

Survival of the Most Adaptable

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Botanic gardens and arboreta are great places for the adventurous gardener to explore for plants and new ways to use them. Tucked into out-of-the-way, often untidy corners one can find plants that are refreshingly different from those offered by the trendy horticultural industry or seen in our monotonous suburban landscapes. Often these plants have been underutilized because they cannot meet the demands of a horticultural marketplace that requires rapid turnover. Botanic gardens, by contrast, are islands of stability where plants can grow and develop at their own pace. This is especially important in the case of trees, which can be very slow to develop, often taking fifteen to twenty years to produce flowers or cones.

A brief summary of how plants become part of botanic garden collections will illustrate the value of these collections for the gardener interested in expanding his or her horticultural options. To begin with, the source of the plants is an important part of the process. Botanic gardens, particularly those with a research mission, go to great lengths to obtain plant material that has been collected in the wild and documented with herbarium specimens. This expensive and time-consuming documentation ensures for future generations that our plants are properly identified. And that represents only the beginning of the plant documentation, which consumes a significant portion of the Arboretum's living collections budget.

In contrast, there is no way to know for certain that a plant in a nursery is what the label says it is. Indeed, most nurseries raise their plants from very small seedlings or cuttings that they purchase, and they use the identifications that come with them. If the seeds were collected from the wild (and correctly identified), the seedlings will be true to type. If the source nursery made an identification mistake, however, the error will spread throughout the industry.

After seeds have been collected in the wild and received at the greenhouse, they are chilled or scarified before being sown. When and if they germinate, the resulting seedlings are potted up. Once they reach an appropriate size in the nursery, which differs widely from garden to garden, they are labeled and planted out in permanent locations where it is hoped they will flourish. The plants are watered and weeded during their first year or two on the grounds, but after that they are generally left to develop in their own good time, under conditions that might be called "benign neglect." The whole process, from seed to being planted out on the grounds, is long, taking three to five years for shrubs and five to seven for trees.

The purpose of this article is to highlight some noteworthy plants that have made it through the cultivation process at the Arnold Arboretum but are still not common in the landscapes and gardens of the Northeast. Some of them can be considered new, having only recently become available commercially, while others are not currently available through nurseries even though they have been growing on the Arboretum grounds for over a hundred years. The latter group includes plants that have always been ignored by the nursery industry, and others that may have been popular in the past but have fallen out of favor and are now essentially forgotten.

Most of the plants on the list are adaptable to a wide range of environmental conditions, growing well in either full sun or partial shade, and on wet or dry sites. All of them have performed well on the Arboretum's well-drained, acidic soils, and most have few, if any, pest or disease problems. Keep in mind, however, that this characterization is based on a small sample size and may not hold true if the plants become widely planted. It should also be noted that the USDA hardiness zone ratings, as well as the

sizes of the plants, are meant as guidelines rather than as absolute judgments.

While most of the plants have multiseason interest, I have organized the list around their primary season of interest. The list is heavily weighted toward species rather than cultivars, for two reasons: first, many of the plants have not yet undergone intensive horticultural selection in either nurseries or landscapes, so no cultivars are available; and second, the primary criterion for selection was ecological adaptability, which is best treated as an attribute of the species as a whole rather than of a particular cultivar.

Selecting plants with broad adaptability may be the best approach to one of the gardener's primary goals: choosing the right plant for the right place. Unfortunately, highly adaptable species can also be highly invasive; the trick is to identify species that are adaptable but not invasive. The amur cork tree (*Phellodendron amurense*) is an example of a species that has the potential to become an invasive if it becomes widely planted in the Northeast. It is an unfortunate conundrum that every plant, including *Stewartia pseudocamellia* and *Acer palmatum*, has the potential to become invasive when growing conditions allow its seedlings to get established.

