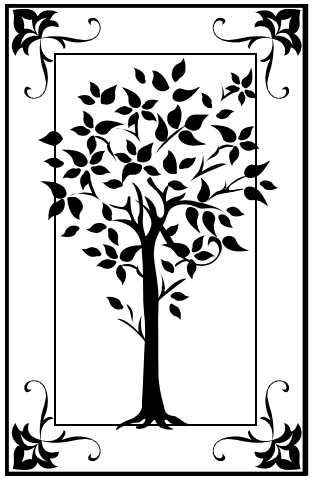
Trees in Your Home Garden

University of California Cooperative Extension
Stanislaus County



A Guide to Choosing & Caring for Landscape Trees

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Trees in Your Home Garden

Trees can add interest and color to a landscape as well as protect a house from the hot rays of the Central Valley sun.

A common question homeowners ask at the UC Cooperative Extension Office in Stanislaus County is: "How do I choose the right tree for my yard?" *Trees in Your Home Garden* will address this question and provide details on tree planting and care.

This publication is broken into two sections; an explanation of the principles regarding tree growth and tree care, and a helpful guide for choosing a tree. Once you read and understand the basic principles regarding tree growth, the guide will make selecting a tree for your landscape much simpler.

TREE TYPES

Trees are generally grouped into three categories: deciduous, evergreen or palm.

Deciduous trees lose all of their leaves almost at once, resulting in bare branches during winter. In fall, many deciduous trees such as ginkgo and Chinese pistache develop colorful leaves.

Evergreen trees keep the bulk of their leaves all year long. However, they do shed some leaves from spring through summer. There are two types of evergreen trees: broadleaf and narrowleaf/conifer. A broadleaf evergreen tree has a similar appearance to a deciduous tree, but keeps its leaves year round. Examples of broadleaf evergreen trees include camphor and bay laurel.

Narrowleaf or conifer trees are evergreen trees whose leaves are needle-like. Examples of conifers include mondell pines and coast redwood.

Palm trees can make an attractive addition to a garden. They vary in height, and once mature may need to be pruned by a professional arborist. Two palms that grow well in our area are the Canary Island date palm and the California fan palm.

TREE FEATURES

When choosing a tree for the landscape, many factors should be considered. These include: location, tree height and spread, rate of growth, fall color and the presence of ornamental flowers and/or fruit.

Sidewalks and Driveways

Certain trees are known for their aggressive root systems and should not be planted near concrete sidewalks and driveways. Fruitless mulberry and liquidambar are two trees that shouldn't be planted in these situations.

Lawn Trees

Trees planted in a lawn will need more water than just surface sprinkling. Trees recommended for lawns include the strawberry tree as well as saucer magnolias. See the section in this publication called "Watering" for more information on how to water properly.

House Proximity

Trees protect buildings from the heat of summer as well as save energy. In the Turlock Irrigation District (TID), homeowners can receive a rebate of $20 per tree. Visit the link on the bottom of this column for more information.

Power Lines and Tree "Topping"

High voltage lines are usually located on 30-35 feet poles. When planting a tree near power lines, it is best to choose one from the "small" section of the tree guide. Use caution near power lines, as each year, hundreds of people are killed

http://www.tid.org/tidweb/Res/ShadeTree/index.htm

Trees in Your Home Garden

or injured attempting to prune or climb trees that have grown into power lines.

Tree topping is the cutting of large branches to stubs on a mature tree. This practice creates an unsightly tree that is more susceptible to disease. Trees that have been topped also generate weakly attached limbs that are prone to breaking, especially during windy conditions.

The Urban Tree Foundation suggests several tips for the reduction of large trees. They can be viewed at the site on the bottom of this column. If a tree is especially large, it may be unsafe for a homeowner to attempt to prune it. In this case, hiring an arborist would be the best idea.

When selecting an arborist, check for proof of insurance, a list of references and membership in a professional organization. Many arborists are certified through the International Society of Arboriculture (ISA), the National Arborist Association (NAA) or the American Society of Consulting Arborists (ASCA). Avoid using companies that advertise "tree topping" as a provided service.

http://66.165.117.218/topping.asp

Pool or Water Feature
When planting near water, use plants without thorns, as they may injure pool users. Palm trees make a nice choice as they will not drop leaves into the pool.

Height & Spread
It's crucial to know the eventual height and spread of a tree. Using this information, a homeowner can judge how it will affect the yard's appearance in the future. Trees planted too close to landscape structures create problems and may eventually need to be removed.

Rate of Growth
Not all trees grow at the same rate. When selecting a tree for quick shade, some species work best. Others take several years to become a part of your landscape. California pepper trees and empress trees provide quick shade, while maytens trees and olive trees grow slower and take longer to provide shade.

Roots
Roots absorb water and nutrients needed by trees for growth and development. Often, gardeners consider roots to be a nuisance. This is due to the tendency of some trees to break up concrete sidewalks and driveways. Trees that have "well-behaved roots" include the London plane tree, Japanese maple, Chinese pistache and most types of magnolias.

Color
Many trees are noted for their attractive fall color. Before losing their leaves in autumn, certain tree species have leaves that undergo colorful changes. Each year is different, because fall color is dependent on the rate of temperature change. Trees in Stanislaus County that often have striking fall color include ginkgo, Chinese pistache, liquidambar, birch, tupelo, mulberry, maples and deciduous oaks.

USING REFERENCES
There are many books available to assist in the search for the perfect tree for your landscape. Many refer to something called plant maps. These maps have been created by several organizations including the USDA (United States Department of Agriculture), AHS (American Horticultural Society) and the Sunset Publishing Corporation. The USDA plant zone notes the coldest temperatures on average recorded for an area, while the AHS plant map denotes the warmest temperature averages for an area.

The AHS zone for Stanislaus County is 8, indicating our area is known to have

Trees in Your Home Garden

temperatures above 86ºF for 90-120 days.

The USDA zones place Stanislaus County zone 9, where temperatures in winter routinely fall between 25-30°F.

Sunset zones break down areas even further than the AHS and USDA maps. The zones document microclimates in the western part of the country. Microclimates are small areas that have temperature characteristics that differ from areas just a few miles away. Most of Stanislaus County is in zone 14. Use the Sunset Western Garden Book as a guide to determine which plants will do well in your landscape.

Local nurseries work hard to provide plants that do well in our region. However some species may need extra protection in the winter, as they are not frost tolerant. Trees that may die from extended days of low temperatures are noted in this guide.

People who favor trees that are not frost tolerant (such as the Queen Palm) take a risk when planting them in Stanislaus County. A freeze often occurs every 5-7 years, injuring or killing sensitive plants.

TREE PLANTING

Correct planting is essential in determining the long term health of a tree in your landscape. Here are some steps to guide you through the process.

STEP 1: *dig the hole twice as wide as the size of the container in which the plant was purchased.*
Do not dig the hole deeper than the container.

