

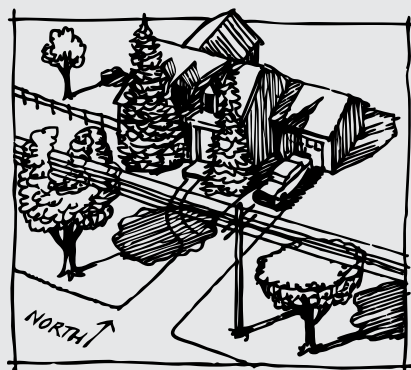


The Right Tree for the Right Place

TREE CITY USA®
BULLETIN

No. 4

Editor: Dr. James R. Fazio • \$3.00

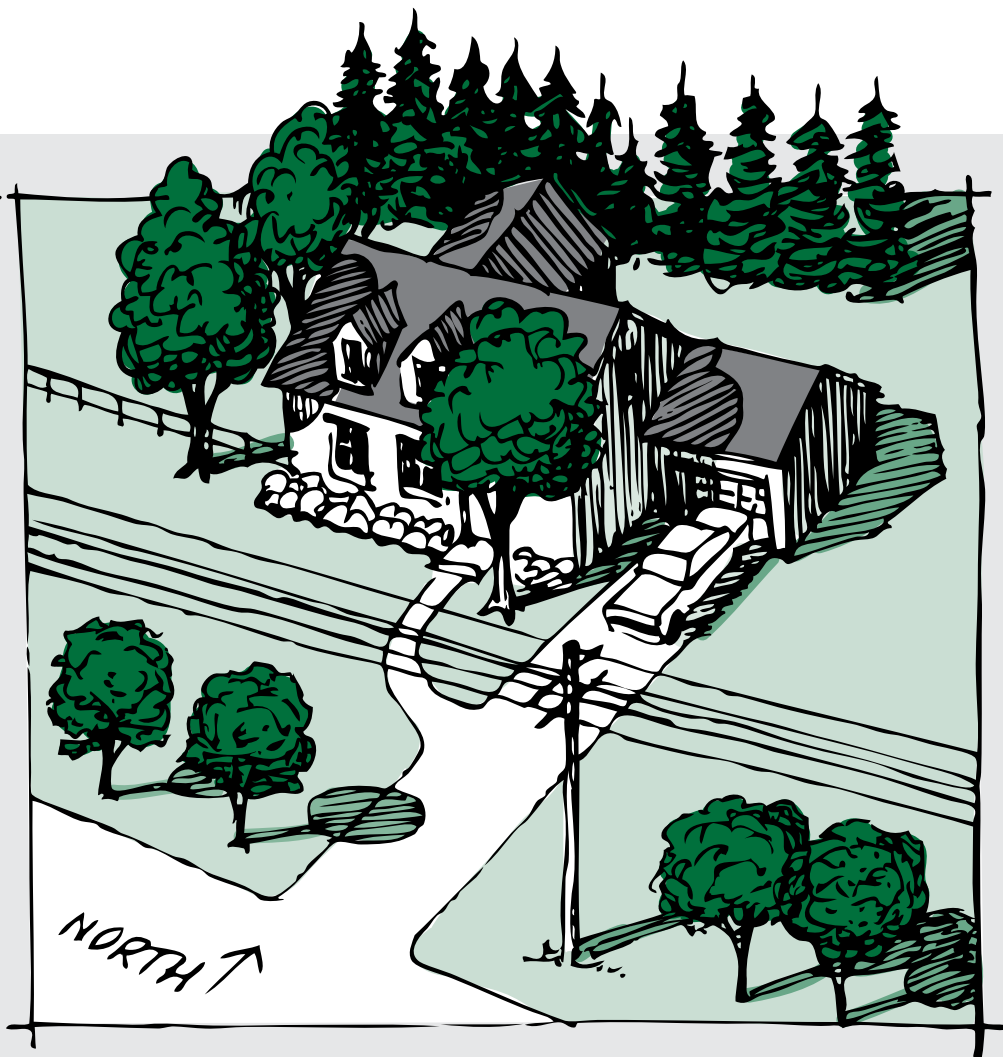


WRONG (above)

Planting large trees under utility lines often means disfigured trees. Large evergreens close to the house on the south block warming winter sunlight.

