

FOURTH WORKSHOP ON  
SEEDLING PHYSIOLOGY AND GROWTH PROBLEMS IN OAK PLANTINGS,  
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## FIELD PERFORMANCE OF PLANTED OAKS

### OAK REGENERATION - WHAT WE KNOW

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Growth and development of saplings of four oak (*Quercus* spp.) species planted at five spacings in a minor stream bottom in southeast Arkansas showed significant differences among species and spacings. Spacing affected all tree size and biomass variables except survival. Water oak (*Q. nigra* L.) developed most rapidly; swamp chestnut oak (*Q. michauxii* Nutt.) most slowly. Diameters and heights, averaged over all spacings, ranged from 4.0 inches d.b.h. and 26.7 feet height for water oak to 2.0 inches and 13.9 feet in swamp chestnut oak. Above ground biomass ranged from 26.1 tons per acre for water oak to 7.4 tons in swamp chestnut oak. If only potential crop trees are considered, there was a 20-25 percent increase in growth over average of all trees.

Measurements made on a 27-year-old water oak plantation near Winnsboro, LA, and a 20-year-old cherrybark oak (*Q. falcata* var. *pagodifolia* Ell.) plantation near Vicksburg, MS, showed that oaks can be successfully grown in plantations. Average stand parameters in the water oak plantation were: 356 trees per acre, 6.6 inches d.b.h., 61 feet height, and 86 square feet basal area. The cherrybark plantation averaged 346 trees per acre. Diameters of the dominant/codominant trees ranged from 6.2 to 9.5 inches and heights from 55-65 feet.

A number of successful plantings from direct-seeding Nuttall (*Q. nuttallii* Palmer), water, cherrybark, and Shumard (*Q. shumardii* Buckl.) oaks have been established. Acorns can be sown by hand or machine at depths from 1 to 6 inches. After 18 years, trees averaged 3 to 3.5 inches d.b.h. and 20 to 25 feet tall with approximately 300 trees per acre in a free-to-grow position. A Nuttall oak stand that averaged 138,000 seedlings/ac after establishment was reduced to 708 trees per acre after 28 years where tree release consisted of a one-time selection cut. The forest openings ranged from 0.02 to 0.84 acre in size. At age 28 years, none of the plots had oaks in a dominant or codominant position and only 20 percent had oak in the intermediate crown class. The stand apparently will regenerate with ash (*Fraxinus* spp.) and sugarberry (*Celtis laepigata* Willd.) replacing the original stand that was two-thirds oak. Openings 300 feet or more in diameter may be necessary to allow naturally regenerated Nuttall oak.

The seedtree method for regenerating oaks was attempted on two sites in Arkansas. Although the initial stand composition was quite different from the parent stands, the two sites are progressing toward the composition of the parent stands. At age 29, there were 35-40 oaks per acre in a dominant or codominant crown position.