

Supplementary Information

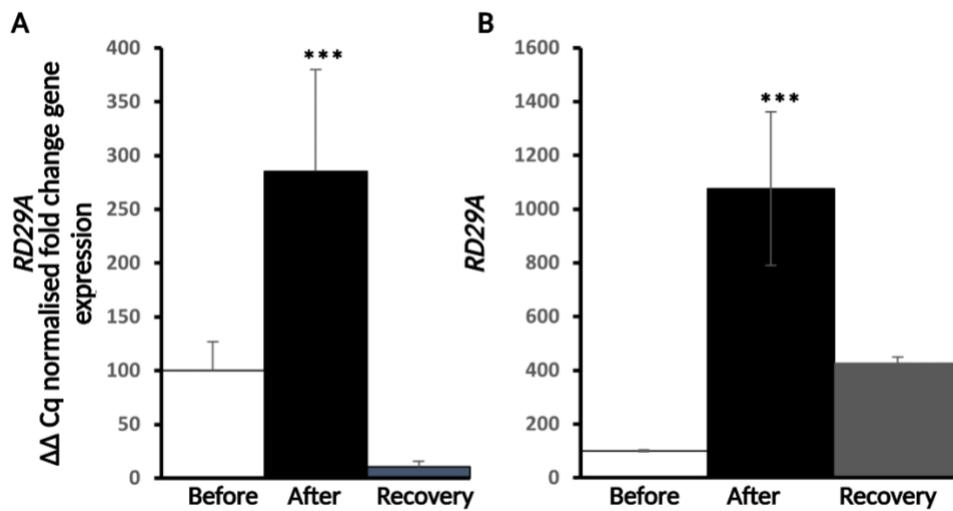


Figure S1: Single D stress experimental scheme and marker gene expression, related to Figure 1
(A) Expression pattern of *RD29A* in WT from second biological replicate. (B) Expression pattern of *RD29A* in WT from third biological replicate. Error bars represent SD values. *** $p < 0.001$.

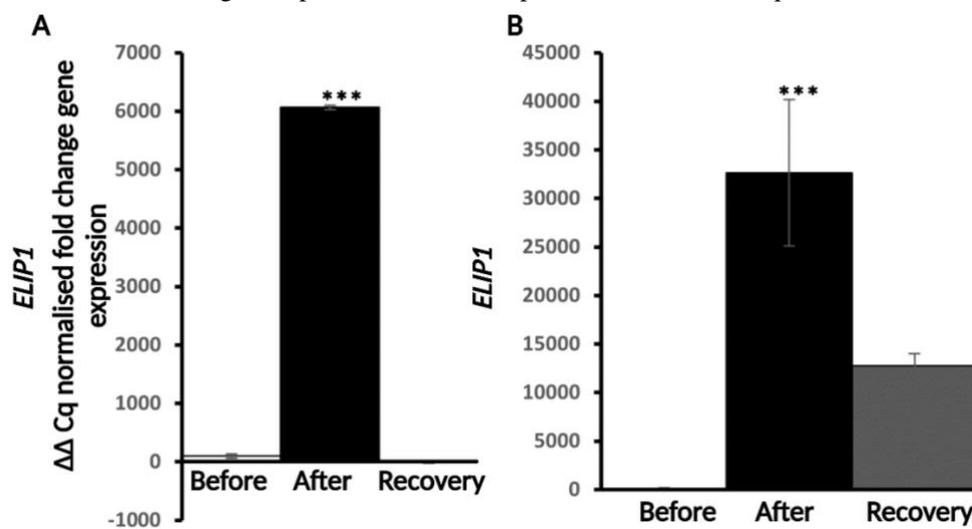


Figure S2: Single HL stress experimental scheme and marker gene expression, related to Figure 2
(A) Expression pattern of *ELIP1* in WT from second biological replicate. (B) Expression pattern of *ELIP1* in WT from third biological replicate. Error bars represent SD values. *** $p < 0.001$.

