Supplementary Document 2

Statistical analyses

Doc S2 Table 1. Statistical analysis (ANOVA/Tukey-Kramer) of growth parameters of wild-type and mutant plants. Growth rates of leaf rosettes were determined for plants grown in soil under SL-conditions (PDF = 150 µmol·m^{-2}·s^{-1}) in the long-day (Figure 2C, main article). Root growth was assessed for plants grown on 1/2MS agar (Figure 2D, main article). For the generative growth parameters plants were grown as described in Table 1 (main article). The biotypes are denoted, *a* = Ws-2, *b* = *xpt-1*, *c* = Col-0, *d* = *tpt-2*, *e* = *tpt-2/xpt-1*, *f* = amiRNA:*XPT tpt-2* #3, and *g* = amiRNA:*XPT tpt-2* #4. DAS = days after sowing. The significance levels of $P < 0.05$ or $P < 0.01$ are indicated by light or dark blue colors.

7 comparisons

Legend: ● = dark blue ($P < 0.01$); ○ = light blue ($P < 0.05$); blank = not significant.

Growth parameter	b vs a	c vs a	d vs a	e vs a	f vs a	g vs a	c vs b	d vs b	e vs b	f vs b	g vs b	d vs c	e vs c	f vs c	g vs c	e vs d	f vs d	g vs d	f vs e	g vs e	g vs f
Rosette area																					
9 DAS									○	○											
13 DAS									●	●	●		○	○		○	○				
17 DAS		○		●	○	○		○	●	●	●	●	●	●	●	●	●				
21 DAS			○	●	●	●		○	●	●	●	●	●	●	●	●	●	●			
Root length																					
3 DAS							●	●	●	○	●										
6 DAS			●	●	●	●		●	●	●	●		○	●	●	○					
9 DAS		○	●	●	●	●		●	●	●	●	●	●	●	●			●			
12 DAS			●	●	●	●		●	●	●	●	●	●	●	●						
Generative growth																					
Inflorescence height	●		●				●	●	●	●	●		●			●			●	●	
Number of sliques	○	●	●	●	●	●	●	●	●	●	●		●			●			●	○	
Seed weight per plant		○	●	●	●		●	●	●	●	●		●	●	●	●		○	●		
Seed weight per 100 seeds	●						●	●	●	●	●		●			●					
Seed number per plant	●	●	●	●	●	●			●			●	●			●	●	○	●		
Seed area	●		●	○		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Doc S2 Table 2. Statistical analysis (ANOVA/Tukey-Kramer) of Chl *a* fluorescence parameters of wild-type and mutant plants impaired in XPT and TPT as well as starch biosynthesis. The growth conditions and experimental setup is described in Supplementary Table 2. The biotypes are denoted, *a* = Ws-2, *b* = Col-0, *c* = *tpt-2*, *d* = *tpt-2/xpt-1*, *e* = amiRNA:*XPT tpt-2* #3, *f* = amiRNA:*XPT tpt-2* #4, *g* = *adg1-1/tpt-2*, *h* = *xpt-1*, *i* = *tpt-1, and j* = *tpt-1/xpt-1.* The significance levels of P < 0.05 or P < 0.01 are indicated by light or dark blue colors.

7 Comparisons

PS Parameters	b vs a	c vs a	d vs a	e vs a	f vs a	g vs a	c vs b	d vs b	e vs b	f vs b	g vs b	d vs c	e vs c	f vs c	g vs c	e vs d	f vs d	g vs d	f vs e	g vs e	f vs g
Long-day HL																					
F_v/F_m			■		◫	■		■		◫	■	■			■	■	■	■		■	■
ΦPSII			■		■	■		■		■	■	■		■	■	■			■	■	
Relative ETR$_{(700)}$			■		■	■		■		■	■	■		■	■	■			■	■	

4 Comparisons

PS Parameters	h vs a	i vs a	j vs a	i vs h	j vs h	i vs j
Long-day HL						
F_v/F_m			■	◫	■	■
ΦPSII		◫	■	◫	■	■
Relative ETR$_{(700)}$		■	■	■	■	■

(■ = dark blue, P < 0.01; ◫ = light blue, P < 0.05)

Doc S2 Table 3. Statistical analysis (ANOVA/Tukey-Kramer) of rosette leaf parameters, i.e. photosynthetic pigments and protein contents as well as specific fresh weights. Plants were grown under HL- (PFD = 300 µmol·m^{-2}·s^{-1}; Tabel 3, main article) or LL-conditions (PFD = 30 µmol·m^{-2}·s^{-1}; Supplementary Table 3). The biotypes are denoted, *a* = Ws-2, *b* = Col-0, *c* = tpt-2, *d* = tpt-2/xpt-1, *e* = amiRNA:*XPT tpt-2* #3, *f* = amiRNA:*XPT tpt-2* #4, *g* = adg1-1/tpt-2, *h* = xpt-1, *i* = tpt-1, and *j* = tpt-1/xpt-1. The significance levels of P < 0.05 or P < 0.01 are indicated by light or dark blue colors.

