



4-H

# Forestry Fact Sheet

YANR-131

ALABAMA COOPERATIVE EXTENSION SYSTEM • ALABAMA A&M AND AUBURN UNIVERSITIES

## Determining the Age and Growth of a Tree

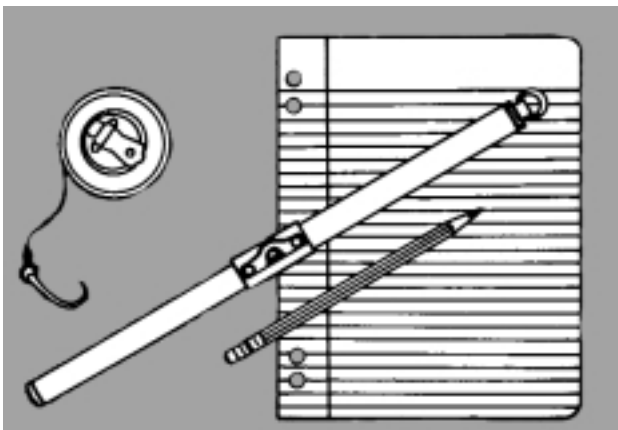
For a tiny seed to change into a mighty tree, a lot of growth must take place. Trees grow in very predictable ways. Scientists have learned to measure this growth to determine not only how old a tree is, but also under what weather, water, nutritional, and other conditions the tree grew.

Foresters study tree age and growth for several reasons. Understanding how a particular tree grew helps them learn what growth factors affect that species of tree. By knowing this, foresters can improve the tree; for example, they can develop a faster growing shade tree for your lawn.

The size of a tree—its height and diameter—can tell foresters the quality of its growing site. They know, for example, whether that site is a good place to plant a pine stand.

Finally, tree growth and age let foresters read the past. By studying tree rings and tree sizes, they can tell what the weather conditions, insect populations, and soil quality were years ago. This tells them about how a region changed so that certain plants that once grew well may no longer thrive there.

Using a tree diameter tape, an increment borer, a pencil, and paper, you, too, can read the age and size of trees.



### What Is a Tree?

A tree is a woody plant at least 10 feet tall when fully grown. It usually has only one stem or trunk with branches at the top. Woody plants with several stems growing up from the ground and never reaching 10 feet tall are not trees. They are shrubs.

Trees are divided into two main classes. These are commonly known as hardwoods and softwoods.

Hardwoods have seeds in fruits and flowers, like persimmon and dogwood. They usually have broad leaves that drop in the fall.

Softwoods have seeds in cones—pine cones, for example. They usually have needles or little scales instead of broad leaves. Pines have needles. Cedars have little scale-like leaves very close together.



### Counting the Rings

In spring and early summer, the cambium produces sapwood cells that are large and thin-walled. These cells are light-colored and are called spring wood. As conditions for growth become hot and very dry during the summer, the sapwood cells formed by the cambium are smaller and have thicker walls. These cells are dark colored and are called summer wood.

Each year a tree produces one light-colored ring (spring wood) and one dark-colored ring (summer wood). Both rings together are called an annual ring. You can tell the age of a tree by counting the rings on a stump. Count either the light rings or the dark rings. Do not count both. Wide rings tell you that the tree grew fast. Thin rings mean the tree grew slowly.

Measure the width of an annual ring and double it to find the diameter growth for that year. This measurement can be made for one year or for groups of years.



## Boring a Tree

Using an increment borer, you can measure age and growth without cutting down the tree. The borer is a hollow auger with a handle. When it is bored into the tree, a plug or cross-section of wood can be removed. The annual rings can be counted on the plug.

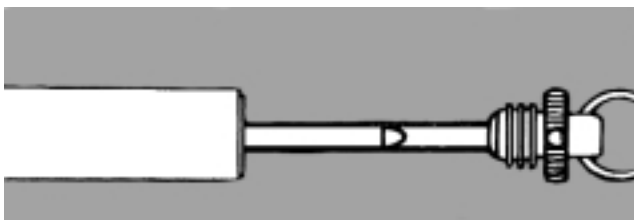
The increment borer has three main parts—the handle, the borer bit, and the extractor or tray. The handle also serves as a case for the borer bit and extractor. It is a hollow steel tube with a square hole midway down the handle. The borer bit is fastened in the hole before being used.

The bit is made of heat-treated steel of the best quality. At one end, there are threads with sharp cutting edges. The other end is square and fits into the square hole in the handle.

The extractor is a long tray. The teeth at the tip draw the core from the hole.

