

Supplementary figures and tables

Table S1. Summary statistics of grain protein concentration in an experiment with 369 European elite wheat genotypes evaluated during 3 years

Trait	Year	Mean	Min.	Max.	Var.	Median	%CV	<i>s.d</i>
GPC (%)	2015	11.85	9.90	14.15	0.404	11.84	5.36	0.64
	2016	10.90	9.72	13.12	0.371	10.85	5.58	0.61
	2017	11.32	9.52	15.31	0.82	11.29	7.98	0.90
	BLUEs	11.37	10.01	13.99	0.274	11.33	4.61	0.52

Min.: Minimum; Max.: Maximum; Var.: Variance; %CV: coefficient of variation; s.d: standard deviation

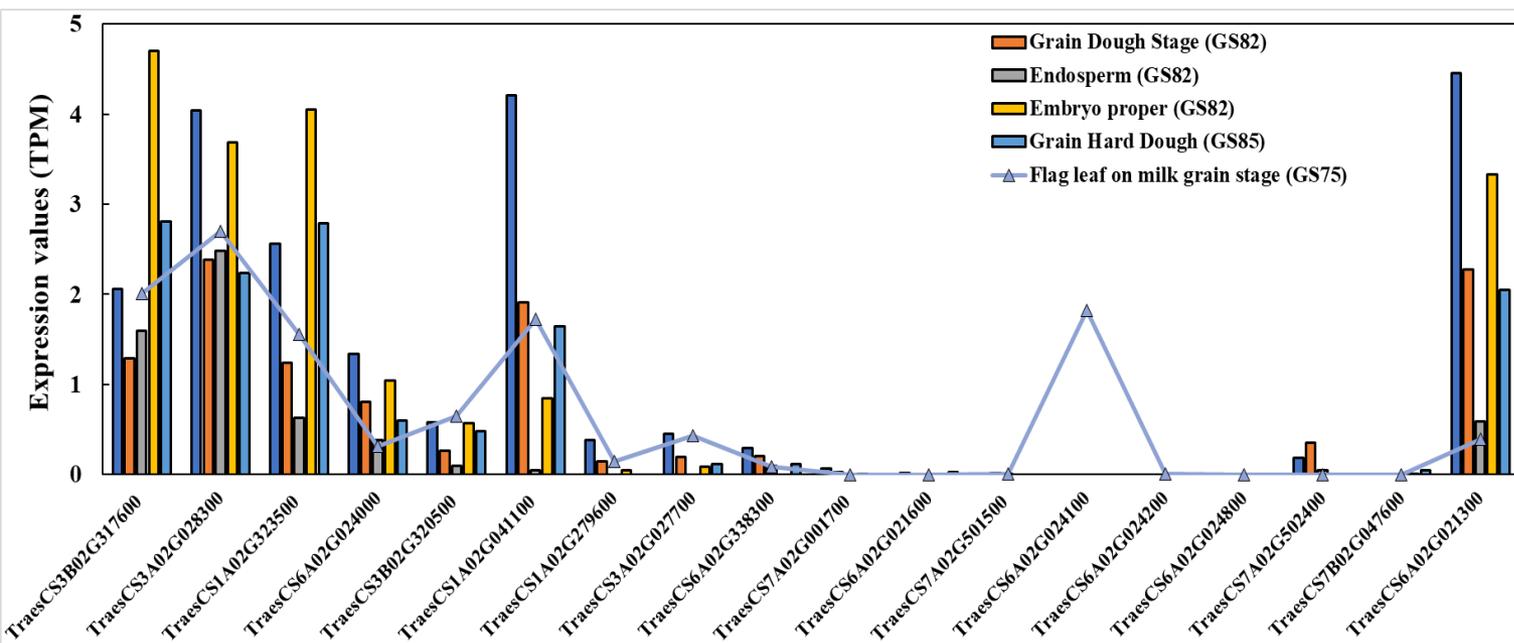


Figure S1. Expression value TPM (Transcripts Per Kilobase Million) of candidate genes in flag leaf (during milk grain stage) and grain development (Milk grain stage, dough stage, endosperm in dough stage, embryo proper in dough stage and grain hard dough)