Legend for cells: **D** = dark blue (P < 0.01), **L** = light blue (P < 0.05), blank = not significant.

7 Comparisons

Parameters	b vs a	c vs a	d vs a	e vs a	f vs a	g vs a	c vs b	d vs b	e vs b	f vs b	g vs b	d vs c	e vs c	f vs c	g vs c	e vs d	f vs d	g vs d	f vs e	g vs e	g vs f
A High light																					
Chl			D	D	D	D	L	D	D	D	D	D	D	L	D					L	D
Carotenoids			L			D					D	D			D						
Chl *a/b*-ratio			D	D		D		D	L		D	D	D		D			D		L	D
Protein		L	D	D	D			D	L		D	D			D						
Spec. fw	L		D	D	D	D	L	D	D	D	D	D	D	D	D			L			
B Low light																					
Chl						D					D				D					D	L
Carotenoids																					
Chl *a/b*-ratio						D					D				D	L		D		D	D
Protein																					
Spec. fw																					

4 Comparisons

Parameters	h vs a	i vs a	j vs a	i vs h	j vs h	j vs i
A High light						
Chl		L	D	D	D	L
Carotenoids						
Chl *a/b*-ratio			D		D	
Protein			D		D	
Spec. fw	D	L	D	D	D	
B Low light						
Chl						
Carotenoids						
Chl *a/b*-ratio						
Protein						
Spec. fw	L			L		

Doc S2 Table 4. Statistical analysis (ANOVA/Tukey-Kramer) of carbohydrate contents in rosette leaves of wild-type and mutant plants. The plants were grown in soil under HL-conditions (PFD = 300 µmol·m^{-2}·s^{-1}) in the long-day (Figure 4, main article). The biotypes are denoted, **a** = Ws-2, **b** = xpt-1, **c** = tpt-1, **d** = tpt-1/xpt-1, **e** = Col-0, **f** = tpt-2, **g** = tpt-2/xpt-1, and **h** = adg1-1/tpt-2. The significance levels of P < 0.05 or P < 0.01 are indicated by light or dark blue colors.

8 Comparisons

Time course	b vs a	c vs a	d vs a	e vs a	f vs a	g vs a	h vs a	c vs b	d vs b	e vs b	f vs b	g vs b	h vs b	d vs c	e vs c	f vs c	g vs c	h vs c	e vs d	f vs d	g vs d	h vs d	f vs e	g vs e	h vs e	g vs f	h vs f	h vs g
A Starch																												
1 h																												
4 h																												
8 h																												
12 h																												
15 h																												
17 h																												
20 h																												
23 h																												
B Σ Sugars																												
1 h																												
4 h																												
8 h																												
12 h																												
15 h																												
17 h																												
20 h																												
23 h																												

Doc S2 Table4 (continued)

Time course	b vs a	c vs a	d vs a	e vs a	f vs a	g vs a	h vs a	c vs b	d vs b	e vs b	f vs b	g vs b	h vs b	d vs c	e vs c	f vs c	g vs c	h vs c	e vs d	f vs d	g vs d	h vs d	f vs e	g vs e	h vs e	g vs f	h vs f	h vs g
C Glc																												
1 h																												
4 h																												
8 h																												
12 h																												
15 h																												
17 h																												
20 h																												
23 h																												
D Fru																												
1 h																												
4 h																												
8 h																												
12 h																												
15 h																												
17 h																												
20 h																												
23 h																												

a = Ws-2, *b* = xpt-1, *c* = tpt-1, *d* = tpt-1/xpt-1, *e* = Col-0, *f* = tpt-2, *g* = tpt-2/xpt-1, and *h* = adg1-1/tpt-2

Doc S2 Table4 (continued)