If soil is hard and compacted, dig the hole three times as wide. Adding fertilizer, soil amendments or root stimulants is not recommended as most trees have already been well-fertilized prior to purchase.

STEP 2: *gently remove the tree from the container.*

If roots are growing in a circular pattern, carefully pull them apart. Use pruning shears if excessive roots exist. The area of roots and soil taken out of the container is known as the 'root ball.'

STEP 3: *place the root ball in the hole so the top of it is one to two inches above soil level.*
It is important to carefully place the tree into the hole, holding it by the root ball and the trunk lightly at the same time.

STEP 4: *fill around the root ball with remaining soil. Lightly pack the soil around the tree*.

Air pockets in the soil will cause the tree to sink. Make sure the top of the root ball is just at soil level when the planting is finished. Do not cover the top of the root ball with excess soil.

STEP 5: *build a four-inch trough around the tree in a circular pattern 2-3 feet away from the plant.*

This will allow water to remain near the tree and penetrate down to the roots. Use this trough during the first year of the tree's life.

STEP 6: *water the tree deeply. Use at least 10 gallons of water.*

Water 1-2 times per week during the growing season. When the weather begins to cool, water less as the tree's demand for water decreases.

Trees in Your Home Garden

STEP 7: *add a 3-4 inch layer of mulch around the tree.*

This will slow the evaporation of water and allow the tree roots protection from extreme summer temperatures in the Central Valley.

For more information on tree planting, refer to the UC ANR leaflet "Planting Landscape Trees" available at http://anrcatalog.ucdavis.edu/pdf/8046.pdf.

Tree Staking and Protection

In most situations it isn't necessary to stake a tree, as most trees have the ability to stay upright without help. However, if a tree is planted in an extremely windy area, using a stake can prevent it from leaning to one side. All tree stakes should be removed after one year of use.

Tree protective sleeves may be needed in areas where weed trimmers and other equipment are used. Check the covering regularly to ensure it does not constrict trunk growth.

WATERING

Young trees need sufficient water during the growing season. Trees not given ample water will have roots that stay near the surface of the soil. Frequent, deep watering is essential for a healthy root system. Shallow lawn water may keep lawns green, but it's not enough for a tree.

During the dry season (May-October) water trees deeply every month. As your tree matures, check soil at the drip line (the area where the tree canopy extends). Investigate the depth of water absorption by digging below the surface soil.

Water penetration will depend upon the combination of sand, silt and clay particles in the soil. Sandy soil is made up of large particles, which also contain large air spaces between these particles. Water drains easiest through this type of soil, making it necessary to water more frequently than other soils.

Clay soils have the smallest particles and the least amount of air space between them. Water drains slowly and stays in the soil longer. In this case, be careful of over-watering, as lack of oxygen can cause tree root suffocation.

AS YOUR TREE GROWS

Pruning a tree is both a science and an art. Pruning decisions in the first few years of the life of the tree are critically important for the future development of the tree.

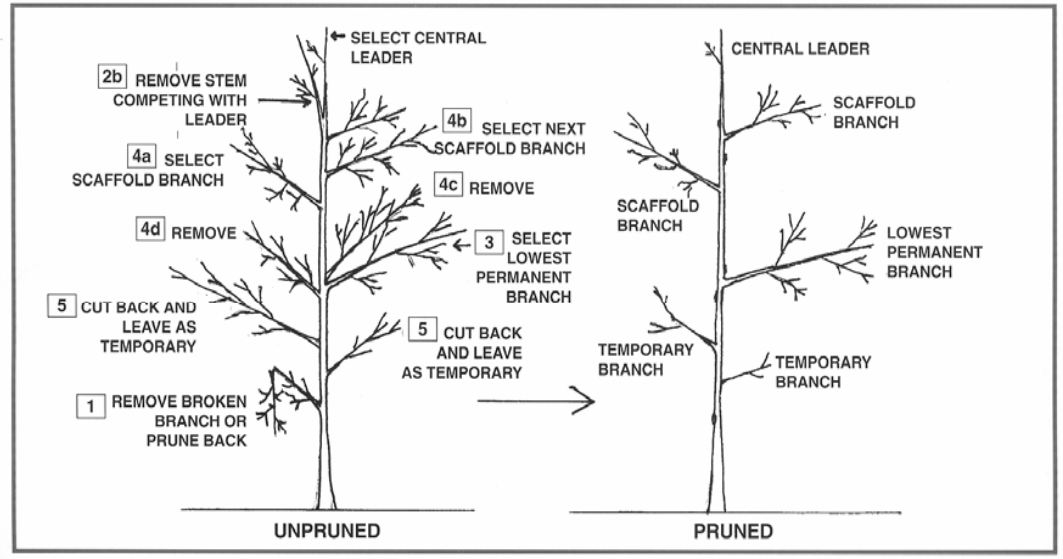


Fig. 2 Applying the 5 steps to the unpruned tree (on the left) creates strong structure and attractive form in young trees. The numbers on the drawing correspond to each of the 5 pruning steps to produce the tree on the right.

Trees in Your Home Garden

Pruning should be done when the tree is dormant (December-February in Stanislaus County). As seasons in our area can vary, begin pruning after the last tree leaves have fallen in autumn.

In spring, when buds begin to swell and leaves develop, arborists discourage major pruning. However, some light pruning can be done during the rest of the year to remove damaged or diseased wood, to make small cuts for shape and also to remove spent flowers.

Dr. Laurence Costello, Urban Forestry and Landscape Horticulture Advisor for San Mateo-San Francisco counties, has developed five steps for training young trees. Homeowners who use Dr. Costello's procedures will improve the structural strength of their tree, reduce maintenance costs for the long term and increase the longevity of trees in the landscape.

Equipment needed to train a tree is relatively inexpensive and consists of hand pruners, loppers, a pole pruner, handsaw and a ladder. Dr. Costello's steps apply to most deciduous and broad-leaf evergreen trees.

<u>Step 1:</u> remove broken, diseased, dying or dead branches.

When making a cut, eliminate the entire injured or diseased branch. Be careful not to cut into tree trunk tissue.

<u>Step 2:</u> select a "leader" to become the main trunk of the tree.

This leader is a central stem that should narrow into a single stem that becomes the main trunk of the tree. Other competing branches should be removed, cut back or selected as permanent branches (see step 4).

<u>Step 3:</u> select the lowest permanent branch (also called the lowest scaffold branch).

The lowest permanent branch is the lowest branch attached to the trunk that will remain on the tree for its lifetime. The height of this branch depends upon the location of the tree. Trees that overhang sidewalk should have permanent branches at least 8 feet high, while those hanging over a street should be at least 14 feet high. The lowest permanent branch on trees planted in yards may be lower depending on surrounding landscape and usage.

Find a branch that meets the height requirement, has a diameter of 1/2 (or less) the diameter of the trunk, and has a strong attachment. You may want to tie a piece of string on this branch so it can be identified later. Smaller branches should be left on the tree temporarily.

