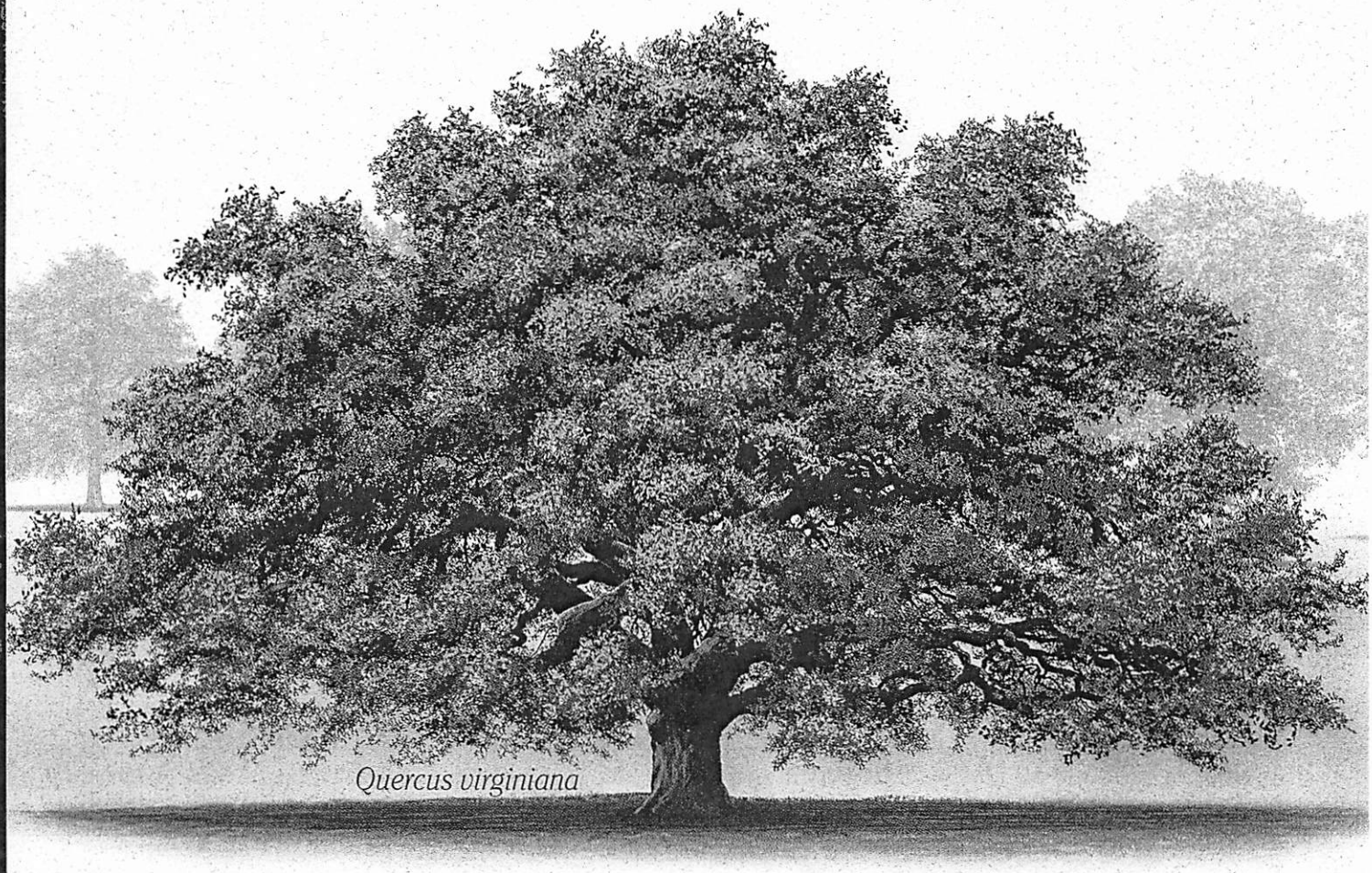
NATIVE & ADAPTED

Trees for Fort Worth

& TARRANT COUNTY



Quercus virginiana

A Tree Planting and Maintenance Guide

Prosopis glandulosa

A TREE PLANTING AND MAINTENANCE GUIDE
MADE POSSIBLE THROUGH THE GENEROUS CONTRIBUTIONS OF

FORT WORTH

TEXAS FOREST SERVICE
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TARRANT REGIONAL WATER DISTRICT

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PLANT A NATIVE OR ADAPTED TREE

Native plants are those found in an area naturally. They were thriving long before man came along with irrigation systems, fertilizers and pesticides. Because they have grown in a region for thousands of years, they have developed methods of surviving the local weather, pests and soil conditions. Adapted plants are a select few non-natives that were introduced by man, but thrive as well as natives. In the Fort Worth area, the hardest conditions for trees to overcome are alkaline soils, irregular rainfall and high summer temperatures.

Planting native and adapted trees can save water and money. The average rainfall in Tarrant County is 32 inches per year. Most of the rainfall occurs in the spring and the autumn, resulting in little rain during the hottest days of summer. This creates challenging conditions for trees from other regions to survive without supplemental watering. Forty to sixty percent of summer water bills are the result of outdoor watering. Once native trees are established, they rarely need watering and can help conserve our water resources.

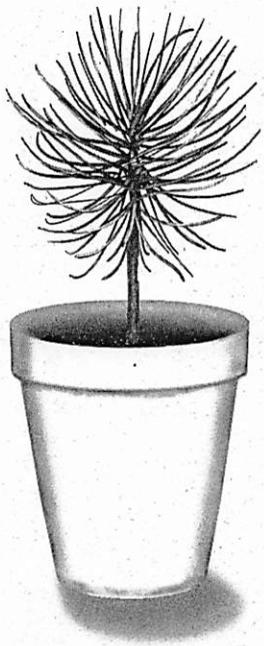
Native and adapted trees require less maintenance. They grow well in Tarrant County soils and are healthier than most introduced trees. They have less mineral deficiencies and need less fertilization. They are inherently healthier and resistant to insects and disease, resulting in a valuable savings of time and money.

Even though native and adapted trees are easier to establish and need less care, they can be difficult to find. Nurseries carry the most commonly known shade trees and ornamentals because that is what most customers want. Many Fort Worth natives are beautiful and functional trees, and there are specialized nurseries that carry these hard to find plants. They may cost a bit more to purchase, but will save money in the end by requiring less care. The other option is to start a tree from seed.

Planting a native or adapted tree is smart. They need less fertilizer and pesticides, require eighty percent less water, and have mechanisms to survive high temperatures. When planting a tree, consider one of those recommended from the "What to Plant" chart on page 14.

