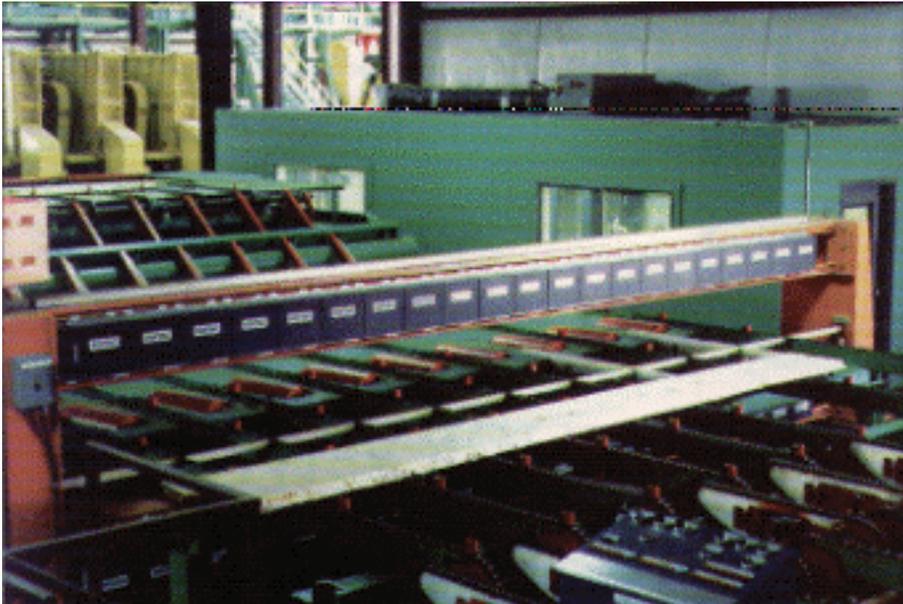


Resource Costs Give Optimization the Edge



As stumpage prices surge and lumber prices for the most part remain flat, equipment that offers 2 to 8 percent recovery with no additional resource costs begins to sound attractive to sawmill owners. Practically all vendors agree—in today's competitive market, a mill without optimization may very well be left in the proverbial dust.

While smaller softwood and hardwood mills may have had difficulty in years past justifying the cost of such technology, today's operating costs cast a different light on the subject. And, while edger and trimmer optimization has historically been geared toward large, high-volume softwood mills, vendors have recently

To optimize or not to optimize—that is the question practically every sawmill has considered at some time or another. Edger and trimmer optimization is a particularly hot topic, as these are among the most wasteful areas of the sawmill because trimmer and edger operators traditionally tend to over edge or trim. By its very definition, optimizing equipment seeks to provide the answer to a problem that plagues every modern mill—how to get the most volume, or the best value, out of every board by considering all the alternatives.

turned their attention to the needs of the hardwood industry, noted for sawing for grade and lower production requirements.

Those same vendors also argue that mills with older technology in place need to take a look at newer generations of equipment and what it can do for them. Today's equipment is more powerful and more accurate than it was just three years ago, and many companies say even better technology is just over the horizon. Companies are starting to design more consumer-specific equipment to suit every mill's needs, whether they be hardwood or softwood, small or large. But even with all this aside, ven-

BY C.M. EDDINS

dors say just about every mill needs optimization simply to get the most recovery-and the best value of lumber—possible.

“It’s commonly believed that optimizers are great at producing a low quality board with a lot of wane on it that just barely makes the rules, but that’s not necessarily the case at all,” says Jeff Franklin of INOVEC. “The truth is, a really good optimizer can be set to make any type of board you want, without losing value. Being able to tightly control the product specifications is the real value of optimization.”

Bill Epps of USNR says, “what’s happened is the cost of raw materials has probably doubled in the last two years, so mills really have to get everything possible out of a tree, and the way to do that is through optimization. A good rule of thumb for return investment is a trimmer optimizer will pick up a 2 to 3 percent increase in recovery overall for the mill; an edger will pick up around 6 to 8 percent.”

