

# FORESTRY FACTS



Department of Forest and Wildlife Ecology

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## What Is Basal Area?

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**A** tree's basal area is the cross-sectional area of the stem at 4 1/2 feet above ground - breast height (see drawing, page 2). Foresters report basal area as either square feet per tree or square feet per acre (see table, page 2).

If you are interested in the mathematics, you can estimate a tree's basal area (in square feet) with the following formula:

$$\text{Basal Area} = \frac{3.1416 \times \text{DBH}^2}{4 \times 144}$$

This formula simplifies to:

$$\text{Basal Area} = 0.005454 \times \text{DBH}^2$$

**Where: DBH equals the diameter of a tree's stem, in inches, at 4 1/2 feet above the ground.**

Basal area per acre, the sum of each tree's basal area in your woodlot divided by the acres involved, is used to gauge whether your forestland is overstocked (too many trees), understocked (too few trees), or just right. For more on estimating and interpreting stocking information, the reader is referred to UW-Extension Bulletin No. G3362.

You could determine the basal area for your entire woodlot by actually summing the basal areas of each tree - after considerable effort was spent in obtaining the individual DBH measurements. Fortunately there are several ways of estimating basal area per acre without measuring every tree.

To determine basal area per acre, foresters use a special kind of prism or an angle gauge to obtain precise estimates. However, if you are interested only in a rough estimate to help decide if you need to thin your stand or call in a forester, there are other tools. For a gauge, glue a 1-inch wide target to the end of a 33-inch stick, or use a penny held 25 inches from the eye - about arm's length. If you use the stick/gauge combination, place the zero end under your eye and look toward the 1-inch target 33 inches away.

While standing over a single point, hold the gauge and look at each nearby tree as you rotate in a full circle. Don't miss any trees as you turn. Focus on each tree at breast height - 4 1/2 feet above ground. If the stem of any tree is wider than your target - sticks out past the sides of the penny, for example -- count the tree (see drawing). You don't have to measure

anything, just count trees. When you've completed a 360-degree circle about the point, multiply the count by 10. The result is one

estimate of basal area per acre. You should repeat this several times throughout your woodlot and average the results.

**Table 1. Basal Area Per Tree**

DBH	SQ. FT.	DBH	SQ. FT.	DBH	SQ. FT.
5	0.14	12	0.79	19	1.97
6	0.20	13	0.92	20	2.18
7	0.27	14	1.07	21	2.41
8	0.35	15	1.23	22	2.64
9	0.44	16	1.40	23	2.89
10	0.55	17	1.58	24	3.14
11	0.66	18	1.77	25	3.41

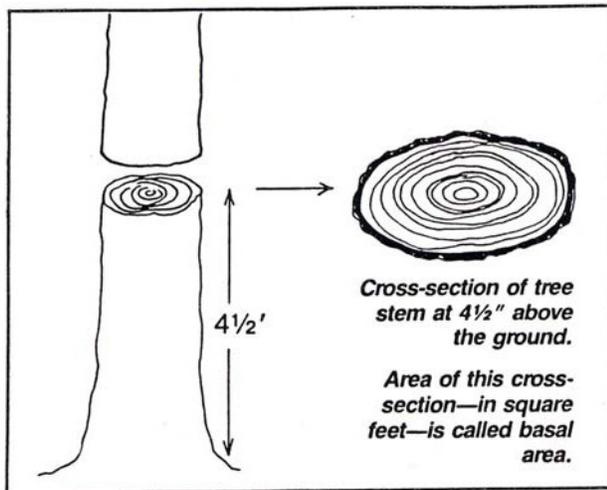


Figure 1....Basal Area Of An Individual Tree

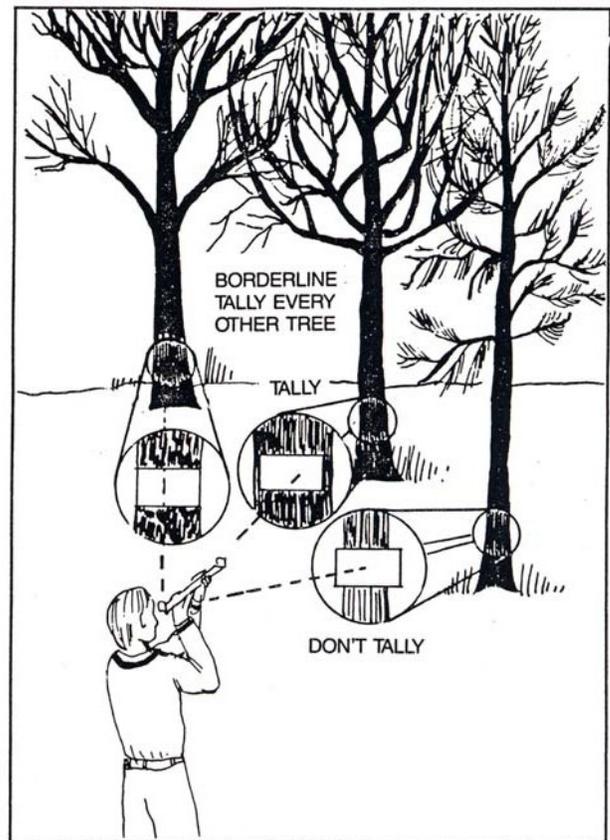


Figure 2....Point Sampling With An Angle Gauge