Specimen Trees

The earliest introduction of exotic trees to Lafayette dates back to Nathanial Jones' Black Locusts planted in the late 1840's. Since that time scores of other trees have been planted in the private gardens of the City. During the field survey 77 specimens representing 38 different species were inventoried and mapped. These trees are mapped on the Lafayette Tree Guide.

Although these specimen trees are not being recommended for official status, they are significant enough to be included in this Plan as superb examples of some of the trees recommended in the various lists of this Plan. The purpose of their inclusion is to afford citizens and other interested people the opportunity of observing mature specimens of the various trees. The Guide can become a "tree tour" of Lafayette. Bicyclists and hikers can use the Guide to locate the trees and increase their tree vocabulary or simply see what a mature tree of any particular species looks like.

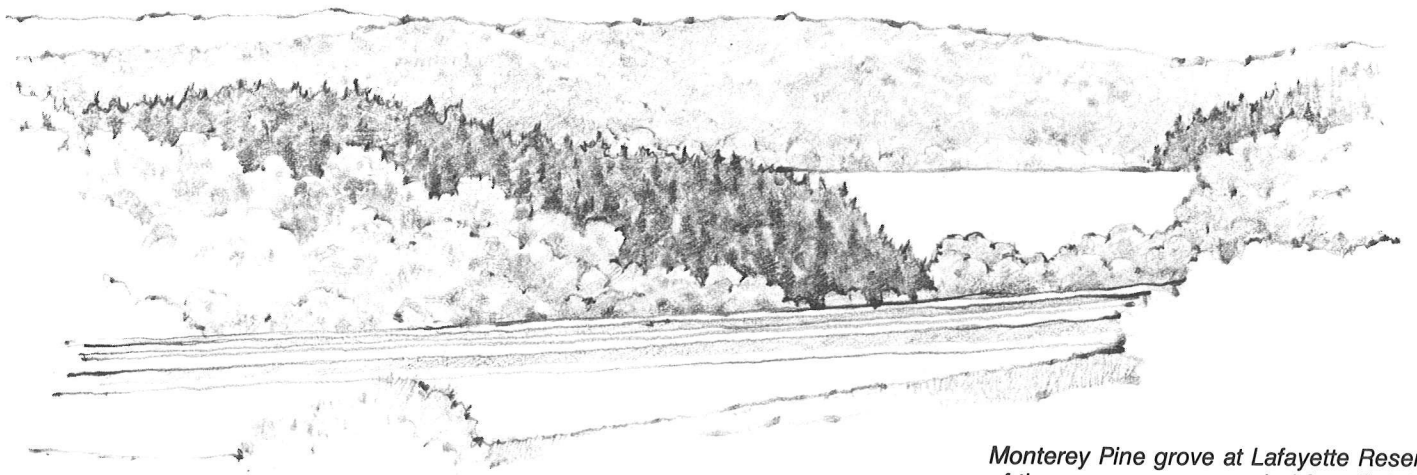
All the trees were selected for their proximity to public viewing, health and form characteristic of the species. Duplicate specimens were selected throughout the City so that the residents of each district might observe specimens closest to their homes. A few species were found in only one location, however. It is hoped that the Guide of these trees will become a useful tool for the study of trees in Lafayette.

Recommendation for Official Tree Groves

Several superb tree groves have also been identified in the field work for this Plan. Using criteria similar to those used for evaluating official trees, these groves have been selected for their visibility, landscape significance, health, and size or extent. The groves include stands of both native and introduced trees and are mapped on the Lafayette Tree Guide. These groves are recommended for further evaluation by the Tree Commission for designation as official Lafayette Tree Groves under the provisions of Ordinance 38.

Two types of groves have been recommended. One includes introduced trees; the other includes prominent, natural woodlands. Groves of introduced trees should be of only one species such as Coast Redwood. Mixtures of various trees that do not give a grove effect are inappropriate. On the other hand, an Oak Woodland grove may include a few other trees typical of that plant community such as California Bay and Buckeye. In this type of grove, the Oaks are dominant and the natural occurance of different species does not detract from the grove effect.

As emphasized in the section on the Riparian Woodlands, the creekside trees are of infinite value to the environment of Lafayette. These linear woodlands cannot be classified as Tree Groves. Nevertheless, these valuable riparian trees should all be designated and protected by the City as irreplaceable resources.

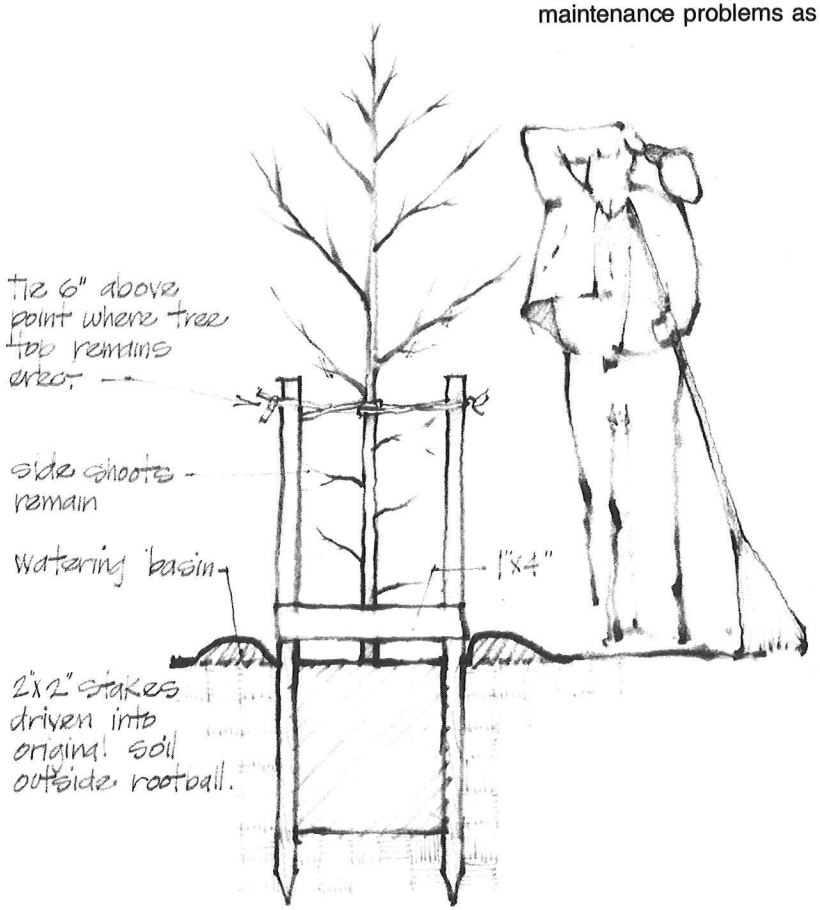


Monterey Pine grove at Lafayette Reservoir–one of the groves recommended for official designation. This grove is visually prominent, yet blends well with the natural land forms.

