.379	0.236	0.054
TG%	CD	11_20606	4H	25.7	7.5	C	G	0.621	0.379	-2.958	0.533
NS%	CD	11_20606	4H	25.7	6.8	C	G	0.621	0.379	-4.173	0.796
KN/spike	C	11_20422	4H	25.9	11.9	C	G	0.654	0.346	5.706	0.805
KN/spike	CD	11_20422	4H	25.9	4.3	C	G	0.654	0.346	2.158	0.536
KW/spike	C	11_20422	4H	25.9	4.6	C	G	0.654	0.346	0.177	0.042
KN/spike	C	11_20680	4H	25.9	9.5	G	A	0.862	0.138	5.352	0.853
KW/spike	C	11_20680	4H	25.9	4.8	G	A	0.862	0.138	0.185	0.043
KN/spike	C	11_21418	4H	26.3	4.6	G	A	0.861	0.139	3.538	0.837
TG%	CD	11_21418	4H	26.3	3.3	G	A	0.861	0.139	-1.946	0.561
NS%	CD	11_21418	4H	26.3	3.5	G	A	0.861	0.139	-2.697	0.752
KN/spike	C	11_21070	4H	26.4	10.2	A	C	0.661	0.339	5.729	0.875
KW/spike	C	11_21070	4H	26.4	4.0	A	C	0.661	0.339	0.176	0.045
NS%	CD	11_21070	4H	26.4	3.5	A	C	0.661	0.339	-2.898	0.808
KN/spike	C	11_21122	4H	35.9	4.5	G	A	0.508	0.492	-2.910	0.701
KN/spike	C	SCRI_RS_209362	4H	35.9	4.5	A	G	0.506	0.494	-2.924	0.702
KN/spike	C	SCRI_RS_145412	4H	40.0	4.0	C	T	0.533	0.467	3.463	0.895
KN/spike	C	11_20012	4H	43.3	4.2	G	A	0.610	0.390	2.936	0.733
KN/spike	C	SCRI_RS_220122	4H	43.5	3.8	T	C	0.596	0.404	2.911	0.774
KN/spike	C	11_10881	4H	53.9	4.5	G	A	0.839	0.161	3.971	0.952
KN/spike	C	11_20610	4H	53.9	3.9	C	G	0.775	0.225	2.519	0.658
KN/spike	C	SCRI_RS_14612	4H	54.5	4.7	C	T	0.826	0.174	4.128	0.971

KN/spike	C	SCRI_RS_133147	4H	54.6	9.7	G	A	0.830	0.170	7.615	1.197
KN/spike	C	SCRI_RS_168496	4H	54.6	3.9	T	A	0.531	0.469	2.938	0.765
KN/spike	CD	SCRI_RS_133147	4H	54.6	4.5	G	A	0.830	0.170	2.891	0.698
KN/spike	C	11_10527	4H	54.6	3.9	G	A	0.606	0.394	2.876	0.754
KN/spike	C	SCRI_RS_228477	4H	54.6	3.7	A	G	0.520	0.480	2.856	0.768
KW/spike	C	SCRI_RS_133147	4H	54.6	3.9	G	A	0.830	0.170	0.228	0.059
KN/spike	C	12_31462	4H	54.8	4.4	G	C	0.528	0.472	2.987	0.729
KN/spike	C	SCRI_RS_182555	4H	56.2	5.1	T	C	0.762	0.238	3.922	0.877
KN/spike	C	SCRI_RS_13552	4H	56.2	4.3	T	C	0.762	0.238	3.483	0.855
KN/spike	C	SCRI_RS_164698	4H	56.2	4.3	A	G	0.762	0.238	3.483	0.855
KN/spike	C	SCRI_RS_148130	4H	56.4	4.3	T	G	0.762	0.238	3.483	0.855
KN/spike	C	SCRI_RS_150615	4H	56.6	4.3	T	G	0.762	0.238	3.483	0.855
KN/spike	C	12_30906	4H	59.5	3.1	G	A	0.667	0.333	-1.873	0.561
TKW	C	11_10309	4H	73.6	6.4	A	G	0.816	0.184	2.525	0.497
TG%	CD	SCRI_RS_181725	4H	78.7	4.1	A	G	0.841	0.159	-1.565	0.399
NS%	CD	SCRI_RS_181725	4H	78.7	3.4	A	G	0.841	0.159	-1.848	0.525
KW/spike	CD	11_20762	4H	98.9	4.6	C	G	0.617	0.383	0.075	0.018
KW/spike	CD	12_10666	4H	99.4	4.6	G	A	0.617	0.383	0.075	0.018
TB	C	SCRI_RS_217794	4H	103.9	5.1	C	T	0.520	0.480	4.102	0.917
TB	CD	SCRI_RS_217794	4H	103.9	4.5	C	T	0.520	0.480	2.500	0.598
TG%	CD	SCRI_RS_192456	4H	111.3	3.7	C	T	0.844	0.156	-1.596	0.431
NS%	CD	SCRI_RS_192456	4H	111.3	3.9	C	T	0.844	0.156	-2.146	0.561
KN/spike	C	11_20553	5H	0.1	6.9	G	A	0.648	0.352	4.213	0.799
KN/spike	CD	11_20553	5H	0.1	5.2	G	A	0.648	0.352	2.376	0.527
TG%	CD	11_20553	5H	0.1	3.7	G	A	0.648	0.352	-2.006	0.540
TKW	C	11_20553	5H	0.1	3.8	G	A	0.648	0.352	-2.922	0.770
TG%	CD	12_30976	5H	1.6	4.2	G	A	0.791	0.209	-1.870	0.467
TG%	CD	12_30979	5H	1.6	4.0	C	G	0.780	0.220	-1.796	0.464