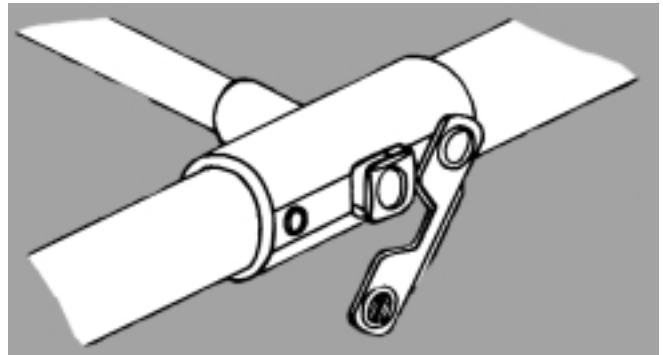
To use the increment borer:

1. Unscrew the extractor or tray and remove it from the handle.



2. Remove the borer bit from the handle by tapping it on the palm of your hand. The bit will slide out.

3. Open the catch on the handle and put the square end of the borer bit into the hole. Then close the catch so that it fits into the groove on the end of the borer bit.

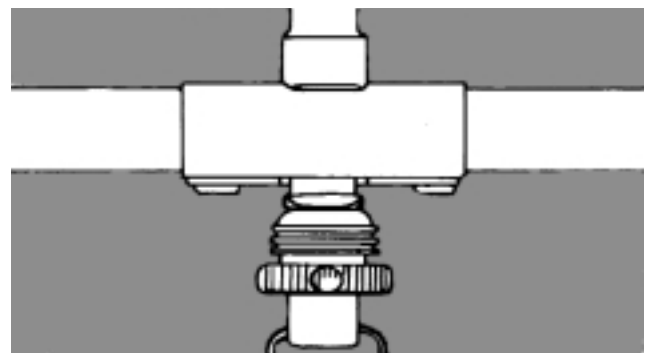


4. Press the borer bit at a right angle against the center of the tree about 4½ feet from the ground. Turn the handle slowly to the right. The threads will secure a grip and, with further turning, the auger will move easily into the tree.

5. Turn the borer without exerting pressure until it reaches the center or pith of the tree.

6. Carefully slide the extractor into the borer bit with the tray turned upward. Push it all the way in but be careful not to force it. The tray may break.

7. Give the handle one full turn backwards to break the core from the tree. Check to be sure the small mark on the edge of the extractor knob is turned upward. That indicates that the tray is turned upward, too.



8. Pull out the extractor, being careful to keep it level. The core of wood will be lying in the tray.

9. Screw the borer bit out of the tree. Detach it from the handle. Slide the bit back into the handle, threaded part first. Be very careful not to nick the cutting edge of the threads.

10. Put the extractor into the borer bit and screw it down tightly.

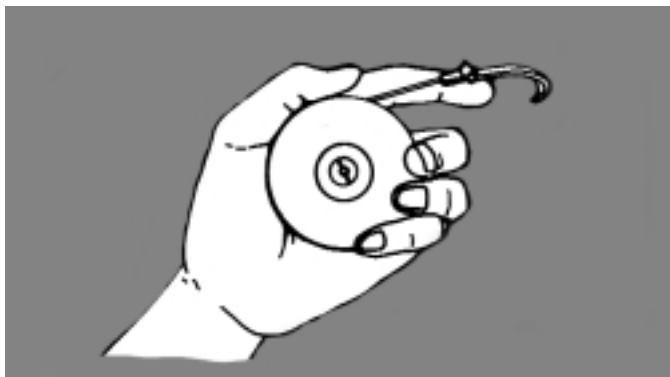
Count the annual rings on the core the same as on a stump. Then add 3 years to the number of annual rings for the time it took the tree to grow  $4\frac{1}{2}$  feet tall.

### Measuring Tree Diameter

Diameter of a tree is usually measured at  $4\frac{1}{2}$  feet from the ground. This is called d.b.h., which means diameter breast height. You can measure up to a point on your clothing that is  $4\frac{1}{2}$  feet from the ground and use that point as a guide for measuring d.b.h.

To use the diameter tape:

1. Hold the tape case in your left hand with the winding handle side down.



2. Wrap the diameter tape clockwise around the tree and grasp the hook end with your right hand.
3. Make sure the tape is  $4\frac{1}{2}$  feet from the ground.
4. Make sure the tape is straight around the tree, not slanted.
5. Make sure the tape is wrapped tightly around the tree.
6. Match the diameter figure with the starting mark on the tape and record the diameter in inches.

### Forestry Activity

Examine a tree stump or cross section of a log. If you have an increment borer, you can take a core sample. Then answer these questions:

1. How many rings of summer wood can you find?

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2. How many rings of spring wood can you find?

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3. About how old is the tree now or when it was cut?

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4. Can you find years of little growth?

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What might have caused this?

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**YANR-131**

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**For more information**, call your county Extension office. Look in your telephone directory under your county's name to find the number.

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