TREE PLANTING AND MANAGEMENT TECHNIQUES

Bringing up young trees can often be as challenging as bringing up young children. We need all the help we can get! And sometimes we are besieged with too much help—from advice freely shared by the "local expert" to the myriad books at the local nursery or bookstore. Much of the information is indeed helpful. Nevertheless, there is considerable misinformation. Many publications about gardening and tree planting are written by Eastern or Midwestern specialists. Text and examples from these books may not apply to Western conditions.

This section of the Plan is intended to cover a few of the basic principles involved in the planting and early care of trees in the Bay Area. At the planting stage, a number of steps can be taken to prevent or minimize future maintenance problems as the trees mature.



Plant Quality

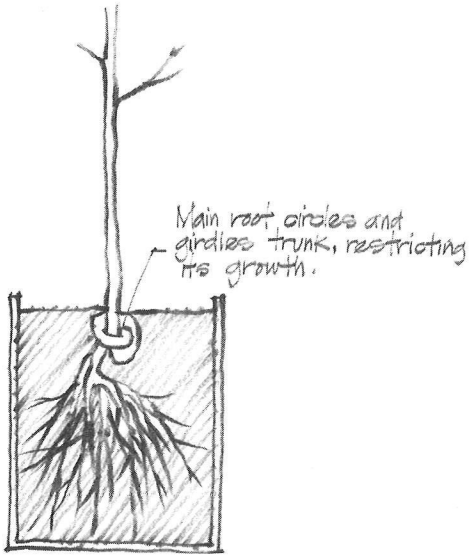
Selecting the best quality planting stock is good insurance for preventing future failures. This is simple logic. Yet the components of high quality trees have puzzled even horticultural experts. Recent research in the Department of Environmental Horticulture at the University of California-Davis has removed some of the mystery. Studies have concentrated on discovering how to detect root defects as well as what constitutes good top growth.

The top of the tree should show good vigor through relatively rapid growth, large-sized leaves and color typical of the species. Trees with stunted growth and yellowish foliage should be avoided. The tree should have small branches all along its trunk to the soil line. This distribution of foliage helps strengthen the tree by developing a more tapered trunk. A well-tapered trunk, like a fishing rod, has great flexibility. It will be able to return to an upright position when deflected in the wind. This means that minimum staking is required and the tree will grow stronger in a relatively short time. Untapered trees with all the lower foliage removed requires staking longer—as much as two or three years. Their tops should be thinned out to relieve their top-heaviness.

Young trees need little pruning. Other than removing dead or broken shoots, the main goal of pruning at this stage should be to thin out a dense foliage crown to decrease the wind load. The central leader should never be headed back. The permanent lateral branches are usually not formed yet on either deciduous or broadleafed evergreen trees. Removal of the leader tends to slow the growth and development of the permanent scaffold branches. Crowded side shoots in the foliage head which criss-cross or closely parallel another branch should be removed. Heavy heading back at the young stage tends to dwarf and deform the tree. Trees that have been severly clipped into a tight foliage head should be avoided. Fruit trees are possible exceptions.

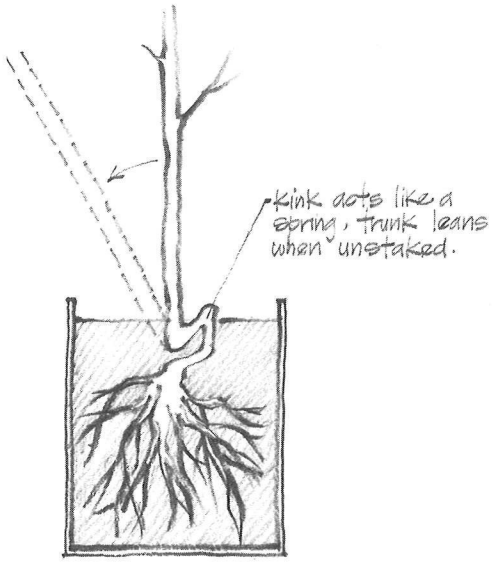
The quality of the root system of container-grown trees is more difficult to assess than the top parts. Nevertheless, serious future problems can be avoided if root defects are detected before planting the tree. The three most serious root defects are:

- girdling roots,
- kinked roots,
- circling roots.

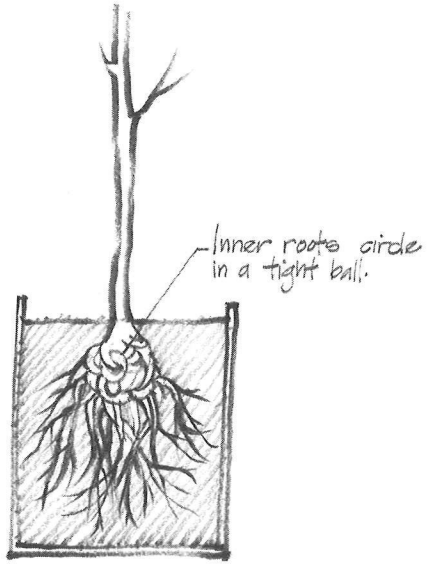


Girdling root.

A girdling root is usually visible at the base of the trunk (crown) or just beneath the soil surface. A quick check with the fingers can reveal such a problem. If undetected, the trunk will become girdled as both it and the main root increase in size. Ultimately the tree can fall over because of this weakened, restricted spot in the trunk.



Kinked root.



Circling roots.

A kinked root is revealed in two ways. If the young tree leans over as though the base were hinged. a kinked root can be suspected. Acting like a spring, the kinked root causes a very unstable top of the tree. No amount of staking can correct this situation. A simple test can be made to determine if a kinked root exists on a container tree. If the tree is slowly lifted vertically by the trunk and the top moves an inch or more before the container rises, a kinked root can be suspected.

Circling roots are the most difficult to detect. They occur inside the root ball below the soil line. They result from improper transplanting at an intermediate growth stage such as when the tree is transplanted from a one-gallon can to a five-gallon container. Only by removing the soil from the root ball can this root defect be discovered. When buying a large quantity of trees, destruction of a 2% sampling is recommended to check for circling roots.

Any one of these three root defects is cause for rejecting the tree or trees. They will only cause very serious future problems possibly complete failure. They are a result of incorrect transplanting techniques in the production of trees. These defects are avoidable and should not be passed on to the consumer.

Matted roots circling just inside the container are not indication of a serious problem. Most container trees will have these matted roots. These roots should be scored with a knife or shears and pulled out lightly from the root ball to encourage rooting in the soil when planted.

Tree Planting

Planting the tree is not difficult if a few basic principles are observed.

