

We - the members of the International Oak Society - are very excited about the newly named National Tree of the United States: the genus *Quercus*! If you are concerned about global warming, you probably know that planting more trees is something that we all can do to help. However, even with massive reforestation efforts, our climate situation will deteriorate further before it begins to stabilize. During the expected lifetime of the shade trees that you might plant next spring, our anthropogenic greenhouse effect may force the natural ranges of many mesic tree species north into Canada, if they survive at all. So, if you live in an area where such trees may be in jeopardy, increase your odds by planting tougher species that are adapted to the projected shift in climate isopleths -- PLANT OAKS!

Oak trees are an ancient and diverse tribe comprised of species that collectively will thrive in the best, but handle many of the worst, planting sites we have to offer. As early as 1924, the famous Oak student, William Trelease, had recorded 371 *Quercus* species in the Western Hemisphere. Most of them occur in the Nearctic Realm, chiefly in the United States and Mexico. The genus includes ecological generalists that are broadly adapted as well as specialists tailored to some of our most severe sites. From a landscape horticulture perspective, let's review some of the better known and most promising examples.

#### AN OAK FROM YESTERDAY

In the past, "Oak" unfortunately has meant "Pin Oak" (*Quercus palustris*) to many people. *Quercus palustris* is a nurseryman's tree: easy to propagate; easy to transplant; fast growing; and naturally blessed with a marketable, excurrent growth habit. However, the tree must be pruned into a lollipop to fit the average yard without

having its pendent, persistent lower limbs usurp the entire lawn. Its low, twiggy growth frequently becomes a traffic hazard in boulevard plantings.

The species also is notoriously intolerant of high pH soils, a trait which frequently is not expressed until the tree is well established in the landscape with its roots exploring beyond the transplanted, acidic nursery soil ball. Suddenly one summer, perhaps with the catalytic effect of the drought, the hapless homeowner might discover that he has planted a chlorotic invalid of a tree that must be acidified, chelated, injected or replaced. Except for those who have moist, acidic soil and plenty of ground-level growing space to accommodate its drooping lower branches, the overused *Q. palustris* should be considered the Oak of the past.

For the 1990's and beyond, there are other Oaks that truly are outstanding performers. Demand for quality landscape trees is increasing so that progressive nurs-

erymen now recognize this market and feel comfortable investing in the production of such species. As the public becomes ever more aware of true "value" landscaping, the supply/demand spiral will bring still more diversity to the *Quercus* sections of nursery catalogs.

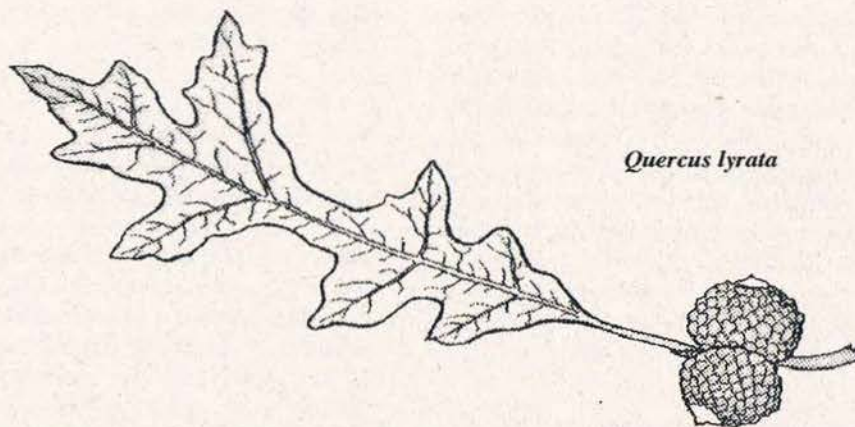
#### OAKS FOR TODAY -- BLACK OAKS (Subgenus *Erythrobalanus*)

The Black (or Red) Oak subgenus is purely American, being endemic to the Western Hemisphere. It includes many of the faster growing and most colorful species of *Quercus*. One of the earliest Oaks to follow *Q. palustris* into popularity throughout much of the United States has been *Q. rubra*, the Northern Red Oak. It is a handsome, pollution-resistant species with a clean branching pattern, good crimson or other fall color and attractive dark bark that develops smooth ridges which almost appear as stripes on vigorous specimens. The tree is relatively easy to transplant (in the early

---

## AMERICAN OAKS IN THE LANDSCAPE

---



spring, as with most Oaks) and if moved when two inches or less in diameter, it recovers quickly. Once established, it is quite drought resistant.

