

Production Forestry - Timber Management and Wood Utilization

Production Forestry - Timber Management and Wood Utilization

V(A). Planned Program (Summary)

1. Name of the Planned Program

Production Forestry - Timber Management and Wood Utilization

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
123	Management and Sustainability of Forest Resources			100%	
	Total			100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	5.6	0.0
Actual	0.0	0.0	7.4	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	128686	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	536089	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	1086102	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conduct research, report results, assist with technology transfer

This program includes research to develop optimum procedures for hardwood timber management and harvest, to increase the efficiency of wood utilization while developing new uses for hardwoods, and to devise means and processes to efficiently utilize wood and timber resources in the production of renewable bio-energy and bio-products. Timber management research includes specifically the development of models to predict yields, protection of forest resources from insect pests, disease, and invasive species; harvest management for optimum regeneration and re-growth; use of harvest and processing wastes to efficiently produce bio-energy; responding to research needs and concerns of corporate and private owners; and providing economic comparisons among alternative management and harvest methods.

Wood utilization research likewise is focused on hardwoods with a goal of maximizing hardwood timber to lumber throughput, reducing the impact of brown rot fungi; development of non-destructive methods to determine lumber strength and stiffness, expanding uses for Appalachian hardwoods; and devising sawmill systems for moderate sized to small operations. Additional research will develop systems for use at harvest to optimize bucking; develop new uses for low quality hardwoods, use ground penetrating radar to develop non-destructive scanning methods to identify subsurface defects in hardwood logs and incorporate cellulose nanocrystals into biopolymer composites to determine the effect on mechanical properties.

Recent survey results indicate that place of residence and aesthetic enjoyment were the two most important reasons for private forest land ownership. Most private landowners are not actively managing their forest lands; 12% have a written management plan with only 13% conducting any sort of management activity during the year preceding the survey. Approximately 4% of respondents indicated attendance at educational workshop within the last year.

Alternative taper models predicting yield for yellow poplar, red maple and red pine were developed. This project has allowed the development of accurate volume, diameter and weight estimating functions for hardwoods grown in the Appalachian region. These polynomial taper systems have been found to be the most accurate in existence for the region, providing merchantable cubic volume and weight estimates to any merchantability limit.

Results from a project to develop optimal sawing systems for small scale sawmills has shown sawmills are consistently over-edging and thus losing clear wood and money in the process.

Seven species of Phytophthora (*P. ramorum* is the causative agent for sudden oak death) were isolated in a multistate survey for soil borne Phytophthoras, two of which may be novel species. Pathogenicity tests indicated the species tested were more damaging to roots than stems with seedling mortality occurring mostly in the first four months. *P. cinnamomi* and *P. citricola* were most aggressive in stem inoculation trials while all species were similarly aggressive to the fine and taproots in soil infestations tests.

The hardwood utilization project in West Virginia has initiated seven research projects over the last four years. The effort has resulted in a 3D optimal bucking system for Appalachian hardwood species which could increase value per tree stem 26 to 43%; a procedure under development to utilize low-value oak species to expand or develop new plants to produce OSB; described differences in morphologies and dimensions of cellulose nanocrystals from avicel and recycled pulp; shown cellulose nanocrystals to vary with nature of the raw material; and demonstrated the ability of GPR to detect subsurface defects such as metals, knots and decays.

2. Brief description of the target audience

Private and corporate commercial producers, managers, consultants, extension educators, regulators, policy makers

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	4	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

Refereed, scientific manuscripts

Year	Target	Actual
2007	4	7

Output #2

Output Measure

Scientific presentations

Year	Target	Actual
2007	5	2

Output #3

Output Measure

Producer workshops & technical assistance

Year	Target	Actual
2007	3	1

V(G). State Defined Outcomes

O No.	Outcome Name
1	Adoption of BMP management and harvesting procedures %
2	Ability to more accurately predict yields of OSB, Paralam and additional wood species from measures on standing timber - new models
3	Development and adoption of field based, computer assisted systems to aid optimal bucking - use %
4	Process for commercial production of a high quality, oak OSB panels
5	Increased use of timber harvest residue. - %

Outcome #1

1. Outcome Measures

Not reporting on this Outcome for this Annual Report

2. Associated Institution Types

3a. Outcome Type:

3b. Quantitative Outcome

Year	Quantitative Target	Actual
------	---------------------	--------

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
---------	----------------

V(H). Planned Program (External Factors)

External factors which affected outcomes

Economy

Appropriations changes

Brief Explanation

None of the outcome measures is being, or will be, measured on a consistent and routine basis. The new OSB process from oak will be a patent when it occurs and others are replaced by an index of forest and wood product industries, specifically, year-to-year changes in total employee compensation in each industry. If necessary, we will develop our own measures.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

Before-After (before and after program)

During (during program)

Evaluation Results

None beyond what is measured by outcomes.

Key Items of Evaluation