



## TREE MEASUREMENTS - USING A BILTMORE STICK

Deborah B. Hill

### To Measure Diameter

1. Diameter is measured at what is called Diameter Breast Height (DBH). This is 4.5 ft. (1.37 m) up the trunk from the ground. If the tree you are measuring is on a slope, diameter should be taken at 4.5 ft. (1.37 m) on the uphill side of the tree.
2. Hold the Biltmore stick against the tree at DBH, 25 in. (62.5 cm) from your eye. Make sure the edge of the stick that reads diameter is facing you.
3. Sight past the zero end of the stick and the edge of the tree.
4. Without moving your head, shift your eyes to other side of the tree and read the black diameter mark nearest to your line of sight.
5. Tree trunks usually are not round. If a trunk is very much out of round, you should measure both wide and narrow diameters and take the average of the two.

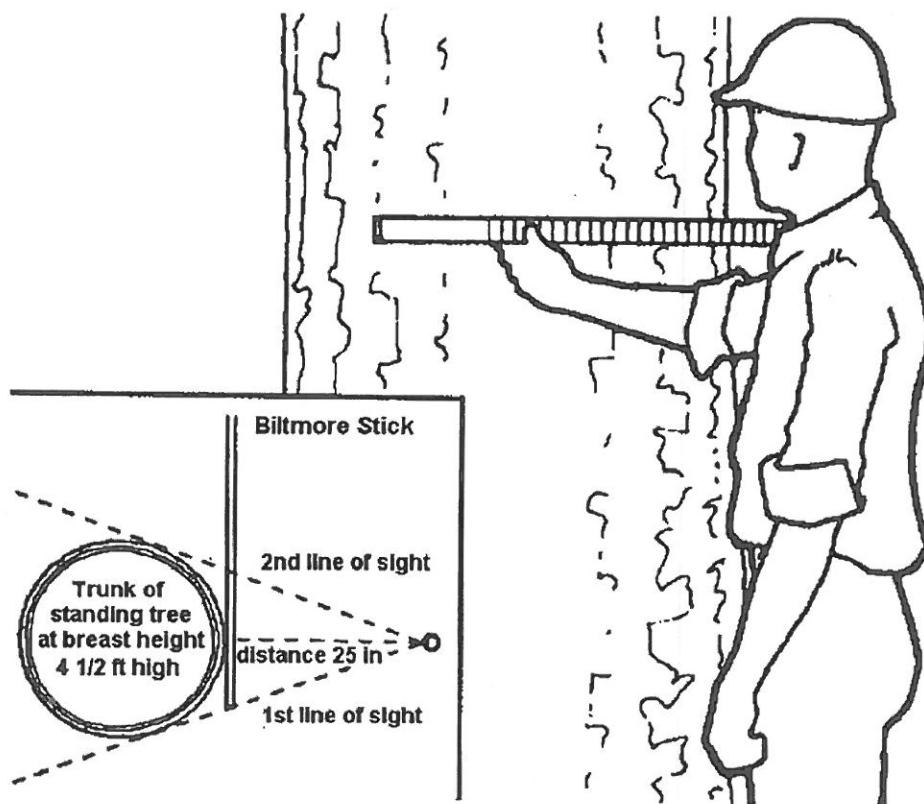
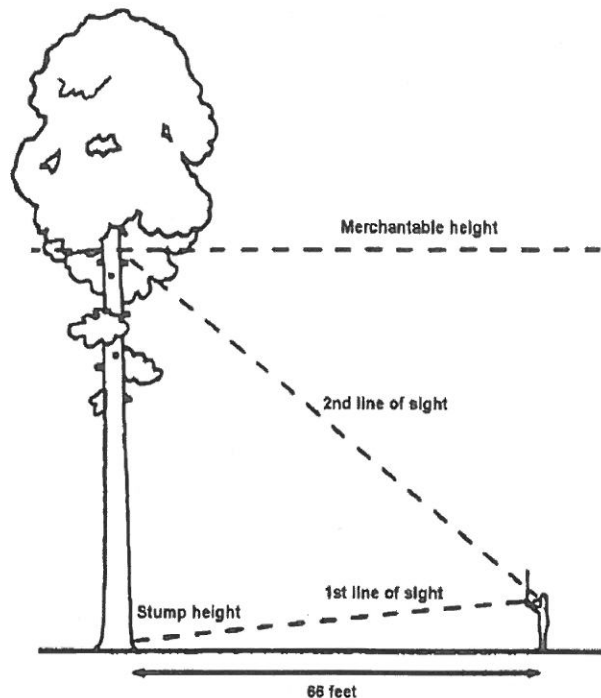


Figure 1. Using a Biltmore stick to find tree diameter.

## To Measure Height

1. Stand 66 ft. (20.12 m) from the tree so that --
  - you are about on a level with the base of the tree. Walk out across the slope instead of up or down slope from the tree.
  - the tree is not leaning away from you.
  - you can see the top up to its merchantable height. If you are measuring for sawlogs, the merchantable height is the point where the top is 6 in. (15 cm) in diameter. For pulpwood, merchantable height is to a 3.6 in. (9 cm) diameter top; and for firewood, it is an 3.2 in. (8 cm) diameter top. Practice estimating these top diameters by standing back from a tree with a known diameter of 6, 3.6, or 3.2 inches (15, 9, or 8 cm) and comparing this to the tops of other trees.
2. Hold the stick vertically 25 in. (62.5 cm) from your eye with the lower end approximately at eye level and with the scale for measuring heights facing you.
3. Line up the zero end of the stick with the stump height - the height of the stump if the tree were cut. This is usually not more than 1 ft. (.3 m) from the ground.
4. Without moving your head or the stick, raise your eyes and sight to the merchantable top.
5. The nearest log mark or meter is the merchantable height of the tree.

Practice measuring heights and diameters to develop your skill before recording actual measurements from your plots.



**Figure 2. Measuring tree height with a Biltmore Stick.**

**Note: Acknowledgment is made to Cornell University for the use of the material from their booklet entitled *Understanding Forest Ecosystems*.**

(D. Hill 1.5M 9/98)

Educational programs of the Kentucky Cooperative Extension Service serve all people regardless of race, color, age, sex, religion, disability, or national origin. Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, C. Oran Little, Director of Cooperative Extension Service, University of Kentucky College of Agriculture, Lexington, and Kentucky State University, Frankfort. Copyright © 1998 for materials developed by the University of Kentucky Cooperative Extension Service. This publication may be reproduced in portions or its entirety for educational or nonprofit purposes only. Permitted users shall give credit to the author(s) and include this copyright notice. This publication is also available on the world wide web at: <http://www.ca.uky.edu/Agriculture/Forestry/SILVA.HTM>.