RIGHT (right)

Short flowering trees don't clash with overhead utility lines. Large deciduous trees on the southeast, southwest, and west provide cooling shade in summer and don't obstruct the low winter sun. An evergreen windbreak on the north blocks cold winter winds.



Any Friend of Tree City USA can list the many benefits of trees — shade, beauty, windbreak, privacy, cleaner air, less noise, less glare, and higher property values to name a few. But the key to these benefits is to select the right tree and plant it in the right place. The right tree in the right place not only ensures a lifetime of satisfaction, it also keeps maintenance costs low.

“What is right?” may sound like an exam question from a class in moral philosophy, but in the green world, it is not quite as complex. A tree’s requirements to thrive, its form or shape, its size at maturity, and its role or function in your landscape help determine the best tree to plant. Beyond that, the question enters the grey area of personal taste where what is “right” is largely a matter of opinion.



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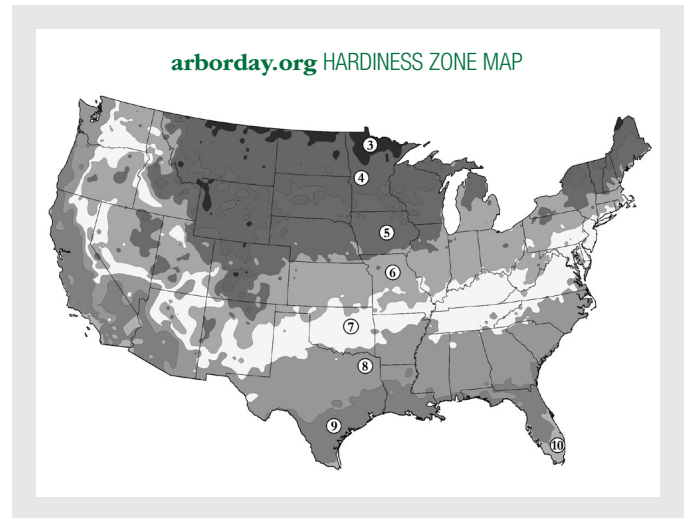
Environmental Factors to Consider

In selecting a tree, your first consideration must be what the tree needs. In other words, what environmental factors limit the ability of a particular species to live a healthy life? One indication is to look at the native species in your area. These trees have developed on their own through thousands of years of self-selection to survive where you now live. However, native species alone are usually not the answer. Some non-native species and horticulturally developed cultivars may also do well on your site and offer attributes such as beauty, size, pest resistance, or diversity that natives may not provide.

MINIMUM TEMPERATURE

The familiar hardiness map has zoned the country based on average annual minimum temperature. The lowest temperature of the zone limits the range of many trees. Low temperatures, especially if they come suddenly, can freeze and kill the living cells in trees. Select a species suitable to the zone where you live.

CAUTION: Elevation and exposure differences (the direction of the slope) within each zone also have an effect. North slopes, windy sites, and higher elevations can make a site equivalent to one or two hardiness zones lower. To find your hardiness zone, visit arborday.org/zones.



MOISTURE

Each species tolerates wet or dry growing conditions to a different degree. Special attention must be given to your selection if the site periodically is flooded, subjected to very dry conditions, or continually exposed to the drying effect of wind. Watering, of course, can modify a dry site, but even when you irrigate, it is important to know the optimal soil moisture requirement for your species. Tip: Since evergreens give off water (transpiration) from their needles all winter, it is important that they are well-watered in the fall before the ground freezes. Also, do not overwater trees. They will drown or develop root rot if the soil is kept too wet. With heavy, clay-type soils, check soil moisture often and water accordingly during dry summer weather. This may be every seven to 10 days or more often if necessary. Sandy soils need water more frequently than clay soils, but watering every other day is probably too much.



LIGHT

Shade tolerance is the term foresters use to rate the light requirements of each species. Some species, like white birch and most pines, require full sunlight. They are shade intolerant. Tolerant species, like most maples, hemlocks, and yews, grow well in shade. Others, like white oak, are somewhere in between and are referred to as having intermediate tolerance. Don't make the mistake of planting your tree where it is mismatched with its need for light.



