

RESPONSE OF LOBLOLLY PINE SEEDLINGS FROM DIVERSE FAMILIES TO CONTROLLED NUTRIENT SUPPLY

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Abstract:-- Trees adjust their growth patterns depending on environmental conditions. For instance, increasing nutrient availability usually results in a shift in allocation of biomass from roots toward foliage. Change in the proportional allocation of biomass among plant organs as related to change in resource supply (i.e., responsiveness) is well documented, but variation in responsiveness between genotypes is not well characterized. To evaluate potential variation in responsiveness among genotypes of loblolly pine (*Pinus taeda L.*), seedlings from five open-pollinated families from the Atlantic Coastal Plain (mesic ecotype) and five from the Lost Pines Texas (xeric ecotype) provenances were grown in sand-filled pots for 14 weeks under two nutrient solution levels (10 and 50 ppm N). Biomass of roots, stems, and foliage was determined, and the differential response of the two ecotypes across nutrient regimes was examined using allometric relationships which account for differences in plant size.

Seedlings of the mesic ecotype (Atlantic Coastal) responded much more than the xeric ecotype (Lost Pines) to different nutrient regimes. Largest shifts in biomass allocation occurred between roots and foliage. The mesic ecotype exhibited a significantly greater shift from roots to foliage in response to the higher nutrient treatment. This finding provides evidence of substantial inherent variation in responsiveness of loblolly pine families and provenances during the seedling stage.

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