

Supplementary material

Table S1. Predicted isotopic enrichment in ^{18}O from irrigation water to leaf water ($\Delta^{18}\text{O}_{\text{LW-IW}}$) after Farquhar et al., 2007 in Cernusak et al, 2016 (Eq.4). Refer to Cernusak et al. (2016) for symbol and calculations used in the table. Added calculations are displayed in grey columns: $\Delta^{17}\text{O}_{\text{LW-IW}}$ and $17\text{O-excess}_{\text{LW-IW}}$ were calculated using $^{17}\alpha_{\text{eq}} = ^{18}\alpha_{\text{eq}}^{0.529}$ and $^{17}\alpha_{\text{k}} = ^{18}\alpha_{\text{k}}^{0.518}$, for the equilibrium fractionation and kinetic fractionation, respectively. $\lambda_{\text{LW-IW}} = \Delta^{17}\text{O}_{\text{LW-IW}} / \Delta^{18}\text{O}_{\text{LW-IW}}$. IW: irrigation water; LW : leaf water. (LW).

Sample	Sampling details			Physiological data		Isotopic data						Calculations																			
	Air temp.	Leaf temp.	Air RH	Stomatal cond.	Boundary layer cond.	Atm. vapor $\delta^{18}\text{O}$	Atm. vapor $\delta^{17}\text{O}$	source water (SW) $\delta^{18}\text{O}$	source water (SW) $\delta^{17}\text{O}$	LW $\delta^{18}\text{O}$	LW $\delta^{17}\text{O}$	air vapor pressur $e - e_a$	leaf vapor pressur $e - e_i$	w_a/w_i	ϵ_k for $\delta^{18}\text{O}$	ϵ_k for $\delta^{17}\text{O}$	ϵ^* for $\delta^{18}\text{O}$ at leaf temp	ϵ^* for $\delta^{17}\text{O}$ at leaf temp	Δ_k for $\delta^{18}\text{O}$	Δ_k for $\delta^{17}\text{O}$	Predicted					Observed					
	$^{\circ}\text{C}$	$^{\circ}\text{C}$	%	$\text{mol m}^{-2} \text{s}^{-1}$	$\text{mol m}^{-2} \text{s}^{-1}$	‰	‰	‰	‰	‰	‰	kPa	kPa		‰	‰	‰	‰	‰	‰	‰	$\Delta^{18}\text{O}_{\text{LW-IW}}$	$\Delta^{17}\text{O}_{\text{LW-IW}}$	$\Delta^{18}\text{O}_{\text{LW-IW}}$	$\Delta^{17}\text{O}_{\text{LW-IW}}$	$^{17}\text{O-excess}_{\text{LW-IW}}$	$\lambda_{\text{LW-IW}}$	$\Delta^{18}\text{O}_{\text{LW-IW}}$	$\Delta^{17}\text{O}_{\text{LW-IW}}$	$^{17}\text{O-excess}_{\text{LW-IW}}$	$\lambda_{\text{LW-IW}}$
P4-75-02-09-2016- Adult leaves: bulk blade	20.0	20.0	73.0	0.066	20	-5.57	-2.92	-5.57	-2.92	9.09	4.77	1.71	2.35	0.73	27.970	14.392	9.807	5.176	0.000	0.000	17.433	9.082	17.283	9.041	-84	0.523	14.744	14.636	7.679	-49	0.525
P4-75-02-09-2016- Adult leaves: bulk blade	20.0	18.0	73.0	0.066	20	-5.57	-2.92	-5.57	-2.92	9.09	4.77	1.71	2.07	0.83	27.970	14.392	9.981	5.268	0.000	0.000	14.868	7.770	14.758	7.740	-52	0.524	14.744	14.636	7.679	-49	0.525

Table S2. Measurement using an IR thermometer and a thermocouple of the temperature of *F. Arundinacea* leaves and the surrounding air (1 to 2 cm from the leaf) in a growth chamber. The air temperature, RH and p_{CO_2} set in the growth chamber are 19°C , 73.5% and 400ppm respectively.

Sample		Air temp.	Leaf temp.	Air-leaf temp.
		$^{\circ}\text{C}$		
F. arundinacea adult leaf sheath	1	21.9	20.5	1.4
	2	21.5	19.7	1.8
	3	21.4	19.2	2.2
	4	21.6	19.1	2.5
	5	21.9	20.1	1.8
	Av.		21.7	19.7
SD		0.2	0.6	
F. arundinacea adult leaf <10cm	1	21.6	19.3	2.3
	2	21.5	19.6	1.9
	3	21.6	19	2.6
	4	21.9	19.7	2.2
	5	22.2	21.1	1.1
	Av.		21.8	19.7
SD		0.3	0.8	
F. arundinacea adult leaf >10cm	1	21.4	19.1	2.3
	2	21.6	19.9	1.7
	3	21.6	19.4	2.2
	4	22.3	19.7	2.6
	5	22.3	20.5	1.8
	Av.		21.8	19.7
SD		0.4	0.5	