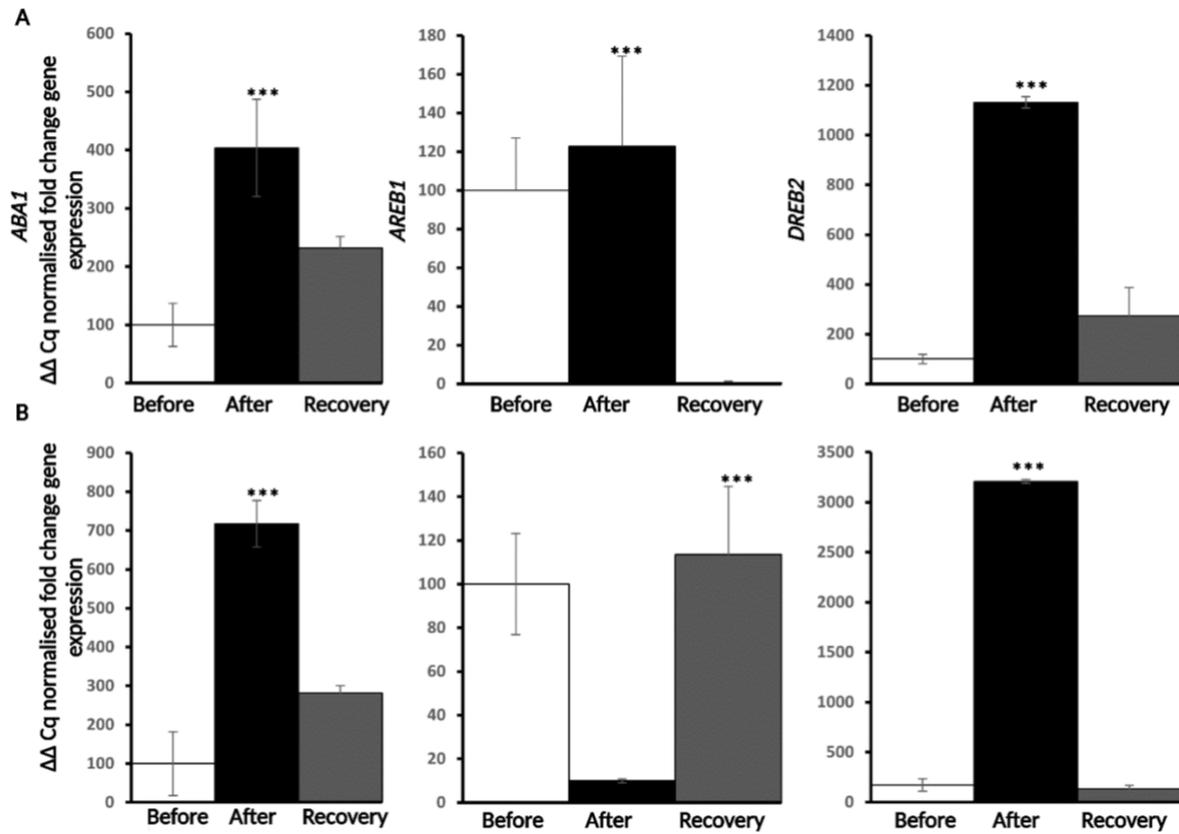


Figure S3. D and HL triggers expression of ABA responsive gene, related to Figure 3

(A) The fold change gene expression of ABA genes in WT from single D stress experiment. (B) Expression of the same ABA genes in WT from single HL stress experiment. Data is a representation of second biological replicate with SD values. *** $p < 0.001$.

