

# Field Guide to Native Oak Species of Eastern North America

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Oaks are primarily temperate region trees and shrubs numbering approximately 600 species worldwide. Oaks have occupied the non-glaciated landscape of North America since the Cretaceous Period. Fifty oak species are represented in two-thirds of the eastern North American forest cover types and dominate 68 percent of hardwood forests (191 million acres).

Oaks have figured prominently in folklore, construction, food sources, medications, and dyes. Great political events have occurred under "charter oaks," and Native Americans utilized acorns as food (particularly the sweeter white oaks) and the inner bark as medicine (*Q. falcata*, *Q. ilicifolia*, *Q. imbricaria*, *Q. muehlenbergii*, *Q. rubra*, and others). This genus, which includes economically important hardwoods, is also critical for meeting watershed, recreation, and wildlife management goals.

The encroachment of urbanization, agriculture, and hydrologic projects continues to negatively impact oak forest types. Such impacts may necessitate the establishment of conservation districts for vulnerable species. Comments in the text associated with conservation status are based upon information compiled by the World Conservation Monitoring Center and published in association with the International Union for Conservation of Nature and Natural Resources (IUCN) in the 1997 *IUCN Red List of Threatened Plants* (Walter and Gillett 1998). In the southern United States, forest management practices favor conifers replacing hardwood forests in rich bottomlands. A new source of concern involves the threat of displacement of native oaks by exotic species. Forest types are placed at risk with the introduction of non-native insects, diseases, and plants. In 1997, a fungal pathogen (*Phytophthora ramorum*) was identified as the cause of Sudden Oak Death (SOD) in California. Screening for potential hosts has identified some susceptible species of eastern red oaks. Additional susceptible hosts include commercial nursery stock (rhododendrons, bay laurel, huckleberry, and others), which increase the probability that SOD will spread to eastern North America.

As the list of susceptible oak and understory hosts expands, this guide will help fill the need to identify and determine the natural occurrence of specific oak species in eastern North America and document any potential loss of species from states or counties.

This field guide provides an illustrated reference for identification of eastern oaks and can be used in several ways. Oak identification can be accomplished by utilizing the leaf keys, cross referencing scientific or local common names in the index, verifying similarities between leaf specimens and the illustrated oak leaf reference charts, and comparing descriptions provided for each species. Distribution maps may also aid in the separation of similar appearing species. The distribution of each oak species can be further defined according to ecoregion. A map of the eastern North American ecoregion provinces is provided (p. 106) and ecoregion provinces associated with each oak species are also included in the summary tables (pp. 109-119). The same common names may be used for different species or many common names may be applied to a single species in more than one location. Therefore, the preferred name is shown in bold with other names cross referenced in the index. Leaf morphology may vary considerably depending upon a combination of hybridization, tree age, position in the crown, and available sunlight. Many oaks are noted for hybridizing with other species in the same subgenus. Such progeny differ from the typical form, are usually isolated individuals or have a limited distribution, and are not included here. Characteristics used in the field identification key are limited to mature leaves with full exposure to the sun. When using the key, it is recommended that species verification be made by reference to other tree characteristics listed in the text.

The genus *Quercus* is generally divided into two major groups: red (Table 1) and white (Table 2) oaks. White oaks are in the *Quercus* subgenus *Leucobalanus* and have leaves lacking bristles on the lobes or leaf apex. Some species (*Q. havardii*, *Q. minima*, *Q. vaseyana*) have lobes modified into short small points called mucronate tips.

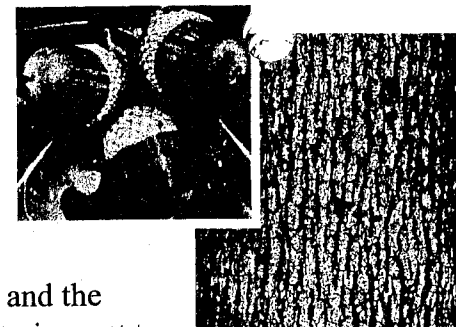
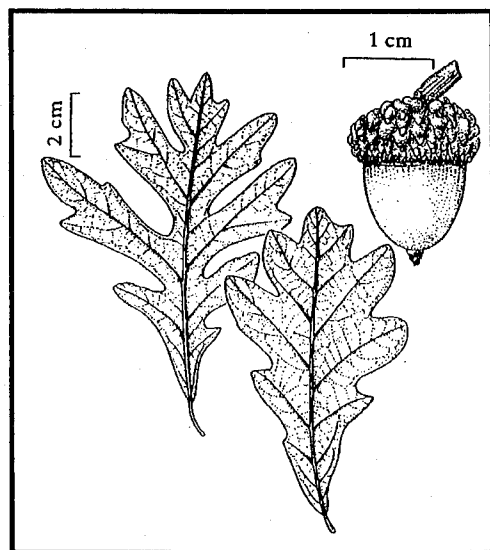
Acorns require one growing season (annual) to mature. Cup scales are thick, usually with a keel, and have a callus growth at the base. The cup has a smooth inner surface, lacking pubescence. The heartwood has clogged vessels, making it impervious to liquids, a characteristic utilized for cooperage in the wine and liquor industry.

Red oaks are in the *Quercus* subgenus *Erythrobalanus*. This group of oaks is characterized by having leaves with bristles at the tips of the lobes and the leaf apex. The acorns require two growing seasons (biennial) to mature and the overlap in age should be evident when comparing nut size on current and second-year twig growth. Cup scales are thin, flat, and without a callus growth at their base. The inner surface of the cup has velvety hairs. These oaks have open vessels in the heartwood that allow absorption of liquid, a characteristic utilized in the penetration of wood preservatives.

This field guide includes all native oak species occurring east of the 100<sup>th</sup> meridian in North America north of Mexico. The nomenclature and treatment of species follows the protocol in the *Flora of North America* (Jensen 1997). Individual species descriptions are based on several sources (Miller and Lamb 1985, Jensen 1997). Distribution records were obtained from USDA Forest Service data, voucher plant specimens, published state floras, and other literature. Native species in arboreta and landscape plantings outside their natural distribution are excluded from the maps (e.g. Canadian occurrence of scarlet oak (*Q. coccinea*)). The natural distribution of each species is presented at the county level except for Canada and Mexico. There are several species whose range overlaps the 100<sup>th</sup> meridian or the Mexican border; these are documented on the distribution maps. Seven species of white oaks (*Q. fusiformis*, *Q. laceyi*, *Q. mohriana*, *Q. muehlenbergii*, *Q. pungens*, *Q. sinuata*, and *Q. vaseyana*) with a Mexican distribution extending from Texas are also noted on distribution maps. The reader is referred to other publications (Muller 1942, Elias 1980, Zavala-Chavez 1989) for details on the oak flora of Mexico.

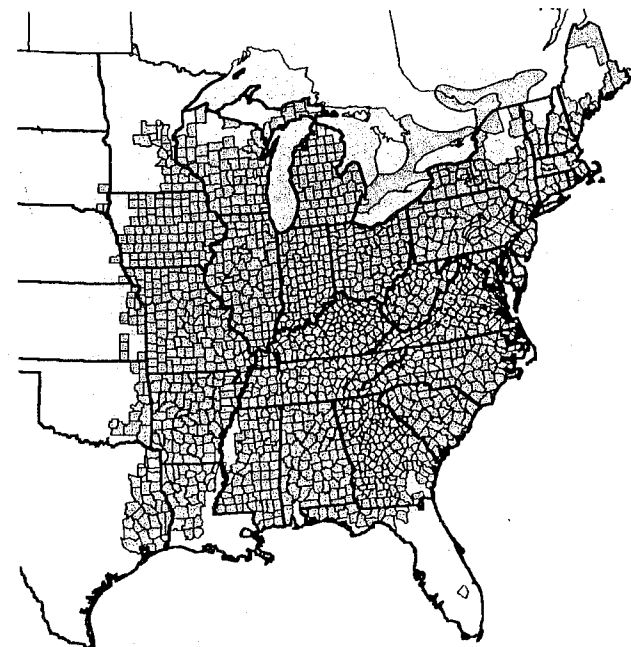
# *Quercus alba* Linnaeus

**White oak**  
eastern white oak,  
stave oak,  
forked-leaf white oak



may grow as a shrub at 4,500 feet (1,372 m) elevation in the southern Appalachian Mountains and reaches maximum potential height on lower slopes of the Allegheny Mountains and bottomlands of the Ohio Basin.

**DISTRIBUTION:** eastern Canada and the United States from Quebec and Ontario west to Minnesota, south to Texas, east to Florida, and north to Maine.



**GROWTH FORM:** popular and long-lived shade tree, which grows to 100 feet (30.5 m), with a wide-spreading rounded crown and with numerous horizontal branches. **BARK:** light gray, shallow furrows forming scaly ridges or plates. **TWIGS and BUDS:** slender to stout, gray to reddish-green

twigs with star-shaped pith; buds are reddish-brown and broadly oval and hairless. **LEAVES:** petiole  $\frac{3}{8}$  - 1 inch (10 - 25 mm) in length; obovate to elliptical leaves, 4 - 8 inches (101 - 203 mm) long,  $2\frac{3}{4}$  -  $4\frac{3}{4}$  inches (70 - 121 mm) wide, margin with 5 - 9 lobes that are widest beyond middle, deep sinuses extending a third or more to midrib; base acute to cuneate, apex broadly rounded; dull or shiny grayish green above, light green with slight pubescence which becomes smooth beneath as they mature.

