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It pays to know how your timber will be valued

The price you will get for your timber could vary significantly depending on the log scale your buyer used and harvest conditions

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You as a forest farmer can usually realize income from your timber investment in two ways. You can rent timberland for nontimber uses (usually hunting), or you can lease or sell your interest in the timber. In most cases, greater returns result from selling timber outright.

Selling or leasing timber cutting rights usually results in timber harvest, but logging does not necessarily occur immediately after an agreement is signed. Leases are often for ten years or more, and buyers may ask for as much as two years for timber cutting. Buyers can therefore gain an economic interest in the timber they buy, and can qualify for capital gains tax treatment for value increases. In such cases, buyers pay a lump sum for timber rights, obtain a deed to the timber, and have it recorded at the courthouse. Timberland

owners retain an economic interest until timber is cut if they are paid as their timber is harvested. In such cases, owners are paid according to the actual volume of timber delivered to a woodyard.

Timber Volume

At most woodyards in the South, delivered volume is determined by scaling or by weight conversion. In either case, the seller should have a good understanding of the scale or conversion factor being used. For example, a conversion factor of 15,000 pounds per thousand board feet (MBF) may be appropriate for logs averaging 14 inches in diameter at the small end (see Figure 1). If 15,000 pounds per MBF were used for 16 inch logs, however, the landowner would not be credited for 20 to 30 percent of the wood delivered.

If your timber is being sold on a "pay-as-cut" basis, be aware of the log rule that is proposed in your cutting contract. Based on log diameter and length, a log rule is a formula used to estimate the board-foot lumber content of standing trees. Three are common in the South: Doyle log rule, Scribner log rule, and the International log rule.

Log rules estimate only the board-foot volume of trees, and each rule has a slight bias that produces overrun (more board-feet of lumber than predicted) or underrun (less board-feet than predicted) for different diameter logs. Bias results from the fact that mathematical formulas seldom predict exactly how many board feet a sawmill will cut from a particular tree.

The Doyle and Scribner log rules provide a good example of how a log rule can influence timber sale revenue. Generally, the Doyle log rule estimates less volume than the Scribner log rule on logs 25 inches or less in diameter, and estimates more board-feet than the Scribner rule for logs greater than 25 inches in diameter (see Figure 2). A 12-inch diameter, 16-foot log, for example, scales 64 board-feet Doyle or 86 board-feet Scribner, while a 30-inch, 16-foot log scales 678 board-feet Doyle or 647 Scribner.

You need to know the average diameter of timber you are selling, and the log rule used to estimate board-foot volumes. If you are selling small-diameter timber, you would prefer the Scribner or International log rule; for large-diameter timber, the Doyle log rule. In a few rare cases you may find the Doyle-Scribner log rule on a proposed timber sale contract. In this case, the Doyle rule is used for logs to about 25 inches, and the Scribner rule is used for larger logs. Unless log prices are adjusted to account for underrun, this log rule should be avoided. You should seek professional assistance before receiving payment-as-cut if you don't understand proposed log scaling or conversion factors.

Timber Values and Harvesting Costs

Timber values are based on the value of logs delivered to a processing facility, minus costs of harvesting and transporting the timber. The value of delivered logs is based on the quantity and value of products to be processed from the logs at a sawmill or manufacturing facility.

Log values are usually related to size and quality. Pulpwood bolts can be from 4 to 24 inches in diameter, for example, while plylogs and chip-and-saw logs must be greater than 6 inches at the small end to be used in the manufacturing process. Log size also affects predicted lumber volume. Larger diameter logs have much greater

board-foot volumes and values, as shown in the table below. Quality is very important for sawlogs and poles. Sawlogs with hidden rot are rejected, for example, and poles are unusable beyond a point where several limbs are in a single whorl. Figure 3 shows the relative value of manufacturing raw materials that might be generated from southern pine trees.