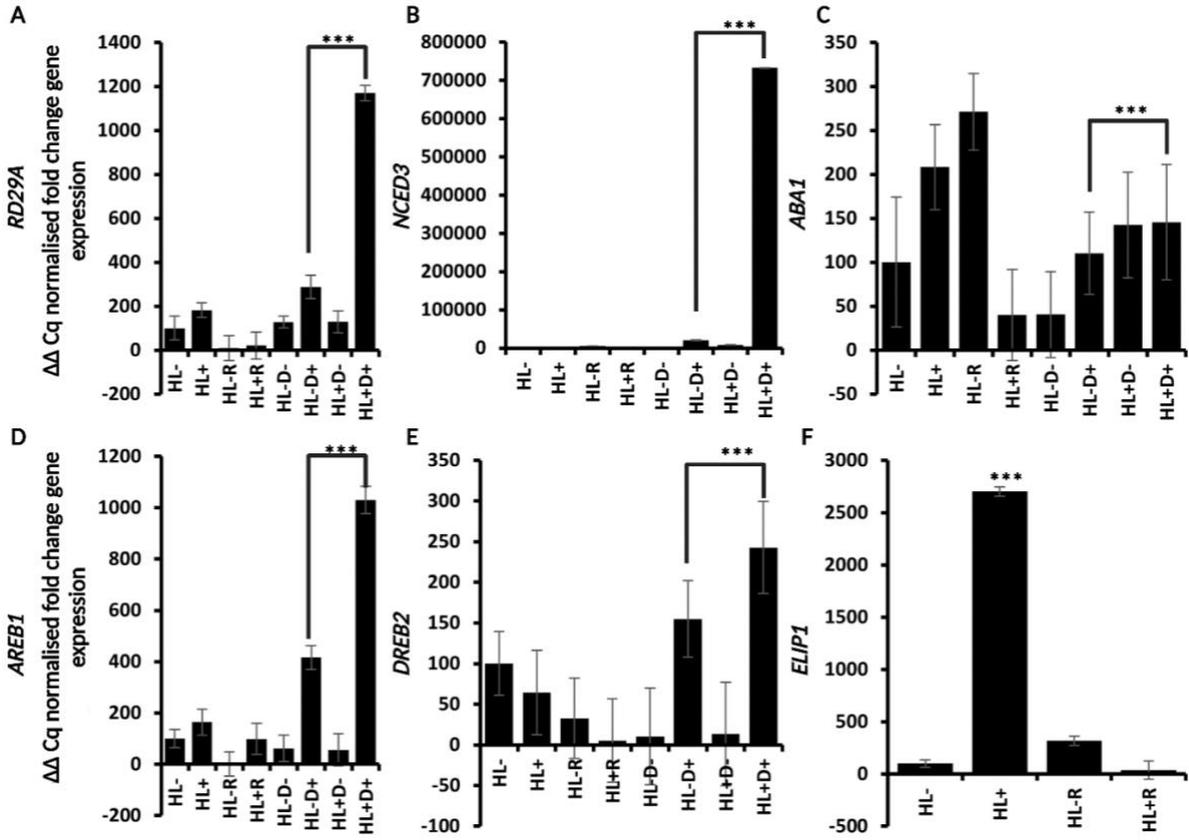


Figure S4: *RD29A* and ABA responsive genes expression pattern in Col-O, related to Figure 5
 (A-E) qPCR analysis of *RD29A*, *NCED3*, *ABA1*, *AREB1*, and *DREB2* at 3 timepoints. (F) Expression analysis of *ELIP1* only at the first two timepoints. Data is a representation of second biological replicate with SD values. *** $p < 0.001$

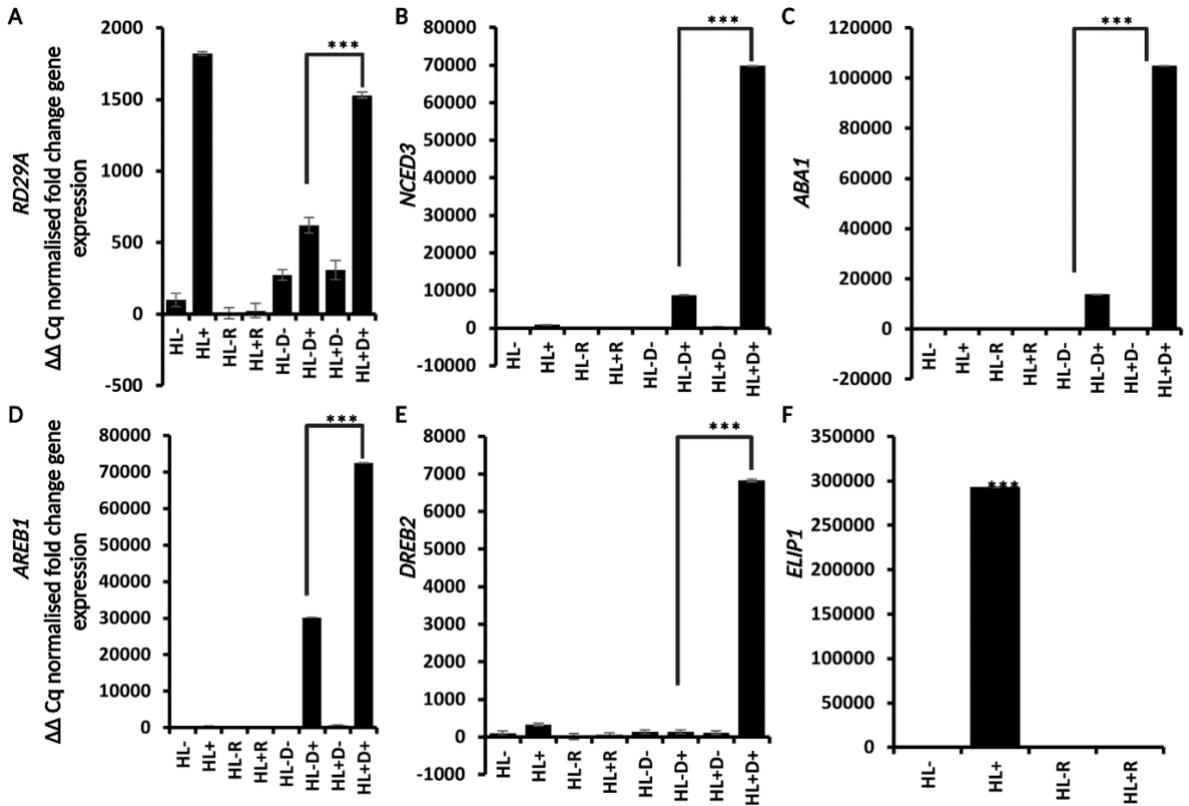


Figure S5: *RD29A* and ABA responsive genes expression pattern in Col-O, related to Figure 5

(A-E) qPCR analysis of *RD29A*, *NCED3*, *ABA1*, *AREB1*, and *DREB2* at 3 timepoints. (F) Expression analysis of *ELIP1* only at the first two timepoints. Data is a representation of third biological replicate with SD values. *** $p < 0.001$

