

## Nuts &amp; Bolts

## Proper edging and trimming will help improve lumber value

By Philip A. Araman

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**D**ecisions on where to edge and trim waning edged boards, or to trim other boards, can have a major effect on the performance of a sawmill. Optimum decisions are difficult for a number of reasons, including: complexity of grading rules; operator skills; operator fatigue or lack of interest at times; and, the inability of operators to include lumber prices in decisions.

Results from a study of three medium-sized hardwood sawmills indicate that edging and trimming can be improved significantly. The mills studied included one of an HMA member.

The study's basic premise: that lumber value — and a sawmill's profitability — could be improved by shifting lumber grading to an earlier phase of the manufacturing process. Emphasizing the "creation" of a high grade board before it's edged and trimmed, rather than grading a board that's been cut, would increase the board's value.

During the study, boards were taken off the chain as they were coming off the head rig. The boards were removed from the mills, and their outlines diagramed on acetate film to record the board outlines and

the location and type of each defect. Then, the boards were returned to the respective mills where the normal workers edged and trimmed them.

Following edging and trimming, the actual resulting boards were compared with optimal boards determined at Virginia Tech using a computer program. The program was designed to find the optimal boards based on value. The study examined optimal value and actual value for all three mills. Among the findings:

### Value and volume

(See Tables 1 & 2)

- Although producing very good volume, Mill A didn't edge and trim in the proper places, and thus failed to maximize value.
- Mills B and C edged too heavily and produced a lesser total volume and lower value lumber.

### Edger operator experience

- The Mill A edger operator was reasonably familiar with lumber grades. He came out fairly well from a volume standpoint, but he could still do better from a value basis.
- The edger operators in Mills B and C were not as familiar with lumber grades. Therefore, those mills suffered losses in both volume and value.

### Potential trim improvements

- Mill A actually produced slightly more lumber than the computer did. But the computer model produced 25 percent higher valued lumber than Mill A.
- The computer model realized about 17 percent more volume and about 54 percent greater value than Mill B.

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**Table 1.** When compared to the computer's decisions on edging and trimming, value improvements at sawmills A, B and C could have been:

Type of Optimization	Sawmill A	Sawmill B	Sawmill C
Edging only	13%	47%	50%
Trimming only	12%	9%	4%
Edging & Trimming	25%	54%	60%

**Table 2.** When compared to the computer's decisions on edging and trimming, volume improvements at sawmills A, B and C could have been:

Type of Optimization	Sawmill A	Sawmill B	Sawmill C
Edging only	3%	15%	23%
Trimming only	-4%	1%	0%
Edging & Trimming	-1%	17%	23%

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- The computer model realized about 23 percent more volume and about 60 percent higher dollar value than Mill C.

This research shows that Mills A, B and C generally produced less volume and less valuable lumber. In many of the cases, the boards were edged or trimmed in the wrong place.

Generally, reasons for the resultant lower value and lower production were over-edging, over-trimming or some under-edging.

Placing lumber value on boards when edging and trimming is a difficult concept for many mill people. It requires comparing market values for different grades of lumber, and making a snap, optimal decision.

In some cases, poor edging and trimming was the result of poor equipment.

#### Edging & trimming training tool

Additional research is underway to improve optimal lumber processing. A semi-automatic or computer-aided edging and trimming system is one project under development. Here's how it works:

1. The system consists of a camera at the head of the edger. The camera takes snapshot pictures of boards and relays those pictures on the bottom half of a computer monitor. The board is outlined, measured in width and length and assigned a potential grade. Then the computer gives the operator a dollar value of the board. For instance, the value of a No. 2 Common board may be \$4.48.
2. The program then helps the operator to make edging and trimming decisions based on optimum value. It shows how to reduce in size that No. 2 16 ft. board worth \$4.48 to an 8 ft. board that is upgraded to a No. 1 common board worth \$4.80. Using one computer system now being tested, laser lights and corresponding saw blades would be positioned for the proper cuts.
3. In another example, from the same No. 2 Common 16 ft. board worth \$4.48, the operator moves his edging and trimming lines on the computer screen and creates a No. 1 common 11 ft. board worth \$6.60.
4. Next, the computer tells the operator, based upon price, how to create a 7 ft. FAS board worth \$7.00.

The above examples, although exaggerated, illustrate how a mill could theoretically improve the value of its lumber by "creating" a higher grade board. Trimmings from the board also generate revenue as wood chips. These revenues, along with those of the higher valued boards, should offset any additional costs associated with extra time invested by workers edging and trimming to obtain the optimal board.

It still requires a skilled person to determine the board grade. Eventually, researchers expect to develop and market a system that will enable boards to be scanned, and edging and trimming decisions will be made within the computer.

Another major goal is to develop edging and trimming training tools to be used for personnel operating edgers and trimmers. Managers could also use this tool to test edging and trimming decisions for special markets such as the export market. This tool will be tested and shown at the HMA Production Meeting on September 11-13 in Louisville. For information on this computer tool, write: Virginia Polytechnic Institute & State University, Brooks Forest Products Center, Blacksburg, VA 24601-0503.



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