

# Island and Median-Strip Planting

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A generation ago the use of plantings to divide highways or regulate the flow of traffic on roads was rare, confined to wealthy residential areas in such cities as Philadelphia, Richmond, and Boston, to cite a few well-known examples. The parkways of Westchester County, New York, and Connecticut, as well as the Shirley Parkway along the Potomac River, were among the first divided roadways with planted strips between them. The plantings were meant to create restful driving conditions and to screen out headlight glare at night. After World War II, highway planting began on a nationwide scale when the huge network of the so-called national defense highway system was installed. Almost all of the superhighways had separated roadways for opposing lanes of traffic, and in all but the most congested urban areas the strips between the roadways were planted with trees and shrubs. Carefully kept accident-rate statistics for old-fashioned and divided-lane highways proved beyond a doubt that the benefits for median-strip planting far exceeded the costs of installation and maintenance.

Now the use of island plantings has begun to spread to other sites. Among these are the parking areas surrounding modern suburban shopping centers. These expanses of pavement become unbearably hot in the summer months, and locked cars quickly reach oven temperatures during the daylight hours.

More and more local planning boards therefore are requiring islands of trees to provide shade and add visual appeal to these otherwise unsightly spaces. Merchants, too, find that although the islands reduce parking space somewhat, they are more effective than painted lines on the pavement in keeping automobiles aligned. Thus, improved utilization of space compensates for the loss.

In selecting trees and shrubs for islands or median strips, one must be aware of the special difficulties that such sites impose. Narrow median strips are especially difficult for trees and shrubs because of wind whip from speeding traffic. On highways especially, with cars and trucks speeding by at 60 miles per hour, the wind damage to foliage can be severe, both in the spring when the leaves are soft and tender and in the summer when weather is hot and dry. For this reason plants with tough, thick leaves are most successful.

In the colder parts of the United States and Canada (zone 6 and below), road salting in winter presents additional difficulties. Speeding traffic can create a salt spray as concentrated as ocean spray. The salt settles on plants and soil, and prevailing winds deposit large concentrations on the downwind side of roadways. It is essential, therefore, that trees and shrubs chosen for these areas are salt tolerant. It is no coincidence that tree species that thrive at the seashore are also successful in island plantings. Thus sugar maple, which is one of the choice

species for residential suburban planting in its native range, is a poor choice for island or median-strip planting, while sycamore maple does well. Canada hemlock, which is also exceptionally susceptible to salt spray, should be avoided, while green ash and Japanese black pine (where it is winter hardy) are sound choices. Indeed the sugar maple decline in New England, about which so much was written 20 years ago, has since been attributed to salt kill. Maintenance crews tend to use salt with a lavish hand, a practice that ought to be vigorously curbed. Meanwhile, salt-sensitive species must be avoided in island plantings for cold areas.

Salt injury to trees in island plantings in parking lots can be very serious even though traffic is too slow to create salt spray. Here salt is spread on the pavement, and often before the snow is melted the salt and snow mixture is scooped up by front-end loaders and disposed of "out of the way" on the islands, to the detriment of the vegetation planted on them.

### Ecological Requirements

The forested areas of the north temperate zone contain a wide variety of tree and shrub species. The greatest number occurs in areas where the old Tertiary forest was not extirpated during the last Ice Age, particularly the eastern United States, Japan, and parts of China. When cleared land is abandoned in naturally forested areas, a gradual process of forest regeneration begins. The first trees are "pioneer" species that can stand exposure to full sun and drying winds. After these have colonized the open field and matured, they are slowly replaced by so-called climax species, which are long-lived

and shade tolerant when young. Climax species ultimately comprise the entire forest except on very exposed sites.

The ecological conditions of island plantings on highways are extremely harsh for tree growth, and only pioneer species or species from dry, inhospitable climates can be expected to grow well. Island sites are exposed to full sun and wind, as well as the turbulence caused by vehicular traffic. They are also narrow, so that natural penetration of rain to the root zone is inhibited. It is essential therefore to plant only those species that are tolerant of dry soil. Among the many species of small maples, the Japanese maple (*Acer palmatum* Thunb.), which is strictly an understory tree in the woodlands of Japan, quickly succumbs in island plantings. The Amur maple (*Acer ginnala* Maxim.), in contrast, thrives under conditions that are lethal to the Japanese tree. Not surprisingly, the Amur maple comes from the harsh climate of the Amur river valley of China, which is bitter cold in winter and hot and dry in summer. Our native eastern flowering dogwood (*Cornus florida* L.) grows poorly and is subject to drought stress and severe borer infestations in island plantings, whereas the native species of hawthorns are excellent for such locations. The cornelian cherry (*Cornus mas* L.), which grows out to the edge of the steppes of Russia, is another tree of choice.

