

GEORGIA FORESTRY
COMMISSION



COMMUNITY TREE PLANTING AND ESTABLISHMENT GUIDELINES



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"The best time to plant a tree was 20 years ago.

The second best time is now."

Chinese Proverb

Introduction

This document is intended to aid homeowners, public works and physical plant staffs in planting and directing the establishment and maintenance of community trees. The landscape design details have been endorsed by the American Society of Landscape Architects. The planting details were written and tested by certified arborists and foresters, and were determined to be minimum requirements for the establishment and growth of community forests.



Source: Morton Arboretum

In addition to the incorporation of these standards, communities and campuses should adopt an active tree conservation, protection and management program.

Roots of mature trees extend far beyond the extent of branch tips and drip lines. With adequate soil volumes, tree roots may extend as far as two and a half times the diameter of the drip line. The majority of a tree's nutrient-absorbing roots lie in the upper 12 to 16 inches of the soil. To provide landscape trees the opportunity to grow to maturity, it is critical to understand the growth requirements of tree roots.

Tree Growth Requirements

Sunlight

Some tree species grow naturally in full sun, while others prefer shade. This characteristic is known as a tree's shade tolerance. Trying to establish a shade-loving tree in full sunlight is stressful to the tree, increases the need for maintenance and may predispose the tree to pests and disease. Measure the total number of hours of direct summer sunlight the tree will receive during the day. Then select a species suited to light conditions and published shade tolerance standards.

Water

All plants need water to survive but the amount of water needed varies by site, species and size. Without sufficient water, trees can't take up enough nutrients to produce the food they need to support life. Likewise, too much water can also be detrimental. In general, mature trees require about one inch of rainfall over their entire root zone every seven to ten days through the growing season (March through October). Trees in the establishment phase may require more. Determine how much water a planting site receives during one week from irrigation, flooding or other sources, and determine if supplemental watering will be required. Adjust watering regimes accordingly. Remember, tree roots under turf get very little water from normal turf irrigation.

Soil

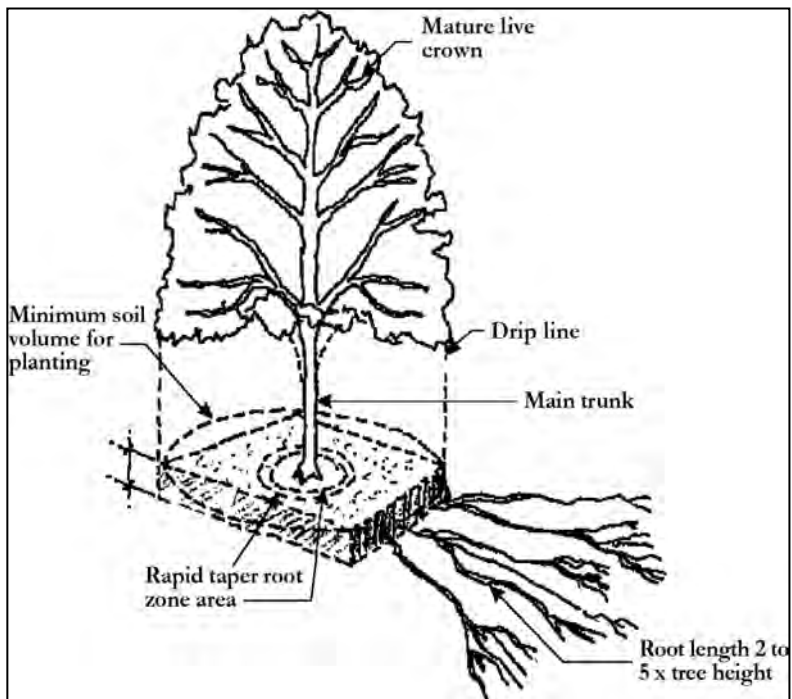
While some trees will grow in dry or wet sites, most require well drained soils with some moisture-holding capabilities to minimize stress. To determine if the selected planting site is acceptable, dig a 12 inch diameter hole about 12 inches deep. Fill it with water. If the water remains after eight hours, pick another spot. Do not add sand or organic matter to the planting hole. This is not a long term solution for improving poor soil quality. Backfill the planting hole with un-compacted native soil. If a soil test indicates that additional soil amendments are required, they must be incorporated into the entire

planting area. Improperly amending the planting area alters the soil hydrology, contributes to root stress and slows tree growth.

Nutrients

With the exception of very poor soils, nutrient additions are seldom required during the early establishment period of a tree. Conduct a soil test after the site is selected to determine the existing balance of nitrogen, potassium, phosphorus and organic matter. Should fertilization be required, proceed cautiously. Typically, fertilization should take place only after the first year of establishment has passed. Nutrient applications should be made at three intervals during the year - spring, summer and fall. Additionally, in situations where soil quality is very poor, the incorporation of mycorrhizae into the soil can be beneficial during the establishment period.

Tree Root Area Requirements



Site Selection

Selection of a Proper Planting Site Depends Upon:

- Placement of overhead and below ground utilities.
- Distance to structures, roads, walks and drives.
- Availability and proximity of water for irrigation.
- Energy conservation opportunities.
- Aesthetic concerns.
- Available soil surface area for rootcolonization.

How to Calculate Minimum Soil Areas:

Step 1: Estimate the maximum expected mature trunk diameter size, 4.5 feet above ground.

Step 2: Calculate required soil area as:

Expected diameter x 2.0 = each side of planting square in feet.

OR Expected diameter x 2.25 = diameter of planting circle in feet.

Example: A 10 inch diameter mature tree would need a 20 x 20 foot planting square or a 22.5 foot planting circle.

Large trees require a minimum of 640 square feet of rooting area to reach maturity and should not be placed within 25 feet of a structure, 30 feet of an overhead utility, or within 15 feet of an underground utility, road, drive or walkway.

Small trees, growing to a mature height of under 30 feet, require a minimum of 400 square feet of rooting area depending on the species, and should not be placed within 15 feet of a structure, 10 feet of an overhead utility, or 10 feet of an underground utility, road, drive or walkway.