Besides saving money and water, planting native or adapted trees at your residence will enhance your property value as well as add to quality of life. Trees add tremendously to the landscape and enhance your property's surroundings.

How to Grow a Tree from Seed



In nature, nearly all trees grow from seed. Millions of tree seeds are produced every year, but only a small percentage germinates to grow into trees. Germination is when the seed sprouts or begins to grow. The period before germination when the seed is at rest, or not growing, is called dormancy.

Many seeds have unique mechanisms to help them survive. Wings for travel, thick seed coats to delay germination and protect the embryo, dormancy to delay germination to a more favorable time and fleshy coverings so the seed will be eaten and passed through the digestive track of an animal for transportation and softening of the seed coat are a few of these mechanisms.

Through trial and error man has developed treatments to overcome or mimic these mechanisms for more consistent and rapid germination.

Most tree seed that ripen and drop in the spring can be planted in the spring and will produce a seedling that same growing season. The soft maples and American elm fall into this category.

Seed that ripen and drop in the fall may germinate in the fall or remain dormant until spring.

Generally seed that ripen, drop and germinate in the fall are difficult to store, must spend the winter as a growing seed, and be protected from freezing.

Seed that ripen, drop in the fall and germinate in the spring can be stored and treated to break dormancy and spring planted. Shumard oak, Texas red oak, Lace bark elm and cedar elm fit in this category.

Some seed must go though a cold period to break dormancy. If that seed is collected and stored indoors, then it will never germinate. Even if the seed is stored outside it may not germinate because there were not enough cold days. Winter can be simulated by cold stratification.

Cedar elm and lace bark seeds can be stored dry. Others, such as Shumard oak and Texas red oak must be stored moist in sealed plastic bags or containers and refrigerated. Some seed can be frozen such as the southern pine seeds; however others are killed by freeze like the live oak.

Cold Stratification

- Purchase a bag of 'sterile' potting mix from any nursery.
- Soak the seed overnight in room temperature water.
- Thoroughly wet a large handful of the potting mix and squeeze out 98% of the water.
- Mix the potting mix and seed together in a clean plastic zipper bag.
- Squeeze the potting mix and seed into a clump to assure good contact between them.
- Seal the bag and place in the vegetable compartment in the bottom of the refrigerator.
- Refer to the chart on page 14 to determine how many days the seed must be cold stratified.
- For best results, time the cold stratification to finish in time for early spring planting.

The ease in which trees can be grown by seed vary widely by variety.

- *Easy to Grow: pecan, green ash, Texas ash, Mexican plum, all varieties of oaks, elms and maples*
- *Difficult to Grow (but worth the effort!): Eve's necklace, eastern red cedar, southern magnolia and golden raintree*
- *Seed Quality Typically Prohibits Germination: bald cypress, redbud, Chinese pistachio*

Tree seed can be planted in any type of container with proper drainage. Large Styrofoam cups with a hole in the bottom make perfect containers for children to start trees. Avoid fungal diseases by using a sterile potting mix available from all local nurseries. Plant the seed 1/4 to 1/2" deep. Germination is usually more successful outdoors in a partially shady spot. Keep the soil lightly damp, but never soaking wet. Never allow it to dry out completely. Germination will usually take place in two to eight weeks.

WHERE TO PLANT

The proper placement of trees around homes and streets can reduce power consumption by twenty to fifty percent by providing shade from the summer sun, blocking cold winter winds and diminishing heat islands.

Large species should be planted at least twenty feet from your home's foundation. Give your tree plenty of space to grow, twenty-five to fifty feet apart is recommended for those with large canopies (live oak.) Small ornamental trees (yaupon holly) should be no closer than ten feet from a building. Ornamentals which grow within the shade of larger trees (Japanese Maple) should be fifteen feet from the trunk of any other tree.

Deciduous trees which drop their leaves in the winter are ideally placed on the south and west sides of your home. This placement provides for shade from the summer sun and solar warmth during the winter. However, if planting a tree with a large trunk, take care not to plant it directly in front of a south-facing window. The trunk of a mature tree can block the warmth of the winter sun.

A row of tall evergreen trees or one large spreading evergreen on the north side of your house will help block cold winter winds and reflect heat back onto your home.

You can further reduce your power bill by shading your air conditioning compressor. If your unit is on the southern or western face of your home, plant trees or shrubs to shade it from the summer sun. Avoid planting species with cottony seed, fine blossoms or catkins that may clog the grill.

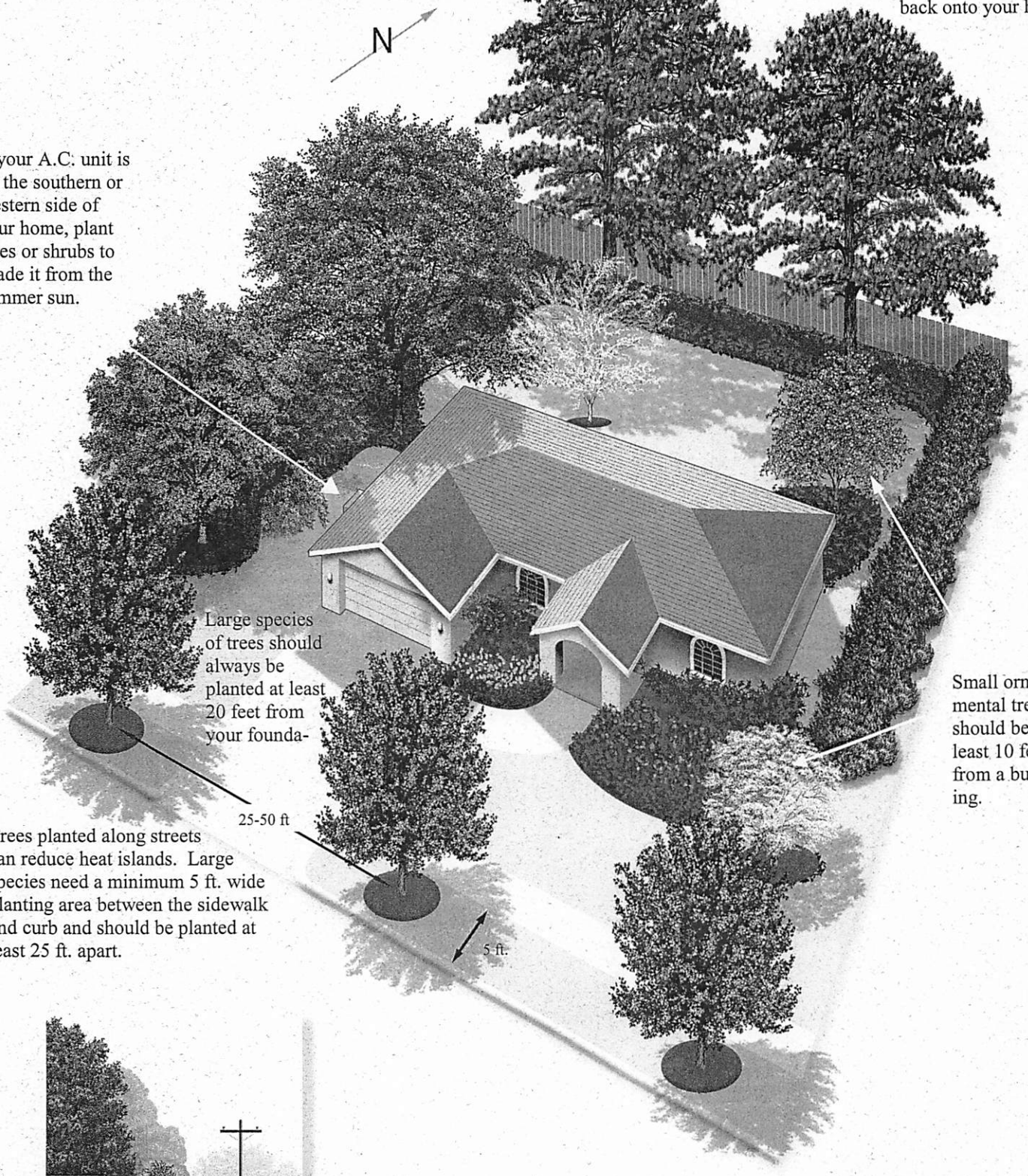
Heat islands are created by large reflective surfaces such as rooftops, parking lots or streets. The islands reflect heat from the summer sun onto the surrounding areas, raising average temperature by ten degrees. Not only is it uncomfortable, but increases the energy consumption of nearby buildings.

