



Trees to Plant In Containers or Wells

*Donna C. Fare
Research Horticulturist
USDA-ARS
US National Arboretum*

*Wayne K. Clatterbuck
Assistant Professor
Forestry, Wildlife
& Fisheries*



Donna C. Fare

Pleasing example of a group of trees growing in containers.



Donna C. Fare

An in-ground tree planter with a magnolia tree.

Landscaping in a small area is challenging, but popular. Planting trees in small areas can limit root and shoot development. Proper selection of plant material for small areas is important to ensure a healthy environment for the plant. Sidewalks, patios, decks, entrances, courtyards and other small areas can be landscaped with the use of containers or wells with restricted soil area.

Container styles and materials are unlimited and include plastic, clay, tubs, wood, barrels, concrete and metal. The main requirements are that containers provide good drainage and a suitable environment for plant growth. Most commercially produced containers have adequate drainage holes. If drainage holes are missing, or if a custom-made container is used, drill two drainage holes (1/2-3/4 inch) for every square foot of bottom surface area. Planters that do not have holes may be the cause of plant mortality due to poor drainage.

An important aspect of container or well planting is the soil or growing medium. A fast draining, porous medium is important to provide air space; but the medium must have enough water-holding capability to provide the water needs of the plant. Heavy, poorly-drained soils such as clay can be a primary cause for plant failures. In wells, aeration can be enhanced by using horizontal and vertical pipes. A good growth medium contains peat moss, organic materials, sand and sandy loam soil. Peat moss provides good water-holding capability in the medium. If too much peat moss is used, the medium may not drain as well and the air space could be restricted. Good substitutes for peat moss are rice hulls, cotton gin waste and kenaf. Most garden centers stock a good selection of prepared potting media.

Botanical Name	Common Name	Comments
<i>Acer ginnala</i>	Amur Maple	Matures at about 20-25 feet tall with a rounded to spreading shape. Usually grown as a multi-stemmed tree. Amur maple has excellent tolerance to urban conditions. Fall foliage color may include yellow, red and purple.
<i>Acer palmatum</i>	Japanese Maple	Many selections of Japanese maples are available with red or green foliage, and various leaf forms. Needs good drainage and some protection from the western sun.
<i>Aesculus x carnea</i> 'Briotii'	Red Horsechestnut	Matures at 30-35 feet tall. Blooms in mid-May with large (10") red flowers. It tolerates a wide pH range, but prefers moist soil.
<i>Carpinus betulus</i> 'Pyramidalis' or 'Fastigiata'	European Hornbeam	May grow up to 35 feet in height, with a triangular canopy form. Foliage is dark green in summer and has yellowish fall leaf color. The bark is steel gray and is attractive during winter.
<i>Cercis canadensis texensis</i>	Oklahoma Redbud	The shiny green leaves on this redbud are thick and leathery with wavy margins. Flowers are purplish to magenta and showy in early spring.
<i>Chamaecyparis obtusa</i>	Hinoki false Cypress	A slow-growing evergreen plant that can reach 50 feet in height. Pyramidal in form. Likes moist, well-drained soil.
<i>Crataegus viridis</i> 'Winter King'	Winter King Hawthorn	One of the best Hawthorns for the landscape. Vase-shaped canopy. White flowers in spring with showy red fruit in late summer and fall.
<i>Fraxinus excelsior</i> 'Rancho'	Rancho European Ash	Smaller than the species, this selection will mature at 30 feet in height. Fall leaf color is a clear yellow.
<i>Hamamelis virginiana</i>	Witch-hazel	A shrubby-looking tree that can reach 20 feet in height. Prefers shade. Blooms in late fall with orange to yellow flowers.
<i>Ilex x attenuata</i> 'Fosteri'	Foster Holly	Grows well in sun or shade. The branching habit is naturally conical and dense, but responds to shearing in a more formal landscape. Foster #2 is a female that produces a multitude of bright red berries. Foster #4 is a male holly.
<i>Koelreuteria paniculata</i>	Goldenrain Tree	A fast-growing tree about 30 feet tall that can be just as wide. One of the few yellow-flowering trees. Flowers are showy in May and June.
<i>Lagerstroemia fauriei</i>	Crapemyrtle	Flowers in summer with large white panicles. Cinnamon-colored bark is showy all year. Many cultivars of <i>L. fauriei</i> x <i>L. indica</i> are available with an array of flower colors.
<i>Lagerstroemia indica</i>	Crapemyrtle	Grown as a single-trunk or more commonly a multi-trunk tree. Flower panicles provide summer color ranging from white, pink, lavender and red.

