

Characterization of Calcium and Boron Deficiency and the Effects of Temporal Disruption of Calcium and Boron Supply on Pansy, Petunia, and Gerbera Plugs

Pansy, petunia, and gerbera daisy plants were grown hydroponically to characterize the deficiency symptoms caused by the absence of calcium (Ca) or boron (B). Primary symptoms occurred on the youngest tissue for both elements, but distinct differences between Ca and B deficiencies were observed. Plants responding to Ca deficiency exhibited discoloration, upward rolling of leaves, and ultimately necrosis (Figure 1-3). Plants responding to B deficiency exhibited minor chlorosis, upward curling, thickening of leaves, distorted meristems, and strap-like leaves (Figure 1-3). A second experiment investigated how a temporary disruption of Ca or B affects the plant throughout the crop cycle. Either Ca or B was removed from the nutrient solution for a 7-day period from Day 15 to Day 21, Day 22 to Day 28, or Day 29 to Day 35 after sowing. After the 7-day disruption, the respective element was reintroduced to the plants. Regardless of when the plants were deprived of Ca or B, the symptoms of the respective deficiency were present at the end of the experiment, even when final tissue concentrations were within the acceptable ranges. These studies have shown that a temporary disruption of either Ca or B can cause lasting symptoms throughout the plug production cycle.



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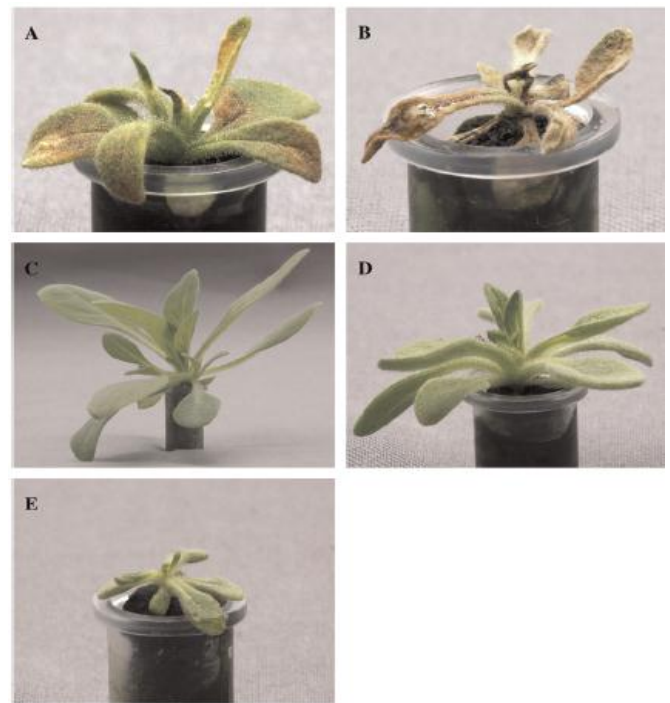


Figure 2. 'White Storm' petunia plants 39 d after sowing with initial (A) or advanced (B) calcium deficiency symptoms, control (C), initial (D), or advanced (E) boron deficiency symptoms (Expt. 1).

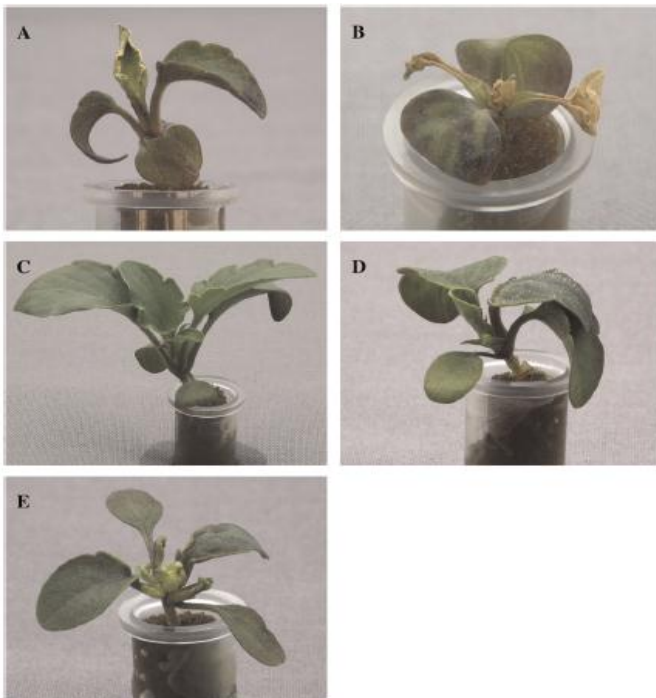


Figure 1. 'Dynamite Yellow' pansy plants 39 d after sowing with initial (A) or advanced (B) calcium deficiency symptoms, control (C), initial (D), or advanced (E) boron deficiency symptoms (Expt. 1).

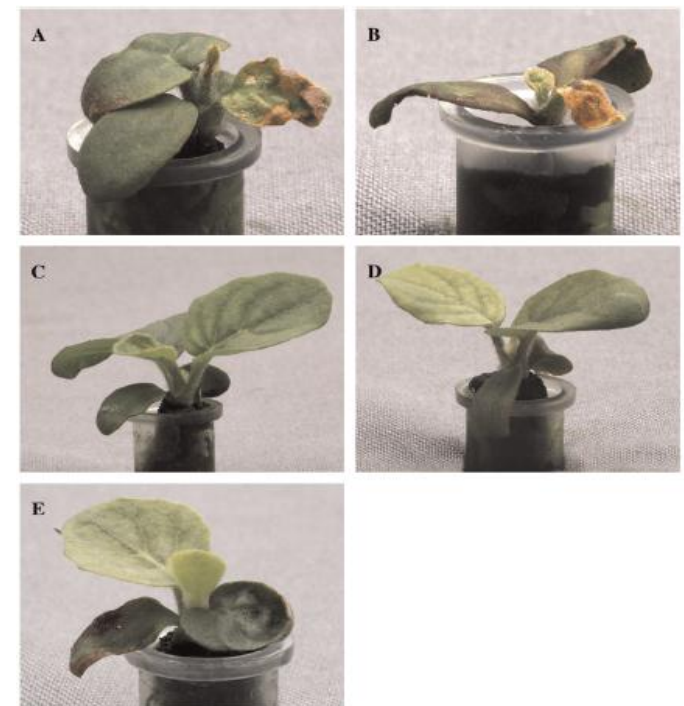


Figure 3. 'Festival Apricot' gerbera plants 39 d after sowing with initial (A) or advanced (B) calcium deficiency symptoms, control (C), initial (D), or advanced (E) boron deficiency symptoms (Expt. 1).