

Figure S1 Effects of Suc, mannitol and turanose on the activity of root ferric chelate reductase (FCR) in *Col-0 Arabidopsis*. The 5-week-old plants were cultured in either complete (+ Fe) or Fe-free (- Fe) nutrient solution. On day 3, the above nutrient solutions were supplied with or without 2 mM Suc , 4 mM or 8 mM mannitol (Man), or 2 mM turanose (Tur). Then, the plants were continuously grown for 24 h. Data are means \pm SD (n=4). Different letters indicate significant differences among treatments (one-way ANOVA, $P < 0.05$).

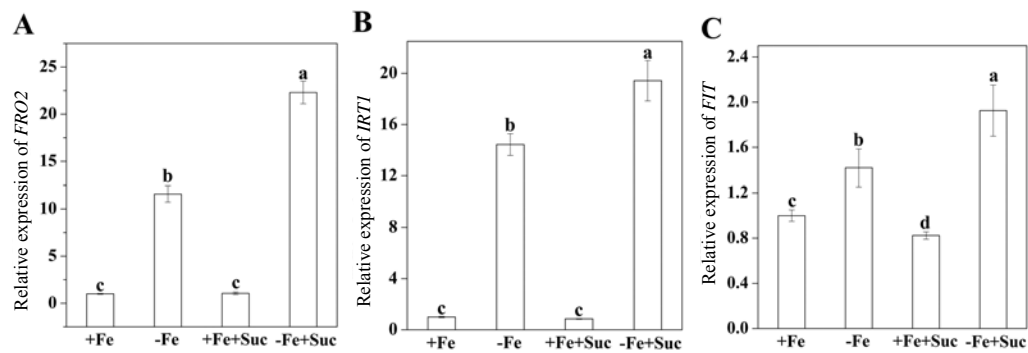


Figure S2 Effect of exogenous Suc on expression of *FRO2* (A), *IRT1* (B) and *FIT* (C) in the roots of *Col-0* plants. The 5-week-old plants were grown in a Fe-free (- Fe) nutrient solution. On day 3, the above nutrient solutions were supplied with or without 2 mM Suc, and the plants were continuously grown for 24 h. Gene expression was analyzed by real-time qPCR. Transcript level of *UBQ10* was used as an internal control. Data are means \pm SD (n=5-7). Different letters indicate significant differences among treatments (one-way ANOVA, $P < 0.05$).

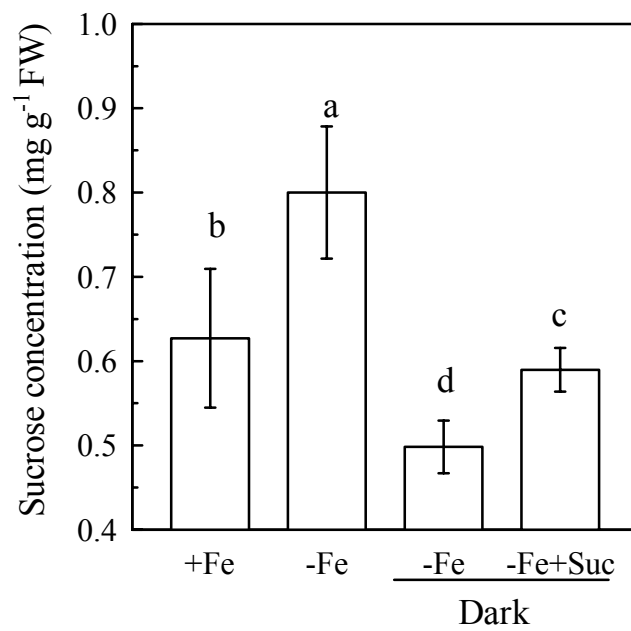


Figure S3 Effects of dark treatment and exogenous Suc application on the sucrose concentration in roots of *Col-0 Arabidopsis* plants. The plants were treated as in Fig. 3. Data are means \pm SD (n=4). Different letters indicate significant differences among treatments (one-way ANOVA, $P < 0.05$).

