

Table S42 QTLs identified for plant height by composite interval mapping in two hybrids

QTL	T	Env.	Flanking markers	RIL'			RIL			BC			MPH			d/a	Type
				LOD	A	Var (%)	LOD	A	Var (%)	LOD	A+D	Var (%)	LOD	D	Var (%)		
XZ hybrid																	
<i>qPH-Chr2-2</i>	<i>t2</i>	E1	PGML0700 SWU12016										3.03	-1.1	10.46	OD	
<i>qPH-Chr4-1</i>	<i>t2</i>	E2	NAU2701 SWU18876						3.39	0.87	5.32					A	
	<i>t3</i>	E1	SWU18881 NAU2701	2.82	1.31	3.86											
	<i>t4</i>	E1	SWU18881 NAU2701	2.67	1.34	4.18											
	<i>t4</i>	E2	NAU2701 SWU18876						3.48	1.98	7.29					A	
	<i>t5</i>	E2	NAU2701 SWU18876						3.47	2.18	7.25					A	
<i>qPH-Chr5-1</i>	<i>t1</i>	E1	PGML1917 SWU17715	3.71	0.85	7.02	5.32	2.32	26.87								
	<i>t2</i>	E1	PGML1917 SWU17715	5.83	1.98	14.46	5.59	3.05	20.49								
	<i>t3</i>	E1	PGML1917 SWU17715	9.7	2.98	20.17	8.49	4.01	24.63								
	<i>t3</i>	E1	PGML1917 SWU17715														
	<i>t4</i>	E2	PGML1917 SWU17715				3.02	3.19	18.21								
	<i>t5</i>	E1	PGML1917 SWU17715	10.65	3.64	26.41											
	<i>t5</i>	E2	PGML1917 SWU17715	2.85	3.48	15.23											
<i>qPH-Chr5-2</i>	<i>t1</i>	E1	TMB1296 HAU1603				5.59	1.39	9.64								
	<i>t2</i>	E1	TMB1296 HAU1603	7.22	1.63	9.74	5.81	2.11	9.81								
	<i>t3</i>	E1	TMB1296 HAU1603	9.79	2.58	14.97	8.06	3.10	14.63								
	<i>t4</i>	E1	TMB1296 HAU1603	10.41	2.78	18.39	6.78	3.12	13.05								
	<i>t4</i>	E2	HAU1603 PGML4457				3.28	1.83	5.94								
	<i>t5</i>	E1	TMB1296 HAU1603	11.89	3.31	21.44	8.58	3.73	16.69								

QTL	T	Env.	Flanking markers		RIL'			RIL			BC			MPH			d/a	Type
					LOD	A	Var (%)	LOD	A	Var (%)	LOD	A+D	Var (%)	LOD	D	Var (%)		
<i>qPH-Chr19-1</i>	<i>t1</i>	E1	Gh616	CIR139	12.53	1.53	22.03				6.84	1.11	12.66		(±0.42)	0.38	PD	
	<i>t1</i>	E1	Gh616	CIR139				6.58	1.53	11.43								
	<i>t1</i>	E2	Gh616	CIR139	21.62	1.86	42.66											
	<i>t1</i>	E2	NAU5330	Gh72				20.26	1.63	35.02								
	<i>t1</i>	E2	Gh616	CIR139							18.38	1.41	32.09	4.43	0.49	9.29	0.3	PD
	<i>t2</i>	E1	NAU5330	Gh72	18.15	2.83	29.1											
	<i>t2</i>	E1	Gh616	CIR139				9	2.69	15.7	10.03	2.01	19.59		(±0.68)	0.25	PD	
	<i>t2</i>	E2	Gh616	CIR139	18.59	2.76	35.26											
	<i>t2</i>	E2	NAU5330	Gh72				18.9	2.65	34.55								
	<i>t2</i>	E2	Gh616	CIR139							12.83	1.89	23.81	4.01	0.57	8.36	0.43	PD
	<i>t3</i>	E1	NAU5330	Gh72	12.25	3.07	21.09											
	<i>t3</i>	E1	Gh616	CIR139				4.95	2.37	8.46	7.38	1.98	14.1		(±0.39)	0.16	PD	
	<i>t3</i>	E2	Gh616	CIR139	8.51	2.91	17.06											
	<i>t3</i>	E2	Gh616	CIR139				11.43	3.09	22.18								
	<i>t3</i>	E2	DC40122	NAU833a							4.01	1.74	7.78		(±1.35)	0.44	PD	
	<i>t4</i>	E1	NAU5330	Gh72	4.72	1.82	7.81											
	<i>t4</i>	E1	Gh616	CIR139							5.17	1.49	10.28		(±0.33)	0.18	PD	
<i>t4</i>	E2	Gh616	CIR139	3.11	2.2	6.66												
<i>t5</i>	E1	NAU5330	Gh72	3.94	1.87	6.59												
<i>t5</i>	E2	NAU5330	Gh72				3.06	2.03	5.63									
<i>qPH-Chr19-2</i>	<i>t1</i>	E1	NAU1042	NAU3437	9.26	1.34	16.95				4.18	0.87	7.99		(±0.47)	0.35	PD	
	<i>t1</i>	E2	NAU1042	NAU3437				13.44	1.49	29.23								

