

ESTABLISHMENT OF NORTHERN RED OAK GENETIC TESTS WITH  
NURSERY-GRADED SEEDLINGS

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**Abstract:** Artificial regeneration of northern red oak (*Quercus rubra* L.) has had variable success over time. Current nursery practices generally involve the growth of seedlings to a standardized height and form with little regard to seed source, seedling quality, or subsequent field performance. Additionally, there is not an accepted culling criteria for hardwood nursery stock. Northern red oak seedlings need sufficient height and root growth in the nursery in order to receive adequate sunlight, water, and nutrients when planted in the field. In the Fall of 1993, acorns were collected from 73 individual trees in a seedling seed orchard on the Watauga Ranger District of the Cherokee National Forest. The acorns were planted by family at the Georgia Forestry Commission's Flint River Nursery, and grown according to prescriptions developed by the USDA Forest Service Institute for Tree Root Biology. The seedlings were lifted after one growing season and visually graded according to number of first order lateral roots (FOLR), tap root size, basal caliper, and stem height. Lateral roots were pruned 6 inches from the tap root to minimize J-rooting. In the late winter of 1995, plantations were established on southern National Forests (16), a Kentucky State Forest (1), and the Ames Plantation in West Tennessee (1). At each location, 25 families were represented with a total of 1,250 high quality seedlings that were planted using a shovel or auger. Eleven of the 18 plantations are still viable after two growing seasons. The effectiveness of artificial regeneration of quality grown graded northern red oak nursery stock will be evaluated. Differences in outplanting performance among provenances and genetic families will be determined.

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