NS%	CD	12_30979	5H	1.6	3.6	C	G	0.780	0.220	-2.287	0.625
TG%	C	SCRI_RS_89108	5H	41.8	3.3	C	T	0.862	0.138	-1.295	0.373
KN/spike	C	SCRI_RS_229980	5H	44.2	3.2	G	A	0.886	0.114	3.046	0.893
KN/spike	C	SCRI_RS_211940	5H	45.1	3.0	G	A	0.669	0.331	2.595	0.782
TG%	CD	12_31033	5H	48.4	3.5	A	G	0.775	0.225	-2.236	0.621
NS%	CD	12_31033	5H	48.4	3.9	A	G	0.775	0.225	-3.252	0.854
TG%	C	11_11159	5H	50.4	4.1	A	G	0.738	0.262	-1.698	0.431
NS%	C	11_11159	5H	50.4	4.1	A	G	0.738	0.262	-2.556	0.652
KN/spike	C	12_11472	5H	120.1	3.1	A	C	0.830	0.170	8.045	2.408
SPKL	C	12_30067	5H	120.4	5.2	G	A	0.788	0.212	-0.740	0.165
SPKL	C	SCRI_RS_202774	5H	121.3	5.1	G	A	0.792	0.208	-0.744	0.166
SPKL	C	11_20298	5H	122.4	4.8	G	A	0.583	0.417	-0.669	0.155
TG%	CD	SCRI_RS_185613	5H	131.7	3.3	G	T	0.727	0.273	-1.177	0.337
TG%	CD	SCRI_RS_168544	5H	131.7	4.5	A	C	0.874	0.126	-1.973	0.474
TG%	CD	SCRI_RS_175848	5H	131.7	4.5	C	G	0.874	0.126	-1.973	0.474
TG%	CD	SCRI_RS_230112	5H	131.9	4.5	A	G	0.874	0.126	-1.973	0.474
TG%	CD	SCRI_RS_4658	5H	134.3	3.9	G	A	0.890	0.110	-1.849	0.482
KN/spike	C	SCRI_RS_167592	5H	134.7	3.6	G	T	0.758	0.242	2.158	0.588
KN/spike	C	SCRI_RS_105705	5H	135.8	3.3	G	A	0.793	0.207	2.003	0.580
KN/spike	C	SCRI_RS_165290	5H	155.6	4.1	G	A	0.788	0.212	3.929	1.002
NS%	CD	SCRI_RS_190416	5H	164.7	3.5	C	A	0.726	0.274	1.613	0.445
TG%	CD	SCRI_RS_190416	5H	164.7	4.5	C	A	0.726	0.274	1.392	0.335
TG%	C	SCRI_RS_10702	5H	168.9	3.7	C	T	0.728	0.272	-1.487	0.399
TG%	C	12_30382	5H	168.9	4.8	A	C	0.717	0.283	-1.624	0.378
TG%	CD	12_30382	5H	168.9	3.4	A	C	0.717	0.283	-1.853	0.523
TG%	CD	SCRI_RS_10702	5H	168.9	3.8	C	T	0.728	0.272	-2.037	0.536
NS%	C	12_30382	5H	168.9	4.5	A	C	0.717	0.283	-2.322	0.557
TKW	C	SCRI_RS_231003	6H	10.4	3.7	A	C	0.663	0.337	-2.001	0.541