The planting hole should be twice the diameter of the root ball. In uncompacted soil, the depth should be no greater than the root ball. Holes dug too deeply cause settling — the tree crown sinks below the normal soil level. Soil deposited around the trunk will cause crown rot and death of most trees. If the hole must be dug deeper to provide a good growing medium, the tree should be planted with the top of the root ball 2 inches higher than the surrounding grade. Planting high is better than planting too deeply.

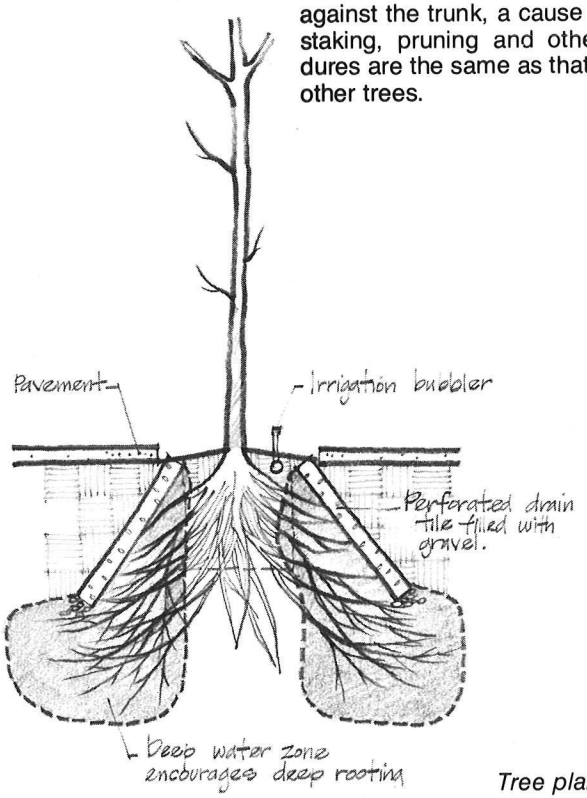
No fertilizer is needed in the planting hole. Vigorous trees will begin root establishment immediately with water and friable soil as the only requirements. After planting, a surface application of a slow-release, balanced fertilizer may be used. This will avoid burning the developing roots and provide a slow, steady supply of nutrients.

The addition of 30 to 50% organic matter to the backfill soil (original soil) helps provide a more porous, friable soil conducive to rapid root establishment. It also aids in water and nutrient retention. Nitrified (nitrogen added) redwood or fir sawdust works well. Peat moss is expensive, difficult to wet and holds too much water when used with clay soil.

Under no circumstances should rock or gravel be placed in the bottom of the planting hole. There is a popular myth still perpetrated in current publications that gravel in the planting hole improves drainage. Research has shown the reverse to be true. The gravel causes an interface where the soil above the gravel remains saturated with water. The plant literally drowns. This is also true for planting in containers.

A watering basin built around the tree helps in the initial watering of a young tree. The berm is formed from loose soil and should be approximately 6 inches high. It should be placed at the outside edge of the root ball so that water can be concentrated in the root zone. The sandy soil mix used in nursery containers can dry out quickly. This sandy soil ball must be kept moist until the roots have become established in the heavier surrounding soil. This usually takes only one growing season. The watering basin should be removed prior to the first winter rains to prevent drowning the plant.

Tree planting in paved areas poses a special problem. Tree wells or cutouts are often small and the surrounding pavement seals off air and water to the soil beneath. The planting hole should be dug deeply enough to break through any compacted layers and into the original soil. The insertion of two 3 or 4 inch diameter drain pipes filled with coarse gravel angled down and away from the root ball permits deep watering. This will help prevent shallow root development and buckling of the pavement. Irrigation should be provided for each tree by means of a bubbler placed in each tree well. Tree wells may be covered with bricks set in sand, metal grates, or precast concrete tree well covers. Any covering should be removable to allow for expansion of the trunk. Sand or soil should not be piled against the trunk, a cause of crown rot. Tree staking, pruning and other planting procedures are the same as that recommended for other trees.



Tree planting in pavement.

Tree Staking

Tree staking has more variations than any other aspect of tree planting. Recent research has proven that, given good quality trees, minimum staking produces a stronger tree more quickly. Trunk movement acts to strengthen the wood fiber much in the same way that exercise strengthens our own limbs. Improper staking causes serious damage to the young tree. The two most frequently found types of damage are:

- girdling of the trunk from tight tree ties;
- rubbing or debarking of trunk from tree stakes.

The nursery stake, a 1 × 1 stake tied tightly to the trunk, should always be removed. Depending upon whether or not the tree can remain upright or nearly so when unstaked, the staking should be done for one of the following reasons:

- support staking—holding a weak-trunked tree upright;
- anchor staking—holding the root ball stable until roots become established;
- protective staking—protecting strong trunked trees from physical damage (mowers, children, etc.).

Support staking is for trees unable to stand upright. The point where the tree is to be tied is determined by holding the trunk vertical at various points along the trunk starting from the base. Tie the tree 6 inches above the point where the top remains upright when deflected. Use two or three stakes driven into the soil *outside* the root ball. Attach the tree to the stakes with flexible ties (elastic web belting, wide rubber bands such as cut from innertubes, wide plastic ties). Stakes should be required only through the first season. Thinning the top improves the tree's ability to stand alone.

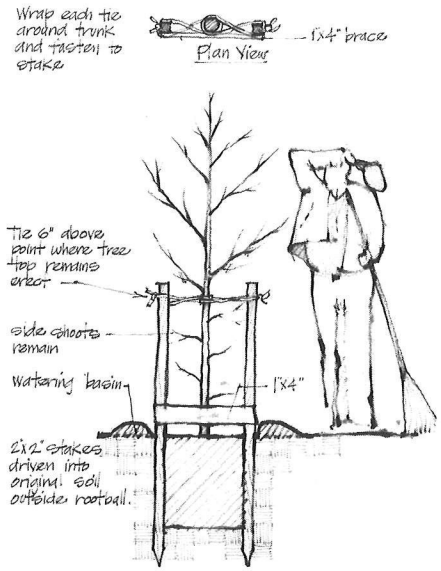
Support staking and typical planting method.