Trees planted along streets can reduce the impact of heat islands. As with any tree planting, make sure your street tree has plenty of room to grow. Large trees need a minimum five-foot wide parkway, the area between the sidewalk and curb. If you parkway is narrower than five feet, plant your large tree on the other side of the sidewalk. Plant the trunk no closer than two and one-half feet from the sidewalk and other structures. If overhead power lines are present, select a smaller species of tree.

The City of Fort Worth requires a free permit to plant trees in the parkway. These can be obtained by calling 817-871-5738. It is prohibited to plant the following species in the parkway: hackberry, sycamore, silver maple, mulberry, Siberian elm, mimosa, Arizona ash, cottonwood and willow.

Large deciduous trees placed on the southern and western side of your home will shade it from the summer sun.

A row of large evergreen trees or one large, spreading evergreen tree north of your house will help block cold winter winds and reflect heat back onto your home.



If your A.C. unit is on the southern or western side of your home, plant trees or shrubs to shade it from the summer sun.

Large species of trees should always be planted at least 20 feet from your founda-

Small ornamental trees should be at least 10 feet from a building.

Trees planted along streets can reduce heat islands. Large species need a minimum 5 ft. wide planting area between the sidewalk and curb and should be planted at least 25 ft. apart.

Select smaller species of trees if planting under or near power lines.

How to Plant a Tree

Arboriculture is the cultivation of trees and shrubs for ornamental purposes. It is an ever-changing and ever-expanding science. What was common practice as little as ten years ago may not be acceptable today. Here are the latest guidelines for proper tree planting.

The Correct Time

- Container grown plants can be planted during any season but we recommend planting all trees, shrubs, and woody vines during the dormant season, from late fall through early spring.
- Balled and Burlapped trees should only be planted during the winter.

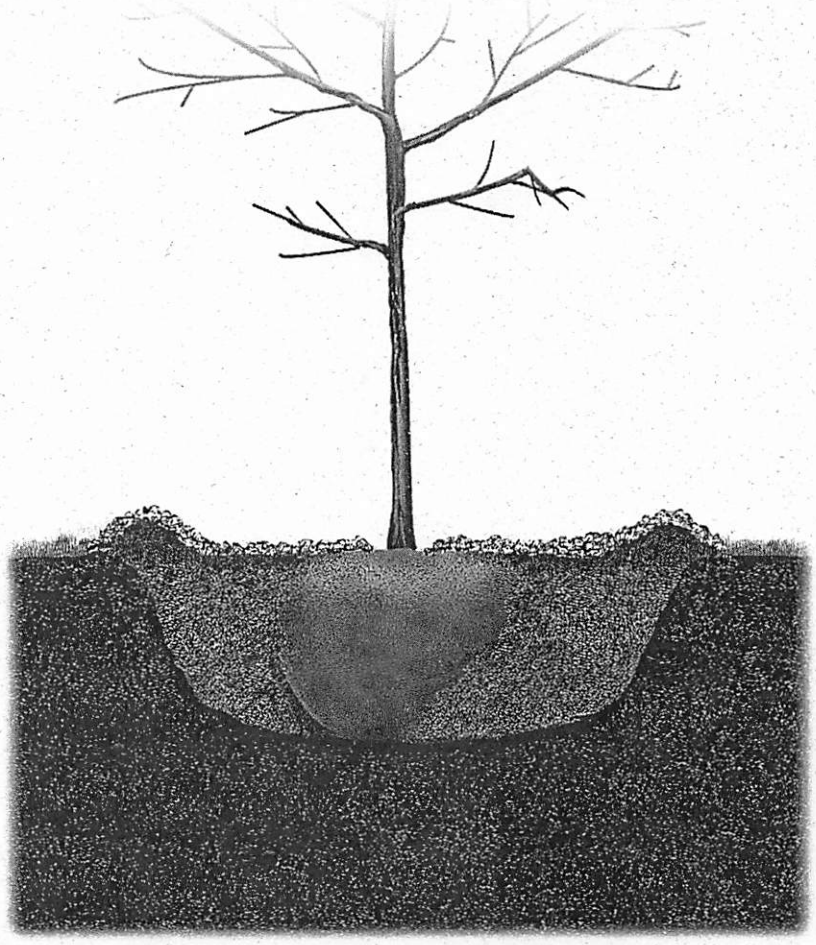
Selecting the Site

- Trees Grow! Make sure you give your new tree enough room.
- Shade trees should not be any closer that 20 feet from your home's foundation and 25 feet from another large tree.
- Small ornamentals should not be closer than 10 feet from your home and 15 feet from any other tree.
- Plant smaller species of trees under power lines. Most utility lines are only 30' high.
- For proper drainage, your selected site should pass the perk test
- Dig a hole the same size as the root ball
- Fill the hole with water and let it sit overnight
- If water is still in the hole in the morning, find another site to plant the tree.

