FOREST PRODUCTS
Project Fact Sheet

EXPLOITING GENETIC VARIATION OF FIBER COMPONENTS AND MORPHOLOGY IN JUVENILE PINE

BENEFITS

- Increased pulp yield of 15%, worth $2 billion
- Savings of $1 billion in harvest and transportation costs
- Increased production by 50%
- Enhanced global competitiveness for U.S. pulp and paper industry
- Improved wood and fiber quality
- Reduced CO2 emissions
- Reduced energy consumption

APPLICATIONS

The technology developed during this project can be used to improve the properties of juvenile loblolly pine.

Genetic Engineering Can Enhance Productivity of Plantation Forests

As demand for pulp and paper increases, the U.S. Industry must find ways to increase the productivity of plantation forests. By associating desirable wood traits with genetic origins, researchers can breed juvenile pines with improved wood quality and plantation productivity. In this project, the partners plan to identify natural variations in the chemical and morphological properties of juvinile loblolly pine and associate these variations with genetic variations in important genes that control wood quality.

Results from this research will help establish plantation forests with higher productivity, more uniform wood, and more desirable wood/fiber quality traits. Improved wood production would reduce energy consumption as well as costs of harvesting and transportation, which account for about half of wood costs to the mill. Greater uniformity in wood and fiber quality would provide additional energy savings in processing.

OFFICE OF INDUSTRIAL TECHNOLOGIES
ENERGY EFFICIENCY AND RENEWABLE ENERGY • U.S. DEPARTMENT OF ENERGY

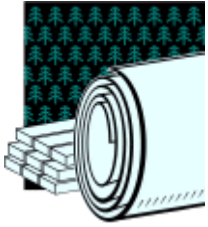
PROJECT DESCRIPTION

Goal: Provide a molecular genetic basis for tree breeding of desirable traits in juvenile loblolly pine, with the goal of increasing the productivity of plantation forests by 50% and decreasing lignin content by 5%.

This project will meet research goals through a multi-disciplinary approach involving three distinct research groups. The Wood and Paper Science Group will develop micro analytical techniques that allow rapid characterization of fiber components and morphology in a large number of samples. The Forest Biotechnology Group will test for alleic variation in candidate wood property genes, develop a pilot-scale mapping microarray, and analyze candidate gene single-nucleotide polymorphisms (SNPs) that segregate in the families chosen for wood property analysis. The Tree Improvement Group will identify parents or families that carry one or more genes that control wood/fiber quality and develop new breeding strategies.

PROGRESS & MILESTONES

- Researchers will focus on method development, sample collection, and sample analysis. Sequencing and field trials will follow.
- This is a three-year project.



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