TKW	C	SCRI_RS_159124	6H	10.6	4.5	T	A	0.560	0.440	-2.024	0.485
TG%	CD	11_20415	6H	15.2	3.6	A	G	0.834	0.166	-1.617	0.445
NS%	CD	11_20415	6H	15.2	3.9	A	G	0.834	0.166	-2.221	0.582
KN/spike	C	11_10064	6H	17.7	7.1	A	G	0.837	0.163	4.503	0.841
TG%	CD	SCRI_RS_222092	6H	28.5	6.4	C	T	0.798	0.202	-2.166	0.429
NS%	CD	SCRI_RS_222092	6H	28.5	3.6	C	T	0.798	0.202	-2.193	0.602
KN/spike	C	12_30697	6H	30.0	3.0	A	C	0.825	0.175	2.148	0.651
TB	C	12_30673	6H	30.1	3.9	A	G	0.682	0.318	5.159	1.344
KN/spike	C	12_30673	6H	30.1	5.7	A	G	0.682	0.318	4.007	0.844
KN/spike	C	12_31308	6H	30.2	4.0	G	C	0.698	0.302	3.165	0.817
TB	C	SCRI_RS_130732	6H	53.3	4.3	T	C	0.511	0.489	4.534	1.114
KW/spike	C	SCRI_RS_130732	6H	53.3	4.4	T	C	0.511	0.489	0.124	0.030
KW/spike	CD	SCRI_RS_130732	6H	53.3	4.0	T	C	0.511	0.489	0.062	0.016
TB	C	12_11353	6H	54.8	5.6	G	A	0.834	0.166	6.405	1.365
KN/spike	C	12_11353	6H	54.8	3.3	G	A	0.834	0.166	2.814	0.807
KW/spike	C	12_11353	6H	54.8	6.1	G	A	0.834	0.166	0.184	0.037
KW/spike	CD	12_11353	6H	54.8	3.6	G	A	0.834	0.166	0.086	0.024
KW/spike	C	12_10348	6H	66.1	3.8	A	T	0.838	0.162	0.099	0.026
KN/spike	C	SCRI_RS_232698	6H	118.4	4.5	A	G	0.674	0.326	2.577	0.621
KN/spike	C	SCRI_RS_175756	7H	3.8	4.7	G	T	0.713	0.287	2.452	0.575
KN/spike	C	SCRI_RS_42792	7H	3.8	4.6	C	T	0.849	0.151	2.142	0.508
KN/spike	C	11_20495	7H	20.4	3.1	G	C	0.815	0.185	3.551	1.065
KN/spike	C	SCRI_RS_148318	7H	21.4	4.2	G	A	0.626	0.374	3.315	0.824
TG%	CD	SCRI_RS_148318	7H	21.4	5.2	G	A	0.626	0.374	-2.125	0.468
NS%	CD	SCRI_RS_148318	7H	21.4	3.5	G	A	0.626	0.374	-2.408	0.674
TG%	CD	SCRI_RS_208770	7H	44.0	3.9	A	G	0.656	0.344	-1.825	0.479
TG%	CD	SCRI_RS_157020	7H	48.3	3.2	T	C	0.546	0.454	-1.323	0.389
TG%	CD	SCRI_RS_164730	7H	48.7	3.9	T	C	0.547	0.453	-1.461	0.381