Selecting the Tree

- The tree should have a single trunk. Multiple trunk trees, especially larger species, have inherent problems that will shorten their life.
- There should be only one central leader. The tallest limb should appear to be an extension of the trunk with all other limbs arising from it. More than one dominant leader will cause the tree to split later in life.
- There should be an obvious root flare. The bottom of the trunk should widen at the base where it is attached to the root crown. If not it may have been transplanted too deep. Another way to

PROPER TREE PLANTING



tell if the tree is planted too deep is to gently rock the trunk from side to side while holding the container or root ball stable. If the movement causes a gap between the soil and the trunk, the tree was transplanted too deep.

- The fine roots should be white in appearance and firm, not woody or mushy.
- The buds should be plump and a thin layer of green should be detected between the bark and wood of twigs and branches when scratched with a knife or key. Anywhere the green layer is missing that section of the tree is dead.
- There should be no scars or tears along the trunk or major limbs.

PLANTING

- Dig a hole the same depth as the container and 2 to 3 times wider.
- Loosen the sides of the hole with a rake.
- Remove the root ball from the container by carefully laying it on its side and rolling the container back and forth with gentle pressure until the root ball is loosened. Slide the container from the root ball.
- Cut one to two inches deep along the side of the root ball in four places
- DO NOT LIFT TREE UP BY ITS TRUNK! Lift by the root ball or gently roll into the hole if the tree is too heavy. Make sure the top of the root ball is at ground level. This can be checked by placing the shovel handle across the top of the hole.
- If the hole is too deep, add enough soil to raise the root ball one to two inches above ground level. This will allow for settling of added soil.
- Using the same soil that came from the hole, fill the hole half way. Lightly tap the soil in around the root ball to eliminate air pockets. Do not amend the soil by adding compost, sand, gravel or other matter. Amending the soil will create a difference in soil texture and may cause improper drainage. It will also encourage tree roots not to grow beyond the original hole.
- Wet down the added soil to further eliminate air pockets.
- Finish filling the hole and use the extra soil to create a water ring at the edge of the planting hole. Do not place any soil over the original root ball.
- Gently tap down the soil and water.
- Place 2 - 4 inches of mulch inside and on top of the water ring, but keep all mulch off the trunk.
- Prune any dead or damaged limbs at the time of planting. You may also remove any co-dominant leaders.
- DO NOT do any aesthetic pruning until the end of the second growing season.

STAKING

- If at all possible, DON'T STAKE. The tree will establish a stronger root system if not staked.
- If necessary stake the tree on two or three sides.
- Protect the tree from wire or use flexible ties.
- Stake the tree loosely enough that it sways in the wind from the base to encourage lateral root growth.
- Remove all staking material within one year or sooner if you detect the tree growing around the staking material.

ESTABLISHMENT

- During the growing season from spring to fall, water the tree once a week for the first two years.
- Water with a slow drip such as a soaker hose or by completely filling the water ring. Deep watering will encourage the roots to grow deeper and become more drought tolerant.
- Take rainfall into consideration when watering trees. Do not water until soil beneath the mulch layer is completely dry.
- Keep the tree ring mulched for at least the first two years adding fresh mulch when needed.

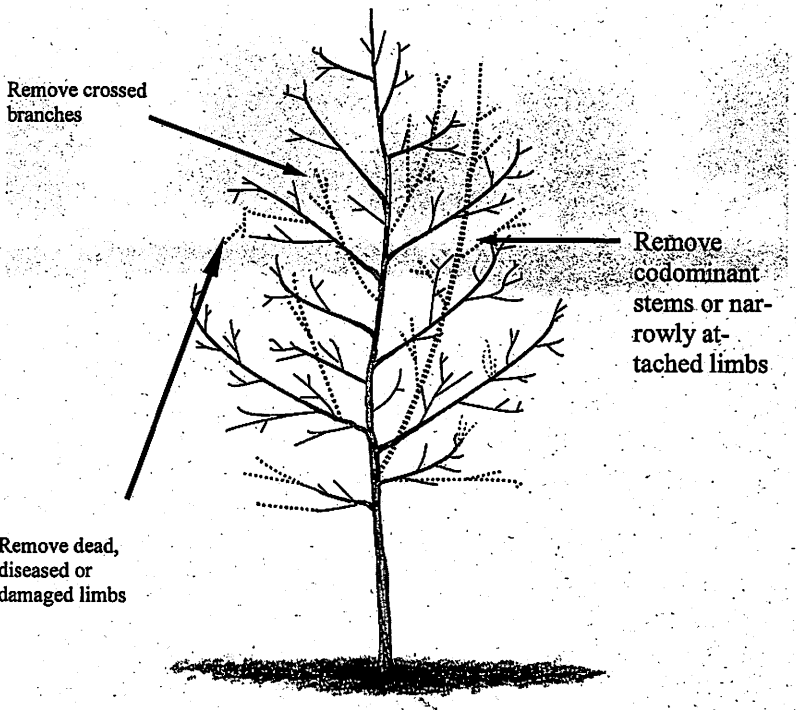
TREE CARE

NEW TREES

MULCH

Mulching is the single most important factor in establishing a tree. It moderates the soil temperature, reduces water loss from evaporation and decreases weed germination. It adds nutrients as it decays and helps protect the tree from weed eater and lawn mower damage.

Put a healthy two to four inch layer of composted mulch inside the watering ring. Place no mulch against the trunk of the tree. Replenish the mulch two or three times a year as it washes away or decomposes. Obtain your mulch from a reliable source. Do not use mulch from treated or post consumer lumber.



YOUNG TREE

WATER

Water newly planted trees once a week during the growing season until established. It is better to water weekly slow and deep than to water a little daily. Fill the water ring around your tree and let the water soak in.

If you have a drip ring or a bubbler system, water your tree slowly until it penetrates at least 6 inches below the surface. You can check this with a rod or a dowel pin. Push the rod into the soil until you feel resistance. Placing your thumb at ground level pull the rod out. Measure from your thumb to the end of the rod to determine how deep the water has penetrated.
Make sure the soil is completely dry on the surface before watering again. You can take a clue from the tree. If this is more than twice a week, apply more water at each application but apply slowly to allow for penetration.

PRUNING

At one time, professionals recommended dramatically pruning a newly transplanted tree, or any tree that had received root damage. Their reasoning was that the canopy would be too large to be supported by the diminished root structure. Studies have shown however, that pruning a tree stimulates growth to the canopy at the expense of root growth. This is just the opposite of what we want for a newly transplanted tree. Pruning should be delayed until the second fall or winter after planting.

