Quality or Quantity:

Stock Choices for Establishing Planted Northern Red Oak

James J. Zaczek, Kim C. Steiner, and Todd W. Bowersox[1]

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Abstract-A northern red oak plantation was established in 1988 in a recently clearcut mixed oak stand to evaluate outplanting performance relative to the type of planting stock (1 -0, 2-0, 1 -1, 2-1, 2-year-old containerized, and direct-seeded) and impositions of other cultural factors (undercutting in the nursery, raising stock in an extended growing season in Alabama vs a local Pennsylvania nursery, top-clipping at planting time, and tree shelters). Twenty different treatments were compared, each with at least 33 replications. To minimize potential genetic bias among treatments, the same seed source was used to produce all but four of the treatments. For the first 3 years after outplanting, the plantation was enclosed by an electric fence to minimize deer damage and competing vegetation was controlled.

Six years after outplanting, seedlings grown from 2-year-old containerized stock were tallest (averaging 3.3 m) and had excellent survival, but were costly to produce and plant. The 2-0 bareroot stock, especially if undercut in the nursery and top-clipped at planting, performed best of the remaining treatments with 100% survival and an average height of 3.0 m. Other treatments, especially 1 -0, were smaller and had lower rates of survival. Seedlings from direct-seeding were as tall as most 1 -0 treatments. Undercutting, top-clipping, nursery transplanting, raising stock in different nurseries, and tree shelters marginally affected the height or survival of most seedlings. However, undercutting was particularly useful on the 2-0 stock not only by increasing outplanting performance but also by making the seedlings easier to lift and handle in the nursery and plant in the field. Seedlings that were above-average in height after 3 years, when deer fencing and weed control were withdrawn, were most likely to survive over the subsequent 3 years. All treatments produced at least some seedlings that were above-average in height (245 cm) and in a superior competitive position 6 years after planting. However, to reach plantation stocking goals on an operational basis, results suggest that choosing high quality and more intensively cultured stock should require considerably fewer seedlings (up to 1/3 less) to be planted initially compared to less intensively cultured stock.

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[1]*School of Forest Resources, Pennsylvania State University, University Park, PA 16802; Tel: 814-865-2054, Fax. 814-863-7193.*