<u>Step 4:</u> select "scaffold" branches and cut back competing branches.

Scaffold branches will become the permanent branches of the tree and make up most of its framework. Scaffold branches are located above the lowest permanent branch and are selected based on spacing and size. The spaces between the branches depend upon the eventual height of the tree. Large trees should have branches spaced 18" apart, while smaller trees should be spaced 12" apart. These scaffold branches should be spaced in a radial fashion around the trunk, similar to that of the spokes of a bicycle wheel. Start by selecting the lowest permanent branch and proceed upward around the trunk.

<u>Step 5:</u> select temporary branches below the lowest permanent branch.

These branches should be shortened to the length of two to four buds. Young trees need to keep small branches along the trunk and between scaffold branches, as their leaves provide food for the tree.

Trees in Your Home Garden

PRUNING GUIDELINES
Dr. Costello recommends that no more than 25% of a young tree's canopy should be removed in any one year. Over-aggressive pruning can hurt a tree. The main idea in pruning is to continually shape the plant into an attractive tree that will function well in the landscape. It will take many years to develop the permanent framework of the tree, so continue to use Dr. Costello's steps each year.

The five steps can also be applied to conifers, but with some modification. Steps 1-4 are important, although step 3 depends upon tree location. For most conifers, the lowest permanent branch may not need to be selected unless clearance is necessary for vehicles or people. Step 4 can also be skipped, and step 5 will only be necessary if a lowest permanent branch is selected.

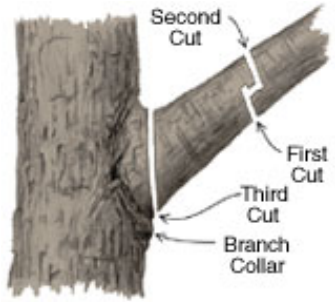
MAKING LARGER CUTS
Once your tree is established and begins to mature, larger branches may need to be pruned due to disease or damage. In order to cause the least amount of harm to the tree, most arborists recommend making three cuts for the removal of a single branch. See the illustration that follows these instructions.

1st Cut: this cut is made on the underside of the branch 1-2 feet away from the main trunk.

2nd Cut: the purpose of this cut is to remove the branch while eliminating the possibility of bark tear.

3rd Cut: the third cut is the removal of the left over stub. Carefully cut the branch where it meets the trunk; avoid cutting into the trunk tissue.

When cutting branches, prune back to their point of origin, being careful not to cut into the branch collar part of the tree.



TREE PESTS, DISEASES & PARASITES
As mentioned previously, some trees are not recommended in this guide due to serious pest and disease problems. Fortunately for some species, newer cultivars have been created that can resist most problems. Many of these plants are available locally and will be listed in the guide.

Even when abiding by the rules of tree care, issues like drought or large populations of pests and diseases can still overwhelm a tree. Many pests and diseases target specific trees. Just as an animal has a habitat or preferred living area, so too, do insect pests and diseases.

The first step in effective pest and disease control is the identification of the problem. Identify and learn how to control the problem using resources available at the University of California Cooperative Extension Office, or enlist the help of an experienced nursery professional or arborist.

Useful UC Cooperative Extension resources include UCIPM Pest Notes and the UCIPM website at http://www.ipm.ucdavis.edu/PMG/menu.homegarden.html.
From there you may choose more detailed links.

PESTS
Often pests occur in small numbers and do not cause noticeable damage. However, if circumstances tip the balance in their favor, they can cause serious harm.

Tree Borers
A number of different types of insects (mainly certain species of beetles and moths) bore into tree trunks and branches during their larval stages, producing sawdust or sap-filled holes. Most borers successfully attack trees that have been stressed by over- or under-watering, disease, lack of proper care or injury by mechanical equipment.

Usually, by the time the tree is infested with borers, little can be done other than improving tree health through proper watering, pruning out infested branches or removing the tree. Insecticides are occasionally used to prevent infestations of bark beetles on high-value trees or to manage certain clearwing moths.

A tree heavily infested with borers will have numerous small holes randomly throughout the branches and trunk. Do not confuse these with the holes left by a sapsucker (woodpecker) which occur in rows.

Sucking Insects
Many insect pests including aphids, scales, whiteflies, mealybugs, leafhoppers and psyllids feed by sucking sap from plants. Their presence is often indicated by a sweet, sticky substance called honeydew that the insects excrete as they feed. Large numbers of ants in trees may also indicate the presence of sucking insect pests. Ants feed on the honeydew while protecting the pest from beneficial insects.
Large populations of sucking insects can cause yellowing of leaves and leaf drop, but rarely result in the death of the tree. A number of products, including Insecticidal soaps, oils and systemic insecticides may be used to control these pests. Once the initial pest is removed, ants will become less of a presence.

Sooty mold, a black, powdery fungi, often accompanies the presence of honeydew. This fungi uses the honeydew to complete its life cycle, but does not directly harm the plant. Sooty mold is unsightly looking but easily cleaned with a stream of water or soapy water.

DISEASES
The main biotic (living) tree diseases are caused by various species of fungi and bacteria. Examples of common fungus diseases include powdery mildew and anthracnose. Fireblight is an example of a common bacterial disease. Unlike most insect pests, many plant diseases do not leave obvious signs of their presence, and may be difficult to distinguish from symptoms caused by cultural problems such as over- and under-watering. It may be necessary to take samples of diseased plants to the UC Cooperative Extension Office or to an experienced nursery professional for help in diagnosis.

NUTRIENT DEFICIENCIES
Occasionally trees may be lacking in nutrients needed for growth and development. Unfortunately, symptoms caused by diseases, insect infestations and water/soil related problems may mimic nutrient deficiency symptoms. This is why it's important to bring samples of tree problems to an experienced nurseryperson or to the UC Cooperative Extension Office.

One deficiency symptom that is mentioned in the tree guide is "chlorosis." This is the yellowing of leaf tissue due to a lack of chlorophyll. There are many reasons for chlorosis, such as poor drainage, damaged roots or compacted soil. Deficiencies of iron, manganese or zinc may also cause chlorosis in trees growing in some soils.

PARASITIC PLANTS
Broadleaf mistletoe is an evergreen parasitic plant that grows on a number of landscape tree species in Stanislaus County. In deciduous trees, it can be seen in fall and winter as clumps of green vegetation that occur throughout a tree. Broadleaf mistletoe commonly

Trees in Your Home Garden

occurs in the tops of large or older trees, as birds that spread the seed prefer to roost/nest there. Common hosts of this parasite include 'Modesto' ash, 'Aristocrat' flowering pear, birch, alder and zelkova.

Mistletoe produce small, sticky, whitish berries that are very attractive to birds such as cedar waxwings and robins. The birds feed on and digest the pulp of the berries, (produced from October through December) excreting the living seeds that stick tightly to any branch on which they land. After the mistletoe seed germinates, it grows through the bark and into the tree's water-conducting tissues.