The central leader is the tallest limb with the most upward growth and is called the dominant leader. If more than one limb is dominant they are called co-dominant leaders. The limbs will grow together where they meet at the trunk, but the layers of bark between the two limbs will always be present creating a weak attachment. As the tree grows larger and the limbs become heavier, the chance of the tree splitting becomes greater. Large trees with co-dominant limbs are hard to correct. The best time to remove one is when the tree is young. In fact, the only pruning recommended on a newly planted tree is removing the weakest or least attractive co-dominant leader and removing any broken or damaged limbs.

Aesthetic Pruning

Training or pruning for aesthetics can begin the winter of the second year. Here are some rules of thumb to remember. Half of the crown should remain on the lower two thirds of the tree. Never remove more than one third of the canopy in one year. When removing limbs, take them all the way back to the next largest limb or point of attachment. Do not leave stubs. Refer to the "Proper Tree Pruning Guide" on the next page.

Remove all dead or broken branches first. Then remove crossed or rubbing branches next. Lastly remove any "Y" crotched or narrowly attached branches. When removing bottom limbs for clearance, remember that half of the crown should remain on the lower two thirds of the tree. This will help the trunk to develop a well defined taper and promotes stability.

Mature Trees

Pruning

Once a tree is mature pruning should be left to a minimum. You may remove dead branches any time of the year. Diseased or broken branches can be removed at the time of detection. All other pruning should take place in the winter.

Water

If the tree was established correctly with slow deep watering, it should only need supplemental water during periods of drought. Water slowly to a depth of six inches or greater. If the tree was not established correctly, it is not too late to do so now. Place a drip or soaker hose close to the drip line, the edge of the canopy, or one-third the way in. Water to a depth of six inches every two weeks. If the tree shows signs of wilting or heat stress, increase to once a week. Deep watering will encourage the roots to grow deeper and will also increase the tree's drought tolerance. Do not over water. Over watering is often the result of daily watering of lawns. If watered slowly and deeply lawns, seldom need watering more than once a week.

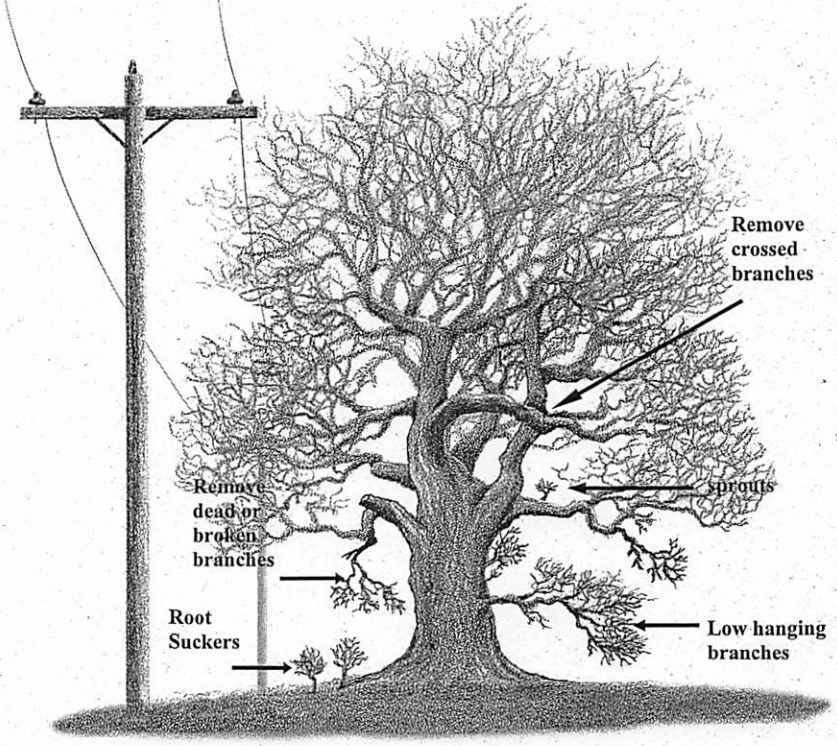
Turf vs. Mulch

If you have a tree that is shading your yard so severely you can not grow even shade tolerant grasses, you may consider laying down mulch in that area. It will give the tree a nutrient boost and add to the aesthetics of your yard. Two to four inches deep is adequate and do not place directly against the trunk.

Planter Boxes

It is not recommended to place a raised flowerbed around the base of your tree. The original ground level should be maintained because placing soil against the trunk can hold excessive moisture and cause fungal growth or rodent damage.

Mature Tree



Aging Trees

Pruning

Any disturbance including a light pruning can be fatal to an old tree. An older tree has a decreased growth rate. It needs every living leaf it has to grow and stay healthy. Only prune dead or hazardous limbs. The slow growth rate of an old tree prolongs the time required to heal a cut or wound and increases the chance of disease or infection. It is essential that you use proper pruning cuts when pruning an old tree.

Cavities

It was once a standard practice to fill tree cavities with cement. Any carpenter can tell you that untreated lumber next to concrete will rot. Cement holds moisture and will promote decay, not decrease it. Do not fill any cavities with anything. If the tree is in a position to do damage if it falls, you may want to contact a certified arborist for a hazard evaluation. If the tree is in a secluded or natural area where it would not harm people or property if it falls, you may consider not treating it at all. Cavities in older trees are an important part of a natural ecosystem, providing habitat for a variety of wildlife.

Water

Do not irrigate an older tree. You will kill it. Use only supplemental deep watering in times of drought.

Fertilization

Do not fertilize an older tree without a soil sample test. Over fertilizing a tree, especially with nitrogen, can cause more harm than good. After fertilization the tree may put on a flush of growth and look phenomenal but remember new growth is more susceptible to pestilence and disease.

Mulching is a much preferred method of fertilization. Mulch provides a rich growing medium for plant roots. Your trees' feeder roots can double in areas where mulch is provided. Place composted mulch two to four inches deep under as much of the drip line as practical. Mulch that is not composted can rob your soil of nitrogen. Do not place mulch or anything else directly against the trunk. The shade of older trees can be so dense that it is difficult to grow grass under most of the drip line. This is the perfect spot to mulch, improving the tree's health and your yard's aesthetics at the same time. Don't mulch too deep. Thick layers of mulch can soak up water like a sponge preventing moisture from reaching the soil below.

