Optimizing boron delivery to subirrigated pot chrysanthemums

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INTRODUCTION

- Greenhouse floricultural operations often supply more fertilizer inputs than necessary, which increases the costs of managing stale nutrient solutions and poses downstream environmental risks.
- Previous studies from our laboratory demonstrated that most macro- and micronutrient supplies to subirrigated chrysanthemums can be dramatically reduced during vegetative growth and removed at bud break without sacrificing plant and flower yield and quality (1-3).
- **Objective:** To optimize boron (B) delivery to subirrigated chrysanthemums.

MATERIALS AND METHODS

- Two chrysanthemum cultivars, 'Milton Dark Pink' and 'Williamsburg Purple', were grown in a naturally-lit greenhouse in two seasonal experiments.
- Plants were supplied with 5.00, 2.50, and 1.25 µM B (Expt. 1) or 1.25, 0.63, and 0.31 µM B (Expt. 2), which correspond to 100%, 50%, 25%, 12.5%, and 6.25% of the industry standard in an otherwise balanced nutrient solution until bud break, then replaced with water.
- Nutrient composition of recently matured leaves at bud break and reproductive morphological and quality characteristics were determined.

FURTHER INFORMATION AND SPONSORS

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RESULTS

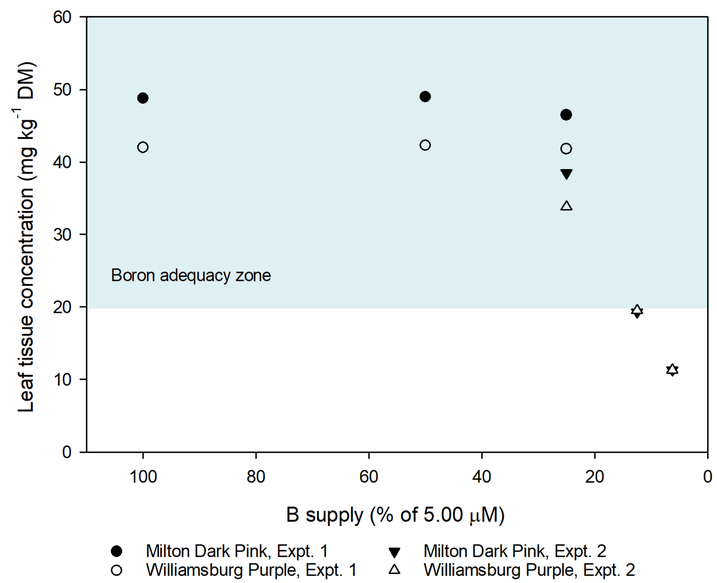

Fig. 1. Leaf B levels were only within the adequate range when B supply was at least 25% (1.25 µM) and was clearly deficient in plants receiving 6.25% (0.63 µM) only.

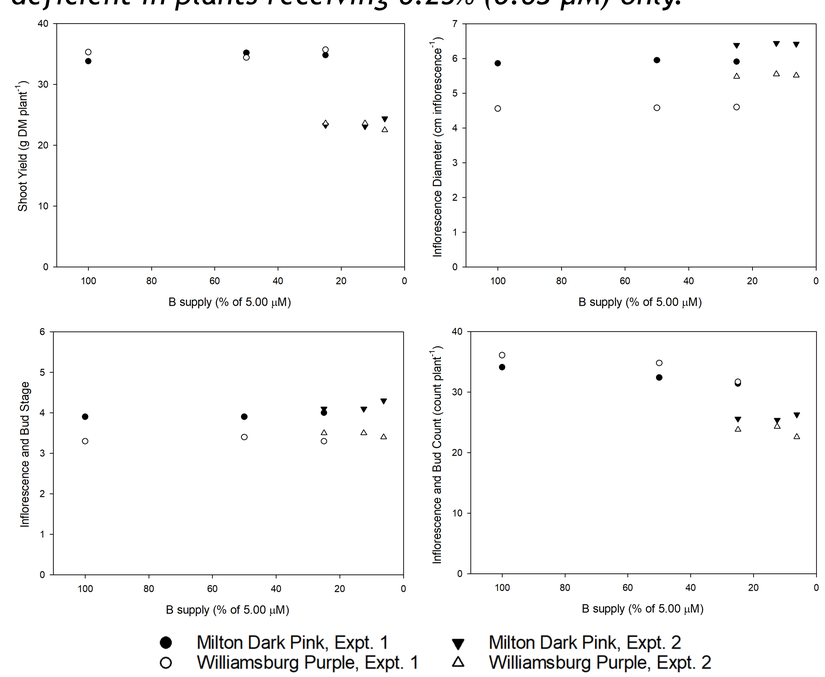

Fig. 2. Shoot yield and reproductive morphological characteristics were unaffected by B treatment from 100% (5.00 µM) to 6.25% (0.31 µM).

RESULTS

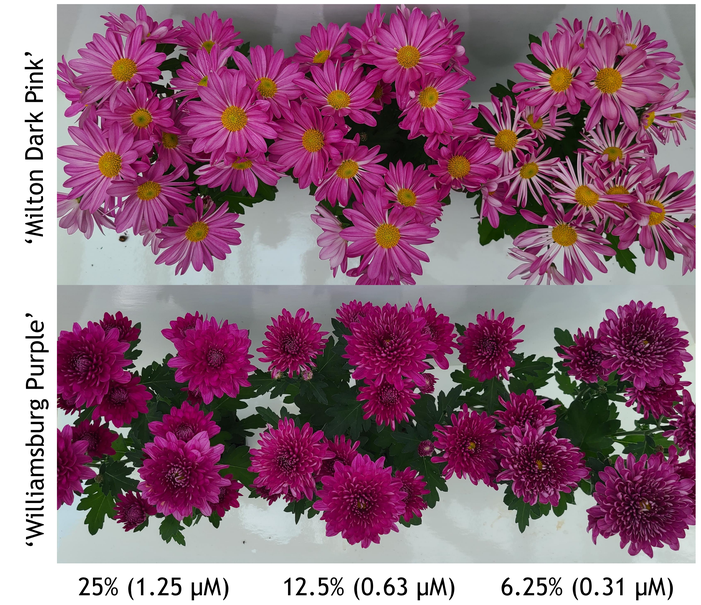

Fig. 3. Symptoms of B deficiency (i.e., petal quilling) were evident in young inflorescences and all inflorescences in plants receiving 12.5% and 6.25% B, respectively.

DISCUSSION

- Boron supply during vegetative growth equivalent to 25% of the industry standard sustained plant yield and flower quality. Leaf B concentrations were clearly deficient and flower quality diminished with supplies at 12.5% or lower.
- These findings suggest that B use efficiency was improved with decreasing B supply to 25% of the industry standard.
- Commercial validation of our optimized nutrient delivery strategy for subirrigated chrysanthemums is underway.

REFERENCES

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