My reasons for assembling this list go well beyond an interest in seeing greater variety in our local landscapes. Our physical environment is changing rapidly—in large part because of human activities—and there is an urgent need to identify plant species that can thrive alongside people and the pollution we inevitably create. The plants listed below have performed reliably under a variety of environmental conditions with minimal maintenance and little supplemental irrigation; they can therefore be considered “pre-adapted” to flourish under the erratic weather extremes that global warming appears to have in store for us. I hope this eclectic sample of ornamentals will not only encourage horticultural

experimentation, but also get more people thinking in practical terms about the impending changes in our environment.

SPRING

Aristolochia manschuriensis (Manchurian dutchman's pipe): zone 4 (?). This rarely seen vine produces three-quarter-inch-long yellow flowers early in spring before the foliage emerges, making it much showier than the American species, *A. macrophylla*, whose flowers are hidden under fully expanded leaves. While the two species are similar in growth rate and habit, the leaves of the Manchurian species are somewhat larger and a duller green than those of the American species.

Chionanthus retusus (Chinese fringetree): zone 5. Chinese fringetree is more tree-like than its straggly American cousin, *C. virginicus*. In May or June, the whole plant is covered by small, white flowers, followed by a large crop of blue-purple fruit in fall. When planted in an open situation, Chinese fringetree will develop into an elegant specimen about thirty feet in height with a similar spread. It has a broad distribution in Asia, where it shows considerable variation in hardiness, leaf shape, and growth form. At least two distinct ecotypes are available from commercial nurseries in the United States,



Chionanthus retusus

one adapted to warm, dry climates like that of southern California and the other better suited to cold, moist climates like that of New England.

Corylopsis spicata (Japanese winterhazel): zone 5. All winterhazels produce beautiful, soft-yellow flowers in early spring and perform best in moist soil under light shade. Japanese winterhazel, together with fragrant winterhazel



Corylopsis spicata

(*C. glabrescens*), is the hardiest species of the genus. It can reach six to ten feet in height with an equal spread and works well as a mass planting. The soft yellow color of its flowers offers an attractive antidote to the bright yellow forsythia that bloom at about the same time.

Fothergilla major 'Mt. Airy': zone 5. The 'Mt. Airy' cultivar is more vigorous and floriferous than the species. It spreads rapidly from underground stems and tolerates a wide range of conditions. It grows to about five or six feet in height and produces fall color in a gorgeous blend of yellow, orange, and scarlet.

Magnolia x 'Wada's Memory': zone 4. This hybrid of the willowleaf (*M. salicifolia*) and kobus (*M. kobus*) magnolias grows to be about thirty feet tall and only ten feet wide, producing

large, pendant, white flowers in early spring. The combination of upright, conical habit and drooping flowers is very striking. Like both its parents, 'Wada's Memory' does best in full sun and moist soil.

Prunus cyclamina (cyclamen cherry): zone 6 (5?). A native of central China, cyclamen cherry grows to thirty feet in height with an equal spread. It produces prolific clusters of small, rose-pink flowers in early spring, and in fall its foliage turns a beautiful orange-red. Compared to other cherries cultivated at the Arnold Arboretum, cyclamen cherry is free of pests and disease.

Rhododendron calendulaceum (flame azalea): zone 5. This azalea is one of the best-adapted to the Northeast. It blooms in late May to early June, producing yellow, orange, or red flowers. It grows equally well in sun and shade and is tolerant of drought and, compared to other azaleas, of soils with high pHs. Inferior hybrids and cultivars have largely displaced the flame azalea in contemporary land-

scapes, but its hardiness and lack of susceptibility to powdery mildew have led to a resurgence of interest, especially for naturalistic plantings.

Syringa x *chinensis* 'Lilac Sunday': zone 3. This cultivar of the persian lilac, selected at the Arnold Arboretum, is a large, spreading shrub that can grow to be ten to fifteen feet tall and equally wide, producing foot-long racemes of light purple flowers in mid-May. In general, persian lilac is more heat tolerant and disease resistant than the common lilac (*Syringa vulgaris*); it also produces a smaller, more delicate foliage, creating a lacy appearance.