The fast-growing *Q. rubra* can become one of our largest deciduous trees in a relatively short time. It is amenable to most average soils, but will respond best to its favorite - rich, well drained, moist, cool clay-loam. The acorns are variable in size and shape from provenance to provenance and from tree to tree. I currently am testing progeny at Starhill Forest from individual well-formed trees with large acorns (for mast production) as well as some with small acorns (for smaller birds and for landscape use with minimal litter problems), and several researchers are making selections for timber production as well.

This species is one of our hardiest Oaks, growing naturally (with somewhat reduced stature) as far north as Lake St. John, Quebec. For more southerly regions, and especially where poor soil or imperfect drainage is a concern, *Q. shumardii* (Shumard Oak) is an almost identical substitute. Another closely related, beautiful southern species useful in poor, dry soils is *Q. falcata*, the Southern Red Oak, which has particularly attractive foliage on selected individuals. For those dry soil conditions of the North, *Q. velutina* (Eastern Black Oak) is a hardy tree with spectacular foliage, from scarlet budbreak through glossy maturity to amber senescence. It is more prone to decay than some others, though, and should be trained when young into a strong growth form with a single dominant leader.

Those who seek a tree more reminiscent of the conical *Q. palustris* might try *Q. coccinea* (Scarlet Oak) on upland or sandy sites, or the fast-growing *Q. nutallii*

(Nuttall Oak) on heavy soils and low ground. Both trees are brilliantly colored in autumn and closely resemble *Q. palustris* in form and foliage.

Another very good choice within subgenus *Erythrobalanus* for landscape use is *Q. imbricaria* (Shingle Oak). Admittedly inferior for timber purposes, this species seems to have been created purely for ornamental horticulture. Its uniform, dense oval growth habit also is comparable to *Q. palustris*, but more rounded and less pendulous. It becomes a medium-sized tree, more suited to the scale of residential suburbia than our largest Oaks. Its acorns are small and inoffensive from a litter standpoint, sifting down among blades of grass or chunks of mulch until they are claimed by birds or squirrels.

*Quercus imbricaria* is as easily transplanted as any oak and is one of the most adaptable of generalists to a variety of exposures and soil types. Its fall color is interesting but not always understanding, varying from greenish-gold to crimson to a warm russet-brown. Many of its leaves may persist through most or all of the winter, adding to its ornamental, screening and wildlife value. While *Q. imbricaria* is hardy throughout most of the central and eastern states, southerners also might try the similar, narrower-leaved *Q. phellos* (Willow Oak) or the equally popular and highly variable *Q. nigra* (Water Oak). Both are at home in wet, sandy or tight soils and have foliage and habit akin to *Q. imbricaria*.

*Quercus marilandica* (Blackjack Oak) is a "scrub" species that can be attractive, dense, small tree for those who have less room. Although often slow growing and unkept in its rigorous native habitats, which range from dune sand to adobe clay, this species makes a pleasant, tough little tree

when brought into cultivation at a young age or grown from seed; do not attempt to transplant wildlings of any size, though, unless you are equipped to dig to China! Other "scrub" Black Oaks, including *Q. ilicifolia* (Bear Oak), *Q. georgiana* (Stone Mountain Oak) and *Q. laevis* (Turkey oak) also can be domesticated into attractive small trees where they are adapted and available locally. They all have beautiful fall color, ranging from russet-orange of *Q. marilandica* to scarlet in some of the others and are impervious to drought. For those so inclined, these diminutive species might serve well as subjects for miniature culture as Bonsai or Penjing, for topiary, or as anchors for the shrub border.

---

#### MORE OAKS FOR TODAY THE WHITE OAKS (Subgenus *Lepidobalanus*)

---

The White Oak subgenus, which is considered by many authorities to include several minor European and Asian sections, classified as separate subgenera by others, includes the species with the greatest stature, longest lifespans, sweetest acorns, most durability, and slowest growth rates of the Oaks. Due to the absence of significant peroxidase enzyme incompatibilities (per Dr. Frank Santamour), this subgenus is much easier than *Erythrobalanus* to propagate asexually by grafting, so horticultural selections of some species already are available in the nursery trade.