Watering is required for all trees through the first two growing seasons. Placement for energy conservation can generate significant savings by shading windows, air conditioners, and south and west facing walls.

Tree Selection

Choose A Quality Tree

The successful growth of a tree to maturity depends upon a number of factors, particularly the quality of the tree itself. Assuming you have selected the right space, use the following guidelines to select a quality specimen:

Don't

- Pick a tree that has been topped or had the central leader cut back.
- Select a tree with damaged bark or old wounds on the trunk or branches.
- Choose a containerized tree that is pot-bound or has girdling roots. Remove the container and inspect the root system, if possible.
- Pick a tree that has been planted too deeply in its container, (trunk root flare should be obvious).
- Pick a tree that has too small of a root ball for the diameter of its trunk. Root ball diameter should be 10 to 12 inches for every inch of trunk diameter measured at six inches above the soil (tree caliper).
- Choose a tree with broken branches, diseased or discolored leaves or cracked bark.
- Select a tree just because it is a bargain.
- Expect a substandard tree to do well in the landscape simply because it is properly planted and maintained.

Do

- Select a tree that conforms to the [American Standard for Nursery Stock](#) for landscape trees.
- Choose a tree that is the correct species for the selected planting site.
- Plant the tree properly.
- Continue good maintenance practices throughout the life of the tree.

Tree Planting

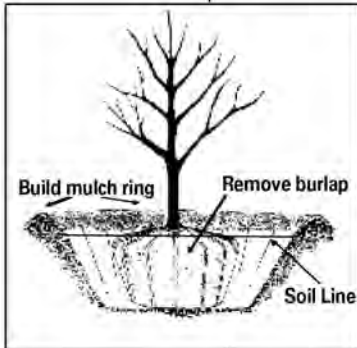
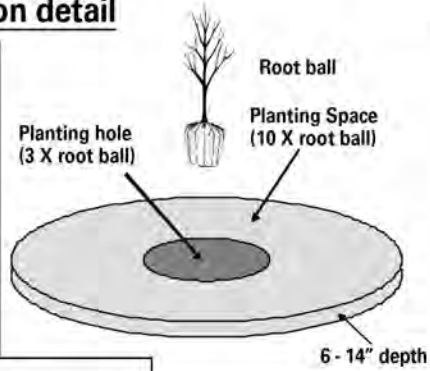
Basic Installation

After following the directions for site selection and soil area determination, proceed as follows:

1. The planting area should be tilled to a depth of six to eight inches (deeper if the soil is compacted) for an area of ten times the diameter of the root ball.
2. Excavate a hole three times the diameter of the root ball and no deeper than the ball or container. Leave the soil at the base of the hole compacted.
3. Remove the container, cut girdling roots and place the tree in the hole. For balled and burlapped (B&B) trees, remove all ties, strapping, and as much of the wire and burlap basket as possible if the root ball is tight and soil is not loose and falling away. The top of the root ball should rest no more than one inch above existing soil line for every ten inches of root ball depth and never lower than the existing soil line (example: a 15 inch deep root ball should rest 1.5 inches above existing soil line).
4. Backfill the hole with the uncompacted native soil that was previously removed to make the hole. Lightly pack the soil and water as you go to eliminate any air pockets. Construct mulch ring at outer edge of planting hole and mulch planting area to a depth of two to three inches with composted wood chips. This ring will reduce lawnmower and weed eater damage and will be removed after the second growing season. Do not mulch within six inches of the trunk. This will allow air to circulate around the trunk root flares and top of the root ball.
5. Stake the tree only if wind throw is a significant issue and allow for at least three inches "slack" in tie wires. Never allow bare wires to contact bark. Remove all stakes, wires, hoses and ties after first growing season.

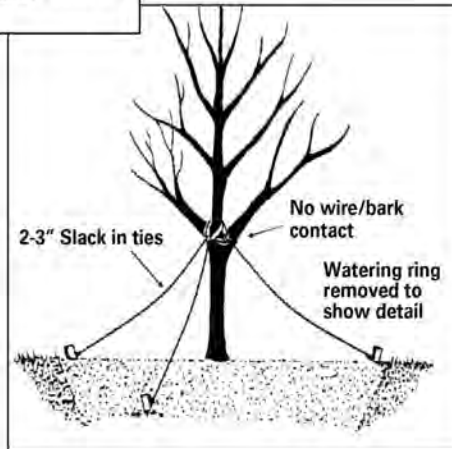
Balled and Burlapped (B&B) Material

Site preparation detail



Planting detail

Staking detail



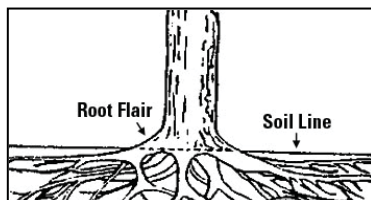
Containerized Trees

Container Size

Containerized trees may come in one, two, or three inch caliper sizes and are usually available in one, three, five, seven, ten or 15-gallon containers. Ideally, the diameter of the container should be eight to ten (preferably 12) inches for every inch of trunk diameter measured at six inches above the ground. A two inch caliper tree should be in a container that has a 16 to 24 inch opening and should be at least a 15-gallon size.

Root Flare

When removing the tree from the container, inspect the soil level in the root ball and make sure the first root flare is at the top of the soil. If not, gently remove the soil until the first root flare is evident.



Girdling Roots

Girdling roots (roots that circle around the root ball inside the pot) present in the root ball at time of planting require a significant amount of work to mitigate before planting. Inspect the root ball for girdling roots and loosen the roots with your fingers as much as possible, ensuring the roots are extended outward. Cut all girdling roots with a sharp knife or pruning shears at both the top and bottom of the root ball. Also make four vertical cuts, one inch deep, evenly spaced around the root ball from top to bottom. Deeper cuts may be required if multiple layers of girdling roots are observed. This should cut many of the girdling roots that may not be obvious. While it is not ideal to cut roots, cutting any girdling roots will benefit the tree in the long-term. University of Florida research (2009) suggests the entire outer inch of the sides and bottom of the root ball should be removed.