Weigela subsessilis (Korean weigela): zone 5. This multistemmed shrub from Korea grows to be about six feet tall and six feet wide. In May it produces three-inch-long flowers that change



Syringa x chinensis 'Lilac Sunday'

gradually from pale yellow to lavender, creating an interesting, multicolored effect. The plant deserves further testing under both nursery and landscape conditions.

Xanthocerus sorbifolium (yellowhorn): zone 4 (3?). An upright shrub or small tree from China, yellowhorn grows to fifteen feet in height with a somewhat gawky growth habit. It produces showy white flowers on six- to ten-inch-long racemes in late spring. Yellowhorn is tolerant of full sun and of dry soils with high pHs; together with its ability to spread from root suckers, this makes it potentially useful for highway embankments and other difficult sites.

SUMMER

Actinidia kolomikta (kolomikta kiwi): zone 4. This unusual vine from northeast Asia normally produces irregularly variegated leaf tips of white and pink in spring and summer, making it look as though someone had splashed paint on its leaves. It should be sited so that its dramatic foliage can be viewed from above (e.g., below a deck). If left to its own devices, the kolomikta kiwi can spread into adjacent trees and damage them, a problem that can be avoided by training it to a trellis or periodically pruning it.

Aesculus parviflora (bottlebrush buckeye): zone 4. This large, July-blooming buckeye is native to the southeastern United States. Its spectacular flower spikes can reach up to twelve inches in length. It is decidedly shrubby in habit, forming large clumps from underground suckers and layers. Unlike most buckeyes, it is totally free of leaf scorch, so its foliage looks good throughout the summer and fall. Because it grows equally well in sun or shade, the bottlebrush buckeye is perfect for sites where the woodland meets the garden's edge—especially since its win-



Aesculus parviflora



Aesculus parviflora



Hydrangea paniculata 'Praecox'

ter habit can be gawky when cultivated as a specimen in the open.

Cercidiphyllum japonicum 'Morioka Weeping': zone 4. This spectacular katsura cultivar originated in Morioka City, Iwate Prefecture, Japan, and was introduced into North America by the Arnold Arboretum in 1981 under the name *Cercidiphyllum magnificum* 'Pendulum'. 'Morioka Weeping' can be distinguished from other weeping katsuras by its ability to form a

central leader without staking. It produces strongly pendant branches with a growth form reminiscent of weeping beech, and it should be planted near water for fastest growth and best effect. Twenty-year-old plants of 'Morioka Weeping' are now over thirty feet tall and ten feet wide.

Hydrangea paniculata 'Praecox' (early hydrangea): zone 3. Early hydrangea forms a large shrub growing to about ten feet in height and the same in width. It begins to flower in midsummer, continuing for about six weeks, with sterile flowers that gradually turn from white to red to papery brown. In appearance, it is more "natural" than the old-fashioned peegee hydrangea (*H. paniculata* 'Grandiflora'), but it is every bit as hardy and flexible in its soil and moisture requirements. The cultivar 'Tardiva' is similar to 'Praecox', but blooms about a month later.

Hydrangea quercifolia (oakleaf hydrangea): zone 5. The horticultural merits of this outstanding shrub, a native of the Southeast, have finally been recognized. It grows well in either sun or shade, and is tolerant of dry soils. It produces beautiful blossoms in July and stunning burgundy-red fall color; in fact, even if

the plant never flowered, it would be worth growing for its bold foliage. This species and all of its cultivars well deserve the popularity they are now enjoying.

Liriodendron tulipifera x *chinense* (Chinese-American tulip tree): zone 5(?). One plant of this cross has been growing at the Arboretum since 1981; it is now over thirty feet tall and fifteen feet wide. Its foliage is bronzy colored in spring, and its flowers, though somewhat smaller than



Quercus phellos

those of the American species, have more orange in their petals. This hybrid tulip tree was developed at the University of North Carolina in 1978 and should be tested in landscape situations. The specimen at the Arboretum has been given the cultivar name 'Chapel Hill'.