Companies which buy timber have procurement organizations to handle purchasing. Overhead costs of personnel, vehicles, and other equipment must be accounted for in the costs of buying timber. In addition to overhead, purchase costs include the costs of cruising, bidding, and legal work. Procurement staffs also account for unsuccessful bids in the costs of successful bids. All costs are deducted from delivered log values in arriving at a price for your standing timber.

The largest cost deducted from log values at the mill is the actual cost of harvesting the timber, which is influenced by many factors. The type of cut, for example, dramatically influences harvesting costs. A partial cut is much more expensive per unit of volume than a clearcut. In partial harvests, operators have to be very careful to prevent damage to remaining trees. Such careful logging often slows production rates, and per unit harvesting costs become higher.

Timber size and species also affect the costs of harvesting. On a per unit of volume basis, large timber is less expensive to harvest than small timber. Hardwood species require more time to delimb than do pines and are, therefore, more expensive to harvest.

Weather conditions can also directly influence harvesting costs. Wet weather probably increases harvesting costs more than any other single factor. During wet periods, skidder capacities must be reduced, if the skidder can work at all. Equipment payments, however, are due even though equipment isn't operating. Banning loggers from a tract during wet weather lowers their costs of logging, but landowners will not realize additional revenues for putting this restriction in sales contracts. Almost all tracts can be logged in dry weather, but very few can be efficiently logged during wet periods. Since most mills cannot stockpile a sufficient quantity of logs to carry them through wet periods, tracts that can be logged in wet weather often get premium timber prices.

The physical condition of a tract also affects logging costs. Fragile soils require special care in logging. Steep slopes not only require special care from machine operators, but also require that skidders travel greater distances to operate safely.

If a stand of timber has no access from existing roads, access must be acquired before logging begins. This can involve buying rights-of-way. Cost of constructing logging roads must also be deducted

Average volume and value of standing trees.

Tree Diameter 4½ Feet Above The Ground, And Number Of 16-Foot Logs

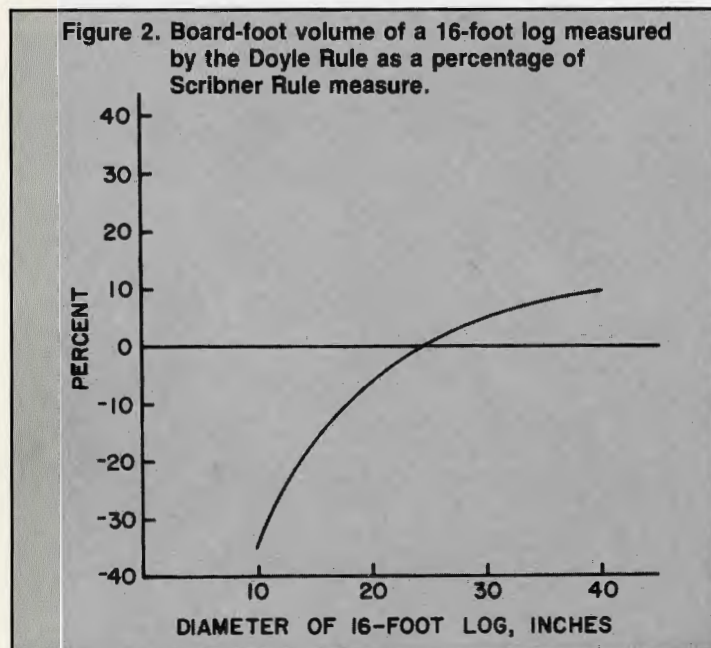
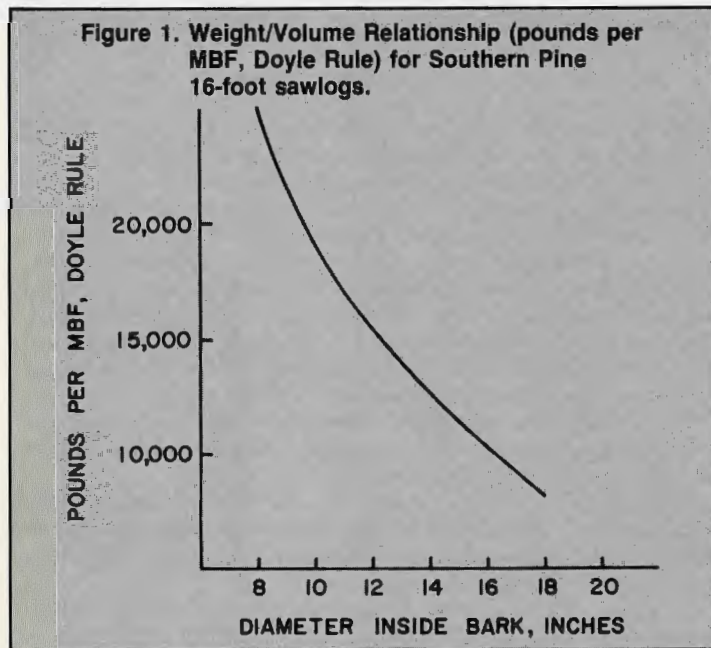
	10" 1 Log	12" 1½ Logs	14" 2 Logs	16" 3 Logs	18" 3½ Logs
Volume, Board-Foot Doyle Rule	14	36	75	149	232
Tree Value, Dollars					
\$100/MBF	\$1.40	\$3.60	\$ 7.50	\$14.90	\$23.20
\$150/MBF	2.10	5.40	11.25	22.35	34.80
\$200/MBF	2.80	7.20	15.00	29.80	46.40