Time course	b vs a	c vs a	d vs a	e vs a	f vs a	g vs a	h vs a	c vs b	d vs b	e vs b	f vs b	g vs b	h vs b	d vs c	e vs c	f vs c	g vs c	h vs c	e vs d	f vs d	g vs d	h vs d	f vs e	g vs e	h vs e	g vs f	h vs f	h vs g
E Suc																												
1 h						■	▨								▨		■				▨					■		
4 h		■	■		■	▨	■	■			■	■	■		■		■		▨		■			■	■	■		■
8 h																	■				■							
12 h		■	■	■		■	■	■			■	■			■		■			■	■			■		■	▨	▨
15 h		■	■	■		■	▨	■				■					■			▨	■			■				
17 h						■	■			▨	▨	■	■				■	■			■	■		■	■	■	■	■
20 h				■		■	■				■	■	■				■	■	■		■	■		■	■	▨	■	■
23 h						■	■					■	■				■	■			■	■		■	■	■	■	■

a = Ws-2, *b* = xpt-1, *c* = tpt-1, *d* = tpt-1/xpt-1, *e* = Col-0, *f* = tpt-2, *g* = tpt-2/xpt-1, and *h* = adg1-1/tpt-2

Doc S2 Table 5. Statistical analysis (ANOVA/Tukey-Kramer) of metabolite contents in leaves of wild-type and mutant plants. The plants were grown in soil under HL-conditions (PFD = 300 µmol·m^{-2}·s^{-1}) in the long-day (see Figure 5, and Supplementary Table 5). Samples were taken at the middle of the dark period (**A**), or the beginning (**B**), and middle of the light period (**C**). The biotypes are denoted, *a* = Ws-2, *b* = *xpt-1*, *c* = *tpt-1/xpt-1*, *d* = Col-0, *e* = *tpt-2*, and *f* = *tpt-2/xpt-1*. The significance levels of P < 0.05 or P < 0.01 are indicated by light or dark blue colors.

6 Comparisons

A Middle of the dark period (5 h in the dark)

Legend: ██ = P < 0.01 (dark blue), ▒▒ = P < 0.05 (light blue)

Metabolites	b vs a	c vs a	d vs a	e vs a	f vs a	c vs b	d vs b	e vs b	f vs b	d vs c	e vs c	f vs c	e vs d	f vs d	e vs f
3-PGA				▒▒				██			██		██		▒▒
DHAP															
S-7-P		██				██				██	██	██			
Ri5P															
Xu5P+Ru5P		██			██	██		██	██	██				██	██
Fru6P															
Glc6P															
Glc1P															
UDPG															
Glycerol-3-P															
ATP															
AMP															
Asn					▒▒										
Phe					██			██				██		██	██
Tyr					██			██				██		██	██
Trp					▒▒			▒▒						██	▒▒

B Beginning of the light period (1 h in the light)

Metabolites	b vs a	c vs a	d vs a	e vs a	f vs a	c vs b	d vs b	e vs b	f vs b	d vs c	e vs c	f vs c	e vs d	f vs d	e vs f
3-PGA															
DHAP															
S-7-P															
Ri5P															
Xu5P+Ru5P		██				██				██				▒▒	
Fru6P															
Glc6P															
Glc1P															
UDPG															
Glycerol-3-P															
ATP															
AMP															
Asn															
Phe		▒▒													
Tyr					██				██			██		██	██
Trp					██				██			██		██	██

C Middle of the light period (8 h in the light)

	b vs a	*c vs a*	*d vs a*	*e vs a*	*f vs a*	*c vs b*	*d vs b*	*e vs b*	*f vs b*	*d vs c*	*e vs c*	*f vs c*	*e vs d*	*f vs d*	*e vs f*
3-PGA															
DHAP															
S-7-P															
Ri5P					▨				▨					▉	▨
Xu5P+Ru5P		▉			▨	▉			▨	▉				▨	
Fru6P															
Glc6P															
Glc1P															
UDPG															
Glycerol-3-P											▉				
ATP															
AMP															
Asn															
Phe	▨	▉										▨			
Tyr					▉				▉			▉		▉	▉
Trp															

a = Ws-2, ***b*** = *xpt-1*, ***c*** = *tpt-1/xpt-1*, ***d*** = Col-0, ***e*** = *tpt-2*, and ***f*** = *tpt-2/xpt-1*.

Doc S2 Table 6 Statistical analysis (ANOVA/Tukey-Kramer) of metabolite contents in leaves of wild-type and mutant plants. The plants were grown in soil under HL-conditions (PFD = 300 µmol·m^{-2}·s^{-1}) in the long day (see Figure 5, and Supplementary Table 5). Samples were taken at the middle of the dark period (**A**), or the beginning (**B**) and middle of the light period (**C**). The biotypes are denoted, **a** = Ws-2, **b** = xpt-1, **c** = tpt-1/xpt-1, **d** = Col-0, **e** = tpt-2, and **f** = tpt-2/xpt-1. The significance levels of P < 0.05 or P < 0.01 are indicated by light or dark blue colors.

A Middle of the dark period (5 h in the dark)

6 Comparisons

Cells are marked D = dark blue (P < 0.01) and L = light blue (P < 0.05); blank = not significant.

