

## FIELD EVALUATION OF CONTAINER-GROWN NORTHERN RED OAK

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Planting seedlings as a method of artificial regeneration has been largely unsuccessful with red oak (*Quercus rubra* L.) because of poor survival and early growth. Seedlings grown in individual containers and inoculated with specific mycorrhizal fungi are believed to experience less planting shock and to have a competitive growth advantage over bare-root seedlings produced in the conventional fashion. The objectives of this study were to determine the effect of containerization and inoculation with a specific mycorrhizal fungus on the survival and early growth of red oak seedlings.

Northern red oak seedlings were grown in a fumigated soil-peat-vermiculite rooting medium in 8 x 8 x 26 cm plastic-coated paper containers for 16 weeks in a glasshouse under 16-hr photoperiod and day-night temperatures ranging from 30 to 20 °C. Seedlings were hardened off in February-March and planted when still dormant. Conventionally grown nursery seedlings were sown in 1978 and lifted in March 1979, four weeks prior to planting. For each method of production, the

soil medium was inoculated (control not inoculated) with the equivalent of 200 ml of vegetative mycorrhizal inoculum of *Pisolithus tinctorius* at the time of seeding. Container-grown seedlings were fertilized every 14 days with 0.5 strength Hoaglands No. 2 solution; nursery-grown seedlings were fertilized according to standard nursery guidelines.

The planting site was an abandoned old field of 5-8% slope, S-E aspect and supporting old field grasses and scrub hardwood vegetation. The soil type is an eroded phase of a Zanesville silt loam (Typic Fragiudalfs) with a fragipan within 36 cm of the surface. Four 25-tree plots of each of the four treatments were planted at random. Weeds were controlled in a 0.5 m radius around each seedling with annual applications of the chemical herbicide Roundup at a rate of 3 kg ai/ha.

Survival and annual height growth were significantly influenced by the method of seedling production and mycorrhizal fungal inoculation (Table 1).

Table 1. Influence of containerization and mycorrhizal inoculation on survival and first and second year height growth increment of red oak seedlings.

	Containerized, inoculated	Containerized, not inoculated	Bare-root, inoculated	Bare-root, not inoculated
Survival (%)	100	96	96	88
Seedling height (cm)				
Initial	62.3	64.3	78.7	73.4
1st year increment	17.3a <sup>a</sup>	11.2b	10.5b	6.0b
2nd year increment	37.8a	16.3c	23.6b	10.1c
Total height	117.4	91.8	112.8	89.5

<sup>a</sup>Row values not followed by the same letter are significantly different ( $\alpha = 0.05$ ) (Duncan's New Multiple Range test).

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