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A STABLE FUTURE: STRATEGIES FOR HALTING HARDWOOD INVENTORY DECLINES IN ALABAMA

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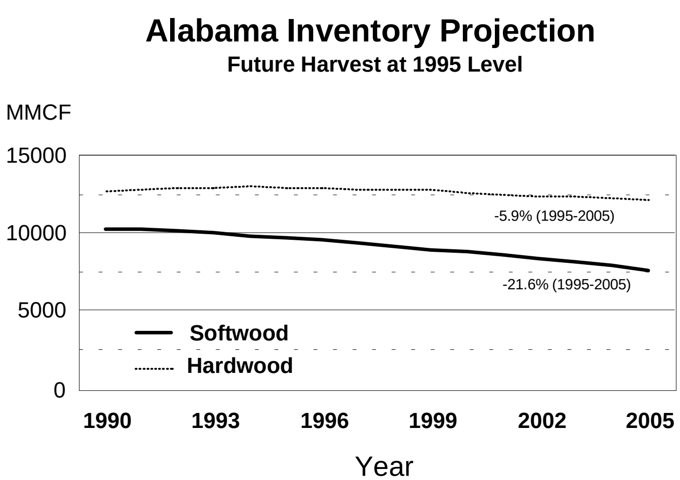
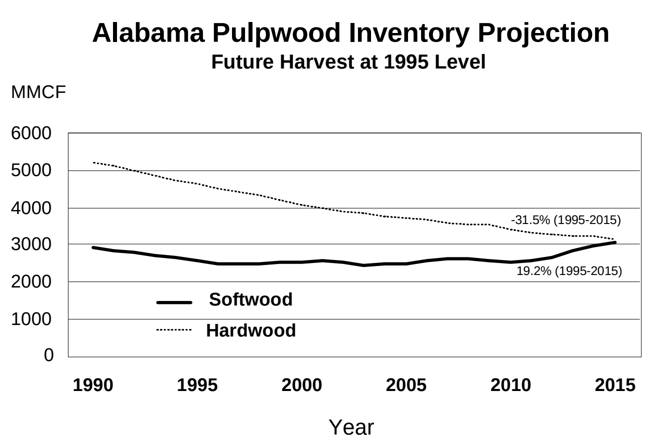
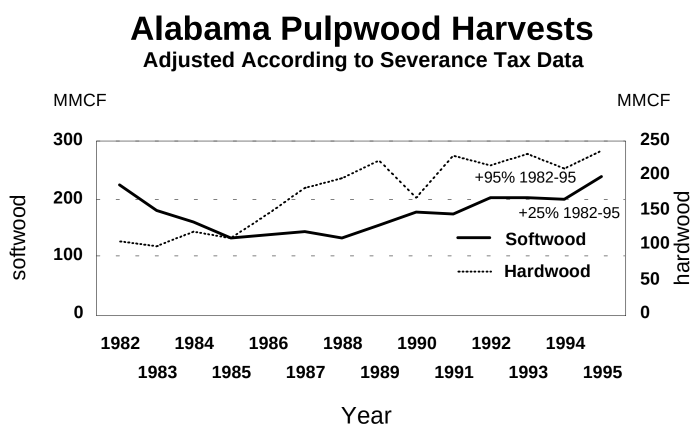
Most everyone here is familiar with the softwood and hardwood projections that have been made for the South over the last couple of years. For Alabama, these projections show significant decreases relative to the last inventory for softwood (-25%) and approximately level inventories for hardwood (-4%) through 2005 (Figure 1). Our work at Auburn with the DPSupply model suggests, however, that over a longer period of time hardwood inventories face challenges that are quite different than those faced by softwood. For example, if we assume future harvests are constant at current levels and project softwood pulpwood inventories through the year 2015 we see a decline followed by significant increases in pulpwood volume as plantations established in the 80s and 90s become available for harvest (Figure 2). Hardwood however, shows continuing declines throughout this projection period. This is primarily a function of slow growth in natural hardwood stands and a lack of aggressive hardwood management strategies similar to those developed for softwood over the last several decades. Although hardwood





inventories throughout much of the South have historically been larger than softwood inventories, this condition came about through many years of relatively light cutting in the hardwood component. In the middle 80s, when companies began a shift to include more hardwood in pulp mixes (both because of their fiber properties and because of their relative abundance and lower price), hardwood harvests began increasing at a rapid rate. During the 1982-1995 period in Alabama, softwood pulpwood harvests increased at an annual rate of 1.7%/yr whereas hardwood increased at a 5.3% annual rate over the same period (Figure 3).



