

Forestry 101

Forestry 101: Aging Trees

by Doug McLaren and Jeff Stringer

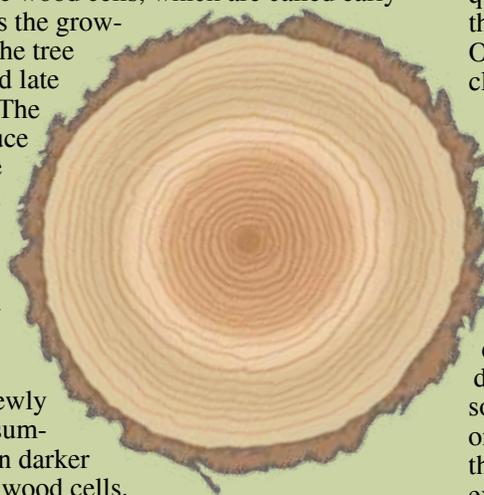
Inevitably, when foresters walk through a woodland with the owner, one of the first questions asked when standing among large trees is “How old do you think these trees are?” This is a common question, and it is important to know the answer if the woodland is to be managed properly. Several methods can be used to age trees. Estimates can be made by experienced foresters and loggers by looking at the size of the trees and considering the site and bark pattern. However, the only accurate way to determine the average age of trees in a woodland or to age a specific tree is by counting growth rings, which are also called annual rings.

Annual Rings

An annual ring, the band of wood that is produced in one year, is actually composed of two types of cells. During the spring of the year trees produce wood cells, which are called early or spring wood cells. As the growing season progresses, the tree produces what are called late or summer wood cells. The two types of cells produce the visible rings that we can count. Spring wood cells are often larger in diameter than summer wood cells. The large spring wood cells allow the tree to move massive quantities of water needed to expand the newly developed leaves. The summer wood cells are often darker in color than the spring wood cells.

The difference in these cell types is very pronounced in some species (called ring-porous trees). In Kentucky examples of ring-porous trees include oak, ash, and elm. In these species, rings are easy to see and count. Some species such as yellow-poplar have little difference between the spring and summer wood cells. This makes their annual rings harder to discern. These are called diffuse-porous trees, and they can be difficult to age (Table 1). Regardless, all trees produce annual rings composed of a ring of spring wood cells inside a ring of summer wood cells.

Counting rings on stumps is an easy way to determine the approximate age of trees in a woods where logging or tree felling has occurred. In these situations it is reasonable to assume that standing trees that are the same diameter and species as the stumps are approximately the same age. This is a general rule and is not precise. The age of tree stumps can not necessarily be applied to standing trees if the stumps and trees are of different species, particularly if they are not related species.



Counting rings on stumps is not possible in woodlands where there has not been any recent logging. In these instances foresters will use a tool called an increment borer to cut and extract a small wooden dowel from the tree, thus providing a view of the tree’s annual increments without having to cut the tree down. The increment borer (also described in “Woodland Management Tools” in this issue) functions in the same manner as a soil probe. The borer is screwed or bored into the tree, and a small round core about the size of a pencil lead is extracted. From this core, you can count the annual rings and estimate the tree’s age. Boring high-value trees is not recommended, as this leaves a hole in the wood of the tree. Generally, if foresters need to determine the average age of the overstory trees in a woodland, they will pick low-value timber trees to bore. Typically, healthy trees will grow over the holes quickly with minimal injury to the wood (besides the hole in the inner wood, which could ruin the veneer value of a tree). Older trees that are not of good vigor may have problems closing up a borer hole. Be careful not to bore trees that are valuable to you for veneer or other high values. Do not bore trees that are old or with signs of stress.

Assessing Crowding and the Need for Thinning

Counting all the rings from the center of the tree (pith) to the last outer ring is required to age the tree. However, it can also be useful to look at the last several years of growth rings and determining how wide they are. Foresters will look at the width of the last several annual rings to determine if the tree is growing at an appropriate rate for the soil, site, and species of tree. If the tree is young and growing on a good site and the rings are very narrow, it may indicate that the woodland is very crowded. Trees need sunlight and expanded crowns to grow. Trees growing in crowded wood-

Table 1.
Examples of Common Trees in Kentucky

Ring Porous	Semi- (Ring and Dif- fuse) Porous	Diffuse Porous
Oaks	Walnut	Maples
Hickories	Persimmon	Birch
Elms	Cherry	Beech
Ashes	Sassafras	Yellow-poplar
Coffeetree	Cottonwood	Gums
Locusts	Willow	Basswood

Forestry for Woodland Owners

lands and/or in limited light due to shading from other trees will have narrow growth rings. Releasing this crowded or shaded tree will increase diameter growth and result in wider ring widths. If you look at the growth rings on a stump (Figure 1) and see areas of growth where the rings are very close together and other areas where they are wide, it generally indicates times when the tree was very crowded and times when the tree had little crowding or competition. A change in competition can happen when a woodland has been logged.



Figure 1.
Annual growth rings can reveal much about a tree's life.

Photo courtesy: Doug McLaren

Response to Thinning

If a thinning, TSI, or crop tree release has been completed in the recent past, compare the width of the rings prior to the treatment. Treatment should result in the widening of the annual rings and eventually increase the trees diameter. If this situation exists where a recent thinning could have increased the growth of the tree, a forester would need to only take a short increment into the tree rather than obtaining a core to the center pith of the tree.

What You Need to Age Trees

As a woodland owner, you can assess the age of your timber stand or individual trees yourself. You will need several items. One would be an increment borer, which comes in a variety of lengths and diameters. You will need to buy a borer that has a length equal to at least half the diameter of the trees that you want to measure. Typically a 14- to 16-inch borer works well in



Tree Health and Age

It may be a cause for concern if the forester looks at the last several years of growth of a larger overstory tree that is not in a crowded condition and sees very narrow rings. If the tree is reaching its maximum age and the tree is growing on a good site, this narrow ring may indicate that the tree is unhealthy, is losing crown, and may be susceptible to dying if a drought or other disturbance such as a defoliation were to occur.

An increment borer is a specialized forestry tool that can be drilled into a tree—the extracted wood core can then be used to determine a tree's age.

Photo courtesy: Billy Thomas

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