**ACORNS:** annual; 1 - 3 acorns on peduncle up to  $1\frac{1}{4}$  inch (32 mm) long, light gray pubescent cup, enclosing  $\frac{1}{4}$  of the nut; light brown, oblong nut, up to 1 inch (25 mm) long; germinates in the fall after dropping to the ground. **HABITAT:** dry upland slopes to well-drained loam in bottomlands;

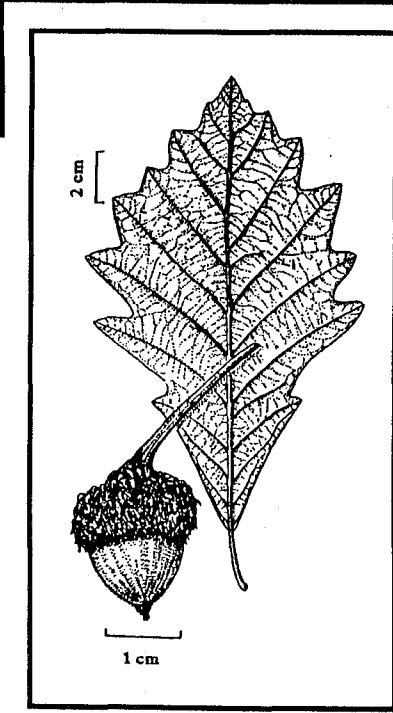


**COMMENTARY:** White oak is one of the most important species in the white oak group. The wood is used for furniture, flooring, and specialty items such as wine and whiskey barrels. Used for shipbuilding in colonial times. Continues to be displaced in the market place by several species of red oaks. Acorns are a favorite food source for birds, squirrels, and deer. Used as medication by Native Americans. The largest known white oak specimen had a circumference of 32 feet and grew in the Wye Oak State Park, Talbot County, Maryland. It was destroyed during a storm on June 6, 2002.

*Quercus bicolor* Willdenow

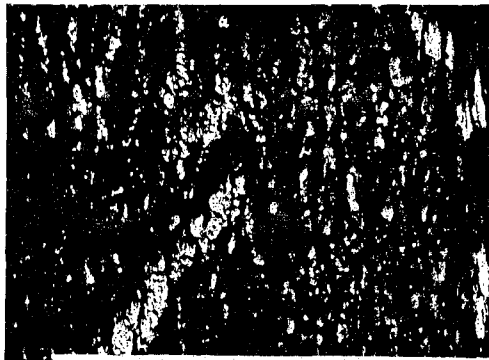
Swamp white oak  
white oak

**GROWTH FORM:** large tree that grows to 100 feet (30.5 m) with an irregular crown. **BARK:** dark gray, deep furrows forming scaly or flat-ridges. **TWIGS and BUDS:** smooth, light brown twigs; buds light orangish-brown, smooth, ovoid and blunt. **LEAVES:** petiole from 3/8 - 1 inch (10 - 25 mm) long; leaves are narrowly elliptical to obovate,

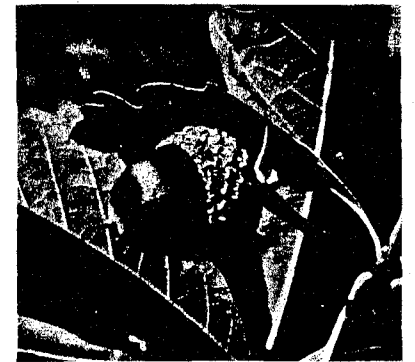


varies up to 7 inches (178 mm) long and 4 3/8 inches (111 mm) wide; base cuneate to acute, rounded apex; margin with 10 - 20 lobes with shallow

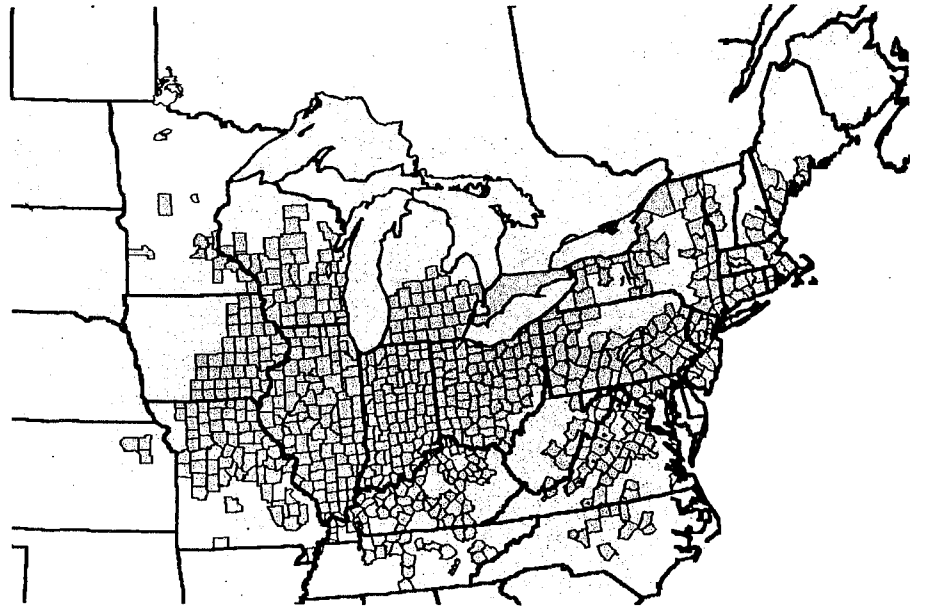
sinuses, distal half of blade may have teeth; glossy dark green above with white velvety pubescence beneath.



**ACORNS:** annual; 1 - 2 acorns on peduncle up to 4 inches (101 mm) long; grayish-green cup with scales covered with fine gray tomentum, cup rim often has spinose bristles, cup covers 1/2 to 3/4 of the nut; oblong or ovoid, light brown nut, up to 1 1/4 inches (32 mm) long. **HABITAT:** poorly-drained mineral soils.



**DISTRIBUTION:** Minnesota south to Nebraska, east to North Carolina, and north to Quebec and Maine.

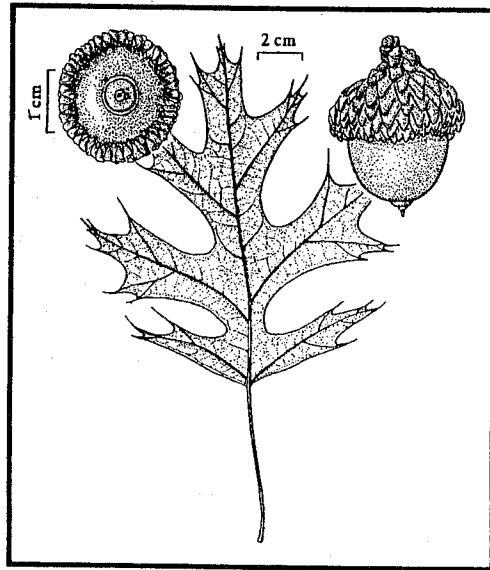


**COMMENTARY:** The scientific name refers to the difference in coloration between upper and lower leaf surface. Swamp white oak produces a hard wood that has been used for construction, cabinet making, boat building, railroad ties, fencing, and cooperage. The Iroquois peoples used this oak as medicine. The two largest known specimens grow in Highland County, Virginia, and Washington County, Ohio.

