Quercus alba


©2011 Horticopia, Inc.

Quercus alba

White Oak

Fagaceae (Beech)

Nomenclature: Royal Hort. Society

Type	Tree, woody plant
Hardy range	3B to 9A
Height	50' to 75' / 15.20m to 22.80m
Spread	50' to 80' / 15.20m to 24.40m
Growth rate	Slow
Form	Pyramidal and rounded
Exposure	Partial shade or partial sun to full sun
Persistence	Deciduous

Bloom Color Brown

Leaf Color Green
Fall Color Red
This plant has attractive fall colors.

Fruit Color Brown
The fruit is dry and oval.

Environment
This plant tolerates some drought, occasional wetness and salt well.
This plant will grow in dry to occasionally wet soil.
Suitable soil is well-drained/loamy, sandy or clay.
The pH preference is an acidic to neutral (less than 6.8 to 7.2) soil.

Landscape Uses
- Street tree
- Specimen

Attributes and Features
- Pest tolerant
- Attracts birds
- Inconspicuous blooms
- Inconspicuous fruit
- Fruit can be a litter problem
- Fruit attracts animals
- Sensitive to ozone

Native Habitat
Eastern North America from Southern Canada and Maine to panhandle Florida except in the lower Mississippi River valley on a wide range of soils except very wet or very dry. Adapts well to infertile sites provided they are not extremely dry. Most abundant on northern and eastern middle and lower slopes. Seldom above 500 feet elevation in the north but can be found as a small tree as high as 4500 feet in the southern Appalachians.

Additional Notes
This plant typically grows with one trunk.
This plant has low flammability.
National champion is 96 x 119 feet in Maryland.

Culture Notes
White Oak has a tap root that grows beneath the trunk in soil that drains well, but this is not present on most trees planted on clay or compacted soil. The availability of new nursery production techniques to control root growth should help growers of nursery plants make more of these native trees available. White Oak grows best in moist soil that does not dry out for long periods. It appears to be well suited for planting in most areas within its hardiness range including the high plains and Rocky Mountains. Trees tolerate high soil salt - up to 8 mmhos/cm. Trees compartmentalize decay fairly well meaning that once injured, the tree has the ability slow or stop the spread of decay.

Trees are usually well structured and require little structural pruning after 20 years except to remove dead wood. Early pruning should concentrate on maintaining a central trunk. Branches should be spaced about 18 to 36 inches apart.

This is the state tree of Connecticut, Illinois and Maryland.

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. Water trees faithfully until well established. Chlorosis due to micronutrient-deficiency occurs on high pH soil.

Wood weighs about 65 pounds per cubic foot and is considered ring porous. Oaks serve as larvae host plants for the brown duskywing butterfly (*Erynnis horatius*) and the gray hairstreak (*Strymon melinus*). Tannin is found in both the bark and acorns. Tannin has very powerful antiseptic and astringent properties.

Maintain adequate mulch area

Clear all turf away from beneath the branches and mulch to the drip line, especially on young trees, to reduce competition with turf and weeds. This will allow roots to become well established and keep plants healthier. Prune the tree so trunks and branches will not rub each other. Remove some secondary branches on main branches with included bark. This reduces the likelihood of the main branch splitting from the tree later when it has grown to become an important part of the landscape. Locate the tree properly, taking into account the ultimate size, since the tree looks best if it is not pruned to control size. The tree can enhance any landscape with its delightful spring flush of foliage. It can be the centerpiece of your landscape if properly located.

Due to the coarse root system, the tree is often raised in fabric containers in field soil, is regularly root pruning in the field, or is grown in air root-pruning or copper root-pruning containers. The container systems allow for less circling roots along the edge of the root ball; the field systems may result in a greater portion of the root system harvested.

Spring transplanting best

Balled-and-burlapped and bare root trees recover best when transplanted in late winter or early spring in the cooler portions of North America. This usually corresponds to the initiation of root growth.

Pests, Diseases and Damaging Agents

Pests: None of major concern although the potential list is long. Usually pest-free. Two-lined chestnut borer can attack stressed mature trees. Galls cause homeowners much concern. Scales of several types can infest twigs. Aphids cause distorted growth and deposits of honeydew on lower leaves. Boring insects are most likely to attack weakened or stressed trees. Many caterpillars feed on Oak. Where they occur, gypsy moth caterpillars are extremely destructive on Oaks. Fall cankerworm has been a problem in some years. Twig pruner causes twigs to drop off in the summer. Lace bugs occasionally suck juices from leaves causing them to look dusty or whitish gray. Leaf miners cause brown areas in leaves. Dogwood borer enters the trunk through wounds such as pruning cuts and other mechanical injuries.

Diseases: None of major concern although the list of potential problems is long. Usually disease-free. Anthracnose may be a serious problem in wet weather. Canker diseases attack the trunk and branches. White oak is a potential host for bacterial leaf scorch but some report good resistance. Leaf blister symptoms are round raised areas on the upper leaf surfaces causing depressions of the same shape and size on lower leaf surfaces. A large number of fungi cause leaf spots but are usually not serious. Powdery mildew coats leaves with white powdery growth and is generally harmless. Shoestring root rot attacks the roots and once inside moves upward, killing the cambium. Oak wilt has killed trees. Most oaks are considered resistant to verticillium wilt.

Bacterial leaf scorch causes leaf scorch, premature browning, and gradual decline of trees. There is often a yellow line or hallow separating the scorched tissue from green tissue. This disease can be devastating, especially if a street or property is planted in a monoculture. Infection probably spreads by root grafts and certainly by leafhoppers, spittlebugs and sharpshooters. Pruning tools are not likely to spread the disease. Neither fertilization nor pruning have any effect on treatment of the disease. There may be chemical treatment that can reduce symptoms but nothing will cure an infected tree. Bacterial leaf scorch can kill trees in several years. Chipped branches from infected trees can be used as mulch without danger of spreading the disease.

This genus is sensitive to fluoride air pollution, sources of which include glass and brick manufacturing plants and other facilities that heat or treat with acid materials containing fluoride. Symptoms due to fluoride injury are more prominent on the side of the plant facing the pollution source. In deciduous plants, symptoms include leaf browning along the margins of the leaves. A dark brownish band may appear along the boundary between healthy green tissue and the affected brown tissue. Eventually, the entire leaf may turn brown. In conifers, the tips of the current year's

needles turn reddish brown. Older needles are typically unaffected. If you suspect fluoride has injured this plant, look in the neighborhood for gladiolus plants. They serve as indicator plants for fluoride air pollution damage because they are very sensitive to it. Other sensitive plants include ash, maple, oak, white pine, poplar, and redbud. Plants that resist injury include birch, flowering cherry, dogwood, hawthorn, American linden, juniper, pear, spirea and sweet gum.

This plant is sensitive to damage from ozone air pollution. Damage can occur in urban or rural areas because ozone can travel long distances away from where it is formed. Typical symptoms on deciduous trees are a flecking or stippling only on the upper side of the foliage between large veins. The small spots or flecks are white, tan or orange-red. Spots or flecks from one-eighth to one-quarter inch long appear on needles of sensitive conifers. Yellow bands that girdle the needle may form, eventually causing the tips of the needles to die and/or needles to drop from the plant. If you suspect ozone is causing damage on this plant, locate White Pines (*Pinus strobus*) in the area to see if they are damaged. White Pines are very sensitive to ozone damage and can serve as indicators of the presence of ozone in concentrations high enough to cause plant damage.

Some report this tree as resistant to ozone.