

**Table S1.** Set of homoeologues and orthologues genes from common wheat and *H. vulgare*, respectively, from the wheat 7D candidate genes for *Lute* locus.

<b>Wheat 7D candidates</b>	<b>Wheat homoeologues</b>	<b>Barley orthologues</b>
TraesCS7D02G011600	TraesCS4A02G481800 TraesCS7A02G014600	HORVU7Hr1G001330
TraesCS7D02G037200	TraesCS7A02G041500	HORVU7Hr1G007590
TraesCS7D02G093200	TraesCS4A02G397000 TraesCS7A02G097100	HORVU7Hr1G021310
TraesCS7D02G094000	TraesCS4A02G397900	HORVU7Hr1G021460
TraesCS7D02G108900	TraesCS7A02G113600	HORVU7Hr1G024220

**Table S2.** Primers designed for amplification of the candidate genes in *H. chilense* and for RT-qPCR experiments.

<b>Gene</b>	<b>Amplification / sequencing</b>	<b>RT-qPCR</b>
HORCH7Hg001330	Fw-AGCGTTGGCTCTTCGTAAGG	Fw-CTGTGCCATTGTAAACCCTCC
	Rv-GCTCTTGAATGCCTTGAGCC	Rv-GACCCGACTTCGAACTGACCA
HORCH7Hg007590	Fw-ACAACTCAAGATGGGCCCTG	Fw-GGCAACATGTTCCAGTTGAGGA
	Rv-AGTGATGCCAACCGTGCATA	Rv-AATAGGAGGTGGAGTGATAAGAAGG
HORCH7Hg21310	Fw-CAGACCGTCGACCAGTTCTC	Fw-AGCGCAGCCGTCAGCTCT
	Rv-GTCGGCGATCACTTGGTTGG	Rv-CAGCATCCCTTCTTCGCCTC
HORCH7Hg021460	Fw-AGTCTGGCAGGCTACAATGG	Fw-GAGCTACCGTTGACTCATTACG
	Rv-CAAAGTCACATGAACCGGCG	Rv-CCTCGGTGAAGCCTTGTGATA
	Fw-TACCAAGCTAAGCTGGCGG	
	Rv-TGAACCAATGTGGCATCAAGC	
	Fw-ATTCGGCACATCACGCTAGT	
	Rv-TCTGGAGTCCACAGGTCAGT	
HORCH7Hg024220	Fw-GTCGGCGACAAGATCTGGAA	Fw-ATCCAGTGGTTCCAGAACCTG
	Rv-TGGGAGTAGAAGTCGGCGTA	Rv-CTCTGCCCCGGCCACTTG

Table S3. BLASTn results using *H. chilense* sequences as queries versus *H. vulgare* and *T. aestivum* genomes at EnsemblPlants (<http://plants.ensembl.org/>).

Query	Genomic Location	Overlapping Gene(s)	Length	Score	E-val	%ID
HORCH7Hg001330	chr7H:2944880-2945196	HORVU7Hr1G001330	317	273	3.7E-151	96.5
	chr7H:2944502-2944831	HORVU7Hr1G001330	330	226	4.1E-123	92.1
	chr7H:2945201-2945266	HORVU7Hr1G001330	66	66	1.2E-27	100.0
	7D:5165878-5166263	TraesCS7D02G011600	386	298	1.3E-165	94.3
HORCH7Hg007590	chr7H:9893237-9893270	HORVU7Hr1G007590	34	22	0.22	91.2
	chr7H:9893575-9893637	HORVU7Hr1G007590	63	31	9.2E-7	87.3
	chr7H:9892960-9893094	HORVU7Hr1G007590	135	71	1.2E-30	88.1
	chr7H:9893367-9893486	HORVU7Hr1G007590	120	72	3.1E-31	90.0
	chr7H:9893661-9893847	HORVU7Hr1G007590	187	131	1.9E-66	92.5
	7D:18882747-18882782	TraesCS7D02G037200	36	24	0.042	91.7
	7D:18882521-18882562	TraesCS7D02G037200	42	34	4.5E-8	95.2
	7D:18882979-18883041	TraesCS7D02G037200	63	35	1.1E-8	88.9
	7D:18882780-18882867	TraesCS7D02G037200	88	48	2.0E-16	88.6
	7D:18882661-18882725	TraesCS7D02G037200	65	57	8.4E-22	96.9
	7D:18882419-18882519	TraesCS7D02G037200	101	77	9.8E-34	94.1
	7D:18883065-18883249	TraesCS7D02G037200	185	129	9.1E-65	92.4
	HORCH7Hg021310	chr7H:30199351-30199620	HORVU7Hr1G021310	270	226	3.1E-123
chr7H:30199076-30199235		HORVU7Hr1G021310	160	152	4.5E-79	98.8
chr7H:30199691-30199745		HORVU7Hr1G021310	55	35	3.0E-9	90.9
7D:55429660-55429950		TraesCS7D02G093200	291	239	1.6E-130	95.5
HORCH7Hg021460	chr7H:30702633-30702961	HORVU7Hr1G021460	329	249	1.0E-136	93.9
	chr7H:30701740-30701997	HORVU7Hr1G021460	258	230	2.2E-125	97.3
	chr7H:30702093-30702326	HORVU7Hr1G021460	234	210	1.9E-113	97.4
	chr7H:30701413-30701604	HORVU7Hr1G021460	192	132	6.7E-67	92.2
	7D:56402774-56402900	TraesCS7D02G094000	127	55	1.8E-20	85.8
	7D:56402368-56402477	TraesCS7D02G094000	110	62	1.2E-24	89.1
	7D:56402531-56402683	TraesCS7D02G094000	153	121	7.3E-60	94.8
	7D:56403322-56403579	TraesCS7D02G094000	258	138	5.3E-70	88.4
	7D:56402979-56403209	TraesCS7D02G094000	231	155	3.8E-80	91.8
	7D:56403780-56403971	TraesCS7D02G094000	192	160	3.9E-83	95.8
HORCH7Hg024220	chr7H:38486150-38486541	HORVU7Hr1G024220	392	324	0.0	95.7
	7D:65600023-65600407	TraesCS7D02G108900	385	321	1.8E-179	95.8