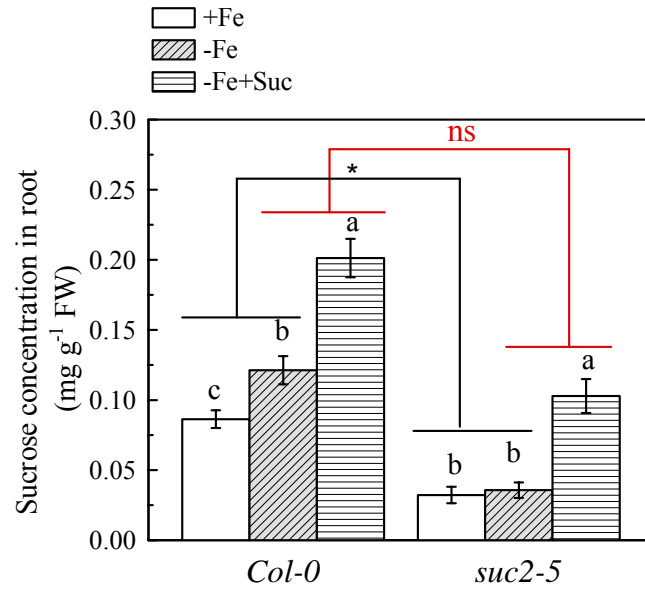


Figure S4 Effect of exogenous Suc application on the Suc concentration in roots of *Col-0* plants and the *suc2-5* mutants. The indicated plants were treated as in Fig. 4. Data are means \pm SD (n=4). Different letters indicate significant differences among treatments with in a genotype (one-way ANOVA, $P < 0.05$). Asterisk and ns indicate that the genotype by treatment interactions are significant and not significant, respectively (two-way ANOVA, $P < 0.05$).

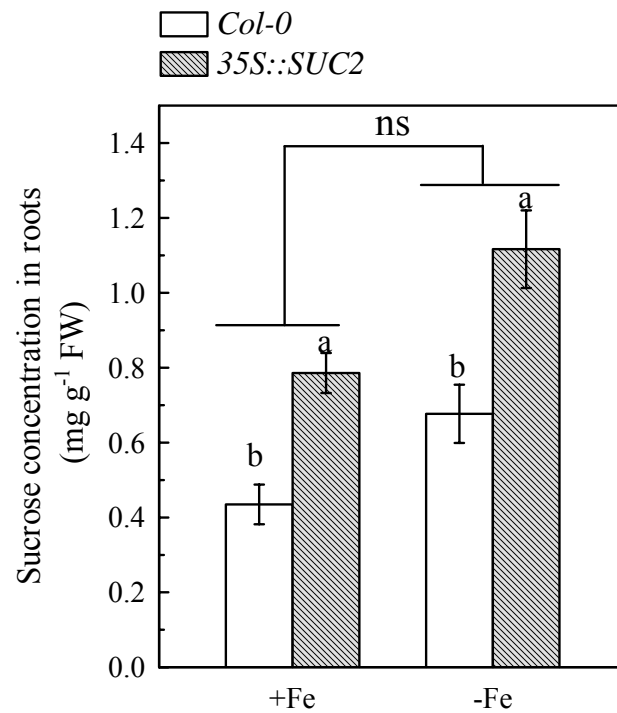


Figure S5 Effect of Fe-deficiency on the sucrose concentration in roots of *Col-0* and *35S::SUC2* transgenic plants. The indicated plants were treated as in Fig. 1. Data are means \pm SD (n=4). Different letters indicate significant differences between two treatments with in a genotype (one-way ANOVA, $P < 0.05$). The ns indicates that genotype by treatment interaction is not significant (two-way ANOVA, $P < 0.05$).