Plant the tree as you would a balled and burlapped (B&B) tree, remembering that containerized trees often require more water than B&B trees and need to be monitored more closely.

Bare Root Trees

Trees

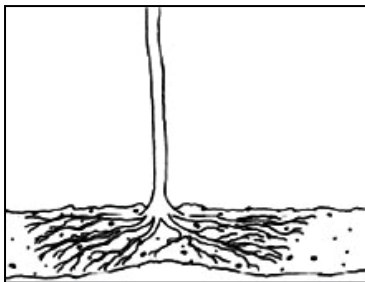
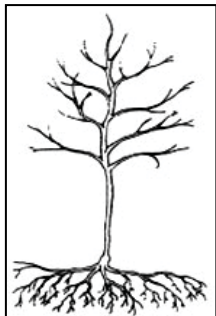
Bare root trees have no soil attached to the root system and are generally sold as one to one and a half inch caliper trees. Because they have no soil, the full extent and quality of the entire root system is known.

Bare root trees are only available during winter when the trees are dormant, and must be planted as soon as they are received. They are also easier to plant because they only require that the planting area be tilled so that the tree can be placed in loose soil about four inches deep.

Place the tree roots so that they are three to four feet deep, uniformly arranged, and the top of the first major root flare is even with the surrounding soil level. Cover the roots with native soil and stake the tree with a single stake and biodegradable twine. Proceed with mulching and watering as you would with other trees.

Seedlings

Before planting, keep the seedling cool with moist soil around the roots. Do not put the tree in the hot sun or in a bucket of water. Dig a hole twice as wide as the roots and deep enough for the full length of the roots so they do not bend. Plant the tree no deeper than it was in the nursery, allowing the evenly distributed roots to rest on naturally firm soil so that the top of the roots are about one inch below the surface. Break up the soil, remove rocks and refill the hole, packing gently but firmly. Follow watering and mulching instructions.



Bare Root Trees

Street Trees

Installation

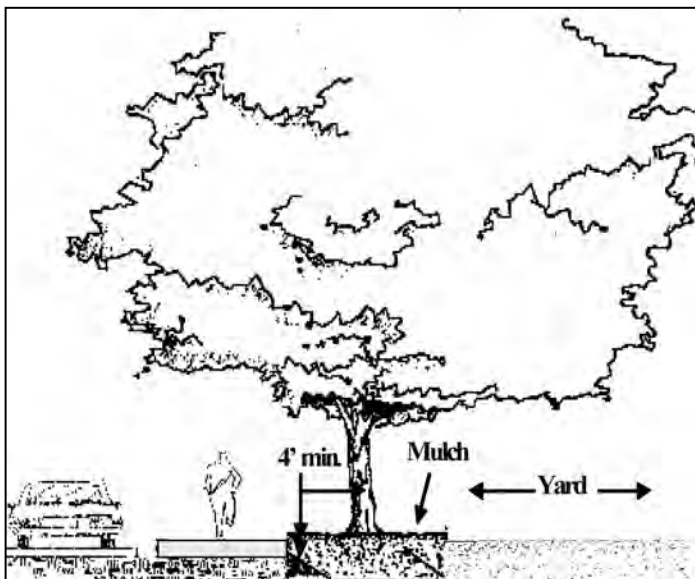
The installation of street trees follows basic installation guidelines.

Soil Volume

Street tree planting along streets, sidewalks, driveways, and medians requires special consideration of soil volume minimums and infrastructure conflicts. Tree spacing widths within the planting area and soil preparation at depths of two to three feet require a significant amount of planning and investment if trees are expected to grow to maturity.

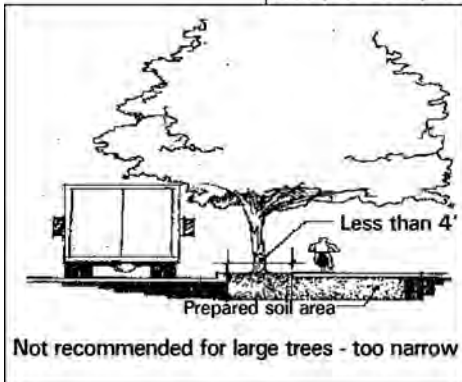
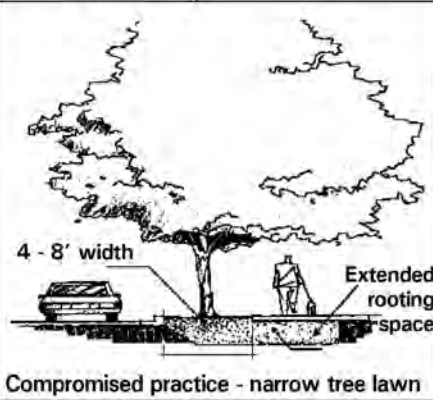
Planting Details

Descriptive details regarding tree placement for typical street tree planting situations follow.



Best Practice - Tree on property side of sidewalk.

Street Tree Planting Details



Medians

Tree Planting

Median plantings differ from street tree plantings in that there are not as many confrontations between tree roots and infrastructure. However, some challenges exist for the successful establishment of trees in medians.