Island plantings of shade trees are particularly exposed to wind damage. Although the Bradford callery pear (*Pyrus calleryana* Decne.) is otherwise suitable for islands, it is susceptible to breakage when it matures. It has been dropped by many state highway departments because of this but is still a favorite for sheltered locations in the downtown areas of cities. The tough-wooded

bur oak (*Quercus macrocarpa* Michx.) can serve as an alternative to Bradford pear. This tree comes from the Plains States, where violent thunderstorms routinely occur each summer.

### **Trees and Shrubs Recommended for Island Planting**

The following is a list of trees and shrubs that have proved adaptable over a wide range of soils and climates in the East and Midwest. For the subtropical climate of Florida and the desert conditions of the Southwest, of course, entirely different lists are needed.

#### *Trees*

*Acer ginnala* Maxim. Height 5–6 m. Hardy to –50°F. Amur maple.

This small tree has the unique characteristic of tolerance of extremes of heat, cold, and drought. It can be grown with several trunks or pruned to a single stem. The Amur maple's beauty lies in its leaves, scarlet in fall and a glossy dark green in summer. A similar species, *Acer tataricum*, merely turns yellow in fall and is much less cold hardy. The Amur maple is very tolerant of salts and alkaline soil and can substitute well for the Japanese maple (*A. palmatum*) in the Midwest, where the latter is not winter hardy.

*Acer platanoides* L. Height 15–18 m. Hardy to –30°F. Norway maple.

The common Norway maple has been much maligned in recent years because trees of seedling origin vary greatly, and many are distinctly inferior in growth habit, growth rate, and quality of foliage. The best grafted

clones are much improved, however, and should rate high on the list of trees for difficult sites. The Norway maple will grow well in island plantings and in polluted conditions in cities, where the sugar maple and red maple will not thrive. It is one of the few species with attractive flowers, which are a clear chartreuse color and abundantly borne. The fall color is a fine yellow.

*Acer pseudoplatanus* L. Height 15–18 m. Hardy to –30°F. Sycamore maple.

Although it is not a particularly distinguished tree, the sycamore maple ranks high wherever salt spray or deicing salts are a problem. After the hurricane in the summer of 1948, it was the only deciduous tree with green leaves (no browning whatsoever) along the coasts of Rhode Island and Massachusetts. Trees from seeds are often mediocre, but the best clones of the variety *purpureum* are vigorous and shapely, and the purple undersurface of the leaves is particularly attractive. The tree tolerates dry soil, pavement glare, and alkaline or saline soils.

*Celtis occidentalis* L. Height 12–15 m. Hardy to –50°F. Hackberry.

The hackberry is one of the last trees to disappear from the landscape as one journeys west across the prairies. It also grows in the thin soil on basalt and granite hills in New England. It is not surprising therefore that it endures the stressful environments of island plantings. Plants from seedlings are variable, and many are subject to unsightly twig and foliar diseases. Grafted clones are available, however, which are both shapely and disease free. Clones and seedling trees are very tolerant of dry, alkaline soil and exposure.



The hackberry tree (*Celtis occidentalis*). Photographs with this article from the Archives of the Arnold Arboretum.

*Cornus mas* L. Height 5–6 m. Hardy to –30°F. Cornelian cherry.

The toughest of the tree-sized dogwoods, the cornelian cherry grows wild on the bleak

steppes of Russia. It is not as showy as the large-flowered species (*Cornus florida*), but it becomes a haze of yellow in early April. The dark green leaves are thick and leathery and do not scorch in summer droughts. It is difficult to grow *Cornus mas* in tree form; it is best grown as a large clump. This tree is



Cornelian cherry (*Cornus mas*).

free of the borers or diseases that plague *Cornus florida*.

*Crataegus crus-galli* L. var. *inermis*. Height 6–8 m. Hardy to –30°F. Thornless cockspur hawthorn.

The common cockspur hawthorn is one of our toughest small trees, but because of its long, needle-sharp thorns, it constitutes a danger in areas where pedestrian traffic is present. The thornless form has the favorable qualities of the species without the dangers: tolerance of drought and exposure, fine glossy foliage, and long-lasting red fruits.

*Crataegus phaenopyrum* (L.f.) Medic. Height 6–9 m. Hardy to –30°F. Washington hawthorn.