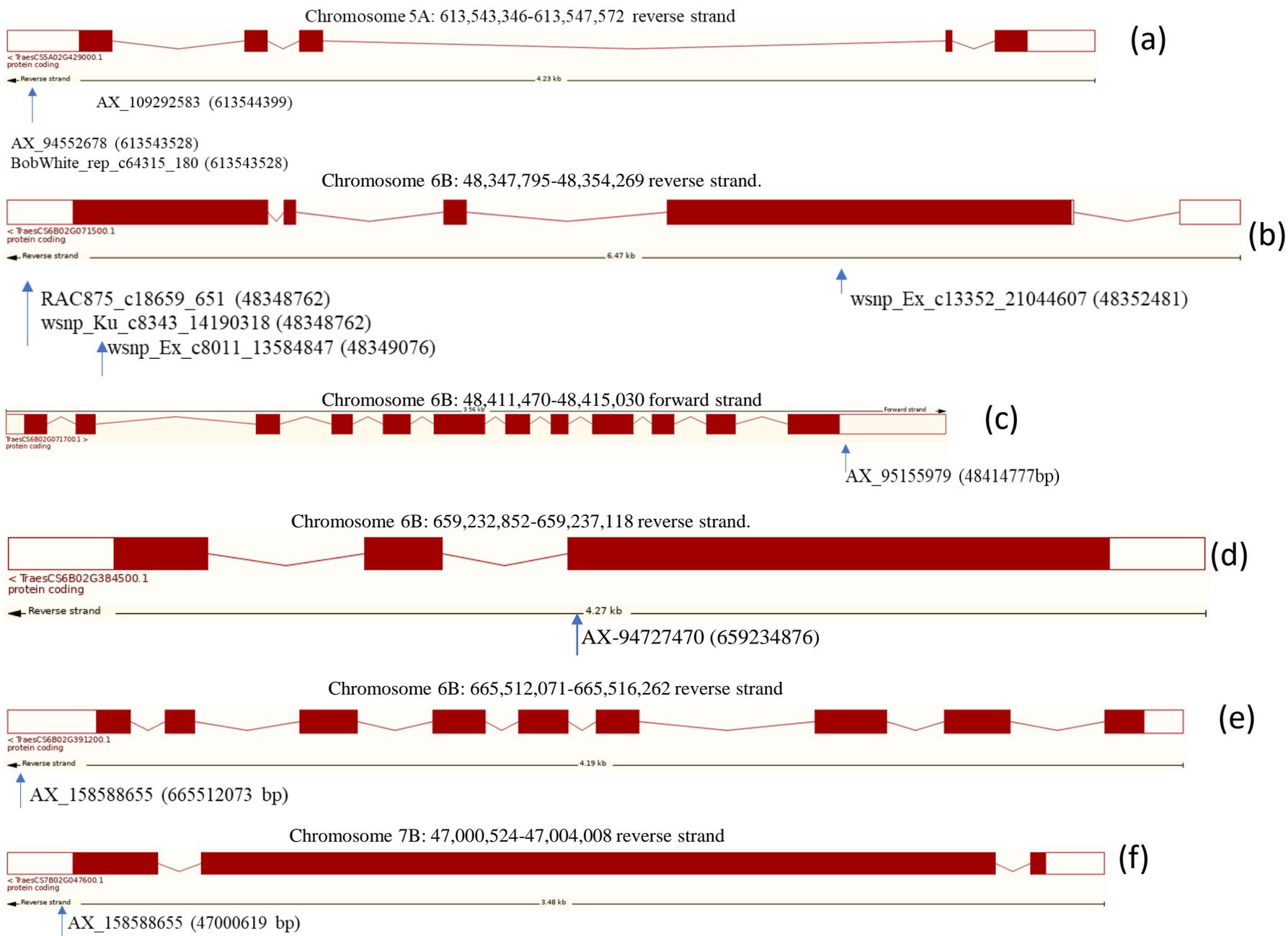
