Supplementary

The preliminary experiment was conducted to screen the tolerant cultivar and the sensitive one. Six cultivars were popular in domestic market of China. They are from Shenqing No. 1(marked SQ1; China, Shanghai, Shanghai Funong Seed Co.,Ltd.), Jinyou No. 35(marked JY; China, Tianjin, Tianjin Kernel vegetable Research Institute), Shenqing No. 5(marked SQ5; China, Shanghai, Shanghai Funong Seed Co.,Ltd.), BoXin No. 525(marked BX; China, Tianjin, Tianjin Derit Seed Co.,Ltd.), BoMei No. 49(marked BM; China, Tianjin, Tianjin Derit Seed Co.,Ltd.), and Chunqiu changjian(marked CQ; China, Beijing, Beijing Flower-goddess Agriculture Co.,Ltd). They were planted in the experiment basement of Anhui Agricultural University.

Seeds were disinfected with 55 °C warm water for 15 min, then washed thoroughly with deionised water. They were germinated in filter papers in petri dishes in the dark for approximately 24 h at 29 °C, When the seed radicle broke through the seed coat by about 2 mm, they were transferred into plastic nursery trays (50 × 50 × 5 cm) containing fine sand. The seedling temperature was controlled at 29 ± 2 °C in the day and 19 ± 2 °C in the night. After cotyledon expansion, seedings were cultivated with half-strength Hoagland nutrient solution; after true leaf expansion, seedings were planted with Hoagland nutrient solution. At the second-leaf stage, seedlings of uniform size were transferred to a crate that contained Hoagland nutrient solution and was aerated with an air pump at an interval of 20 min to maintain the dissolved

oxygen (DO) level at 8.0 ± 0.2 mg l−1. Fifteen cucumber seedlings were planted in one crate. The seedlings were cultivated in a greenhouse. The highest temperature during the day was 31 °C, and the lowest temperature at night was 23 °C, and the relative humidity was 51%–71% during their growth period under natural illumination. After one day of the transplanting seedling stage, seedlings were treated with 80 mM Ca(NO3)2. After 9 days, root morphology was measured by sampling, and the two cultivars with the greatest difference under stress were screened out according to root length and root tip number. After 9 days, root morphology was measured by sampling, and the two cultivars with the greatest difference under stress were screened out according to root length and root tip number. The two selected varieties were cultured in the same way, respectively treated with Ca(NO3)2 of 50, 60, 70, 80 and 90 mM. At 9 days, root morphology was measured by sampling, and the most significant stress concentration was screened out according to root length and root tip number.

Table S1. Effects of 80 mM Ca(NO3)2 Stress on Different Cucumber Cultivars

	Length (cm)	SurfArea (cm^2)
CQ	327.64 ± 3.55e	125.39 ± 1.32a
SQ1	331.36 ± 2.52e	89.73 ± 1.13e
JY	373.14 ± 1.37b	108.52 ± 0.59c
SQ5	356.51 ± 2.67c	105.56 ± 1.15c
BX	342.03 ± 1.06d	97.63 ± 0.54d
BM	388.25 ± 4.67a	119.33±1.21b

Note：Values represent the mean ± SE (n = 3). Letters indicate significant differences at $P<0.05$ according to Duncan's multiple range tests.

According to table S1, under the stress treatment of 80 mM Ca(NO3)2, the root length of 'CQ' was the smallest, the root length of 'BM' was the largest, and the surface area of 'CQ' and 'BM' was the largest. Root length of other varieties was in the middle, and the surface area of other varieties was lower than that of 'CQ' and 'BM'.

Table S2. Effects of Different $Ca(NO_3)_2$ Concentrations on Cucumber

	Length (cm)		SurfArea (cm^2)	
	CQ	BM	CQ	BM
0mM	541.55±3.43b	544.08±1.70b	173.34±1.50b	172.21±1.01b
50mM	612.25±5H.21a	623.65±3.04a	191.30±1.80a	188.88±2.41a
60mM	524.42±3.91c	544.01±2.72b	175.64±2.73b	167.14±2.08b
70mM	353.80±2.82d	414.61±1.58c	157.02±1.37c	126.27±1.84c
80mM	324.30±1.40e	388.25±1.71d	125.39±1.32d	118.67±2.28d
90mM	280.91±1.93f	332.60±1.34e	103.83±0.46e	116.3±0.463d

Note：Values represent the mean ± SE (n = 3). Letters indicate significant differences at $P<0.05$ according to Duncan's multiple range tests.

According to table S2, under the treatment of 60mm Ca(NO3)2, the length and surface area of 'CQ' and 'BM' increased, and both root length and surface area decreased with the increase of concentration. The change of length and surface area under 70 mM Ca(NO3)2 treatment was the biggest difference from that under 60 mM Ca(NO3)2 treatment, and the length and surface area gradually decreased with the increase of concentration.