



**Supplemental Figure 1. T-DNAs Used in Monocot Transformation Experiments**

(A), (B) Control T-DNA configurations containing DsRED and PAT expression cassettes (A) or moPAT-YFP and PMI (B), both without *nos<sub>pro</sub>:Wus2:pinII* or *Ubi<sub>pro</sub>:Bbm:pinII* expression cassettes.

(E to H) Variations in constructs containing both *nos<sub>pro</sub>:Wus2:pinII* and *Ubi<sub>pro</sub>:Bbm:pinII* expression cassettes used in specific experiments.

(G and H) T-DNA configurations containing either *nos<sub>pro</sub>:Wus2:pinII* alone (G) or *Ubi<sub>pro</sub>:Bbm:pinII* alone (H).

Component Type	Label	Description	References
Promoters	<i>Ubi<sub>pro</sub></i>	The maize ubiquitin promoter, the 5' UTR and the first intron	Christensen et al., 1992
	<i>Sb-Ubi<sub>pro</sub></i>	The sorghum ubiquitin promoter, the 5' UTR and the first intron	An unpublished Pioneer sequence
	BSV <sub>pro</sub>	Viral promoter from a banana streak virus, isolate <i>Acuminata Yunnan</i>	Diehn et al., 2012
	CaMV 35S <sub>pro</sub>	The cauliflower mosaic virus 35S promoter	Odell et al., 1985
	<i>nos<sub>pro</sub></i>	The Agrobacterium-derived nopaline synthase promoter	An, 1986
	<i>rab17<sub>pro</sub></i>	The maize <i>rab17</i> promoter and 5' UTR	Busk et al., 1997
3' Sequences	CaMV 35S 3'	The cauliflower mosaic virus 3' sequence	Hirt et al., 1990
	pinII	The potato proteinase inhibitor II (pinII) 3' sequence	An et al., 1989
	<i>Sb-Ubi</i> 3'	The Ubiquitin 3' regulatory sequence from <i>Sorghum bicolor</i>	An unpublished Pioneer sequence
	<i>Sb-Actin</i> 3'	The Actin 3' regulatory sequence from <i>Sorghum bicolor</i>	An unpublished Pioneer sequence
	<i>UBIQ3</i> 3'	The Arabidopsis Ubiquitin-3 3' regulatory sequence	An unpublished Pioneer sequence
Marker Genes	PMI	The phosphomannose isomerase gene from <i>E. coli</i>	Negrotto et al., 2000
	GAT	A glyphosate N-acetyltransferase enzyme shuffled and optimized to confer glyphosate tolerance	Castle et al., 2004
	PAT	The phosphinothricin acetyltransferase gene from <i>Streptomyces hygroscopicus</i>	White et al., 1990
	moPAT	A maize codon-optimized gene encoding phosphinothricin acetyltransferase	Jayne et al., 2000 US6096947
	moPAT-YFP	The maize optimized PAT gene fused to the Zs-Yellow1-N1 gene	Jayne et al., 2000 and Matz et al., 1999
	GUS	The beta-glucuronidase gene from <i>Escherichia coli</i>	Jefferson et al., 1997
	moGFP	The maize-optimized GFP encoding the protein from <i>Aequorea victoria</i>	Gordon-Kamm et al., 2002
	YFP	The Zs-Yellow1 N1 gene encoding a yellow fluorescent protein from <i>Zoanthus sp.</i>	Matz et al., 1999.
	CYAN	A gene encoding the Am-CYAN1 protein from <i>Anemonia majano</i>	Matz et al., 1999.
	GFP	A gene encoding the Zs-GREEN protein from <i>Zoanthus sp.</i>	Matz et al., 1999.
	HYG	The hygromycin phosphotransferase gene from <i>E. coli</i> .	Walters et al., 1992
	YFP~HYG	A gene encoding a protein fusion between Zs-Yellow1 N1 and HYG	An unpublished Pioneer sequence
	DsRED	The DsRed gene with a potato proteinase inhibitor second intron LS1	Baird et al., 2000 and Eckes et al., 1986
Maize Developmental Gene Expression Cassettes	<i>Wus2</i>	The maize <i>Wuschel2</i> ( <i>Wus2</i> ) gene	Lowe et al., 2007 US7256322
	<i>Bbm</i>	The maize <i>Baby boom</i> gene ( <i>Bbm</i> )	Gordon-Kamm et al., 2005 WO2005075655
	<i>OsBbm</i>	The <i>Baby boom</i> gene from japonica rice	see LOC_OS01g67410 Rice Genome Annotation Project (RGAP) OSA1 Release 7
Recombinase Expression Cassettes	CRE	A maize-optimized CRE recombinase gene (originally from the P1 bacteriophage), with an inserted potato LS1 intron	Odell et al., 1990
	FLP	A maize-optimized FLP recombinase (originally from <i>Saccharomyces cerevisiae</i> ), with an inserted potato LS1 intron	Baszczyński et al., 1999 US5929301
Recombinase Target Sites	loxP	The recombinase target site for the CRE recombinase from <i>E. coli</i>	Odell et al., 1990.
	FRT	The recombinase target site for the FLP recombinase from yeast	Schlake and Bode, 1994

