

Landowners Guide to Identification and Characteristics: **NORTHERN RED OAK (*Quercus rubra*)**

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Northern Red Oak (*Quercus rubra*)

Northern red oak is widespread and one of the most important oaks of the red oak group. It is a medium-sized to large tree that grows 60 to over 100 feet tall and two to three feet in diameter. Often considered one of the highest quality tree species in upland forests, it is an important tree for lumber. In addition both the leaves and acorns provide food for wildlife.

Identification

The leaves are the easiest characteristic to use for identifying oaks. Northern red oak leaves are deciduous and about 5 to 8 inches long, with seven to 11 pointed lobes that have bristle tips; the bristle tips on the lobes help distinguish red oaks from white oaks. The gap between the lobes typically extends about halfway to the midrib of the leaf. The leaf surface is somewhat lustrous to dull and dark green on top and smooth on the underside. The leaf stem occasionally will be reddish. Autumn color is red or brown.

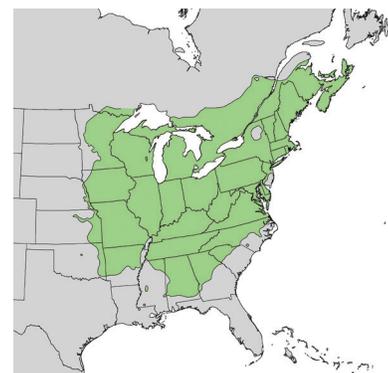


Figure 1: Northern red oak range map. Photo courtesy: Atlas of United States Trees

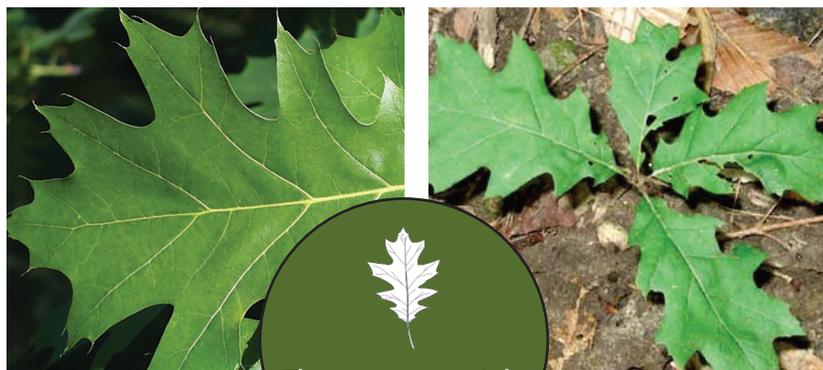


Figure 2: Northern red oak leaf. Photo courtesy: Paul Wray, Iowa State University, Bugwood.org

The stem or petiole is often reddish

Figure 3: Seedlings commonly have slightly larger leaves with shallow lobes when growing in less than full sunlight. Photo courtesy: Purdue University

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 smooth and greenish brown on young stems, but on mature trees it is brownish-gray and broken into wide, flat-topped ridges that resemble ski slopes; notice that ski slopes or alternating bands of light and dark appear all the way down the tree to the lower trunk. Both northern red oak and scarlet oak bark have vertical stripes but they are not as prominent on scarlet oak.



Figure 4: Northern red oak bark is identifiable by the lighter shaded vertical stripes.

Acorns

The acorns are typically $\frac{3}{4}$ to 1 inch long with a nearly round cap that resembles a beret-bottle cap. The cap is flat and thick and covers about $\frac{1}{4}$ or less of the acorn. The acorn without a cap has a flat-top. The flat top of the acorn as well as the flat

bottle cap shape of the acorn cap is an important identifying characteristic of northern red oak. Northern red oak acorns mature over the course of two growing seasons and drop in late summer or early fall.



Acorns are fairly large with a noticeably flat top



Using the twig and buds to identify oaks can be difficult and tricky. However oaks can be distinguished from non-oaks by the characteristic grouping of buds clustered near the tip of the twig. The twig is somewhat stout and reddish-brown. The terminal buds at end of twig are numerous, quite large, cone-shaped, and covered with red-brown, mostly hairless scales that can be seen using a hand-lens.

