

Composite Hardwood Volume Equations

By T. W. Beers

October 1964

Excel formulas by David R. Larsen

These volume equations have been useful for student inventory projects in Missouri. The equations are extracted with Excel examples for ease of use.

Three base equations are needed.

$$a = \frac{D^2(D + 190)}{100,000}$$

$$b = \frac{1}{100} \left[\frac{H(168 - H)}{64} + \frac{32}{H} \right]$$

$$c = 475 + \frac{3H^2}{128}$$

Volume in cords = a * b

Volume in board feet (Int. ¼" rule) = a * b * c

A cord is assumed to contain fit into 128 cubic feet, but will have 79 feet of solid woods

Volume in cubic feet (excluding bark) = 76 * a * b

Volume in cubic feet (Including bark) = 92 * a * b

Reference

Beers, T. W. 1964 Composite Hardwood Volume Tables. Purdue University, Agricultural Experiment Station, Lafayette, IN. Research Bulletin 787. 12p.

Excel formulas

The following equation assume DBH is in cell A1 and merchantable height H is in cell B1

Formula a:

$$=((A1^2*(A1+190))/100000)$$

Formula b:

$$=(1/100)*(((B1*(168-B1))/64)+(32/B1))$$

Formula c:

$$=475+((3*B1^2)/128)$$

For testing purposed:

$$\text{DBH} = 12.0$$

$$\text{H} = 8.0$$

$$\text{a} = 0.29088$$

$$\text{b} = 0.24$$

$$\text{c} = 476.5$$

$$\text{Volume in board feet} = 33.26504$$

$$\text{DBH} = 20.0$$

$$\text{H} = 40.0$$

$$\text{a} = 0.84$$

$$\text{b} = 0.808$$

$$\text{c} = 512.5$$

$$\text{Volume in board feet} = 347.844$$