NS%	CD	SCRI_RS_137626	7H	52.0	4.3	A	C	0.818	0.182	-2.932	0.724
KN/spike	C	12_30149	7H	62.0	3.6	C	A	0.674	0.326	1.895	0.515
SPKL	C	SCRI_RS_129757	7H	70.2	4.3	T	C	0.819	0.181	-0.893	0.221
TB	C	11_11291	7H	70.5	4.4	C	A	0.725	0.275	4.126	1.010
TKW	C	11_11291	7H	70.5	4.3	C	A	0.725	0.275	2.180	0.539
KW/spike	C	11_11291	7H	70.5	5.0	C	A	0.725	0.275	0.121	0.027
KW/spike	CD	SCRI_RS_141164	7H	70.5	4.6	C	A	0.672	0.328	0.088	0.021
KW/spike	CD	12_30486	7H	70.5	4.5	G	A	0.674	0.326	0.087	0.021
KW/spike	CD	SCRI_RS_132879	7H	70.5	4.5	T	C	0.674	0.326	0.087	0.021
KW/spike	CD	12_31227	7H	70.5	4.1	A	C	0.665	0.335	0.082	0.021
TG%	C	12_31227	7H	70.5	3.9	A	C	0.665	0.335	-1.490	0.388
TG%	C	SCRI_RS_164251	7H	70.5	5.9	A	G	0.723	0.277	-1.662	0.344
TG%	C	12_30486	7H	70.5	5.9	G	A	0.674	0.326	-1.829	0.377
TG%	C	SCRI_RS_132879	7H	70.5	5.9	T	C	0.674	0.326	-1.829	0.377
TG%	C	SCRI_RS_141164	7H	70.5	5.9	C	A	0.672	0.328	-1.832	0.378
NS%	C	SCRI_RS_164251	7H	70.5	4.2	A	G	0.723	0.277	-2.137	0.537
NS%	C	12_30486	7H	70.5	4.0	G	A	0.674	0.326	-2.296	0.587
NS%	C	SCRI_RS_132879	7H	70.5	4.0	T	C	0.674	0.326	-2.296	0.587
NS%	C	SCRI_RS_141164	7H	70.5	4.0	C	A	0.672	0.328	-2.298	0.588
TG%	C	SCRI_RS_66459	7H	70.6	5.5	C	T	0.659	0.341	-1.818	0.389
NS%	C	SCRI_RS_66459	7H	70.6	3.5	C	T	0.659	0.341	-2.188	0.610
TB	C	12_31140	7H	70.6	5.6	A	C	0.777	0.223	5.058	1.076
TKW	C	12_31140	7H	70.6	5.0	A	C	0.777	0.223	2.554	0.580
KW/spike	C	12_31140	7H	70.6	6.4	A	C	0.777	0.223	0.148	0.029
KW/spike	CD	SCRI_RS_177060	7H	70.6	4.6	G	A	0.672	0.328	0.088	0.021
KW/spike	CD	SCRI_RS_134797	7H	70.6	4.5	G	A	0.674	0.326	0.087	0.021
TG%	C	SCRI_RS_135346	7H	70.6	5.7	T	C	0.719	0.281	-1.638	0.343
TG%	C	12_30794	7H	70.6	5.7	A	G	0.719	0.281	-1.638	0.343

TG%	C	11_10924	7H	70.6	5.9	G	A	0.723	0.277	-1.662	0.344
TG%	C	SCRI_RS_133777	7H	70.6	5.0	G	A	0.772	0.228	-1.663	0.378
TG%	C	SCRI_RS_134797	7H	70.6	5.9	G	A	0.674	0.326	-1.829	0.377
TG%	C	SCRI_RS_177060	7H	70.6	5.9	G	A	0.672	0.328	-1.832	0.378
TG%	C	SCRI_RS_237881	7H	70.6	5.7	C	T	0.672	0.328	-1.845	0.389
TG%	C	SCRI_RS_228070	7H	70.6	5.7	T	C	0.672	0.328	-1.845	0.389
NS%	C	SCRI_RS_135346	7H	70.6	4.1	T	C	0.719	0.281	-2.101	0.535
NS%	C	12_30794	7H	70.6	4.1	A	G	0.719	0.281	-2.101	0.535
NS%	C	11_10924	7H	70.6	4.2	G	A	0.723	0.277	-2.137	0.537
NS%	C	SCRI_RS_237881	7H	70.6	3.6	C	T	0.672	0.328	-2.232	0.608
NS%	C	SCRI_RS_228070	7H	70.6	3.6	T	C	0.672	0.328	-2.232	0.608
NS%	C	SCRI_RS_134797	7H	70.6	4.0	G	A	0.674	0.326	-2.296	0.587
NS%	C	SCRI_RS_177060	7H	70.6	4.0	G	A	0.672	0.328	-2.298	0.588
KW/spike	CD	SCRI_RS_115208	7H	70.7	4.6	G	A	0.670	0.330	0.089	0.021
KW/spike	CD	SCRI_RS_188905	7H	70.7	4.6	C	T	0.670	0.330	0.089	0.021
KW/spike	CD	12_30053	7H	70.7	4.5	G	A	0.674	0.326	0.087	0.021
KW/spike	CD	SCRI_RS_13927	7H	70.7	4.6	A	C	0.670	0.330	0.087	0.021
KW/spike	CD	11_10394	7H	70.7	4.2	G	C	0.678	0.322	0.080	0.020
TG%	C	11_10394	7H	70.7	5.0	G	C	0.678	0.322	-1.622	0.368
TG%	C	12_30053	7H	70.7	5.9	G	A	0.674	0.326	-1.829	0.377
TG%	C	SCRI_RS_115208	7H	70.7	5.9	G	A	0.670	0.330	-1.834	0.379
TG%	C	SCRI_RS_188905	7H	70.7	5.9	C	T	0.670	0.330	-1.834	0.379
TG%	C	SCRI_RS_13927	7H	70.7	6.0	A	C	0.670	0.330	-1.836	0.376
NS%	C	12_30053	7H	70.7	4.0	G	A	0.674	0.326	-2.296	0.587
NS%	C	SCRI_RS_115208	7H	70.7	4.0	G	A	0.670	0.330	-2.297	0.589
NS%	C	SCRI_RS_188905	7H	70.7	4.0	C	T	0.670	0.330	-2.297	0.589
NS%	C	SCRI_RS_13927	7H	70.7	4.1	A	C	0.670	0.330	-2.305	0.586
KW/spike	CD	SCRI_RS_148407	7H	70.7	4.6	T	C	0.672	0.328	0.088	0.021