One of the finest small-flowered trees for island planting. In the mini parks of downtown New York City, it thrives under the most adverse conditions. It is attractive, although not spectacular, in bloom. The glossy foliage turns red in the fall, and the brilliant red berries hang on until the follow-

ing spring. Unfortunately, no thornless clone of this species is available, but its thorns are much shorter and less dangerous than those of *C. crus-galli*.

*Fraxinus pennsylvanica* Marsh. Height 15–18 m. Hardy to –40°F. Green ash.

While the white ash (*Fraxinus americana* L.) is preferable for its superior autumn color, it is not as suitable for stressful environments as the green ash, which will tolerate drought, heat, cold, and saline and alkaline soils with impunity. Seedling trees are variable, and many female trees set large crops of seed and defoliate very early in the fall. As is common to trees with a broad latitudinal range, green ash has a number of geographical races. Trees grown from Florida seed are as hardy as orange trees in North Dakota, while trees from North Dakota provenance grow as well as balsam fir would in Florida! Several fine male clones are available, all from the North Central States, where green ash is an important shade tree. 'Marshall's Seedless' is unsuitable, however, because nurserymen have found that it has begun to seed overabundantly.

*Gleditsia triacanthos* L. var. *inermis* Willd. Height 15–18 m. Hardy to –30°F. Thornless honeylocust.

The selection and introduction of a number of thornless clones with shapely crowns have transformed the honeylocust from an unattractive weed tree into an important street tree. The thornless honeylocust is rapid growing, easy to transplant, and tolerant of very difficult urban environments. Like green ash, it is among the trees that persist longest as one crosses the northern prairie states with their harsh extremes of

climate and alkaline soil. Such tolerance for adversity is an indication of the honeylocust's suitability for island planting. It is particularly desirable for parking lots because its tiny leaflets blow away after dropping and do not have to be removed. Though cold hardy, it does not thrive in the very acid soils of parts of Maine and Nova Scotia.

*Malus baccata* (L.) Borkh. Height 9–12 m. Hardy to –50°F. Siberian crab apple.

A native of one of the world's harshest climates, the Siberian crab apple is a first choice among flowering trees for island plantings. It survives drought and a wide range of soil conditions. The flowers are red to pink in bud and pale pink to pure white on opening. Bloom is heavy on alternate years. The tree is virtually immune to apple scab disease and mildew and resistant to fire blight. In fact, in the Pennsylvania crab-apple trials, which have been conducted for many years, the only clones to receive recommendations have been *Malus baccata* seedlings or hybrids derived primarily from *baccata*. A very desirable feature of this species is its disease-free foliage, a trait that is shared by *M. ×atrosanguinea* (F.L. Späth) C. K. Schneid. and *M. floribunda* Siebold ex Van Houtte. Crab-apple trees chosen for island planting where pedestrian traffic is present should be trees that bear tiny fruits or few fruits.

*Phellodendron amurense* Rupr. Height 9–12 m. Hardy to –40°F. Amur cork tree.

Having originated in the fierce climatic extremes of the Amur River valley, this small, spreading tree easily endures poor, dry soil, reflected heat, and atmospheric pollution. Its lower branches must be pruned when the

tree is young to prevent interference with passing traffic. The thick, corky bark of mature trees is an attractive feature. The foliage, which is free of pests and diseases, turns a clear yellow in the fall. Staminate (male) trees are preferable for urban settings, as pistillate (female) trees produce large crops of fruits.

*Platanus ×acerifolia* (Ait.) Willd. Height 21–27 m. Hardy to –30°F. London plane tree.

This vigorous hybrid is the city tree par excellence, a standard against which others must be judged. Tolerant of drought, poor soil, reflected heat, and atmospheric pollution, it is easy to transplant and grows rapidly. The original clone, now often called the "Bloodgood strain" is resistant to anthracnose leaf disease, which defoliates our native sycamores during wet springs. The London plane tree has gone through several cycles of popularity and disapproval. Many years ago a few nurserymen grew the trees from seed that produced great variation in habit of growth and disease resistance, and this may be one cause for the disapproval. Another may be the plane tree's vulnerability to canker stain disease, a serious condition spread by pruning tools or other mechanical means. The severity of the disease once led the city of Philadelphia to enact ordinances that prohibited planting the tree. Still, where a large tree is needed for island planting, it is a first choice.

*Pyrus calleryana* Decne. Height 12–15 m. Hardy to –30°F. Callery pear.

