



HOLDEN
FORESTS &
GARDENS



Tree Care Toolkit

**BEST PRACTICES FOR SELECTION, PLACEMENT,
PLANTING, PROTECTION, MAINTENANCE AND MORE.**



Benefits of Trees

Why do we care so much about trees? Because trees are the only infrastructure elements that increase in value over time! Think about it. It is obvious that healthy trees beautify our urban environment, but did you know they also provide numerous environmental, economic, social and health benefits that make our communities more livable? Trees are also on the front lines of our changing climate and naturally mitigate the effects. Invest in planting trees and properly care for them so they prosper for decades. Trees really do pay us back!



The following are just some of the many benefits healthy trees provide.

Environmental Benefits

- Absorb carbon dioxide
- Cool pavement
- Release oxygen
- Store carbon
- Intercept & clean rainwater
- Trap particulate matter
- Reduce stormwater runoff
- Moderate stream temperatures
- Prevent soil erosion
- Provide wildlife habitat

Economic Benefits

- Increase property values
- Increase business traffic
- Reduce energy consumption
- Buffer noise
- Calm traffic
- Increase pavement longevity
- Create green jobs

Social & Public Health Benefits

- Reduce UV-B exposure
- Improve respiratory health
- Provide green exercise
- Improve mental health
- Decrease stress
- Provide places to gather
- Provide Inspiration





Tree Selection and Placement

Tree Selection

Many homeowners choose trees for their property on impulse or emotion. This scenario is usually played out at the local nursery when the plant selected is in bloom. The unsuspecting plant victim is bought because of its beauty and then taken home to its final resting place. To be more specific, the casual tree consumer will bring the tree home and site it on property as they would a piece of furniture in their living room. Unfortunately, where the tree looks best is not necessarily the best location for it to grow. The tree may look good for a couple of years or longer, but eventually its health will fail, insects or diseases will find it, and the next thing you know its R.I.P. on the compost pile.

If these events sound familiar to you, then read on and learn how to select trees which will flourish in your home landscape. The first step to proper plant selection is reversing your thought process. By this, I mean to change the criteria you use for selecting trees.

Considerations for Planting

Too often we choose trees on appearances only, when in reality we should look at their adaptability first. The process can be broken down into four steps:

1. Analyze the site to determine:

- Light Exposure – full sun, part sun, shade, or dense shade.
- Soil Drainage – is there standing water for more than a few hours at any time? If there is, you may have a problem.
- Soil Compaction – is the ground hard like concrete or soft as the forest floor? Harder, or dense soils, are more difficult to grow trees in.
- Soil pH – a measurement on a scale from (1-14), 7 is neutral; below that is acidic and above is alkaline. The ideal pH for most conditions is 6.5. Mix a tablespoon of dried soil into an ounce of distilled water and use litmus paper to get a good pH estimate.
- Soil Fertility – this factor is directly related to organic matter content. All urban soils in northeast Ohio are low in organic matter and thus, low in fertility. These are the main limiting factors to growing plants in the Cleveland area. You can choose plants which will adapt to them or correct the problems before planting.

2. Decide on how much care you are willing to give your trees. Some trees require more frequent attention with pruning, watering and protecting from pests. Other trees are very low maintenance.

3. What function will the tree fill in the landscape? Trees can be used in many different ways – for shade, screening, buffering, accenting – to name a few. When you know how a tree is going to be used,

select ones which will mature at the size for the function. This will reduce unnecessary pruning. You will no longer need to fight with your trees in order to contain them.

4. Now that you have the difficult decisions done, you are ready to do what everyone enjoys the most – picking out the aesthetic features you desire in a tree. Colors, textures, seasons of interest – all that your landscaping dreams can conceive.

