**PROJECT ID:** CAFS.21.88

**YEAR:** 3

**PROJECT TITLE:** Quantifying silvicultural treatment effect on lumber quantity and quality in loblolly pine

**INVESTIGATOR(S):** Joe Dahlen (UGA), Corey Green (VT), Cristian Montes (UGA), Tom Eberhardt (USFS)

|  |
| --- |
| **PROJECT DESCRIPTION:**  Even though over 18 billion board feet of southern pine lumber are produced each year from the U.S. south, information on silvicultural treatment impacts on lumber quantity and lumber is very limited. Information is limited because forest through mill studies are difficult to conduct and thus rarely done. This study will investigate the impact of silvicultural treatment on the lumber quantity and quality from loblolly pine from the Forest Modeling Research Cooperative’s Regionwide Intensively Managed (IMP) study. The study has 3 treatments, a control treatment with no thinning or pruning, a light thinning treatment where approximately ½ of the trees have been removed, and a heavy thinning treatment where approximately ¾ of the trees were removed and the first log was pruned. |
| **HYPOTHESES or OBJECTIVES:**  The major research question is, will the heavy thinning treatment plus pruning the first log result in more value than the control or light thinning treatments?  The objectives are to compare the effects of thinning on loblolly pine lumber grade and mechanical properties. |
| **METHODS:**  Trees will be felled from five sites in the Virginia Piedmont. From each site, 7 trees per treatment for a total of 21 trees per site and 105 trees overall will be felled, cut into 17 feet logs, and processed through a lumber mill into dimension lumber. The lumber quantity and quality will be measured via nondestructive testing and destructive testing to investigate the impact of silvicultural treatment on product quality. |
| **MAJOR FINDINGS:**  Lumber has been sawn from the trees harvested. A total of 1,099 pieces were obtained. We are currently working on the extensive laboratory work related to this project. The lumber has been visually graded. We have cut the lumber to the test span required for destructive testing. We are almost finished with the non-destructive evaluation of the lumber, which when combined with the current visual grade, can be used to estimate the machine-stress rated lumber yield. After completing the non-destructive tests, the lumber will be imaged for knots and then destructively tested in static edgewise bending to measure the modulus of elasticity and modulus of rupture. |
| **DELIVERABLES:**  The volume, grade and mechanical properties of lumber will be measured to determine silvicultural treatment effects. |
| **MEMBER COMPANY BENEFITS:**  Information on lumber quality based on silvicultural treatment. Relationships between nondestructive tests and destructive tests at a variety of scales (e.g. log, lumber). |