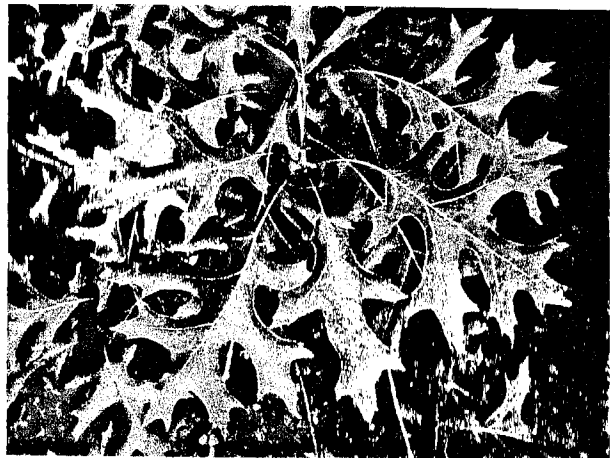
# *Quercus coccinea* Muenchhausen

**Scarlet oak**  
black oak, red oak,  
Spanish oak

**GROWTH FORM:** fast growing large tree that can obtain a height of 120 feet (36.6 m), with frequent downward arching branches, trunk usually enlarged at the base, and usually retains dead branches. **BARK:** brown with fine fissures and scaly ridges, inner bark is red to orangish-pink. **TWIGS and BUDS:** twigs are smooth

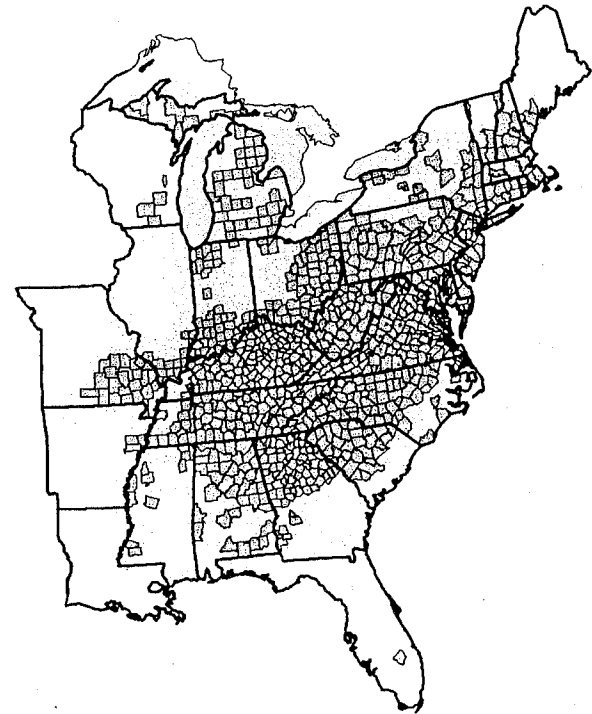


reddish-brown; clustered terminal buds are ovoid and reddish-brown with pubescence near the apex, 5-angled in cross section. **LEAVES:** smooth petiole  $\frac{3}{4}$  -  $2\frac{3}{8}$  inches (19 - 60 mm) in length; leaves are elliptic to obovate,  $2\frac{3}{4}$  -  $6\frac{1}{4}$  inches (70 - 159 mm) long, 3 -  $5\frac{1}{8}$  inches (76 - 130 mm) wide, margins with 5 - 9 lobes extending more than  $\frac{1}{2}$  the distance to the midrib, base truncate, apex acute; upper surface a glossy light green, with tufts of axillary tomentum beneath,



secondary veins raised on both surfaces. **ACORNS:** biennial; cup is a glossy dark reddish-brown, inner surface is smooth and light brown, covering  $\frac{1}{3}$  -  $\frac{1}{2}$  the nut; bluntly oblong nut,  $\frac{1}{2}$  -  $\frac{7}{8}$  inches (13 - 22 mm) in length, smooth

with concentric rings at apex. **HABITAT:** found in a variety of habitats including poor soils in mixed forests, especially on upland ridges; this oak is probably a climax tree on dry soils. **DISTRIBUTION:** range extends from Maine west to Michigan, south to Missouri and Mississippi, and east to South Carolina and the eastern Atlantic coast.

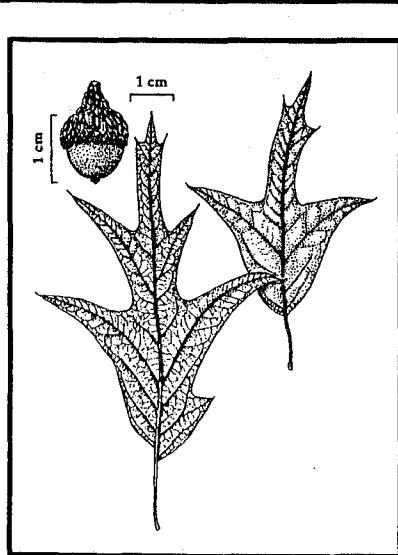


**COMMENTARY:** Scarlet oak lumber is marketed as red oak but is of poorer quality than *Q. rubra* or *Q. velutina*. This species is very susceptible to fire damage because of its thin bark. Such injuries often result in heart rot. Grows rapidly and begins to bear fruit at age 20. Acorns provide food for squirrels, chipmunks, mice, deer, wild turkey, bluejays, and redheaded woodpeckers. Extensively planted as an ornamental tree because of its brilliant autumn color, and has been introduced into Canada and Europe. The largest known scarlet oak grows in Powell County, Kentucky.

# *Quercus falcata* Michaux

## Southern red oak

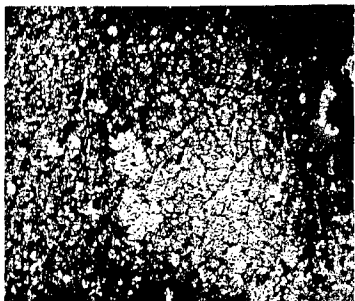
Spanish oak, swamp red oak, water oak, turkey-foot oak



**GROWTH FORM:** moderately fast growing, medium to large tree, which grows to 150 feet (45.7 m); tree with a short bole and a globe shaped crown. **BARK:** dark gray, developing furrows produce ridges and scaly plates; inner bark is orange. **TWIGS and BUDS:** pubescent reddish-brown twig with star shaped pith; reddish-brown terminal bud is ovoid and pubescent. **LEAVES:** petiole  $\frac{3}{4}$  -  $2\frac{3}{8}$  inches (19 - 60 mm) in length, smooth to sparsely

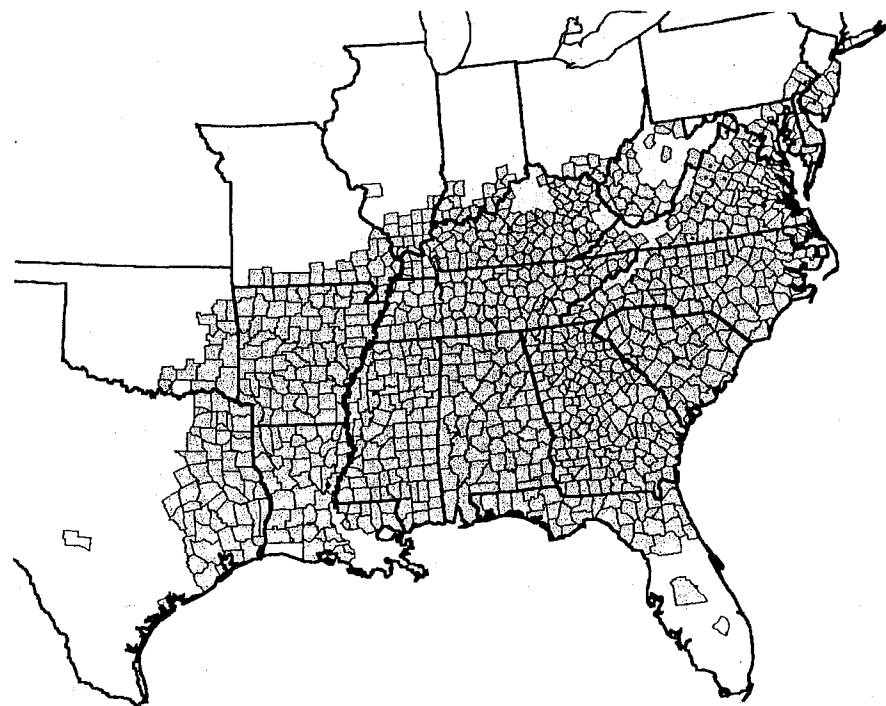
pubescent; leaves are elliptical to ovate, 4 -  $11\frac{3}{4}$  inches (101 - 298 mm) long and  $2\frac{3}{8}$  -  $6\frac{1}{4}$  inches (60 - 159 mm) wide, u-shaped base, margin has 3 - 7 deeply divided lobes with 1 - 3 bristle-tipped teeth, apex longer than

lateral lobes; upper surface a glossy green often with some pubescence along midrib, lower surface covered with gray or tawny pubescence, secondary



veins raised on both surfaces. **ACORNS:** biennial; thin, reddish-brown cup with pubescent inner and outer surface, usually covers up to  $\frac{1}{3}$  of the nut; rounded, brown nut,  $\frac{3}{8}$  -  $\frac{5}{8}$  inch (9 - 16 mm) long, may be striated at the tip with pubescence.

**HABITAT:** dry upland sites of sandy or clay loam throughout the southeastern United States. **DISTRIBUTION:** occurs from New Jersey and Florida west to Oklahoma and Texas.