Metabolites	b vs a	c vs a	d vs a	e vs a	f vs a	c vs b	d vs b	e vs b	f vs b	d vs c	e vs c	f vs c	e vs d	f vs d	e vs f
Glu															
Asp					L										
Ser															
Gly						D	L	D	D						
Thr															
Pro															
Phe															
Tyr									L			L		L	
Val															
Leu															
Ile															
Lys															
Met															
β-Ala					D			L	D			D		D	D
Glycerol															
Mannitol									L					L	
Myoinositol				L											
Sorbitol															
Putrescine															
(Iso) Citrate															
2-Oxoglutarate					D						L			D	
Succinate					D				D			D		D	D
Fumarate									L						
Malate															
Glycolate															
Lactate															
Glycerate		D			D		L		D	D				D	
Gluconate					D				D			D		D	
Maleate															
Malonate									L					L	
Shikimate															L
Quinate															
Glc														D	
Fru		D			D		L		D					D	D
Suc															
Maltose		D	D	D	D			D			D	D	D	D	
Mannose							L							D	
Xylose															

B Beginning of the light period (1 h in the light)

Metabolite	b vs a	c vs a	d vs a	e vs a	f vs a	c vs b	d vs b	e vs b	f vs b	d vs c	e vs c	f vs c	e vs d	f vs d	e vs f
Glu		░													
Asp															
Ser															
Gly		░	░		▓	▓	▓		▓						
Thr															
Pro															
Phe		▓			░	▓				▓					
Tyr														░	
Val					▓				▓			▓		▓	
Leu					░				░					░	
Ile					░				▓					░	
Lys															
Met															
β-Ala					▓				▓			▓		▓	▓
Glycerol															
Mannitol															
Myoinositol			▓	░			░								
Sorbitol															
Putrescine															
(Iso) Citrate															
2-Oxoglutarate														░	
Succinate					▓				▓			▓		▓	▓
Fumarate					░	░		░	▓						
Malate															
Glycolate															
Lactate															
Glycerate															
Gluconate					▓				▓			▓		▓	▓
Maleate															
Malonate			░										░		
Shikimate					░				░						
Quinate															
Glc															
Fru				░				▓							░
Suc												░			
Maltose					▓				▓			▓		▓	▓
Mannose															
Xylose															

a = Ws-2, *b* = xpt-1, *c* = tpt-1/xpt-1, *d* = Col-0, *e* = tpt-2, and *f* = tpt-2/xpt-1.

Doc S2 Table 6 (continued)

C Middle of the light period (8 h in the light)

Metabolites	b vs a	c vs a	d vs a	e vs a	f vs a	c vs b	d vs b	e vs b	f vs b	d vs c	e vs c	f vs c	e vs d	f vs d	e vs f
Glu		□													
Asp															
Ser															
Gly		■	■	■	■	■			■						
Thr															
Pro	■	■	■	□	□										
Phe		■			□										
Tyr															
Val									■					■	
Leu									■					□	
Ile									■					□	
Lys															
Met		□			□										
β-Ala				□	■			■	■		□	■		■	■
Glycerol															
Mannitol									□						
Myoinositol			□	■						□	■				
Sorbitol															
Putrescine															
(Iso) Citrate															
2-Oxoglutarate															
Succinate					■				■			■		■	□
Fumarate				□	■			□	■					□	
Malate															
Glycolate															
Lactate									□						
Glycerate															
Gluconate					■				■			■		■	■
Maleate															
Malonate					■				■			■		■	■
Shikimate															
Quinate	□					□	□	□							
Glc															
Fru				□			□	□						■	■
Suc		■		□											
Maltose		□			■	□			■	■		■		■	■
Mannose															
Xylose															

a = Ws-2, *b* = xpt-1, *c* = tpt-1/xpt-1, *d* = Col-0, *e* = tpt-2, and *f* = tpt-2/xpt-1.

Doc S2 Table 7. Statistical analysis (ANOVA/Tukey-Kramer) of soluble amino acid contents in leaves of wild-type and mutant plants. The plants were grown in soil under HL-conditions (PFD = 300 µmol·m^{-2}·s^{-1}) in the long-day (Figure 6C, main article). Samples were taken either 4 h in the dark (**A**, **C**) or 8 h in the light (**B**, **D**). The data represents the mean ± SE of n = 4 to 5 independent replicates. The biotypes are denoted, *a* = Ws-2, *b* = Col-0, *c* = tpt-2, *d* = tpt-2/xpt-1, *e* = amiRNA:*XPT tpt-2* #3, *f* = amiRNA:*XPT tpt-2* #4, *g* = adg1-1/tpt-2, *h* = xpt-1, *i* = tpt-1, and *j* = tpt-1/xpt-1. The significance levels of P < 0.05 or P < 0.01 are indicated by light or dark blue colors.