Figure 5: Northern red oak twig and terminal buds. Photo courtesy: Rob Routledge, Sault College, Bugwood.org

General Information

Reproduction and Regeneration:

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

- Seed regeneration via acorn: Northern red oak typically begins acorn production around 25 years but abundant production may not be until 50 years of age. Trees produce good acorn crops every two to five years with acorn production being variable among trees. The acorns are dropped or dispersed by birds and animals in the fall. Gray squirrels, which are scatter-hoarders, are very important for acorn dispersal and burial. Blue jays have been shown to be good long-distance dispersers of red oak acorns. The acorns mature on the tree over two growing seasons and drop in late summer or early autumn. The acorns will not germinate immediately but will over-winter and germinate the following spring.
- Regeneration via sprouting: Northern red oak can sprout vigorously following damage to the trunk due to harvesting, fire etc. In fact, the vast majority of northern red oak regeneration comes from stump sprouts.

Site Location and Competition:

- Northern red oak is more commonly found on the north and east facing slopes and typically in the middle to lower portion of the slope. These types of sites are characterized as having moderate to moist soils. Northern red oak is considered fast growing, compared to other upland oaks.
- Northern red oak is often a component of rich mesophytic forests with yellow-poplar, sugar maple, black walnut, white ash and hickories.
- Other upland oaks found competing with northern red oak on these same sites include white oak, chinkapin oak and occasionally southern red oak and black oak.

Sunlight Requirement:

- Northern red oak is intermediate in shade tolerance; it is similar in tolerance to black and chinkapin oak.

Other Oaks that Look Similar:

- A mature northern red oak can be confused with scarlet oak. Both exhibit the characteristic bark ridges that resemble ski slopes. The difference is northern red



Light gray ridges resembling ski slopes on the lower trunk

oak retains the ski slope appearance farther up the trunk than scarlet oak. On scarlet oak the ski slope ridges tend to broaden and become lighter gray on the upper trunk.

- Other oaks that may be confused with northern red oak are southern red oak, black oak, and Shumard oak.

Uses:

- This species is an important source of lumber, having wood that is close-grained, heavy and hard. The wood is used for furniture, veneer, cabinetry, flooring as well as posts and railway ties.
- The wood makes excellent firewood because of its high fuel value.
- The leaves are commonly browsed by deer, elk and rabbits and the acorns are eaten by a variety of large and small mammals as well as birds.

Figure 6: Notice the flat acorn caps that cover less than ¼ of the rather large acorn. Photo courtesy: Paul Wray, Iowa State, Bugwood.org



Other Facts:

- Northern red oak does not live as long as white oak but can live up to 200 to 300 years.
- Northern red oak's scientific species name *rubra* means "red" and refers to the fall leaf color as well as the color of the wood.
- As of 2020, the National Champion northern red oak is 92 feet tall and has a circumference of 335 inches. It is located in Ashtabula, Ohio.

An approximation of **Shade Tolerance** of upland oaks from least to most tolerant

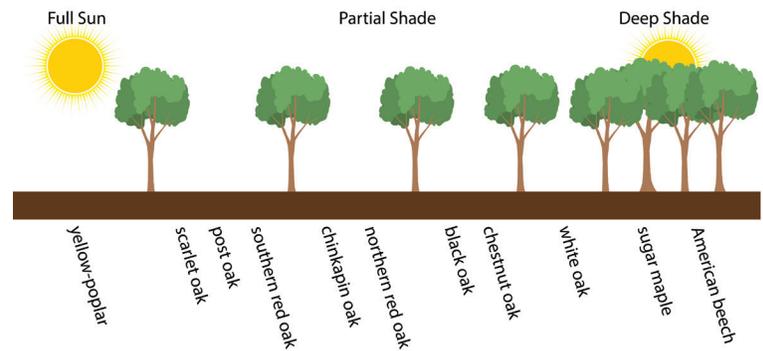


Figure 7: Shade tolerance of upland oaks.

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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