Supplemental Table 1. List of components and abbreviations used in vector maps.

Medium name	Use	Medium base	Ingredients
700	Infection	MS	68.5g/l sucrose, 36g/l glucose, 1.5mg/l 2,4-D, pH 5.8
710I	Co-cultivation	MS	20g/l sucrose, 10g/l glucose, 2.0mg/l 2,4-D, 100um acetosyringone, 50mg/l thymidine, pH 5.8
605J	Callus development	MS+N6	20g/l sucrose, 0.6g/l glucose, 0.8mg/l 2,4-D, 1.2mg/l dicamba, 100mg/l carbenicillin
605T	Callus development	MS+N6	20g/l sucrose, 0.6g/l glucose, 0.8mg/l 2,4-D, 1.2mg/l dicamba, 100mg/l cefotaxime, 150mg/l timentin, pH 5.8
605K	Bialaphos Selection	MS + N6	605T + 3 mg/l bialaphos
605N	PMI Selection	MS + N6	605T with adjusted sugars; 5g/l maltose, 12.5g/l mannose, pH 5.8
2890	Shoot formation	MS	60g/l sucrose, 0.5mg/l zeatin, 0.1mg/l thidiazuron, 1mg/l BAP, 100mg/l carbenicillin, pH 5.8
272V	Root development	MS	40g/l sucrose, hormone-free
13300	Green tissue culture	MS	0.25 g/l myo-inositol, 1 g/l casein hydrolysate, 1 mg/l thiamine, 1 mg/l 2,4-D, 30 g/l maltose, 0.69 g/l L-proline, 1.22 mg/l CuSO <sub>4</sub> , 5 g/l glucose, pH 5.8
13152T	Green tissue selection	MS	13300 with no glucose, 5 g/l maltose and 12.5 g/l mannose, pH 5.8
13158	Seed germination		272V with 100mg/l benomyl, pH 5.8

**Supplemental Table 2.** Medium formulations used for maize and rice transformation and tissue culture

Medium Name	Use	Medium Base	Other Ingredients
DBC3 (M5G)	Co-cultivation	MS	30 g/l maltose, 5 g/l glucose, 2 mg/l thiamine, 0.25 g/l myo-inositol, 1 g/l casein hydrolysate, 0.69 g/l proline, 4.9 $\mu$ M CuSO <sub>4</sub> , 1 mg/l 2,4-D, 0.5 mg/l BAP, pH 5.8
DBC3	Phase I Callus proliferation	MS	30 g/l maltose, 2 mg/l thiamine, 0.25 g/l myo-inositol, 1 g/l casein hydrolysate, 0.69 g/l proline, 4.9 $\mu$ M CuSO <sub>4</sub> , 1 mg/l 2,4-D, 0.5 mg/l BAP, pH 5.8
DBC6	Phase II Callus proliferation	MS	30 g/l maltose, 2 mg/l thiamine, 0.25 g/l myo-inositol, 1 g/l casein hydrolysate, 0.69 g/l proline, 4.9 $\mu$ M CuSO <sub>4</sub> , 0.5 mg/l 2,4-D, 2 mg/l BAP, pH 5.8
MSA	Maturation	MS	20 g/l sucrose, 1 g/l myo-inositol, pH 5.8
MSB	Rooting	MS	20 g/l sucrose, 1 g/l myo-inositol, 1 g/l indole-3-butyric acid, pH 5.8

**Supplemental Table 3.** Medium formulations used for sugarcane transformation and tissue culture.

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