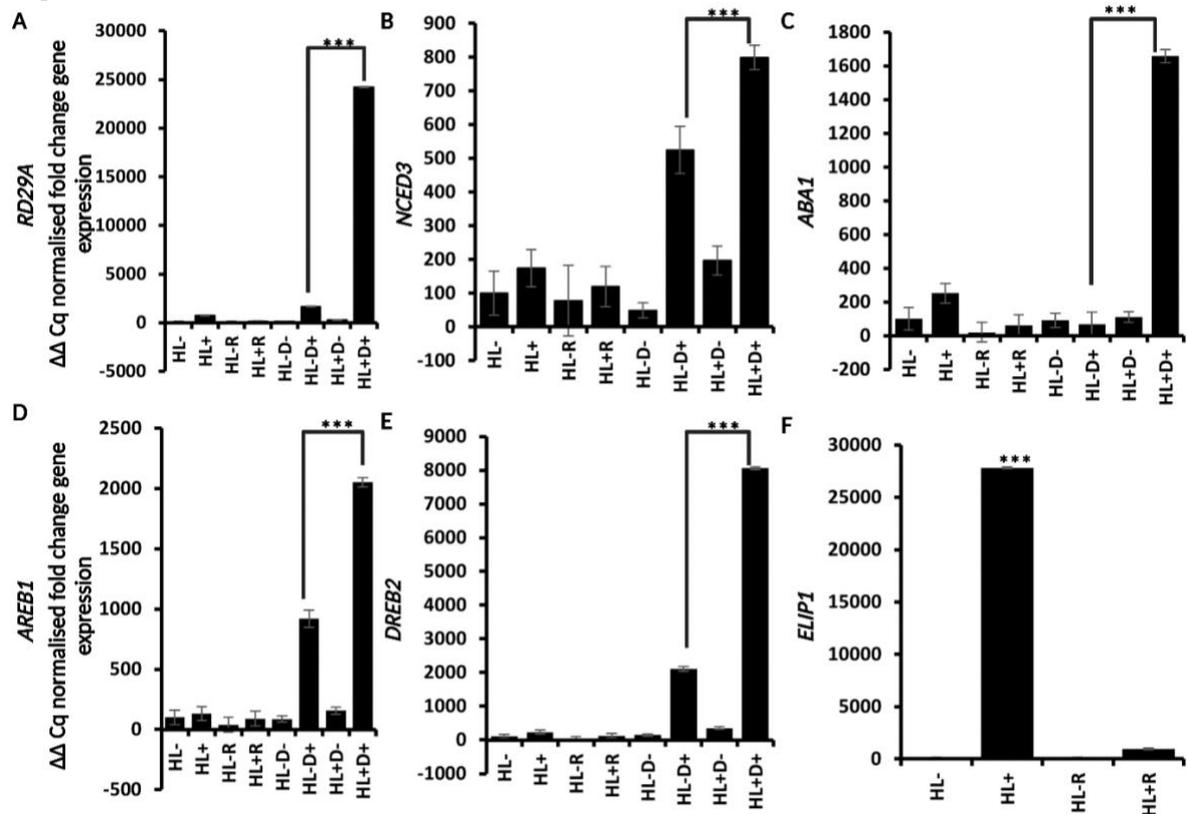


Figure S6: *RD29A* and ABA responsive genes expression pattern in *aba1-3* mutant, related to Figure 6

(A-E) qPCR analysis of *RD29A*, *NCED3*, *ABA1*, *AREB1*, and *DREB2* at 3 timepoints. (F) Expression analysis of *ELIP1* only at the first two timepoints. Data is a representation of second biological replicate with SD values. *** $p < 0.001$