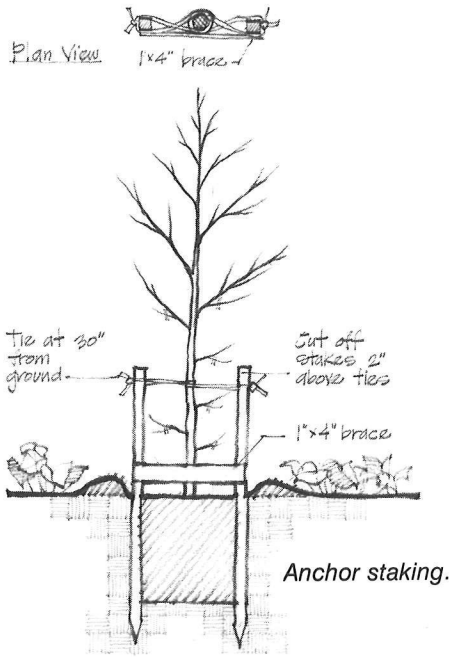
Anchor staking holds the root ball in place, allowing the young roots to become established in the soil. Movement of the root ball from excessive top movement can break the young roots. Staking is kept quite low (about 30 inches above the ground) using two or three short stakes and flexible ties attached several inches from the end of the stakes. These ties should also be removed at the end of the first growing season.

Protective staking is done for trees able to stand upright that need protection. They prevent damage from mowing equipment or other inadvertant abuse. Three stakes are better than two for this purpose. The stakes should be tall enough to be seen and placed at the edge of the root ball.

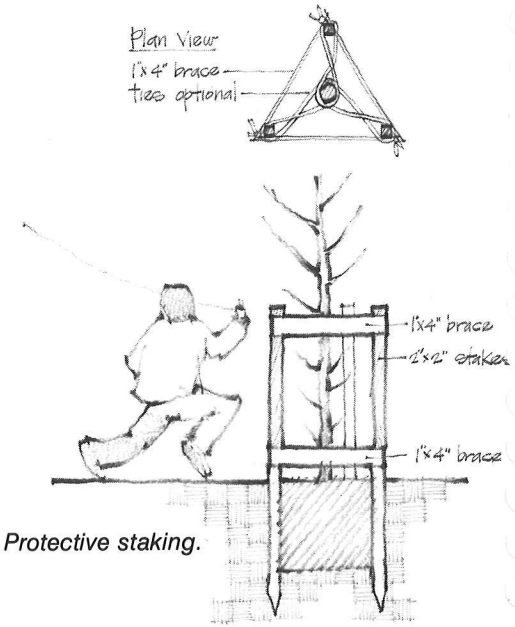
Bare-root trees and most young conifers need no staking unless they are too large. The tops of these trees should be able to stand upright. Thus, if staking is required, root anchorage is all that is needed.

These are the essential steps to be followed in planting young trees. More detailed instructions can be found by consulting the various publications listed in the References.





Anchor staking.



Protective staking.

TREE MAINTENANCE

The maintenance of mature trees begins the day the decision to plant is made. A tree species selected to suit a particular site and a good quality young tree properly planted will solve most of the future maintenance problems. Another way of putting it is that the vast majority of maintenance problems result from planting the wrong tree. Thus the best way to prevent maintenance problems as a tree or trees mature is to:

- select the appropriate species for the site and function served;
- select high quality stock free from root and top defects;
- plant the young tree correctly using proper pruning and staking techniques.

Beyond these important preventative measures, there are a few basic maintenance procedures to consider. These include fertilization, watering, staking and pruning.

Fertilization

Nutrient requirements for trees are not as critical as for herbaceous plants. A tree's root system can literally "mine" a large soil volume for nutrients and water. The period when fertilization can benefit tree growth is during the first few years, before the root system is fully developed.

California soils tend to lack nitrogen, the nutrient essential for foliage and shoot growth. Initially, surface applications of a moderately high nitrogen fertilizer in a slow-release form is sufficient. Two applications, once in spring and another in mid-summer, of a 10-5-5 fertilizer should be sufficient for the first two or three years (fertilizer formulas are written in figures representing the per cent by weight of the nutrients nitrogen, potassium, phosphorous: N-P-K). As the tree matures and the root system expands, deeper applications should be made. Using a water powered root feeding needle, fertilizer can be injected 2 to 3 feet into the soil at or near the dripline. One feeding a year for the next few years should help push the tree along and establish a reasonably good sized tree within six years after planting. The best indicators of whether a tree requires fertilizer or not are the vigor of the shoots and color of the foliage. If the growth is abnormally slow or the older leaves are pale green or yellow-green, nitrogen fertilization may be needed. If only the young leaves show yellowing between the veins and shoot growth is good, the tree is probably suffering from iron deficiency. In this situation the addition of either granular or liquid iron sulfate is recommended.

An important principle to remember is that nutrients are made available to the tree by water. Fertilizer should never be applied when the soil is bone dry. Irrigate first and fertilize a day or two later. Always irrigate deeply after applying fertilizer.

Watering

Like fertilization, watering trees is most critical during the first few years after planting. If a watering basin was constructed around the tree at planting time, it should be broken and the soil graded level prior to the first winter rains. Basins left during the winter form "bathtubs" around trees growing in heavy clay (adobe) soils. Most trees will not tolerate standing water at their base and young trees can be killed easily if this situation occurs.

Trees growing in lawns tend to develop shallow roots. This results from the frequent, shallow waterings lawns receive. Tree roots develop where the water supply is most ample—the top foot of soil. The occasional use of a root watering needle can help create a deeper root system if this technique is done consistently. Also aeration of the lawn annually using a turf hole-punching machine can help increase water penetration.

Trees planted in paved areas such as sidewalk street trees or trees in paved plazas need special watering considerations. Each tree should be provided with its own irrigation bubbler or drip emitter and a drainage pipe to carry the water into the root zone. Care must be taken to avoid planting the tree too deeply—the "bathtub" mentioned previously results. The drain pipes should be checked frequently to insure proper draining of irrigation water.

Staking

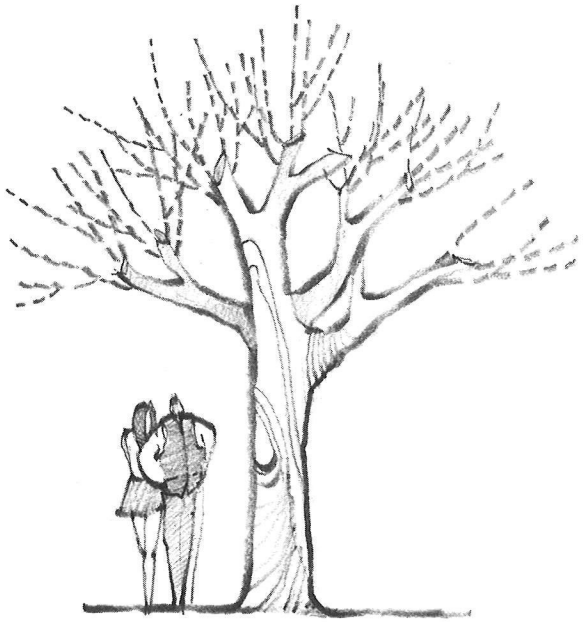
A number of future maintenance problems can be averted if the maturing young tree is checked periodically during its period of establishment. Other than forgetting about the soil berm watering basins, the most frequently neglected early maintenance chore is the removal of the tree stakes. In every city, maturing trees can be seen with the support stakes still in the ground long after the tree is able to stand alone. Set it and forget it seems to be the policy! Tree ties girdle the trunk as it grows and expands; stakes rub gashes in the bark. **Support stakes should be removed no later than two years after planting.**

