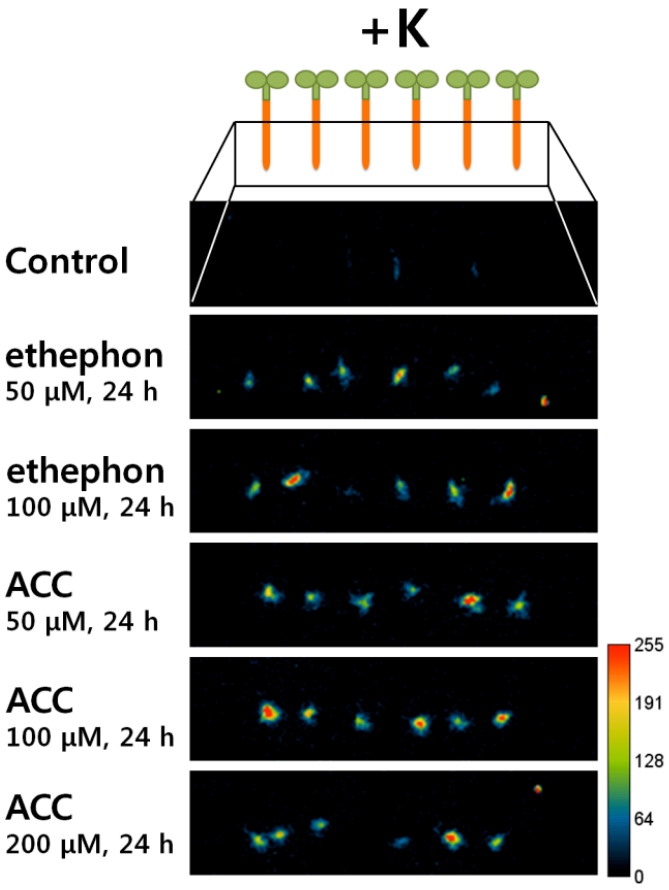
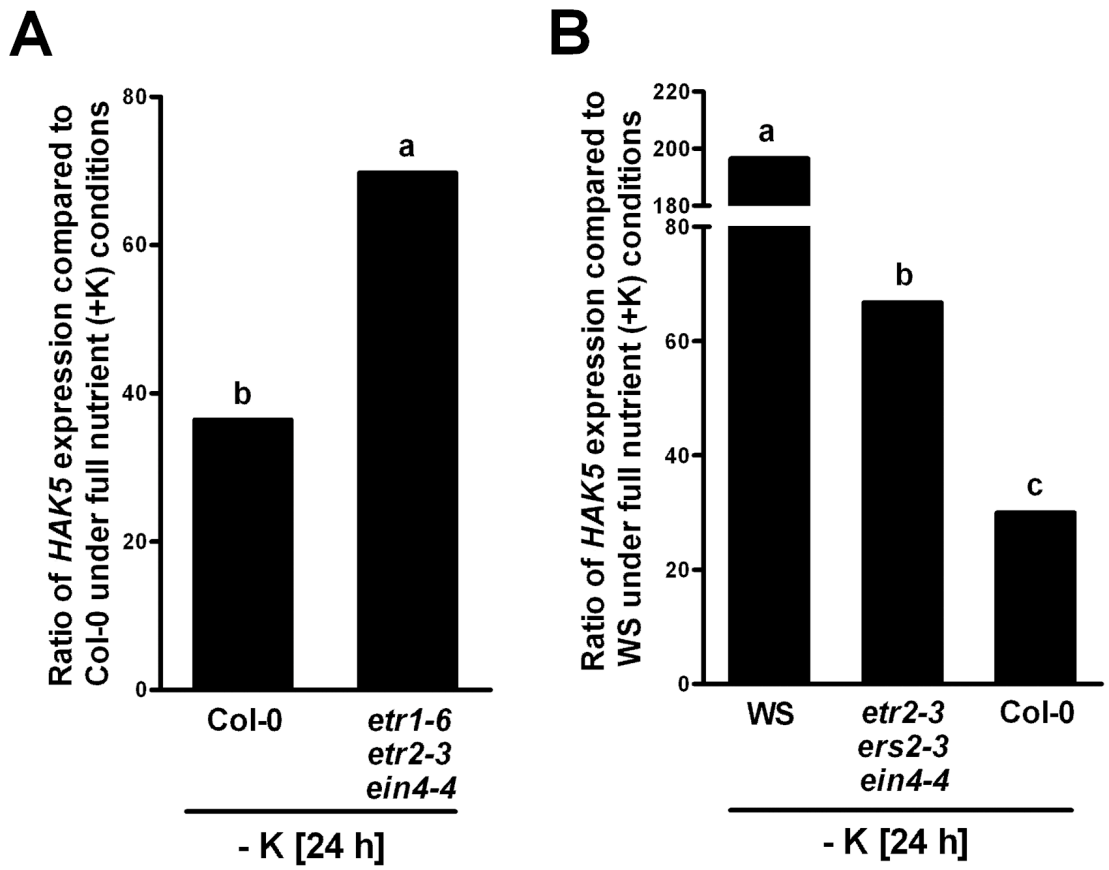


