



OAK (*Quercus*) Genus Overview

Quercus is an expansive genus consisting of over 500 species from all corners of the globe. Oaks have long been considered among the strongest and noblest of all woody plants, and exhibit an impressive range of ecological, industrial and horticultural merit. Our native oaks range from shrubby, multi-stemmed plants of the sporadic ‘barrens’ ecotype of eastern North America to the majestically spreading monarchs of Midwestern savannas. Though the Mid-Atlantic representatives of the genus are typically deciduous, dozens of evergreen species occur throughout the world’s warmer temperate and tropical regions. The fruit of all oaks is the familiar acorn which is botanically identified as a nut covered by a cap of scales, or involucre (*in-vol-OO-ker*). The leaves of many oak species are conspicuously lobed, but the genus does include many examples of those with simple, unlobed foliage. Regardless of their individual leaf morphology, all oaks produce foliage in an alternately arranged pattern. The bud scales are imbricate (overlapping) and most oaks feature a cluster of buds at the terminal end of each stem. Oaks are monoecious plants, meaning that both the male flowers (elongated catkins) and female flowers (smaller and much less conspicuous) are borne separately but on the same tree.

Taxonomically, the majority of cultivated oak species are placed in one of two sections: the Red Oak group (section *Lobatae*) and the White Oak group (section *Quercus*). The Red Oaks include those producing acorns requiring two years to ripen. The White Oak group consists of species with acorns that ripen in a single season. A fascinating aspect of this relationship is that all of the species within each section are capable of hybridization, but those in separate sections cannot interbreed. Wherever they grow, oaks provide valuable habitat and nutrition for a variety of wildlife. Historically, oak wood has been used in a variety of industries such as shipbuilding, construction, furniture making and distilling. Oaks have become prominent members of the horticultural community and make for soaring, long-lived specimens for large properties, rural roadways and city streets.

1: *Quercus dentata*

The rare Daimyo Oak (aka Japanese Emperor Oak) is a curious small tree residing on the northwestern corner of Fischer Greenhouse. At just over 20 years of age, our specimen (93-47*1) has grown to about 18 feet tall, but has developed the rough, furrowed bark of a much older tree. This Japanese member of the White Oak clan (Section *Quercus*) features scalloped, obovate leaves reminiscent of native species like Swamp White Oak (*Q. bicolor*) or Chestnut Oak (*Q. montana*). However, the leaves of Daimyo Oak are much larger at up to 12 inches long and 8 inches wide. Like several of its American cousins, the species typically retains a portion of its dried, tawny foliage throughout the winter. This phenomenon is known as marcescence (*mar-SESS-ents*) and can also be observed in Beeches (*Fagus spp.*), Hornbeams (*Carpinus spp.*), and the fabulous Willow-leaved Spicebush (*Lindera angustifolia*). A closer look at the plant’s winter silhouette reveals a rather inelegant framework of velvety young twigs punctuated by fat, equally

pubescent buds. A final quirk is the highly fringed acorn caps that mimic woody sea anemones and reveal very little of the nut itself. Impetuous critics might dismiss its stark appearance as botanical grotesque, but fans of unique arboreal detail will find much to love about *Quercus dentata*.

2: *Quercus ilicifolia*

Our native Bear Oak might challenge some common perceptions of the genus *Quercus*. Also known as scrub oak, this shrubby, diminutive species is restricted mainly to dry, rocky sites in the Mid-Atlantic and southern New England. It is a primary component of the “barrens” habitats found in various locations around eastern North America. These include the sandy, nutrient-deficient soils of the New Jersey Pine Barrens and, more locally, the Chrome Serpentine Barrens near Nottingham, Pennsylvania. The dainty, 2-4 inch long leaves are sparsely lobed, somewhat glossy and recall those of holly (*Ilex*), hence bear oak's specific epithet, “*ilicifolia*.” Bear Oak exhibits a dense, low growth habit and can form impenetrable thickets in its native haunts. Along with a supporting cast of the UDBG's lesser known native oaks, a trio of *Quercus ilicifolia* can be observed in an island planting on the former golf course just east of the UDBG's Lepidoptera Trail. Bear Oak is unlikely to garner widespread ornamental acclaim, but deserves admiration as a hardscrabble indigenous species with a strict ecological disposition.