Healthy trees can withstand a few infestations of mistletoe, but will most likely lose infected limbs. Trees under poor cultivation or advanced in age can be visibly stunted or even killed by mistletoe.

The best way to control mistletoe is to immediately remove the limb or branch when it first appears. Simply pruning or cutting off the mistletoe from a tree will not remove it completely, as the parasite is actually imbedded in plant conductive tissue. However, constantly removing the plant as it grows will weaken the mistletoe and also prevent its spread by reducing the possibility of it setting seed. Mistletoe does not set seed until it is mature, a process that takes 2-3 years. For more in-depth information about how to control mistletoe in trees, see the UC IPM Pest Note website at http://www.ipm.ucdavis.edu/PMG/menu.homegarden.html. Click on 'Weeds' and then 'Mistletoe.'

USING THE TREE GUIDE

This guide categorizes trees by their common names, as this is how most home gardeners know them. In order to ensure the correct species is identified, the common name will be followed by the genus and species. Information will be categorized into columns that list the height and spread of the tree, indicate whether it has flowers and fruit, if it is deciduous 'D' or evergreen, 'E', and finally the "remarks" section will note other features about the tree.

Tree Size

The trees in the guide are grouped into sizes: small, medium and large. Small trees eventually reach 25-30 feet, medium 30-60 feet and large trees can be taller.

In the box marked "Height and Spread" the top number is for eventual height, and the bottom number indicates the spread or width of the tree.

Tree growth rate varies, so a tree in the large category may not reach its eventual height until 50 years from now if it has a slow to moderate growth rate. Before planting, take into consideration the eventual height of your chosen tree.

Tree Features

The tree guide will note if a tree has fall color, spring flowers or a combination of these. Not all trees have showy flowers, but may have a graceful structure or interesting bark. This information will be listed under the "remarks" section. Often trees have flowers followed by fruit, and although some may be tiny, they can be messy if planted near sidewalks, decks or driveways.

Popular but Problematic

There are a few trees that are commonly planted in the landscape that are not listed in this guide, which may surprise some gardeners. The omissions were done because as horticulturists, we feel these trees have disadvantages that outweigh most of their benefits.

Trees in Your Home Garden

For example, a weeping willow (*Salix babylonica*) can be a stunning tree. Unfortunately, the roots of this tree are extremely invasive. They break up sidewalks and are difficult to garden under. Willows are also susceptible to many insect pests. A gardener prepared to deal with the disadvantages of the tree and who understands proper placement can still enjoy a weeping willow. A gardener who wants the "look" of a weeping willow minus the drawbacks can plant a maytens or Australian willow tree.

The Silk Tree (*Albizia julibrissin*) is known for having attractive, wispy pink flowers. The main drawback of this tree is the profusion of seedlings that will sprout in lawn and nearby garden beds. A gardener with sufficient time for weeding who likes this tree might not mind the extra work involved.

Queen palms (*Syagrus romanzoffianum*) and King Palms (*Archontophoenix cunninghamiana*) are popular palm trees planted in many new subdivisions. However, both are extremely frost sensitive and during the winter of 2007, many suffered extensive damage or were killed. Queen palm leaves also have a tendency to turn yellow, as they are prone to nitrogen deficiency in our soils and require extra fertilizer to stay green.

Unfortunately, there aren't any palms that truly mimic the look of these two species. However, there are attractive palms recommended in this guide that are more tolerant to frost.

Another tree not found in this guide is the evergreen flowering pear, *Pyrus kawakammi*, which is extremely prone to fire blight. *Pyrus calleryana* 'Aristocrat' is also another flowering pear not recommended because it is especially prone to both fire blight and mistletoe.

Modesto ash (*F. velutina* 'Modesto') was named after the city of Modesto, where many were planted. Unfortunately, the Modesto ash is susceptible to many problems, including the fungus disease anthracnose and mistletoe. The City of Modesto no longer plants this species, and many planted during the 1960's and 1970's are being removed as they decline.

AVAILABILITY

The tree you are looking for may not always be found locally. Nurseries and garden centers have limited space, so if you can't find the tree you are looking for, be sure to ask.

HARD TO FIND BUT WORTHWHILE

These trees may not be available locally, but can often be special ordered at a nursery or found in a catalog.

1. Alder Trees *Alnus species*. Trees in this genus can take sun or shade and need frequent moisture. Male trees have yellow catkins in spring before leaves form, and female trees have small cones used in flower arrangements. Black alder (*A. glutinosa*) is a fast growing, multi-stemmed tree that reaches 70' tall and makes a good screen. Italian alder (*A. cordata*) has heart-shaped leaves and can reach 40' tall. White alder (*A. rhombifolia*) is very fast growing and tolerant of heat and wind. All trees need regular to ample water.

2. Ash Trees *Fraxinus species*. White ash (*F. americana*) can grow to 80' tall and has a straight trunk and oval shaped crown 50' wide. Cultivar selections include 'Autumn Applause', 'Autumn Purple' and 'Royal Purple.' All have purplish fall color.

3. Hornbeams *Carpinus species*. These small shade trees have a slow to moderate growth rate. They make good street trees and need little to no pruning once established. They do, however, need regular deep water. American

Trees in Your Home Garden

hornbeam (*C. caroliniana)* is round-headed and can reach 25-30' tall and as wide; it can take full sun or heavy shade. European hornbeam (*C. betulus*) has a pyramid shape and reaches 40' tall. 'Fastigata' develops an oval-vase shape with age.

4. Linden Trees *Tilia species.* These trees have a moderate growth rate. They have heart-shaped leaves and fragrant yellow flower clusters in the spring. Lindens need regular, deep watering. Native to eastern North America, the American linden/ basswood (*T. americana*) is 40-60' tall, 20-25' wide. Cultivar 'Redmond' has glossy leaves. Little Leaf Linden (*T. cordata*) is 30-50' tall and 15-30' wide. It makes a good lawn, street or patio tree.

5. Palms Many palms do well in our area and are frost tolerant. They may not be in stock locally, but can be special ordered. Mexican blue palm (*Brahea armata*) is frost tolerant to 18°F and grows slowly to 40' tall and 25' wide. The leaves are an attractive silvery blue. Guadalupe palm (*Brahea edulis*) is frost tolerant to 20°F and has light green leaves. It is a slow grower to 30' tall and 15' wide.

6. Mondell Pine (*Pinus eldarica*). This tree needs little water once established and tolerates most soil types with good drainage. It can reach 30-40 feet tall and as wide and has an upright, pyramidal shape.

EXCELLENT TREE PHOTOS

It's difficult to choose a tree when visiting a nursery or garden center, as nursery stock trees are just a few years old.

The web address at the bottom left of this page leads to a link from The National Arbor Day Foundation. Type in the common or botanical name of the tree you wish to see. The tree image will appear towards the bottom of the site, so scroll down to see images of the selected tree.