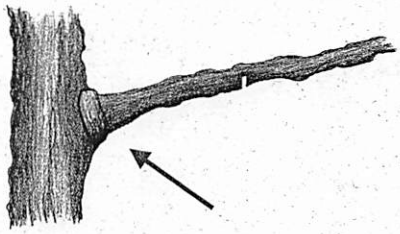
Proper Tree Pruning

Branches smaller than 1" can be removed with bypass loppers.

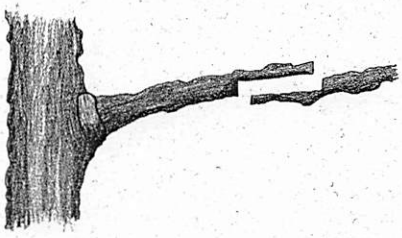
Branches greater than 1" should be removed with a handsaw or chainsaw using the three cut method. This method was designed to prevent the limb from tearing bark or splitting the trunk as it is removed.

Where a branch attaches to a larger branch or trunk it forms a union called the branch collar. The branch collar sometimes appears as a swelling at the base of the branch.

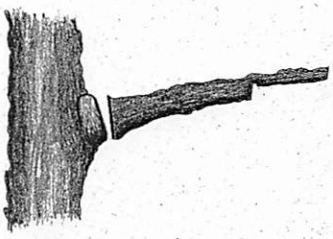
1. Undercut the limb 8-12" from the branch collar.



2. Make the second cut from the top beyond the first cut all the way through the branch. If the branch falls before the cut is finished, the undercut will stop the bark from tearing.



3. The last cut should be as close to the branch collar without cutting into it. It is often easier to make the last cut from the bottom upward.



BENEFITS OF TREES

Most people are aware of how beautiful trees are, and how they can make any location more enjoyable. They screen ugly views or create privacy. They reduce glare and light reflection as well as noise pollution from near-by businesses. They add to the beauty of the landscape by acting as a background, by framing a view or by complementing architecture. However, many people are unaware of the countless other benefits afforded by trees.

Trees' functions are multifaceted in the urban community. They reduce air pollution, abate heat islands and increase water quality. They provide economic benefits to both homes and businesses. A stream of modern studies has shown that trees also offer a measurable social benefit by reducing violence and crime, improving mental health, and strengthening communities.

TREE FACTS

- Trees store carbon reducing the greenhouse effect.
- Large long lived shade trees
- can sequester 3 metric tons of carbon.
- Urban trees sequester more carbon per tree than rural trees because they grow faster and shade buildings reducing electric consumption from fossil fuel driven electric plants.
- A single large tree can remove as much heat from the air as five medium sized air conditioners.
- A 32' tall tree can reduce storm water run off by 327 gallons.

TREES IMPROVE AIR QUALITY

Tree leaves act like giant air filters catching particulate matter, those small particles in the air that cause lung irritation, including heavy metals. Trees filter many noxious air pollutant gases such as ozone, sulfur dioxide, and nitrogen dioxide. Trees breathe in carbon dioxide and release oxygen, just the opposite of what we do. Along with all the other green plants on earth, they constantly replenish our oxygen supply. The carbon they take in is converted to wood and other tissues. The carbon is stored or sequestered in the tree until it decays. Carbon dioxide is a greenhouse gas that is produced by burning fossil fuels and deforestation. As trees sequester carbon, they reduce the greenhouse affect.

Trees also reduce carbon emissions by shading buildings, streets, and parking lots. By shading buildings, trees reduce the amount of electricity needed for air conditioning and reduce emissions from fossil fuel burning electric plants. Sixteen percent of all hydrocarbon emissions come from evaporation of gasoline from parked cars. Shading driveways and parking lots can significantly reduce fuel evaporation.

TREES REDUCE HEAT ISLANDS

Urban heat islands are caused by streets, parking lots, buildings and asphalt structures absorbing heat throughout the day and releasing it at night, causing a dome of air temperature 9 to 14 degrees Fahrenheit hotter than surrounding rural areas. Heat islands have a negative effect by increasing ozone, car emissions and cooling costs. A NASA study in Huntsville, Alabama showed an average temperature of a mall parking lot to be 113 degrees compared to 85 degrees in a nearby forested area. However, the area near a small tree island located in the lot was only 89 degrees, a 24 degree difference. Five hours after sunset the tree island was still 11 degrees cooler than the parking lot, effectively reducing the stored heat in the surrounding asphalt. Planting trees strategically around buildings, streets and parking lots can reduce the heat island effect and reduce the number of "Ozone Action Days."

TREES IMPROVE WATER QUALITY

Trees intercept rainfall and reduce storm water run off. As water collects on the tree leaves, it travels more slowly to the soil surface allowing time for penetration. A 32' tall tree can reduce storm water run off by 327 gallons. As less water runs off, it reduces the burden on the city's storm water drainage system. As water travels more slowly, it picks up less sediment that would later be deposited in streams and rivers and increases water quality. The decreased run off also reduces flooding. Trees planted over non-permeable surfaces such as streets and parking lots give the

most reduction in storm water run off.

Trees Increase Property Value and Stimulate The Local Economy

Trees are a valuable feature on residential property. Studies have shown that healthy trees and landscaping can account for up to 30% of a home's market value. Street trees alone can add 6% to the sale price. The majority of real estate agents surveyed agreed that large healthy trees made a home more marketable. Very few people want to live in a home without trees.

Not only do trees stimulate the sale of homes but they can stimulate the sales of other products as well. In a southern community, 74% of customers surveyed preferred to shop at businesses with trees and landscaping. A study by the University of Washington showed that patrons perceived products to be of higher quality and rated customer service 15% higher in landscaped shopping districts. They also were willing to drive farther to a shopping district with trees, were more willing to pay for parking and pay 11% more for products. A smart entrepreneur will make planting a tree their first act of business.

Trees Reduce Crime

Frances Kuo and William Sullivan from the University of Illinois Human-Environment Research Laboratory have found that trees and green spaces play an important role in softening the harshness of urban life. They found that the greener a building's surroundings were the fewer reported crimes. Residents spend more time outside where green spaces are available, decreasing the opportunity for crime. There was also a reduced incidence of domestic violence. Green spaces alleviate mental fatigue, a precursor to violent behavior and domestic disharmony.

Trees Benefit Mental Health

Using trees and green spaces to promote mental wellness is not a new idea. Thousands of years ago, ancient Egyptians built gardens to "restore the spirit". Today scientists are rediscovering that philosophy and backing it up with scientific study. One of the first studies that demonstrated the physiological impact of trees was by Roger Ulrich, Director for the Center for Health Systems and Designs, Texas A&M. Ulrich found that patients with a view of trees from their hospital window had shorter hospital stays and took fewer painkillers. This spurred many other studies into the human relationship with trees.

