

Supplementary Material

Characterisation of a rice vacuolar invertase isoform, *OsINV2*, for growth and yield-related traits

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Table S1. *OsINV2* primer sequences

Primers	Sequence (5'-3')	Size of the amplicon (bp)
Genotyping		
F7	5'-CTCTGCTTCCCGAGACGA-3'	304
R7	5'-GAGTTGGTCCAGGCGTAGTC-3'	
T6	5'-AGGTTGCAAGTTAGTTAAGA-3'	180
Complementation		
PL1	5'-CAACATATGCCTAAAGTCCATGC-3'	8318
cds3T	5'-CTAGTCTACATATGGACGGA-3'	
Promoter::<i>GUS</i>		
INV2-PL1	5'-CAACATATGCCTAAAGTCCATGC-3'	2125
INV2-ATG	5'-GGAGATGGCCGGGATCAT-3'	

Table S2. Segregation of WT and the KO alleles of *OsINV2* and *OsINV3* genes expressed as number of plants, as observed in the F2 lines generated by crossing the *OsINV2* and *OsINV3* KOs

Note that the cross failed to generate double KOs of *OsINV2* and *OsINV3*

		<i>OsINV3</i>		
		WT/WT	WT/KO	KO/KO
<i>OsINV2</i>	WT/WT	6	12	4
	WT/KO	29	40	6
	KO/KO	10	8	0

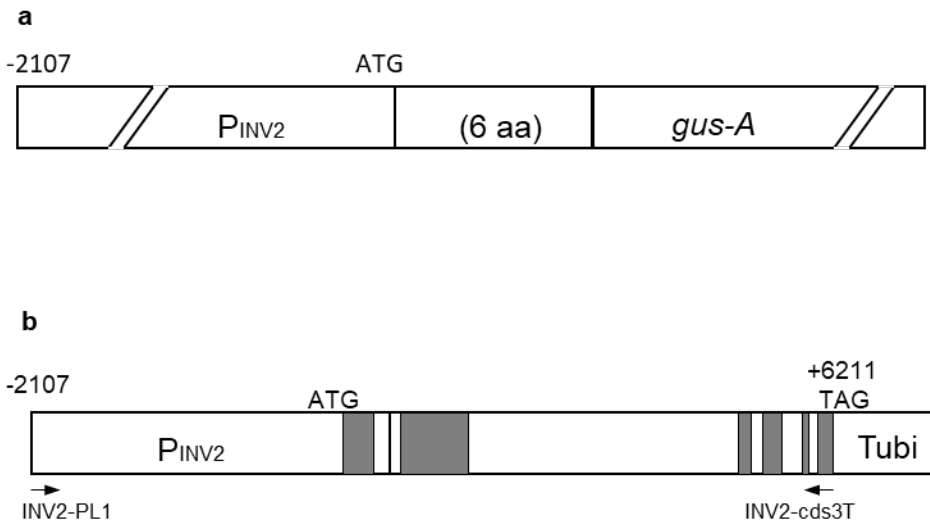


Fig. S1. The constructs used for generating (a) *OsINV2*-GUS lines with *gus-A* driven by the *OsINV2* promoter interlinked by 6 amino acids downstream of the promoter region, and (b) complement lines with *OsINV2* gene driven by its promoter. Exons are indicated by grey boxes.

