

Quercus alba: White Oak¹

Edward F. Gilman, Dennis G. Watson, Ryan W. Klein, Andrew K. Koeser, Deborah R. Hilbert, and Drew C. McLean²

Introduction

White oak is a long-lived, slow-growing tree, reaching 60 to 100 feet in height with a spread of 50 to 80 feet in its native bottomland soil. Old specimens can be massive, growing to be several hundred years old. Since trunks can be six feet in diameter leave plenty of room for this tree in the landscape. The trunk flares out at the base lifting sidewalks and curbing if planted in tree lawns less than eight feet wide. The red fall color is fairly reliable year to year and is outstanding among the oaks in USDA hardiness zones 8a and colder areas. Brown leaves may be held on the tree into the early part of the winter.

General Information

Scientific name: *Quercus alba*

Pronunciation: KWERK-us AL-buh

Common name(s): white oak

Family: *Fagaceae*

USDA hardiness zones: 3B through 8B (Figure 2)

Origin: native to the eastern half of the United States, and southern Quebec and Ontario, Canada

UF/IFAS Invasive Assessment Status: native

Uses: specimen; parking lot island > 200 sq ft; tree lawn > 6 ft wide; highway median; shade



Figure 1. Full Form - *Quercus alba*: white oak
Credits: UF/IFAS

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2. Edward F. Gilman, professor emeritus, Environmental Horticulture Department; Dennis G. Watson, former associate professor, Department of Agricultural and Biological Engineering Department; Ryan W. Klein, graduate assistant, Environmental Horticulture Department; Andrew K. Koeser, assistant professor, Environmental Horticulture Department, UF/IFAS Gulf Coast Research and Education Center; Deborah R. Hilbert, graduate assistant, Environmental Horticulture Department, GCREC; and Drew C. McLean, biological scientist, Environmental Horticulture Department, GCREC; UF/IFAS Extension, Gainesville, FL 32611.

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Figure 2. Range

Description

Height: 60 to 100 feet

Spread: 50 to 80 feet

Crown uniformity: irregular

Crown shape: pyramidal, round

Crown density: moderate

Growth rate: slow

Texture: medium

Foliage

Leaf arrangement: alternate

Leaf type: simple

Leaf margin: lobed, parted

Leaf shape: obovate, oblong

Leaf venation: pinnate



Figure 3. Leaf - *Quercus alba*: white oak
Credits: UF/IFAS

Leaf type and persistence: deciduous

Leaf blade length: 2 to 8 inches

Leaf color: blue green and shiny on top, paler green to almost white underneath with slight pubescence

Fall color: red

Fall characteristic: showy

Flower

Flower color: male – yellow-green; female – reddish-green

Flower characteristics: not showy; male – 2 to 4 inch long catkins; Female – spike that emerges from leaf axils

Flowering: mid spring, with the leaves



Figure 4. Flower - *Quercus alba*: white oak
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Fruit

Fruit shape: oval

Fruit length: ½ inch

Fruit covering: dry or hard pubescent acorn; cap is bowl-shaped, thin, flattened, slightly pubescent, and covers 1/3 to 1/2 of the nut

Fruit color: orange-brown

Fruit characteristics: attracts squirrels/mammals; not showy; fruit/leaves a litter problem

Fruiting: early fall

Trunk and Branches

Trunk/branches: branches droop; showy; typically one trunk; no thorns

Bark: whitish, scaly, and flaking in irregular blocks or plates with age, smooth patches are also common

Pruning requirement: little required

Breakage: resistant

Current year twig color: brown

Current year twig thickness: medium, thick

Wood specific gravity: 0.68



Figure 5. Fruit - *Quercus alba*: white oak
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Figure 6. Bark - *Quercus alba*: white oak
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Culture

Light requirement: full sun to partial shade

Soil tolerances: clay; sand; loam; acidic; moist but well-drained

Drought tolerance: moderate

Aerosol salt tolerance: high

Other

Roots: not a problem

Winter interest: yes

Outstanding tree: no

Ozone sensitivity: tolerant

Verticillium wilt susceptibility: resistant

Pest resistance: resistant to pests/diseases

Use and Management

White oak has a stately silhouette all year long. It is one of the best-looking oaks in the winter due to the light grey, platey bark and open crown. The trunk is straight with main branches well-attached to the tree making this a long-lived, durable tree for large, wide-open landscapes. Best to leave the area within the drip line totally undisturbed if attempting to save an existing tree on a construction site.