Kuo and Sullivan found that Symptoms of Attention Deficit Hyperactivity Disorder (ADHD) were reduced after contact with green areas. Playing outdoors in green spaces reduced fatigue, restored focus, and improved concentration in ADHD children. Green spaces also allowed for more creative play and interaction with adults, both beneficial to a child's mental health development.

The benefits of trees on mental wellness are not limited to patients and ADHD children. A Cornell University study showed that children moving to homes with more green areas boosted their attention span and had increased test scores. They also found that women moving to homes with more green space had reduced sociological distress.

Trees Strengthen Community Ties

Kuo and Sullivan found that trees created a community space for people to gather called common areas. People living with close access to green common areas had more social activities, more visitors, knew more of their neighbors, and had stronger feelings of belonging. Belonging to a community is important because it offers a sounding board and a support system. In turn, people in this study found it easier to cope with the harshness of poverty and urban life and had less incidents of verbal and physical abuse toward other family members. Green spaces were the meeting places that bound their communities together.

Trees add so much more than the obvious to our lives and our communities. They shelter us from the harshness of the world around us. They clean our air and our water and make shopping more enjoyable. They bring us together, strengthen our communities, and "restore our spirit". Planting a tree in front of a business, in a park, at a school, in a yard, along the street, or in a parking lot can be one of the wisest investments one is ever likely to make.

What is That?

Tree Identification

In order to identify a tree it is helpful to learn some basic terms. Since flowers and fruit are not always present, leaves are the tool used most often to identify trees as well as other plants.

Three basic leaf characteristics are type of venation, leaf arrangement on a stem (twig) and leaf type.

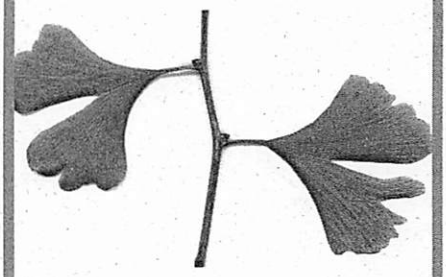
A bud is present where a leaf is connected to a stem. If there is only one leaf blade at that connection, then it is a simple leaf as in a magnolia. If however, there are two or more individual **leaflets,** then it is a compound leaf as in a pecan. The leaf is comprised of the leaflets and the rachis to which they are attached.

If there are two leaves (simple or compound) attached to a stem directly across from each other, the leaves are opposite as in a maple. If the leaf (simple or compound) attachment is staggered, then the arrangement is alternate as in a pecan or sycamore.

If the main veins of a leaf radiate like your fingers on your hand, the venation is palmate like a maple or sycamore. If the main veins look like a feather with a midrib, then it is pinnate like a magnolia.

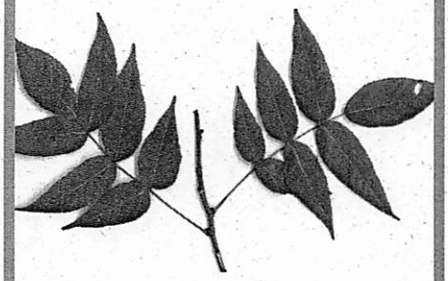
Learning the characteristics of a tree's leaves will help identify it.

Ginko



Simple

Mexican Buckeye

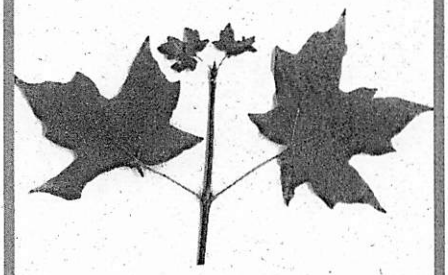


Compound

Persimmon

Alternate

Caddo Maple



Opposite

Bigtooth Maple

Palmate Venation

Canby Oak

Pinnate Venation

What to Plant

Common Name	Scientific Name	Height	Cold Stratify	Ever-green	Showy Flowers	Vibrant Fall Color	Simple Leaves	Com-pound Leaves	Opposite Leaves	Alter-nate Leaves	Pal-mately Veined	Pin-nately Veined	Fort Worth Native
Bald Cypress	*Taxodium distichum*	70'	90	☐	☐	☐	■	☐	☐	■	☐	■	☐
Bur Oak	*Quercus macrocarpa*	70'	0	☐	☐	☐	■	☐	☐	■	☐	■	☐
Green Ash	*Fraxinus pennsylvanica*	70'	210	☐	☐	■	☐	■	☐	■	☐	■	☐
Pecan	*Carya illinoensis*	70'	90	☐	☐	☐	☐	■	☐	■	☐	■	☐
Shumard Oak	*Quercus shumardii*	70'	0	☐	☐	■	■	☐	☐	■	☐	■	■
Post Oak	*Quercus stellata*	70'	0	☐	☐	☐	■	☐	☐	■	☐	■	■
Blackjack Oak	*Quercus marilandica*	60'	0	☐	☐	☐	■	☐	☐	■	☐	■	■
Cedar Elm	*Ulmus crassifolia*	50'	90	☐	☐	☐	■	☐	☐	■	☐	■	■
Chinquapin Oak	*Quercus muhlenbergii*	50'	0	☐	☐	☐	■	☐	☐	■	☐	■	■
Eastern Redcedar	*Juniperus virginiana*	50'	120	■	☐	☐	☐	☐	☐	☐	☐	☐	☐
Eldarica Pine	*Pinus eldarica*	50'	*	■	☐	☐	☐	☐	☐	☐	☐	■	☐
Live Oak	*Quercus virginiana*	50'	0	■	☐	☐	■	☐	☐	■	☐	■	■
Southern Magnolia	*Magnolia grandiflora*	50'	180	■	■	☐	■	☐	☐	■	☐	■	■
Texas Ash	*Fraxinus texensis*	50'	*	☐	☐	■	☐	■	☐	■	☐	■	☐
Texas Red Oak	*Quercus texana*	50'	0	☐	☐	■	■	☐	☐	■	☐	■	■
Chittamwood	*Bumelia lanuginosa*	50'	60	☐	☐	☐	■	☐	☐	■	☐	■	■
Ginkgo	*Ginkgo biloba*	45'	60	☐	☐	■	■	☐	☐	■	☐	■	☐
Lacebark Elm	*Ulmus parvifolia*	45'	90	☐	☐	■	■	☐	☐	■	☐	■	■
Chinese Pistache	*Pistacia chinensis*	40'	*	☐	☐	■	■	☐	☐	■	☐	■	■
Western Soapberry	*Sapindus drummondii*	40'	90	☐	☐	■	☐	■	☐	■	☐	■	■
Bigtooth Maple	*Acer grandidentatum*	35'	30	☐	☐	■	■	☐	■	■	■	☐	☐
Eve's Necklace	*Sophora affinis*	30'	*	☐	☐	■	■	■	☐	■	☐	■	■
Japanese Black Pine	*Pinus thunbergii*	30'	*	■	☐	☐	☐	☐	☐	☐	☐	■	☐
Bigelow Oak	*Quercus sinuata*	30'	0	☐	☐	☐	■	☐	☐	■	☐	■	■
Mexican Buckeye	*Ungandia speciosa*	30'	*	☐	■	☐	■	☐	☐	■	☐	■	■
Carolina Buckthorn	*Rhamnus caroliniana*	25'	*	☐	☐	☐	■	☐	☐	■	☐	■	■
Golden Raintree	*Koelreuteria paniculata*	25'	90	☐	■	☐	■	■	☐	■	☐	■	☐
Mesquite	*Prosopis glandulosa*	25'	0	☐	☐	☐	☐	■	☐	■	☐	■	■
Redbud	*Cercis canadensis*	25'	56	☐	■	☐	■	☐	☐	■	☐	■	■
Crepe Myrtle	*Lagerstroemia indica*	20'	*	☐	■	☐	■	☐	☐	■	☐	■	■
Desert Willow	*Chilopsis linearis*	20'	0	☐	■	☐	■	☐	☐	■	☐	■	■
Lacey Oak	*Quercus glaucoides*	20'	0	☐	☐	☐	■	☐	☐	■	☐	■	■
Mexican Plum	*Prunus mexicana*	20'	*	☐	■	☐	■	☐	☐	■	☐	■	☐
Japanese Maple	*Acer palmatum*	15'	*	☐	☐	■	■	☐	☐	■	■	☐	☐
Yaupon Holly	*Ilex vomitoria*	15'	**	■	☐	☐	■	☐	☐	■	☐	■	■