A 4 h dark (absolute)

7 Comparisons

Amino acids	b vs a	c vs a	d vs a	e vs a	f vs a	g vs a	c vs b	d vs b	e vs b	f vs b	g vs b	d vs c	e vs c	f vs c	g vs c	e vs d	f vs d	g vs d	f vs e	g vs e	f vs g
Glu																					
Gln																					
Asp																					
Asn																					
Ala																					
Ser																					
Gly																					
Thr																					
His																					
Arg																					
Phe																					
Tyr																					
Trp																					
Val																					
Leu																					
Ile																					
Lys																					
Σ																					

4 comparisons

	h vs a	i vs a	j vs a	i vs h	j vs h	i vs j
Glu						
Gln						
Asp						
Asn						
Ala						
Ser						
Gly						
Thr						
His						
Arg						
Phe						
Tyr						
Trp						
Val						
Leu						
Ile						
Lys						
Σ						

Doc S2 Table 7. (continued)

B 8 h light (absolute)

Amino acids	b vs a	c vs a	d vs a	e vs a	f vs a	g vs a	c vs b	d vs b	e vs b	f vs b	g vs b	d vs c	e vs c	f vs c	g vs c	e vs d	f vs d	g vs d	f vs e	g vs e	f vs g		h vs a	i vs a	j vs a	i vs h	j vs h	i vs j
Glu																												
Gln	■	■				■	■	■	■	■	■							□		■	■				■		□	
Asp			■					■				□													■			
Asn		■				■					■				■			■		■	■							
Ala	□	■	■					■			■					■	■	■										
Ser	■	■						■	■	■	■	■	■	■	■									■	□	□		
Gly	■	■	■	■	■	■		□			■			□										■	■	■	■	■
Thr	■	■	■	■	■						■									■	■		□	□				□
His	□					□																						
Arg						■										■		■		■	■							
Phe			□					■																				
Tyr			□			■		■			■					■	□	□		■	■			□	□			
Trp																								□	□			
Val			■			■		■	□		■	■			□	■	■							□				
Leu	■	□	■	■	■	■										■	■	■						■				
Ile			■			□		■						□	□	■	■							■	□		□	
Lys			■			■					■					■	□	■		■	■			■	□	□		
Σ							□		■	■	□																	

a = Ws-2, *b* = Col-0, *c* = *tpt-2*, *d* = *tpt-2/xpt-1*, *e* = amiRNA:*XPT tpt-2* #3, *f* = amiRNA:*XPT tpt-2* #4, *g* = *adg1-1/tpt-2*, *h* = *xpt-1*, *i* = *tpt-1*, and *j* = *tpt-1/xpt-1*.

Doc S2 Table 7. (continued)

C 4 h dark (relative)

Legend for shaded cells: D = dark blue, L = light blue, blank = unshaded.

Amino acids	b vs a	c vs a	d vs a	e vs a	f vs a	g vs a	c vs b	d vs b	e vs b	f vs b	g vs b	d vs c	e vs c	f vs c	g vs c	e vs d	f vs d	g vs d	f vs e	g vs e	f vs g		h vs a	i vs a	j vs a	i vs h	j vs h	i vs j
Glu		L	L	L		L	D	D	D	L	D				D					D	D			D	D	D	D	D
Gln						D					D				D					D	D							L
Asp						D			L		D				D			D		D	D				D		D	D
Asn						D					D				D		D	D										
Ala			D					D				D				D	D	D										
Ser																							L					
Gly	L	L	L	L	L	L																				L	L	
Thr		D	D	L	D						D				D			D		D	D				D	D	D	
His											D					L		D										
Arg	D					D	D	D	D	D					D			L		D	D			L				
Phe			D	L		D	D	D	D	D	D				D			D						D	D	D	D	
Tyr		L	D	D		D	D	D	D	L	D				D			D		D	D			D	D	D	D	
Trp		D	L	D	L	D	D	D	D	D	D				D			D		D	D			D	D	D	D	
Val		D	D	D		D	D	D	D	D	D				D			D		D	D			D	D	D	D	
Leu		D	D	D	D	D	D	D	D	D	D	L	L		D			D		D	D			D	D	D	D	
Ile		L	D			D		D			D				D			D		D	D			D	D	D	D	
Lys		D	D			D	D				D				D			D		D	D			D	D	D	D	

a = Ws-2, *b* = Col-0, *c* = tpt-2, *d* = tpt-2/xpt-1, *e* = amiRNA:*XPT tpt-2* #3, *f* = amiRNA:*XPT tpt-2* #4, *g* = adg1-1/tpt-2, *h* = xpt-1, *i* = tpt-1, and *j* = tpt-1/xpt-1.