KW/spike	CD	12_30544	7H	70.7	4.5	G	A	0.674	0.326	0.087	0.021
KW/spike	CD	SCRI_RS_185707	7H	70.7	4.5	A	G	0.674	0.326	0.087	0.021
KW/spike	CD	SCRI_RS_189067	7H	70.7	4.2	G	A	0.676	0.324	0.079	0.020
TG%	C	SCRI_RS_189067	7H	70.7	4.9	G	A	0.676	0.324	-1.617	0.369
TG%	C	12_30544	7H	70.7	5.9	G	A	0.674	0.326	-1.829	0.377
TG%	C	SCRI_RS_185707	7H	70.7	5.9	A	G	0.674	0.326	-1.829	0.377
TG%	C	SCRI_RS_148407	7H	70.7	5.9	T	C	0.672	0.328	-1.832	0.378
NS%	C	12_30544	7H	70.7	4.0	G	A	0.674	0.326	-2.296	0.587
NS%	C	SCRI_RS_185707	7H	70.7	4.0	A	G	0.674	0.326	-2.296	0.587
NS%	C	SCRI_RS_148407	7H	70.7	4.0	T	C	0.672	0.328	-2.298	0.588
KW/spike	CD	12_10222	7H	70.8	4.5	C	G	0.674	0.326	0.087	0.021
TG%	C	12_10222	7H	70.8	5.9	C	G	0.674	0.326	-1.829	0.377
NS%	C	12_10222	7H	70.8	4.0	C	G	0.674	0.326	-2.296	0.587
TB	C	11_10773	7H	71.0	4.2	G	A	0.720	0.280	4.107	1.024
TKW	C	11_10773	7H	71.0	4.3	G	A	0.720	0.280	2.218	0.548
KW/spike	C	11_10773	7H	71.0	4.9	G	A	0.720	0.280	0.122	0.028
KW/spike	C	11_10115	7H	71.0	4.4	C	A	0.751	0.249	-0.124	0.030
TG%	C	12_30600	7H	71.0	5.0	A	C	0.772	0.228	-1.663	0.378
KN/spike	C	12_31211	7H	72.5	4.0	G	A	0.509	0.491	2.092	0.542
TG%	CD	12_30996	7H	78.1	6.8	G	A	0.801	0.199	-3.250	0.619
NS%	CD	12_30996	7H	78.1	5.1	G	A	0.801	0.199	-4.018	0.901
PH	C	SCRI_RS_163463	7H	109.7	4.7	C	T	0.888	0.112	-4.186	0.978
NS%	CD	SCRI_RS_196031	7H	119.8	3.6	A	G	0.770	0.230	-2.946	0.808
NS%	CD	11_21209	7H	120.4	3.7	G	A	0.772	0.228	-2.958	0.801

Table S10 Co-localize candidate genes with significant marker-trait associations for traits under control (C) and chemical desiccation (CD) treatments at post anthesis drought stress experiment. SNPs were located within the physical position of the candidate genes.