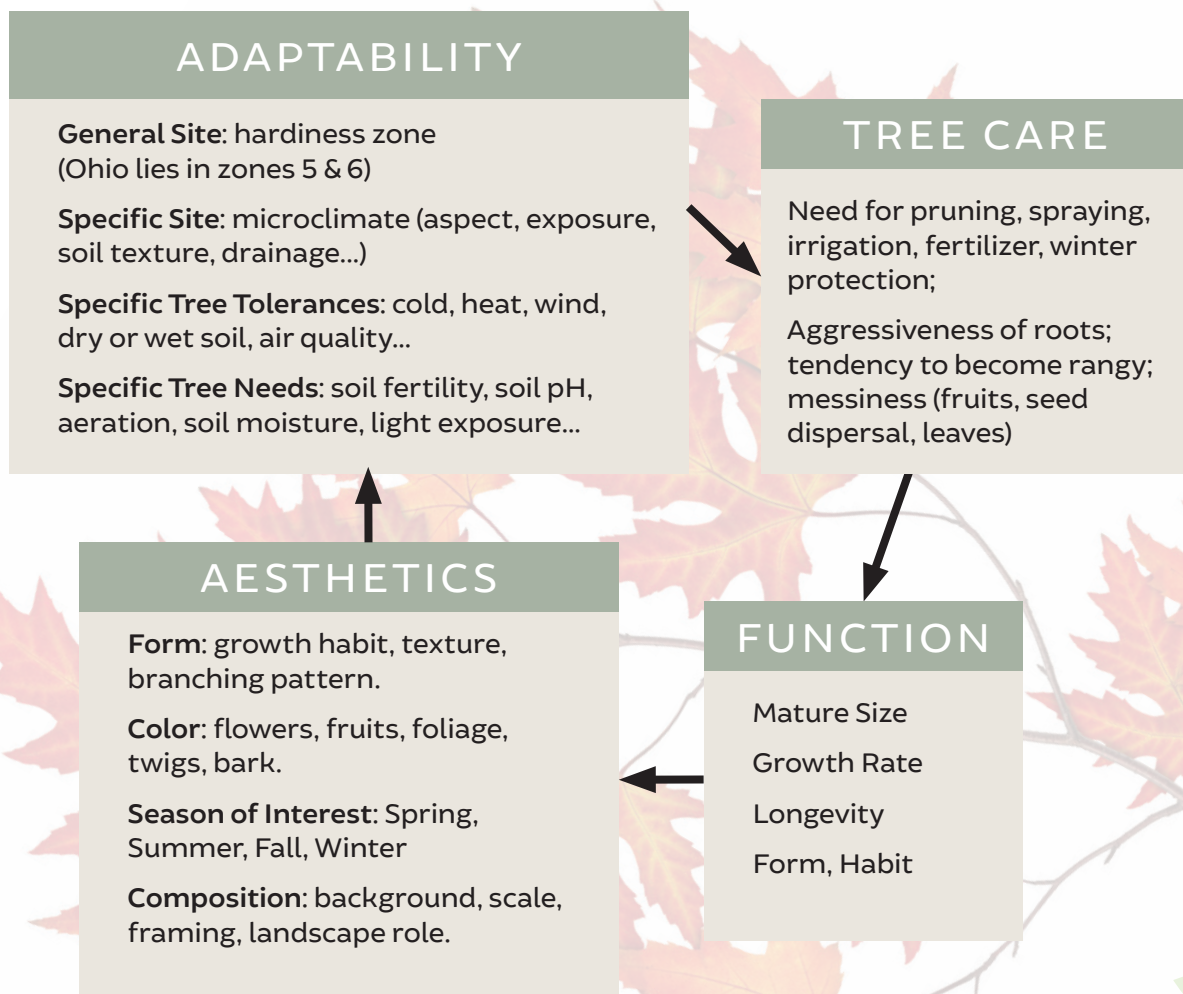


Criteria for Tree Selection

After compiling criteria from these four steps, take your list to a website or library with a good selection of resources on woody plants.

