

**Dominance/Suppression Competitive Relationships
in Loblolly Pine (*Pinus taeda* L.) Plantations**

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Dissertation submitted to the Faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy
in
Forestry

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November 13, 1997
Blacksburg, Virginia

Keywords: Relative Growth Rate, Resource Depletion, Resource Pre-emption, Thinning

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(ABSTRACT)

Data from three long-term field studies with loblolly pine (*Pinus taeda* L.) plantations were used to examine inequality (Gini coefficient) trends in diameter and the relationship between diameter relative growth rate (r) and initial size. Analysis with two spacing studies shows inequality increases with increasing density. For a given initial density, inequality initially decreases and then begins to increase as trees compete for resources. The slope of the linear relationship between r and relative size also increases with increasing density. The slope is initially negative and switches to positive as competition intensifies. The switch in the slope of the r /size relationship occurs when the crown projection area exceeds 1.05 or when the crown ratio falls below 0.75. These results are consistent with the resource pre-emptive or dominance/suppression theory of intra-specific competition. The r /size trends are not evident when calculations are based on class means as opposed to individual trees.

The slope of the r /size relationship is a function of stand height, density, and to a lesser extent, site quality. Density reduction through mid-rotation thinning tends to decrease the slope coefficient. The r /size trends are used to develop a disaggregation model to distribute stand-level basal area growth over an initial tree list. This approach compares well with two other disaggregation models but tends to over predict growth on the largest trees.

Acknowledgments

I offer my sincere thanks to Dr. Burkhart for his steadfast support and encouragement during the course of my studies; a student could hope for no better mentor. The members of my committee have been exceptional in providing sage advice. Dr. Shep Zedaker and Dr. Tim Gregoire deserve special mention for their efforts throughout my graduate program. The efforts of my friends and colleagues at Westvaco Corporation in providing the time needed to complete my studies is greatly appreciated.

I am indebted to the Loblolly pine Growth and Yield Research Cooperative and the College of Forestry and Wildlife Resources for their financial support throughout my degree program and for providing quality data. The USDA Forest Service, Southeastern Forest Experiment Station also provided data for this study.

To my mother and father, who instilled in their sons the importance of working to achieve one's goals - thank you. Finally, I must express my heartfelt thanks to my wife, Susan, and my sons, Nathan and Adam, for their understanding and encouragement during the many hours spent in my graduate studies.

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