QTL	T	Env.	Flanking markers		RIL'			RIL			BC			MPH			d/a	Type
					LOD	A	Var (%)	LOD	A	Var (%)	LOD	A+D	Var (%)	LOD	D	Var (%)		
	t2	E1	NAU1269	NAU828	12.45	2.45	21.2											
	t2	E1	NAU1042	NAU3437									2.69	0.86	6.25	0.32	PD	
	t2	E2	NAU1042	NAU3437				13.8	2.7	36.07	8.91	1.81	22.73					
	t3	E2	NAU1042	NAU3437				9.19	3.36	26.95								
	t4	E2	NAU833a	NAU1269				3.78	2.02	6.95								
qPH-Chr20-1	t1	E1	CGR6154	SWU20246							3.18	-1.17	14.79				A	
	t2	E1	CGR6154	SWU20246	3.39	-1.09	4.33											
	t3	E1	CGR6154	SWU20246	2.63	-1.74	6.88											
	t4	E1	CGR6154	SWU20246							2.68	-1.79	15.38				A	
	t5	E1	CGR6154	SWU20246							4.37	-2.23	22.78					
qPH-Chr20-2	t2	E1	CER0167	SWU20064							2.74	-1.38	9.52				A	
	t2	E2	CER0167	SWU20064							3.14	-1.15	9.52				A	
	t3	E1	CER0167	SWU20064							2.96	-1.69	10.69				A	
	t3	E2	CER0167	SWU20064	3.03	-2.12	9.61											
	t4	E2	CER0167	SWU20064							2.50	-2.32	9.86				A	
qPH-Chr20-3	t1	E1	DPL0319	HAU1378				5.26	1.4	9.83								
	t2	E1	SWU20035	DPL0319				5.57	2.37	12.05								
	t3	E1	SWU20035	DPL0319				2.71	2.19	7.26								
	t4	E1	SWU20035	DPL0319				2.83	2.44	8.01								
	t5	E1	SWU20035	DPL0319				3.73	2.83	9.40								
qPH-Chr21-1	t1	E1	DPL0777	CGR5217							3.94	0.85	7.62				A	
	t2	E1	DPL0777	CGR5217							3.71	1.20	6.97				A	

QTL	T	Env.	Flanking markers		RIL'			RIL			BC			MPH			d/a	Type
					LOD	A	Var (%)	LOD	A	Var (%)	LOD	A+D	Var (%)	LOD	D	Var (%)		
	t5	E2	HAU0921	NAU2768	2.51	1.64	5.25											
qPH-Chr9-1	t1	E1	SHIN0830	Gh111	4.10	0.71	7.36											
	t3	E2	SHIN0830	Gh111				3.63	1.53	7.43								
qPH-Chr13-1	t2	E1	SWU13032	HAU2850				3.42	-1.23	8.15								
	t3	E1	SWU13032	HAU2850				3.73	-2.17	9.94								
	t4	E1	SWU13032	HAU2850				4.55	-2.29	9.48								
	t4	E2	SWU13032	HAU2850	3.08	-1.90	8.90	3.08	-1.97	9.01	3.12	-1.46	10.02	(±0.51)	0.26	PD		
qPH-Chr13-2	t2	E1	NAU3398	CGR5331				3.63	-1.04	5.76								
	t3	E1	NAU3398	CGR5331				3.55	-1.62	5.46								
	t4	E1	NAU3398	CGR5331				5.02	-1.98	7.09								
	t4	E2	NAU3398	CGR5331	3.19	-1.59	6.19											
	t5	E1	NAU3398	CGR5331				5.28	-2.03	7.10								
	t5	E2	NAU3398	CGR5331	3.44	-1.83	7.01											
qPH-Chr14-1	t1	E1	DPL0502	ICR00401	3.05	0.63	5.95											
qPH-Chr14-2	t1	E2	TMB0071	HAU1000				2.69	-0.49	4.94								
	t2	E2	TMB0071	HAU1000	4.20	-1.02	8.72	4.91	-1.10	9.87								
	t3	E2	TMB0071	HAU1000	2.72	-1.24	6.17											
	t4	E2	TMB0071	HAU1000	3.60	-1.78	7.73											
	t4	E2	HAU1000	TMB1931				3.27	-1.69	6.46								
qPH-Chr15-1	t3	E2	NAU3736	SWU11691	3.42	1.54	9.52											
qPH-Chr16-1	t1	E2	SWU10211	SWU10266				3.22	0.53	5.85								
	t4	E2	HAU1129	C2_0011B				4.08	2.35	12.84								