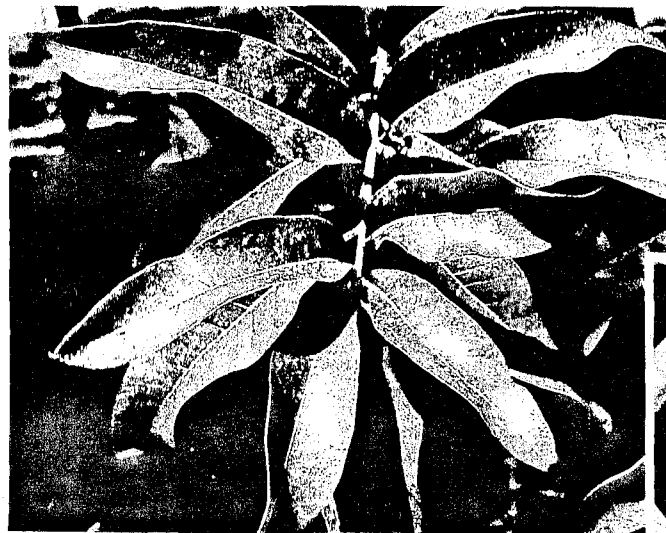
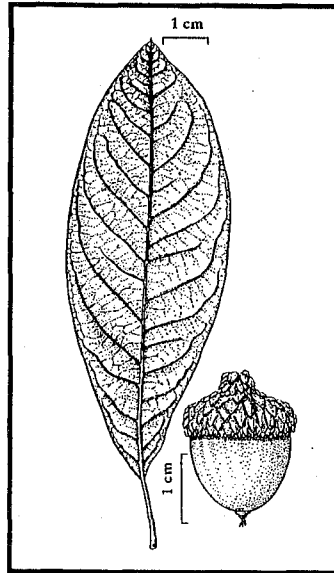


**COMMENTARY:** Southern red oak lumber is marketed as red oak for construction and furniture. This oak is common throughout the South and often called Spanish oak because of the association with early Spanish settlement. The largest known southern red oak grows in Upson County, Georgia.

*Quercus imbricaria* Michaux

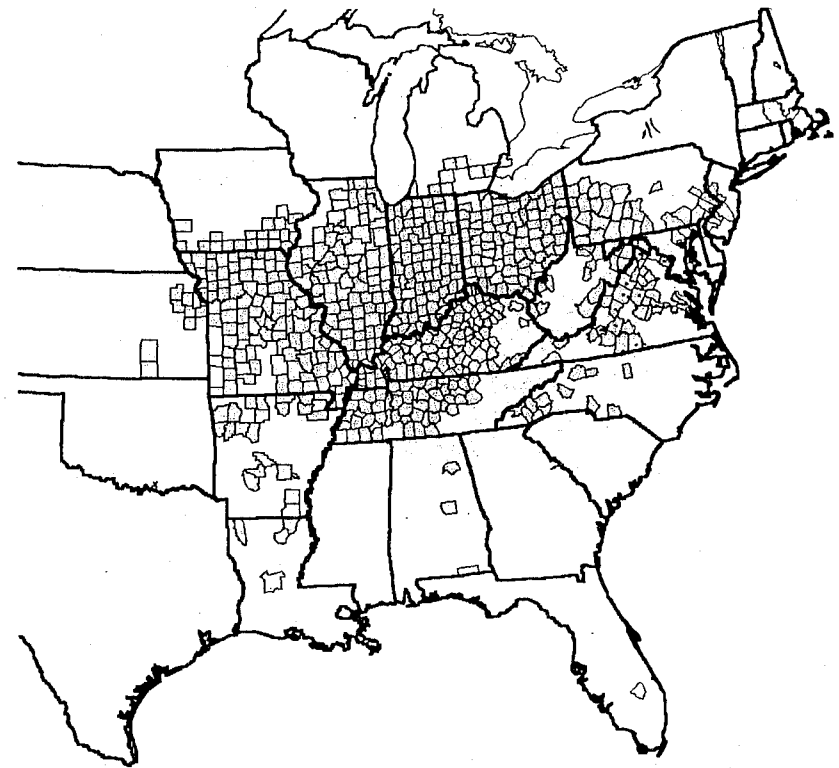
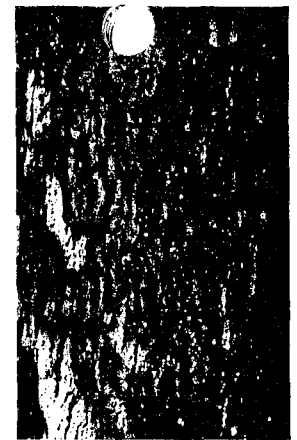
Shingle oak  
laurel oak

**GROWTH FORM:** medium tree which normally grows to 65 feet (19.8 m), occasionally to 105 feet (32 m), and has a rounded crown. **BARK:** grayish-brown with shallow fissures becoming scaly ridges, pinkish inner bark. **TWIGS and BUDS:** twigs are smooth and brown or slightly pubescent; large terminal bud is brown and 5-angled in cross-section, scales are pubescent with ciliated edges. **LEAVES:** smooth petiole to 3/4 inch (19 mm); ovate and widest near the middle, 3 1/8 - 8 inches (79 - 203 mm) long, 5/8 - 3 inches (16 - 76 mm) wide, margin entire and may be slightly wavy and turned under, base obtuse, apex obtuse and tipped with one bristle, shiny dark green above, light whitish-green with uniform pubescence below. **ACORNS:** biennial;



1 - 2 formed on stout peduncle, cup minutely pubescent on outer surface, inner surface is

smooth and tan to reddish-brown, enclosing up to 1/2 of nut; nearly round nut, 3/8 - 3/4 inch (10 - 19 mm) long, chestnut-brown with faint stripes, and concentric rings around apex. **HABITAT:** moderately dry to moist soils. **DISTRIBUTION:** Iowa south to Louisiana, east to North Carolina, and north to Massachusetts.



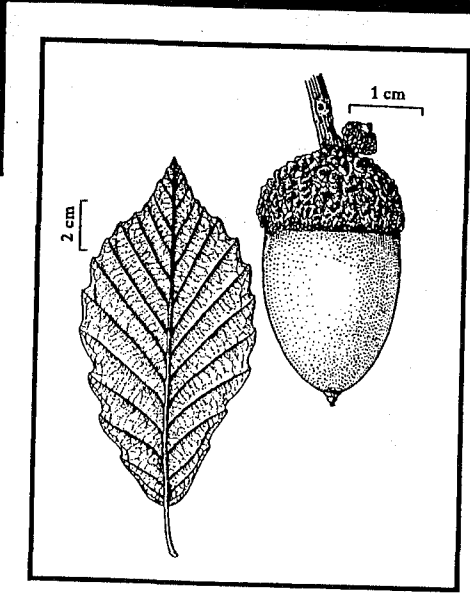
**COMMENTARY:** The common name of this oak refers to the use of its wood as shingles by early settlers. The Cherokee people used the bark of shingle oak as medication. The largest shingle oak grows in Cincinnati, Hamilton County, Ohio.



# *Quercus montana* Willdenow

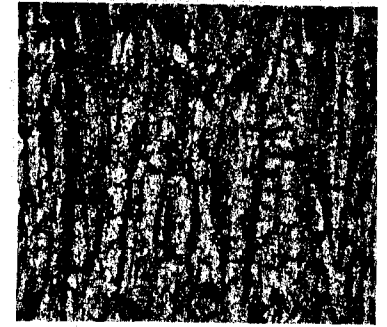
**Chestnut oak**  
rock chestnut oak,  
mountain chestnut oak,  
rock oak, tanbark oak

**GROWTH FORM:** medium to large tree, 65 - 145 feet (19.8 - 44.2 m), broad open and irregular crown, chestnut like foliage. **BARK:** dark reddish-brown to dark gray, mature bark with deep v-shaped furrows producing broad ridges. **TWIGS and BUDS:** stout twigs, dark green to reddish-brown; light brown to reddish-brown ovoid bud, pointed apex, bud scales may have slight pubescence. **LEAVES:** yellow petiole  $\frac{3}{8}$  -  $1\frac{1}{4}$  inches (10 - 32 mm) long; leaf blade obovate,  $4\frac{3}{4}$  - 8 inches (121 - 203 mm) long,  $2\frac{3}{8}$  - 4 inches (60 - 101 mm) wide, margins have 10 - 14 rounded teeth, base subacute, apex broadly acuminate; thick firm blade, shiny dark yellowish-green above, light green with slight pubescence along veins below.



mm) long; leaf blade obovate,  $4\frac{3}{4}$  - 8 inches (121 - 203 mm) long,  $2\frac{3}{8}$  - 4 inches (60 - 101 mm) wide, margins have 10 - 14 rounded teeth, base subacute, apex broadly acuminate; thick firm blade, shiny dark yellowish-green above, light green with slight pubescence along veins below. **ACORNS:** annual; 1 - 2 acorns on peduncle  $\frac{3}{8}$  - 1 inch (10 - 25 mm) long; cup has gray scales

with red tips, pubescent inner surface, encloses  $\frac{1}{3}$  -  $\frac{1}{2}$  of nut; chestnut-brown, long oval nut,  $\frac{3}{4}$  -  $1\frac{1}{2}$  inches (19 - 38 mm) long. **HABITAT:** shallow soils, dry sandy soils, and rocky upland forests. **DISTRIBUTION:** southern Ontario, south to Louisiana, east to Georgia, and north to Maine.