Planting Area

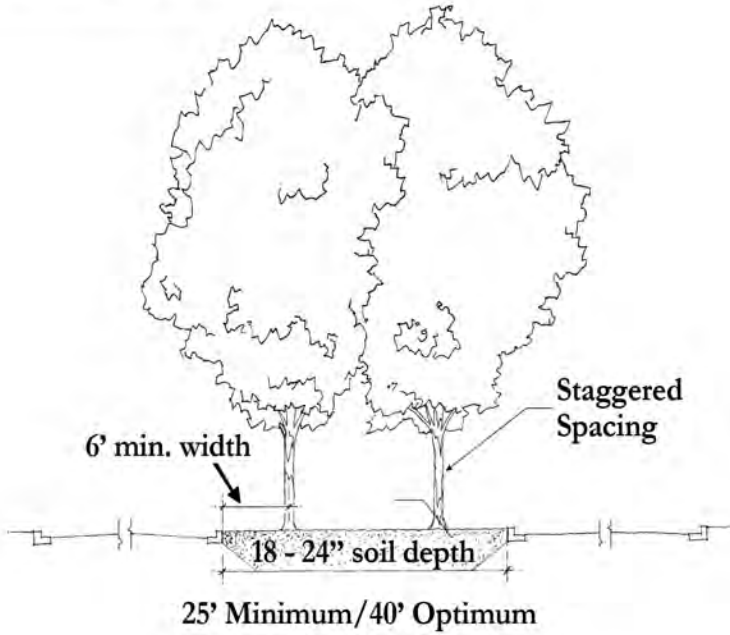
The width of a planting area determines how many, what size and what species of tree is acceptable for successful growth in medians. Many medians are too narrow to support more than one row of trees. Soils are usually very poor in these narrow medians, often composed of spoil left over from road construction. The narrower the median the more likely that extensive soil preparation will be necessary. Sometimes soil replacement is a more effective use of available resources. Where soil quality is acceptable, follow the guidelines for tree planting and soil preparation.

Wider medians have more available soil area for root colonization and can support larger growing trees with fewer maintenance problems. Medians measuring more than 25 feet in width can support two rows of trees spaced 25 to 40 feet apart in staggered rows. Medians less than 25 feet wide have difficulty supporting more than one row of trees. The actual number of trees a planting area can support depends upon species, soil type, water availability, maximum expected size of the tree, and required minimum soil area needed to support the tree to maturity. As with any tree planting, matching species to site is critical for successful establishment and growth to maturity.

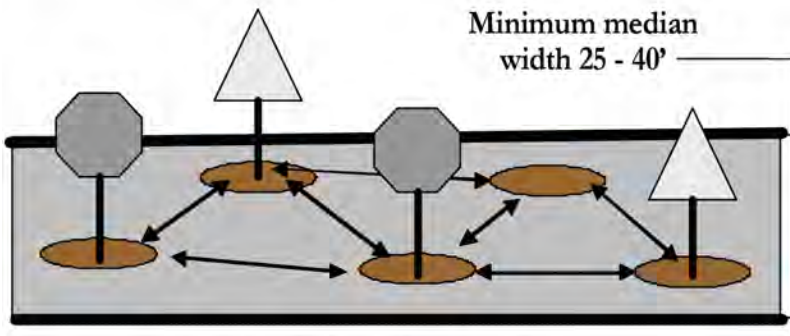
Irrigation and watering, whether temporary or permanent, must be planned and implemented as soon as the trees are installed. Maintenance (mulching, watering, insect control, and pruning) needs to continue throughout the life of the tree.

Also, remember to consult with transportation authorities to ensure median and rights-of-way plantings meet local regulations.

Median width detail



Staggered spacing detail



Note: 20 to 40' tree spacing

Parking Lots

Tree Planting

Planting trees in parking lots is a quick way to reduce the environmental impacts associated with auto emissions, heat island effects and storm water runoff. Successful tree growth in parking areas is a function of quality soil volume and water availability. Water may be made available through irrigation from in-ground systems or hand watering.

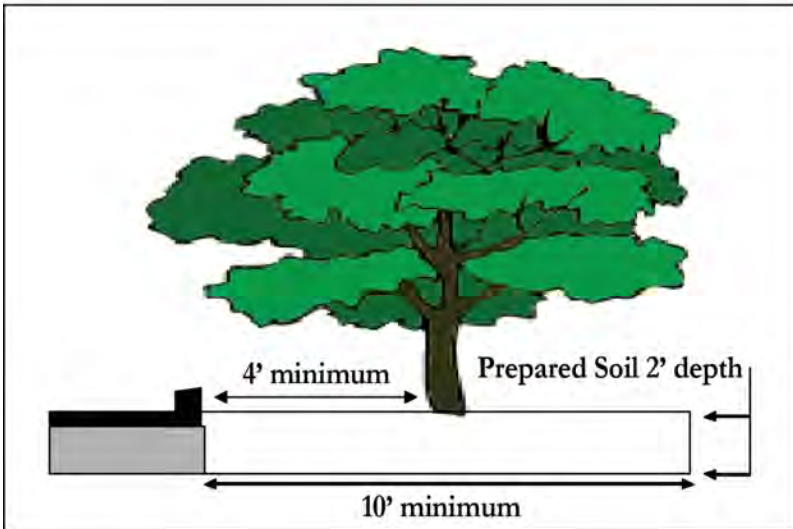
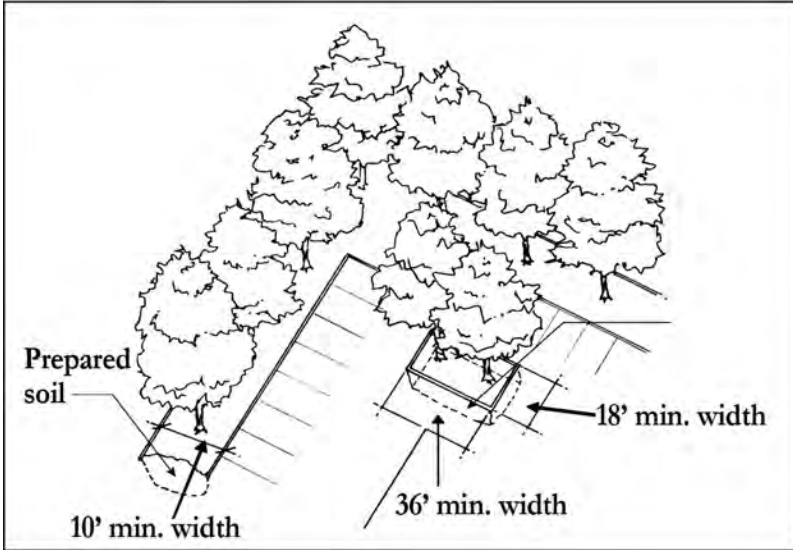
Soil Volumes and Type

The required soil volumes needed for trees to reach maturity must be engineered into the parking lot design prior to construction. Soil types must be specified in construction plans. Always make sure soil type is continuous throughout the islands, soil pH is acceptable (5.5 to 7.0) and the installation of underground irrigation lines takes place prior to tree planting. There is a limited selection of tree species that can survive the environmental stresses of parking lots and reach maturity. This list expands as planting soil areas and volumes increase.