This poses a series of potential problems for pulp and paper production unless steps are taken to stabilize the hardwood decline. These problems could include an inability to obtain adequate amounts of fiber at critical times, higher prices for hardwood (due to scarcity), and a temptation to add more softwood fiber to pulp mixes (possibly juvenile fiber), bringing that inventory down as well.

In order to avoid these conditions, short term and long term strategies to mitigate this trend should be investigated. Several general strategies have potential to help companies get through a future period of tight supplies:

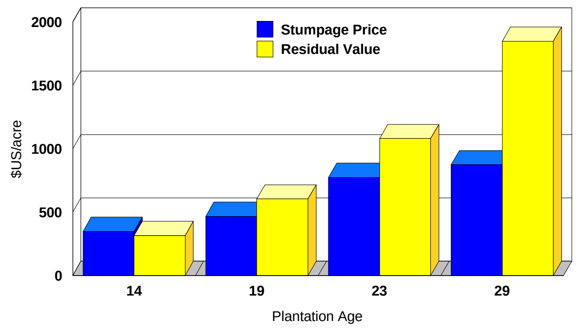
1) Residual analysis to improve competitive procurement position

2) Imports, including purchases of wood from other states or other countries (foreign imports may need to be pulp imports instead of chips)

3) Begin an aggressive program of hardwood management (particularly high investment short rotation strategies).

In the short run, strategies 2 or 3 may not be cost effective. Strategy 1 has been investigated by several companies and the results are enlightening. Mark Dubois (Auburn University) and Billy Watson (Mississippi State University) reported an analysis of the

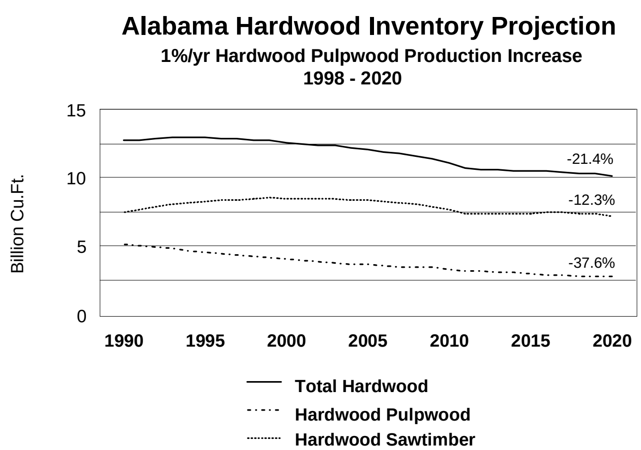
Stumpage Price & Residual Value



Source: Dubois, M.R. and W.F. Watson. 1997. A comparison of stumpage valuation methods for procuring wood used in linerboard production.

residual value of stumpage to the linerboard production process and discovered that the difference between stumpage price and the net value of the final product increases with stand age (Figure 4). The differences are significant. According to Dubois, analyses such as this one can be conducted for any product and should apply equally well for processes requiring a large proportion of hardwood. AA better understanding of the physical and economic relationships of producing paper products from a given tree or set of trees with known properties will facilitate improved wood procurement decisions@ (Dubois and Watson 1997). Armed with such an analysis, this is a short-run strategy that can be used to justify higher bids (according to the results of the analysis) for stumpage that offers the collection of properties yielding the highest value in the firm=s production process. An additional benefit of implementing such an analysis is that it will provide an economic estimate of the maximum that can be paid for local stumpage as a benchmark for comparison with the prices used to evaluate the other two options.