Pruning

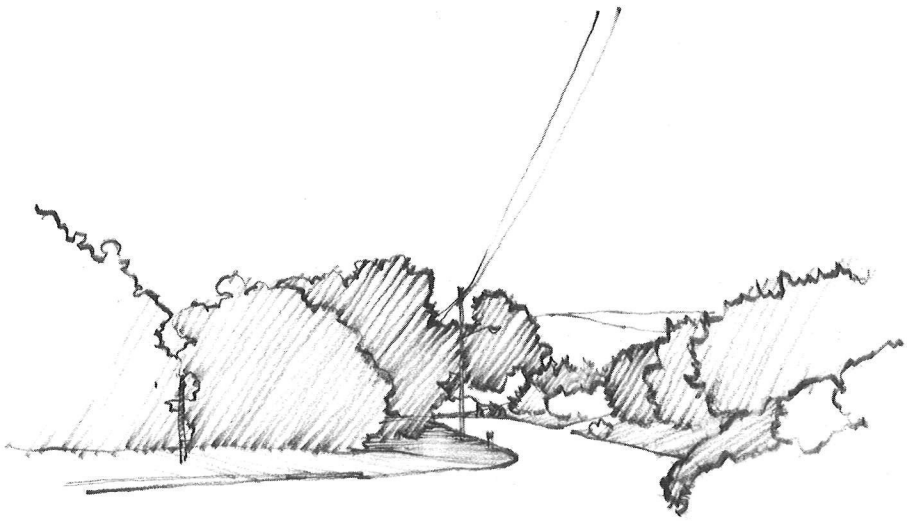
Pruning of mature trees is by far the least understood aspect of tree management. In many cases more damage is done to trees *by pruning* than by not pruning. Even so-called tree pruning experts butcher young and old trees alike. Trees can be ruined forever if improperly pruned.

The most common error committed is hacking back large branches to barren stubs. The result is a "shaving-brush" type of growth which sprouts from dormant buds just behind the cut. This growth in the form of long, vigorous shoots grows attached to the outside of the main wood of the limb and never forms a strong point of connection. If allowed to grow into large branches, they are in danger of breaking off at the main limb. Once this "stubbing back" type of pruning has been done, it is usually repeated during subsequent years.

Incorrect power line clearance–trees are ruined and quality of street is degraded.



Incorrect pruning method–severe heading back to stubs ruins form of tree; brushy shoots result.



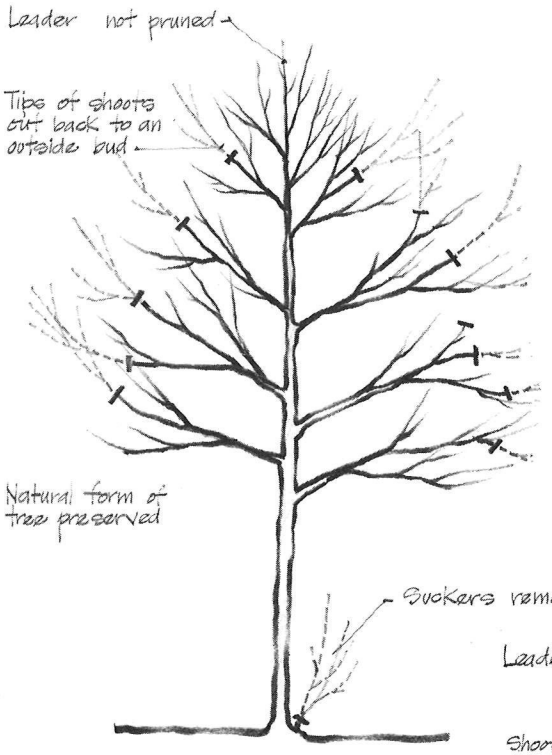
Incorrect line clearance and power line siting–hole cut through mature Live Oak deforms tree.

Several tree species stand out as the ones most commonly butchered. Fruitless Mulberry *(Morus alba 'Fruitless')* heads the list. It grows exceedingly fast—up to 6 feet a year. Frustrated with this rapid growth, the tree pruner gives it a good hair cut. The next year it sends out sprouts 10–12 feet long and again gets the same treatment. Other trees which are often incorrectly pruned include: London Plane *(Platanus acerifolia),* Silver Maple *(Acer saccharainum),* Modesto Ash *(Fraxinus velutina 'Modesto')* and Weeping Willow *(Salix babylonica).*

A few of these broad spreading, fast growing species are appropriately used as street trees throughout Lafayette. If improperly pruned they can downgrade the visual quality of an entire neighborhood.

Utility line clearance is a frequent excuse for stubbing back mature trees. *The conflict can be anticipated in advance and the trees sensitively pruned before the crisis actually exists.* In new residential areas, utility lines can be placed underground to prevent this conflict as well as the visual disruption of the skyline. In established areas where undergrounding is not possible, trees which are easy to control can be selected. This does not necessarily mean the use of small trees. Medium to large trees can be trained to grow around the wires. Gradual heading back with moderate thinning out over a period of several years can accomplish the necessary line clearence without distorting the tree form. Chemical growth control has been used successfully in a number of Bay Area communities and is a very satisfactory solution for rapid growing trees. Street trees are assets which should be managed as neighborhood and community resources.

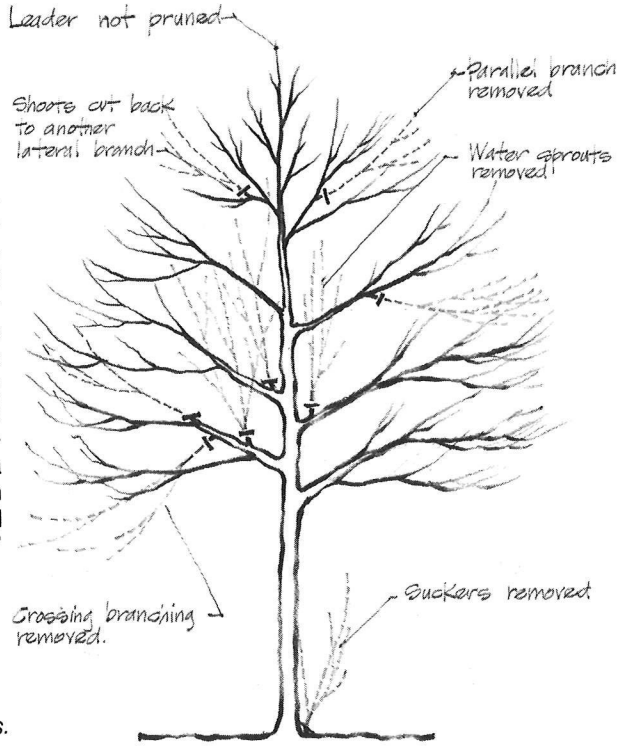
To stress a point mentioned before, maintenance begins the day a tree is planted. If a small tree is needed, a tree which matures to a small size should be planted. Fast growing, large trees will always need severe pruning if they are planted in a small space. Good design decisions should not have to be corrected by pruning.