As Andrew Jackson Downing wrote in 1847 of "our finest and hardiest Oaks - rich in foliage and grand in every part of their trunks and branches" his description singles out most precisely the tree that I consider to be the standard-bearer for the entire White Oak subgenus - *Q. macrocarpa*, the Bur Oak. An adaptable inhabitant of

many landscapes, from prairie groves and savannas to both upland and riparian forests, it ranges from the Texas Gulf coast to the latitude of Reindeer Island in Lake Winnipeg, Manitoba! Throughout this vast range, *Q. macrocarpa* is the archetype of permanence and venerability.

It begins life as a slow-growing, awkward, sparsely branched sapling - the ugly duckling of Oaks. Then it attains a diameter of about three inches and starts a transformation into a rugged, massive monarch with a potential lifespan of many centuries. The characteristic corky bark and picturesque form improve as the tree matures, and old age can be associated with immense size in the more hospitable portions of its range. Favorable growing conditions also can coax the tree into episodic flushing (buds breaking summer dormancy and adding a second year's growth the same Year). This tends to compensate to some extent for its usual slow growth rate.

The leaves of *Q. macrocarpa* are deprived of the brilliance that enlivens many other Oaks in autumn, but they are dark and lustrous all summer, with contrasting abaxial surfaces that flash in the wind. *Q. macrocarpa* is undaunted by heat, cold, drought, flash floods, prairie fires, a wide soil pH range, climbing boys, and city conditions. The only serious threats affecting it are lightning and "bulldozer blight," both of which frequently are fatal to old patriarchs.

While local provenances are recommended in general for planting all trees, I am successfully growing *Q. macrocarpa* individuals from seed sources several hundred miles north and south of my location. Such trees appear quite distinct from their local counterparts, in evidence of the clinal variation (or introgression) for which the species is well known, but they are growing

well here in Illinois under cultivation. It will be interesting to compare their sizes and growth forms in a few hundred years!

*Quercus macrocarpa* is named for the tangerine-sized fruits of some southern provenances, particularly those in the Wabash Valley of Illinois and Indiana. However, like those of *Q. rubra*, the acorns vary considerably in size among different ecotypes. They can be so sweet that selections have been made for nut tree orchard planting. Obviously, these acorns will not constitute a serious litter problem in the maintained landscape if squirrels and other wildlife, livestock or health food enthusiasts, have access to them!

This species should be grown from seed, transplanted when small, or tended as a spontaneous volunteer if possible. Larger specimens can be moved with a mechanical transplanter that will dig a deep, conical rootball, or hand-dug if they were undercut by the nurseryman when young. The root physiologists who claim trees don't have taproots (based upon research in claypan soils) have never dug a *Q. macrocarpa* grown in good loam; a three-inch tree can have a carrot sixteen feet long!

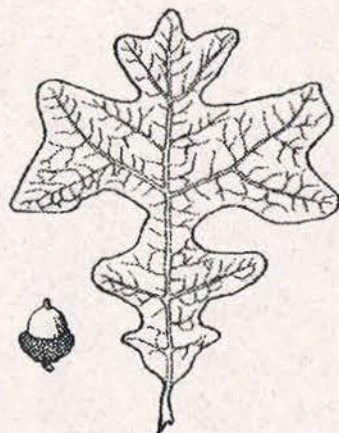
If you like *Q. macrocarpa* but need a tree that's easier to transplant, or more tolerant of soggy soil, try some of its first cousins: *Q. lyrata* (Overcup Oak) or, in cold climate areas, *Q. bicolor* (Swamp White Oak). *Quercus lyrata* is a round-headed, lustrous, southern swamp substitute which can be grown at least as far north as central Illinois from northern seed types. The more northerly *Q. bicolor* reputedly is the easiest of the White Oaks to transplant; it has attractive peeling bark on its smaller branches, and color-contrasting ("bicolored" leaves, which shimmer in the wind like those of *Q. macrocarpa*. Along with *Q. lyrata*, it toler-

ates tight or wet soil and thrives on better sites when planted in the landscape, but neither tree shares the tolerance of *Q. macrocarpa* for high pH.

*Quercus michauxii*, the Swamp Chestnut Oak, is a tree of similar habits. It has fiery autumn color, which shows to advantage against its nearly white bark, and develops into a tall and majestic specimen. If you need one of the Chestnut Oaks for drier sites, *Q. prinus*, the Rock Chestnut Oak, is a tough and colorful tree available at many nurseries. And if extremely high pH soil is your concern, whether wet or dry, choose *Quercus muehlenbergii*, the Yellow Chestnut Oak or Chinkapin Oak - nothing else will do as well. All of the trees in this group have sweet acorns, attractive bark and foliage, and interesting branching patterns.

