



## TREE PLANTING AND CARE

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Trees are the most dominant plants in the landscape. They tower over everything else including the structure they grace. They compliment the home, office, business, or street and moderate the environment through the seasons. Establishing trees should be at the top of every property owner's list of things to do.

Nothing enhances a neighborhood like its trees. Find a street of hardy oaks and you will find the neighborhood holds its property values above the average. Trees not only beautify but also cut cooling costs, reduce water bills, cleanse and freshen the air we breathe and reduce noise, heat, and glare of the city.

The kind of tree you select has more bearing on its long term health and performance than anything you can do to promote tree health. Our most desirable trees exhibit strong branching, moderately fast growth rates, good resistance to pests and are well-adapted to our soils and climate. Trees live a long time and if they have problems you will have to live with their problems for a long time too. The importance of species selection cannot be overemphasized. Because diseases and insects tend to attack trees of similar species in the same genus foresters encourage planting species diversity. We would prefer that any given genus comprise no more than ten percent of our urban forest.

The top 33 trees to plant in Denton County from tallest to shortest are as follows (the first number for each tree is the height and the second number is the width): **Pecan**, *Carya illinoensis* (70' x 70'); **American elm**, *Ulmus americana* (70' x 70'); **Shumard red oak**, *Quercus shumardii* (70' x 50'); **Sycamore**, *Platanus occidentalis* (70' x 40'); **White ash**, *Fraxinus americana* (60' x 50'); **Bald cypress**, *Taxodium distichum* (60' x 30'); **Bur oak**, *Quercus macrocarpa* (60' x 60'); **Cedar elm** *Ulmus crassifolia* (60' x 40'); **Water oak**, *Quercus nigra* (60' x 40'); **American sweetgum**, *Liquidambar styraciflua* (50' x 30'); **Chinkapin oak**, *Quercus muehlenbergii* (50' x 40'); **Escarpment live oak**, *Quercus fusiformis* (50' x 50'); **Osage orange**, *Maclura pomifera* (50' x 50'); **Red mulberry**, *Morus rubra* (50' x 50'); **Eldarica Pine**, *Pinus eldarica* (40' x 30'); **Chinese pistache**, *Pistacia chinensis* (40' x 40'); **Common persimmon**, *Diospyros virginiana* (40' x 30'); **Eastern red cedar**, *Juniperus virginiana* (40' x 30'); **Lacebark elm**, *Ulmus parvifolia* (40' x 40'); **Texas ash**, *Fraxinus texensis* (40' x 30'); **Cherry laurel**, *Prunus caroliniana* (30' x 30'); **Winged elm**, *Ulmus alata* (30' x 30'); **Eastern redbud**, *Cercis canadensis* (25' x 25'); **Crape myrtle**, *Lagerstroemia indica* (20' x 15'); **Eve's necklace**, *Sophora affinis* (20' x 15'); **Mexican plum**, *Prunus mexicana* (20' x 20'); **Possum haw holly**, *Illex decidua* (20' x 15'); **Rough-leaf dogwood**, *Cornus drumondii* (20' x 15'); **Southern wax myrtle**, *Myrica cerifera* (20' x 20'); **Texas redbud**, *Cercis*

*canadensis* var. *texensis* (20' x 20'); **Yaupon holly**, *Illex vomitoria* (20' x 15'); **Carolina buckthorn**, *Rhamnus caroliniana* (15' x 10'); **Mexican buckeye**, *Ungnadia speciosa* (15' x 10'). All of the species above will grow in any moderately drained soil except, water oak, sweetgum, and cherry laurel which prefer or require an acidic soil reaction.

Proper placement in the landscape is critical for maximizing the energy conservation benefits of trees. Evergreen windbreaks are placed along the northwest side of the structure to block the worst winds the winter can bear. The effective distance from the structure is five to seven times the height of the break, e.g., a 40 feet tall eldarica pine will provide an effective windbreak for a distance of 200 to 280 feet from the structure.

Maximum shading is achieved by placing deciduous shade trees on the southwestern exposure of the structure. More complete shading can be achieved by covering all the exposures from east to south to west. The north face does not need shading since it does not receive direct sunlight. Plant trees so the canopies can overhang the roof of the structure without touching the roof itself. It is best to keep trees a minimum of fifteen feet from the structure to avoid foundation problems. Keep trees a minimum of five feet from concrete patios, sidewalks, driveways, and masonry retaining walls to avoid cracking these materials. Interlocking pavers can be reset as trees grow and may be a good substitute for concrete in some cases. Where large expanses of hard surfacing are required over a good portion of tree roots you may want to select pervious pavers that allow tree roots to breathe.