Doc S2 Table 7. (continued)

D 8 h light (relative)

Legend: ■ = dark blue (significant), ▨ = light blue, blank = white (not significant).

Amino acids	b vs a	c vs a	d vs a	e vs a	f vs a	g vs a	c vs b	d vs b	e vs b	f vs b	g vs b	d vs c	e vs c	f vs c	g vs c	e vs d	f vs d	g vs d	f vs e	g vs e	f vs g		h vs a	i vs a	j vs a	i vs h	j vs h	i vs j
Glu					▨	▨																			■		▨	
Gln						■	■				■							▨		■	■							
Asp			▨					■	▨	■	■	▨													■		■	■
Asn						■					■				■			■			■							
Ala	▨		■					■			▨				▨	■	■	■										
Ser	■	■		▨								■	■	■	■									■	■	▨	■	
Gly	■	■	■	■	■	■			▨	▨					■									■	■	■	■	■
Thr		■	■	■	■	■	■	■	■	■	■				▨			■		■	■				■		■	■
His		▨	▨	■																								
Arg						■					■				■			■		■	■							
Phe			■					▨	■	■	■														■		▨	
Tyr			■						■	■	▨							■		■	■			▨	■	▨	■	
Trp			▨			■					▨									■	■				■		■	
Val			■		▨			■			■				■			■							■		■	
Leu		■	■	■	■			■	▨	▨	■						■	■						▨	▨		■	
Ile			■	■	▨			■	■	■	■				■									▨	■	▨	■	
Lys			■	▨		■		■	▨		■				■					■	■			▨	■	■	■	

a = Ws-2, *b* = Col-0, *c* = tpt-2, *d* = tpt-2/xpt-1, *e* = amiRNA:*XPT tpt-2* #3, *f* = amiRNA:*XPT tpt-2* #4, *g* = adg1-1/tpt-2, *h* = xpt-1, *i* = tpt-1, and *j* = tpt-1/xpt-1.

Doc S2 Table 8. Statistical analysis (ANOVA/Tukey-Kramer) of elemental analyses (N, C) in rosette leaves as well as fw/dw-ratios of wild-type and mutant plants. The plants were grown in soil under HL-conditions (PFD = 300 µmol·m^{-2}·s^{-1}) in the long-day (Table 3, main article). The biotypes are denoted, **a** = Ws-2, **b** = *xpt-1,* **c** = *tpt-1*, **d** = *tpt-1/xpt-1*, **e** = Col-0, **f** = *tpt-2*, **g** = *tpt-2/xpt-1*, and **h** = *adg1-1/tpt-2.* The significance levels of P < 0.05 or P < 0.01 are indicated by light or dark blue colors.

8 Comparisons

Legend: ● = P < 0.01 (dark blue), ○ = P < 0.05 (light blue)

Element contents and ratios	b vs a	c vs a	d vs a	e vs a	f vs a	g vs a	h vs a	c vs b	d vs b	e vs b	f vs b	g vs b	h vs b	d vs c	e vs c	f vs c	g vs c	h vs c	e vs d	f vs d	g vs d	h vs d	f vs e	g vs e	h vs e	g vs f	h vs f	h vs g
fw/dw-ratio																		●			○						○	●
N (%)		●			●		○	●	○		●							●		○		●	●			●	○	●	●
C (%)			●		●	●		●			●	●	●					●	●	●	●				●		●	●
C/N-ratio		○			●		●	●			●		○	●				●		●		●	●		●	●	●	●

Doc S2 Table 9. Statistical analysis (ANOVA/Tukey-Kramer) of feeding Suc, Gln or both on rosette growth of wild-type and mutant plants. Plants were grown under HL-conditions (i.e. a PFD of 300 µmol·m^{-2}·s^{-1}) in the long-day on 1/2 Ms agar plates in the absence or presence of 50 mM Suc, 2 mM Gln, or both. under HL. (Figure 7, main article; Supplementary Figures 2 and 3). The biotypes are denoted, *a* = Ws-2, *b* = *tpt-1/xpt-1*, *c* = Col-0, *d* = *tpt-2/xpt-1*, *e* = *gpt2-1/tpt-2/xpt-1*, and *f* = *adg1-1/tpt-2*. DAS = days after sowing. The significance levels of P < 0.05 or P < 0.01 are indicated by light or dark blue colors.