Besides recovering more lumber, the computerized equipment can assist the mill in analyzing production. Such controls allow mill owners to record data from the optimizer and make decisions based on the direct performance of the edger or trimmer, “The optimizers provide a very useful quality control tool to management,” says Jack Thompson of Coe Manufacturing. “There are a lot of reports and graphs that indicate to the mill manager whether there’s a problem with an upstream center. We’ve gone so far as to identify these upstream centers so they can find out why the product is being manufactured off size.”

Several companies are trying to reach into the hardwood market, which Hi-Tech’s Chris Raybon says is “vir-

tually untapped. The market has been almost exclusively softwood mills because they are typically much larger volume mills which could afford to spend a lot on machinery. And until recently, the amount of software needed to trim or edge hardwood has been way too small. But today, computers are much more powerful and faster.”

“It’s hard for a hardwood mill that’s running 12 to 18 boards a minute through the edger to justify the expense of a high speed system, which can be up to \$1 million,” says Matt Benable of Koch Machinery Systems. “Now, however, hardwood mills need that advantage of getting the maximum amount of material out of their edger,”

A study published in 1992 entitled “Value of defect information in automated hardwood edger and trimmer systems” evaluates the need for optimization in hardwood” mills. The results, based on boards tested at three different sawmills, show that it is possible to obtain lumber values higher than actual sawmill output from a computer-based edging and trimming optimization procedure, even if not all board defects are considered.

Philip Araman, project leader for the Southeastern Forest Experiment Station and one of the study’s authors, says that basically what the study shows is the mills “edged and trimmed in the wrong places. With the optimization, we essentially did not increase the total volume, but we did increase the value. We found that just a small change in where you edge can change the grade of the board which can definitely change the value of the board.”

In addition, many vendors argue an optimizing edger or trimmer based on readings of an accurate scanner is better than manual edging or trimming simply because it is more consistent, whether in softwood or hardwood mills. "As a general rule, scanners usually do not measure up to what a human being can do when he is fresh at the beginning of the day—but scanners do not suffer from fatigue," says Bob Lewis of Control Technology, a sister company with Filer & Stowell. "That's the big thing that makes scanners as a group a practical approach to the situation. Certain applications that would not be economically feasible with manpower become feasible with proper application of a scanner."

No matter how good today's optimizing equipment is, tomorrow's will be better, and many companies are already looking towards the future. Both Epps and Raybon see a future in using one optimizing computer to control two or more pieces of equipment.

"We're working on putting a single optimizer on two edgers," Epps explains. "Optimization systems are awfully expensive, so we're trying to find ways to get better utilization out of the equipment for the sawmills."

"A new development we hope to see is the combo edger-trimmer optimizer, which would run the edger and trimmer from the same machine center," says Raybon. "It would save money, but it's certainly not for everyone because it will be volume-constrained. Probably the interest will be in smaller softwood mills, and and to medium hardwood mills. "

Lewis says his company is working on a prototype system that uses "curtain scanning, where the wood passes through and a ray of photocells scans it. " The machine runs about 30 pieces a minute, but the unique aspect of this system is that typical users would be "people who are dealing with low-grade raw material with some very high grade parts. Imagine wood that is so poor it wouldn't burn well in your fireplace, and recovering small pieces of wood big enough to make golf tees. " Lewis adds that the prototype may be marketed in the future.

Of course, the brass ring is still a marketable grade scanning system. The reason it is so important, Araman explains, is that it is crucial to proper optimized edging and trimming. "The whole point is that you can't just scan for wane, which is kind of what present scanners do. That doesn't answer the whole question because (today's scanners) are not actually grading the board. Our goal is to be able to come up with an optimal solution based on surface measure, potential grade, and current market values of each grade. So it's not just volume maximization, it's value maximization."

A few companies have actually come up with a workable grade scanner, although the accuracy of these machines is still questioned by many. All agree, however, that grade scanning will be a reality within the next few years.