Another site is listed at the bottom of this page is from the University of Auburn in Georgia. This site may not have every tree you are looking for, but for the trees it does have there are detailed photos of the trees and their leaves, flowers and bark.

A NOTE ABOUT TOXICITY

Plants are toxic in small to large doses, depending on the type of plant. Since livestock and domestic animals have a tendency to ingest large quantities of plants, it is essential to know which trees in your landscape may have negative effects.

In the case of children, the basic lesson to be taught is not to eat or taste anything not approved of by parents or teachers.

Trees have been used in the landscape safely for many years, so there is no need to have an unreasonable fear of their use. The key points to remember are education and prevention.

http://www.ag.auburn.edu/hort/landscape/dbpages/botanicalindex.html

Tree Guide

Small Trees (up to 30 feet tall and as wide)

Common & Botanical Name	Flowers & Fruit	D	E	Height & Width	Remarks
Australian Willow Geijera parviflora	Small, inconspicuous flowers.		X	25-30' 15-20'	Fast growing. Little to moderate water once established. Excellent patio or street tree. Resembles a weeping willow tree in appearance, but has the advantage of roots that are deep and non-invasive. Frost-sensitive, plant where it will be protected.
Chaste Tree *Vitex agnus-castus*	Violet-blue, white or pink flowers.	X		20-25' 15-20'	Needs regular water. Thrives in hot weather. Usually a multi-trunk tree with silvery-gray aromatic foliage. Flowers bloom summer through fall.
Chitalpa *X Chitalpa tashkentensis*	Frilly, trumpet-shaped pink, white or lavender flowers.	X		20-30' 20-25'	Fast grower. Little to moderate water once established. Susceptible to powdery mildew and anthracnose, plant in full sun. Some cleanup is required due to flowers that drop in springtime.
Crabapple *Malus species*	Pink, white or red flowers.	X		10-20' 15-20'	Excellent lawn tree but needs additional deep watering. 'Prairifire' has red buds that open as single deep pink blossoms and high disease resistance. 'Weeping Candied Apple' has outer petals in deep pink, inner petals whitish pink and good disease resistance. Both species have attractive berries favored by birds.
Crape Myrtle *Lagerstroemia (*hybrids)	Pink, white, red, or purple flowers.	X		10-25' 10-25'	Moderate growth rate. Deep water occasionally once established. Excellent patio tree. Some cleanup required Blooms July-September, smooth bark is striking in winter. Plant in full sun to avoid powdery mildew. Disease resistant cultivars have Native American names (i.e. Catawba, Cherokee, Hopi). Leaves can turn chlorotic in high pH soils, use an iron fertilizer to remedy the problem. Stake young trees until established.
Desert Willow *Chilopsis linearis*	Pink, purple, rose, white or lavender flowers.	X		15-30' 10-20'	Fast growth at first, then slower. Prefers to be on the dry side. Willow-like leaves accompanied by trumpet shaped flowers in spring. Attracts humming-birds. Seed pods held through winter. Staking required, prune to avoid limb breakage. California native.
Dogwood *Cornus florida*	Pink, red and white flower bracts.	X		20-30' 20-30'	Deep water regularly. Needs afternoon shade to do well in our climate, otherwise leaves will burn in summer. Many cultivars available from local nurseries and garden centers.
English Hawthorn *Crataegus laevigata*	Tiny flower clusters.	X		18-25' 15-20'	Moderate growth rate. Do not over-water or fertilize as new growth is susceptible to fire blight. 'Paul's Scarlet' cultivar is extremely attractive with double rose-colored blooms.

Tree Guide

Small Trees (up to 30 feet tall and as wide)

Common & Botanical Name	Flowers & Fruit	D	E	Height & Width	Remarks
Fringe Tree *Chionanthus virginicus*	White "fringe" flowers last three weeks in spring.	X		12-20' 12-20'	Moderate to regular water. Makes a good patio tree. Has handsome gray-brown bark that provides winter interest. Leaves appear late in spring season. Native tree to the U.S.
Flowering Cherry *Prunus species*	Flower colors can be pink, white or red.	X		Height and width vary	Moderate water. Needs good drainage. Numerous varieties available that come in weeping and upright forms. 'Kwanzan' can be 30' tall and has large double pink blossoms that appear midseason. 'Snow Fountains' is a weeping type that reaches a height of 15' and has single blossoms early in the season.
Flowering Plum *Prunus cerasifera*	Light pink flowers; varieties listed bear little to no fruit.	X		Height and width vary	Give moderate water and ensure good drainage. 'Krauter Vesuvius' can reach 30' and has blackish purple foliage followed by light pink flowers and little fruit. 'Purple Pony' is a semi-dwarf tree not reaching more than 10-12' in height and has deep purple foliage, followed by pale pink flowers and no fruit.
Hawthorn (Washington) *Crataegus phaenopyrum*	Shiny red fruit in winter.	X		20-25' 18-20'	Moderate growth rate. Needs regular, deep water. Glossy leaves turn purple, orange or red in fall. The bright red berries are a nice feature and attract many birds.
Japanese Maple *Acer palmatum*	Small, mostly inconspicuous blossoms.	X		Height and width vary	Slow growing tree. Needs moderate to regular water. Protection from sun needed, especially in the Central Valley, where leaves tend to sunburn. Leaf burn can also be caused by an excess of salts in some soils. Japanese maples can grow well under the canopy of another tree. Nurseries carry many cultivars with interesting leaf and bark color.
Lilac *Syringa vulgaris*	White, pink, purple or blue flowers.	X		5-20' 8-20'	Regular water. Light shade. Multi-trunk tree does best with morning sun and afternoon shade. Cut spent blossoms just after flowering to encourage more flowers.
Magnolia *Magnolia species*	White, pink, yellow or purplish-red flowers.	X		10-25' 20-25'	Water regularly. Commonly sold varieties include 'Saucer' and 'Star'. 'Star' (also called 'Stellata') is a slow growing tree with early season, white flowers. 'Saucer' is an excellent lawn tree with fragrant blossoms. Many varieties of small magnolias can be found in local nurseries and garden centers.