Botanical Name	Common Name	Comments
<i>Magnolia grandiflora</i> ‘Little Gem’	Little Gem Magnolia	A slow-growing, evergreen Magnolia that can withstand urban conditions of extreme heat and drought.
<i>Magnolia</i> x <i>Galaxy</i>	Galaxy Magnolia	An introduction from the US National Arboretum. In most cases, blooms late enough to escape damage by late frosts. Canopy develops into a formal symmetric pyramidal tree.
<i>Magnolia</i> x <i>soulangiana</i>	Saucer Magnolia	Many seedling selections bloom early and are often damaged by spring frosts. The Greshman hybrids, the Little Girl hybrids and the Lily Magnolia selections bloom later and often avoid frost damage.
<i>Prunus caroliniana</i>	Carolina Cherry Laurel	Small evergreen tree with a pyramidal to rounded canopy form. Fragrant white flowers bloom in March-April. Likes full sun to partial shade and well-drained soil.
<i>Prunus cerasifera</i> ‘Atropurpurea’	Purple-leaf Plum	An upright-growing plum with reddish-purple foliage. Flowers light pink before the foliage emerges in the spring. For the best foliage color, plant in full sun.
<i>Prunus</i> x ‘Okame’	Okame Cherry	A early-flowering cherry that often blooms in February during a short warm spell. Growth habit is distinctly upright.
<i>Rhus typhina</i> ‘Dissecta’	Cut-Leaved Sumac	Prefers full sun. Trees can be grown as a single-trunk or multi-trunk with a loose, round-headed canopy. This tree is not poisonous to humans.

When potting, be sure that the level of the medium is about 1 inch below the top edge of the container or well to make watering easier and more efficient. The top of the root system should be level with the surface of the medium. If planted too deep, roots can suffer from lack of air space. When selecting plants for containers or wells, be sure to size the plant to the space available. The root system of the plant must have room to grow. As the tree grows larger, it may become root bound and need replanting to remain healthy.

Water is critical for trees growing in containers or wells. Thorough watering can prevent salt buildup from fertilizer release. If the medium and the root system are very dry, the medium can shrink away from the sides of the container, allowing the water to run down the sides and out of the container without wetting the medium. When this happens, water frequently so that the medium is re-saturated.

Monitor the soil moisture of trees planted in wells often. Supplemental watering is crucial during hot, dry periods. Trees may be stressed from excess water during periods of extensive rainy weather when drainage is poor.

Add fertilizer frequently to containers and wells. Routine watering can leach some of the fertilizer out of the container. Therefore, light and frequent fertilization is preferable to single, heavy applications. Commercial fertilizers are avail-

able that can be applied with water. Another approach is to use a controlled-release fertilizer granule. Depending on the release pattern (three to four months, six to eight months, etc.), these fertilizers could provide season-long nutrition to the plant.

Trees planted in containers must be able to withstand temperature extremes. The roots are exposed to colder temperatures in the winter and hotter temperatures in the summer because they are above ground. Extra care must be provided for the trees to perform well in the landscape. The effects of freezing and thawing can be reduced with insulated containers.

Wells for street trees or other landscape use must provide a healthy environment for the trees, while being pleasant to the eye. The amount of space required is based on the size of the tree at maturity and the expected lifespan. Stressed trees have a reduced life expectancy. Researchers have concluded the minimum well size for small trees is 4' x 4' x 4' (64 ft³). Medium-sized trees require a well 6' x 6' x 5' up to 7' x 7' x 6' (170-300 ft³) for adequate soil volume.

An alternate method of determining well dimensions is to tailor the well size to the tree selection and lifespan. Estimate the mature diameter of the tree, then allow 2 feet along the side of the well for each inch of diameter. For example, a Foster Holly with a 5-inch diameter would need 10-foot sides



Donna C. Fare

Tree planted in a well and covered with a grate on a city sidewalk.



Donna C. Fare

An island for tree planting along a sidewalk.

on the planting wells. The width of the sidewalk or the distance to the curb often determines the planting well size. Porous pavers can be used to cover the soil on large wells and provide a surface for pedestrian traffic.

Isolated wells have been problematic in many urban areas. Underground utilities (gas, electric and fiber optic cable) can restrict the depth of planting since these areas are shared. It is more difficult to manage the soil environment in the well due to soil compaction, poor drainage and aeration and irrigation demand. In lieu of wells, landscape professionals recommend the use of island planting in urban areas. Islands are larger and can be strategically placed to allow the planting of a greater diversity of plants.

In courtyards and residential environments, planting wells can be used successfully. The soil is usually less compacted than in a street environment, there are fewer utility constraints and watering needs are more readily met.

Landscaping in a small restricted area can be successful. Select trees that can tolerate the adverse conditions of containers and wells and thrive in a limited root zone area. Trees recommended in this publication have been successfully grown in containers or wells and can add an aesthetic quality to the landscape.



Wayne K. Clatterbuck

Monitor trees planted in wells to prevent damage from grates as the tree grows.

Appreciation is expressed to Robin Young for design of this publication.

SP 532-15M-3/99

R12-4910-17-001-00

 A State Partner in the Cooperative Extension System, The Agricultural Extension Service offers its programs to all eligible persons regardless of race, color, age, national origin, sex or disability and is an Equal Opportunity Employer, COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS, The University of Tennessee Institute of Agriculture, U.S. Department of Agriculture, and county governments cooperating in furtherance of Acts of May 8 and June 30, 1914. Agricultural Extension Service, Billy G. Hicks, Dean

Printing for this publication was funded by the USDA Forest Service through a grant with the Tennessee Department of Agriculture, Division of Forestry. The *Trees for Tennessee Landscapes* series is sponsored by the Tennessee Urban Forestry Council.