Take your criteria list and decide what is the most limiting factor for growing plants in your landscape. Use that criterion to start your research. Write down the names of plants from the reference's list which fit the basic form of tree you are looking for (i.e. evergreen, deciduous). Now cross reference the list you just created with lists in the references from other criteria (shade, dry soils, etc.) Cross off the names of trees on your list which do not appear in the resources. When you get to your criteria for landscape function and aesthetics, you should have a fairly short list. For these criteria you will need to look up each tree individually and determine which ones will fit your needs. If your site is not too difficult to work with, you should finish this research with a list of good trees – all of which will adapt to your site conditions.

Now you can take your tree list to any nursery and buy your trees with the confidence that you are selecting the right tree for the right place. To help you make the best selection from your nursery's stock, use the following table as a check list.



Choosing a Tree at the Nursery

General Appearance

- The tree should have a balanced shape.
- Make sure there are no bare spots in the foliage, missing or damaged limbs, spotted or discolored leaves.
- The tree should have a single "central leader" (main stem).
- Check the size of the crown and root ball in relation to the caliper of the tree - should not be top heavy.

Crown

- Seek trees with branches which come off the trunk at between 45° and 90° angles. The closer the angle is to 90°, the stronger the branch will be.
- Wounds from pruning should be callused over or well on their way.
- Branches should be distributed evenly with 6-8" between them on the main trunk.
- Branches should not be longer than 1/4 the height of the tree. Too long limbs place undue burden on the tree.



Root-bound Tree. The circling roots of this tree indicate it was in the container too long

Trunk

- The trunk should be straight.
- Look for insect damage such as borer holes.
- The trunk should be free of discolored, swollen, or sunken areas.
- No wound should be larger than 1/4 of the trunk's circumference.

Balled-And-Burlapped (B&B) Trees

- Trees should be dug during or close to dormant season.
- The trunk should not move independently of the root ball.
- The burlap should be tightly wrapped.
- The trunk should be in the center of the root ball.
- Select trees with some indication of a trunk flare at the top of the ball. This indicates you are getting a larger portion of the root system than you would with one in which the trunk flare is buried in the ball.

Containerized Trees

- Pot bound roots are in danger of "girdling" – encircling the pot and cutting off the vascular system. This can continue even after planting.
- Avoid trees that have large roots coming out of the container's water holes or roots circling on the soil surface.

Bare-Root Trees

- When available, bare root is a good choice. Properly dug, they will retain more roots than similar sized B&B trees. Bare-root trees will adapt to their site more quickly.
- Care must be taken to ensure that the roots do not dry out.
- Bare-root trees must be planted before leafing-out.





Proper Tree Planting

Recent research and information on plant biology has given us new insights on how to improve the survival rate of newly planted trees and shrubs. Appropriate site selection, planting hole preparation and most importantly, planting depth are factors that will help ensure that your trees and shrubs are healthy, vigorous and add beauty to your landscape for many years.

Timing

When is the best time of year to plant trees in Northeast Ohio? **Spring** and **Fall** are the best times for planting new trees (Late March through early-June and late October to mid-December)

Deciduous trees (A)

- Plant when the tree is dormant - either before the tree breaks bud in the spring or just after it loses its leaves in the fall
- Another good rule is to plant at least four to six weeks before either the extreme conditions of winter or summer are expected to arrive

Evergreen trees (B)

- Evergreen trees transplant well in spring and fall

Spring Planting Benefits

It's a popular time to get out in the yard and there is often better selection of trees available.

Magnolia, Willow, Dogwood and Birch are recommended for spring planting as they require more time to establish. Fruit trees are best planted in spring as well to avoid damaging their tender shoots.

Fall Planting Benefits

The leaves are off and there is less chance of sun damage to leaves or drought damaging roots. Since trees focus on growing new roots in fall, planting new trees in the fall helps develop denser, stronger roots.

Not recommended - Planting in Summer

Planting in summer's heat is not recommended as it creates conditions too dry and stressful for the tree. If you must plant in the summer, plant a containerized tree. You **MUST** water it frequently!



Bare root tree at the nursery.