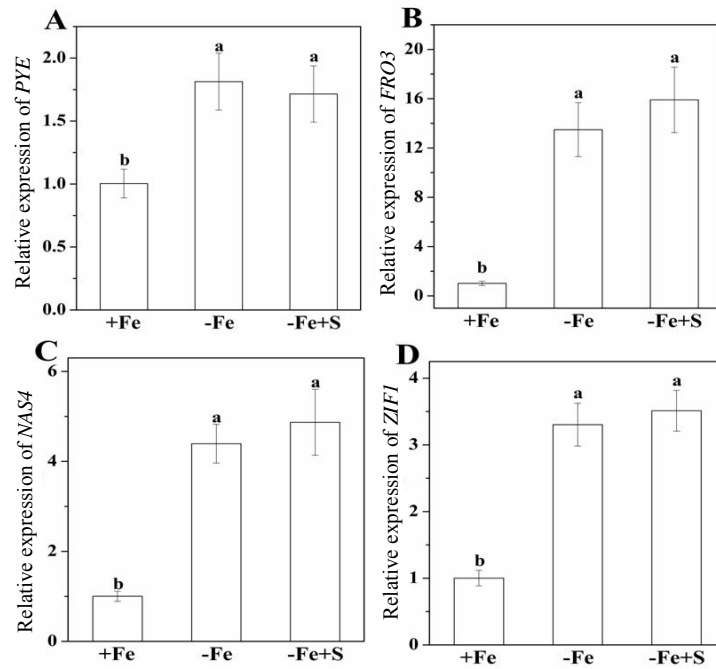


Figure S6 Effects of exogenous sucrose on expression of *PYE* (A), *FRO3* (B), *NAS4* (C) and *ZIF1* (D) in the roots of *Col-0* plants. The 5-week-old plants were grown in a Fe-free (- Fe) nutrient solution. On day 3, the above nutrient solutions were supplied with or without 2 mM Suc, and the plants were continuously grown for 24 h. Gene expression was analyzed by real-time qPCR. Transcript level of *UBQ10* was used as an internal control. Data are means \pm SD (n=5-7). Different letters indicate significant differences among treatments (one-way ANOVA, $P < 0.05$).

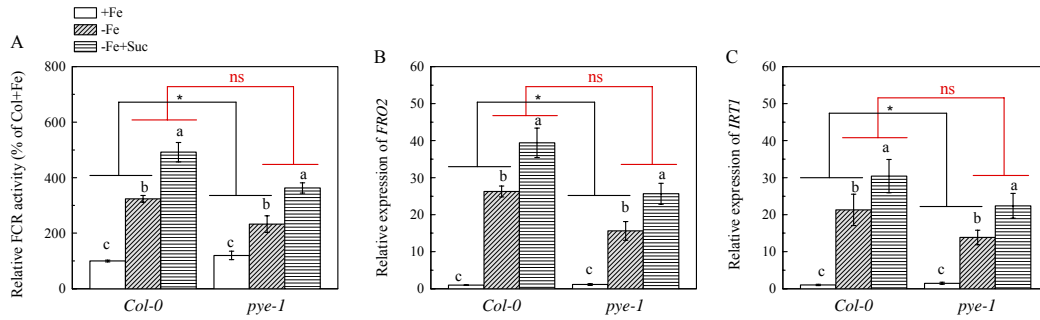


Figure S7 Effects of Suc on Fe-deficiency-induced responses in the roots of *Col-0* plants and *pye-1* mutants. The treatments are the same as those in Figure S6. (A) Relative ferric chelate reductase (FCR) activity. (B-C) Expression of *FRO2* and *IRT1*. Transcript level of *UBQ10* was used as an internal control for Gene expression. Data are means \pm SD (n=5-7). Different letters indicate significant differences among treatments with in a genotype (one-way ANOVA, $P < 0.05$). Asterisk and ns indicate that the genotype by treatment interactions are significant and not significant, respectively (two-way ANOVA, $P < 0.05$).

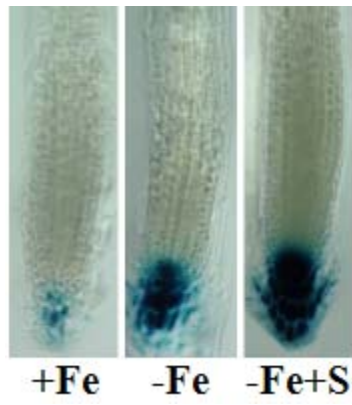


Figure S8 Effects of Fe-deficiency and exogenous Suc application on GUS staining in the roots of *DR5-GUS* transgenic plants. The plants were treated as in Fig. 2C.

