Special Research Report #502: Production Technology

Effect of a Novel Phosphorus Fertilizer on Production of Florist Azalea and Pythium Resistance of Geranium

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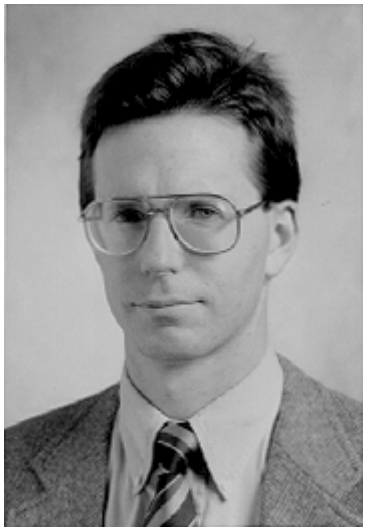
BACKGROUND

We have developed a novel phosphorus (P) fertilizer which acts as a buffer. This is it releases P into the medium as plants remove it from the soil solution. This maintains a low but constant supply of P to the roots. Previous research indicated that buffered-P fertilizer (Al-P) provided adequate P nutrition to bedding plants and resulted in more compact, drought tolerant plants. In this study, we tested two additional hypotheses: (1) that Al-P could provide adequate P to crops with a long production time, e.g., florist azalea; and (2) that Al-P might increase resistance to disease, specifically *Pythium* root rot, which had previously been shown to be exacerbated by high fertilizer rates.



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MATERIALS AND METHODS

The florist azalea trial was conducted at Yoder Brothers commercial production facility in Alva, FL. Four cultivars of florist azalea were grown in 6" diameter azalea pots with standard P fertilization (normally used by Yoders) or with 1% or 2% Al-P added to the medium, and no P added in the fertigation solution. Plants were grown to maturity and quality and postproduction quality were evaluated.

The *Pythium* trial was conducted in the Penn State greenhouses using 'Showgirl' and 'Red Elite' geraniums. They were grown with 1% Al-P, 2% Al-P, or P supplied by 15-15-15 soluble fertilizer. Plants were inoculated with 3 different *Pythium* species and disease was evaluated. Susceptibility to *Botrytis* (gray mold) was also evaluated in 'Red Elite' geraniums by a leaf disk assay.

RESULTS

Florist Azalea Production. Use of Al-P reduced the release of P into leachate by about 67% (Fig. 1).

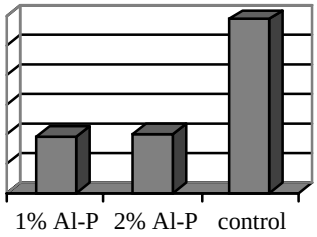

Figure 1. Total P leached from azalea pots during the production period (relative units).

Al-P provided adequate P nutrition for the 11-month duration of crop production,

and an additional month of postproduction life. Plant quality was very similar among treatments. There was a slight (1 week) delay in flowering of 'Gloria', but no significant differences in total flower number. Postharvest evaluations at Penn State and University of Florida (with Dr. Terril Nell) indicated no significant differences in postharvest quality.

Disease Resistance. Use of Al-P fertilizer had no significant effect on the development of *Pythium* root rot on intact plants or gray mold (Botrytis) on leaf disks.

CONCLUSIONS

Alumina-buffered phosphorus fertilizer provided adequate phosphorus nutrition over a long term (1 year) crop production period, with no reduction of quality. Leaching of phosphorus from pots fertilized with Al-P fertilizer was much less than from conventionally fertilized pots. There was no significant impact of Al-P on disease resistance to *Pythium* or *Botrytis*.

IMPACT TO THE INDUSTRY

(1) We have developed a novel method of providing phosphorus nutrition, which reduces leaching of phosphorus from greenhouses and nurseries. This technology will be valuable for **growers** who must meet environmental impact regulations. (2) The alumina-buffered phosphorus fertilizer provides sufficient phosphorus so that crop quality is not reduced, and may even be improved in some cases. (3) The fertilizer does not require supplementation or replacement for long-term crops such as florist azalea.

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