Tools and Materials for Planting

To facilitate easy planting, make sure you have the proper tools for the job!

Checklist:

- ✓ Gloves - to protect your hands
- ✓ Long Pointy Shovel - for digging and breaking up soil
- ✓ Soil Knife or 'Hori Hori' - for digging and cutting (one blade edge is serrated)
- ✓ Bypass Pruners - for pruning roots, limbs and cutting tags. One blade bypasses the other. Makes clean cuts.
- ✓ 5-gallon Bucket or Hose - for watering the tree
- ✓ Mesh Tree Guard - for protecting tree against deer, mechanized equipment, etc.
- ✓ Wooden Stakes - to keep your tree secure for its first year
- ✓ Tree Tie - wide, flexible material for securing tree to stake
- ✓ Small Sledgehammer - for pounding the wooden stakes into the ground
- ✓ Mulch - to protect tree, hold moisture, reduce weed competition, add nutrients and moderate soil temperature



Planting Step-by-Step

1. Select The Site

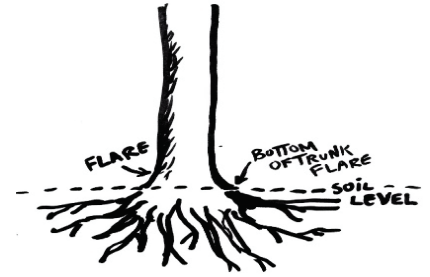
Evaluate the needs of the plant and the conditions of the site before you make a purchase and make sure they are compatible. Consider whether the site's exposure is in sun, part sun, or shade. Know the ultimate size of the tree – will it be too close to the house or power lines when mature? Is the tree's purpose to provide shade, fall color, screen an unsightly view, be a windbreak or serve some other function? Is the plant hardy to minus 10 to 20 degrees F. in NE Ohio's zone 5? Is the soil texture sand, loam, clay, well drained, dry, or frequently wet. Site incompatibility will result in the certain decline and premature death of the tree.

2. Call Before You Dig

At least 48 hours before planting, take a few minutes to call 800-362-2764 or 8-1-1, or visit e-dig to request the location of underground utilities (gas, electric and other facilities) near your digging site. This will keep you safe from personal injury, property damage, fines and utility disruption.

3. Prepare The Tree

One of the most common mistakes is planting too deeply, resulting in poor vigor and growth and also a major factor in the formation of stem girdling roots which in time can kill the plant. Locate the area at the base of the trunk where it flares out. This is the trunk flare zone where the roots meet the trunk. On balled and burlapped plants, the trunk flare is frequently one to several inches inside the rootball. Untie the twine and burlap and locate the trunk flare. Remove the excess soil above the flare zone. This will become the soil line. Measure the rootball height from trunk flare to the bottom of the rootball.