The cultivation of the vigorous, thornless 'Bradford' pear by the U.S. Department of

Agriculture Plant Introduction Station at Beltsville, Maryland, transformed an unknown, thorny scrub tree into one of the most popular street trees. This tree has everything to recommend it: rapid growth, beautiful pure white flowers, and richly colored fall foliage. Like all pears, it grows well in compacted, poorly oxygenated soil. Brittle wood is its only weakness, and mature trees can literally collapse in a violent summer wind storm, as the parent tree did at Beltsville. The Pennsylvania highway department and others have removed it from their planting lists for that reason. However, for street or island plantings in more sheltered urban locations it is still an excellent choice. Several cultivars that are more wind firm and/or more cold hardy than 'Bradford' are now available in the nursery trade.

*Quercus macrocarpa* Michx. Height 18–24 m. Hardy to –50°F. Bur oak.

Many species of oaks make excellent shade trees under ordinary street conditions, but few thrive in constricted island plantings, especially where soil pH is high. Members of the black oak division of the family (pin, red, scarlet, willow, and black oaks) turn yellow from chlorosis under these circumstances and gradually die out. The bur oak is unique in that it grows well in alkaline soils, stands drought, heat, and cold and is tolerant of deicing salts. It is not so easy to transplant as the pin oak but is comparable in this regard to red and scarlet oaks. It grows slowly but becomes a tough, long-lived tree. Its native range extends farther west than that of any of the other eastern oaks, which means that it is naturally adapted to ecological conditions similar to those of island plantings.

*Sophora japonica* L. Height 15–18 m. Hardy to –30°F. Japanese pagoda tree.

This unusual summer-flowering tree has been in the nursery trade since the 19th century but only recently has become a popular street tree. It is one of the most variable of all species; a single seedlot can produce both dwarf weepers and tall, full-headed trees. Now improved clones with first-rate shade tree form are readily available. This species tolerates compacted soils (including the "brick yard" soils of Washington, D.C.), high pH, salt, drought, and polluted air. It is a conspicuous bloomer in August and retains its dark green leaves later in the fall than other deciduous trees. Like honeylocust it will not grow in highly acidic soils, however.

*Syringa reticulata* (Blume) Hara. Height 6–9 m. Hardy to –30°F. Japanese tree lilac.

This tough, hardy small tree is covered with huge panicles of white flowers in June, after the blooming season of most other flowering trees has passed. It withstands exposure and alkaline soils and is not troubled by mildew on the leaves or stem borers as are other lilacs. The lower branches must be pruned when young so that they will not interfere with pedestrian traffic. Several clones are now available, including one from Canada. These have been selected for their superior foliage, growth habit, and larger blossoms.

*Tilia cordata* Mill. Height 15–20 m. Hardy to –30°F. Small-leaved European linden.

Lindens in general grow well under city conditions, and the best clones of this species are especially reliable. Like those of the pagoda tree (*Sophora japonica*), populations of small-leaved lindens grown from seed are



Flowers of the Japanese tree lilac (*Syringa reticulata*).

The small-leaved European linden (*Tilia cordata*).



extremely variable. Growth may be either rapid or slow; wood is sometimes weak; and leaves may be small and leathery or large and easily scorched. Grafted trees do not exhibit graft incompatibility and reproduce exactly the very best forms. Easy to transplant, fairly rapid in growth, and tolerant of many soils and climatic conditions, they are excellent subjects for urban islands. The flowers are not conspicuous, but their rich fragrance is a great rarity among shade trees.

*Tilia* × *euchlora* C. Koch 'Redmond'. Height 12–15 m. Hardy to  $-30^{\circ}\text{F}$ . 'Redmond' linden.

Much controversy exists as to whether this tree is a Crimean or an American linden cultivar. It has the large leaves and resistance to spider-mite attacks characteristic of American lindens. A compact, upright tree that is native to Nebraska, it is inured to climatic extremes of heat, cold, and drought and thrives in urban locations.

*Ulmus* × *hollandica* Mill. hybrids. Height 15–18 m. Hardy to  $-30^{\circ}\text{F}$ . Dutch elm.

The Dutch elm disease, which was first identified in Holland, has destroyed a major portion of the splendid elm populations of Europe and North America during this century. In response to the crisis, the Dutch government selected and bred elms to produce forms that would be immune to the disease. Seven clones were distributed, some of which have demonstrated remarkable resistance to even the most virulent strains of the fungus. These have the upright, rectangular crowns of European elms rather than the wine-glass shape of American elms. Although vulnerable to elm-leaf beetle, they are exceptionally well adapted to urban

street conditions and grow well in narrow planting pits and poorly oxygenated soil.

