

FACT SHEET

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Timber & Timber Harvesting in West Virginia

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Rules Used In Estimating Tree and Log Volumes.

Standing trees (stumpage) and logs are both sold and purchased by the number of board feet they are thought to contain. A board foot is a piece of green (freshly sawn) lumber one inch thick, 12 inches wide and 12 inches long. Dried and surfaced lumber is based upon the gross measurements before drying and surfacing. One weekly service now quotes dried lumber prices in both gross and net tallies.

Board foot estimates, however, can only be approximate because so many factors are involved. They depend to a large extent upon the skill of the sawyer, accuracy of the mill machinery, width of the saw blade, defects in the logs, and the length and thickness of the boards being produced. Another variable is that logs are cut into lengths that are multiples of two feet, that is 8 (half log), 10, 12, 14 and 16 (full log) feet plus a trim allowance of at least three inches. Some mills require a six inch trim allowance. Logs without a proper trim allowance are measured as the next lowest length and this alone can ruin an estimate.

Sale prices are usually quoted in dollars per thousand board feet (MBF) or per 100 cubic feet (CCF). Both trees and logs are graded for defect and the board foot volume is adjusted accordingly, usually by a percentage deduction based upon the experience of the person doing the grading (scaler).

In preparing an estimate of the volume occurring on a tract of land, the forester walks across the property (cruising), accurately measuring the trees on specific size and specifically located plots. The diameters are measured at the standard height of 4.5 feet (diameter breast high or dbh) above average ground level and the merchantable height is measured (in logs and half logs) to an eight, 10 or 12-inch top, depending on local custom.

Form class (how rapidly a tree tapers) is also vital to volume estimates. A species that tapers more rapidly than another will have less board feet in the same diameter stem (dbh). Publications contain the differences for trees of different sizes. Form class 78 is mostly used in West Virginia, except for older yellow poplar, basswood, black cherry and older white oak. For these species, a form class of 80 or even 82 is more accurate. For American beech, foresters often use 84.

A computerized program translates the measurements and form class into volume and expands the sample into an estimate of total volume.

The results are printed to show the number of trees and the volume per acre and total acreage by tree species in two-inch diameter classes, i. e., the 16" diameter class is trees from 15.1 to 17 inches. Sawtimber classes begin at 12 inches. The 6-10 inch classes are termed pulpwood. There are about 20 commercial hardwood (broad-leaved) tree species in West Virginia and four softwood (needle-leaved) species. The many other species (Black Gum, etc.) are usually classified in a "miscellaneous" or sometimes a specialty (Red Cedar) category.

There are timber buyers who will tell you that they can accurately estimate timber volumes simply by walking through a wooded area. A few are very good at this, but the results are open to bias. Remember, buying timber is a business and the purchaser wants to buy it as cheaply as possible and sell it as high as possible. When buying for someone else, the buyer's commission may be based upon the cheapness of the purchase in relation to the current average price.

The approximate relationship between log dimensions and the number of board feet that can be produced from it is expressed by a log rule. There are three board foot rules or scales in use in West Virginia – the Doyle, Scribner and International ¼ inch. The Doyle scale is the most used and is the most inaccurate. It greatly underestimates the volume of small logs, but mill owners defend it on the basis that it more closely approximates the value of the smaller products cut from the log. The Scribner rule provides a better estimate of the true board foot volume, but since it is based upon the small end of the log it does not take into account the product that can be produced farther up the log where it is larger. Thus, it too is somewhat inaccurate. The International ¼ rule accounts for slabbing, shrinkage, saw kerf and log taper and is by far the best. Some buyers using the Doyle rule adjust their prices upward so as to pay for the wood that doesn't get measured by the Doyle scale, but this is not a universal practice. With new thin kerf saws, the International 1/8" rule is even more accurate.

Due to the inaccuracies of and differences between log rules, the U.S. Forest Service and many State Forestry Services have started selling only in cubic feet which they deem to be a much more accurate and unbiased measurement. If the total cubic foot volume of a log could be converted into lumber, the ratio of board feet to cubic feet would be 12. However, because wood is lost during conversion via slabbing, edging, kerf removal, and other factors, the true ratio is usually between five and seven depending on the species and the size of the log. Holsoe and Longacre published cubic foot-board foot ratios for different diameter trees in 1949 while at West Virginia University. Their lowest ratio was 3.62 board feet per cubic foot for eight-inch trees up to a ratio of 6.88 board feet per cubic foot for 28 inch trees. For average trees and average utilization, the common conversion factor is 6 board feet per cubic foot. This translates to 600 board feet per 100 cubic feet (CCF) or 166.7 cubic feet per 1,000 board feet (MBF).

Pulpwood and similar small-sized products are usually sold by weight with the price being quoted at so many dollars per ton. Pulpwood was once sold by the cord (a pile 4' x 4' x 8') but seldom is today.

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