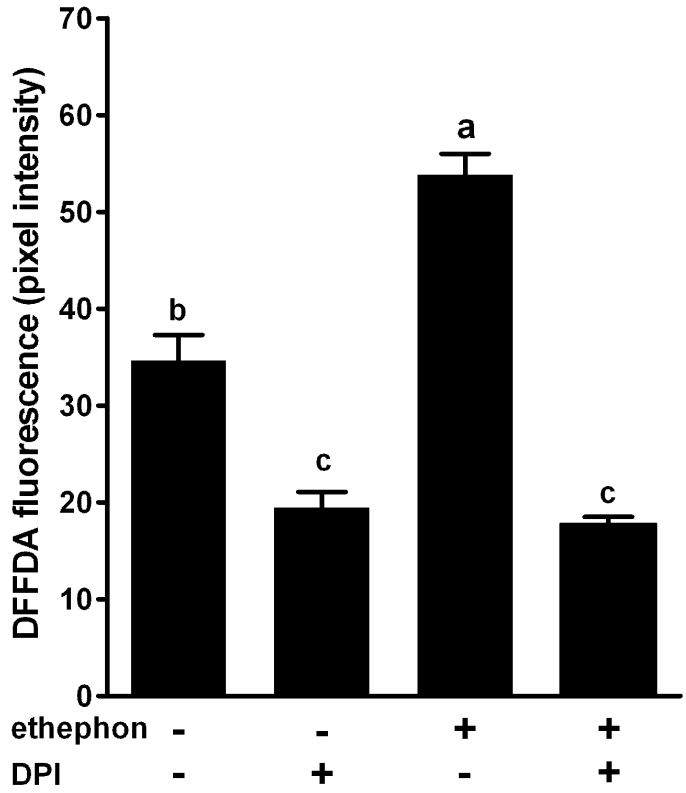
Supplemental Figure 1. Effects of ACC on *HAK5* expression in *Arabidopsis* roots.

ACC stimulates *HAK5* expression in roots. Pseudocolored luminescence images of homozygous transgenic *Arabidopsis* seedlings carrying *AtHAK5pro:LUCIFERASE* are shown. Three-day-old seedlings were incubated with ACC for 24 h under the K^+-sufficient (+K, 5 mM K^+) conditions. Yellow and red colors indicate a high luciferase expression. Experiments were performed three times, and data from one experiment are shown here.