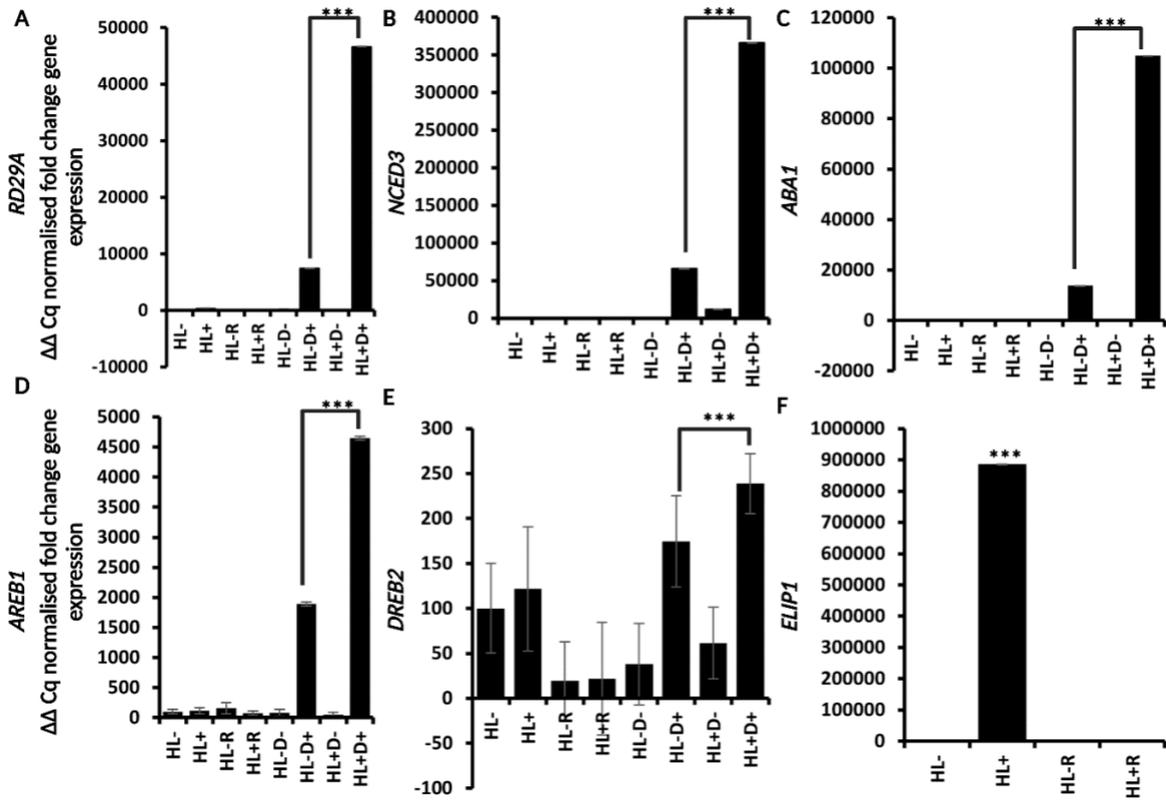


Figure S7: *RD29A* and ABA responsive genes expression pattern in *aba1-3* mutant, related to Figure 6 (A-E) qPCR analysis of *RD29A*, *NCED3*, *ABA1*, *AREB1*, and *DREB2* at 3 timepoints. (F) Expression analysis of *ELIP1* only at the first two timepoints. Data is a representation of third biological replicate with SD values. *** $p < 0.001$

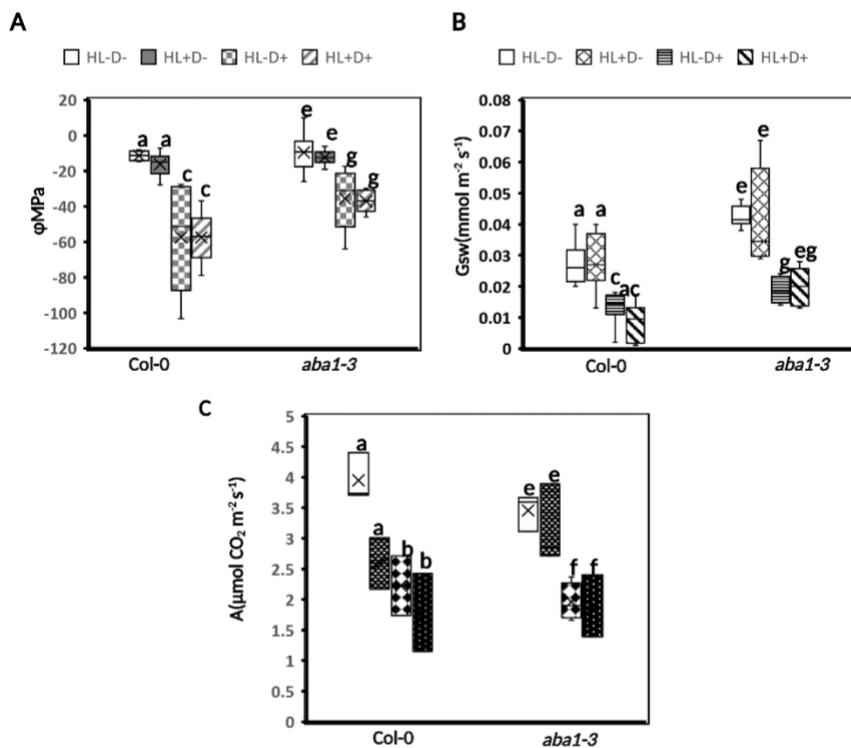


Figure S8. Water, conductance, and assimilation responses were triggered by D but HL treatment had little to no effect on these responses after subsequent D stress, related to Figure 7

(A) Relative water potential, (B) stomatal conductance, and (C) carbon assimilation responses were altered by D independent of HL pre-treatments. Measurements were taken at the end of the subjective drought period for all four treatments. The data are a representation of the second biological replicate with mean values. Statistical significance analysed by one-way ANOVA test and post-hoc Tukey's HSD test.