Spacing is a primary consideration when placing trees in the landscape. When you use different tree species side by side you need to observe the full mature width of both trees to determine their separation, e. g., if you want to plant a shumard oak with a mature width of 50 feet next to a bur oak with a mature width of 60 feet you would need to plant them 55 feet apart to insure they do not grow together. If you plant two or more trees of the same species together you can crowd them closer than their mature width because they will work together without one clearly dominating the other. In this way you can achieve a greater shade coverage in a shorter span of time. For instance, you plant bur oaks ten feet apart and have complete canopy coverage in a matter of seven years or so from one-inch trunk diameter planting stock. This spacing is not so outrageous when you look at the native oak forest and see trees closer to four feet apart working together in a complimentary fashion. When you mix species together on the other hand you inevitably have one species over crown and disfigure the other.

Avoid planting trees too close to overhead utility lines. This is when it is most important to observe the mature tree width. Tree limbs touching power lines can ground through the tree and anyone touching the tree electrocuted. This is especially likely if the tree is wet from precipitation. Trees touching power lines are also a common cause of power outages during storms. If the tree is taller than 15 feet then the tree needs to be planted a minimum of half the mature width plus five additional feet. For instance, if you plant a chinkapin oak with a mature width of 40 feet you will need to plant the trunk 25 feet or more from any overhead utility lines.

When you go to the nursery, selecting which tree to buy is simple but critical. Use the same care you use when buying produce. Expect the same quality. Inspect the trunk closely. Avoid trees with missing, cut, leaking, bruised, or discolored bark. There is no such thing as a “new” tree, they all have a history and those that have received the best care from the first day they germinated as a seed will establish the quickest with the fewest problems. Look for strong shoot development with smooth, straight wood, large leaves, and plump buds for the species. Avoid trees with weak, broken, scarred, scaley, or cankered

wood.

For container trees, pull the root ball out of the pot and look for roots winding around the outside of the ball particularly at the bottom of the pot. These winding roots will wrap around the ball as the tree grows and develops, strangling the tree so they will have to be removed at the time of planting causing some degree of transplant shock. If you can buy trees without “bound roots” do so, if not be sure to remove them when you plant the tree.

Container-grown trees cost more than field grown trees because they cost more to produce. Container-grown trees establish more quickly than dug trees. The root ball of dug trees should be large enough to support the tree. The industry standard provides ten inches of root ball diameter for every inch in trunk diameter. Dug trees are good when you want a large tree instantly and don’t really expect it to grow much for the first several years of establishment.

Soil preparation is the first key to establishing trees. The hole should be dug no deeper than the root ball so the root ball rests on firm, undisturbed soil and will not sink or settle when the tree is watered in. The soil may be dug as wide as you like. Backfill with a 4:1 ratio of native soil to finely-screened, well-rotted compost.

Poor soil drainage is one of the most common causes of tree losses during the first year or two after planting. Check the drainage by digging a hole 2 feet deep and fill it with water. If it drains completely through the bottom within 48 hours your soil is suitable to plant. If you have a poorly drained site, you can improve survival rates by planting the root ball above ground level. Simply set the root ball on top of the ground, cover the root ball with a medium-textured soil and grade away from the tree at a 6:1 slope or less. In this way you are essentially planting on a soil berm or raised bed which automatically increases the soil depth and drainage. Make the top of the berm flat enough to create a watering basin and wide enough to include an area one or two feet wider than the original root ball.

Once you have the tree planted, stake it upright if the tree is likely to blow over. Trees with undersized root balls or planted in loose, heavily-amended soils are subject to wind-throw and should be staked. If necessary, loosely tie the trunk two-thirds the way up the trunk. Use wide bands of soft flexible material such as nylon belting or strips of old tire tubes to loop around the trunk and tie to two (2" x 2") stakes driven straight into the ground along the side of the root ball. Allow enough play in the trunk to flex as much as possible without the root ball rotating in the hole. Allowing play and flex in the trunk makes the trunk stronger when the stake is removed. Remove the stakes after two or three years.

After the tree is planted and staked, apply a heavy, three to four inch layer of an organic mulch such as shredded bark. This will help keep the soil moist to the surface where the roots are most active and also prevents the soil from cracking and tearing the roots apart in expansive clays. Mulches make the soil cooler in summer and warmer in winter which improves root function. Mulches help reduce weed competition. Use glyphosate herbicides to kill weeds and grasses including turf that grows up in the mulch. Do not spray herbicide on green parts of the tree. Roundup degrades quickly and does not affect tree roots.