PESTS

Every locality has its problems with particular insects or diseases. The best way to avoid trouble is to avoid the species that host these pests. In some cases, it is possible to buy cultivars that have been bred for resistance to a disease. For example, where white pine blister rust is a problem, it is best to buy white pine that is certified to be resistant to it. Some species, such as ginkgo, are known for their natural resistance to most pests. Others, such as American elm or ashes, are just the opposite. In most cases, planting a species on a site unlike its natural environment is asking for trouble. For example, birch trees grow naturally in moist environments, including river and lake edges. Planting them in an arid site subjects them to stress and makes them more vulnerable to boring insects.

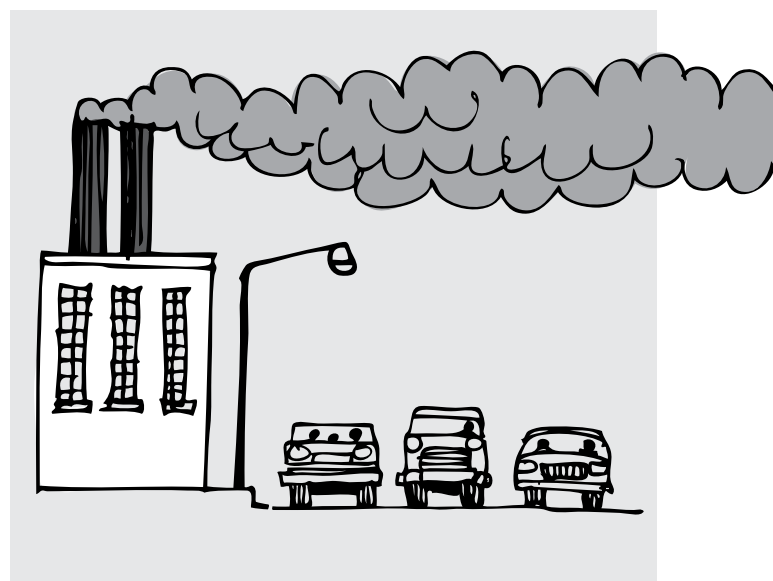
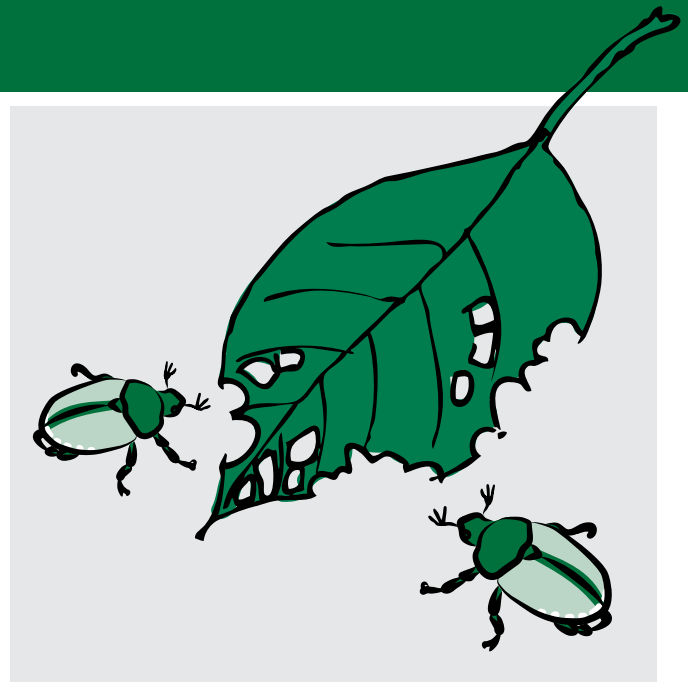
SOIL

Soil factors are probably the most overlooked when selecting a tree. Soil depth, structure, moisture, and pH can make the difference between success or failure after planting. For example, deep-rooted species will need adequate soil depth for their structural roots, whereas shallow-rooted species may do well on sites where soils thinly cover bedrock or a hard layer of clay. Species that need light or sandy soil should not be planted in rocky or clay-type soils. Also, each tree species has a tolerance range related to acidity and alkalinity, just as it does for shade. This requirement should be matched with the soil where you plan to plant. To learn about the soils in your area, obtain a soil survey map at the county office of the USDA Natural Resources Conservation Service. Unfortunately, soils are often disturbed in urban areas. Trees that would typically do well in native soil may struggle due to poor soil structure from soil being disturbed or mixed during construction or other building activities. Compaction of any soil due to heavy pedestrian or vehicle use often reduces a tree's growth, size potential, and overall health.

