

Can Growth of Seed-Propagated Oaks Be Predicted before Lining Out in Nursery Rows? ©

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Growth rates of nursery-grown oaks are reported to vary considerably and many oak species, in spite of other desirable attributes, are not commonly grown because of slow growth when young. In this study, we investigated a method for rapid screening of very young oak seedlings to predict potential growth in a production nursery. Acorns from single maternal trees of four Virginia native oak species, *Quercus montana* Wild. (chestnut oak), *Q. palustris* Münchh. (pin oak), *Q. velutina* Lam. (black oak), and *Q. alba* L. (white oak) were collected from the campus of Virginia Tech in Blacksburg, Virginia in fall of 1999 and subjected to stratification at 5°C for approximately 3 mon. Single acorns were then planted in individual cells of 50-cell liner trays and grown in a heated greenhouse until individual seedlings had set first buds. Height at first budset was recorded for individual seedlings. Trees were then transplanted into 1-gal containers and grown outdoors in Blacksburg, Virginia until June, 2001, at which time they were planted in single nursery rows with trees approximately 1.2 m apart. All trees were grown in the ground for three additional growing seasons (four total from seed), and final trunk diameters were measured 15 cm above ground level in February 2004. Species varied dramatically in growth over the 4 years. Pin oak and chestnut oak had the greatest growth, followed by black oak and white oak. Height at first budset was not related to trunk diameter at the end of the experiment for any species and was only weakly related to final height for black oak. Trunk diameter of seedlings when planted in field beds 1.5 years from seed was related to trunk diameter at the end of the experiment for all trees, but little variation was explained by the relationship for chestnut oak or black oak. Plant height at field planting was not as good as trunk diameter for prediction of final trunk diameter except for black oak. The utility of screening a group of germinated oak seedlings at the liner stage by trunk diameter or height is species-specific. Screening liners by trunk diameter may be especially beneficial for the slow-growing white oak.