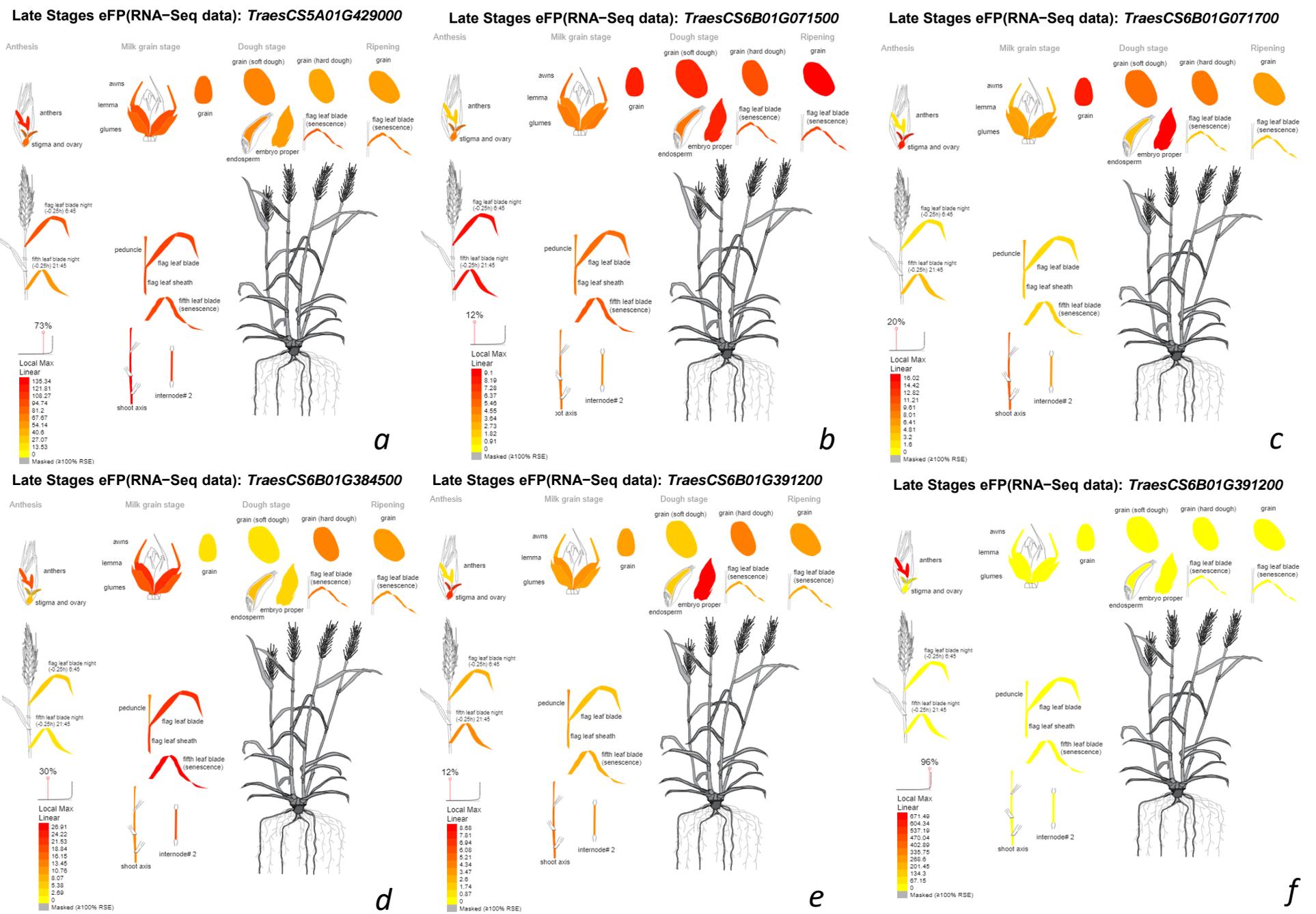