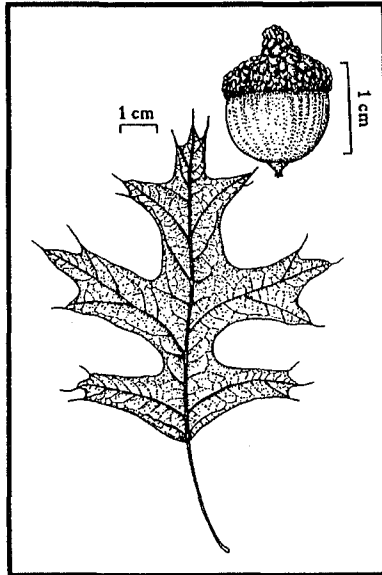


**COMMENTARY:** The bark of chestnut oak has a high tannin concentration and was once used for tanning leather. Thus the common name 'tanbark oak.' Acorns provide a food source for turkey, rough grouse, songbirds, deer, and small mammals. This species is commonly referred to as *Q. prinus* in forestry literature. The largest known chestnut oak grows in the Great Smoky Mountains National Park, Tennessee.

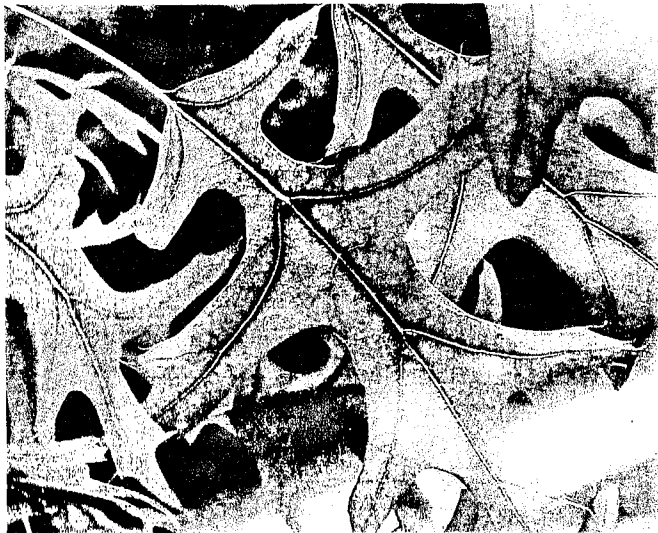


# *Quercus palustris* Muenchhausen

**Pin oak**  
swamp oak, Spanish oak,  
swamp Spanish oak, water oak



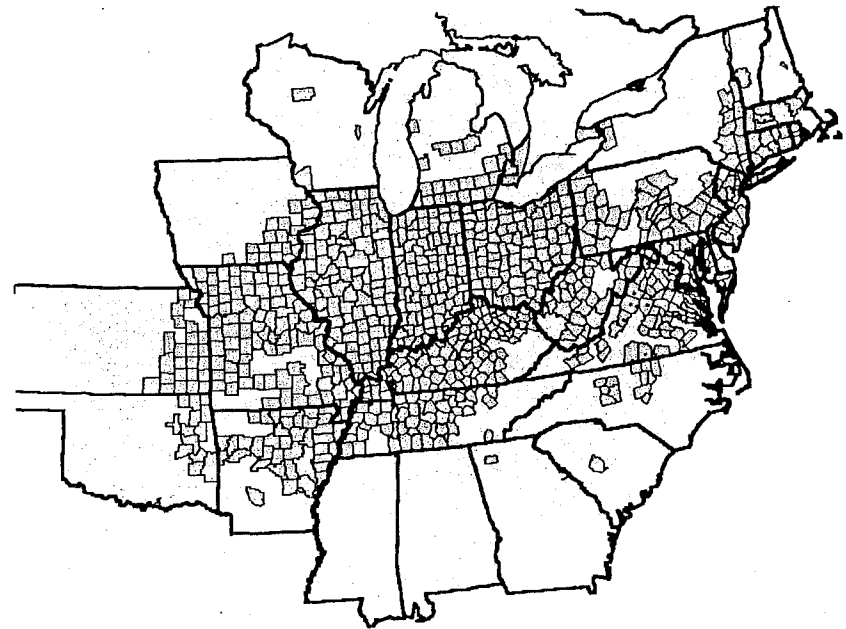
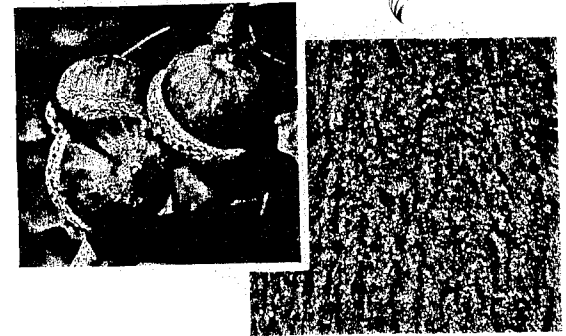
**GROWTH FORM:** medium to large tree 50 - 130 feet (15.2 - 39.6 m), somewhat conical crown with horizontal inner branches and lower branches angled downward. **BARK:** gray-brown, smooth juvenile bark, mature bark with broad scaly ridges, pink inner bark. **TWIGS and BUDS:** twigs shiny chestnut-brown; ovoid bud with pointed apex, chestnut-brown scales. **LEAVES:** smooth petiole  $\frac{3}{4}$  - 2  $\frac{1}{2}$  inches (19 - 63 mm) long; elliptical to oblong leaf, 2 - 6  $\frac{1}{4}$  inches (51 - 159 mm) long, 2 - 4  $\frac{3}{4}$  inches (51 - 121 mm) wide, base truncate, apex acute, margin with 5 - 7 lobes with 1 - 3 bristle-tipped teeth, deep sinuses nearly to the midvein, basal lobes somewhat recurved; glossy dark green above, light green below with axillary tufts or tomentum next to raised veins.



### **ACORNS:**

biennial, clusters of 1 - 2 acorns on each peduncle, thin reddish-brown cup, smooth scales, enclosing  $\frac{1}{4}$  of the nut; rounded nut,  $\frac{5}{8}$  inch (16 mm) in length, light brown and often striped.

**HABITAT:** wet-site species found in nearly pure stands on poorly-drained soils; usually tolerates intermittent flooding during the dormant season but not during the growing season; extensive stands of pin oak are found on glacial till, with excessive moisture during the winter and spring; not adapted to alkaline soils. **DISTRIBUTION:** Vermont and Ontario, south to North Carolina, west to Oklahoma, and north to Wisconsin.



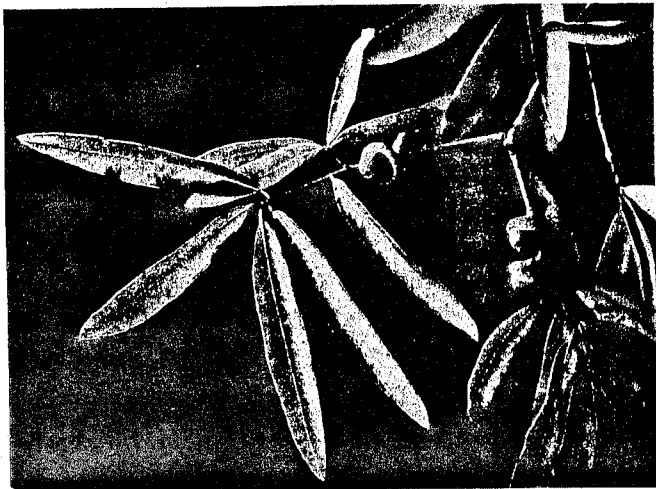
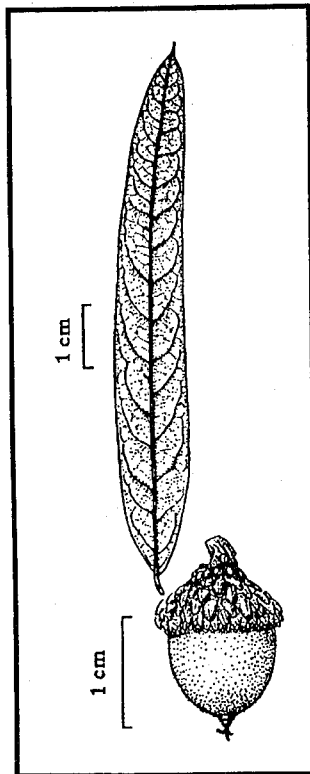
**COMMENTARY:** Pin oak is extensively planted as an ornamental in North America and has been introduced into central and western Europe as a shade tree. It is noted for a shallow root system that allows easy transplanting. Native Americans used bark from this tree for medicine. The largest known pin oak grows in Bell County, Kentucky.