Transplant white oak when the trees are young since the deep-growing tap root in well-drained soil can make transplanting very difficult. White oak grows in sun or partial shade and prefers an acid, moist, well-drained soil. Unfortunately, it is not readily available in the nursery trade. Not adapted to dry areas. Supply new transplants with plenty of water and mulch the area beneath the canopy to eliminate grass competition.

Propagation of oaks by seed is the most common, but horticulturists are developing techniques for vegetative propagation.

Pests

None normally serious. In spite of a long list of pests found on the oaks, white oak is long-lived and durable if given enough room to develop.

Galls cause homeowners much concern. There are many types and galls can be on the leaves or twigs. Most galls are harmless so chemical controls are not suggested.

Scales of several types are usually controlled with sprays of horticultural oil.

Aphids cause distorted growth and deposits of honeydew on lower leaves. On large trees, naturally-occurring predatory insects will often bring the aphid population under control.

Boring insects are most likely to attack weakened or stressed trees. Newly planted young trees may also be attacked. Keep trees as healthy as possible with regular fertilization and water during dry weather.

Many caterpillars feed on oak. Large trees tolerate some feeding injury without harm. Trees repeatedly attacked, or having some other problem, may need spraying. Tent caterpillars form nests in trees then eat the foliage. The nests can be pruned out when small. Where they occur, gypsy moth caterpillars are extremely destructive on oaks, especially white oak. Fall cankerworm has been a problem in some years.

Twig pruner causes twigs to drop off in the summer. The larvae ride the twig to the ground. Rake up and destroy fallen twigs.

Lace bugs occasionally suck juices from leaves causing them to look dusty or whitish gray. They are usually not serious.

Leaf miners cause brown areas in leaves. To identify leaf miner injury tear the leaf in two across the injury. If the injury is due to leaf miner, upper and lower leaf surfaces are separate and black insect excrement will be seen.

Diseases

None normally serious. In spite of a long list of pests found on the oaks, white oak is long-lived and durable if given enough room to develop.

Anthrachnose may be a serious problem in wet weather. Infected leaves have dead areas following the midrib or larger veins. These light brown blotches may run together and, in severe cases, cause leaf drop. Trees of low vigor, repeatedly defoliated, may die. Trees defoliated several years in a row may need spraying, to allow the tree to recover.

Canker diseases attack the trunk and branches. Keep trees healthy by regular fertilization. Prune out diseased or dead branches.

Leaf blister symptoms are round raised areas on the upper leaf surfaces causing depressions of the same shape and size on lower leaf surfaces. Infected areas are yellowish-white to yellowish-brown. The disease is most serious in wet seasons in the spring but it usually does not need to be treated.

A large number of fungi cause leaf spots but are usually not serious. Rake up and dispose of infected leaves.

Powdery mildew coats leaves with white powdery growth but is not a serious problem.

Shoestring root rot attacks the roots and once inside moves upward, killing the cambium. The leaves on infected trees are small, pale or yellowed and fall early. There is no

practical control. Healthy trees may be more resistant than trees of low vigor.

Chlorosis due to iron-deficiency occurs on high pH soil.

Reference

Koeser, A. K., Hasing, G., Friedman, M. H., and Irving, R. B. 2015. Trees: North & Central Florida. University of Florida Institute of Food and Agricultural Sciences.