*Zelkova serrata* (Thunb.) Mak. Height 15–18 m. Hardy to  $-20^{\circ}\text{F}$ . Japanese zelkova.

Not many decades ago this species was rarely encountered outside arboreta and botanical gardens. Seedling trees are very variable, and most have irregular, zig-zag habits of growth and small yellowish foliage. The original introductions came from the warmer regions of Japan and were not too cold hardy. It was not until the Dutch elm disease destroyed the American elm and the search began for replacement species, that zelkova began to receive serious attention. Hardier clones with excellent shade-tree shapes are now available and are being widely used on city streets. Tolerant of pollution, drought, and heat, they have shown remarkable vigor in downtown locations in Washington, D.C., and Baltimore, Maryland. They are not as cold hardy as most important shade trees but otherwise are excellent choices for island planting. Any tree with such a wide native distribution as zelkova must have hardy races in the colder parts of its range, and a serious attempt to find them would increase the uses of this excellent tree. Although artificial inoculations of *Zelkova serrata* with the Dutch elm fungus have demonstrated that this species is vulnerable to the disease, this factor can be ignored because the insect vectors of the disease do not feed on this tree.

### *Shrubs*

Shrubs for urban islands should share the same characteristics as trees chosen for

these sites. They must be tolerant of poor soil, drought, and exposure to wind and heat. Salt spray is just as damaging to shrubs as to trees in island plantings, and it is not surprising that several of the species listed below are also first choices for seashore planting. In addition, shrubs, like trees, are vulnerable to the problem of vandalism. The New York City Public Housing Authority has found that it is best to avoid shrubs with conspicuous flowers except for extremely vigorous growers such as forsythia. All of the shrubs listed below are on the approved list for the authority and have withstood the severest tests of time in very unfavorable inner-city conditions. They are relatively free from diseases and insect pests and can truly be termed low-maintenance shrubs.

Shrubs that grow to be too tall for their location can be safely cut down to the ground and will resprout and grow more densely than ever. On level sites a well-sharpened brush mower can be used at a great savings in labor costs. Cutting back is best done in November or December so that the cut surfaces can dry out and seal themselves before the sap begins to run in the spring. Also, cutting off at this time will result in the most vigorous regrowth.

*Acanthopanax sieboldianus* Mak. Height 2–3 m. Hardy to  $-30^{\circ}\text{F}$ . Five-leaf aralia.

This dense, many-stemmed shrub is especially tolerant of poor, dry soil and atmospheric pollution. It is thorny and makes an excellent barrier planting. Other than its abundant disease-free foliage, it has no special beauty but is most useful for its vigor under adverse conditions.

*Berberis thunbergii* DC. Height 2 m.  
Hardy to  $-20^{\circ}\text{F}$ . Japanese barberry.

Japanese barberry plants were once sold by the millions for low-growing hedges, but their use has declined as formal clipped hedges have lost popularity in home gardens. It is still useful as a barrier and tall ground cover, however, and will grow well in conditions of poor soil and neglect. The numerous, small thorns are needle sharp, a real deterrent to trespassers without being dangerous. The brilliant shades of scarlet foliage in the fall and the persistent red berries are very attractive. The redleaf form is colorful throughout the growing season.

*Chaenomeles lagenaria* (Loisel.) Koidz.  
Height 1–2 m. Hardy to  $-30^{\circ}\text{F}$ . Flowering quince.

One of the most colorful early-flowering shrubs, the flowering quince resists vandalism because of its numerous prickly thorns. It is a popular substitute for the Kurume azaleas in cold areas where the latter are not winter hardy. There are numerous named clones with flowers ranging in color from pure white through various shades of pink and orange to deep crimson red. They vary in height and density, and the low, bushy forms are excellent for ground cover.

*Deutzia gracilis* Siebold & Zucc. Height 1 m. Hardy to  $-30^{\circ}\text{F}$ . Slender deutzia.

This low, twiggy shrub has greatly increased in popularity in recent years for the purpose of mass plantings. It is covered with pure white flowers in May and has abundant pest-free foliage. It is also useful as a hedge

but, being thornless, it should not be planted where it can be trampled by pedestrians. Several forms that are lower and more spreading are grown in Japan, but unfortunately these are not available in this country.

*Elaeagnus umbellata* Thunb. Height 3–4 m. Hardy to  $-40^{\circ}\text{F}$ . Autumn olive.