Tree Guide

Small Trees (up to 30 feet tall and as wide)

Common & Botanical Name	Flowers & Fruit	D	E	Height & Width	Remarks
Mediterranean Fan Palm *Chamaerops humilis*	Inconspicuous flowers; small, 1" brownish red fruit.		X	18-20' 18-20'	Deep water regularly. Full sun to partial shade. Multi-trunk palm has offshoots that curve in many directions. This palm is very frost tolerant, can survive (brief) low temperature drop. Normally frost tolerant to 18°F. Greenish blue leaves.
Olive Tree *Olea europaea*	Choose fruitless varieties for near sidewalk.		X	25-30' 25-30'	Slow grower; puts on height quickly when young. Prune early to create shape. Little to moderate water once established. 'Majestic Beauty' bears almost no fruit. 'Bonita' is sold as fruitless but actually bears tiny fruits. Male flowers can cause hay fever in allergic people.
Pineapple Guava *Feijoa sellowiana*	Whitish-purple petals with red center; edible green fruit.		X	18-25' 18-25'	Plant is drought tolerant but needs regular water to bear fruit. Multi-trunk tree with grayish-green leaves. Flowers attract birds and bees. Fruit is soft and sweet to bland flavored.
Redbud (Eastern) *Cercis canadensis cultivars*	Pea-shaped rosy purplish pink flowers.	X		15-35' 15-35	Fast growing tree with heart-shaped leaves. Regular water. Nurseries carry 'Oklahoma', 'Mexican' and 'Forest Pansy'. All have spectacular flowers and nice fall color. U.S. native tree.
Smoke Tree *Cotinus coggygria*	Stunning lavender or purple "smoke".	X		20-30' 20-30'	Moderate growth rate, has a bushy form that can be trained into a tree. Give moderate water. The "smoke" look is caused by clusters of fading flowers.
Strawberry Tree *Arbutus unedo*	Greenish white flowers; attractive red fruit.		X	10-30' 10-30'	Slow to moderate grower. Can take partial shade. Moderate to little water needed once established. Makes an excellent lawn tree. Bark is dark brown and fibrous, but peels away to reveal a smoother lighter colored skin. Flowers are bell shaped. Strawberry-shaped fruit is bland but edible.
Trident Maple *Acer buergerianum*	Inconspicuous flowers.	X		20-25' 20-25'	Moderate to regular water. Excellent patio tree with fall colors of yellow, orange and/or red. The bark of older trees peels attractively. Leaves burn in Central Valley heat; plant on north or east-facing site or in partially shaded area.
Windmill Palm *Trachycarpus fortunei*	Yellow to Greenish-yellow flowers; brown fruit.		X	25-30' 8-10'	Moderate to fast grower. Regular water needed. Trunk is covered with fiber-like bark that falls off as the tree grows. Old, dead leaves remain on trunk until removed. Frost tolerant to 10°F.

Tree Guide

Medium Trees (30-50 feet tall and as wide)

Common & Botanical Name	Flowers & Fruit	D	E	Height & Width	Remarks
Birch[1] (European White) *Betula pendula*	Hanging green seedpods dry, wither and blow away.	X		30-40’ 15-20’	Grows quickly at first, then somewhat slower. Water regularly. Good lawn tree if given additional deep water. Avoid planting near patios or driveways as susceptibility to aphids leads to honeydew drip that sticks to cement, car paint and windows.
California Fan Palm *Washingtonia filifera*	Large clusters of blackish-purple berries.		X	50-60’ 15-20’	Needs little water once established. Best used on large properties, as it grows too large for most gardens. The trunk can reach up to 2’ in diameter. Native to California and Arizona.
California Pepper Tree[2] *Schinus molle*	Yellow flower clusters; rose colored berries in fall and winter.		X	25-40’ 25-40’	Fast growing tree. Prefers little to moderate water. Has delicate, fern-like foliage. Makes an excellent shade tree. Some cleanup required due to leaf, flower and berry drop. Aggressive roots make it difficult to garden under and can disrupt pavement. Frost sensitive tree in our area. Flowers attract large amounts of bees.
Camphor Tree[1] *Cinnamomum camphora*	Inconspicuous flowers; small black berries.		X	45-50’ 50-60’	Slow grower. Little to moderate water once established. Has competitive roots that may invade sidewalk and lawn. Aromatic foliage. Some cleanup required due to heavy leaf drop in spring followed by twig, flower and berry drop. Susceptible to crown rot if over-watered.
Canary Island Date Palm *Phoenix canariensis*	Blossoms; date clusters on mature trees.		X	50-60’ 20-40’	Needs regular water. Large tree that does best planted in parks or on a wide street, as it is too big for most yards. Frost tolerant to 20°F.
Catalpa *Catalpa bignonioides*	2” white trum-pet-like flowers; seed capsules.	X		30-40’ 30-40’	Moderate to regular water. Extremely tough tree that can withstand hot climates. Some cleanup required due to leaf, flower and twig drop. Native to South-Eastern U.S.
Chinese Pistache *Pistacia chinensis*	Female trees produce clusters of red fruit that ripens to black.	X		30-50’ 30-50’	Slow to moderate grower. Will tolerate most watering situations, but deep, infrequent water is best. Non-aggressive roots. Provides stunning fall colors of yellow, orange and red. Can be used near sidewalks, lawn or a patio. Female trees have attractive berries but require more cleanup.

Tree Guide

Medium Trees (30-50 feet tall and as wide)

Common & Botanical Name	Flowers & Fruit	D	E	Height & Width	Remarks
Chinese Tallow Tree[1&2] *Sapium sebiferum*	Yellowish-green fruit; attractive white berries.		X	30-40' 25-30'	Fast grower. Needs regular water. Leaves appear in late spring and are oval-shaped with a pointed tip. Fall colors include purple, red, yellow and orange. Some cleanup required due to leaf, fruit and twig drop. Has shallow, aggressive roots. Do not plant near native habitats, as this species is invasive.
Dawn Redwood *Metasequoia glyptostroboides*	Small brown cones.	X		40-50' 15-25'	Fast grower when young. Needs regular watering with good drainage. Makes a good lawn tree, although some surface roots appear. This tree resemble a coast redwood. Leaf drop in fall reveals attractive textured bark.
Empress Tree *Paulownia tomentosa*	Fragrant, purple, trumpet-shaped flowers; seed capsules.	X		40-50' 40-50'	Fast grower. Needs regular, deep water. Makes an excellent shade tree. Blossoms are stunning in spring. Has surface roots. Dense shade canopy makes it impossible to garden under. Some cleanup required when flowers drop.
European Hackberry *Celtis australis*	Small red berries.	X		40-60' 40-50'	Moderate grower. Needs moderate water. Good choice for a street or lawn tree. Roots are well-behaved, so trees can be grown near pavement. Stake young trees until established. Mature trees have attractive bark.
Flowering Pear *Pyrus calleryana*	Showy white flowers; small, inedible fruit.	X		25-35' 15-20'	Needs moderate water. Ensure the tree is *P. calleryana* and not *P. kawakammi*, as latter species is especially prone to fire blight. Cultivars of *P. calleryana* recommended for this area include 'Chanticleer', a narrow, pyramid-like tree with orange to reddish-purple fall color and 'Trinity' which has a round-headed form and orange-red fall color. Some cleanup required due to the inedible fruits that drop in spring and summer.
Fruitless Mulberry *Morus alba cultivars*	Choose male trees unless fruit is desired.	X		30-50' 30-50'	Fast growing tree. Needs regular water. Difficult to garden under due to dense shade and surface roots. Male varieties produce a lot of pollen which may bother allergy sufferers. Theses trees are often pruned incorrectly. Do not "top", instead shorten the branches to a lateral branch.
Ginkgo *Ginkgo biloba*	Fruit of female tree has extremely unpleasant odor.	X		35-50' 25-30'	Slow growing. Give moderate to regular deep water. Can grow to 70' tall, but most nursery cultivars reach 50' or less (i.e. 'Autumn Gold'). Foliage turns a beautiful gold color in fall. Purchase only male-budded trees, not seedlings. Female trees do not produce fruit for several years.