Coe Manufacturing is one of the companies that has developed grade scanning technology. Jack Thompson, Coe's spokesperson, says that while it's "still not in the marketplace, it's being talked about more and actually marketed by one or two companies. I think it's at a point where it needs to go into the market to be evaluated. I think we've done as much as we can in the lab, and we need to sell a couple and evaluate what we have." Thompson explains the grade scanner is meant to identify defects beyond con-

ventional characteristics of the board such as knots, rot, or splits. With probably little or no testing in actual sawmill situations, he adds "I don't think there's anyone stepping out and guaranteeing anything."

Many vendors still remain skeptical, however, as to the actual effectiveness of these grade scanners. Barry Dashner of Dynamic Control Systems says, "It's very important the industry represent what the products can really accomplish and that the customers don't have unrealistic expectations, because it may fall short."

"Grade scanning is really going to be implemented widely in secondary processing before it hits green lumber processing," says INOVEC's Franklin. "We're building all of our optimizers so that when grade scanners are available and commercially viable, they can be attached to our existing optimizers, and the software can be upgraded to accept this additional information."

Indeed, that seems to be the attitude of several companies. Most don't have any real hope of being the first to market a commercially viable grade scanner, but certainly they want to be prepared when it happens. Araman says he and his colleagues at the USFS Research Station are working on a grade scanner that can be integrated upstream on current optimized edger and trimmer systems.

"What we'd like to see and what we're working toward is being able to scan the flitch as it is going down the conveyor from the headrig and make a mark on the board where it should be edged and trimmed, possibly with an ink jet, and then have the board go through the regular processes," says Araman. "By putting the lines on the board the operator could line up the laser lights with the lines on the board and push it through the machine."

While the debate over grade scanning rages on, there are several quality optimization systems on the market today that appeal to a wide range of operations. Epps says his company, USNR, offers complete optimized trimmer and edger systems, with both camera-based and laser-based scanners. The systems scan every 4 inches down the length of the flitch and every 60/1000 to 70/1000 across the width.

Epps estimates a complete edger optimizer system is \$800,000, while the trimmer system is around \$95,000.

Newnes has been one of the leading companies in this area, selling more than 200 optimized edger and trimmer systems in nine years, according to spokesperson Randy Folkard. Newnes supplies a completely integrated system as it manufactures all its own software, scanner hardware, and machinery. "The systems are modular, designed so that, as the years pass, we're able to do upgrades if the customer needs any changes. We also have an ongoing software development program where we're able to keep the customer supplied with new software products," Folkard explains, adding that the company is now offering a Windows 'M interface on the operator's terminal.

Koenig, Inc. distributes Esterer machinery, manufactured by a German company serving the industry since 1862. "The Optime is a board edger that handles up to 4-inch thicknesses with 4 moveable saw heads for around \$800,000 for the complete system," explains Eugen Koenig. The scanners use a laser and camera combination to scan the board. Koenig adds that the machinery can handle up to 50 boards a minute, or 40 boards with an average length of 14 feet.

Coe's Thompson says his company is "a leading supplier of primary and secondary products. We supply a full line of machinery as well as scanning controls. We also spend a great deal of time building on our optimization software and building a user interface that is probably second to none in the industry." While Thompson says the company's majority of customers are softwood mills, their scanners are also for use in hardwood mills.

New to the U.S. market is Koch Machinery Systems' Paul AB 920 CNC optimizing edger. Unlike most volume-driven optimizing systems, this equipment edges up to 18 boards per minute. With a price range of \$400,000 for the complete system, it costs much less than most edger optimizers, which Benable says appeals to many small hardwood mills that can't justify an expenditure of almost \$1 million. In addition, floor space requirements are at a minimum, and

the machinery can be equipped for gang edging. The scanner uses “multiple lasers which measure the width of the board and the wane. On a 12 inch board it will give about 4,000 total measurements per second,” Benable explains.

While Dynamic Control Systems offers only scanners, it is perhaps one of the leading companies in this area. “I think in a lot of ways we have helped turn scanners into a commodity, where at one time they were just a specialized product,” explains Dashner. The company’s popular DynaVision scanners are used in several different edger and trimmer systems. The M6 model has 6 lasers, scans every 4 inches, and runs nominally at about 1,000 scans per second. The M24 scans at 1 inch intervals and “has the same package size as the M6 so you can literally unbolt an M6, put an M24 in its place, make a few changes, and go from 4-inch to 1-inch scanning,” explains Dashner. The scanner has a common set of interface cards that plug into an IBM personal computer, which Dashner says makes it easy to configure any size system.

