

Landowners Guide to Identification and Characteristics:

WHITE OAK (*Quercus alba*)

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White Oak (*Quercus alba*)

White oak is a wide ranging oak that can be found from southern Maine to southeast Minnesota. From there it extends south all the way to eastern Texas across to northern Florida. White oak is a member of the white oak group and considered by many the most important of all the oaks. White oak is the most important oak in the timber industry and its acorn is the most palatable of all the oaks. It is considered a medium to large tree and can attain heights of over 100 feet. White oak can be found growing on a wide range of soils and sites.

Identification

The leaves are the easiest characteristic to use for identifying oaks. White oak leaves are deciduous, somewhat oblong to ovate in shape and generally between 4 to 7 inches in length. Each leaf is made up of seven to 10 rounded lobes, with many having a finger-like appearance. The upper surface of the leaf is green to blue-green with a pale underside.

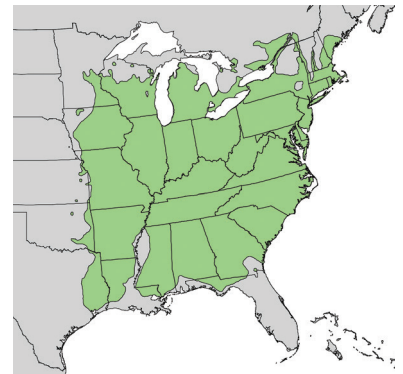


Figure 1: White oak range map. Photo courtesy: Atlas of United States Trees



Figure 2: White oak leaves in the upper canopy are deeper lobed giving an exaggerated finger-like appearance. Photo courtesy: T. Davis Sydnor, The Ohio State University, Bugwood.org



Figure 3: White oak leaves have finger-like lobes. Photo courtesy: Chris Evans, University of Illinois, Bugwood.org

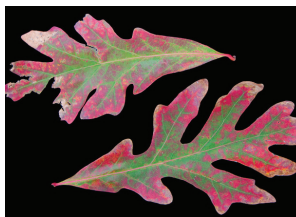


Figure 4: Fall color of white oak leaves can range from brown to red, or even slightly purple. Photo courtesy: David Cappaert, Bugwood.org

This publication is part of the White Oak Initiative's (www.whiteoakinitiative.org) **Landowners for Oaks Series** designed to provide foundational information necessary for sustainable management of white oak and upland oak forests.

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Bark

The bark is light gray to almost white and appears flaky. White oak trees can have two different types of bark patterns on the lower trunk of the tree; a blocky bark pattern and a flaky bark pattern with long plates or scales that resemble vertical shingles. However the upper canopy trunk and limbs always have the flaky or plated bark pattern.

Acorns

The acorns are about 1 inch long and are considered medium to large. They are oval to oblong with the acorn cap covering almost $\frac{1}{4}$ of the acorn. They start out light green and turn brown when they mature. They mature in one growing season, and germinate upon dispersal in the fall.

Figure 5: White oak acorns nearing maturity.



Figure 6: Prior to maturity, white oak acorns appear light green. Photo courtesy: Paul Wray, Iowa State University, Bugwood.org



Using the twig and buds to identify oaks can be difficult and tricky. The twig is red-brown to light grey, but can appear slightly purple as well with several buds at the end of the twig. The buds are red-brown, small and rounded. Using a hand-lens can be helpful.

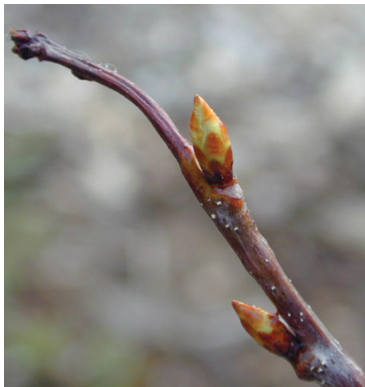


Figure 7: White oak twigs are commonly red-brown with small rounded terminal buds. Photo courtesy: Paul Bolstad, University of Minnesota, Bugwood.org



Figure 8: White oak seedlings growing in limited sunlight often have shallow lobes compared to leaves in full sunlight.



Figure 9: Notice the flaky bark pattern with long plates resembling overlapping shingles.