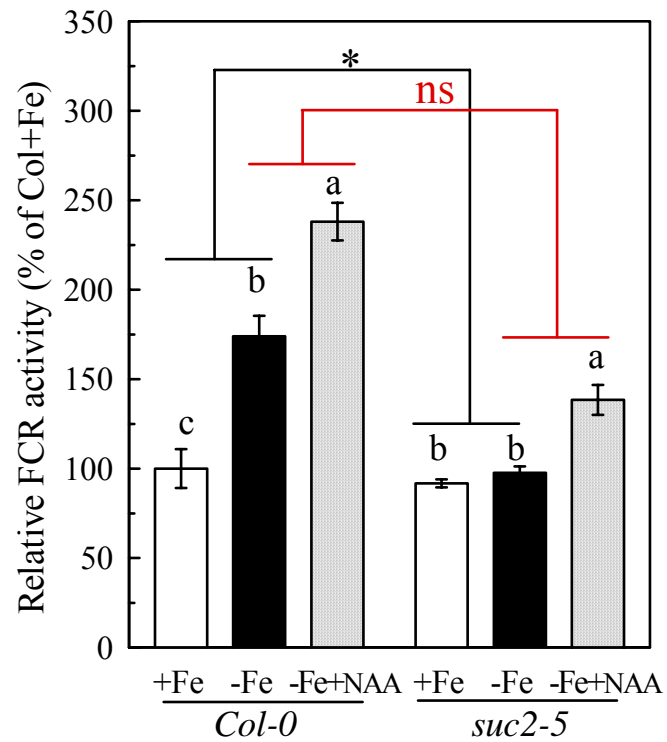


Figure S9 Effect of the NAA treatment on root ferric chelate reductase (FCR) activity in Col-0 plants and the *suc2-5* mutants. The 20-day-old plants were transferred to either complete (+Fe) or Fe-free (- Fe) agar medium supplied with or without 0.1 μ M NAA for 4 days. Data are means \pm SD (n=5). Different letters indicate significant differences among treatments with in a genotype (one-way ANOVA, $P < 0.05$). Asterisk and ns indicate that the genotype by treatment interactions are significant and not significant, respectively (two-way ANOVA, $P < 0.05$).

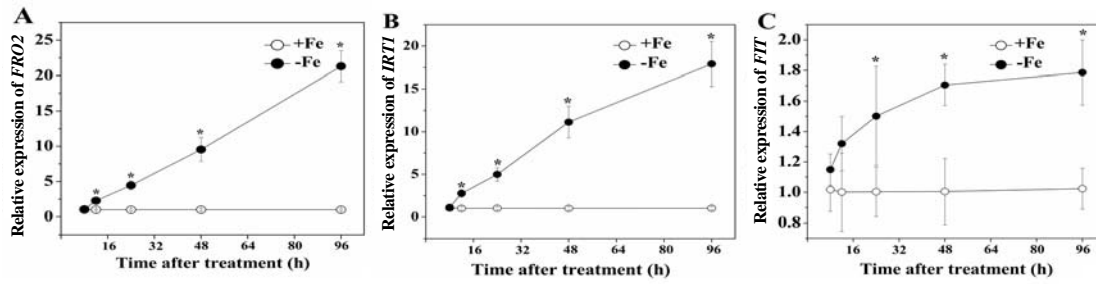


Figure S10 Time-course expression of Fe-deficiency-responsive genes in the roots of Col-0 plants. The 5-week-old plants were grown in either complete (+ Fe) or Fe-free (- Fe) nutrient solutions. The expression of *FRO2* (A), *IRT1* (B) and *FIT* (C) were analyzed at 8 h, 12 h, 24 h, 48 h, and 96 h after each treatment. Data are means \pm SD (n = 4-7). Gene expression was analyzed by real-time qPCR. Transcript level of *UBQ10* was used as an internal control. An asterisk indicates significant difference between two treatments at each time point (one-way ANOVA, $P < 0.05$).