Planting Islands

Constructing planting islands of proper width will reduce plant stress and ensure long tree life. Continuous landscape beds on the perimeter of the parking area should be at least 10 feet in width. Interior parking islands should be at least 18 feet wide and 36 feet long. Tree planting islands should have no less than 100 square feet of soil surface area which will support only the very smallest growing tree or shrubs. Small growing trees (which reach a mature height of under 20 feet) require at least 200 square feet of open soil surface area, while medium trees require 400 square feet of surface rooting area and a soil depth of 18 inches. Small growing trees should not be placed within three feet of a parking stop or curb. Large trees require at least 640 square feet of surface rooting area and a soil depth of 18 to 24 inches for each square foot of expected basal area. Large growing trees should not be placed within six to eight feet of a parking stop or curb.. Finally, develop a long term maintenance and management plan for the planting spaces.

Parking lot detail



Near Utilities

Overhead Lines

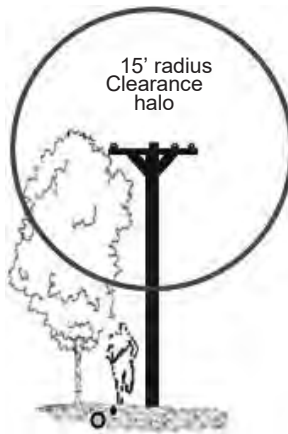
One of the first rules of tree planting is “Look up!” Many of our urban trees would have much fuller canopies and longer lives if planters had done that prior to turning over that first shovel of soil. Overhead utility lines may be as low as 20 feet overhead and need at least 15 feet of clearance in all directions (the “clearance halo”) to insure free and unhindered power lines. Planting anything but the smallest growing trees under low hanging utility lines insures at best, a misshapen crown and at worst, tree removal.

Underground Utilities

Planting above underground utilities can also result in tree damage when utility lines need to be repaired. Never plant closer than six feet to below-ground utilities. A good rule of thumb is to plant outside the mature tree's expected root plate, or one half foot radius for every inch of mature trunk diameter at 4.5 feet above the ground.

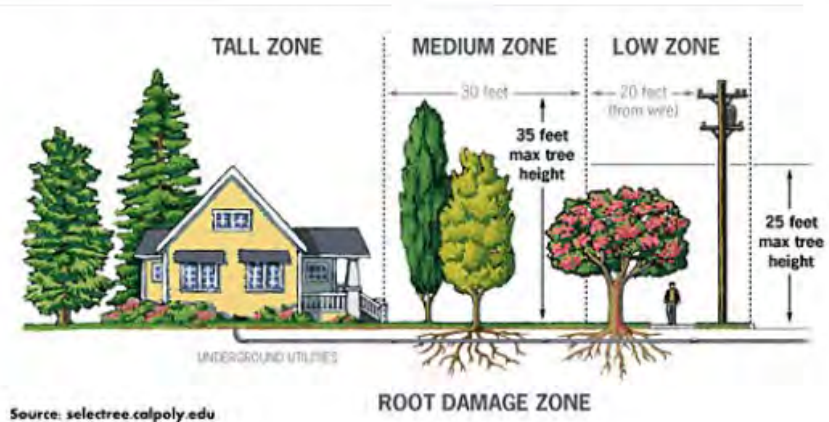
Tree Planting

With all tree planting, whether on public or private property, it is critical to avoid current and future utility conflicts. Determine half the average mature crown spread of the tree to be planted. Add 15 feet to the measurement. That distance is the closest to an overhead power line that the chosen species of tree may be safely planted.



Call Before You Dig

Extreme care should be taken before any tree planting or tree maintenance is performed. Look up, look down and look around to assess hazards. Prior to digging, call 811.



Plant Trees—Save Energy!

Carefully positioned trees can reduce a household's energy consumption for heating and cooling by up to 25%. Computer models devised by the U.S. Department of Energy predict that the proper placement of only three trees can save an average household between \$100 and \$250 in energy costs annually.

Trees properly placed around buildings can reduce air conditioning needs by 30% and can save 20–50% in energy used for heating

For maximum energy savings, plant deciduous, large-growing shade trees to the west, east, and southwest of the structure.

Basic Tree Maintenance

Planning for Survivability

Trees growing in parking lots, along streets, and in front yards have more stress placed upon them than trees growing in natural environments. Each site has different watering, pruning, mulching and fertilization requirements. Therefore, it is critical to the long term survivability of trees that a proper maintenance plan be established.

Watering

All plants need supplemental watering to survive the first and second years of establishment. Watering requirements are driven by evaporation rates on the site, moisture-holding capability of the soil and species type. Newly planted two inch caliper trees require approximately four to five gallons of water over their entire root zone, one to two times a week through the summer months, depending upon local conditions and soil types. This may be supplied by hand watering or in-ground irrigation systems. Determine how much water a planting site currently receives per week from irrigation, flooding and other sources. Determine if supplemental watering will be required. Check existing soil moisture prior to watering and do not water if soils are saturated.

Pruning

Limit pruning in the first two years to the removal of dead, dying, damaged or diseased branches. Reduce risk by removing defective branches that would cause personal injury or line of sight issues (most often related to pedestrian or vehicular traffic). All pruning should follow the *American National Standard for Tree Care Operations - Tree, Shrub, and Other Woody Plant Management - Standard Practices (Pruning)*, or ANSI A300 Pruning Standard—Part 1.