Figure 10: This blocky bark pattern is also a characteristic of white oak bark, especially on the lower trunk.

General Information

Reproduction and Regeneration:

Most hardwood trees use seed and vegetative (root and stump sprouting) regeneration to reproduce.

- Seed regeneration via acorn: White oak typically begins acorn production around 20 years. Mature trees growing in full sunlight and large trees greater than 20 inches in diameter produce the best acorn crops. White oaks do not produce good acorn crops every year. Good acorn crops (bumper crops) can occur every three to five years. The acorns are dispersed by birds, rodents and gravity in the fall. The acorns mature on the tree in one growing season and drop in late summer or early autumn and germinate upon dispersal. Acorns require direct contact with soil for successful germination.
- Regeneration via sprouting: White oak sprouts vigorously after disturbance or damage to the tree. It both stump and root sprouts, which is necessary for young white oaks to compete with faster growing species.

Site Location and Competition:

- White oak is one of the most widely distributed of all the oaks growing on a wide range of soils and sites. White oak can be found growing on dry upper slopes and south and west facing slopes as well as north and east facing slopes and in valleys along streambanks. However white oak is most commonly found on medium to medium/low quality sites where competition from faster growing trees is less severe.
- It can be found growing alongside any of the upland oaks. However it is most commonly found with black oak, post oak, chestnut oak, and scarlet oak.

Other Oaks that Look Similar:

- White oak leaves could be confused with post oak, bur oak, or overcup oak. However a closer inspection of white oak should distinguish the deep finger-like rounded lobes that are characteristic of the species.
- The bark looks similar to swamp white oak, swamp chestnut oak, chinkapin oak and overcup oak. White oak bark also looks similar to post oak bark, but only on the lower trunk.

Sunlight Requirement:

- White oak is intermediate in shade tolerance, but is considered to be the most shade tolerant of all the oaks.

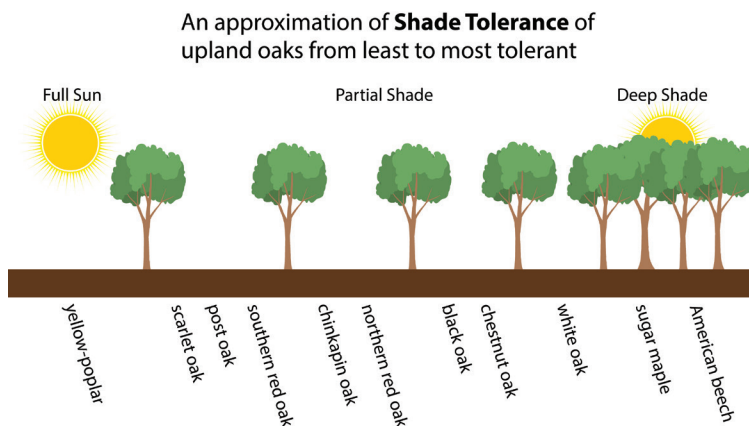


Figure 11: Shade tolerance of upland oaks.

The photos at the top of page one represent a few of the many benefits and uses of white oak, making it one of the most important tree species in the Eastern United States. Photos and images courtesy of the authors or the University of Kentucky Department of Forestry and Natural Resources unless otherwise noted.

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Uses:

- White oak wood is the most highly prized species used to make barrels for the wine and spirits industries.
- This species is also used for lumber, cabinets, furniture and pallets.
- The wood makes excellent firewood because of its high fuel value.
- The leaves and young shoots are commonly browsed by deer and rabbits.
- The high-quality acorns are a favorite food source for deer, wild turkey, gray squirrels, black bears, and a host of birds and other wildlife species.
- Oaks support more than 500 butterfly and moth larva which in turn support our migrating and breeding bird populations and bats.

Other Facts:

- White oaks are long-lived, with some specimens living over 500 years.
- White oak's scientific species name *alba* is Latin for white, named after its light gray to almost white bark.
- White oak acorns are the most palatable of all the oaks due to their low concentration of tannic acid that makes other acorns bitter. This made white oak acorns valuable as a food resource for Native Americans.
- As of 2020, the National Champion white oak was 90 feet tall and 331 inches in circumference. It is located in Brunswick County, Virginia.

Sources

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