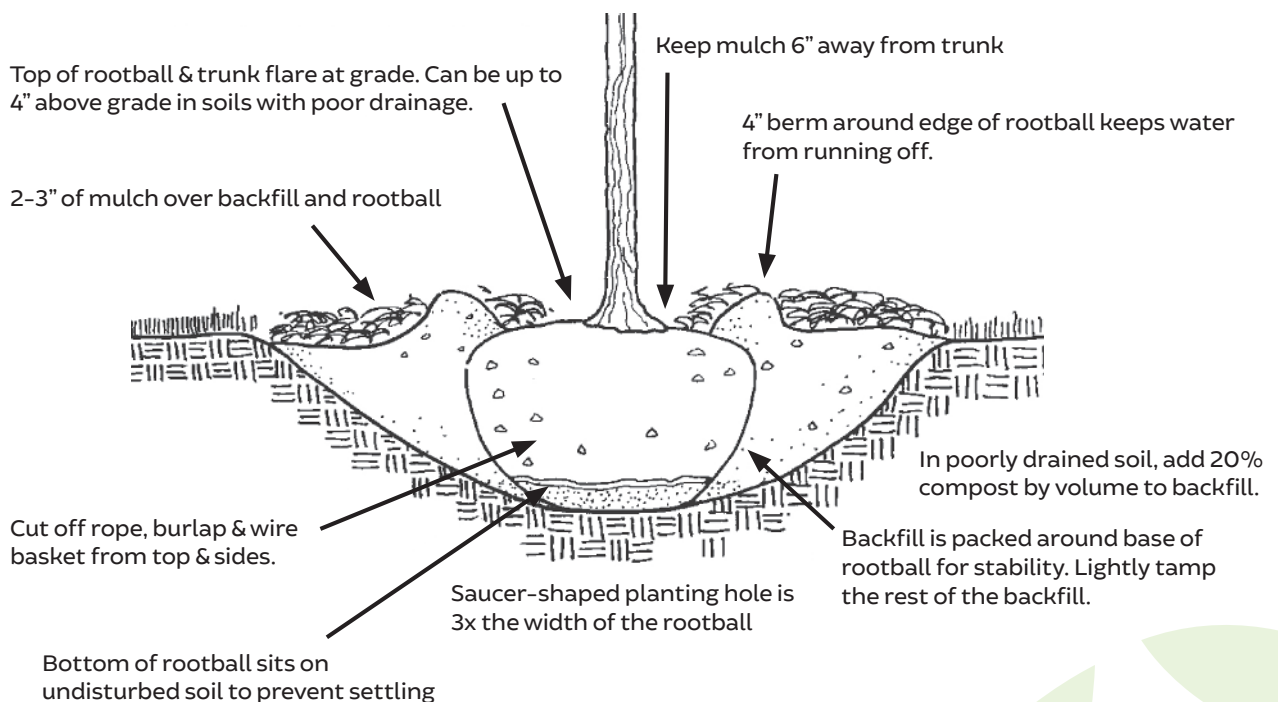
4. Dig The Hole

Dig a saucer-shaped hole 2 to 3 times the width of the rootball. Do not dig deeper than the measurement you made in step 2. Do not loosen the soil at the bottom of the hole. The rootball must rest firmly on undisturbed soil so the tree doesn't settle.

5. Set The Plant

Balled and Burlapped (B&B) Nursery Stock

Lower the rootball into the hole, keeping the tree's soil line level with the top of the hole. Cut the wire cage and remove as much of it as possible. If it is left in place, the wires can girdle the roots. Cut and remove the burlap as far down as possible. Remove all tags, nails, and twine. Backfill with the original soil taken from the hole until the fill soil is level with the trunk flare and existing grade. Up to 20% organic matter (compost) by volume may be mixed with the soil used for backfilling. Firm the soil around the base of the rootball to stabilize it, then slightly tamp the rest of the backfill soil or just let it settle. Make a temporary soil "berm" 4 inches high, just outside of the rootball to create a watering basin.



Containerized Nursery Stock

Loosen and remove the container. If the roots are circling in the container, gently massage or tease them with your fingers to loosen them from the soil. Prune any difficult to loosen, matted roots with bypass pruners or vertically shave the outside root ball with a saw to loosen. Backfill and firm as directed for B&B plants.

Post Planting Care

6. Mulching

Remove the grass and mulch an 8 ft. diameter circle 2 to 3 inches deep. Keep mulch 6 inches away from the trunk to prevent fungi and rodent injury. Maintain a 3- inch layer of mulch from year to year and apply it after the soil has warmed in the spring.

7. Watering

Fill the "reservoir" made by the soil berm. Watering the rootball and backfill slowly. Use 20 gallons per tree within 8 hours of planting. Since a B&B plant may have had as much as 90% of its roots left at the nursery when dug, regular and sufficient watering the first two years until the plant is established is critical. Apply 10 to 15 gallons of water at a rate less than 3 gallons per minute once a week, May through November, unless more than 1 inch of rain falls during the week as measured on your property.

8. Undressing

Remove any tags, tape, twine or other materials from time of purchase that may still be attached to the branches or trunk.