* No information available ** Not recommended

Que Plantar

Nombre Común	Nombre Científico	Altura	Estratificación de Frío	Nativo de Fort Worth	Forma de Pino	Forma de Palma	Hojas Alternantes	Hojas Opuestas	Hojas Compuestas	Hojas Simples	Color de Otoño	Flores Llamativas	Perenne
Yanilla	Ilex vomitoria	15'	**	■	■	☐	■	■	☐	■	☐	☐	■
Arce del Japón	Acer palmatum	15'	*	☐	☐	■	☐	☐	☐	■	■	☐	☐
Ciruelo	Prunus mexicana	20'	*	☐	■	☐	■	■	☐	■	■	■	☐
Encino Blanco	Quercus glaucoides	20'	0	☐	■	☐	■	☐	☐	■	☐	☐	☐
Flor de Mimbre	Chilopsis linearis	20'	0	☐	■	☐	■	■	☐	■	☐	■	☐
Crespón	Lagerstroemia indica	20'	*	☐	■	☐	■	☐	☐	■	■	■	☐
Ciclamor	Cercis canadensis	25'	56	☐	■	☐	■	☐	☐	■	■	■	☐
Mezquite	Prosopis glandulosa	25'	0	☐	■	☐	■	☐	■	☐	☐	■	☐
Alfombrilla Japoneas	Koelreuteria paniculata	25'	90	☐	■	☐	■	☐	■	☐	■	■	☐
Rhamnus	Rhamnus caroliniana	25'	*	☐	■	☐	■	☐	☐	■	☐	■	☐
Monillo	Ungandia speciosa	30'	*	☐	■	☐	■	☐	☐	☐	■	■	☐
Roble de Bigelow	Quercus sinuata	30'	0	☐	■	☐	■	☐	☐	■	☐	■	☐
Pino Negro Japones	Pinus thunbergii	30'	*	☐	☐	☐	☐	☐	☐	☐	☐	■	☐
Collar de Eva	Sophora affinis	30'	*	☐	■	☐	■	☐	☐	■	☐	■	☐
Palo de Azúcar	Acer grandidentatum	35'	30	☐	■	☐	■	■	☐	■	■	☐	☐
Amole	Sapindus drummondii	40'	90	■	■	☐	■	☐	■	☐	☐	☐	☐
Pistache Chino	Pistacia chinensis	40'	*	☐	■	☐	■	☐	☐	■	■	■	☐
Olmo Chino	Ulmus parvifolia	45'	90	☐	■	☐	■	☐	☐	■	■	■	☐
Ginko	Ginkgo biloba	45'	60	☐	☐	☐	■	☐	☐	■	■	☐	☐
Coma	Bumelia lanuginosa	50'	60	■	■	☐	■	☐	☐	■	☐	■	☐
Roble Rojo de Texas	Quercus texana	50'	0	■	■	☐	■	☐	☐	■	■	☐	☐
Fresno De Texas	Fraxinus texensis	50'	*	■	■	☐	☐	☐	■	☐	■	■	☐
Magnolio	Magnolia grandiflora	50'	180	☐	■	☐	■	☐	☐	■	■	■	☐
Roble Verde	Quercus virginiana	50'	0	■	■	☐	■	☐	☐	■	■	■	☐
Pino Eldarica	Pinus eldarica	50'	*	☐	☐	☐	☐	☐	☐	☐	☐	■	☐
Cedro Rojo	Juniperus virginiana	50'	120	■	☐	☐	☐	☐	☐	☐	☐	☐	☐
Encino Chinquapin	Quercus muhlenbergii	50'	0	■	■	☐	■	☐	☐	■	■	☐	☐
Olmo de Cedro	Ulmus crassifolia	50'	90	■	■	☐	■	☐	☐	■	■	☐	☐
Roble de la Ventiuna	Quercus marilandica	60'	0	■	■	☐	■	☐	☐	■	■	☐	☐
Roble Para Postes	Quercus stellata	70'	0	■	■	☐	■	☐	☐	■	■	☐	☐
Encino Chumardi	Quercus shumardii	70'	0	☐	■	☐	■	☐	☐	■	■	☐	☐
Pecana	Carya illinoensis	70'	90	■	■	☐	■	☐	■	☐	■	☐	☐
Fresno	Fraxinus pennsylvanica	70'	120	■	■	☐	■	☐	☐	■	■	☐	☐
Encino Azul	Quercus macrocarpa	70'	0	■	■	☐	■	☐	☐	■	■	☐	☐
Ciprés Calvo	Taxodium distichum	70'	90	☐	■	☐	■	☐	☐	■	■	☐	☐

* No hay información disponible ** No se recomienda