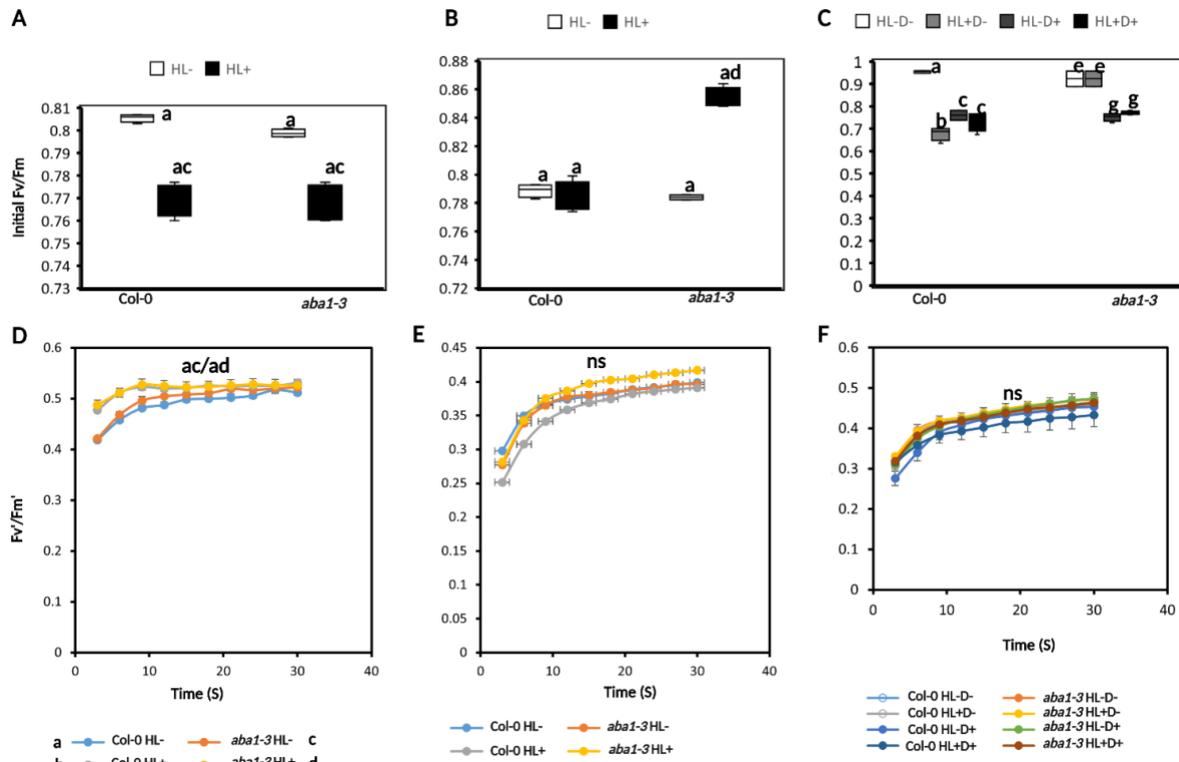


Figure S9. Photosynthetic initiation was not affected by D and HL stress, related to Figure 8

(A) Intial Fv/Fm measurement after HL stress. (B) Intial Fv/Fm after recovery. (C) Intial Fv/Fm after D stress. (D) Photosynthesis induction (Fv'/Fm') over 30 seconds after HL stress. (E) Photosynthesis induction after recovery. (F) Photosynthesis induction after D stress. Data is a representation of second biological replicate with mean values. Statistical significance analysed by one-way ANOVA test and post-hoc Tukey's HSD test.