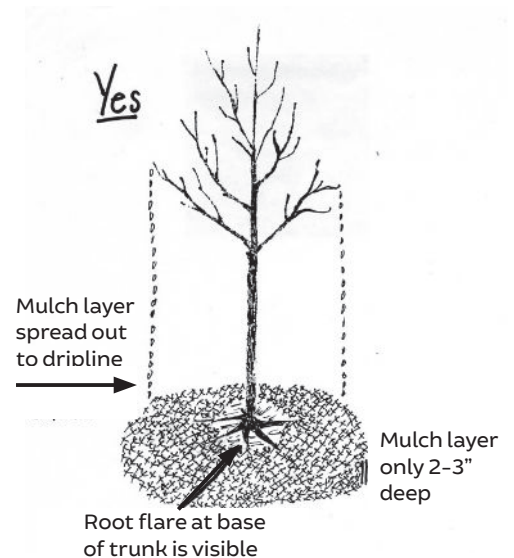
9. Protection

Young trees are often damaged by deer rubbing their antlers against the tender bark or string trimmers gouging the root flare. Protect the tender bark of young trees against mechanized equipment, deer and rodents with a commercial tree protector. These covers should be placed loosely around the trunk of the tree and checked periodically to ensure they are not cutting into the bark or harboring undesirable critters.

10. Staking

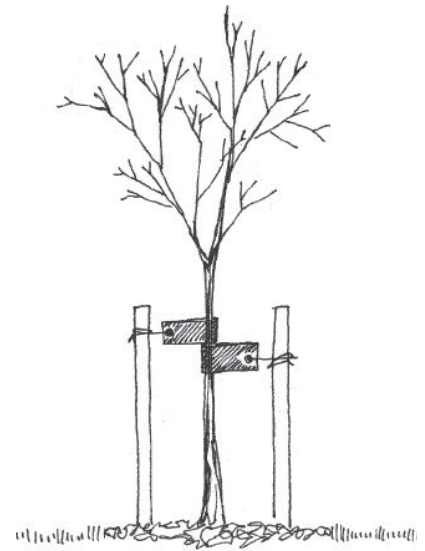
This is only necessary if the tree cannot support itself in the wind. Stake as low as possible on the tree to encourage flexibility and proper trunk flare development. To prevent trunk injury use flexible staking straps instead of rubber hose covered wire. All staking should be removed after one year.

Staking can have detrimental effects on the development of a tree. When compared to trees that have not been staked, staked trees have less trunk diameter growth, a smaller root system and are more subject to breaking or tipping after stakes are removed. In addition, staked trees may become injured or girdled from the staking materials. Almost every response to support staking prevents a tree from becoming strong. For the most part, the sooner a tree can stand alone, the sooner it will become strong. Yet, staking does play a valuable part, if done properly, in protecting young trees from equipment, animals, strong winds and vandalism.



Weak trunks are common on many container grown trees. They should be attached to the stake at the lowest level at which the trunk can be held and the top will return upright after being bent to the side. This location will allow the tree to sway, stimulating trunk diameter growth, while providing adequate support. The higher the support, the less the crown has flexibility to sway when taking the brunt of strong winds. When only one stake is used, there are usually several points of attachment; besides the direct effects of trunk immobility, other difficulties may occur:

1. The ties may girdle the trunk. Frequent inspection can limit this.
2. Greater stress will occur at the top ties during a wind if the trunk below is not able to flex in the opposite direction as the top is blown back and forth; the trunk is then more likely to break at the top tie or to be seriously deformed.
3. The stake may also shade the trunk, causing the xylem cells to elongate more on the shaded side so that the tree actually grows away from the stake. Two stakes can minimize the problems encountered in support staking; some arborists and landscape architects even recommend three stakes. Two support stakes with one flexible tie near the top of each will hold the tree upright, provide flexibility, and minimize trunk injury and deformation.