Trait	Chromosome	Locus Name	Position (cM)	iSelect Marker	Gene Name	Locus Length (bp)	SNP Position (AGP) bp	AGP Start	AGP End	Confidence	Annotation	GO Terms
TG%_C,CD; KN/spike_C,CD	1H	11_10933	49.86	BOPA1_7800_594	HORVU1Hr1G051470.3	121	381326003	381324749	381328658	HC_G	S-adenosyl-L-methionine-dependent methyltransferases superfamily protein	GO:0008168
TG%_C,CD; KN/spike_C,CD	1H	SCRI_RS_198546	50.42	SCRI_RS_198546	HORVU1Hr1G051660.8	61	383207519	383207142	383217745	HC_G	MADS-box transcription factor 56	GO:0003677, GO:0046983
TG%_C,CD	1H	SCRI_RS_21483	55.5	SCRI_RS_21483	HORVU1Hr1G058500.1	23	427145216	427144050	427145261	HC_G	Histone H2B.1	GO:0000786, GO:0003677, GO:0046982
TG%_C,CD	1H	SCRI_RS_199689	92.35	SCRI_RS_199689	HORVU1Hr1G076110.4	61	513210386	513207370	513211200	HC_G	Protein kinase superfamily protein	GO:0004672, GO:0005524, GO:0006468
TG% C_CD; NS%_CD	1H	11_10686	67.1	BOPA1_4665_882	HORVU1Hr1G067110.1	122	476365129	476364163	476366114	HC_G	Ethylene-responsive transcription factor 8	GO:0003677, GO:0003700, GO:0006355
TKW_C,CD	2H	BK_16	19.9	BK_16	HORVU2Hr1G013400.32	78	29124351	29123785	29127889	HC_G	pseudo-response regulator 7	GO:0000160, GO:0005515
TG%_CD	2H	SCRI_RS_141874	58.07	SCRI_RS_141874	HORVU2Hr1G041320.2	61	203352775	203352353	203357165	HC_G	3'(2'),5'-bisphosphate nucleotidase 1	GO:0046854
NS%_CD	2H	SCRI_RS_59851	64.59	SCRI_RS_59851	HORVU2Hr1G084790.1	61	613854115	613853781	613859358	HC_U	unknown function	none
TG%; NS%;TB_CD; KN/spike_C,CD	2H	SCRI_RS_2961	74.4	SCRI_RS_2961	HORVU2Hr1G091010.1	61	646873475	646872648	646879519	HC_G	WD repeat-containing protein 44	GO:0005515
KN/spike_C,CD	2H	SCRI_RS_166540	75.6	SCRI_RS_166540	HORVU2Hr1G091030.9	61	646934425	646930203	646939373	HC_G	RNA polymerase II C-terminal domain phosphatase-like 1	none

Table S11 Total number of significant marker trait associations (MTAs) passed false discovery rate (FDR) for digital biomass (DB) at each phase and the most significant markers on different chromosomes (Chr) at different position (Pos) with the – log10(Pvalue) and the alleles in addition to the frequency and the effect of each allele.

Trait	Treatment phase	FDR < 0.05	1H	2H	3H	4H	5H	6H	7H	Most sign. marker	Chr.	Pos.	-log10(Pvalue)	Allel 1	Allel 2	Frequency	Frequency	Effect	Effect
DB	Pre-stress	217	2	37	13			5	160	12_11536	7H	70.54	6.2	G	A	0.919	0.081	-1.990	0.401
DB	Control	28		24					4	SCRI_RS_ 210172	2H	18.9	6.9	T	C	0.887	0.113	-119.260	22.563
DB	Drought	581	23	61	23	2	40	98	334	12_10981	3H	154.15	9.4	A	C	0.934	0.066	-21.689	3.458
DB	recovery	24		23			1			SCRI_RS_ 233272	2H	18.9	6.6	G	T	0.777	0.223	-26.759	5.204

Table S12 Total number of significant marker trait associations (MTAs) passed false discovery rate (FDR) for each trait under control (C) and drought (D) treatments and the most significant markers on different chromosomes (Chr) at different position (Pos) with the $-\log_{10}$(Pvalue) and the alleles in addition to the frequency and the effect of each allele.