Quercus phellos (willow oak): zone 5b. Although commonly planted as a street or park tree in the South, willow oak is underutilized in the Northeast. When raised from seed collected in the northern part of its range (e.g., central New Jersey), it is perfectly hardy into southern New England. It grows to about sixty feet and maintains a strong central leader well up into the crown. Its small, narrow leaves cast a light shade that allows grass to prosper underneath it, and, as an added bonus, are easy to clean up in the fall. Willow oak is late to leaf out in the spring, but it makes up for its slow start by growing continuously throughout the heat of summer.

Rhododendron arborescens (sweet azalea): zone 4. Sweet azalea is native to moist habitats throughout the mountains of the Southeast. In late June and July it produces extremely fragrant white flowers that are highlighted by bright red anther filaments. Since its glossy green foliage is generally undamaged by insects or fungi, it remains attractive throughout the growing season. Sweet azalea can grow to about six feet in height and spreads laterally by underground stems, making it an ideal choice for naturalistic landscapes.

Xanthorhiza simplicissima (yellowroot): zone 3. This woody groundcover grows to be about two feet tall, spreading vigorously by underground stems and performing well in both wet and dry soils and in sun or shade. Its adaptability and persistence make yellowroot a good choice for low-maintenance landscapes. It was used more commonly in the past than it currently is.

FALL

Acer pseudosieboldianum (Korean maple): zone 4. This medium-sized understory tree from northeast Asia produces spectacular fall color ranging from orange to scarlet in late October. The species is similar in general appearance to the Japanese maple (*A. palmatum*), but it is more upright in habit—growing to be about thirty feet tall and fifteen feet wide—and more cold hardy. It deserves wider testing under landscape conditions, particularly in zones 4 and 5, where Japanese maple can have problems.

Acer triflorum (twisted-bark maple): zone 5 (4?). This mid-sized tree from northeast China can grow to forty feet in New England. Like its near relative the paperbark maple (*A. griseum*), it produces trifoliate leaves. Its most striking features include late fall color that ranges from bright red to orange, and its whitish-tan, shredding bark in winter. *A. triflorum* performs reliably under a wide range of conditions and appears to be hardier than *A. griseum*.

Enkianthus perulatus (white enkianthus): zone 5. White enkianthus is a slow-growing deciduous shrub from Japan that eventually grows to six feet in height with a similar spread. In spring

it produces small, white flowers, and in fall its fine-textured foliage turns rich burgundy to flaming scarlet, brighter than any other plant cultivated at the Arnold Arboretum, where specimens of *E. perulatus* have been growing in full sun and dry soil for over a hundred years.



Enkianthus perulatus

Euonymus carnosus (glossy euonymus): zone 6 (5?). This small deciduous tree from China can grow to about twenty feet in height. At the Arnold Arboretum, glossy euonymus has been free of pests and disease for nearly twenty years. Its shiny, dark green foliage turns a striking burgundy red in late fall, quite unlike that of any other euonymus cultivated at the Arboretum.

Heptacodium miconioides (seven-son flower): zone 5. This tall deciduous shrub or small tree, introduced from China in 1980, can grow to be about twenty feet tall and fifteen feet wide. *Heptacodium* produces six-inch-long panicles of small, white flowers in late summer, followed rapidly by a beautiful display of showy, rose-magenta seeds in early autumn. It is tolerant of clay soils, road salt, and full sun, making it a good choice for roadside plantings. Its white, exfoliating bark is spectacular in winter, especially when trained to develop a single stem.

Koelreuteria paniculata 'Rose Lantern' ('Rose Lantern' golden raintree): zone 5. This deciduous, round-headed tree grows from thirty- to forty-feet tall with an equal spread. It produces striking yellow flowers in showy panicles in late August or early September, almost a month later than is typical of the species. The fruit capsules are an attractive light pink, eventually turning paper-brown. 'Rose Lantern' grows well in full sun and dry soil, making it suitable for streets and parking lots. This clone has been widely distributed under the cultivar name 'September'.