6 Comparisons (left)

Legend: ■ = P < 0.01 (dark blue), ▨ = P < 0.05 (light blue), blank = not significant.

Time course rosette growth	b vs a	c vs a	d vs a	e vs a	f vs a	c vs b	d vs b	e vs b	f vs b	d vs c	e vs c	f vs c	e vs d	f vs d	f vs e
½ MS															
11 DAS		■	■	■	▨	■	■	■		■	■	■		▨	
15 DAS	■	■	■	■	■	■		▨		■	■	■			
19 DAS	■	▨	■	■						■	■	■			
22 DAS	■	■	■	■						■	■	■			
+Gln															
11 DAS			■	■	■		■	■		■	■	■			
15 DAS		▨	■	■	■					■	■	■			
19 DAS	■									■	■	■			
22 DAS	■		■	■	■					■	■	■			

6 Comparisons (right)

Time course rosette growth	b vs a	c vs a	d vs a	e vs a	f vs a	c vs b	d vs b	e vs b	f vs b	d vs c	e vs c	f vs c	e vs d	f vs d	f vs e
+Suc															
11 DAS			■				■	▨		■	■	▨		▨	
15 DAS	■	▨	■	■	■	■				■	■				
19 DAS	■		■	■	■	■									
22 DAS	■		■	■	■	■									
+Suc + Gln															
11 DAS			■	■	■		■	■	■	■	■	■			
15 DAS	■		■	■	■	■			▨	■	■	■			
19 DAS	■		■	■	■									▨	
22 DAS	■		■	■	■				■	■	■	■		■	■

Doc S2 Table 10. Statistical analysis (ANOVA/Tukey-Kramer) of feeding Suc, Gln or both on rosette growth of wild-type and mutant plants. Plants were grown under HL-conditions (i.e. a PFD of 300 µmol·m^{-2}·s^{-1}) in the long-day on 1/2 Ms agar plates in the absence or presence of 50 mM Suc, 2 mM Gln, or both. under HL. (Figure 7, main article; Supplementary Figures 2 and 3). The conditions are denoted, **a** = 1/2 MS, **b** = 50 mM Suc, **c** = 2 mM Gln, and **d** = 50 mM Suc and 2 mM Gln. DAS = days after sowing. The significance levels of P < 0.05 or P < 0.01 are indicated by light or dark blue colors.

(Legend: ██ = P < 0.01 (dark blue); ▒ = P < 0.05 (light blue); blank = not significant)

4 Comparisons

Time of growth	b vs a	c vs a	d vs a	c vs b	d vs b	d vs c
Ws-2						
11 DAS			██			
15 DAS			▒			▒
19 DAS						
22 DAS						
tpt-2/xpt-1						
11 DAS	██		██	██		██
15 DAS	██		██	██		██
19 DAS	██		██	██		██
22 DAS	██		██	██		██

4 Comparisons

Time of growth	b vs a	c vs a	d vs a	c vs b	d vs b	d vs c
tpt-1/xpt-1						
11 DAS	▒		██			██
15 DAS	▒		██		▒	██
19 DAS			██			▒
22 DAS			██			▒
gpt2-1/tpt-2/xpt-1						
11 DAS	██		██	██		██
15 DAS	██		██	██		██
19 DAS	██		██	██		██
22 DAS	██		██	██		██

4 Comparisons

Time of growth	b vs a	c vs a	d vs a	c vs b	d vs b	d vs c
Col-0						
11 DAS						
15 DAS			▒			▒
19 DAS						
22 DAS						
adg1-1/tpt-2						
11 DAS	██		██	██		██
15 DAS	██		██	██		██
19 DAS	██		██	██		██
22 DAS	██		██	██	▒	██

Doc S2 Table 11. Statistical analysis (ANOVA/Tukey-Kramer) of feeding Suc, Gln or both on modulated Chl *a* fluorescence parameters in wild-type and mutant plants. Plants were grown under HL-conditions (i.e. a PFD of 300 µmol·m^{-2}·s^{-1}) in the long-day on 1/2 Ms agar plates in the absence or presence of 50 mM Suc, 2 mM Gln, or both. (Figure 7, main article; Supplementary Figure 4). The biotypes are denoted, *a* = Ws-2, *b* = *tpt-1/xpt-1*, *c* = Col-0, *d* = *tpt-2/xpt-1*, *e* = *gpt2-1/tpt-2/xpt-1*, and *f* = *adg1-1/tpt-2*. The significance levels of P < 0.05 or P < 0.01 are indicated by light or dark blue colors.

