

Plantation Management Research Cooperative

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LOBLOLLY PINE GROWTH AND YIELD

Beginning in 1977, loblolly pine plantation growth and yield plots were established in cutover, non-old field site prepared plantations of the North and South Carolina coastal plain. The plots were remeasured in 1981. Also in 1981, new plots were established in the lower coastal plain of Georgia and north Florida and those were subsequently remeasured in 1985 and again in 1989. A total of 606 plots make up the lower coastal plain database. In addition, 199 monumented plots were established in the piedmont of Georgia, Alabama, and South Carolina in 1982. These plots were remeasured in 1987 and 1991. In 1981, 116 monumented plots were installed in the upper coastal plain of Alabama, Georgia, and South Carolina. They were remeasured in 1986 and 1991. Detailed descriptions of plot layout and data collection are provided in PMRC Technical Report 1990-2 by Borders et al. Beginning in 1994, new loblolly growth and yield plots have been established as PMRC membership has changed. In addition, new plots were established on long time members' lands to reflect changes in yields resulting from more intensive cultural practices. The following table presents the new series growth and yield plots:

1994	84 in South AL (~50% intensive) 17 in North GA (~20% intensive)
1995	35 in South AL 23 in South GA and North FL
1996	66 in South GA (~50% intensive)
1997	42 in coastal plain of SC (~60% intensive)
1999	Remeasured 1994 & 1995 plots
2000	40 in North FL (~30% intensive) Remeasured 1996 plots Remeasured 1997 plots
2001	35 in piedmont of NC and SC (~40% intensive)

Status

- **This is an ongoing project. A major model revision was presented in PMRC Technical Report 2004-4 by Borders et al.**

- During 2000, 42 plots were remeasured on Westvaco lands and 66 other plots were remeasured throughout the coastal plain. These plots were originally established in 1994-95 with roughly 1/2 of them representing intensive management.
- A new version of the Piedmont loblolly model covering all cultural treatments and types of site preparation was presented at the 2001 PMRC meeting and an Excel spreadsheet to facilitate use was also distributed.
- An updated version of both the Piedmont and Coastal Plain models was presented at the 2004 PMRC meeting.
- New dominant height models will be presented at the 2005 annual meeting
- New volume, weight, and taper functions will be presented at the 2005 annual meeting.

Key Research Results (by physiographic region as needed)

- Individual tree volume equations, green and dry weight equations, and taper functions
- Dominant height and site index functions
- Survival functions
- Basal area prediction and projection equations
- Whole stand volume (inside and outside bark), green weight outside bark, and dry weight inside bark equations
- Product breakdown functions
- An implicit yield prediction system using percentile predictions and a Weibull parameter recovery system.
- A generalized stand table projection system compatible with the whole stand basal area projection
- A height-dbh function
- Basal area growth equations for thinned plantations developed using data from a McIntire-Stennis thinning study
- Separate basal area and height models for conversion plantations, second rotation plantations, and intensively managed plantations including effects of tillage, herbaceous weed control, and hardwood control.
- Dominant height growth response to mid-rotation N and/or P fertilization
- Basal area per acre growth response to mid-rotation N and/or P fertilization
- Per-acre yield response to mid-rotation N and/or P fertilization (all of the mid-rotation growth response models were obtained using the North Carolina State University Forest Nutrition Cooperative Regionwide 13 Study data).
- The new version of the model allows for multiple cultural treatments including herbaceous weed control, release, fertilization, and thinning.