Lindera obtusiloba (Japanese spicebush): zone 5b. This deciduous, wide-spreading shrub grows to about fifteen feet in height with an equal spread. Its leathery, distinctively lobed leaves are extremely handsome and turn a bright, chrome yellow for a full two weeks in late fall—indeed, in terms of fall

color, Japanese spicebush is one of the Arboretum's most reliable performers. It is a complete mystery why one seldom sees this plant in New England landscapes.

WINTER

Ilex pendunculosa (longstalk holly): zone 5. This Japanese species, which can grow to be fifteen feet tall and ten feet wide, is one of the hardiest of the upright hollies. Its attractive red fruit and delicately creased, glossy foliage make it an excellent choice for northern gardens, either as an informal hedge or as a specimen. Like most hollies, it grows best in light shade and moist, well-drained soil.

Magnolia virginiana var. *australis* (evergreen sweetbay): zone 5b. This slender, upright tree grows to be thirty feet tall and ten to fifteen feet wide, with a strong central trunk. The evergreen sweetbay has narrow leaves and deliciously fragrant, two-inch-wide flowers in June and July. A native of the Southeast, it is botanically and



Magnolia virginiana var australis

horticulturally distinct from the shrubby, deciduous sweetbay that grows in the Northeast (var. *virginiana*), but not quite as hardy.

Stewartia sinensis (Chinese stewartia): zone 6 (5?). This species is an understory tree from China that can grow to thirty or forty feet in height. In summer it produces small, white flowers (one-and-a-half-inch in diameter). With its smooth bark, white to tan in color and resembling alabaster, Chinese stewartia is every bit as beautiful as the more commonly planted Korean stewartia, *S. pseudocamellia*. It needs moist, well-drained soil and performs well in either full sun or light shade.

CONIFERS

Abies koreana (Korean fir): zone 5. This relatively small fir, around twenty to thirty feet tall and ten feet wide at maturity, produces highly ornamental purple-blue cones at a young age. Like most true firs, this Korean species requires

full sun, but unlike other species it flourishes at sea level and is tolerant of a variety of soil conditions. This is one of the few firs suitable for use in small residential landscapes.

Calocedrus decurrens (California incense cedar): zone 5. This tall evergreen from the mountains of California grows to be about fifty feet tall in the East. Incense cedar typically develops a narrow, almost fastigiate, growth habit that is very striking in the landscape, with foliage that stays bright green through the winter. It grows best in full sun and is tolerant of a wide range of soil conditions, including clay and extreme drought, and has no serious pest or disease problems in the East. This plant deserves to be much more widely grown than it currently is.



Abies koreana

Cedrus deodara 'Shalimar': zone 6. This hardy form of the deodar cedar was selected at the Arnold Arboretum in 1982, where it grows to about thirty feet in height. Its beautiful, blue-gray foliage and graceful, drooping branches make the deodar cedar a dramatic landscape specimen. It grows best in full sun and is very tolerant of dry soil.

Thuja plicata (western arborvitae): zone 5. Although native to northwestern North America, this species is perfectly hardy in the Northeast. In comparison to *T. occidentalis*, the eastern arborvitae, *T. plicata* is taller and looser in growth habit, forms a strong central leader, and has much better winter color. It can grow to be fifty or sixty feet tall in the East, with a spread of about twenty feet.



Calocedrus decurrens



Cedrus deodara 'Shalimar'

Tsuga chinensis (Chinese hemlock): zone 6 (5?). A tall evergreen, Chinese hemlock grows to at least fifty feet in height in the Boston area. Preliminary evidence indicates that it is resistant to the hemlock woolly adelgid, but more research is needed before the species gets a full recommendation. The oldest specimen in North America, collected in China by E. H. Wilson, has been growing at the Arnold Arboretum since 1910.

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For a list of nurseries that carry these plants, contact the Arboretum's membership department by mail or by e-mail (membership@arnarb.harvard.edu).