

We expect to formally publish these results in a referred journal in the future.

Conclusions

This study was able to demonstrate the importance of N fertilization in nursery culture of oaks. We also found that the principles of exponential nutrient loading (examined in detail by many authors for conifer species) appear to also be applicable to oak species. Luxury consumption of N was induced in these two oak species, and seedlings appeared able to store excess N in seedling tissues beyond that needed to maximize morphological growth. Increased growth and N uptake occurred with the exponential treatment even though the total N delivered over the entire growing season did not vary from current conventional practices. Exponential nutrient loading has potential to improve nursery seedling quality of oaks by maximizing morphological development and optimizing nutrient storage reserves in plant tissues. Simultaneously, the process has potential to improve fertilizer use efficiency, thereby decreasing fertilizer costs and leaching losses. Additional studies need to closely examine responses of nutrient loaded hardwood seedlings during outplanting, and examine performance of additional hardwood species under this fertilization technique.

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