# *Quercus phellos* Linnaeus

## Willow oak

pin oak, peach oak,  
swamp willow oak, black oak

**GROWTH FORM:** medium to large trees that grow to 140 feet (42.7 m), with a rounded crown and spur-like branches, long-lived with rapid growth and heavy acorn production. **BARK:** young bark is smooth and dark gray, mature bark with deep furrows and rough ridges, pink inner bark. **TWIGS and BUDS:** smooth red to chestnut-brown twigs; ovoid bud with pointed apex, smooth chestnut-brown scales. **LEAVES:** short smooth petiole up to ¼ inch (6 mm) in length; narrowly oblong or lanceolate, 2 - 4 ¾ inches (51 - 121 mm) long, ¾ - 1 inch (10 - 25 m) wide, margin entire with bristle-tipped apex, both base and apex are acute; light green and slightly shiny above, duller pale green below, some

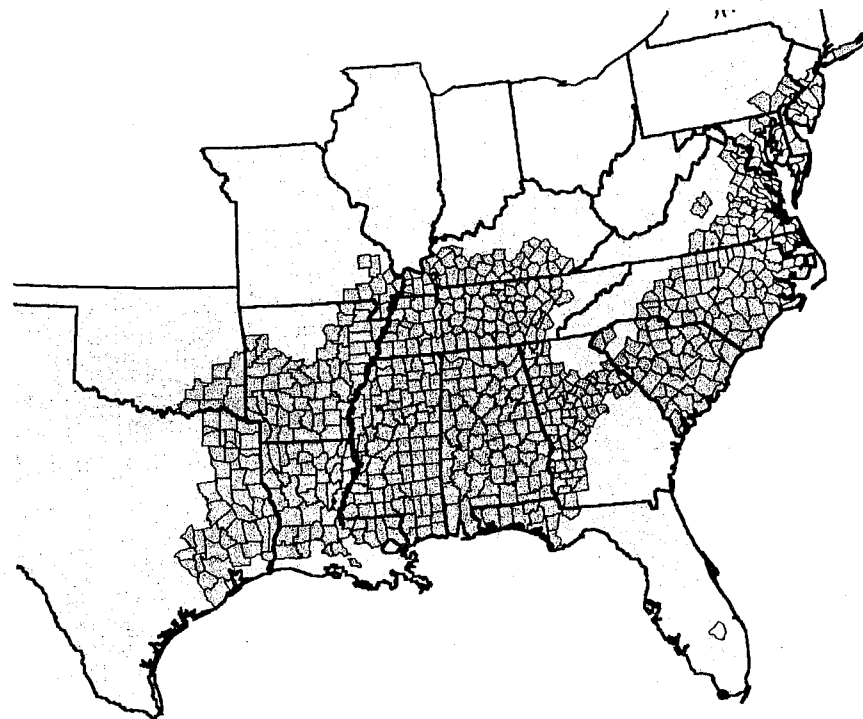
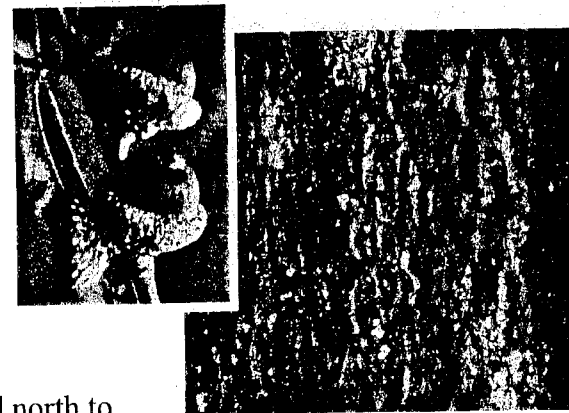


with grayish pubescence. **ACORNS:** biennial; 1 - 2 nearly stalkless acorns, shallow saucer shaped cup with pubescent scales, light brown pubescent inner surface, enclosing up to ⅓ of the nut; nearly oval

nut, ⅜ - ½ inch (10 - 13 mm) long, brown with faint stripes.

**HABITAT:** moist alluvial soils along streams and rivers.

**DISTRIBUTION:** New York, west to Missouri, south to Texas, east to Florida, and north to Delaware.



**COMMENTARY:** Willow oaks are easily transplanted because of their shallow root system. This oak's acorns are an important food source for wildlife. The largest known specimen of willow oak grows in Thomaston, Upson County, Georgia.

# *Quercus rubra* Linnaeus

## Northern red oak

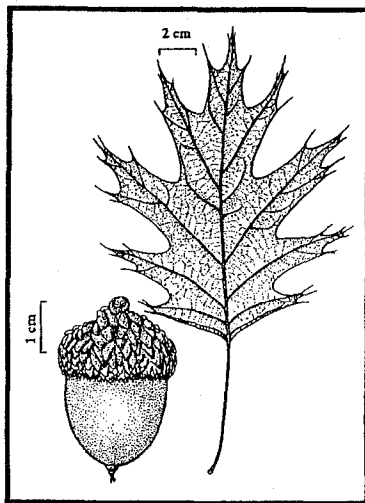
red oak, gray oak, eastern red oak,  
mountain red oak

**GROWTH FORM:** medium to large tree that grows to 100 feet (30.5 m), rounded crown with large branches; fast growing tree that transplants easily, often forming pure stands.

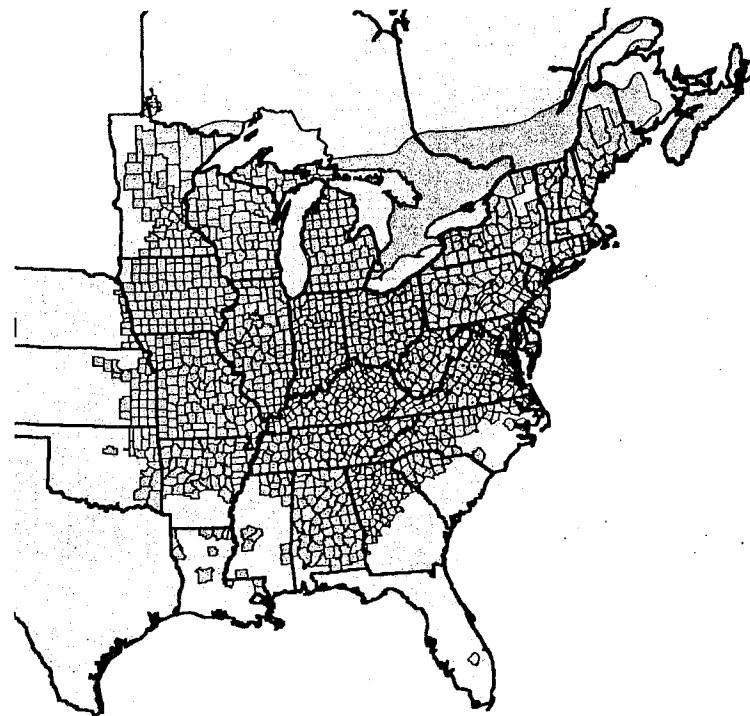
**BARK:** mature bark dark gray to black, shallow furrows separating wide scaly ridges, upper trunk has flat, shiny plate-like ridges, inner bark pink.

**TWIGS and BUDS:** smooth, reddish-brown twigs; ovoid buds are pointed with pubescent chestnut-brown scales.

**LEAVES:** smooth reddish petiole 1 - 2 inches (25 - 51 mm) long; elliptical leaves, 4 ¾ - 8 inches (121 - 203 mm) long, 2 ⅜ - 4 ¾ inches (60 - 121 mm) wide, margin with 7 - 11 lobes, each with 1 - 3 bristle-tipped teeth, sinuses are less than ½ distance to the midrib, base broadly cuneate, apex acute; dull to lustrous dark green above, gray to light yellowish-green below with short axillary tufts of brown



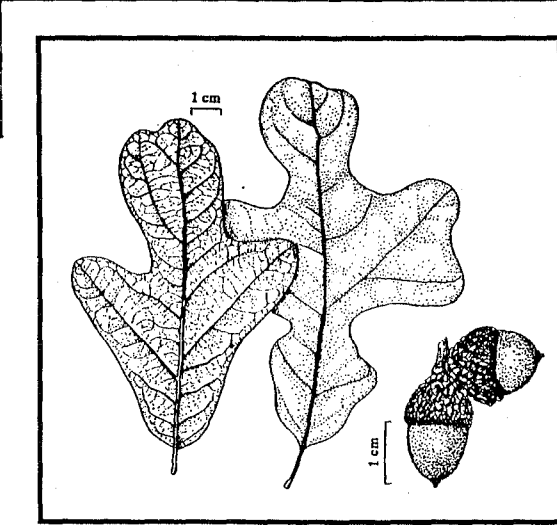
tomentum. **ACORNS:** biennial; 1 - 2 acorns are stalkless or on a very short peduncle, shallow or deep saucer shaped cup enclosing up to ½ of nut, reddish-brown pubescent scales with dark margins, inner surface with ring of pubescence around scar; oblong to nearly oval nut, ⅝ - 1 ¼ inches (16 - 32 mm) long, brown with gray stripes. **HABITAT:** variety of moist soils with a loam texture. **DISTRIBUTION:** Quebec and Nova Scotia, south to South Carolina and Georgia, west to Oklahoma, and north to Ontario.



**COMMENTARY:** Northern red oak is the most valuable timber species in the red oak group. It has been used in construction, flooring, and furniture. The British Royal Navy once used it in shipbuilding. With some taxonomic treatments, populations of northern red oak that had leaves with red petioles and smaller acorns were given the varietal designation of *Q. rubra* var. *borealis*. A source of food for wildlife, it starts fruiting at age 25 and produces substantial crops after 50 years. Acorns germinate in the spring following seedfall. Native Americans utilized northern red oak as medicine for numerous ailments. The largest known specimen grows in Monroe County, New York.

