**List of supplemental materials**

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Supplemental Table S2. External validation of ortholog-trained Arabidopsis and rice model using known causal genes in Arabidopsis and rice.

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Supplemental Figure S7. Multiple sequence alignment for a RIO2 protein across grass species, yeast and human using Clustal Omega (v1.2.4).

Supplemental Figure S8. Multiple sequence alignment for a RIO2 protein across grass species using Clustal Omega (v1.2.4).

Supplemental Figure S9. Multiple sequence alignment of a candidate gene *SD1* across grass species using Clustal Omega (v1.2.4).

Supplemental Figure S10. A candidate gene encoding a ribosomal protein in the L1P family has higher expression in *Setaria italica* (Seita.5G389700)than in *Setaria viridis* (Sevir.5G394900)*.*

Supplemental Figure S11. Pairwise sequence alignment shows polymorphisms in the putative promoters of an ortholog pair of genes encoding L1P ribosomal proteins.