Trait	Treatment	FDR < 0.05	1H	2H	3H	4H	5H	6H	7H	Most sign. marker	Chr	Pos	Log	Allel	Allel	Frequency	Frequency	Effect	Effect
DTH	Drought	54	5	10	11	1	3	2	22	12_30697	6H	30.0	5.6	A	C	0.830	0.170	-4.729	1.002
KW/plant	Control	7			2			5		11_10189	6H	60.6	5.8	A	G	0.562	0.438	-1.830	0.380
KW/plant	Drought	2		1			1			SCRI_RS_226193	2H	133.3	6.0	C	T	0.725	0.275	1.797	0.368
PH	Control	17	1		16					11_21197	3H	49.7	8.3	G	A	0.869	0.131	-8.694	1.490
PH	Drought	7			6			1		11_21197	3H	49.7	11.1	G	A	0.869	0.131	-7.019	1.024
SN	Control	2					1	1		SCRI_RS_143508	5H	93.4	5.2	A	G	0.726	0.274	1.549	0.341
SN	Drought	40	2	11	11	7	5	2	2	SCRI_RS_144102	2H	118.4	8.8	T	G	0.587	0.413	-1.439	0.238
SPKL	Control	4		1	1	1			1	SCRI_RS_188133	7H	47.3	5.2	C	A	0.765	0.235	-1.098	0.242
SPKL	Drought	22	3	4	3	1	2	2	7	11_21495	3H	90.7	8.8	T	A	0.755	0.245	-0.929	0.154
SY	Control	3					3			12_31417	5H	93.4	4.6	G	C	0.772	0.228	5.275	1.250
SY	Drought	22	3	4	3	1	2	2	7	11_21495	3H	90.7	8.8	T	A	0.755	0.245	-0.929	0.154
TB	Control	13					3	8	2	12_30752	7H	48.9	4.9	C	A	0.579	0.421	-5.315	1.217
TN	Control	1	1							12_21522	1H	117.5	6.1	G	A	0.888	0.112	5.558	1.122
TN	Drought	4		1	3					SCRI_RS_202428	3H	123.2	11.1	A	C	0.537	0.463	-2.343	0.343
UTN	Drought	3			3					SCRI_RS_202428	3H	123.2	5.1	A	C	0.537	0.463	-1.219	0.272

Table S13 Total number of significant marker trait associations (MTAs) passed false discovery rate (FDR) for each trait under control (C) and chemical desiccation (CD) treatments and the most significant markers on different chromosomes (Chr) at different position (Pos) with the $-\log_{10}$(Pvalue) and the alleles in addition to the frequency and the effect of each allele.

Trait	Treatment	Year	FDR < 0.05	1H	2H	3H	4H	5H	6H	7H	Most sign. marker	Chr	Pos	Log	Allel	Allel	Frequency	Frequency	Effect	Effect
KN/spike	C	2016	33	5	18		7	1		2	SCRI_RS_2961	2H	74.4	12.7	C	T	0.687	0.313	7.768	1.059
KN/spike	CD	2016	15		8		3		1	3	SCRI_RS_235860	2H	76.2	12.4	G	A	0.657	0.343	5.647	0.779
KW/spike	C	2016	15	1	4	4	1	2		3	SCRI_RS_2961	2H	74.4	8.1	C	T	0.687	0.313	0.235	0.041
KW/spike	CD	2016	37	1	7	4	3	2	3	17	11_20762	4H	98.9	5.8	C	G	0.617	0.383	0.138	0.029
TKW	C	2016	5		1		1	3			SCRI_RS_166540	2H	75.6	5.6	G	A	0.656	0.344	-4.125	0.872
TKW	CD	2016	9		8			1			12_30871	2H	19.9	5.5	A	G	0.882	0.118	3.679	0.787
SPKL	C	2016	10	4	3			3			SCRI_RS_144102	2H	118.4	5.0	T	G	0.533	0.467	-0.677	0.154
TB	CD	2016	5		3		1		1		SCRI_RS_217794	4H	103.9	4.9	C	T	0.520	0.480	4.536	1.038
SY	CD	2016	1			1					*SCRI_RS_155763*	*3H*	*75.2*	*5.2*	*A*	*G*	*0.654*	*0.346*	*4.373*	*0.967*
TG%	C	2016	139	23	40	14	1	7	1	53	12_30896	2H	79.4	15.8	G	A	0.693	0.307	-2.430	0.294
TG%	CD	2016	131	15	27	14	4	7	5	59	SCRI_RS_3125	3H	90.2	18.4	A	G	0.670	0.330	-3.442	0.385
NS%	C	2016	59	11	15	7		3		23	SCRI_RS_3125	3H	90.2	15.6	A	G	0.670	0.330	-3.741	0.457
NS%	CD	2016	50	8	15	12	5	1	1	8	SCRI_RS_157347	2H	75.6	7.4	C	G	0.779	0.221	-4.304	0.782
				68	**149**	**56**	**26**	**30**	**12**	**168**										
DTH	C	2017	2		1			1			SCRI_RS_210172	2H	18.9	7.0	T	C	0.863	0.137	1.899	0.356
GDD	C	2017	1	1							SCRI_RS_126734	1H	42.1	5.0	T	C	0.762	0.238	-24.848	5.617
KW/spike	C	2017	30		10	2	4	1	6	7	SCRI_RS_235860	2H	76.2	9.1	G	A	0.657	0.343	0.223	0.036
HI	C	2017	1			1					12_20198	3H	142.6	11.5	C	A	0.849	0.151	0.149	0.021
SPKL	C	2017	5					3		2	SCRI_RS_202774	5H	121.3	5.6	G	A	0.792	0.208	-0.819	0.174
KN/spike	C	2017	150	20	40	3	24	4	9	50	SCRI_RS_2961	2H	74.4	21.2	C	T	0.687	0.313	9.166	0.951
TB	C	2017	8		3	1	1		2	1	SCRI_RS_210172	2H	18.9	7.3	T	C	0.863	0.137	4.948	0.905
TKW	C	2017	17		10	1	1	1	1	3	11_10309	4H	73.6	7.4	A	G	0.816	0.184	2.696	0.492
TKW	CD	2017	33		3	2	1	24		3	SCRI_RS_237094	2H	48.6	7.0	G	T	0.751	0.249	1.641	0.308