3: *Quercus myrsinifolia*

The Chinese Evergreen Oak is another small species that contradicts the typical appearance of oaks in this part of the world. It is certainly the cold hardiest of all evergreen *Quercus* species and our accession (94-67*1) has performed admirably at the UDBG for nearly 20 years. It has proven fully evergreen in Zone 7, and could be an exciting possibility for protected Zone 6 sites. The leathery, unlobed leaves closely resemble a Camellia or Cherry Laurel (*Prunus laurocerasus*) at first glance. Moreover, this oak's specific epithet arose from a resemblance of the foliage to that of the tropical genus *Myrsine*. The trademark acorns appear each autumn and give away this plant's true familial connections. To further complicate matters, recent taxonomic work by Chinese botanists places *Q. myrsinifolia* and numerous related evergreen oaks in the genus *Cyclobalanopsis*. Our retention of its former moniker, however, does not change the fact that it forms a tidy, round-headed tree reaching 25-30 feet tall at maturity. The bark is surprisingly smooth, ashy gray and similar to that of an older American Holly (*Ilex opaca*). Chinese Evergreen Oak is more commonly encountered in Southern landscapes, but has excellent potential for wider use in Maryland, Delaware, Pennsylvania and southern New Jersey. Inherent toughness and a reputation for heat and drought tolerance should endear this beautiful Asian oak to those seeking low-maintenance, sustainable landscape plants.

4: *Quercus virginiana*

Live Oak is arguably one of the more “zone-blurring” specimens at the UDBG. Known and loved as the arching, Spanish moss-clad tree of the Deep South and Gulf Coast, *Quercus virginiana* has a natural range extending only to the Tidewater region of southeastern Virginia. It is planted as an ornamental near Richmond, but is noticeably absent from landscapes further north. The UDBG's lone accession (08-43*1) has spent the last 5 years in the protected environment of Townsend Hall's northern courtyard and provides a small taste of home to

southern transplants. Like the hardier and more common Willow Oak (*Q. phellos*), Live Oak also features simple, unlobed leaves with a smooth (entire) margin. The elliptical leaves are glossy and fully evergreen across its native range, but should be expected to drop in response to exceedingly cold conditions in this area. Plants can attain gargantuan proportions where winters remain mild, and typically mature at 50-75 feet tall and nearly twice as wide. Our specimen has little chance of achieving comparable dimensions, but we will remain keenly aware of its performance in light of ongoing climatic conjecture. Might Live Oak become a common shade tree in Newark with further selection from its northernmost seed sources? Ongoing work by the curatorial team of Tony Aiello (Morris Arboretum) and Michael Dosmann (Arnold Arboretum) is centered on identifying such trees. In this time of unprecedented horticultural elasticity, botanical gardens and arboreta will continue to serve as the procurers, evaluators and promoters of new, underused or unknown plants.

5: *Quercus* × *heterophylla*

Bartram's Oak, as this hybrid is known, is one of the UDBG's largest and most prominent specimen trees. It is also an excellent example of the promiscuous intra-sectional inclinations of many oaks. In fact, many of the possible progenic combinations have been granted unique names by botanists. But one example, *Quercus* × *heterophylla* represents a natural cross of our native Red Oak (*Q. rubra*) and Willow Oak (*Q. phellos*). The leaves intuitively reveal the genetic contribution of each parent in their elongated shape and shallow, pointed lobes. This oak is named in honor of American's forefather of botany, John Bartram, who was the first to identify the plant near the site of his Philadelphia home and garden. Our humbling specimen (69-54*1) towers over the northern section of the Clark Garden along South College Avenue. It provides ample shade to the collection of rhododendrons and azaleas planted around its base. When you consider this stately tree's eventual height of 60-80 feet, the planting of Bartram's Oak is truly a gift to future generations.

Works Cited

- Dirr, Michael. 2009. *Manual of Woody Landscape Plants*. 6th ed. Stipes Publishing LLC, Champaign, IL
- Dosmann, Michael and A. Aiello. 2013. *The Quest for the Hardy Southern Live Oak*. *Arnoldia*. 70(3). 12-24.
- Stein, J., D. Binion and R. Acciavatti. 2003. *Field Guide to Native Oak Species of Eastern North America*. USDA Forest Service, Morgantown, WV

**Please reference Oak Featured Selections Map pdf
for locations of these oaks at UDBG.**