Pruning cuts must be made carefully to prevent possible damage to the tree. When heading back, prune at a slight angle about ¼ inch from a bud. Select a bud pointing in the direction where growth is wanted, usually one going away from the center of the tree (outside bud). Inside buds promote criss-cross branching. Similarly, thinning out cuts should be made to an outside pointing branch or shoot.

Correct method of heading back trees.

The proper method of controlling tree size (within reason) is to head back the major branches moderately each year—about 1/4 to 1/3 of their total yearly growth. Thinning out of approximately 20% of the brushy inner growth, especially watersprouts, also helps control the next year's growth. This will have a dwarfing influence on the tree without causing excessive growth the subsequent year. Each year less and less pruning is required. Eventually the tree's growth is distributed over a larger branching pattern and is slower than in the youthful stage. Pines are easily controlled by pinching out the new shoots or "candles" in the spring when they reach 2 inches.



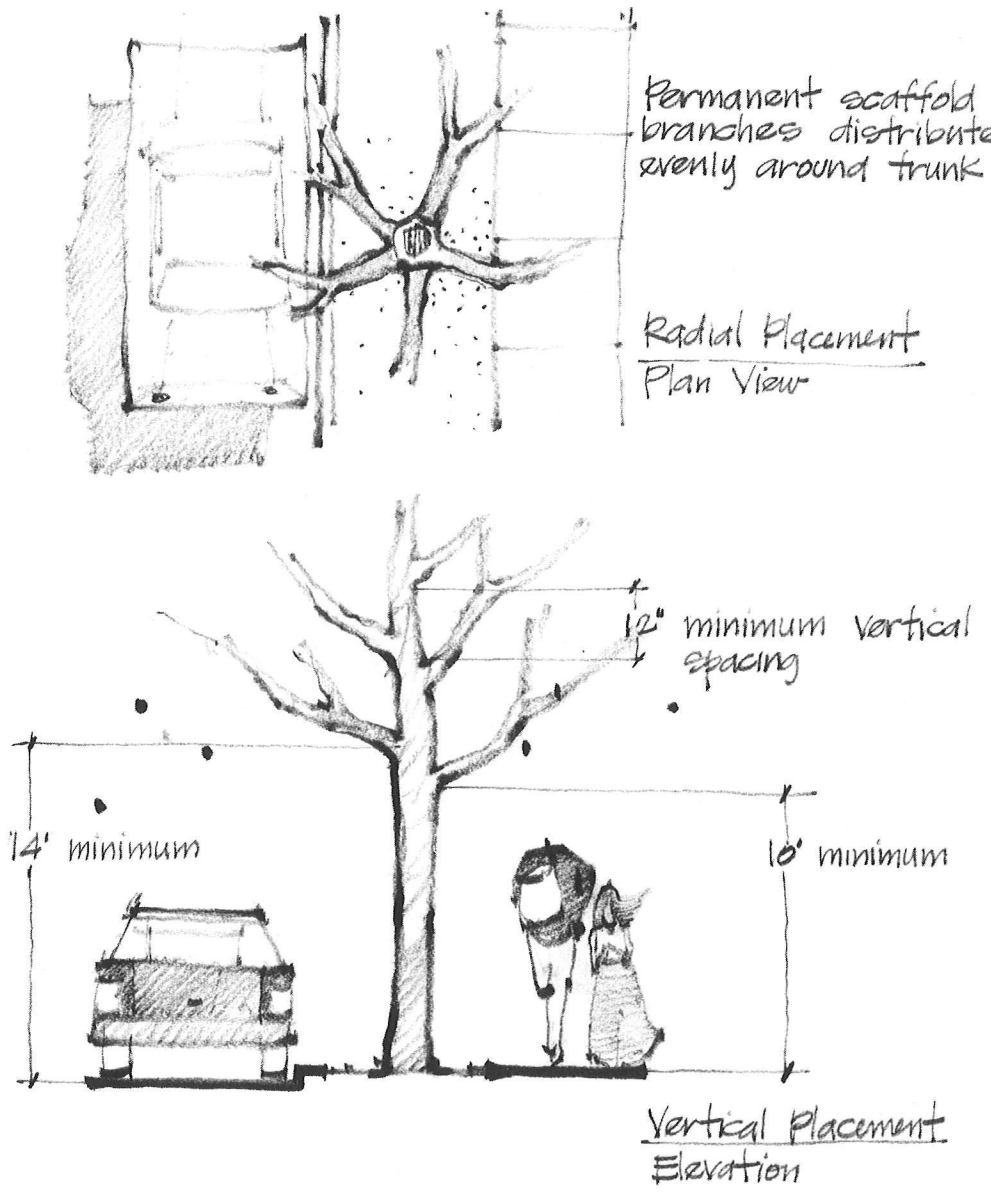
Correct method of thinning out trees.

Branching clearance and the shape of the tree canopy can be controlled by pruning. It is important to identify scaffold branches, those permanent branches which form the basic structure of the tree, before pruning cuts are made. Tree branches grow radially from a trunk in a more or less symmetrical pattern. Limbs lopped from only one side destroy the form of the canopy.

Large limbs should be cut in two stages using three cuts as shown in the diagram. This prevents the bark or wood from being ripped down the trunk causing a huge wound. Branches should be cut off cleanly at the connection where a series of ridges or shoulder rings is usually visible. The wound will then heal quickly. A "coathanger stub" never heals.

Considerable controversy surrounds the use of wound dressing. Traditionally the use of such a material (usually a black asphaltic emulsion) has been similar to the use of iodine on a cut finger—to prevent infection. What can happen is this: the thick tarry substance hardens, cracks and provides a moist environment in which disease organisms can enter and grow rapidly. Therefore, its purpose is contradicted. Small sized wounds (1 to 3 inches) on properly made cuts heal very rapidly. Even larger cuts, if made at the proper place and angled to drain water, will remain dry and heal in a few years. The main principle is to keep the wound dry.

This is also true for large cavities caused by interior rotting at a wound or at the base of a tree. The practice of filling the cavity with cement simply seals the heartwood in a moist chamber which hastens rotting. Keeping the cavity dry and open is essential. Occasionally a small pipe (1/2 to 3/4 inches diameter) must be inserted in a hole drilled at an angle up to the bottom of the cavity. This will insure drainage of the wound. Use plastic irrigation pipe, *not copper pipe* which is toxic to plants.