Figure S2. Gene structure and significant QTNs reported (*TraesCS5A02G429000* (a), *TraesCS6B02G071500* (b), *TraesCS6B02G071700* (c), *TraesCS6B02G384500* (d), *TraesCS6B02G391200* (e), *TraesCS7B02G047600* (f) associated with grain protein content in European winter wheat accessions.



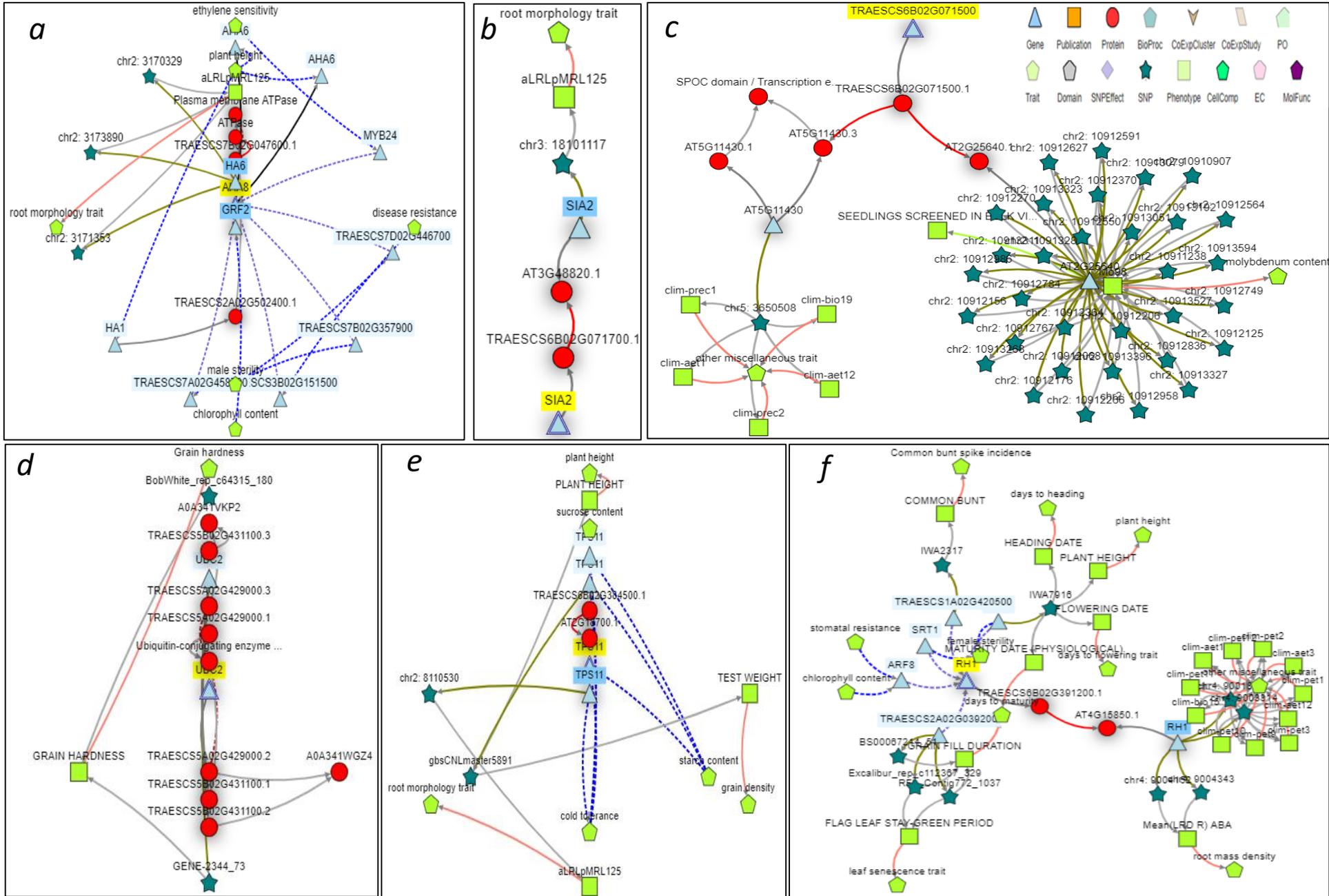


Figure S4. Gene network of the identified gene models *TraesCS7B02G047600* (a.), *TraesCS6B02G071700* (b.), *TraesCS6B02G071500* (c.), *TraesCS5A02G429000* (d.), *TraesCS6B02G384500* (e.), *TraesCS6B02G391200* (f.) associated with grain protein content in European winter wheat accessions.