AIR POLLUTION

Unfortunately, the ability of a species to tolerate air pollution is becoming more important. Chemicals in the air vary with localities, and in some cases, the accumulative effects of pollution are just beginning to show up. The best course of action is to ask a local professional if there are problems in your town and, if so, what species are affected. Similarly, salt spray from either the ocean or street de-icing can be a problem locally, and some species are more sensitive to it than others. Where these are problems, ask a certified arborist, nursery professional, urban forester, or extension agent about which trees to avoid.

TIP: Local nurseries generally do not carry trees that are incompatible with the local climate. However, for site factors other than climate, it is pretty much a matter of "buyer beware." Get the answers before you buy, and look around your neighborhood to see what may be growing well.



Tree Factors to Consider

1 THE TREE'S PURPOSE

A tree's function is the purpose you want it to serve for you. Some of the most common are listed here to help ensure you get the right tree for the right place.

SHADE

This is why many people plant trees. Trees provide a greater cooling effect than man-made structures because not only are the rays of the sun blocked, water is also added to the air through transpiration.

Observation is the best way to determine where to plant to maximize shade. In the drawing, notice the difference between July and early autumn. Plant for where you want the shadow during the hottest time of the year — and the time of day you desire the shade.

High, wide-crowned trees with deciduous leaves are the best providers of shade.

AESTHETICS

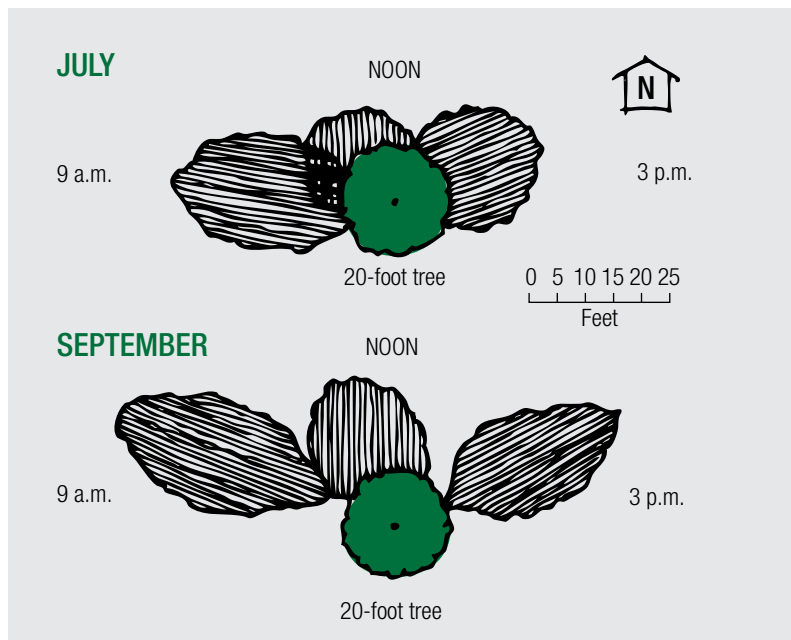
To create an accent, select a tree that will contrast with the predominant landscape character. For example, to give the lot an appearance of greater depth, plant on a diagonal line outward from the front corners of the house. This is called framing. Trees planted behind the house and to the side will provide background. Trees can also add visual appeal to a patio, pool, or play area. They can also be used to separate spaces and provide space enclosure.

ACCENTS: A tree with color or some other showy feature can be used as an accent point in your landscaping picture. Don't overdo accents. One accent plant in a given setting or view area is usually enough.

For a visual accent, select a tree that contrasts with the characteristic landscape in one or more of the design elements — form, size, color, or texture. The more contrasts, the stronger the accent will be.

If you wish to have a strong point of emphasis, select a specimen tree with two, three, or even all four of these characteristics:

- ✓ **FORM OR SHAPE:** A tree's form should contrast with the predominate landscape character in a setting. For example, horizontal lines may dominate in a rural midwestern landscape. Accent forms will be those that contrast with that character, such as pyramidal, columnar, or upright oval tree shapes. Weeping forms will also accent since they are uncommon to this characteristic landscape.
- ✓ **SIZE:** A tree that stands out because of its large size will tend to accent.