Placement of permanent scaffold branches.

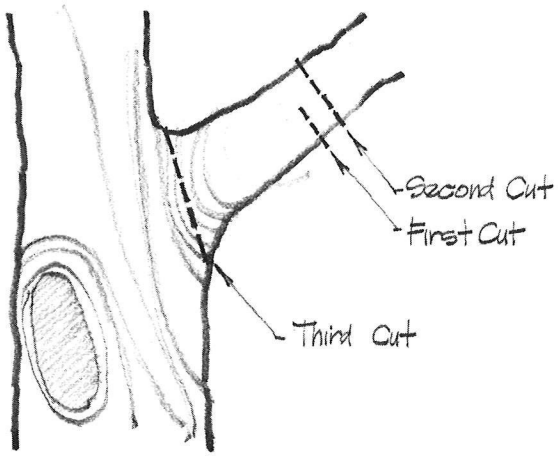
To summarize and simplify pruning practices let us look at the principal goals to be achieved:

- removal of dead, diseased or broken branches;
- directing growth to improve tree form;
- controlling size (within limits).

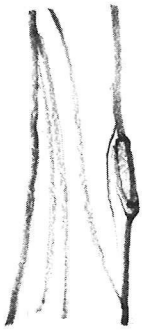
Pruning for the sake of habit or ritual should be avoided. If the tree or trees do not require any of the above training, pruning is not required.

A conservative rule of thumb is stressed - **when in doubt, don't prune!**
At least don't overprune.

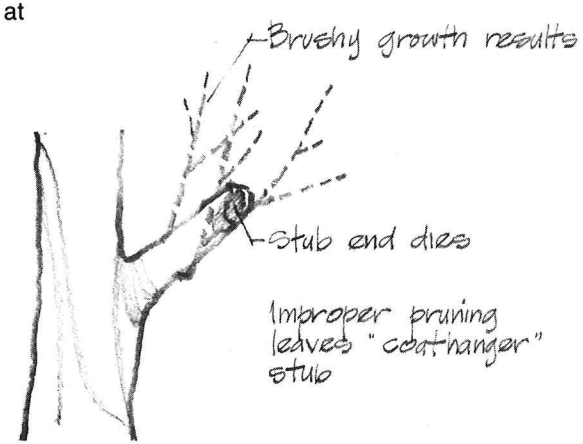
There are a number of other problems for which maintenance procedures are required. Some of these are covered in the section on Tree Preservation. Others, such as Mistletoe control or maintaining old Walnut trees are special problems. Information on these is available free in pamphlets from the Agricultural Extension Service of the University of California. A few are listed under the References at the end of this Plan.



Removal of a large limb.



Cut branch close to trunk or limb; small wound heals rapidly.



Correct method of branch removal.

TREE PRESERVATION

Cultural attitudes can be observed by how people treat their environment. People destroy, preserve, revere and neglect trees. All these actions can be read in the landscape and indicate the varied attitudes that exist. A city can also have a cultural attitude toward its environment and specifically toward its trees. If the care and preservation of its trees is placed low on the list of priorities, future generations will inherit a legacy of neglected, abused and dead trees. Cultural ambivalance or apathy can have the same results. Only an aggressive, consistent, pro-tree policy can be effective for both today and the future. The excuse—lack of funds—means lack of commitment. It is a question of attitude, not resources. Oakland has all but lost its Oaks; Walnut Creek, its Walnuts (certainly the creek). Lafayette is not *named* for its trees, but is *known* for them.

With a positive commitment, the City of Lafayette adopted in Ordinance Number 38 the basic attitude that the City's trees warrant protection. The Ordinance gives the legal guidelines to this end. The design guidelines in this Plan are intended to help implement the City Code. Merely allowing trees to stand does not insure their preservation. There are a number of declining, old trees in the City which have been left, *but not preserved.* Technically, the code was fulfilled—the trees were not cut down. Nevertheless, their slow death is sufficient evidence to warrant special regulations for their preservation.

Like all living things, trees too are born, live, reproduce and die. Some species of trees, such as Oaks, live much longer than others, but people, through mistakes, can cause the premature death of any tree.

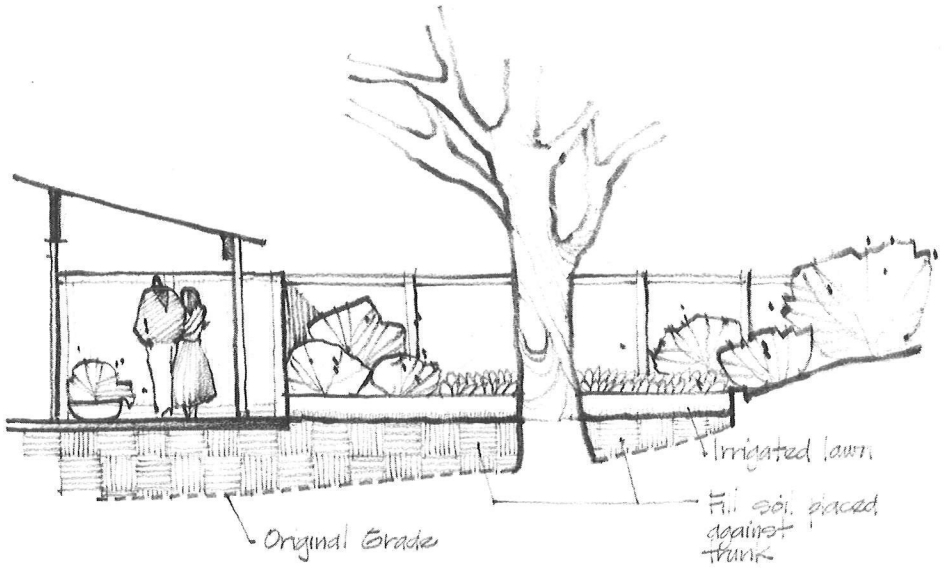
The following recommendations are developed to protect existing trees, particularly native Oaks, against the most commonly encountered errors. Trees live in a delicate balance, but can survive minor stress and damage. Major changes to their environment or structure will almost certainly cause their demise.