Tree Guide

Medium Trees (30-50 feet tall and as wide)

Common & Botanical Name	Flowers & Fruit	D	E	Height & Width	Remarks
Golden Rain Tree[1&2] *Koelreuteria paniculata*	Showy flower clusters; seed capsules.	X		30-40' 20-40'	Needs moderate to regular water. An excellent patio, lawn or street tree. Needs good drainage. Seedlings of the tree will self-sow. Lantern-like golden capsules persist until fall and are an attractive feature.
Holly Oak[1] *Quercus ilex*	Oval, 1 1/2" brownish gray acorns.		X	30-60' 30-60'	Moderate growth rate. Needs little water once established. Good evergreen street or lawn tree. Deep roots do not disturb pavement. Susceptible to crown rot diseases if over-watered.
Japanese Pagoda Tree[2] *Sophora japonica*	Purplish blossoms and pods may stain concrete.	X		45-50' 45-50'	Young trees grow rapidly for several years but then have a moderate growth rate. After 30 years, the tree may still be 25-30 feet tall, although it can reach 50-60' tall many years later. Needs moderate water. Excellent choice for shading a lawn. Leaves are graceful and fern-like.
Locust Tree[1&2] *Robinia X ambigua*	Magenta or purplish pink flowers.	X		40-50' 20-30'	Fast growing tree adapted to hot conditions. Does best with moderate water but can tolerate less. 'Idahoensis' has bright magenta flowers, 'Purple Robe' has darker purplish-pink flowers. Root system is aggressive, avoid planting near sidewalk.
Magnolia *Magnolia species*	White, pink, yellow or purplish red flowers.	X		30-45'	Full sun or partial shade. Regular water. 'Daybreak' has 8-10" fragrant flowers, 'Columbus' has white flowers with purple highlights, 'Yellow Bird' has deep, yellow-colored flowers.
Maytens Tree *Maytenus boaria*	Inconspicuous flowers.		X	30-50' 30-50'	Slow to moderate grower. Water deeply to prevent roots from appearing at surface. Graceful tree that is similar in appearance to a weeping willow. Some cleanup is required due to constant shedding of small amounts of leaves.
Raywood Ash *Fraxinus angustifolia oxycarpa 'Raywood'*	Inconspicuous flowers.	X		25-35' 20-25'	Fast growing tree. Give regular water. Resistant to anthracnose. Pollen can cause hay fever in allergic individuals. Although this tree is a popular choice for city streets and homeowners, it often has branch dieback. This is a result of a combination of water stress, disease and suboptimal conditions. Tree experts recommend not planting this tree in California.

Tree Guide

Medium Trees (30-50 feet tall and as wide)

Common & Botanical Name	Flowers & Fruit	D	E	Height & Width	Remarks
Red Horse Chestnut[1&2] *Aesculus x carnea*	Red plume flowers in spring.	X		35-40' 25-30'	Fast growing tree. Give regular water. Casts a dense shade. Bears hundreds of flowers that make a spectacular display in spring.
Red Maple *Acer rubrum or A. X freemanii*	Showy flowers; red fruit.	X		50-60' 40-50'	Fast growing shade tree. Needs regular water. Local nurseries have several cultivars from which to choose, many provide stunning fall color.
Sawleaf Zelkova *Zelkova serrata*	Inconspicuous flowers.	X		40-60' 40-60'	Moderate to fast grower. Give regular water. Makes a good shade tree. Has smooth, cinnamon colored bark. Fall color is golden yellow to rusty brown. Roots can be invasive.
Sweet Bay Laurus nobilis	Small yellow flower clusters; dark purple fruit.		X	12-40' 12-40'	Slow growing tree. Give moderate water and good drainage. Can be easily trained as a topiary tree. 'Saratoga' can be trained into a single-trunk tree. Aromatic leaves are used in cooking, remove the leaves once the dish is done.
Silver Dollar Eucalyptus[1] *Eucalyptus cinerea*	Insignificant white flowers; small capsules.		X	20-55' 20-45	Fast grower. Water regularly when young. Once established, prefers a dry environment. Young foliage has round leaves, mature foliage is slender and elongated.
Tristania *Tristaniopsis laurina*	Eye-catching yellow flowers.		X	30-45' 25-30'	Slow growing tree. Needs good drainage and extra water in the summer. Handsome reddish bark peels to reveal cream-colored new bark beneath; leaves are dark green on top, paler underneath.
Tupelo Nyssa sylvatica	Inconspicuous flowers; female trees bear bluish-black fruit liked by birds.	X		30-50' 20-30'	Slow to medium grower. Give moderate to regular water. Makes an excellent lawn tree. Fruit drop can be messy, avoid planting near sidewalks. Foliage turns yellow and orange before dropping in fall. Native to Eastern U.S.

Tree Guide

Large Trees (60 feet tall +)

Common & Botanical Name	Flowers & Fruit	D	E	Height & Width	Remarks
Bald Cypress *Taxodium distichum*	Small, round cones.	X		50-70' 20-30'	Fast growing tree. Tolerates both wet and dry conditions. Does not need much pruning. Remove dead, damaged or diseased wood only. Has shaggy brown bark. Fine textured foliage turns orange-brown each fall before dropping, resulting in a "bald" tree. Native to Southeastern U.S.
Blue Gum[1] *Eucalyptus globulus*	White/yellowish flowers; bumpy seed capsules.		X	45-150' 30-75'	Fast grower. Little to no water once established. Some cleanup required due to bark, leaf, twig and seed capsule drop. 'Compacta' is a smaller, multi-trunk form. Blue gums make good windbreaks. Can be damaged by frost at temperatures below 22°F.
California Laurel *Umbellularia californica*	Tiny yellow flowers in spring; purplish, inedible fruit.		X	40-60' 40-60'	Little to regular water once established. California native makes a good shade tree, but can also be grown under shade. Slow growing until 25' tall. Leaves can have black patches of sooty mold from aphid or scale infestation. Avoid planting near patios, sidewalks and driveways.
Canary Island Pine *Pinus canariensis*	Glossy brown 4-9"oval cones.		X	50-80' 30-40'	Fast growing tree. Little to no water once established, some summer water helpful. Very young plants are gawky but eventually fill in to become more graceful. Shiny, grass-green needles grow in bunches of three.
Catalpa *Catalpa speciosa*	White, trumpet shaped flowers; bean shaped capsules.	X		40-60' 20-40'	Needs moderate to regular water. Well-adapted to extremes of hot and cold in our area. Some cleanup required due to falling flowers, leaves and pods. Plant away from sidewalks. Native to Central U.S.
Chinese Elm *Ulmus parvifolia*	Inconspicuous flowers.		X semi	40-60' 50-70'	Fast growing tree that can reach 30 feet in 3 years. Regular water needed. Evergreen in our area, although some leaf shed can be expected. Bark is decorative and sheds in puzzle-like patches. Makes a good patio or street tree, can also be used as a privacy screen. 'Drake' is resistant to anthracnose.
Coast Live Oak[1] *Quercus agrifolia*	Cone shaped 3/4-1 1/2" acorns.		X	20-70' 20-70'	Moderate grower. Little water once established. Shiny, prickly green leaves turn dry and drop in spring. This California native species makes a handsome shade or street tree with some cleanup required. Susceptible to crown rot diseases if over-watered.

