

SAMPLE ABSTRACT

Iron nutrition of *Pinus elliotii* var. *densa* seedlings in two different soils with different Iron availability.

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Abstract

Seedlings of endangered Dade County pine, *Pinus elliotii* var. *densa*, must survive long enough to form symbiotic associations with ectomycorrhizal fungi that assist uptake of mineral nutrients. Although plants need nitrogen (N), phosphorus (P), and potassium (K) in relatively large quantities, pine seedlings also may need relatively high amounts of iron (Fe). I hypothesized that iron would limit the growth of non-mycorrhizal pine seedlings in a low-Fe soil, but not in a soil with relatively abundant Fe. I grew pine seedlings in a three-factor, fully factorial experiment in pots in a greenhouse. The factors are two soils (flatwood and sandhill) with different Fe availability from the Archbold Biological Station, three levels of weekly Fe addition (none; 37 mg; 74 mg chelated iron), and two levels of N, P, and K fertilization (none; one-time addition of 0.93, 0.28, and 1.85 g, N, P, K, respectively). I measured height, length of longest needle, and stem diameter fortnightly for four months. Surprisingly, the high iron addition had a negative effect on growth. NPK fertilization had a beneficial effect, but only in Flatwood soil. These results suggest that phosphorus might be the growth limiting nutrient because native iron in Sandhill soil may have complexed with added phosphorus, preventing a response to NPK. Phosphorus limitation also is consistent with the strong negative effect of the high iron addition. I conclude that in these Archbold soils, non-mycorrhizal pine seedling growth is not limited by natural iron availability, but instead, may be restricted by phosphorus.