



[Available Issues](#) | [Japanese](#)

Author:  [ADVANCED](#) | Volume  Page

Keyword:



[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

## Horticultural Research (Japan)

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### **The Effects of Excess Boron on Growth, Photosynthesis and Maturity of Tomato (*Solanum lycopersicum* L.) Grown in Hydroponic Culture**

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To clarify a critical concentration of excess boron (B) in nutrient solution for hydroponically cultured tomato, the influences of excess B on growth, photosynthesis and maturity were investigated. In tomato topped at the first truss, B concentration in nutrient solution resulted in a significant increase in leaf B concentration. At the developmental stage, fresh weights of leaf and fruit were suppressed.

in nutrient solution, respectively. Photosynthetic rate, respiration rate and transpiration conductance decreased with excess B at 4 ppm or higher concentrations during the flowering stage to fruit developmental stage. When tomato was top pruned and limited to two fruits in each truss, excess B did not affect fruit growth in the first truss. However, fruit size and Brix were reduced in the second truss, which was caused by decrease in the photosynthate distribution to fruit in the second truss due to the decrease in photosynthetic activity. Furthermore, excess B could increase ethylene production in the second truss because of production of ethylene with increase in photosynthetic activity. On these results, we suggest that the critical concentration of B in nutrient solution is 4 ppm for long-term hydroponic cultivation of tomatoes.

**Key Words:** [ethylene](#), [excess boron stress](#), [fruit development](#), [respiration](#)

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