The foliage of this species is not so showy as the pale silvery leaves of the Russian olive (*Elaeagnus angustifolia*). Yet it has the advantage of being better adapted to the Eastern States and other areas where summer humidity is normal. The extensive highway plantings of Russian olive in the East in the 1950s all have gradually succumbed to twig blight, while the disease-free autumn olive has become extensively naturalized in the same areas. Autumn olive is a superb tall shrub for roadway or seashore planting, withstanding salt, poor soil, and drought without setback. The silvery green foliage and pretty bronze-to-red fruits are decidedly ornamental. The U.S. Soil Conservation Service has introduced a strain grown from seed called 'Cardinal' with fruits that are a brighter red.

*Forsythia*  $\times$  *intermedia* Zab. Height 2 m. Hardy to  $-20^{\circ}\text{F}$ . Showy border forsythia.

Wherever it is winter hardy, this is one of the best shrubs for screening purposes. It is vigorous, pest free, tolerant of city conditions, and unaffected by deicing salts. Vandals do break off branches in the blooming season (April), but the plant quickly recovers from the injury.

Three excellent new clones of the much hardier *Forsythia ovata* have been bred for

the northern Plains States and Canada, where border forsythias will survive.

*Ligustrum obtusifolium* var. *regelianum* (Koehne) Rehd. Height 2 m. Hardy to  $-40^{\circ}\text{F}$ . Regel privet.

This is the only hardy privet that is low growing, dense, and spreading, and exceptionally useful for mass planting. One of the toughest shrubs for city use, it is a mainstay for adverse sites. Almost 100 years of extensive planting in New York City and elsewhere have shown that it is one of the most reliable shrubs for city landscaping.

*Lonicera fragrantissima* Lindl. & Paxt. Height 2 m. Hardy to  $-10^{\circ}\text{F}$ . Winter honeysuckle.

This handsome semievergreen shrub is often listed as hardy to  $-20^{\circ}\text{F}$ , but it is better grown at minimum winter temperatures of  $-10^{\circ}\text{F}$  and above. It has leathery foliage and deliciously fragrant flowers, which open in March in the south and in April further north. It withstands poor soil and polluted air and is free of pests and diseases. Young plants are sparsely branched but fill out with age to form an impenetrable screen.

*Myrica pensylvanica* Loisel. Height 2 m. Hardy to  $-40^{\circ}\text{F}$ . Bayberry.

One of the three most appropriate shrubs for the seashore, bayberry has proved to be equally indispensable for roadways. It grows wild in the poorest, most sterile soils and withstands salt spray, heat, drought, and polluted air. It is semievergreen in the southern part of its range, and the foliage is pleasantly aromatic. The gray-white berries of female plants last far into the winter. This is a dense

shrub, spreading gradually by underground runners.

*Potentilla fruticosa* L. Height 1 m. Hardy to  $-50^{\circ}\text{F}$ . Bush cinquefoil.

This hardy, drought-resistant shrub is suitable for mass planting in full sun but does not thrive in shade. It is not spectacular in bloom, but the pretty yellow flowers are borne over a long period during the summer. It is especially useful where summers are dry, with low humidity. Many cultivars are available, varying in flower color, habit of growth, and tolerance for adverse conditions. 'Katherine Dykes' is among the best for ground-cover use.

*Prunus maritima* Marsh. 1–2 m. Hardy to  $-40^{\circ}\text{F}$ . Beach plum.

This was once a rarely grown native shrub chosen by knowledgeable landscape architects for mass plantings in seashore gardens. It is now extensively used, not only for the traditional seaside uses, but also for roadway planting, because it is so tolerant of salt spray and poor, sterile soil. The white flowers are attractive in the spring, and the fall foliage is more colorful than that of many other plums. The dense branching habit renders it useful for barrier planting.

*Rosa rugosa* Thunb. Height 1 m. Hardy to  $-50^{\circ}\text{F}$ . Rugosa rose.

Generally regarded as the most beautiful of all the wild rose species, this splendid shrub is unsurpassed for mass planting. It is a seashore plant in its native Japan and has become widely naturalized in this country on the East Coast. The red, pink, or white flowers are deliciously fragrant, and the



Arrowwood (*Viburnum dentatum*) in flower.

handsome disease-free foliage turns orange and red in the fall. It thrives along the seashore and in adverse urban locations. Like other shrub roses, it benefits from being periodically pruned to ground level and grows best in full sun. Rugosa rose has the advantage of blooming throughout the summer, unlike most other wild roses.

*Rosa virginiana* Mill. Height 1 m. Hardy to  $-40^{\circ}\text{F}$ . Virginia rose.