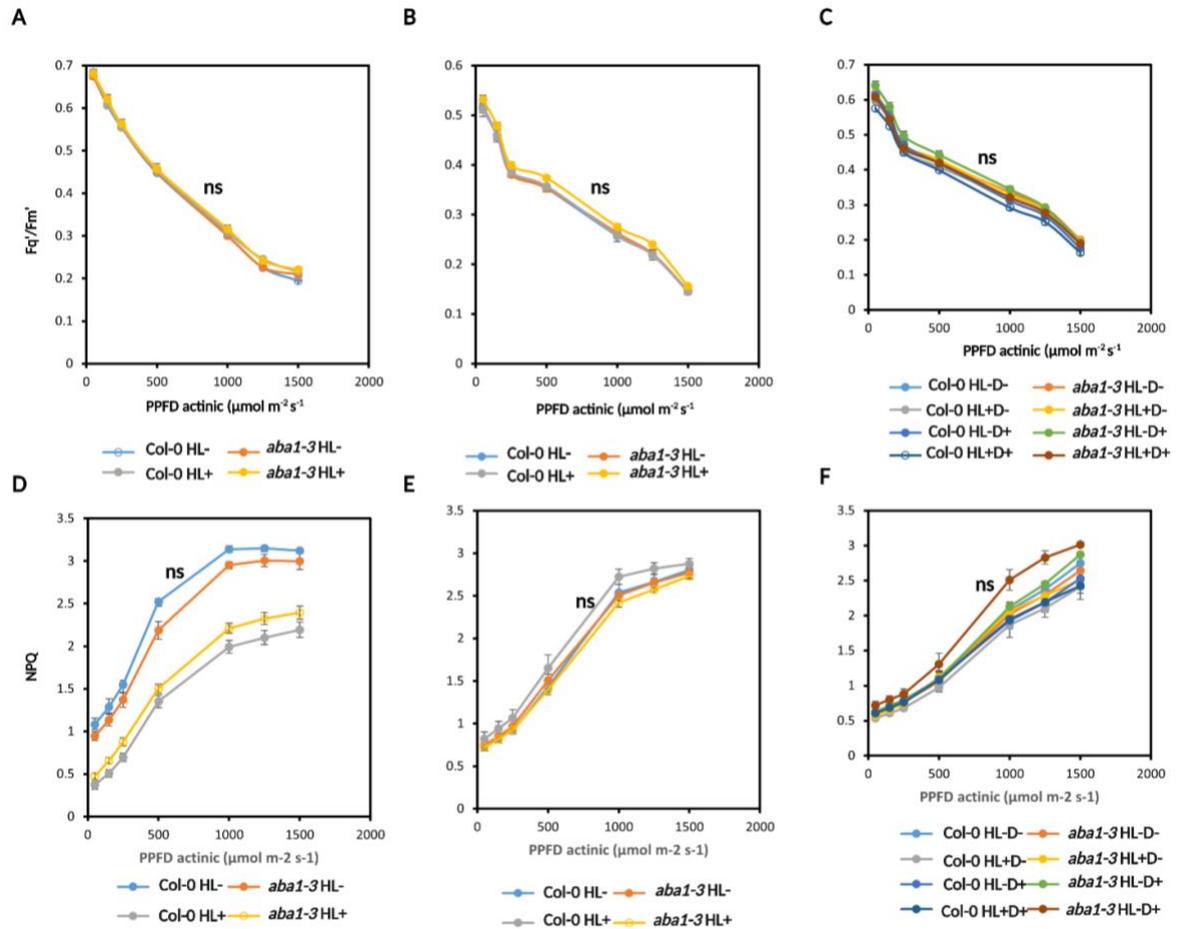


Figure S10. Photosynthesis performance was not affected in response to D and HL, related to Figure 9 (A) CF images of WT rosette after HL stress at first pixel measurements on F_o , F_m , F' , F_m' , $F_m/F_m'-1$, and F_q/F_m' . (B) Photosynthesis operating efficiency measured by CF imaging using a light response curve of actinic light between 50-1500 $\mu\text{mol m}^{-2} \text{s}^{-1}$ after HL stress. (C) Photosynthesis operating efficiency measured after recovery stress. (D) Photosynthesis operating efficiency measured after D stress. (E) NPQ measured using a light response curve of actinic light between 50-1500 $\mu\text{mol m}^{-2} \text{s}^{-1}$ after HL stress. (F) NPQ measured after recovery. (G) NPQ measured after D stress. Data is a representation of second biological replicate with mean values. Statistical significance analysed by one-way ANOVA test and post-hoc Tukey's HSD test. ns = not significant.