SY	C	2017	2		1				1		SCRI_RS_210172	2H	18.9	5.6	T	C	0.863	0.137	2.687	0.570
DSI	CD	2017	3							3	11_11098	7H	64.8	4.9	A	G	0.580	0.420	0.202	0.046
Injury%	CD	2017	3							3	11_11098	7H	64.8	4.9	A	G	0.580	0.420	2.879	0.656
TG%	C	2017	10		2	3	1			4	11_10379	4H	52.3	5.6	G	A	0.840	0.160	-2.084	0.444
TG%	CD	2017	17	2	2	4	1	6		2	11_10686	1H	67.1	8.8	A	G	0.707	0.293	-2.727	0.451
NS%	CD	2017	10	3	1	4	1			1	11_20290	1H	66.3	5.5	A	G	0.625	0.375	-4.761	1.017
				26	**73**	**21**	**34**	**40**	**19**	**79**										
DTH	C	BLUEs	3		3						SCRI_RS_210172	2H	18.9	5.8	T	C	0.863	0.137	1.426	0.298
GDD	C	BLUEs	1		1						SCRI_RS_162700	2H	59.1	5.6	G	A	0.754	0.246	-37.342	7.954
PH	C	BLUEs	2	1						1	SCRI_RS_126734	1H	42.1	4.9	T	C	0.762	0.238	-2.492	0.572
SPKL	C	BLUEs	7	2	1			3		1	12_30067	5H	120.4	5.2	G	A	0.788	0.212	-0.740	0.165
KN/spike	C	BLUEs	114	21	45	4	25	7	6	6	SCRI_RS_2961	2H	74.4	17.7	C	T	0.687	0.313	8.559	0.977
KN/spike	CD	BLUEs	18	4	9	1	3	1			SCRI_RS_166540	2H	75.6	9.4	G	A	0.656	0.344	2.812	0.451
KW/spike	C	BLUEs	21	1	5	3	5		3	4	SCRI_RS_235860	2H	76.2	8.0	G	A	0.657	0.343	0.211	0.037
KW/spike	CD	BLUEs	25			5	2		2	16	12_30960	3H	142.9	5.0	G	A	0.688	0.312	-0.062	0.014
TKW	C	BLUEs	21		13	1	1	1	2	3	11_10309	4H	73.6	6.4	A	G	0.816	0.184	2.525	0.497
TKW	CD	BLUEs	1			1					12_30002	3H	51.8	5.4	A	C	0.718	0.282	-3.107	0.674
TB	C	BLUEs	12		3	2	1		3	3	SCRI_RS_235860	2H	76.2	6.2	G	A	0.657	0.343	6.912	1.391
TB	CD	BLUEs	3		2		1				SCRI_RS_235860	2H	76.2	5.3	G	A	0.657	0.343	3.873	0.851
HI	CD	BLUEs	1			1					SCRI_RS_150883	3H	51.8	5.1	T	C	0.876	0.124	3.080	0.690
TG%	C	BLUEs	55	11	9	6		4		25	11_21495	3H	90.7	7.9	T	A	0.699	0.301	-1.979	0.348
TG%	CD	BLUEs	57	4	15	15	4	12	2	5	SCRI_RS_3125	3H	90.2	19.9	A	G	0.670	0.330	-3.201	0.343
NS%	C	BLUEs	33	2	5	4		2		20	SCRI_RS_116920	2H	58.6	4.9	G	A	0.754	0.246	-3.079	0.706
NS%	CD	BLUEs	38	8	5	10	5	3	2	5	11_20626	3H	88.2	8.5	A	G	0.878	0.122	-3.909	0.661
				54	**116**	**53**	**47**	**33**	**20**	**89**										