The two or three stakes suggested for proper tree staking usually provide enough anchorage for roots. Place one loop or figure eight tie between each stake and the tree trunk. Make sure that the bindings on the tree can flex without the tree rubbing against the stake. The ties must not be so tight or inflexible that they are likely to damage tender bark or girdle the expanding trunk. There should be enough slack so that the tree can move up to two inches in every direction. If the trunk can't move, it won't grow in girth and will remain weak.

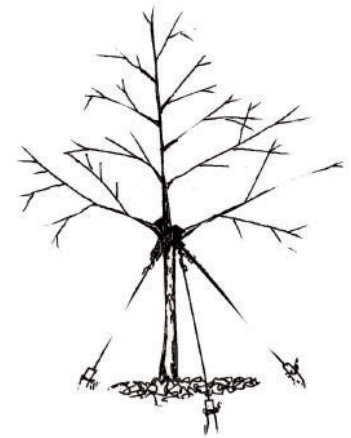
Materials

Any material used should contact the trunk with a broad, smooth surface and have enough elasticity to minimize trunk abrasion and girdling. Secure the tree to the stakes with broad, soft straps. Common tie material includes elastic webbing, belting and polyethylene tape.

A number of patented ties and support devices are also available for staking. UV sensitive polyethylene fabric ties that only last a year will minimize the problem of girdling, although they may allow stake rubbing.

Guying

Trees greater than four inches in diameter are often supported with guy wires. Trees are generally guyed with three or four wires that are anchored in the ground with stakes. Guy wires should be passed through a section of hose to protect the tree or attached to the end of straps. The wires and hose or straps are passed around the tree at crotches and the wires are twisted to tie them off. The guy wires must not be tied tightly around the tree trunk as this could cause girdling. Any modification to reduce friction will minimize damage to the tree. Guy lines and stakes should be driven into the ground at the drip line and brightly marked to prevent tripping or mowing over them.



If support systems are left in place for more than two years the tree's ability to stand alone may be reduced, and the chances of girdling injury are increased. Staking and guying systems should be checked within one year to be sure they are not injuring the tree. You can usually remove staking by the end of the first growing season.



Who
to Call for
Expert Help



Call an Expert for Help

Trees are complex organisms and require specialized care and attention. Caring for trees is both an art and a science and you often get what you pay for with tree care services. A company that provides the least expensive quote may not be qualified to work on trees and may actually do more harm than good.

If you need advice about your tree's health or someone equipped to care for it, contact a professional arborist. There are two types of professional arborists: certified and consulting. Certified arborists are accredited through the [International Society of Arboriculture](#) (ISA) and generally work for businesses, government or organizations that offer a variety of tree care services, such as pruning, planting, pest & disease management, fertilization, etc. Consulting arborists are often certified arborists with a wide range of credentials from organizations like ISA and the [American Society of Consulting Arborists](#) (ASCA) Consulting Academy. Consulting arborists offer specialized services such as detailed reports to property owners and clients regarding risk assessments, value appraisals and detailed tree care reports. Consulting arborists can also be expert witnesses in legal issues involving trees. Professional tree care companies have certified arborists on staff and are accredited by the [Tree Care Industry Association](#) (TCIA). Tree work can be very hazardous and accredited companies carry the proper liability and worker's compensation insurance, ensuring that employees are sufficiently protected.

These certifications and affiliations ensure the arborists stay up to date on the latest and greatest tree care & safety education and standards, adhere to industry standards for tree care practices, and comply with OSHA regulations. Ask for ISA or TCIA credentials and look for the logos below when selecting someone to care for your trees.

Certified arborists and professional consulting arborists offer many services for trees including:

- Consultation & Diagnosis
- Appraisal
- Inspection
- Planting & Transplanting
- Pruning
- Removal
- Fertilization
- Soil Treatments
- Storm Damage Cleanup
- Construction Protection & Monitoring
- Risk Assessment
- Pest & Disease Treatment
- Cabling & Bracing
- Lightning Protection
- Inventorying

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Vision: All communities transformed into vibrant places where trees, plants, and people thrive

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