

THREE-YEAR BOLE RESPONSE OF WHITE OAK (*QUERCUS ALBA* L.) CROP TREES
TO FERTILIZER AND CROWN RELEASE ON A TENNESSEE UPLAND SITE

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Abstract: Bole diameter responses to fertilization, crown release, and fertilization x release treatments with untreated controls and treatment-by-year interactions were studied in pole-sized (approx. 43 years old) white oak (*Quercus alba* L.) crop trees. In the main study, fertilizer was applied by broadcast to plots at a rate of 150 lbs N and 35 lbs P₂O₅ per acre, and crown release removed competing trees around crop trees—dominate or codominate trees selected for favorable timber characteristics—in randomly selected plots during spring 1993. Another fertilizer application was applied during spring 1995 at the same rate and method as the first application. Bole diameter, measured at 4.5 ft above ground line (dbh); scaling diameter inside-bark (sdib) and radial increment, both variables measured at 17.3 ft above ground; form class; and stem taper were examined. Dbh, sdib, increment, and form class were measured for 4 years beginning with 1992 pretreatment data; stem taper was measured for 1995 only. Stem taper and form class did not differ significantly among treatments (Table 1). Dbh differences among treatments were not significant; however, pooled mean dbh increased significantly each year from 9.44 inches in 1992 to 10.29 inches in 1995 (2.9% compound growth rate). Sdib differences among treatments also were not significant, but pooled mean sdib increased from 7.28 inches in 1992 to 7.97 inches in 1995 (3.1% compound growth rate). At the end of the 1993 growing season, radial increments for release (0.12 in.) and fertilization x release (0.12 in.) treatments were significantly greater than the control (0.09 in.). The fertilization x release treatment continued to significantly increase radial increment (0.14 in.) more than fertilization and control treatments (0.11 in., both treatments) in 1994. At the end of the 1995 growing season, radial increment for fertilization x release (0.16 in.) was significantly greater than release, fertilization, and control (0.12 in., 0.11 in., 0.10 in., respectively). Fertilization x release treatment provided greater cambial increment for the first 3 years on mid-rotation white oak crop trees. Should trends continue, the fertilization x release treatment will improve volume in the first log and may improve log form more than release, fertilization, and the control treatments.

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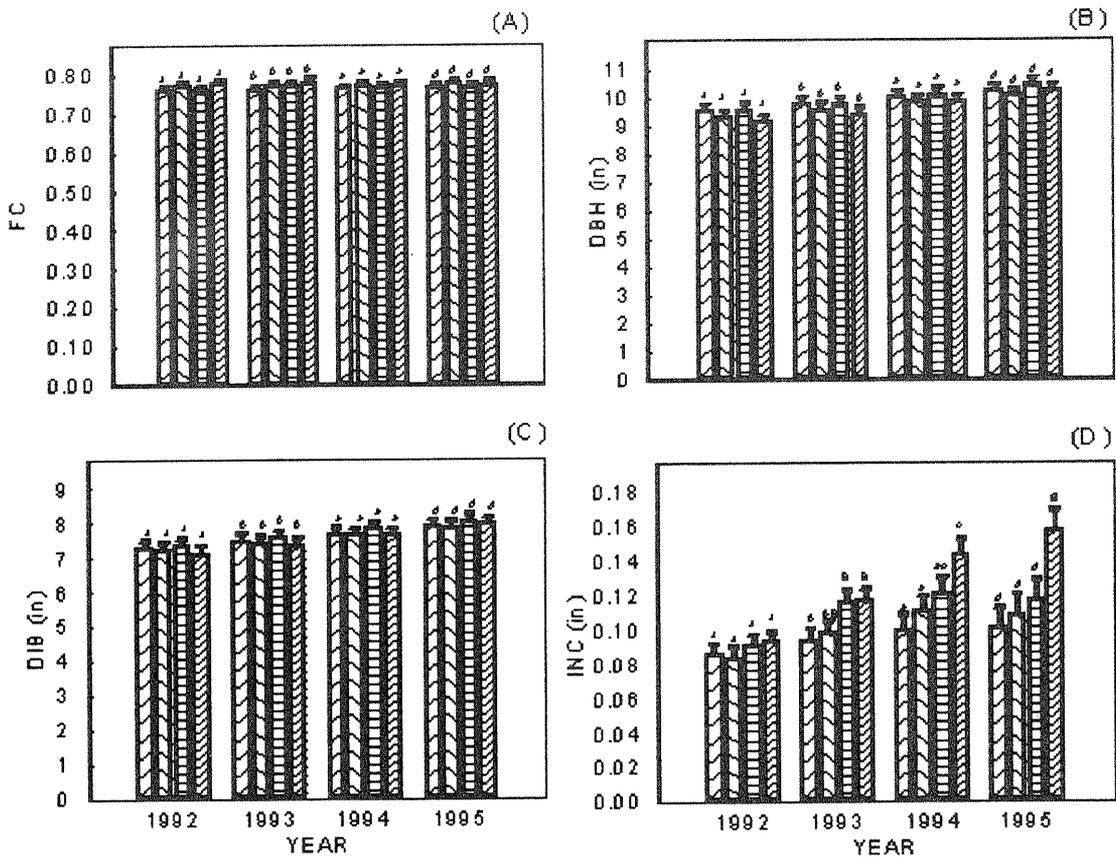
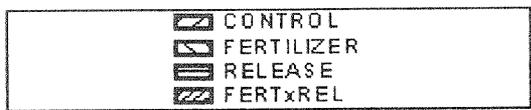


Figure 1. Treatment least square means and 1 SE bars in [A] form class (FC), [B] diameter breast height (DBH), [C] scaling diameter (DIB), and [D] radial increment (INC) of white oak boles at the end of growing season in 1992 (pretreatment year), 1993, 1994, and 1995. Means not labeled by the same letter differ at $P = 0.05$ in a given year.