# *Quercus stellata* Wangenheim

Post oak  
iron oak



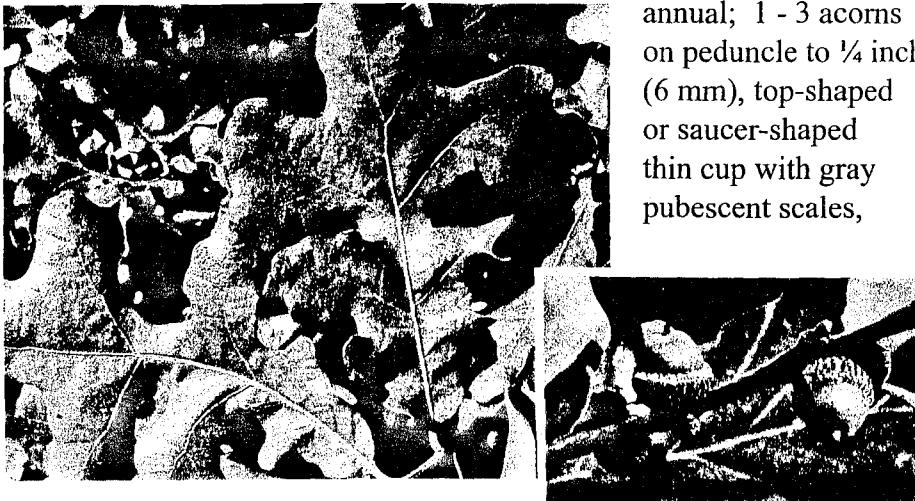
**GROWTH FORM:** shrub to medium sized tree with a dense rounded crown, slow growing up to 85 feet (25.9 m) under good environmental conditions.

**BARK:** gray with shallow fissures and scaly ridges.

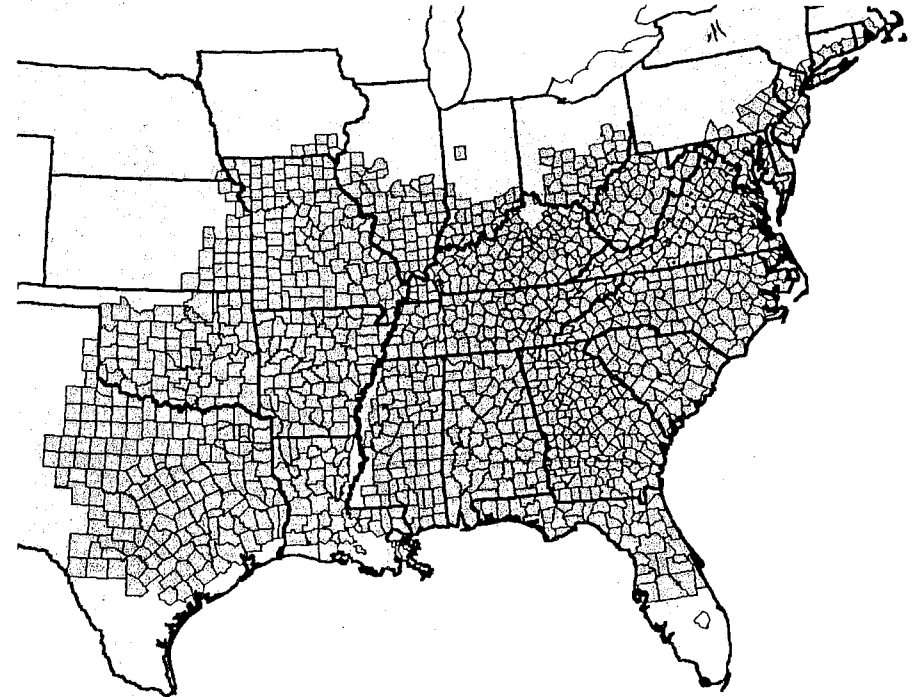
**TWIGS and BUDS:**

pubescent yellowish-gray twigs; chestnut-brown, ovoid buds with pubescent scales and a pointed apex. **LEAVES:** petiole  $\frac{1}{8}$  -  $\frac{5}{8}$  inch (3 - 16 mm) long; thick and leathery obovate leaf, 1  $\frac{1}{2}$  - 6 inches (38 - 152 mm) long,  $\frac{3}{4}$  - 4 inches (19 - 101 mm) wide, margins with 5 - 7 shallow to deep lobes, middle lobes are opposite and resemble a Maltese Cross, base attenuate-rounded, apex rounded; dull or shiny dark green above with rough texture, pubescent yellowish to gray-green beneath, star-shaped

hairs. **ACORNS:** annual; 1 - 3 acorns on peduncle to  $\frac{1}{4}$  inch (6 mm), top-shaped or saucer-shaped thin cup with gray pubescent scales,



enclosing  $\frac{1}{4}$  -  $\frac{2}{3}$  of the nut; rounded, light brown nut, may have dark brown faint strips,  $\frac{3}{8}$  -  $\frac{3}{4}$  inch (10 - 19 mm) long. **HABITAT:** occurs on poor upland clay and sandy soils. **DISTRIBUTION:** Massachusetts south to Florida, west to Texas, north to Iowa, and east to Pennsylvania.



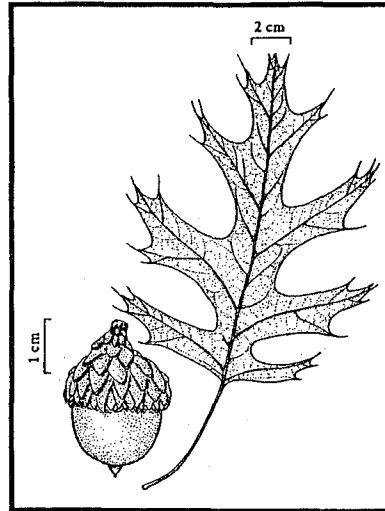
**COMMENTARY:** Post oak is a valuable timber species marketed as white oak. Post oak is drought resistant and can be used on drier sites in the landscape plantings. The extreme western populations in Oklahoma and Texas, existing in harsh conditions, are usually shrubs or small trees. The common name derives from its use as fence posts. Native Americans used post oak as medication. The largest known specimens are growing in Jackson County, Georgia and Surry County, Virginia.

# *Quercus velutina* Lamarck

## Black oak

yellow oak, quercitron oak,  
yellow-bark oak, smooth-bark oak

**GROWTH FORM:** medium to large tree, 50 - 110 feet (15.2 - 33.5 m) in height, open and wide spreading crown. **BARK:** thick dark brown to black bark with deep furrows, rough ridges, yellow or orange inner bark. **TWIGS and BUDS:** smooth to pubescent chestnut-brown twigs, pith star-shaped; ovoid buds with tan pubescence, 5-angled in cross sections. **LEAVES:** petiole 1 - 2 3/4 inches (25 - 70 mm) long, may have sparse pubescence; obovate leaf outline, 4 - 11 3/4 inches (101 - 298 mm) long, 3 - 6 inches (75 - 153 mm) wide, margin has 5 - 9 lobes ending in 1 - 4 bristle-tipped teeth, base obtuse to truncate, apex acute; glossy dark green to yellow green above, pale green with scurfy pubescence and axillary tomentum beneath, raised secondary veins on both surfaces. The pubescence



is shed during late summer.

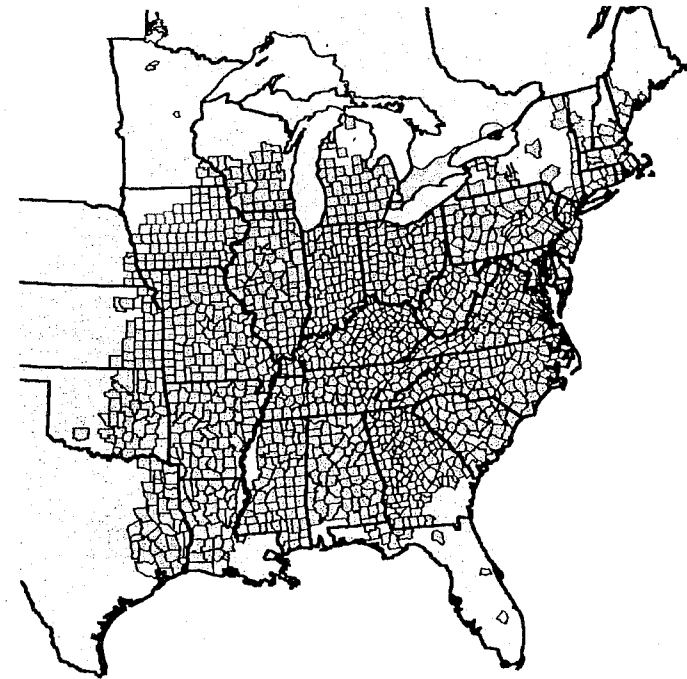
**ACORNS:** biennial; 1 - 2 short stalked acorns on short peduncle; reddish-brown pubescent cup, thick top-shaped with fringed edge, pubescent inner surface covers up to



1/2 of nut; ovoid to elliptical nut, up to 3/4 inch (19 mm) long, light reddish-brown with faint stripes. Nut germination is in the spring following seedfall.

