Assessment the Profitability of Intensive Silvicultural Treatments in the U.S. Pulp and Paper Industry

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Abstract: Current economic analysis shows that fiber costs represent up to 40% of the total cost to manufacture paper in the U.S. The U.S. paper industry must compete with emerging forest countries, located near the equator, whose costs are significantly lower. The U.S. could offset these cost disadvantages by incorporating biological technologies and more intensive management regimes, which would lead to improved tree growth, as well as better wood and fiber qualities. In turn, this would maximize processing efficiency, product performance, and give a better economic return.

The forest cost model considers both mill (fiber production) and NIPF (timber production) perspectives. The optimum rotation age is evaluated using bare land value criterion (BLV) in thinned and unthinned management regimes. This model incorporates numerous variables such as stand density, intensive stand management prescriptions with their correspondent growth responses, as well as harvesting and transportation costs. These variables can be modified individually or simultaneously. An integrated Excel spreadsheet, incorporating the latest loblolly pine growth-and-yield models for the Lower Coastal Plain and publicly available cost data, was used to build the model. The model allows for the estimation of the mill-delivered cost of wood under various ‘likely’ scenarios. It, therefore, assesses the profitability of current and potential biotechnological advances. The model also has the ability to determine the land base required for a given size mill.

Multiple scenarios were explored in order to determine factors that optimize profitability and to suggest operating strategies. The findings show that more intensively managed regimes with higher growth rates increase marginal returns. In a commonly used fiber production regime returns were maximized at year 15, whereas returns in a wood production regime (with a thinning at age 10) were maximized at year 18.