QTL	T	Env.	Flanking markers		RIL'			RIL			BC			MPH			d/a	Type
					LOD	A	Var (%)	LOD	A	Var (%)	LOD	A+D	Var (%)	LOD	D	Var (%)		
	t5	E2	HAU1129	C2_0011B				4.14	2.77	15.16								
<i>qPH-Chr16-2</i>	t2	E2	SWU10211	SWU10266				3.6	0.92	7.06								
	t4	E2	SWU10211	SWU10266				4.9	2.06	9.74								
	t5	E2	SWU10211	SWU10266				4.63	2.23	9.73								
<i>qPH-Chr16-3</i>	t4	E2	SWU10266	SWU18366				3.04	2.55	14.99								
<i>qPH-Chr18-1</i>	t1	E2	TMB1638	CGR6812	2.89	-0.79	10.15	4.29	-0.86	15.55								
	t2	E2	TMB1638	CGR6812	2.77	-0.98	8.12	3.72	-1.38	15.69								
<i>qPH-Chr21-1</i>	t4	E1	JESPR154	BNL5602							2.75	-1.12	5.61				A	
	t5	E1	JESPR154	BNL5602							3.63	-1.61	7.98				A	
<i>qPH-Chr23-1</i>	t1	E1	CGR5158	HAU1758				4.96	-1.52	25.69								
	t2	E1	CGR5158	HAU1758				4.42	-1.26	7.6								
	t3	E1	CGR5158	HAU1758				8.72	-2.8	15.02								
	t4	E1	CGR5158	HAU1758				8.3	-2.76	12.59								
	t5	E1	CGR5158	HAU1758				8.67	-2.86	12.58								
<i>qPH-Chr23-2</i>	t4	E2	BNL3482	HAU0244									3.65	-1.31	11.11		OD	
	t5	E2	BNL3482	HAU0244									2.53	-1.27	6.41		OD	
<i>qPH-Chr23-3</i>	t1	E1	NAU2140	DC40286	3.24	-0.67	6.84											
	t2	E1	NAU2140	DC40286	5.05	-1.31	10.93				6.77	-1.4	18.14	(±0.09)		0.07	PD	
	t3	E2	NAU2140	DC40286				3.49	1.76	10.02								
	t5	E1	NAU2140	DC40286							4.43	-1.91	11.09				A	
<i>qPH-Chr23-4</i>	t1	E1	DC40286	PGML1434				7.76	-1.16	15.51	4.92	-0.88	13.07					
	t1	E2	DC40286	PGML1434				5.55	0.74	11.07								

QTL	T	Env.	Flanking markers		RIL'			RIL			BC			MPH			d/a	Type
					LOD	A	Var (%)	LOD	A	Var (%)	LOD	A+D	Var (%)	LOD	D	Var (%)		
	<i>t2</i>	E1	DC40286	PGML1434				8.60	-1.71	15.41								
	<i>t3</i>	E1	DC40286	PGML1434	3.22	-1.43	7.33	7.86	-2.56	13.52	3.97	-1.35	9.2	(±1.21)		0.47	PD	
	<i>t4</i>	E1	DC40286	PGML1434				11.44	-3.2	18.29	3.06	-1.25	6.83	(±1.95)		0.61	PD	
	<i>t5</i>	E1	DC40286	PGML1434				14.57	-4.23	23.25								
<i>qPH-Chr26-1</i>	<i>t1</i>	E2	CGR6477	PGML2562							3.46	-0.55	9.15				A	
	<i>t3</i>	E2	CGR6477	PGML2562							2.56	-1.34	11.51				A	
	<i>t4</i>	E2	CGR6477	PGML2562							3.17	-1.56	11.38				A	
	<i>t5</i>	E2	HAU1571	CGR6477							3.07	-1.46	8.57				A	
<i>qPH-Chr26-2</i>	<i>t4</i>	E2	SWU16721	SWU16680										3.27	1.01	7.31	OD	
	<i>t5</i>	E2	SWU16721	SWU16680										3.24	1.31	7.46	OD	

Bold figures indicate the QTL was detected in more than two environments or populations simultaneously

[QTL identified from present study and the QTL from Shang et al.\(2015\) were compared, and common QTLs are shown as blue figures](#)

Env., Environment, E1: Handan; E2: Cangzhou; T, Stage t1, t2, t3, t4, t5

Effect, the genetic expectation of a QTL effect obtained is the additive effect (A) when estimated from the RILs and RIL's, the additive and dominance effects (A+D) from the BCF₁ mean values

Var%, Phenotypic variation explained by a single QTL

d/a, dominance ratio

Type, The QTLs which were identified in backcross population were grouped into three types: (A) additive effect, (PD) partial dominance effect, (OD) overdominance effect.