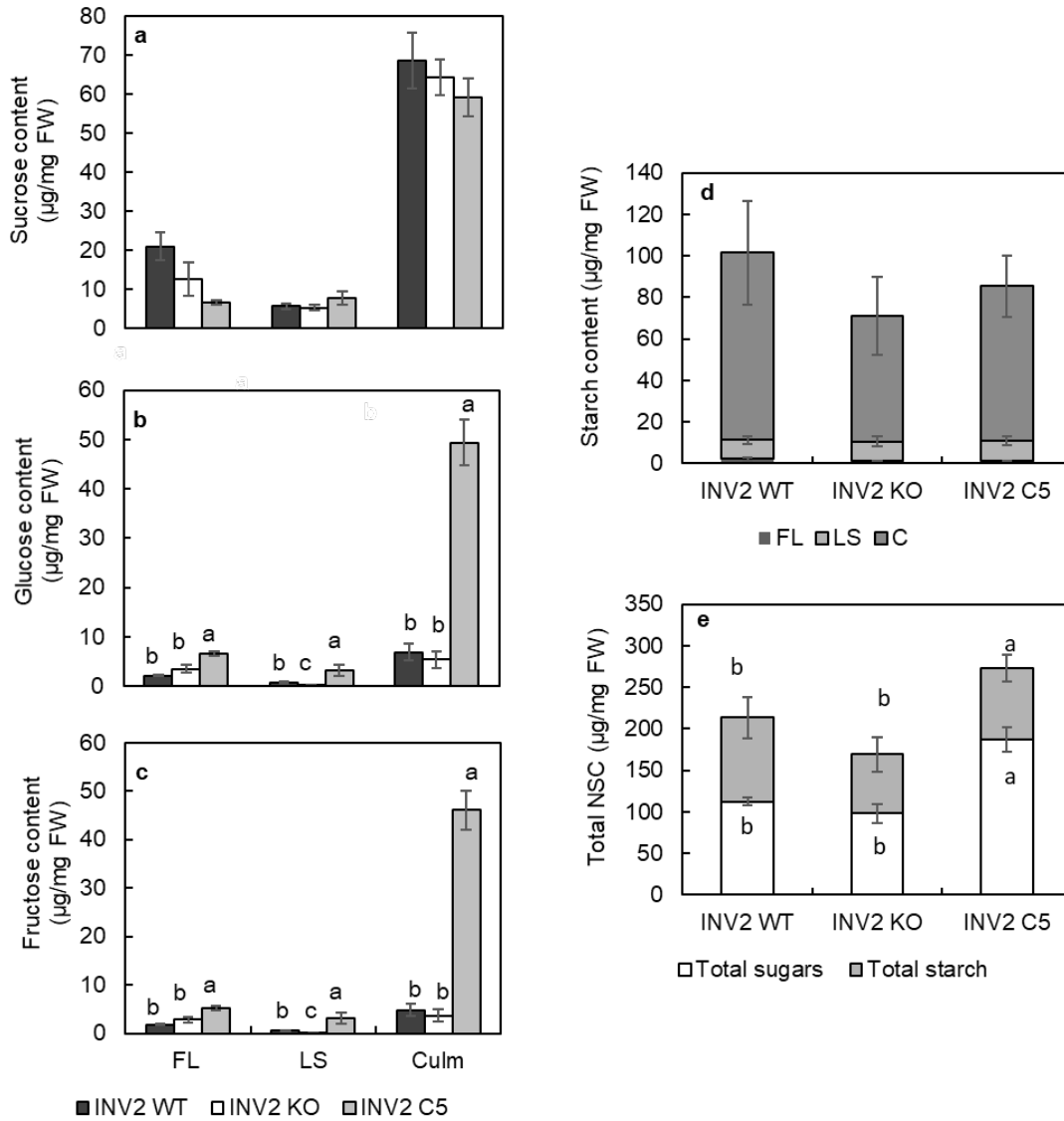


Fig. S2. The NSC content in the FL, LS and Culm of *OsINV2* WT, KO and C5 lines grown in controlled conditions is shown, with (a), (b) and (c) showing the sucrose, glucose and fructose content respectively, and (d) and (e) showing the total starch and total NSC content respectively. Data represent the mean \pm s.e. ($n=5$). Same letters indicate insignificant differences between the lines.

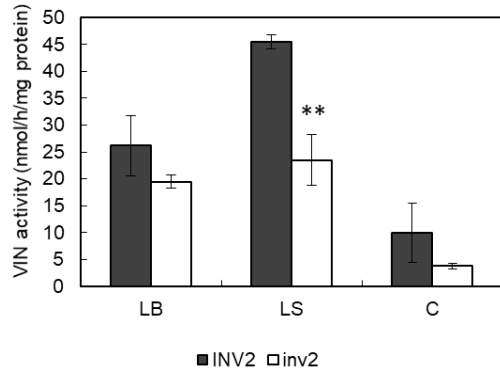


Fig. S3. Soluble acid invertase activity in LB, LS and C for *OsINV2* WT and KO at harvest. Data represent the mean \pm s.e. ($n=4$). Asterisks indicate statistical significance of difference using Student's T-statistic with $**$ - $P < 0.01$.

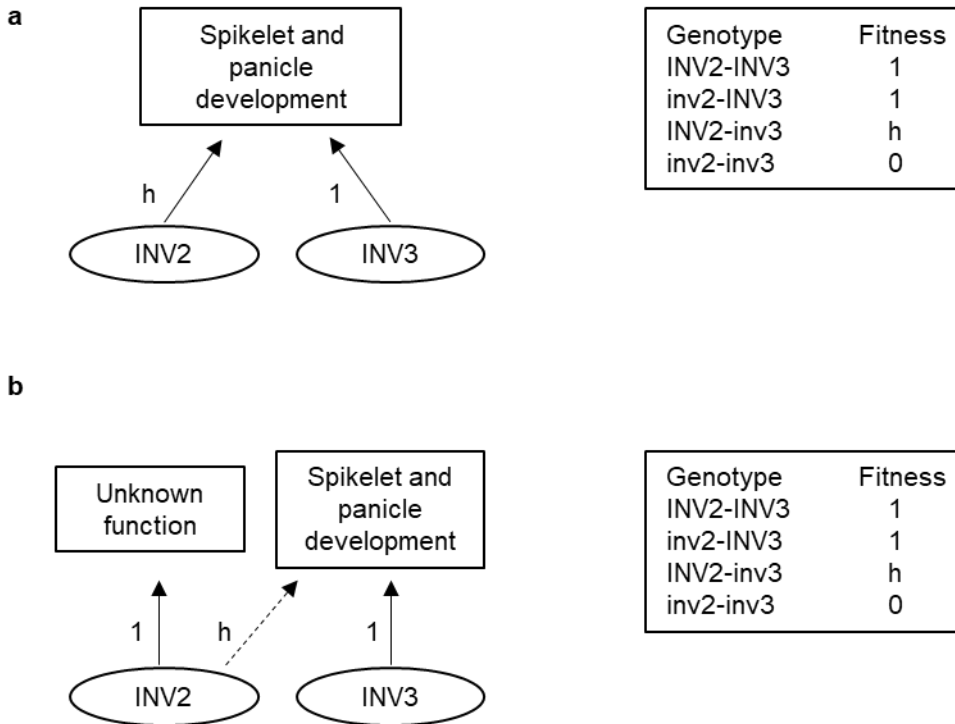


Fig. S4. Illustrated figure is an adaptation from the models of genetic redundancy as described by Nowak *et al.* 1997, with (a) and (b) representing models 2 and 3 respectively. The models are based on the roles of VIN in spikelet and panicle development, where in (a) *OsINV2* and *OsINV3* are assumed to perform similar functions, but *OsINV2* with a lower efficacy *h*, thereby causing a reduced fitness *h* upon absence of *OsINV3*. In (b) in addition to the lower efficacy of *OsINV2* towards spikelet and panicle development, it is assumed to perform an unknown function that is deemed to be key under unpredictable environments.