The trunks of newly planted trees and young trees with thin, smooth bark should be wrapped from the ground up to the first limb from December through February to prevent freeze damage to the trunk tissues and from June through August to prevent sun scald damage to the trunk tissues. Remove wraps in

March and September and replace them with new wraps in June and December. This way the trunks “breathe” for three months in the spring and three months in the fall. Trunk wraps should be used until the trees develop woody bark, usually a couple of years. Another way to protect the trunk without wrapping is to drive a flat board straight down into the ground parallel with the trunk so it casts a shadow against the western side of the tree during the afternoon during all seasons of the year. This prevents bark damage in both summer and winter. Be careful you do not damage roots when inserting the board. You can do this by attaching the flat board to a smaller stake for insertion into the soil.

Protect the base of trunks from string trimmers and lawn mower decks with some kind of trunk guard. Specially designed heavy rubber tree trunk guards are best. Flimsy plastic tree guards don’t work. Flex-drain pipe works very well and can be purchased in various different sizes to match the tree. Usually 4-inch drain pipe is large enough to get the trees up to a size the bark is thick and tough enough to resist incidental contact but any sized tree can be girdled and killed with string trimmers and mower decks if you are persistent. Trimmers are powerful enough today to whack completely through one inch trunks. Everyone should know you only have to remove the outer bark down to the sapwood for the tree to be killed.

Watering is critical to the survival of newly planted trees. Even with a heavy mulch, trees should go no longer than ten days without irrigation or effective rainfall during their first two years of establishment. Over watering can be just as deadly however and trees should not be watered more often than every five days. You cannot drown a tree by applying too much water. In fact, when you water, you want to soak the soil down through the bottom of the root. The only way you can drown a tree is by watering too often. Generally, a one inch application of water will go down into the soil about six inches. Two inches of water is sufficient for most trees. Water the soil ball plus two additional feet past the root ball in all directions the first year and then add two additional feet radius to the wetting pattern each year until you are watering as far from the trunk as the tree is tall. This assumes the roots will grow laterally away from the trunk out into the native soil about two feet each year. This area may be considered the “effective root area” and is the area to be fertilized as well as watered.

You may want to create a watering basin the first year. Create a watering basin by berming the soil about six inches high, two feet beyond the original root ball. Mulch the basin with coarse wood chips or shredded bark. Hay will work but is not very attractive. The mulch will not only perform the functions of any normal mulch but will break the erosive action of water as the basin is filled.

Trees should be fertilized from the day they are planted if they are actively growing. There is needless confusion about whether or not to fertilize newly planted trees. Container-grown trees have been fertilized all their life and continue to need fertilizer. They have fully functioning roots because they kept all of them intact when you planted them out from the container. Dug trees have a limited system but they also need to be fertilized from the first year if they are actively growing. The notion that their roots are too tender for fertilizer is wrong because the feeder roots of any tree take up water and mineral for only a couple of weeks before they are so woody they can no longer imbibe water. Feeder roots are forever and always young. The problem with fertilizers occurs when people put too much on or apply them too often.

A good rule of thumb for fertilizing trees is to use a one cup of 15-10-10 or equivalent fertilizer per 100 square feet of effective root area. The effective root area on established trees extends in all directions as far from the trunk as the tree is tall. For newly planted trees or trees in the first three to five years of establishment, the effective root area described above for watering should be used. When you

fertilize, water the fertilizer into the soil immediately. Fertilizer is applied basically whenever shoot growth is initiated in the spring and then repeated every six weeks so long as the trees are still putting on new growth. Lawn fertilizers applied to the critical root area substitute for this fertilization recommendation.

Pest management requirements should be few if you have planted a recommended tree species. Every tree is highly susceptible to attack by borers the first two years of establishment. During the first two years following planting, a product with EPA registration for shade trees containing the active ingredient imidachloprid, such as Merit® or Bayer® Advanced Garden Tree and Shrub Insect Control should be applied as directed on the label. Imidachloprid is applied as a soil drench over the roots where it is taken up into the tree which makes the tree resistant to attack by both flat-headed and round-headed borers. Borers are active from April through October but the application needs to be applied in the early spring, on or about the first of March in order for the tree to assimilate the chemical before the borers attack. One application should provide season-long control.

Occasionally, foliage feeding insects will attack trees but a weekly inspection will reveal any trouble and the appropriate labeled insecticide can be applied for control. An insect which feeds on tree sap comes in a variety of forms. These are seen as tiny hard, shell-like growths attached to stems and branches like barnacles, particularly congregating at the nodes of stems. You can take the back of a knife and scrape them off like fish scales revealing a pearly white pit where the insect was attached to and feeding on the stem. Unfortunately many trees come from the nursery with scale and the trees struggle. Every tree should be inspected for scale at planting and treated if found. The traditional treatment is a dormant oil in the winter but if it is not winter, don't wait. Apply an insecticide product containing malathion, acephate, or imidachloprid to the trunks, branches and stems from the ground up. If the daily high temperatures remain below 80 degrees for two days following the application you can add a summer oil for good effect.