- ✓ **COLOR:** Planting trees for their spring flower color, fall foliage color, or interesting winter bark is quite popular. While such color is often temporary, it is an important consideration. Summer foliage color, while not as intense, can lend an accent element of longer duration.
- ✓ **TEXTURE:** Foliage texture can be classified as fine, medium, or coarse. If a tree's texture is used as an accent element, it should be an abrupt change from textures that predominate in the characteristic landscape. Bark texture or picturesque branching structure can also complement an accent plant.

WINDBREAKS AND SCREENS

Low-branching conifers that hold their foliage are most effective for screening unsightly areas and providing privacy. Noise is best reduced by tall, densely planted trees with fleshy, broad leaves. If combined with conifers, some noise reduction can be extended throughout the year. Dust can also be filtered by such a combination. Windbreaks can be made most effective through a dense, step-like arrangement of both conifers and deciduous trees. However, for protection on south and east sides of a house, deciduous species work best because they allow incoming solar radiation in winter.

BOUNDARIES

Trees can help to visually delineate your property. Small, narrow-crowned species will do the job while not invading your neighbor's space. Plant far enough on your property to avoid the trunk touching the actual property line when mature.

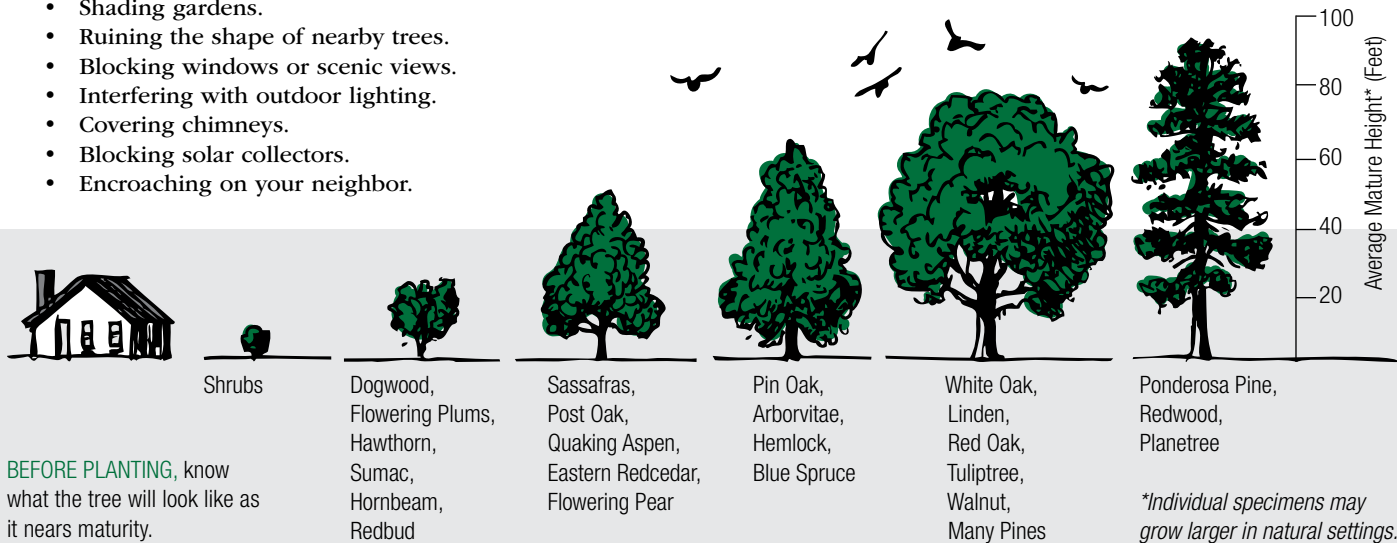
2 SIZE AND LOCATION

Available space is probably the consideration most often overlooked or misunderstood when deciding what tree to plant. Even for professionals, it is often difficult to envision the planting site five, 10, or 20 years in the future. Yet this is essential. Before planting, know what the tree will look like as it nears maturity. Consider its height, crown spread, and root space.

Some of the problems below can be dealt with by subsequent pruning. However, it is far easier, less expensive, and better for tree health to select and plant your tree to meet a desired objective while at the same time preventing it from:

- Lifting walks.
- Entering or moving drainage pipes or other utilities.
- Tangling with wires or eaves.
- Shading gardens.
- Ruining the shape of nearby trees.
- Blocking windows or scenic views.
- Interfering with outdoor lighting.
- Covering chimneys.
- Blocking solar collectors.
- Encroaching on your neighbor.

