EVALUATION OF ROOT FORCE™ CONTAINER SEEDLINGS OF FOUR OAK SPECIES FOR BOTTOMLAND FOREST RESTORATION IN SOUTHERN INDIANA: 2 YEAR RESULTS

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Bottomland forest restoration has become an area of interest in the last 10 to 15 years due to large scale bottomland flooding. Seed sources for large heavy seeded species such as the various native bottomland oaks are nonexistent, thus planting seedlings is needed to increase the proportion of heavy seeded trees to diversify bottomland forests. Nursery-grown bareroot seedlings are not usually competitive and do not survive well in areas with heavy vegetation and grass, especially where herbicides cannot be used for competition control. Larger container-grown seedlings may be more competitive than bareroot seedlings in afforesting productive bottomlands.

We tested the field performance of one-year-old, large-rooted Root Force™ seedlings grown in 3.8- and 11.4-L containers and compared them with 1-0 bareroot seedlings at a bottomland restoration project along Otter Creek on the Hoosier National Forest in southern Indiana. Four bottomland oak species were used: bur (*Quercus macrocarpa* Michx.), pin (*Quercus palustris* Muenchh.), Shumard (*Quercus shumardii* Buckl.), and swamp white (*Quercus bicolor* Willd.). Seedlings were planted in a fescue-dominated bottomland pasture. Half of the seedlings had a weed control treatment that consisted of placing a 1.2- x 1.2-m weed barrier mat around each seedling. The remaining seedlings grew in direct competition with fescue grass and other vegetation.

Survival for all species and stock types was similar after the first-year, 99 to 100 percent, and second-year, 87 to 93 percent. Although the 3.8-L container-grown seedlings (shoot height, 30.9 cm, and diameter, 5.6 mm) were the smallest at planting, their survival after two years was highest. Survival for the 11.4-L container-grown seedlings was lowest even though their initial shoot diameter (7.8 mm) was larger than the 3.8-L container-grown seedlings. Shumard oak had the lowest survival rate after the second year. Weed control had no influence on survival either year.

For all four species, bareroot seedlings had the lowest net height growth after two years. The 11.4-L container-grown and bareroot seedlings showed negative height growth the second year. After two years, the 3.8-L container-grown seedlings remained the shortest in total height (initial height 30.9 cm) while the 11.4-L container-grown (initial height 51.6 cm) and bareroot seedlings (initial height 62.6 cm) were similar. In the 2 years, the 3.8-L container-grown seedlings grew 13 cm; the 11.4-L container-grown seedlings grew 6.5 cm, and the bareroot seedlings lost 3 cm in height. The height growth for all seedlings was influenced by deer browsing; thus there appeared to be no preference for any stock type. Two year field performance provides no clear superior stock type.