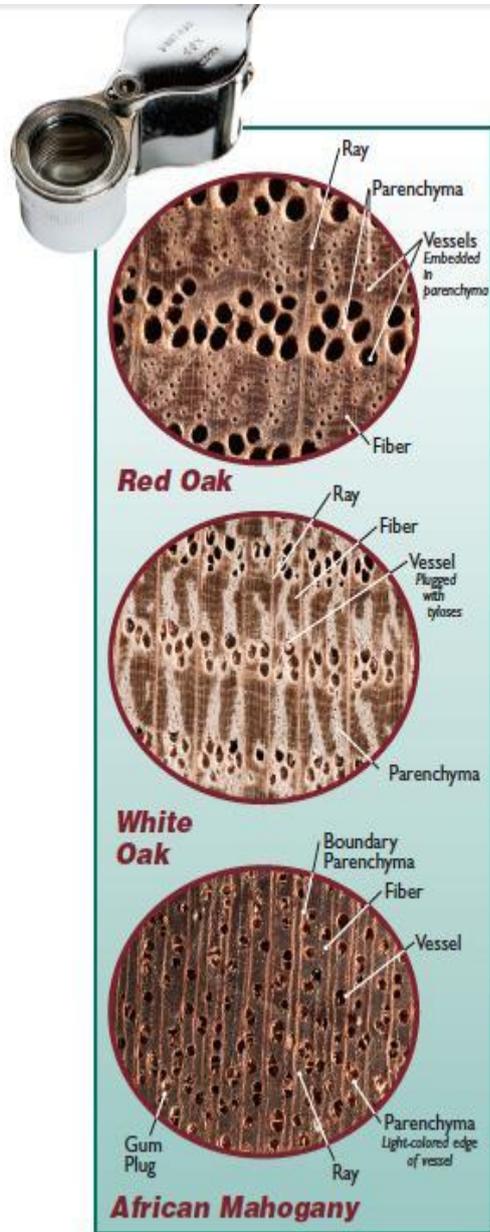




About Wood End Grain

It is important to understand the cell structure of wood and its grain as this has an impact on how it reacts to moisture. Three images show three types of grain.



Reading end grain above

- **Rays:** In each photo, the rays are the lines running more or less vertically. They are profuse in white oak, less so in red oak. In both oaks, there are very fine rays between the larger ones.

Because the four elements found in hardwoods — vessels, fiber, parenchyma, rays — are uniquely represented in each species, the ability to analyse these differences is the key to being able to identify the type or species of any wood. As an introduction to wood identification, I've chosen three well-known and widely used species: red oak, white oak and African mahogany.

- **Vessels:** It is the early wood large vessels that form the concentric rings. These are the large-cavity, thin-walled transport elements needed at the onset of the spring/summer growth period. They typically get abruptly smaller, although in both oaks they continue to be made and used throughout the growing season.

The major difference between the oaks is that vessels are free of any inclusions in red oak, whereas the vessels in white oak are plugged with tyloses. (We will see the effect of these when we look at utilization in Part 2.)

Vessels in mahogany are smaller and consistent in size. Some are arranged in twos and some in threes. The white deposit in some vessels is a common feature and is likely some form of gum deposit.

- **Parenchyma:** In both oaks the parenchyma is the tissue that surrounds the large vessels. It's easy to see in white oak because of its white colour and typical flame-like shapes; in red oak, it's a shade of brown, and entirely surrounds the smaller vessels, which are much easier to see than in white oak. Parenchyma is very sparse in mahogany, visible only as the light-coloured edges of some of the vessels.

In mahogany, fibre is the red ground that is neither rays nor vessels and the rays are more or less the same thickness. They are little more than two-vessel diameters apart, and they bend around the vessels.

- **Fibre:** The fibre in each photo is the dark background material. At this low magnification it's never possible to see the thick-wall, small-cavity elements as separate items. In both oaks, you will see very thin light-coloured lines running horizontally through the fibre. This is parenchymatous material.