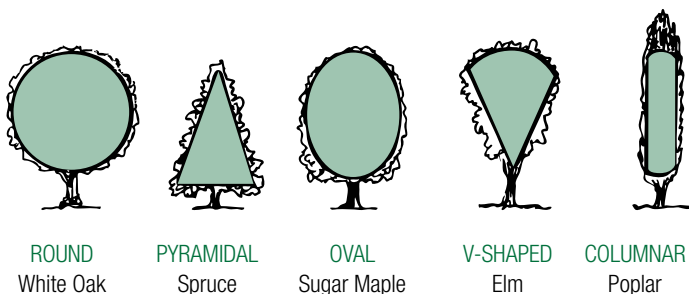
Spacing Guide	Small tree (<30')	Medium tree (30'-70')	Large tree (>70')
Spacing plant massings	6'-15'	30'-40'	40'-50'
Minimum spacing from wall (one-story building)	8'-10'	15'	20'
Minimum spacing from corner (one-story building)	6'-8'	12'	15'



BEFORE PLANTING, know what the tree will look like as it nears maturity.

(These examples are typical mature heights in city conditions. Check booklets published by local forestry professionals or books such as *Manual of Woody Landscape Plants* for the expected mature height and crown spread of trees you are considering.)

3 CROWN FORM OR SHAPE



The character of tree crowns and thus the form or shape of trees varies among species as much as leaf shapes or bark patterns. Shape is another clue to how well a tree will fit the space you have available, what problems might occur, and how well it will help meet the goals you have for your property.



Columnar cultivars help adapt street trees to fit narrow spaces or avoid signs.

What About Planters?

Under some urban conditions there is no alternative to planting trees in planters or containers. Because of the severe conditions of restricted space for roots and exposure to freezing, it is essential to use a container that is as broad and deep as space allows. Roots freeze more easily in narrow containers; the recommended minimum is 5 feet on the sides and 2 feet deep.

When considering using planters, recognize that regular, conscientious maintenance will be needed and that the tree's longevity will be relatively short, requiring replacement. Other tips:

- In dry weather during the growing season, water at a rate equivalent to 1 inch of rain per week.
- Slope the bottom slightly toward small-diameter drain tile or 1-inch plastic pipe with holes drilled in it. Wrap in filter pads to prevent clogging and cover with 1 inch of sand. If no outlet is possible, place tile over gravel to help remove excess water.
- To reduce weight and aid aeration, a soil mix of coarse sand, organic matter or perlite, and a small amount of loam soil is necessary. Ask an arborist or nursery specialist what is used locally.
- For most tree species, the soil pH should be between 6.0 and 7.0.
- To help keep tree size small, fertilize only if a nutrient deficiency is indicated (by leaf discoloration).



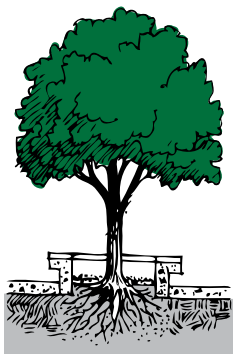
If you must use planters in a cold climate, it's best to use large ones with several trees. The earth mass helps protect the roots.

SOME TREES THAT DO WELL IN PLANTERS

Crapemyrtle
Dwarf Conifers

Dwarf Fruit Trees
Holly

Japanese Maple
Star Magnolia



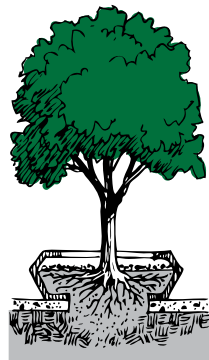
GOOD

Seat-wall ground-level planter, planted at grade. This planter has a neat appearance, fair aeration and root room, is convenient to water, provides a place for people to sit,

and has a good sense of permanence. Trees planted in such a container are generally safe from snowmelt salt, are easy to mulch, and have normal frost tolerance. The container provides good drainage and offers a place to plant flowers.

DISADVANTAGES: These containers are expensive to build or buy, difficult to clean, may restrict pedestrian traffic, and may interfere with snow removal operations. Root constriction limits the number of species suitable for planting in the open-bottom container.

— Adapted from *Containerized Trees for Urban Settings* by Jean E. Olson, Iowa State University.