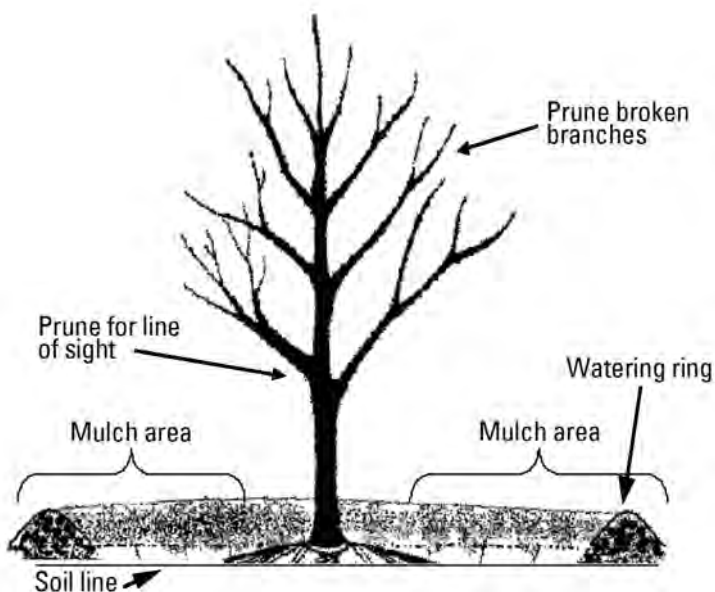
Mulching

Placing mulch around newly planted and established trees reduces watering requirements, weed competition and reflected heat stress. Mulch should be spread over the tree's entire expected root system to a depth of two to three inches.

Keep mulch six inches away from the trunk to allow for air exchange between the root collar, root ball and above ground environment. Mulching to a deeper depth or against the tree's trunk may cause pest and disease problems and increase tree stress. Mulch with composted wood chips (composted for four months minimum), maintain the two to three inch depth and keep root flares uncovered.

Fertilization

Conduct a soil test to determine the balance of existing nutrients and soil pH. Nutrient additions to planting areas are seldom required in yard plantings. However, fertilization may be needed in street and parking lot plantings where soil quality is very poor. Amend poor soils throughout the entire island or root zone. Soil of poor quality or improper pH may have to be replaced. Additional fertilization of the site should not take place during the first year of establishment. When additional fertilization is required, nutrient applications should take place at three intervals during the year - spring, summer and fall.



Tree Conservation

Tree Root Systems

Tree root systems extend far beyond the drip line and vary in length from two to five times the height of the tree, depending on the species, size, soil type, and location of the tree. Successful tree conservation efforts require that a large portion of the tree's root system, the critical root zone (CRZ), be protected for all trees to remain in the landscape.

First, determine the **root zone** for established trees as follows:

Step 1. Measure trunk diameter at 4.5 above soil line.

Step 2. Multiply trunk diameter in inches times 2.5

Example: 20 inch diameter oak x 2.5 = 50 foot diameter root zone.

Root systems have a threshold of loss above which long term damage or death can occur. This threshold is that area defined by the limits of the critical root zone (CRZ). Eliminating soil impacts in the CRZ significantly reduces the likelihood of long term damage.

Next, determine the **critical root zone** for established trees as follows:

Step 1. Measure trunk diameter at 4.5 feet above soil line.

Step 2. Multiply trunk diameter in inches times 1.25.

Example: 20 inch diameter oak x 1.25 = 25 foot root radius or a 50 foot diameter critical root zone.

Grade changes, cuts and fills can alter the hydrology of the site and the water and nutrients available to the tree, which impacts root system vitality.

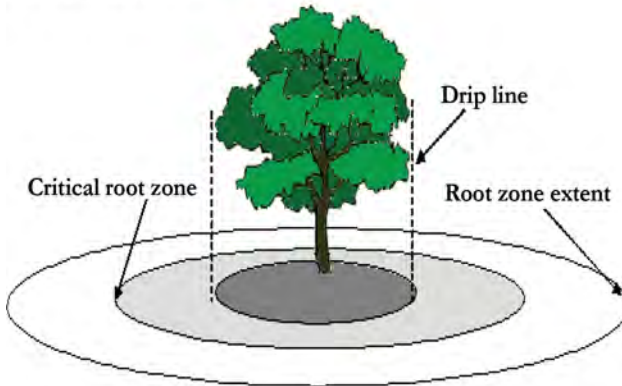
Construction and Trees

When construction activity is necessary around a group of trees, the trees' cumulative critical root zones should be determined in order to reduce or eliminate impacts on these areas.

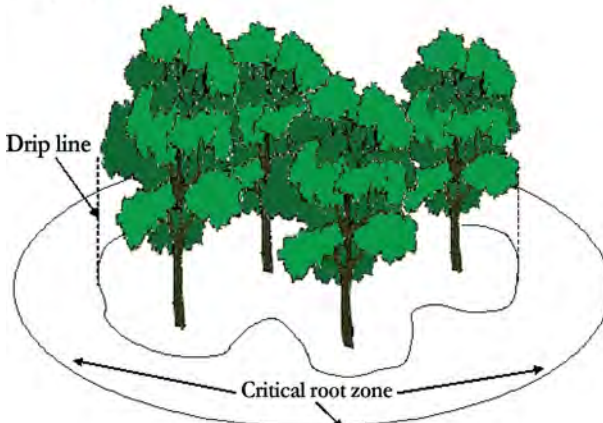
When to Remove Trees

Consider removing trees that have sustained CRZ loss in excess of 30%. Tree species, health, structural integrity, soil type, vegetation competition, structure proximity, future planned impacts and planned maintenance and management regimes contribute to the determination of which trees should be removed.

