

What: Making and Using A Tree Measuring Stick

John W. LeBlanc, University of California Cooperative Extension

A Simple Tool for Measuring Standing Trees

The tree measuring stick is a simple tool that uses geometry to measure the diameter and height of standing trees. While not as accurate as special tools specifically designed for diameter and height measurement, the tree measuring stick is convenient to carry and use and accurate enough for many purposes.

Making a Tree Measuring Stick

The tree measuring stick is easy to make. At the back of this leaflet are 2 templates, the Biltmore scale used to estimate diameter and the Merritt hypsometer used to estimate height. Because of differences in printing, you should check the dimensions of the template with the table.

1. Carefully cut apart the templates along the lines. A razor blade and straight edge work well.
2. Spread rubber cement or a waterproof, clear, household cement on a sanded 25 – inch – long wood blank, 1.5 inches wide by at least 1/4 inch thick (lathing or an old yard stick will do).
3. Paste the Biltmore stick template to the wood, carefully matching the edges. Allow to dry.
4. Paste the Merritt hypsometer template to the opposite side of the wood, carefully matching the edges. Allow to dry.
5. Seal with clear, waterproof shellac or other coating.
6. Trim and sand edges for a comfortable grip.
7. You may want to drill a hole in one end and loop a cord through it.

Measuring Diameter

1. Hold the stick 25 inches from your eye (about arm's length) and against the tree with the Biltmore side facing you. Diameter is measured at 4.5 feet from the ground (Diameter at Breast Height—DBH) on the uphill side of the tree. You should measure your reach (the distance from your eye to the tree) and breast height from the ground, the first few times you use the stick.
2. Align the left edge (0 end) of the stick with the left-most visible portion of the tree.
3. WITHOUT MOVING YOUR HEAD (this takes some practice), sight down the stick to the right-most visible portion of the tree.
4. Read the diameter from the scale at the point where your line of sight and the tree meet.

Measuring Height

1. Pace or measure a distance of 100 feet from tree.
2. Hold the stick 25 inches from your eye with the hypsometer side facing you and parallel to tree.
3. Align top end of stick (zero end) with top of tree.

4. WITHOUT MOVING YOUR HEAD, sight down stick to ground level at base of tree.
5. Read height from scale where your line of sight and the base of the tree intersect.

NOTE: The hypsometer scale gives tree height by indicating the percent of the distance that you are away from the tree. That is, the reading on the tree stick indicates how tall the tree is in relation to the distance that you are from it. For the 100-foot distance, tree height is read directly—30 percent of 100 feet is 30 feet ($.30 \times 100 = 30$). But it may be necessary to measure tree height from less than 100 feet. For example, if you stood 50 feet from the tree and the hypsometer scale read 30, then the tree would be 30 percent of 50 feet or 15 feet tall ($.30 \times 50 = 15$).

Biltmore Stick Calculator		
Reach	25	inches
Diameter	Length from 0	Difference
0	0.0	0.00
1	1.0	0.98
2	1.9	0.94
3	2.8	0.91
4	3.7	0.88
5	4.6	0.85
6	5.4	0.82
7	6.2	0.80
8	7.0	0.78
9	7.7	0.75
10	8.5	0.73
11	9.2	0.72
12	9.9	0.70
13	10.5	0.68
14	11.2	0.66

15	11.9	0.65
16	12.5	0.64
17	13.1	0.62
18	13.7	0.61
19	14.3	0.60
20	14.9	0.59
22	16.0	1.14
24	17.1	1.10
26	18.2	1.06
28	19.2	1.03
30	20.2	1.00
32	21.2	0.97
34	22.1	0.94
36	23.0	0.91
38	23.9	0.89

NOTE: When you print the template, make sure the measurements match the table!

Merrit Hypsometer Calculator		
Reach	25	inches
Length	Length from 0	Difference
0	0.00	0.00
5	1.25	1.25
10	2.50	1.25

15	3.75	1.25
20	5.00	1.25
25	6.25	1.25
30	7.50	1.25
35	8.75	1.25
40	10.00	1.25
45	11.25	1.25
50	12.50	1.25
55	13.75	1.25
60	15.00	1.25
65	16.25	1.25
70	17.50	1.25
75	18.75	1.25
80	20.00	1.25
85	21.25	1.25
90	22.50	1.25
95	23.75	1.25
100	25.00	1.25
105	26.25	1.25
110	27.50	1.25
115	28.75	1.25
120	30.00	1.25
125	31.25	1.25
130	32.50	1.25
135	33.75	1.25
140	35.00	1.25
145	36.25	1.25

In accordance with applicable State and Federal laws and University policy, the University of California does not discriminate in any of its policies, procedures, or practices on the basis of race, religion, color, national origin, sex, marital status, sexual orientation, age, veteran status, medical condition, or handicap. Inquiries regarding this policy may be directed to the Affirmative Action Director, University of California, Agriculture and Natural Resources, 300 Lakeside Drive, 6th Floor, Oakland, CA 94612-3560. (510) 987-0096.

Publication of this series was in part funded by the California Department of Forestry and Fire Protection under Contract numbers 8CA96027 and 8CA96028