

Table S1. Values of the model parameters used in ODE equations, described in the Supplementary Information. The Table divided on four parts (A-D), which correspond to parts A-D of the Supplementary Information.

A. Parameters of carbon fixation and starch synthesis reactions						
Parameter	Pi_{tot}	$K_{M_ATP_{synt}}$	K_{M_HP}	K_{M_THP}	K_{M_SP}	V_{m_sFBP}
Value	10 mM	0.3 mM	0.04 mM	0.08 mM	0.6 mM	0.85 mM/s
ref	1	2	1, 3	1, 3	varied, text	4
Parameter	K_{iF6P_FBPase}	K_{M_sFBP}	ATP_s	ADP_s	V_{m_agp}	$K_{M_agp_G1P}$
Value	0.7 mM	0.033 mM	0.71 mM	0.23 mM	0.24 mM/s	0.08 mM
ref	5	6	7, 8	7, 8	5, 9	5
Parameter	$K_{M_agp_ATP}$	$K_{a_agp_PGA}$	V_{M_TPT}	K_{eq_sAld}	K_{eq_TPiso}	$K_{eq_PGA_GAP}$
Value	0.08 mM	0.1	1.1 mM/s	7.1 mM ⁻¹	22	0.009 mM
ref	5	5	10	11	11	11
Parameter	$NADP$	$NADPH$	K_{eq_PGI}	K_{eq_PGM}	v_{phsyn}^{obs}	v_c, v_s
Value	0.29 mM	0.21 mM	2.3	0.058	0.4 mM/s	65, 23 μl/gFW
ref	12	12	11	5	13, 14	15
B. Parameters of starch degradation reactions						
Parameter	f	f_M	f_{G3}	$K_{M\beta}^{St}$	k_{β}^G	$K_{M\beta}^G$
Value	0.582	0.87	0.13	1.46 mM	1.25	4.27 mM
ref	16	17	17	16	16	16
Parameter	K_{M_mex}	K_{M_glut}	K_{Misa}	K_{Mr}	v_s	v_c
Value	4 mM	19.3 mM	1.46 mM	12 mM ²	65 μL/gFW	23 μL/gFW
ref	17	18	estim., text	17	15	15
Parameter	K_{eq}^{dpe}	$K_{eq}^{dpe2_phs}$	V_{M_dpe1}	V_{M_dpe2}	V_{M_mex}	V_{M_glut}
Value	1	1	0.1 mM/s	0.1 mM/s	0.1 mM/s	0.02 mM/s
ref	17	17	17	17	18-23, see text	18-23, see text
Parameter	$V_{M_β}$	V_{M_isa}	k_{d_int}	K_{M_hxx}	K_{iG6P}	V_{M_hxx}
Value	0.09 mM/s	0.005 mM/s	0.003 s ⁻¹ mM ⁻¹	0.035	4 mM	0.1 mM/s
ref	18-23, see text	18-23, see text	assumed, see text	24	25	9
C. Parameters of sucrose metabolism						
Parameter	$NADP$	$NADPH$	ATP_c	ADP_c	Pi_c	$K_{M_cFBPase}$
Value	0.29 mM	0.21 mM	2.57 mM	0.3 mM	3 mM	0.0025 mM
ref	12	12	7, 8	7, 8	26	27
Parameter	K_{iF6P_FBPase}	K_{iF26P}	$v_{M_cFBPase}$	v_{M_PGI}	v_{M_PGM}	K_{eq_PGI}
Value	0.7 mM	2 μM	0.2 mM/s	0.7 mM/s	1.8 mM/s	2.3
ref	28	29	30	31	31	11
Parameter	v_{M_UGPase}	K_{eq_UGPase}	K_{M_UTP}	UTP_c	K_{M_F6PK}	v_{M_PFP}
Value	3.6 mM/s	0.31	0.093 mM	1.9 mM	0.5 mM	0.1 mM/s
ref	32	33	34	35	36	9
Parameter	K_{eq_PGM}	v_{M_SPS}	K_{M_F6P}	K_{M_UDPG}	K_{iF6P_F26PP}	K_{iPGA}
Value	0.058	0.3 mM/s	2 mM	2 mM	0.1 mM	0.084 mM
ref	37	38	38	38	39	40

Parameter	K_{eq_sAld}	K_{eq_TPiso}	$K_{eq_PGA_GAP}$	K_{eq_PGI}	K_{eq_PGM}	K_{M_F26PP}
Value	7.1 mM ⁻¹	22	0.009 mM	2.3	0.058	0.032 mM
ref	11	11	11	11	37	41
Parameter	v_{M_F6PK}	v_{M_F26PP}	v_{M_resp}	K_{M_resp}	PPi_c	K_{eq_PPF}
Value	0.00002 s ⁻¹	0.001 s ⁻¹	0.1 mM/s	0.13 mM	0.04 mM	3.3
ref	varied, see text	varied, see text	42	7, 43, see text	estimated, see text	44
D. Parameters of the model related with sink metabolism and diurnal regulation. The rate constants of the diurnal regulation are slower than the rate constants of the enzymatic reactions, so the diurnal parameters are presented in h ⁻¹ units for clarity of the Table						
Parameter	K_{eq_SuSy}	v_{M_SuSy}	V_{so}	K_{i_cons}	UDP_c	K_{i_st}
Value	0.15	0.6 mM/s	0.75	0.3	1.3 mM	1 M
ref	45	46, 47	48	47, 49	35	50, 51, text
Parameter	v_{M_cons}	v_{M_exp}	$k_{sb,1}$	$k_{sb,2}$	$K_{sb,1}$	$K_{sb,2}$
Value	0.6 mM/s	0.004 mM/s	0.02 h ⁻¹	0.06 h ⁻¹	0.4	0.2
ref	51, text	35, 42, text	47, 49, 51	47, 49, 51	47, 49, 51	47, 49, 51
Parameter	k_{db}	k_{sX}	k_{dX}	K_{iX_I}	K_{X_I}	$k_{sa,1}$
Value	0.5 h ⁻¹	0.0023 h ⁻¹ mM ⁻¹	1 h ⁻¹	0.2	1	0.012 h ⁻¹
ref	47, 49, 51	47, 49, 51	47, 49, 51	52	52	47, 49, 51
Parameter	$k_{sa,2}$	$k_{sa,3}$	$K_{sa,1}$	$k_{da,1}$	$k_{da,i}$	k_{sI}
Value	0.02 h ⁻¹	0.23 h ⁻¹	0.2	0.03 h ⁻¹	0.07	0.6 h ⁻¹
ref	47, 49, 51	47, 49, 51	47, 49, 51	47, 49, 51	47, 49, 51	47, 49, 51
Parameter	k_{dI}	K_{i_sI}	k_{sD}	k_{dD}	k_{sGPT}	k_{dGPT}
Value	0.2 h ⁻¹	1 mM	0.0004	0.1 h ⁻¹	4 h ⁻¹	0.3 h ⁻¹
ref	47, 49, 51	47, 49, 51	47, 49, 51	47, 49, 51	Kunz 10	Kunz 10
Parameter	K_{sGPT}	V_{M_GPT2}	K_{St_sink}	$V_{M_St_sink}$	k_{diurn0}	K_{i_diurn}
Value	1.5	0.08 mM/s	0.1 mM	0.005 mM/s	0.3	0.3
ref	47, 49, 51	47, 49, 51	47, 49, 51	47, 49, 51	47, 49, 51	47, 49, 51

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