Critical Root Zone Detail for individual trees



Critical Root Zone Detail for grouped trees



**Recommended Overstory Tree Species by Open Soil Surface Requirements at
1 sq. ft. Basal Area**

Species Common Name	Genus & Species	Estimated minimum open soil surface area to reach 1 sq. ft. basal area	Estimated minimum cu. ft. soil volume of planting area in urban soils to reach 1 sq. ft. basal area	Overstory Landscape Areas
Baldcypress	<i>Taxodium distichum</i>	640	960	X
Basswood, American (Linden)	<i>Tilia americana</i>	640	960	X
Beech, American	<i>Fagus grandifolia</i>	640	960	X
Chestnut, Chinese	<i>Castanea mollissima</i>	640	960	X
Elm, Chinese	<i>Ulmus parvifolia</i>	640	960	X
Elm, Winged	<i>Ulmus alata</i>	640	960	X
Ginkgo (male)	<i>Ginkgo biloba</i>	640	960	X
Hickory (spp.)	<i>Carya spp.</i>	640	960	X
Honeylocust (seedless)	<i>Gleditsia triacanthos</i>	640	960	X
London Planetree	<i>Platanus x acerifolia</i>	640	960	X
Magnolia, Southern	<i>Magnolia grandiflora</i>	640	960	X
Maple, Sugar	<i>Acer saccharum</i>	640	960	X
Oak, Black	<i>Quercus velutina</i>	640	960	X
Oak, Chestnut	<i>Quercus prinus</i>	640	960	X
Oak, Laurel	<i>Quercus hemisphaerica</i>	640	960	X
Oak, Northern Red	<i>Quercus rubra</i>	640	960	X
Oak, Nuttall	<i>Quercus nuttalli</i>	640	960	X
Oak, Overcup	<i>Quercus lyrata</i>	640	960	X
Oak, Post	<i>Quercus stellata</i>	640	960	X
Oak, Sawtooth	<i>Quercus acutissima</i>	640	960	X
Oak, Scarlet	<i>Quercus coccinea</i>	640	960	X
Oak, Shumard	<i>Quercus shumardii</i>	640	960	X
Oak, Swamp White	<i>Quercus bicolor</i>	640	960	X
Oak, Water	<i>Quercus nigra</i>	640	960	X
Oak, White	<i>Quercus alba</i>	640	960	X
Oak, Willow	<i>Quercus phellos</i>	640	960	X
Pagodatree, Japanese	<i>Saphora japonica</i>	640	960	X
Pecan	<i>Carya illinoensis</i>	640	960	X
Planetree, London	<i>Platanus x acerifolia</i>	640	960	
Popular, Tulip	<i>Liriodendron tulipifera</i>	640	960	X
Sweetgum (fruitless)	<i>Liquidambar styraciflua</i>	640	960	X
Sycamore, American	<i>Platanus occidentalis</i>	640	960	X
Tupelo, Swamp	<i>Nyssa ogechee</i>	640	960	
Walnut, Black	<i>Juglans nigra</i>	640	960	X
Zelkova, Japanese	<i>Zelkova serrata</i>	640	960	X

Road Frontage Street	Road Frontage Yard	Parking Lot Tree Islands 400 to 600 sq. ft.	Parking Lot Tree Islands 100 to 200 sq. ft.	Buffers	Riparian/ Drainage Areas	Utility Corridors	Urban Tolerant	Native
					X		X	X
					X		X	X
					X			X
	X							
	X							X
X	X	X						X
X	X	X						
								X
								X
X	X	X			X		X	
				X	X			X
X	X				X			X
X	X	X						X
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X	X							X
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		X						X
								X
					X			
					X			X
		X						

Recommended Midstory Tree Species by Open Soil Surface Requirements at 1 sq. ft. Basal Area

Species Common Name	Genus & Species	Estimated minimum open soil surface area to reach 1 sq. ft. basal area	Estimated minimum cu. ft. soil volume of planting area in urban soils to reach 1 sq. ft. basal area	Overstory Landscape Areas
Birch, River (std.)	<i>Betula nigra</i>	400	600	X
Blackgum (Tupelo)	<i>Nyssa sylvatica</i>	400	600	X
Buckthorn, Carolina	<i>Rhamnus caroliniana</i>	400	600	X
Cedar, Deodar	<i>Cedrus deodara</i>	400	600	X
Cedar, Lebanon	<i>Cedrus libani</i>	400	600	X
Cherrylaurel, Carolina	<i>Prunus caroliniana</i>	400	600	
Elm, Chinese	<i>Ulmus alata</i>	400	600	X
Hemlock, Canadian	<i>Tsuga canadensis</i>	400	600	X
Hophornbeam, American	<i>Ostrya virginiana</i>	400	600	X
Hornbeam, American	<i>Carpinus caroliniana</i>	400	600	X
Hornbeam, European	<i>Carpinus betulus</i>	400	600	
Katsura Tree	<i>Cercidiphyllum japonicum</i>	400	600	X
Locust, Black (seedless)	<i>Robinia pseudoacacia</i>	400	600	X
Magnolia, Japanese (Saucer)	<i>Magnolia x soulangiana</i>	400	600	X
Magnolia, Southern "Little Gem"	<i>Magnolia grandiflora 'Little Gem'</i>	400	600	
Magnolia, Sweetbay	<i>Magnolia virginiana</i>	400	600	X
Maple, Hedge	<i>Acer campestre</i>	400	600	X
Maple, Red (var.)	<i>Acer rubrum</i>	400	600	X
Maple, Southern Sugar	<i>Acer barbatum</i>	400	600	X
Maple, Trident	<i>Acer buergerianum</i>	400	600	
Pine, Virginia	<i>Pinus virginiana</i>	400	600	
Pistache, Chinese	<i>Pistacia chinensis</i>	400	600	
Redcedar, Eastern	<i>Juniperus virginiana</i>	400	600	X
Redwood, Dawn	<i>Metasequoia glyptostroboides</i>	400	600	X
Sassafras	<i>Sassafras albidum</i>	400	600	X
Silverbell, Carolina	<i>Halesia carolina</i>	400	600	X
Sourwood	<i>Oxydendrum arboreum</i>	400	600	X
Yellowwood, American	<i>Cladrastis kentukea</i>	400	600	X