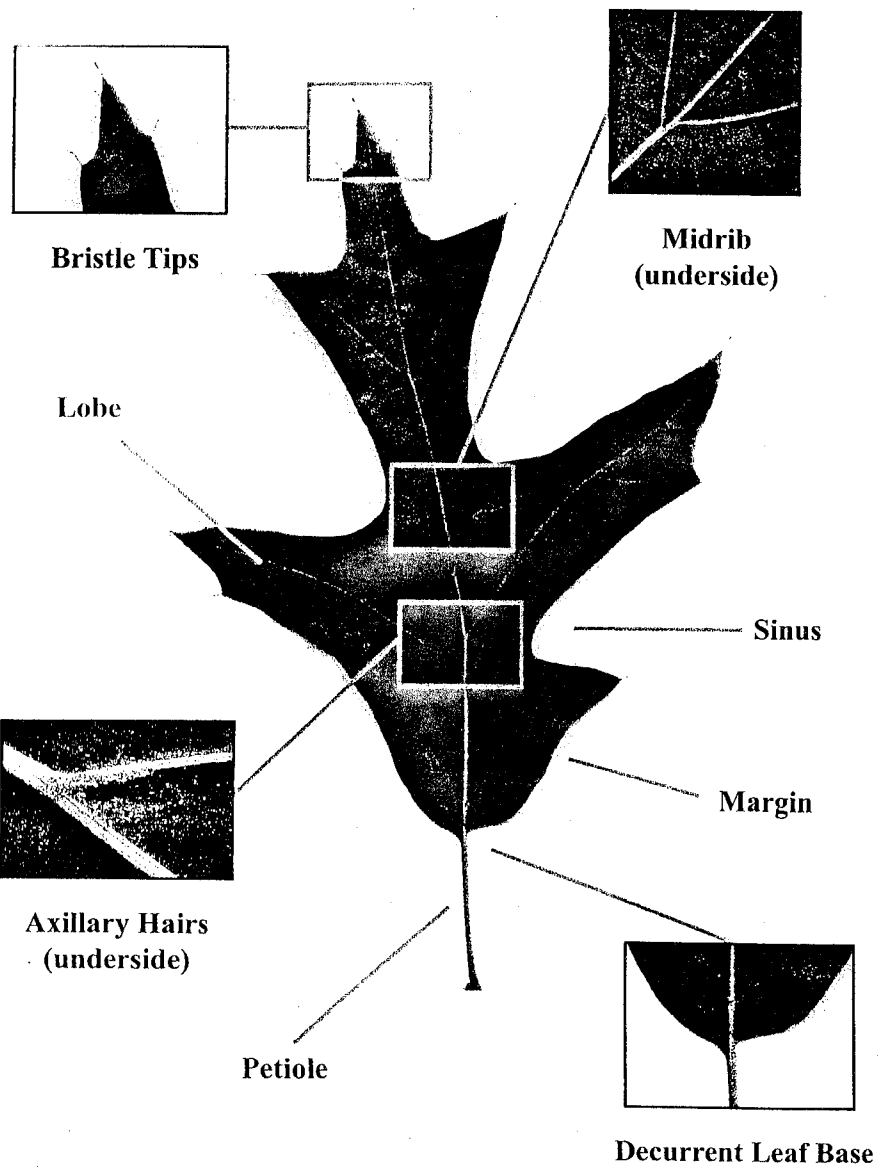
**HABITAT:** dry uplands but grows best on lower slopes in rich well-drained soils.

**DISTRIBUTION:** Maine west through Ontario to Minnesota, and south to Texas and Florida.



**COMMENTARY:** Black oak is a valuable timber species marketed as other red oaks. The bark was once used as a source for the yellow dye, quercitron, and for tannins to tan leather. Acorns are a food source for turkey, ruffed grouse, songbirds, deer, squirrels, and other small mammals. Black oaks begin to produce acorns at age 20, with optimum production at 40 - 75 years. The largest known specimen occurs in Westmoreland County, Virginia.

## Leaf Characteristics



Illustrated examples of typical leaf characters used for field identification of oak species. Scanned image of southern red (*Quercus falcata*).

## Oak Groups\*

Leaf blade entire, or lobed with shallow or deep sinuses; lobes and apex armed with bristled tip

**Red Oak Group** ..... 123



Leaf blade entire, dentate, sinuate, or lobed with shallow or deep sinuses; lobes and apex without bristled tips, leaves without lobes lack bristle at apex but may have mucronate tip

**White Oak Group**.....136



\* Characteristics in this key are based upon mature leaves exposed to full sunlight. Oaks normally associated with southwestern species are included in this key if their distributions extended east of the 100<sup>th</sup> meridian.

## GLOSSARY

**Acorn.** A single nut, circular in cross section with a scaly cup attached at the base.

**Acuminate.** The leaf tip is narrowed abruptly into a tapering point.

**Acute.** Either the leaf tip or the leaf blade ends in an angle less than 90° and the tip is not prolonged into a point.

**Allelopathy.** Organic chemicals released by one plant that have a detrimental effect on the germination, growth, or metabolism of a different plant.

**Annual.** Acorns that mature in one growing season.

**Apex.** Tip, terminal end, or the narrowed and pointed end.

**Appressed.** Lying close and flat against.

**Ascocarps.** Sexual fruiting bodies of ascomycete fungi.

**Attenuate.** Leaf blade tapering to a long slender point.

**Awn.** A small pointed process or slender bristle.

**Axillary.** Situated in or growing from the angle formed by the junction of a vein and the midrib of a leaf.

**Biennial.** Acorns that mature in two growing seasons.

**Bristle-tipped.** The leaf tip and lobes are prolonged into a long slender bristle.

**Ciliate.** Margin fringed with short hairs.

**Cordate.** Heart-shaped with the base rounded and notched where the blade is attached to the petiole.

**Cuneate.** The leaf base is shaped like a wedge with straight sides tapering down to a point on the petiole.

**Cup.** Basal covering of an acorn.

**Decurrent.** Leaf blade extends down the petiole.

**Dentate.** The leaf margin has wide-angled teeth pointing outward.

**Distal.** Far from the point of attachment.

**Elliptical.** Leaf shaped like an ellipse with both the tip and base sloped uniformly.

**Entire.** Leaf margin is a smooth, even line with no indentations.

**Glabrous.** Smooth, not pubescent or hairy.

**Glandular.** Bearing glands.

**Glaucous.** Surface is covered with a whitish bloom that rubs off.

**Lanceolate.** Leaf shape is several times longer than wide and broadest below the middle, shaped like a spear point.

**Lateral.** Relating to the side.

**Lenticel.** Lens-shaped corky growths on young bark.

**Lobe.** The division of a leaf blade.

**Margin.** The edge of a leaf.

**Midrib.** The central vein or associated area of the leaf.

**Mucronate.** Lobe tip ends abruptly in a short, small point.

**Nut.** In the text, it is a general reference to the acorn, the 1-seeded nut of an oak (see acorn).

**Oblanceolate.** Leaf shape is somewhat lanceolate but is widest above the middle and tapering toward the petiole.

**Oblong.** Longer than broad with rounded ends and sides nearly parallel.

**Obovate.** Leaf shape is broadly egg-shaped and widest above the middle.

**Obtuse.** The leaf tip tapers abruptly to a blunt or rounded point forming an angle greater than 90°.

**Ovate.** Egg-shaped in outline; broad end at the base with the tip acute or rounded.

**Peduncle.** Stalk supporting one or more acorns.



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**Petiole.** Slender stem-like structure that supports the leaf blade.

**Pith.** Center of a stem.

**Pubescent.** Covered with fine soft short hairs.

**Revolute.** Edge of leaf is slightly rolled or turned under.

**Rhizomatous.** Thickened subterraneous stem producing shoots above and roots below.

**Rounded.** The leaf tip or leaf base makes a full arc in outline, U-shaped base.

**Rugose.** Wrinkled.

**Sessile.** Without a stalk or petiole.

**Sinuate.** The margin bends in a strong wavy line without producing a sinus.

**Sinus.** The space between two lobes of a leaf.

**Spatulate.** Leaf shape is broad and rounded above the middle but with the sides wedge-shaped and tapering toward the petiole.

**Stellate.** Resembling a star in shape or cross section.

**Tomentulose.** Slightly pubescent with matted (woolly) hair.

**Tomentum.** Densely pubescent.

**Tooth.** An edge or lobe of a leaf blade divided into toothlike projections, usually ending in a slender bristle.

**Truncate.** Leaf base almost forms a straight line at right angles to the midrib.

**Vein.** A rib-like thickened tissue in the leaf blade.

**Woolly.** Covered with long matted hairs.

**Xerophytic.** Structurally adapted for survival with a limited supply of water.