DIFFICULT

Raised planter with open bottom, soil level raised not more than 1 foot above grade. This container is aesthetically pleasing, has excellent space definition, a strong sense of permanence, and provides

good drainage, a place for people to sit, and a place to plant flowers. Trees planted in this type of container are generally safe from snowmelt salt and are easy to water and mulch. Deep roots can penetrate well below the frost line.

DISADVANTAGES: These containers are expensive to install, are usually limited to outdoor use, and may interfere with snow removal operations and pedestrian traffic. There are a limited number of tree species suitable for planting in this type of container due to root restriction. Shallow feeder roots of trees may freeze, reducing tree life.



MOST DIFFICULT

Closed-bottom container. This container is aesthetically pleasing, easy to install and move, provides a sitting area, and is relatively safe from snowmelt salt. Such containers provide good definition of space and are readily available at known cost in a wide variety of sizes, shapes, materials, textures, and colors. Trees planted in these containers can be placed in almost any location; exotic species can be used indoors. Flowers can be planted in this container.

DISADVANTAGES: Trees planted in closed-bottom containers are highly susceptible to salt buildup from normal watering procedures (unless drainage holes are provided) and to root freezing. The containers can burst from winter freezing. Tree species suitable for planting in this container are very limited. It does not work in colder areas of the country.

Right Trees and Urban Forestry Programs

All that has been said about selecting the right tree for the right place is as true for street, park, and public building plantings as it is for residential properties. In fact, mistakes at the community level are magnified many fold. The widespread planting of a disease-prone species or trees too large or too small along an avenue will eventually plague the taxpayers with costly maintenance bills.

Fortunately, communities served by an urban forester or arborist are usually assured that species are selected with great care. In fact, if a staff forester, arborist, or landscape architect is not employed by the municipality, it will pay great dividends to retain the service of a qualified consultant when planning for tree plantings. When such professionals are on staff, the ideal situation is to combine their expertise into a team. For example, the knowledge of a forester or arborist about the site requirements of a tree or its maintenance needs can often be joined with the artistic talents of a landscape architect and the infrastructure knowledge of a city engineer to produce a plan that is both workable and visually attractive.

THE EDUCATION CHALLENGE

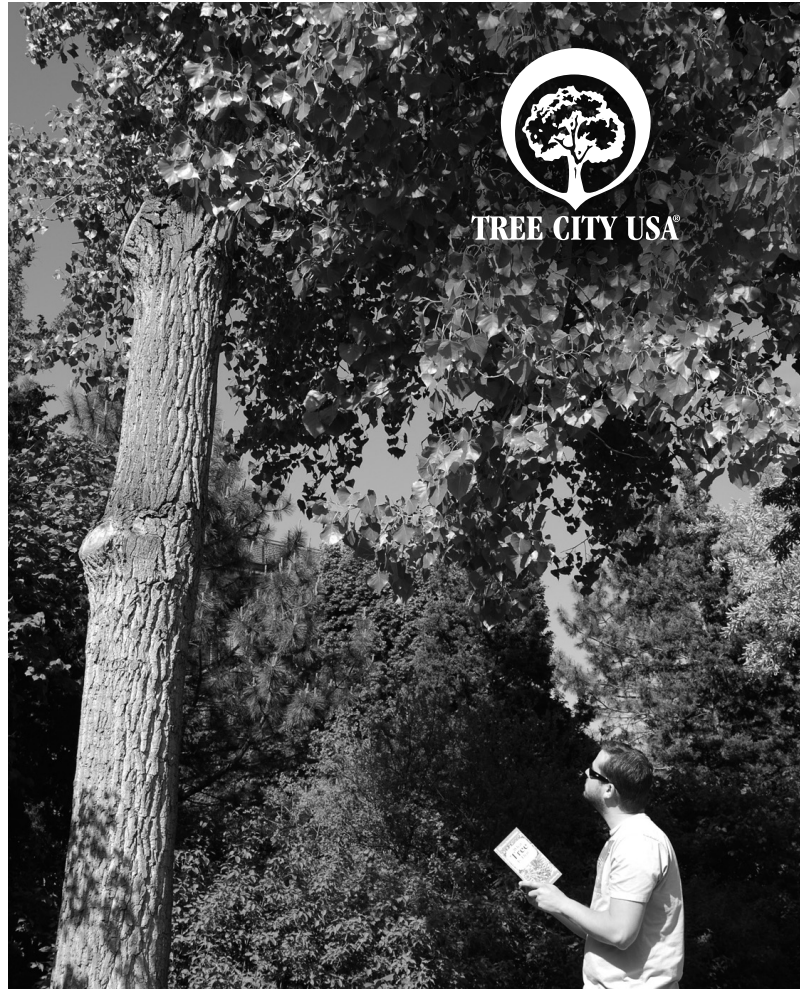
One of the challenges to all professionals is the large task of public education about trees. Helping homeowners and businesses start their trees correctly through careful selection and placement is one of the greatest needs in the wide spectrum of tree-care topics. It is preventive medicine at its best. Fortunately, there is much material available to help, including this bulletin. The need, however, is to (a) localize the information, and (b) get it into the hands of the people who need it.