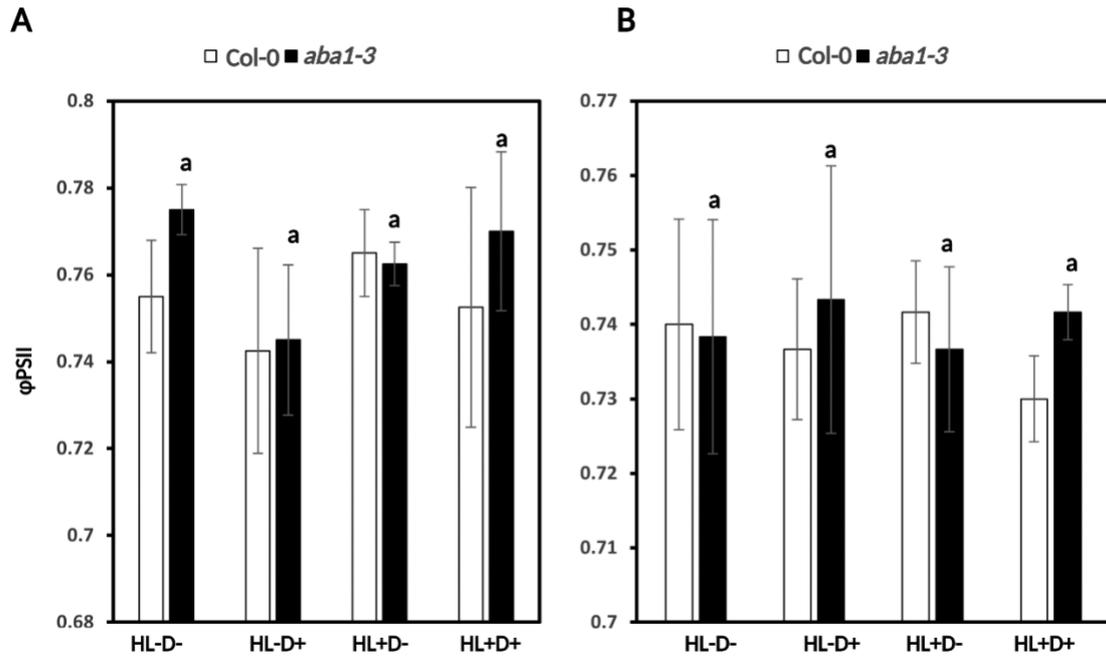


Figure S11: Quantum yield of fluorescence measured after D stress, related to Figure 9

(A-B) Data is a representation of two replicates. Statistical significance analysed by one-way ANOVA test and post-hoc Tukey's HSD test.

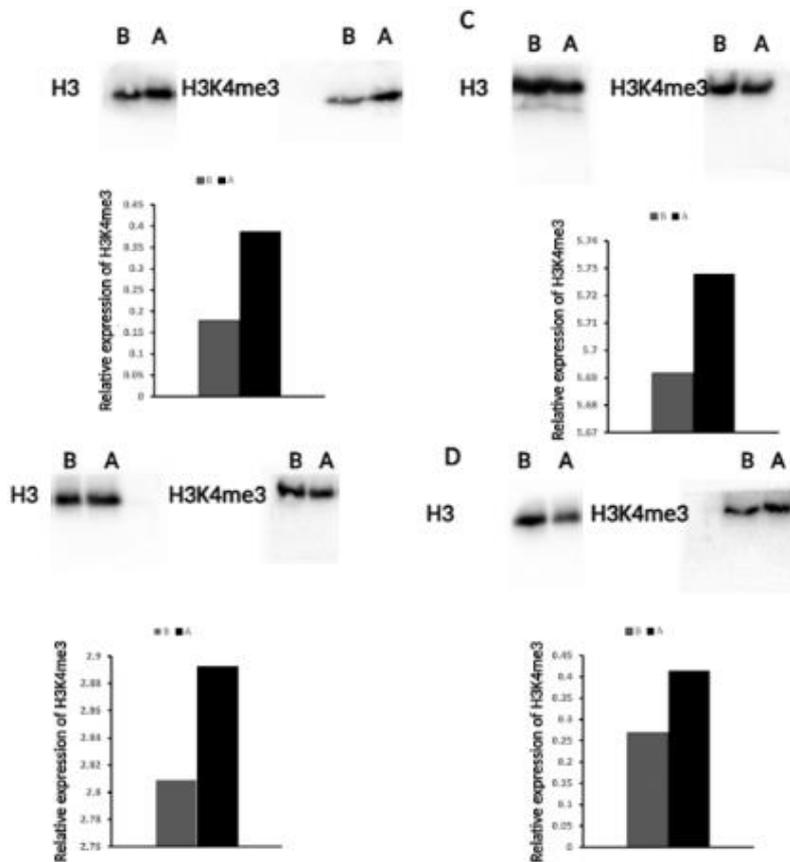


Figure S12. H3K4me3 increased in response to D and HL, related to Figure 10

(A-B) Immunoblot of WT plants stressed with D at 3-week-old. Histone extracts were probed with H3K4me3 specific antibodies, and H3 was used as loading control. Relative expression obtained from two independent replicate with densitometric analysis. (C-D) Immunoblot of WT plants stressed with HL at 3-week-old. Relative expression obtained from two independent replicate.

Table S1. Primers used in this study

qPCR	Forward	Reverse	Source
<i>Act8</i>	AAACCCGCTCTCGCTCTTAC	CTGAGTTTGAAACGCGGATT	This study
<i>UBQ10</i>	GGTTTGTGTTTTGGGGCCTTG	CGAAGCGATGATAAAGAAGAAGTTCG	This study
<i>RD29A</i>	CCGGAATCTGACGGCCGTTTA	CCGTCGGCACATTCTGTCGAT	Lee et al., 2016
<i>ELIP1</i>	TCGCAAGATCAACACCAACAA	AGGTTAGGGAAGCTACCGGC	This study
<i>AREB1</i>	AACAGGCTTACACCGTGGAG	CTTTGGACCTCCTTGCAGAA	Roca Paixao et al., 2019
<i>DREB2</i>	GACCTAAATGGCGACGATGT	TCGAGCTGAAACGGAGGTAT	Sakuma et al., 2006
<i>ABA1</i>	GATGCAGCCAAATATGGGTCAAGG	GCCATTGCATGGATAATAGCGACTC	This study
<i>NCED3</i>	GGTGGTTTACGACAAGAACAA	CAGAAGCAATCTGGAGCATCAA	This study