Road Frontage Street	Road Frontage Yard	Parking Lot Tree Islands 400 to 600 sq. ft.	Parking Lot Tree Islands 100 to 200 sq. ft.	Buffers	Riparian/ Drainage Areas	Utility Corridors	Urban Tolerant	Native
X	X	X		X	X			X
X	X	X			X		X	
X	X		X		X			
	X			X				
	X							
	X		X	X	X			X
X	X	X	X					
		X			X			X
	X	X	X		X			X
X	X	X	X	X				
	X	X	X					
X					X		X	X
	X							
X	X	X		X		X		X
	X			X	X		X	X
X	X	X			X			
X	X	X		X	X			X
X	X	X	X	X	X			X
X	X	X	X	X		X	X	
				X				X
X	X	X	X				X	
	X			X				X
	X			X				
	X							X
							X	X
	X						X	X
	X	X						

Recommended Understory Tree Species by Open Soil Surface Requirements at 1 sq. ft. Basal Area

Species Common Name	Genus & Species	Estimated minimum open soil surface area to reach 1 sq. ft. basal area	Estimated minimum cu. ft. soil volume of planting area in urban soils to reach 1 sq. ft. basal area	Overstory Landscape Areas
Chastetree (Vitex)	<i>Vitex agnus-castus</i>	250	225	X
Cherry, Kwanzan	<i>Prunus serrulata</i>	250	225	
Cherry,Sargent	<i>Prunus sargentii</i>	250	225	
Cherry, Yoshino	<i>Prunus x yedoensis</i>	250	225	
Crabapple, Japanese Flowering	<i>Malus floribunda</i>	250	225	
Cryptomeria	<i>Cryptomeria japonica</i>	250	225	X
Dogwood, Flowering	<i>Cornus florida</i>	250	225	X
Flametree, Chinese (Bougainvillea)	<i>Chionanthus retusus</i>	250	225	X
Fringetree (Grancy Gray Beard)	<i>Chionanthus virginicus</i>	250	225	X
Golden Rain Tree	<i>Koelreuteria paniculata</i>	250	225	
Hawthorn, Washington	<i>Crataegus phaenopyrum</i>	250	225	
Maple, Japanese	<i>Acer palmatum</i>	250	225	X
Plum, Purpleleaf	<i>Prunus cerasifera</i>	250	225	
Redbud, Eastern	<i>Cercis canadensis</i>	250	225	X
Serviceberry, Downey	<i>Amelanchier arborea</i>	250	225	X
Alder, Hazel	<i>Alnus serrulata</i>	100	125	X
Crapemyrtle, Common	<i>Lagerstroemia indica</i>	100	225	
Holly, American	<i>Ilex opaca</i>	100	125	
Smoketree	<i>Cotinus obovatus</i>	100	125	

Road Frontage Street	Road Frontage Yard	Parking Lot Tree Islands 400 to 600 sq. ft.	Parking Lot Tree Islands 100 to 200 sq. ft.	Buffers	Riparian/ Drainage Areas	Utility Corridors	Urban Tolerant	Native
				X				
	X			X	X	X		
	X			X		X		
	X			X		X		
X	X			X		X		
				X				
	X			X		X		
X		X			X	X	X	
X					X	X	X	
X	X	X	X					
X	X		X			X		X
	X					X		
				X		X		
X	X	X		X		X		X
X	X			X	X	X	X	
					X	X	X	X
X	X	X	X			X	X	
	X	X		X			X	X
	X					X		

Tree Characteristics, Shipping and Handling

Tree Characteristics

When choosing a tree, consider plant hardiness, tree shape and size at maturity, rooting space, fruit and flowers, sun exposure, drainage, human activity, resistance to insects and disease, and necessary maintenance. Choose a quality tree based on the guidelines provided.

Shipping and Handling

After the tree has been selected and purchased, ensure proper shipping and handling. When transporting trees in an open vehicle, cover trees with a tarp to prevent them from drying out and being damaged by the wind. All protective covering should remain until the tree has been planted. Trees with a large root ball are very heavy. Ensure enough people are helping to lift and lower the root ball. Do not drop trees into the hole. Or drag trees by the trunk.

Trees should be planted as soon as possible after delivery. Keep trees out of the sun, and keep roots cool and moist..

The best time to plant trees in Georgia is the late fall or early winter, between October and late February.

Corrective Pruning

Using sharp, clean tools, prune newly planted trees, if necessary, to create one central leader. Trim away any broken, defected or damaged branches to prevent future issues.

Resources

Sources

Georgia Forestry Commission, [Georgia Model Urban Forest Book](#), January, 2001, GaTrees.org.

Coder, K. Various [outreach publications](#) available. University of Georgia Cooperative Extension, Warnell School of Forestry and Natural Resources.

Gillman, Ed. Various [publications](#) available. Environmental Horticulture Department, University of Florida, Gainesville.

[Look Up, Virginia! Utility-Friendly Trees.](#)

[Energy.gov. Landscaping for Energy-Efficient Homes](#)

[U.S. Forest Service](#)

Additional Resources

[American Standard \(ANSI\) for Nursery Stock](#)

[ANSI A300 Parts 1-10](#)

[Arbor Day Foundation](#)

[Ask the Arborist](#), Georgia Forestry Commission

[Georgia Tree Council](#)

[International Society of Arboriculture](#)

[National Tree Benefit Calculator](#)

[Southern Regional Extension Forestry](#)

[Soil Testing in Georgia](#), University of Georgia Extension

Tree Care Industry Association, [Hiring a Tree Care Company](#)

[TreesAreGood.org](#)

U.S. Forest Service – [UrbanForestrySouth.org](#)

[USDA Plant Hardiness Zone Map](#)

[Vibrant Cities Lab](#)

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