This species, the shining rose (*Rosa nitida*), and several other native species comprise a confusing group of very similar wild roses of doubtful identity. Whatever their taxonomic

status, these plants are an exceptional group of shrubs for mass plantings in adverse locations. They are covered with fragrant pink flowers in June, and their glossy foliage turns scarlet in the fall. The red new stems and abundant red fruits are colorful throughout the winter. Easily transplanted, they withstand drought, salt spray, and exposure and are free from pests and foliar diseases.

*Symphoricarpos*  $\times$  *chenaultii* Rehd. 'Hancock'. Height 45–60 cm. Hardy to  $-20^{\circ}\text{F}$ . 'Hancock' coralberry.

This low, rapidly spreading shrub from Canada is an excellent ground cover in full

or partial sun. It has tiny, neat foliage and spreading branches that root wherever they touch the ground, forming a dense mat. Coralberry grows well in poor soil and is free of pests and diseases.

*Viburnum dentatum* L. Height 3–4 m.  
Hardy to –50°F. Arrowwood.

This splendid shrub is one of another cluster of species whose identity is doubtful. Although it inhabits wet, lowland areas in the wild, it is also drought tolerant and withstands salt spray and exposure. The foliage and stems are immune to the stem cankers and leaf spots that disfigure other hardy viburnums. The berries are an inconspicuous blue-black color, but the yellow and red fall color of the foliage is first rate.

*Viburnum prunifolium* L. Height 4–5 m.  
Hardy to –40°F. Black haw.

One of the tallest native viburnums, the black haw makes an excellent screening plant and can also be sheared to create a formal hedge. This is an upland species, injured to poor soil and drought. In autumn the smooth oval leaves initially turn pink, then red, and finally purple. The berries also change from green to pink and finally blue-black in the fall.

### Island Tree Planting

Island beds for tree planting should be raised well above the level of the surrounding pavement. The runoff from the impermeable pavement can so concentrate rain and snow melt in a sunken island that death from root rot can occur. Although raised above grade level, the surface of the island also should be somewhat dished to retain rainwater (see

figure 1). Plantings often fail when the soil is graded to an even crown so that water runs off instead of being absorbed. As noted earlier, the surface area for rainwater infiltration is very limited in island plantings, and because islands are surrounded by pavement, which carries off precipitation, the subsoil beneath is usually deficient in moisture. Thus, little capillary replenishment to the root zone can occur.

Because islands are small and their soil is often poor, too much peat or humus is frequently added to the beds. Many old backfill specifications called for up to a third or a half of the mix to be well-rotted manure or other forms of humus. Trees initially grow vigorously in such high-humus soils, but when the surrounding soil is clay, they begin to slow down and stagnate in a couple of growing seasons. Organic matter of any kind is gradually decomposed by soil bacteria and eventually disappears into the atmosphere as carbon dioxide. As the volume of humus in the backfill disappears, the tree settles deeper in the soil and roots become situated too deeply for proper growth. Arborists and landscape architects are now re-examining the old specifications for soil amendment. Unless the soil on the site is entirely unsuitable — a mixture of brickbats and rubble for example — they recommend adding fertilizer and enriching the existing soil with a minimum of humus, not more than 10 percent. Such minimal treatment avoids the interface problems that can occur when the backfill mix is very different in texture from the soil in which the planting pits were excavated. Since trees for island plantings have to be large enough in caliper to withstand vandalism, they are usually balled and burlapped rather than container-grown. These transplant with little difficulty and do not

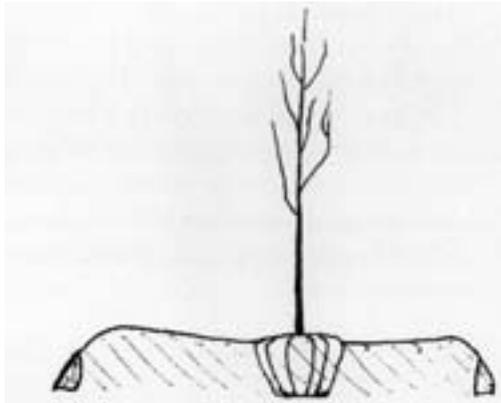
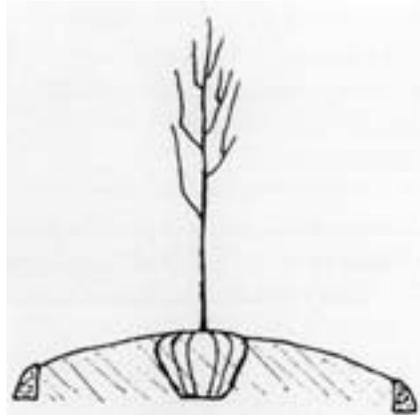