The real comparison for all White Oaks (and all other Oaks as well) is *Quercus alba*, the Eastern White Oak. An ancient, dramatic, open-grown *Q. alba* is a Druid's dream and probably was the actual inspiration for Downing's 1847 admiration. Nearly as hardy and picturesque as *Q. macrocarpa*, this species' population has a more eastern concentration (and was very common in the Hudson Valley that Downing knew so well) but shares much of the central range of *Quercus macrocarpa* also. *Quercus alba* is a superior timber tree and has excellent fall color, among the best of its subgenus. The tree is limited horticulturally by immitigable slow growth and difficulty in transplanting, and has a preference for acidic soil; but, like *Q. macrocarpa*, it will be the living legacy we leave for our great-grandchildren when lesser trees have followed us to the grave.

As with subgenus *Erythobalanus*, the ranks of subgenus *Lepidobalanus* include some species that are scaled down to smaller



*Quercus stellata*

spaces. *Quercus stellata* (Post Oak) can become fairly large but usually is a medium-sized tree. It has heavy, glossy foliage that may yield good color over an extended fall season. Once established, the species is drought immune, but it is extremely slow to develop and cannot be transplanted easily in larger sizes.

Still smaller species include *Quercus prinoides*, the Dwarf Chestnut Oak of the midwestern and eastern states, *Q. gambelli* (Utah White Oak) of the Rocky Mountains, and many others of the deep South, Southwest and far West. They make interesting pets for the small garden and have the same potential for creative pruning as the shrubby *Erythobalanus* species.

Around the milder maritime fringes of the United States, several outstanding native Oaks are adapted locally. The magnificent *Q. virginiana* (Southern Live Oak) and its evergreen counterparts in California, together with the awesome *Q. lobata* (Valley Oak), *Q. douglasi* (Blue Oak), and *Q. garryana* (Gary Oak) are White Oaks which should be preserved where they occur and planted where they are adapted.

Many interesting Oaks, both trees and shrubs, also inhabit semi-arid portions of the Southwestern United States and Mexico. Many are evergreen and some of those which occur at high elevations may have potential for selection or breeding for cold tolerance farther north. Perhaps evergreen Oaks will be a possibility for mid-latitude areas of the United States in the future.

---

#### OAKS FOR TOMORROW THE CLONES AND HYBRIDS

---

It seems that horticulturists never are content with plant species, no matter how diverse and useful those species might be. We all want to find something special, or be creative and tinker with nature. Now that cloning and grafting problems with Oaks are being overcome, *Quercus* can serve as an endless source for such delights.

Individual trees of many species can be highly variable, inviting selection for various horticultural qualities. And with (but not between) their respective subgenera, Oaks seem to be almost universally interfertile -- spontaneous hybrids are everywhere, and serious plant breeders can foster thousands more by planting allopatric species in close proximity or by intervening directly with transfer of pollen from distant areas. We are just beginning to explore the possibilities of artificial pollination of Oaks.

Hybrid Oaks can offer three major advantages:

1. The opportunity to garnish good species with special qualities from related species
2. The introduction of heterosis ("hybrid vigor") for faster growth, better color, etc., than that expressed by either plant.
3. The excitement of exploring the unknown and the potential for discovery.

Several Oak hybrids are beginning to appear in the nursery trade already, as seed or F2 seedlings. One of the most promising for future release as F1 clonal material is a selection of *Quercus x saulii* (*Q. prinus* pistillate x *Q. alba* staminate) which displays brilliant fall color over an extended season on a tree with outstanding form, foliage and vigor. Another is not yet a determined cross of *Q. alba* by *Q. macrocarpa* and/or *Q. muehlenbergii*, which exhibits all of the best qualities of *Q. alba* on a tree with exceptionally fast growth. Several hybrids of American *Lepidobalanus* species with European and Asian species also show tremendous promise.

This introductory article has merely scratched the surface of the potential *Quercus*, the United States' National Tree. While it seldom is advisable to encourage exclusive use of any genus as a monoculture, Oaks should become a primary component of the Americas' nucleus of trees for the future. Δ



*Quercus macrocarpa*