from delivered log values.

Constraints which the tract or landowner place on the logger increase harvesting costs. The presence of gas lines, power lines, and streams decrease the logger's productivity and increase hazards of logging. Moreover, landowner restrictions on length of work day or work week, condition of fences, ponds, and logging roads, aesthetic barriers, or game habitat all increase logging costs. These restrictions should be included in the sales prospectus and contract, but with the understanding that revenue from the sale may be reduced.

Timber Values and Transportation Costs

Costs of moving loggers to and from various timber tracts can vary greatly. The distance that equipment must be moved to begin logging a tract, and the number of machines to be moved affect total harvesting costs. As the amount of wood to be moved from



a tract increases, however, the influence of moving cost is greatly reduced. For example, suppose moving costs are \$2500 and there are 250 cords to be harvested. Moving costs average \$10 per cord. Had there been 2500 cords to be harvested, moving costs would average \$1 per cord. Tract size and the total volume offered for a particular sale can thus influence per unit prices for standing timber.

A large logging truck costs \$250 per workday to own and operate. This typical truck will carry an average of 9 cords per trip. If the truck can make 5 trips per day, the cost of hauling the wood to a mill would be \$5.56 per cord. If the truck can only make 2 trips per day, the hauling cost per cord would be \$13.89. Factors which can decrease the number of trips a log truck can make each day are

- (1) distance to mill on public roads,
- (2) condition of public roads and bridges
- (3) towns enroute to mill, and
- (4) distance and condition of woods roads.

Also beginning to affect hauling costs are gross truck weight laws enacted by counties and municipalities. For example, some counties have gross vehicle weight limits of 40,000 pounds on paved roads. Such limits extend the life of rural roads, but decrease the net hauling capacity of log trucks by as much as two-thirds. In such cases, hauling costs can be driven up to \$16.67 per cord, even when trucks can make five trips per day.

Costs of purchasing, harvesting, and hauling timber from a tract are all deducted from the delivered value of the timber to derive a bid price for a tract of timber. Some factors influencing log values and harvesting costs cannot be controlled by timberland owners, and the per unit price you receive for timber can vary greatly from the price your neighbor receives. In many cases, you can increase timber sales revenues by placing fewer restrictions on loggers. You should consider the alternatives, however, before leaving out restrictions, since it is often less expensive for loggers to accomplish desired results than for you as a landowner to correct damages after a timber sale.

Successful timber sales can be very profitable, and can encourage you in your timber management practices. Part of the success of a timber sale, however, depends on conditions after harvest, and you are wise to consider past experience and professional assistance in planning and selling standing timber. □