6 Comparisons (left)

PS-parameters	b vs a	c vs a	d vs a	e vs a	f vs a	c vs b	d vs b	e vs b	f vs b	d vs c	e vs c	f vs c	e vs d	f vs d	f vs e
½ MS															
F_v/F_m	■		■	■	■	■	■		■	■	■	■		■	■
ΦPSII	▨		■		■	■			■	■	■	■	▨	■	■
+Gln															
F_v/F_m	■		■	■	■	■			■	■	■	■		■	■
ΦPSII					■	■			■	■	■	■		■	■

6 Comparisons (right)

PS-parameters	b vs a	c vs a	d vs a	e vs a	f vs a	c vs b	d vs b	e vs b	f vs b	d vs c	e vs c	f vs c	e vs d	f vs d	f vs e
+Suc															
F_v/F_m	■		■	■	■			■	■	■	■		■	■	■
ΦPSII	■		■		■			■	■	■		■	■	■	
+Suc + Gln															
F_v/F_m			■	■		■		■		■	■	■	■	■	
ΦPSII				■	■			■		▨	■	■		■	

Doc S2 Table 12. Statistical analysis (ANOVA/Tukey-Kramer) of feeding Suc, Gln or both on modulated Chl *a* fluorescence parameters in wild-type and mutant plants. Plants were grown under HL-conditions (i.e. a PFD of 300 µmol·m^{-2}·s^{-1}) in the long-day on 1/2 Ms agar plates in the absence or presence of 50 mM Suc, 2 mM Gln, or both. (Figure 7, main article; Supplementary Figure 4). The conditions are denoted, *a* = 1/2 MS, *b* = 50 mM Suc, *c* = 2 mM Gln, and *d* = 50 mM Suc and 2 mM Gln. The significance levels of P < 0.05 or P < 0.01 are indicated by light or dark blue colors.

(■ = dark blue, P < 0.01; ▨ = light blue, P < 0.05; blank = not significant)

4 Comparisons

PS parameters	b vs a	c vs a	d vs a	c vs b	d vs b	d vs c
Ws-2						
F_v/F_m	■	■	■	■		■
ΦPSII	▨	■	■	■	■	
tpt-2/xpt-1						
F_v/F_m	■	■	■	■		■
ΦPSII	■		■	■		

4 Comparisons

PS parameters	b vs a	c vs a	d vs a	c vs b	d vs b	d vs c
tpt-1/xpt-1						
F_v/F_m	■		■			
ΦPSII	▨			▨		
gpt2-1/tpt-2/xpt-1						
F_v/F_m	■					
ΦPSII					▨	

4 Comparisons

PS parameters	b vs a	c vs a	d vs a	c vs b	d vs b	d vs c
Col-0						
F_v/F_m	▨		■		▨	■
ΦPSII		■	■	■	■	
adg1-1/tpt-2						
F_v/F_m	■	■	■			■
ΦPSII	■	■	■	■		■

Doc S2 Table 13. Statistical analysis (ANOVA/Tukey-Kramer) of spectroscopic analysis of thylakoid membranes isolated from wild-type and mutants plants. Plants were grown in soil under HL-conditions (PFD = 300 µmol·m^{-2}·s^{-1}) in the long-day. Functional components of PSII, PSI and the Cyt b$_6$/f complex were determined by spectroscopic methods using thylakoids isolated from the plants and were either referred to a leaf area- (Figure 8B, main article) or Chl basis (Supplementary Figure 5). The biotypes are denoted, *a* = Col-0, *b* = tpt-2, *c* = tpt-2/xpt-1, *d* = amiRNA:XPT tpt-2 #4, *e* = Ws-2, *f* = xpt-1, *g* = tpt-1, and *h* = tpt-1/xpt-1. The significance levels of P < 0.05 or P < 0.01 are indicated by light or dark blue colors.

8 Comparisons

Legend: D = dark blue (P < 0.01), L = light blue (P < 0.05), blank = not significant.

PS complexes	b vs a	c vs a	d vs a	e vs a	f vs a	g vs a	h vs a	c vs b	d vs b	e vs b	f vs b	g vs b	h vs b	d vs c	e vs c	f vs c	g vs c	h vs c	e vs d	f vs d	g vs d	h vs d	f vs e	g vs e	h vs e	g vs f	h vs f	h vs g
Leaf area basis																												
PSII		D	L				D	D					D		D	D	L			D		L			D		D	D
Cyt b$_6$/f		D	D				D	D			D		L	D	D	D	D		D		L				D		D	D
PSI	D	D	D		D	D	D	D	D	D	D		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Chl basis																												
Chl *a/b*-ratio		D						D						D	D	D	D				L				L			L
PSII																		D										
Cyt b$_6$/f					L							L																
PSI		D			L			D		L				D	D	D	L	D		D		L			D		D	