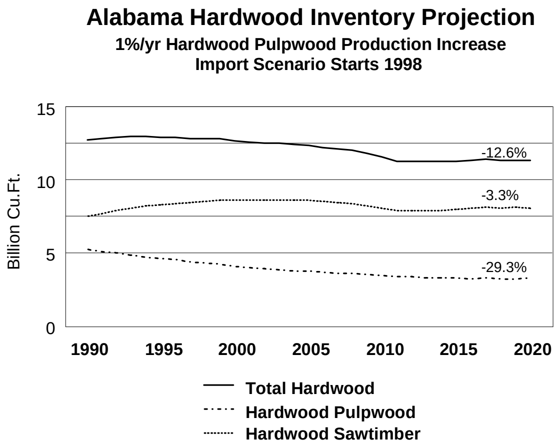
An earlier slide (Figure 2) represented trends in future inventories if future hardwood harvest levels are held at their 1995 levels. Given recent trends in harvest that we viewed in Figure 3, it seems unlikely that harvests will remain flat over an extended time period. A recent issue of Papermaker (January 1997) forecasted an anticipated increase in capacity to produce wood pulp of about 1%/year through the end of the decade. This seems reasonable (if not conservative) given recent trends in industry expansion. Incorporating that level of harvest in our projections results in an inventory decline of about 21.4% by 2020 relative to our 1995 inventory (the year used for benchmarking future harvests). I will consider this a base projection for the remainder of this talk (Figure 5).



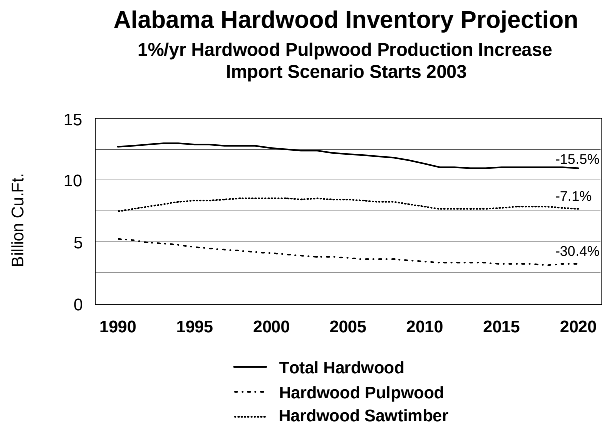
Importing will be seriously considered when the price of importing (e.g., by rail, truck or barge from another state or by boat from South America) approaches the cost of local fiber. Bringing fiber in from outside the region reduces local harvest levels and keeps both pulpwood and sawtimber inventories from declining at such a rapid pace. The DPSupply model was used to test two import scenarios to determine their affects on projected inventory declines:

1). Begin importing next year (1998), importing 5% of the current hardwood harvest level (~ 25 MMCF or about 900,000 tons) and increasing that level by 5%/yr.

2). A similarly constructed scenario that includes a wait-and-see period (while hardwood prices increase and inventories decline) initiating the import program 5 years later.



Under these conditions, scenario 1 reduces inventory declines over the 1995-2020 period from about -21.4% to -12.6% (Figure 6). Imports in year 2020 will be about 13% of total hardwood requirements, or about 2.7 million tons. If imports are initiated 5 years later, the positive effect on inventory declines is less (down 15.5% from 1995) and quantity imported in 2020 is also less (2.1 million tons)(Figure 7). A conclusion that can be drawn is that an import program of this magnitude stabilizes the inventory decline but is not sufficient to reverse it.