Figure 1. Dished island surface



crowned surface

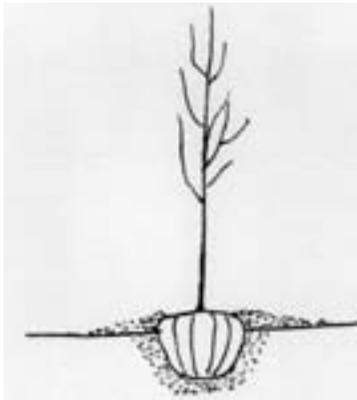
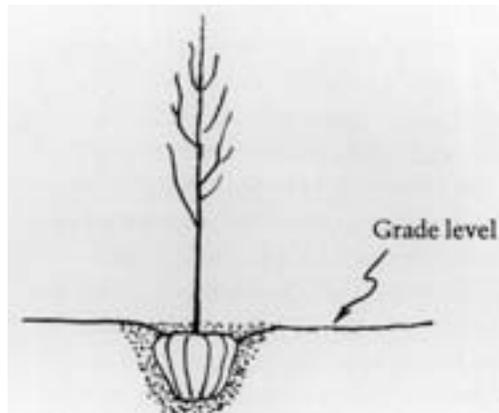


Figure 2. Planted high



Planted too deep

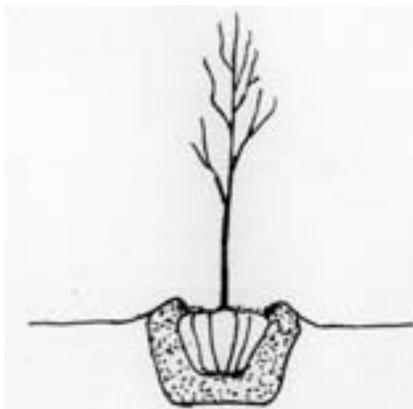
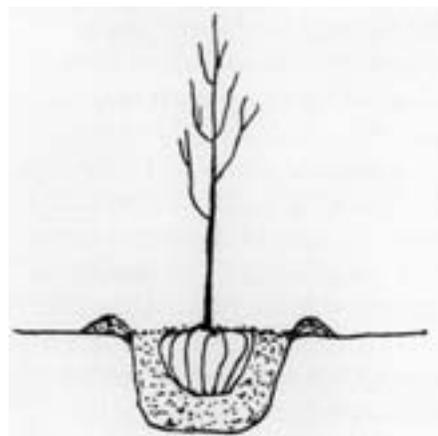


Figure 3. Improved method  
Edges of basin placed over edges of ball



Traditional method

need high-humus backfills. If the existing soil is a heavy clay and requires lightening for proper air penetration, coarse sand, calcined clay particles, or similar nonorganic materials should be used.

Whenever trees are planted in newly worked or loosened soil, they should be set "high" in relation to the final grade level (see figure 2). The ideal system is to place the ball on an unbroken column or pedestal of undisturbed soil so that it cannot settle, though such extra care is impractical in all but a few planting situations. An alternative solution is high planting, 5 cm above grade for the top of a 60 cm ball, 8 cm for a 90 cm ball. It is far better to err on the side of too shallow rather than too deep planting. A famous example was the red oak avenue leading to the Rutgers University stadium in New Jersey. The land on the site was a very poor red-clay soil, so generous amounts of rotted manure were incorporated in the backfill. The trees all lived and grew well for the first two growing seasons, only to stagnate later on. Eventually all the trees were dug up again and reset with the tops of the balls above grade, and thereafter they grew beautifully. High planting is the best way to avoid these difficulties.

Most planting specifications for shade trees recommend forming a shallow berm around the edge of the planting pit to facilitate watering. Experience in California, where water is scarce and expensive, has shown that the basin is much more effective if the edges are placed over the edge of the ball (see figure 3). Particularly in sandy locations, this assures that the ball itself is well watered during irrigation and that the moisture does not slip down the side of the pit.

One detail that is often overlooked in island planting, especially in parking lots, is to ensure that trees and shrubs are planted far

enough from the perimeter of the island so that the bumpers of cars will not debark the trunks or flatten the stems. The large automobiles of the 1960s are no longer common, but even small cars have substantial overhangs. In far too many island plantings, trees become well established initially but eventually succumb to repeated debarking by careless drivers.

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