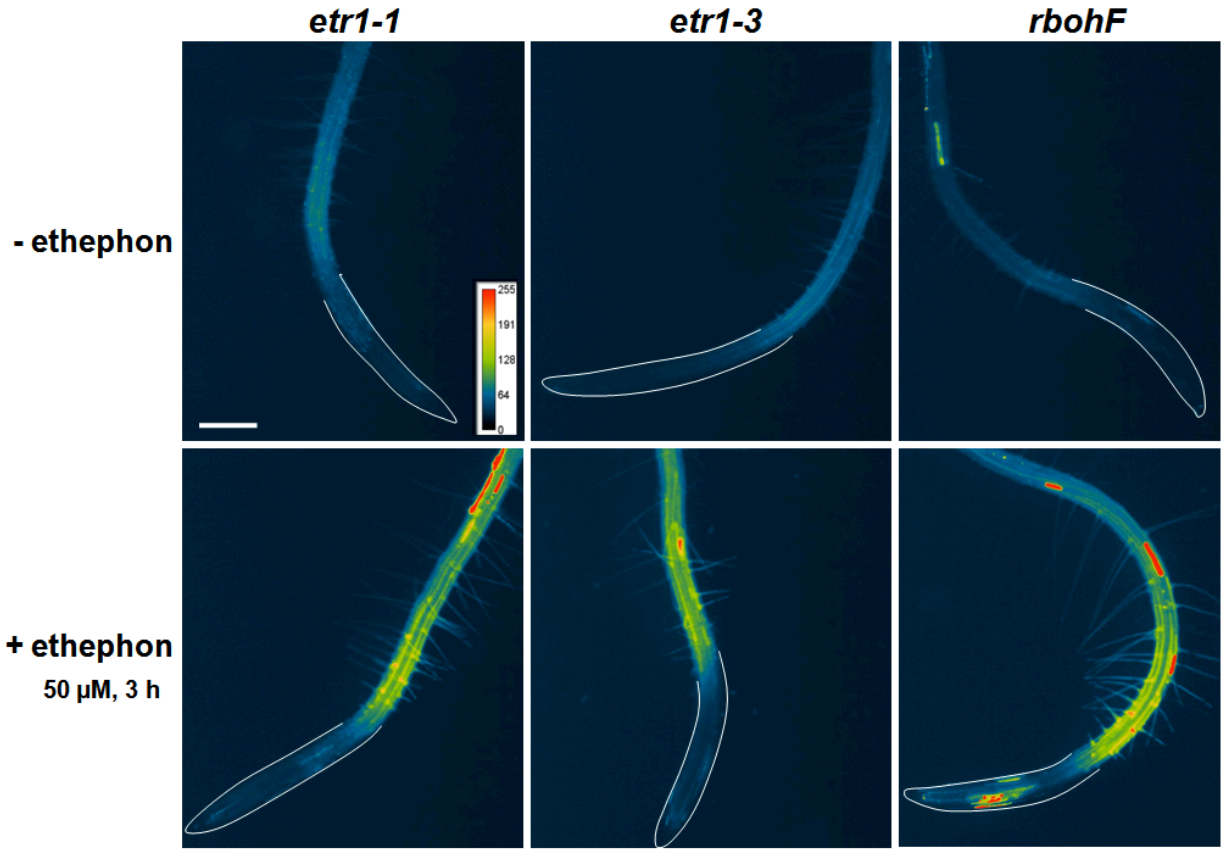
Supplemental Figure 2. Low K^+ induces *HAK5* expression in triple mutants of ethylene receptors.

(A) *HAK5* expression levels in *etr1-6 etr2-3 ein4-4* under K^+-deficient (no K^+) conditions compared to Col-0 under full nutrient (+K) conditions. (B) *HAK5* expression levels in *etr2-3 ers2-3 ein4-4* under K^+-deficient (no K^+) conditions compared to WS under full nutrient (+K) conditions.



Supplemental Figure 3. DPI inhibits ethephon-induced ROS production in roots.

Three-day-old seedlings grown under full nutrient conditions were treated with 50 μM ethephon for 2 h. Then seedlings were transferred to medium containing 50 μM ethephon and 10 μM DPI for 1 h. ROS images were collected following staining of roots with 20 μM DFFDA. Quantified data were obtained using imageJ software (n=5 to 10 seedlings ± SE). Means that have different letters at the top are significantly different ($P < 0.05$; t test).



Supplemental Figure 4. Ethephon induces ROS production in *etr1-1*, *etr1-3* and *rbohF* plants.

Pseudocolor images of ROS fluorescence are shown for K^+-sufficient (1.75 mM K^+) *etr1-1, etr1-3, rbohF* roots in the absence or presence of ethephon (scale is in pixel intensity). Three-day-old roots were treated with 50 µM ethephon for 3 h, followed by staining with 20 µM DFFDA. Yellow and red colors indicate a high ROS production. White lines were drawn by hand to show the boundary of roots. Scale = 200 µm.

Supplemental Table 1. Root hair number under K^+-deficient and -sufficient conditions

	Percent of total root hair cells[a]		Percent of root hair cells in the N position[b]	
	24 h	**48 h**	**24 h**	**48 h**
+K	47.0 ± 1.17	49.5 ± 1.23	0 ± 0	1.0 ± 0.70
- K	49.5 ± 1.23	49.5 ± 0.95	1.0 ± 0.70	1.0 ± 0.70

Values shown are means ± SE (n=200).
[a] Percentage of root hair–bearing epidermal cells among total epidermal cells counted, including cells in both the H and N positions.
[b] Percentage of root hair–bearing epidermal cells at the N position among total epidermal cells counted.
H position, epidermal cells that develop into hair cells.
N position, epidermal cells that develop into nonhair cells.

Supplemental Table 1. K^+ deprivation does not cause ectopic root hair formation in *Arabidopsis*. Plants were grown under full nutrient conditions (+K, 1.75 mM K^+) for 2 d and then transferred to either full nutrients (+K) or no potassium (-K) for 24 and 48 h.