Tree Guide

Large Trees (60 feet tall +)

Common & Botanical Name	Flowers & Fruit	D	E	Height & Width	Remarks
Cork Oak[1] *Quercus suber*	Egg-shaped 3/4– 1 1/2" acorns.		X	60-70' 40-50'	Needs moderate water and good drainage. Good shade or street tree. Leaves are shiny green with a grayish underside. Handsome tree trunk is covered with a corky bark (used in many products) that can be easily damaged, avoid planting in front yard where it may be a target for vandals.
Deodar Cedar *Cedrus deodara*	Brown, oval-shaped cones.		X	70-80' 35-40'	Fast growing tree that can easily take over an area. Give moderate water. This tree has a graceful, wispy appearance.
Incense Cedar *Calocedrus decurrens*	Small yellow-brown to red cones.		X	75-90' 10-15'	Slow grower at first, but then can add 2' per year. Moderate to little water once established. Tree has a pyramidal shape. Foliage gives off a pleasant fragrance when crushed. Makes an excellent wind-break. Native to western California.
Italian Stone Pine *Pinus pinea*	Globe-shaped brown 4-6" cones.		X	40-80' 40-60'	Has a moderate growth rate. Tolerates dryness, some summer watering needed. Rigid, bright green needles grow in clusters of groups of two. Overall tree shape eventually similar to that of an umbrella. This tree is one source of the edible pine nut.
Japanese Black Pine *Pinus thunbergii*	Brown, oval 3" long cones.		X	40-80' 35-40'	Fast grower. Give regular water during summer. Bright green needles form in bunches of two. Handsome plant that can be used as a living Christmas tree.
Liquidambar *Liquidambar styraciflua*	Brown, hard and spiky round Seedpods may interfere with lawn-mowing.	X		50-75' 35-50'	Moderate growth rate. Needs moderate to regular water. Makes a good street tree if given a large area to grow. Otherwise, surface roots crack sidewalks and come up in lawns. Excellent fall color tree, with yellow, orange, red and purple depending on the weather. Some cleanup required due to seedpod litter. This tree can be chlorotic in high pH soils and may need additional iron fertilizer to keep leaves green.
London Plane Tree *Platanus X acerifolia*	Soft, ball-shaped brown seed clusters hang through winter.	X		40-80' 30-40'	Fast growing. Give moderate to regular water. Makes an excellent street or lawn tree. In winter, cream-colored bark turns gray, giving it a mottled yet attractive look. Rake fallen leaves immediately to dispose of fungus spores that can cause anthracnose. 'Bloodgood' is resistant to anthracnose. 'Yarwood' is resistant to powdery mildew.
Pin Oak[1] *Quercus palustris*	Inconspicuous flowers.	X		50-80' 30-40'	Fairly rapid grower. Needs moderate water. Makes an excellent lawn tree. Dead foliage hangs on tree during winter, replaced in the spring by new growth. Glossy green leaves have "pin-like" bristles on the ends.

Tree Guide

Large Trees (60 feet tall +)

Common & Botanical Name	Flowers & Fruit	D	E	Height & Width	Remarks
Red Ironbark Eucalyptus[1] *Eucalyptus sideroxylon*	Fluffy pink flowers in clusters during fall to late spring.		X	30-90' 30-60'	Fast growing tree. Little to no water once established. Makes good street tree or privacy screen. Blue-green leaves turn bronze in winter. Some cleanup required due to leaf, twig and bark drop. In windy conditions, limb breakage may occur. Frost sensitive below 23°F.
Redwood (Coast) *Sequoia sempervirens*	1/2" to 1 1/2" round brown cones.		X	70-90' 15-30'	Fast grower when young, can reach 90' tall by 30' wide in 25 years. This California native prefers to live near the coast. In our area it does well in some microclimates. Give regular, deep watering. Oldest leaves normally turn yellow to brown in late summer and early fall and drop. Yellowing of new leaves is a sign of chlorosis.
Southern Magnolia *Magnolia grandiflora*	Fragrant white flowers 8-10" across. Red, showy seed capsules in spring.		X	60-80' 30-40'	Moderate growing tree. Give regular water. Tolerates heat very well. Makes a good shade or street tree, although the deep shade makes it difficult to garden under. Roots can lift pavement. Some cleanup required due to leaf, flower and pod drop.
Tulip Tree *Liriodendron tulipifera*	Orange-yellow flowers appear on mature trees.	X		75-80' 35-40'	Fast growing tree. Give regular water. Does well as a shade or lawn tree. Prefers acidic soil. Difficult to garden under because it casts such a dense shade. Prone to aphid infestations. Native to the Eastern U.S.
Valley Oak[1] *Quercus lobata*	Shiny, 1 1/2" acorns hang singly or in pairs	X		70'+ 65-70'+	Grows quickly with ample water. This classic tree is often seen growing in California oak woodlands along roads in Eastern Stanislaus County. Makes an excellent shade tree. Some cleanup required. Valley oaks often have an interesting feature known as a "gall." Galls are structures that house tiny wasps (the size of a gnat). Gall wasps lay their eggs in stems and leaves, causing the tree to respond and create a gall that encloses the egg, which later develops into larvae and hatches an adult wasp. Gall characteristic vary depending upon the type of wasp. A common gall found on this tree is a large, off-white gall close in size to a golf-ball, which later turns brown and spongy. Another type of wasp makes a tiny gall that appears to "jump" about and is known as the jumping oak gall wasp. All of these wasps are tiny and harmless to humans, and usually to the tree. High numbers of leaf galls may cause some defoliation, but in general the tree is unharmed.

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ILLUSTRATIONS

(p. 4) *Texas Agricultural Extension Service*: http://aggie-horticulture.tamu.edu/extension/homelandscape/tree/planting.html

(p.5) Used with permission from Dr. Larry Costello.

(p.6)*Creativehomeowner:* http://www.creativehomeowner.com/images/chgdn012fig2.jpg

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Questions? Comments?

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If you have trouble accessing any of the Websites listed in *Trees in Your Home Garden*, please contact me, as they may have changed since the time of this publication was printed.

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Notes