Young tree training is critical for building a strong, well-branched tree. Although some tree species have naturally strong branching habits almost any tree will benefit from selective pruning in the early years of its life.

The first rule is to "eliminate forks". Forks always result in weak branch attachments. Where more than one limb arises from a single node, a fork automatically develops. Each winter, remove all but one limb per node leaving only side branches to a limb as it grows out from the trunk. These main limbs are called scaffolds and become the basic framework of the tree. Similarly, forks in the side branches coming off the main scaffolds should also be prevented from developing.

The second rule is to "nip it in the bud". Unwanted growth should not be allowed to develop. It is better to direct the growth of the tree during the growing season than waiting until the dormant season and pruning off wood after it has already grown. Stop growth of shoots you will not keep anyway by removing the growing point from the end of the shoot tip as it grows so it does not put out additional leaves. When you nip a shoot in the bud the shoot stops laying on new leaves but the leaves that are already out will expand, mature, and go to work for the tree. Once a leaf is out you may as well keep it until winter and let it make food for the tree then remove it in winter dormancy. The shoots you do not "tip out" will grow unabated and lay out wood and branches wherever you let them grow.

The third rule is to "develop a strong central leader". The central leader is a strong growing shoot

which you allow to develop through the center of the tree and become the main trunk. Some trees have strong apical dominance and develop a central leader easily and without too much help. Other species require continuous shoot tip pruning to direct the growth into the central leader. If a central leader becomes too dominant and “takes off like a whip” it may tend to lean over of its own weight or lean in the wind. If so, the growing tip should be removed, or “tipped out” to slow it down and make it break lateral branches. This makes the tree stockier and stronger. Still this needs to be balanced with the need to have the central leader take the lead by growing straight up faster than any other shoot or branch on the tree.

The fourth rule is to “develop a trashy trunk”. This means leaving the lateral limbs on the trunk longer than most people would think necessary. They look odd but the lateral or side branches feed and strengthen the trunk. This increases the girth of the trunk and makes it stronger. Lower leaves on the trunk resist the wind better than leaves higher up on the trunk resulting in a tree with far less wind lean with the same amount of leaf area to build a strong root system. In the dormant season each winter, remove all the limbs on the lower one-third of the trunk. As the tree grows the lowest limbs get higher and higher as you remove the trashy limbs from the lower trunk. Finally, when the tree is eighteen to twenty-one feet tall the lowest limbs are six or seven feet off the ground which is where most people like them and you are finished.

Lifting the canopy of mature trees even higher than the typical six or seven feet is often desirable. The foliage of many trees is so dense that the home cannot be seen for the forest. Trees are planted and it takes so long for them to grow we do not realize they have begun to screen the home from view. Sometimes a whole new perspective on the home can be gained by removing the lowest limbs so you can see the home under the trees.

The lowest limbs are the weakest limbs on the tree. Because the light at the lowest levels of the tree canopy is of lowest intensity, the lowest limbs may actually consume more energy than they produce for the tree. Pruning the lowest limbs usually results in a more vigorous tree with stronger peripheral canopy development.

Pruning the lowest limbs also increases light penetration into the vegetation under trees. Low light levels can result in low plant performance. Plants exhibiting low vigor may simply be suffering from low light conditions that have developed over time. This is especially common in turf such as St. Augustine.

Removal of dead, dying, damaged, or diseased wood is probably the most common reason to prune mature trees. Limbs die over time from many causes. Periodic removal of weak and damaged wood improves the physical appearance, lowers the potential safety hazard of falling limbs, and helps maintain the structural integrity of the tree.

Leaves fall to the ground each year to mulch and feed the roots. Soil microbes compost the leaves and release the minerals for root uptake. This is the natural feeding cycle for trees. Don't bag your leaves and send them to the landfill. Shred them down into the turf with your lawn mower where they will break down into the soil. If there are too many leaves to mulch or you have tall fescue which mulched leaves will smother, vacuum them up into the mower bag and spread the shredded leaves in shrubbery and ground cover beds. If you have ground covers under your trees let them filter down into the groundcover and be trapped as leaf mulch. Excess leaves can be blown out of the ground cover into lawn areas and treated as described above.

Trees provide so many benefits for such long periods of time it is a great accomplishment and significant contribution to the environment to establish one. It is even better if you establish one of a superior species. Although the establishment requirements described here seem rigorous, they are intended to get the trees off to the best possible start with the least possibility of failure. There are so many things that can go wrong, failures are almost as common as successes. By careful application of these methods you have every reason to believe your efforts will result in the establishment of a tree that will grow to maturity and live a long, productive life.

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