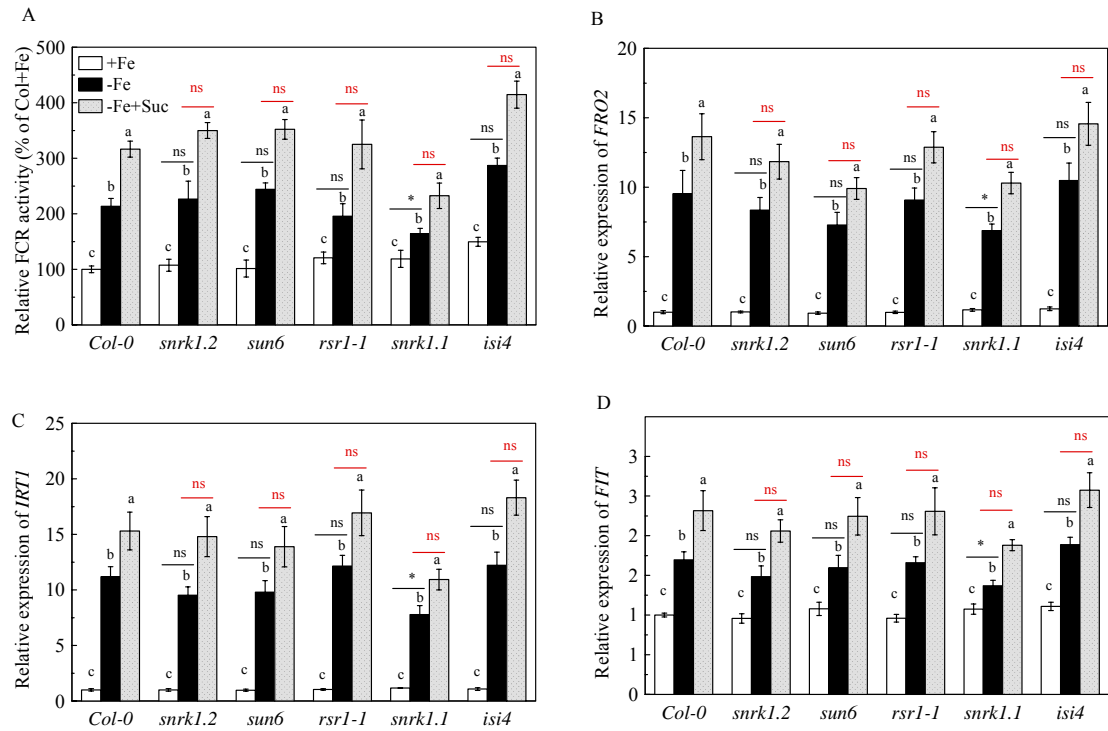


Figure S11 Effects of sucrose on Fe-deficiency responses in the roots of Col-0 plants and sucrose-sensing mutants. The treatments are the same as those in Fig S6. Data are means \pm SD ($n=5-7$). Different letters indicate significant differences among treatments within a genotype (one-way ANOVA, $P < 0.05$). Asterisk and ns indicate significant differences and no significant differences between mutant and Col-0 genotypes, respectively, in response to a treatment (two-way ANOVA, $P < 0.05$).

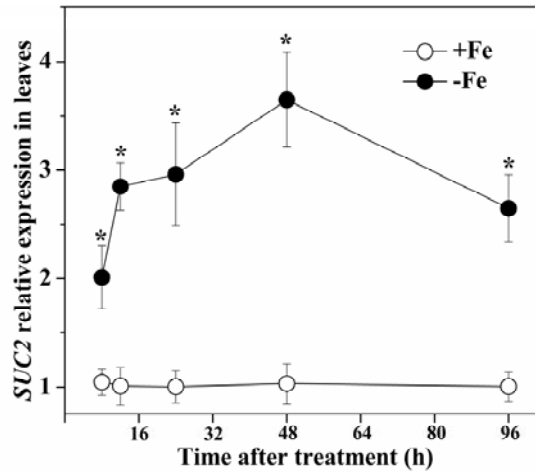


Figure S12 Time-course effect of Fe deficiency on *AtSUC2* expression in the leaves of *Col-0* plants. The treatments are the same as those in Fig. S10. Gene expression was analyzed by real-time qPCR. Transcript level of *UBQ10* was used as an internal control. Data are means \pm SD (n=5-7). An asterisk indicates significant difference between two treatments at each time point (one-way ANOVA, $p < 0.05$).

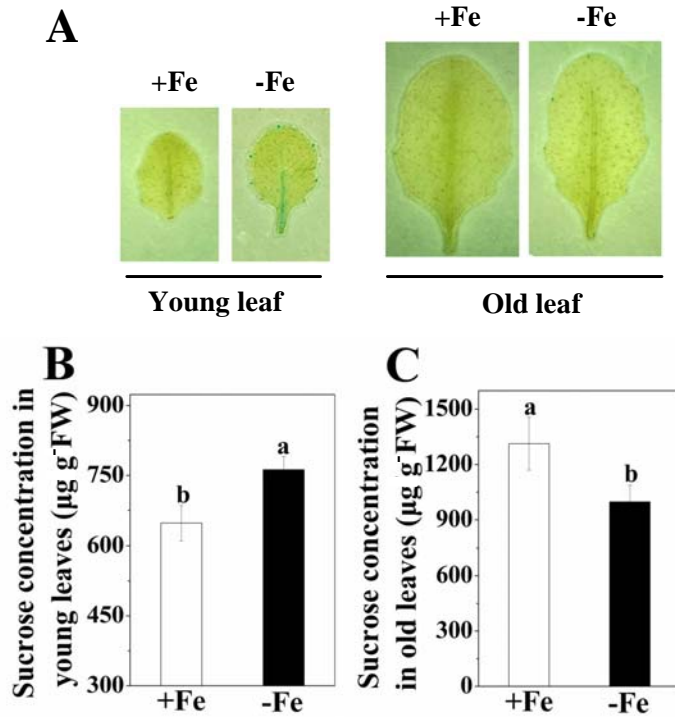


Figure S13 Effects of Fe deficiency on GUS staining and Suc concentration in *DR5-GUS* transgenic plants. The treatments are the same as those in Fig. S5. Data are means \pm SD ($n=4$). Different letters indicate significant differences between two treatments (one-way ANOVA, $P < 0.05$).