Information needed in community literature includes lists that show:

- Species that thrive in the local climate, preferably arranged by tree characteristics and/or functions they best serve.
- Species to avoid because they are known to have persistent insect or disease problems or are sensitive to local air pollution.
- Species that are prohibited or discouraged — and the reasons why.
- Locations such as an arboretum, park, campus, or street where mature specimens of desirable species may be viewed.

Getting the information into the hands of people who can use it is not easy. Budget constraints are often the first problem but should not be allowed to stop the project. The publications that are illustrated above range from single-page fliers that can be duplicated at little cost on office equipment to elaborate multicolor booklets. Whatever the cost, the investment will repay taxpayers in the long run.

Distributing the publications should not be left to chance. The use of literature racks in the office or distribution at



Publicity about planting the right tree is essential to the long-term health of any community forest.

workshops reaches too few people. Door-to-door distribution in new developments, direct mail, and using local realtors, developers, and nursery operators are more effective ways to reach the entire population of tree owners.

PLANNING AHEAD

In the urban forestry program, the best ideas for using the right trees in the right places can come undone when the desired planting stock is not available, is too expensive, or is the wrong size. One solution that sounds simple, but is rarely practiced was developed by the late Bob Skiera, former forester for the City of Milwaukee. Bob studied his streets and parks and planned for new plantings several years in advance. He then grew the needed stock in the city nursery and was assured of an adequate supply in his preferred size of 2-inch caliper. Similar arrangements could be made with contract suppliers and would give them the advantage of being sure of their future market. Either way, the result will be less reliance on chance and more precision in planting the right tree in the right place.

Finding More Information ...

There is considerable help available for selecting the right tree for the right place. Sources include:

- Local tree selection guides available from city or state urban foresters.
- Publications produced by private and public utilities.
- Books on trees that include site requirements and characteristics at maturity.

A good place to start your search for more information is **arborday.org**. This is the official website of the Arbor Day Foundation and includes not only more materials related to Tree City USA Bulletin No. 4, but also additional tips on tree care, how to purchase trees online, and an online tree guide. The guide offers detailed information on dozens of commonly planted landscape trees that grow throughout the United States. Included for each is information on sun and soil requirements for planting, mature height and spread, growth rates, and more. For other sources of information about this topic, go to **arborday.org/bulletins**.



The right trees in a residential median not only beautify the neighborhood, but raise property values and help tame traffic as well.



Selecting the right trees for the right places will result in beautiful and safer streets such as this. Proper selection will also reduce maintenance costs and provide other practical benefits such as energy savings, prolonged life of pavement surfaces, and cleaner air.

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For a complete list of Tree City USA Bulletins, visit **arborday.org**.

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Arbor Day Foundation in cooperation with the U.S. Forest Service and National Association of State Foresters. To achieve the national recognition of being named as a Tree City USA, a town or city must meet four standards:

- Standard 1: A tree board or department
- Standard 2: A tree care ordinance
- Standard 3: A community forestry program with an annual budget of at least \$2 per capita
- Standard 4: An Arbor Day observance and proclamation

Each recognized community receives a Tree City USA flag, plaque, and community entrance signs. Towns and cities of every size can qualify. Tree City USA application forms are available from your state forester, the Arbor Day Foundation at **arborday.org/treecity**, or your state forestry agency.

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SPANISH LANGUAGE EDITION A one-page summary of Tree City USA Bulletin No. 4 in Spanish is available at no cost. Call Member Services at 888-448-7337 or go online to **arborday.org/bulletins** to obtain a copy.