Hi-Tech Engineering is another company with a successful track record offering a complete line of edger and trimmer optimizers. “Currently we are creating and shipping optimizers at the rate of three a month,” explains Raybon. Hi-Tech uses DynaVision scanners in its systems, offering both 1-inch and 4-inch scans. The systems have reman capabilities, including the Trim and Edge Saver, which allows the operator to send back portions of the cut flitch for further edging or trimming. In addition, “we now have several systems operating at more than 100 lugs per minute, and the absolute maximum for 8 foot materials is 140,” says Raybon.

Another company that has made inroads in edger and trimmer optimizers for hardwood mills is INOVEC. “We specialize in hardwood, but not to the exclusion of softwood,” explains Franklin. The company sends software programmers and engineers to the NHLA grading school to learn the basics of hardwood grading, which can then be applied to their systems. In addition, hardwood sawmill experts are on staff to assist mills in evaluating the new technologies. Franklin says the company’s WaneMaster (TM) and TrimMaster(TM) systems offer payback in two years or less. Hardwood mills can typically expect a 10 to 18 percent increase in recovery on boards going through the edger while increased recovery at the trimmer should be around four to seven percent. In addition, both machines can consider reman opportunities while the WaneMaster (TM) is well suited to retrofit mills with little floor space.

Phil Judson of Salem Equipment can vouch for Inovec’s optimizers, because his company makes machinery designed to work with the systems. “We have specially designed some of our trimmers and edgers to work in conjunction with their electronics,” he explains. While Judson says the mechanical side is “just a matter of applying good machine design,” he points out that Salem’s machines meet the requirements necessary for use with an optimizing system.

Vendors offer a variety of advice for sawmill operators considering adding optimizing at the edger or trimmer, as well as for those considering an upgrade. While studying specs for the scanners, computers, and machinery itself is no doubt important, they agree there is more involved.

System setup, upgradeability, and operator training are among the topics manufacturers agree should be explored

as a mill investigates its options. A careful look at mill expectations, mill production requirements, costs, and pay-back periods are also considerations.

“One of the major things you want to consider when buying an optimizer, especially if you are not familiar with the technology, is which systems are the most reliable and tested,” says Epps, who adds that USNR sets up each system and tests it before sending it out to the mill. “We actually set up the customer’s parameters and run it in the shop. And the mill’s electronics person can come out and assist in setting up their system. We have a training school right (at the shop) so they actually can train on their machine.”

“The hardest part of selling this product is trying to point out the differences between your software and someone else’s because it’s not always easy to discern,” says Thompson of Coe Manufacturing. He adds that while more people in the industry are wanting to employ high tech equipment, understanding the software is very important.

The issue of whether a mill should purchase an entire system through one vendor or buy parts from several vendors has both its advocates and opponents. Folkard says Newnes is a “single source supplier, which is one of the reasons for our success. When a customer comes to us, we’re able to jot down requirements and provide all the applications they need.”

Yet a company like Dynamic Control Systems, which markets scanners only, has only one area on which to focus and improve, according to Dashner. “I think its become more popular lately because of the need to continually develop products. It’s easier for us to maintain top products for the industry because we have no other demands.”

Despite the confusing nature of the business, vendors say don’t lose sight of the big picture—in particular, what does your sawmill need? “I personally don’t think anyone should be afraid to take out an old system and replace it with a new one,” says Raybon. “Some people hesitate to throw out the old, tried-and-true system, but the new one will perform so much better.”

“The really important issue for most mills is, ‘Will an investment in this technology pay back in a short enough amount of time to be a viable investment?’” says Franklin. “Our way of looking at it is to choose applications that have a payback of one to two years.” □

Companies contacted for this article are representative of companies offering similar products or services to the forest products industry. This is not intended to be a complete listing nor are these companies being specifically recommended.

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