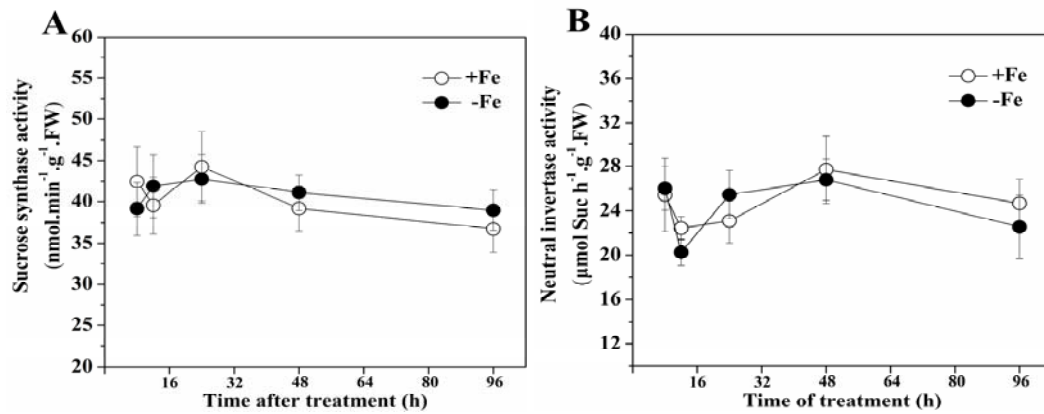


Figure S14 Effects of Fe deficiency on the activities of sucrose synthase (A) and neutral invertase (B) in the roots of *Col-0* Arabidopsis. The treatments are the same as those in Fig. S10. Data are means \pm SD (n=4). One-way ANOVA test ($P < 0.05$) shows that there is no significant difference between two treatments at each time point.

Supplemental table S1. Primers used in this work.

Gene	Primer	Sequence (5'-3')	Method
AT4G05320	UBQ10 F	ACCCTAACGGGAAAGACGA	Real-time qPCR
	UBQ10 R	GGAGCCTGAGAACAAGATGAA	
AT1G01580	FRO2 F	GCGACTTGTAGTGCGGCTATG	Real-time qPCR
	FRO2 R	CGTTGCACGAGCGATTCTTG	
AT4G19690	IRT1 F	CGGTTGGACTTCTAAATGC	Real-time qPCR
	IRT1 R	CGATAATCGACATTCCACCG	
At2G28160	FIT F	GGAGAAGGTGTTGCTCCATC	Real-time qPCR
	FIT R	TCCGGAGAAGGAGAGCTTAG	
At1g22710	SUC2 F	TGCCTTTCACGATGACTGAG	Real-time qPCR
	SUC2 R	TTCCTTGAAAGCTCCGAAGA	
AT3G47640	PYE F	CAGGACTTCCCATTTTCCAA	Real-time qPCR
	PYE R	CTTGTGTCTGGGGATCAGGT	
AT1G23020	FRO3 F	TTCTTCCGACCTCTCAATGC	Real-time qPCR
	FRO3 R	TTTCTCTCGGGTGACAAAGG	
AT1G56430	NAS4 F	GGCTTCGACGTTGTGTTCTT	Real-time qPCR
	NAS4 R	AGCAAAGCACCAGGAGACAT	
AT5G13740	ZIF1 F	TTTGC ACTATGGGCTAACAGTC	Real-time qPCR
	ZIF1 R	TGAAAAGAGAATAGGCCGAGA	
AT1G22710	Salk_087046 LP	TTTACCTGAGGGACGACAATG	Genotyping
	Salk_087046 RP	GTTTTTCGGAGAAATCTTCGG	
AT3G29160	Salk_139618 LP	GATTTTAACCCGCGGTATACC	Genotyping
	Salk_139618 RP	GAAAACTGACAAGAACCACCG	
pBIN-pROK2 T-DNA	Lab 1.3	ATTTTGCCGATTTTCGGAAC	Genotyping