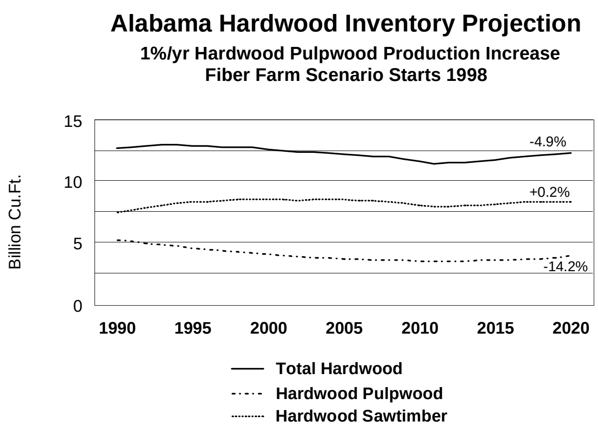


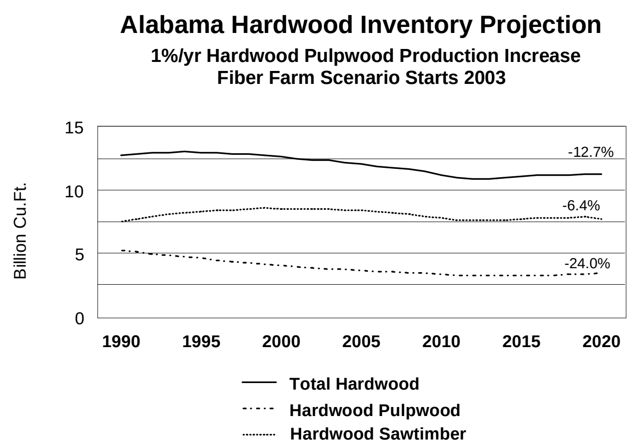
Developing improved hardwood management strategies is a research objective for many companies and academics although relatively fewer dollars (compared to softwood) are directed toward those efforts. Much of the work has focused on fast-growing short rotation hardwood plantations (usually cottonwood or poplar) harvested between 5 and 8 years after establishment and yielding between 40 and 70 cords/acre. Some companies are already experimenting with these technologies on a scale that surpasses the modest scenarios described below. Although these technologies are still unproven, once they become established, history shows that companies will begin adopting them at a rapid rate. We developed 2 scenarios requiring future implementation of these technologies:

1.) Starting in 1998 regenerate 10% of hardwood harvested acres using high yield short rotation technologies (average 5-year rotation yielding 40 cords/acre at harvest). This amounts to approximately 18,000 acres in 1998 state-wide (less than 0.1% of the forestland base in Alabama) and increases to approximately 316,000 acres by 2020 or about 1.5% of total forested acres. Average acreage converted per year over the 1998-2020 period is approximately 13,700 (less than the initial conversion rate because fewer natural stand acres will need to be harvested in the future).

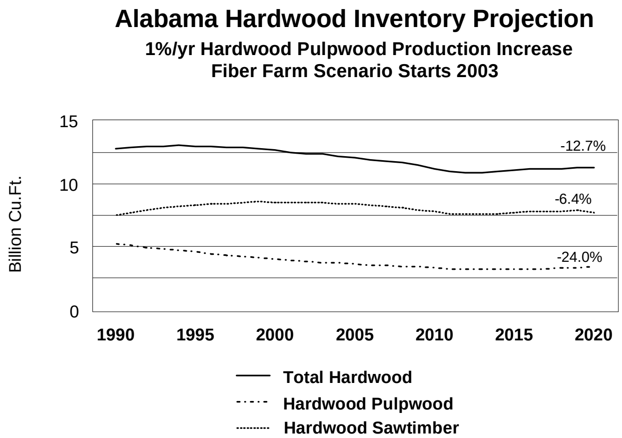
2). Start the same scenario 5 years later. In this scenario, total acreage devoted to fiber farms is less (274,000 acres) but annual conversions, once initiated, are slightly higher (15,200 acres/yr during the 2003-2020 projection).

Under scenario 1, inventory declines are reduced (-5% compared to -21%) but are not completely mitigated (Figure 8). The trend in inventory under this scenario is definitely up though, significantly improving prospects for both sawtimber and pulpwood inventories. Following the 5-year delay scenario, the declining inventory trend is also reversed, but inventory rebuilds much more slowly to a level still 12.5% below the 1995 inventory in 2020 (Figure 9).





Finally, given the unlikely prospects that firms will begin either of these strategies in a meaningful way by next year, we looked at a scenario that combined both importing and fiber farms, but initiating those options after a wait-and-see period in 2003 (Figure 10). Under this scenario, the inventory deficit is substantially reduced (down only 6.5% relative to the 1995 level) and the trend in inventory is definitely increasing. This is in spite of the fact that (according to our assumptions) pulpwood requirements are expected to be 24% higher in 2020 than in 1995.



In conclusion, hardwood inventories in Alabama are drifting downward and it may be prudent for companies to begin developing strategies for mitigating the decline. In the absence of action, only a modest increase in pulpwood production (1%/yr) will yield an inventory in 2020 that is 21% below its 1995 level. In the short-run, firms may try to offset increases in the average cost of fiber by implementing procurement programs that focus on the particular fiber properties most valuable to the production process. Long-term, a conservative program of importing fiber will serve to stabilize inventory at between 11.0-11.3 billion cubic feet (12.6-15.5% below the 1995 level). An alternative fiber farm scenario offers better long-term prospects for inventories, but much depends on the ultimate competitiveness of these technologies and the subsequent willingness of firms to adopt them in a consistent and timely way. Some combination of these scenarios in the future is most likely and, if they follow the assumptions outlined here, suggest that the long term prospects for hardwood fiber in Alabama are quite good.