TechLine

Forest Products Laboratory

# Linking Log and Product Quality for Structural Wood Products

The fifth Resource Planning Act Assessment estimates that softwood harvests will increase 30% over the next 50 years. The majority (79%) of this projected increase will come from the South. With 37 million acres of industrial timberland, the South has more timberland devoted to timber production than all other areas of the country combined. Large increases in production from private timberland in the West are not expected until about 2030.

## Background

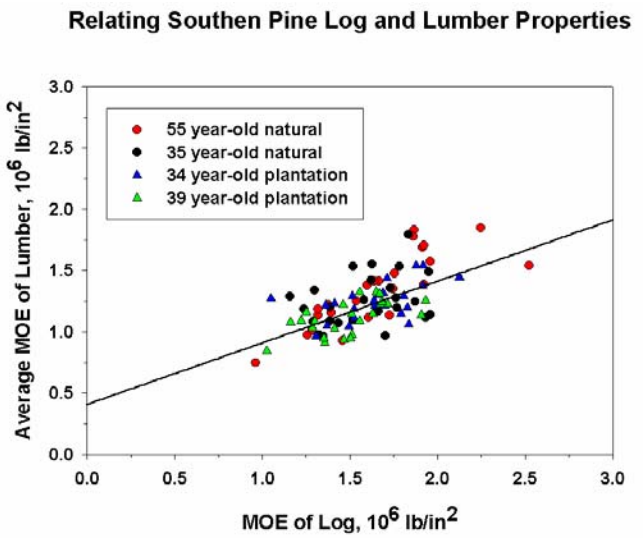
Traditionally, log-grading procedures used visual assessment of defects, in relation to log-scaling diameter, to estimate the yield of products that might be expected from a log. This procedure was satisfactory when structural grades were based on only visual assessment of defect size and location. For engineered wood products, such as mechanically graded lumber, glulam beams, and veneer for the production of laminated veneer lumber, the visual estimation of defects is coupled with the nondestructive evaluation of stiffness or modulus of elasticity (MOE) to obtain a more precise estimate of product properties.

## Objectives

Considerable savings in material and processing costs might be achieved if a better relationship could be established between log quality and the quality of products cut from the log (Green and Ross 1997). The capability to improve log sorting becomes especially important as the wood industry adapts to a resource base that includes more plantation-grown species, nontraditional species, and small-diameter trees.

## Approach

Studies are in progress to establish relationships between log stiffness and the stiffness of lumber cut from the log. These studies are a cooperative effort between the Forest Products Laboratory of the USDA Forest Service in Madison, Wisconsin, the Southern Research Station in Athens, Georgia, and the Pacific Northwest Research Station in Portland, Oregon. Initial studies have shown good correlations between log and lumber stiffness for a number of species (Wang and Ross 2002).




Analysis is now focusing on comparing the improvement in sorting efficiency of this approach versus traditional visual methods.

## Outcome

Good relationships have also been found between the MOE of logs and veneer bolts cut from those logs. Such presorting could eliminate the cost of conditioning, peeling, and veneer drying for logs that are not suitable for the manufacture of laminated veneer lumber.

USDA Forest Service

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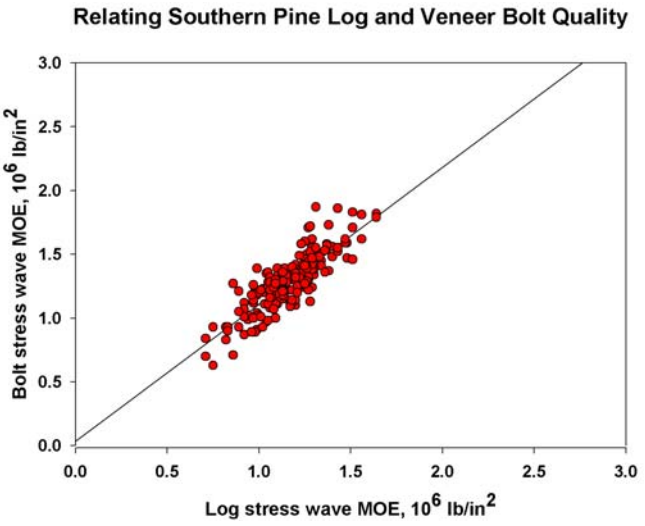
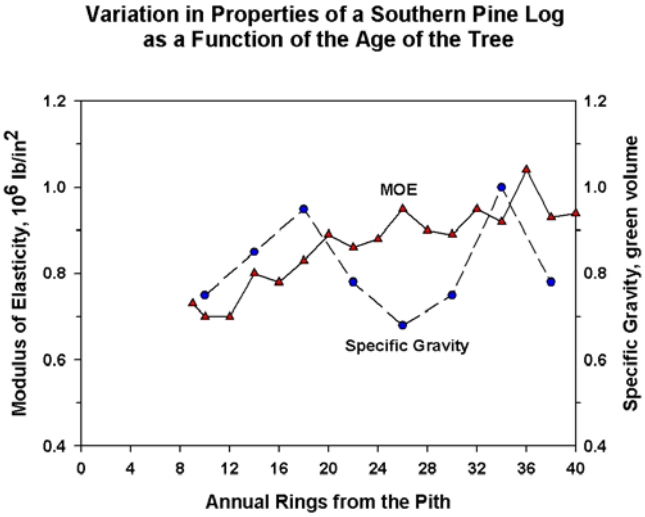



It is also possible to monitor the quality of growing trees as an indication of future wood quality. Studies indicate that direct monitoring of MOE may provide a better indicator of stiffness than does the traditional approach of monitoring specific gravity.




Continuing studies will establish the basic relationships between log and veneer properties for Southern Pine and yellow-poplar logs.

## Learn More About It

Green, D.W.; Ross, R.J. 1997. Linking log and lumber quality with product performance. In: Role of wood production in ecosystem management. Gen. Tech. Rep. FPL-GTR-100. USDA Forest Service, Forest Products Laboratory, Madison, WI. 53–58.

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