Each of the following situations causes a drastic change in a tree's environment. Frequently several of these situations are combined to speed the process of decline or death:

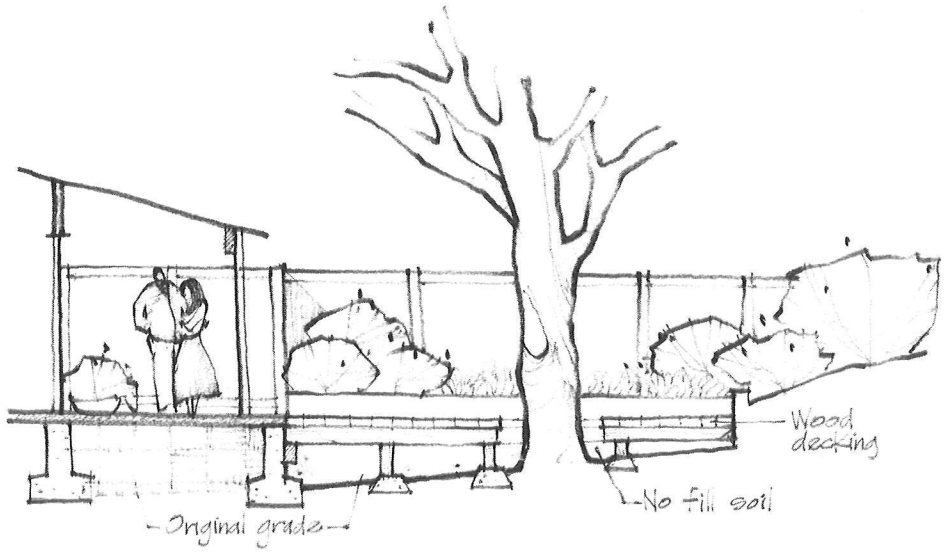
- Fill soil placed around the trunk;
- Water drainage directed toward the trunk;
- Excessive pavement over roots;
- Extensive root removal;
- Trunk and limb damage;
- Excessive pruning (heading back);
- Change of moisture level with irrigation.

Let us look at how each affects most trees.

Fill soil placed around the trunk provides a moist environment around the normally dry bark which encourages the growth of rot inducing organisms; the bark and cambium layer are killed. If the tree is girdled completely (bark killed all around the trunk), the entire tree will die. **There should be no fill soil placed against the trunk.**

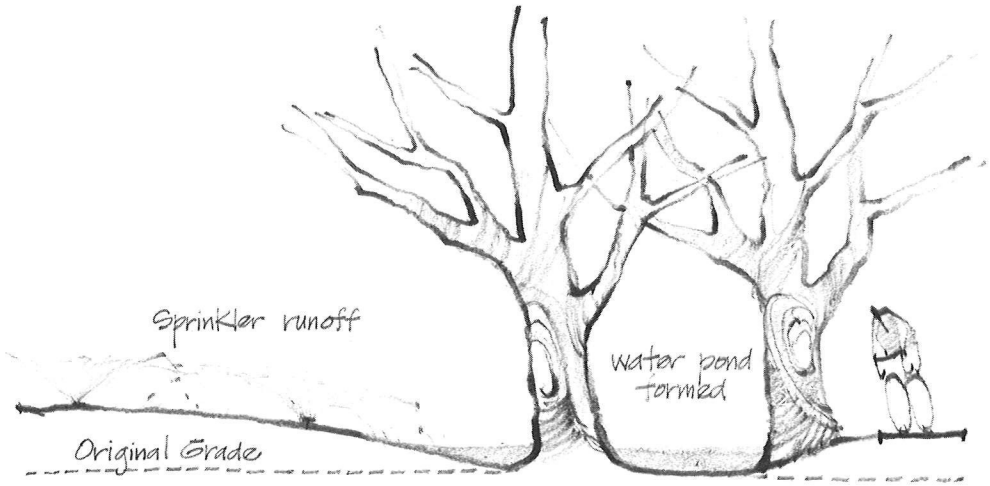


Fill soil placed around trunk of mature tree; tree eventually dies.

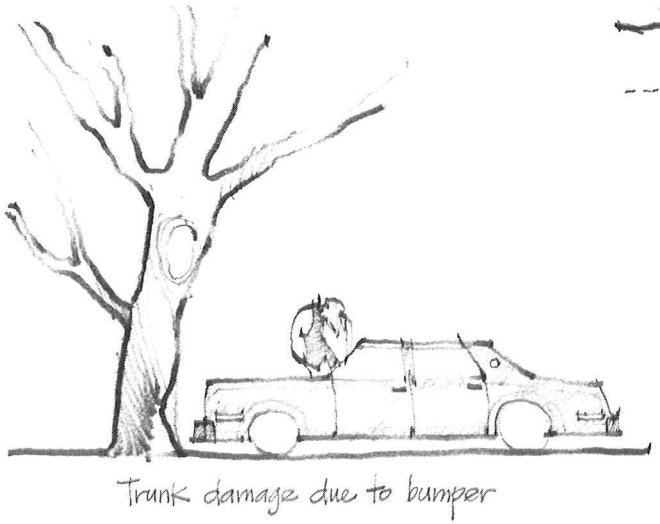


Original grade maintained by using decking around tree.

Water drainage directed toward the trunk as a result of grading causes constantly moist soil at the normally dry base (root crown) of the tree and innundation for extended periods in winter. Crown rot organisms are favored and attack at the soil line, weakening and eventually killing the entire tree as above. **The grade of the soil should always be sloped away from the base of the tree. Catch basins and drain lines tend to clog and are not good, permanent solutions.**

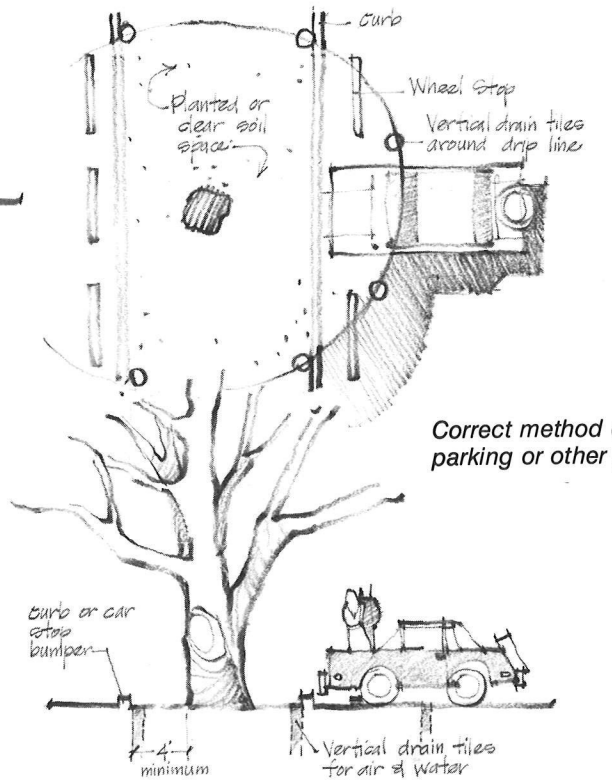


Incorrect grading directs water toward trunk; crown rot develops in constantly wet soil.

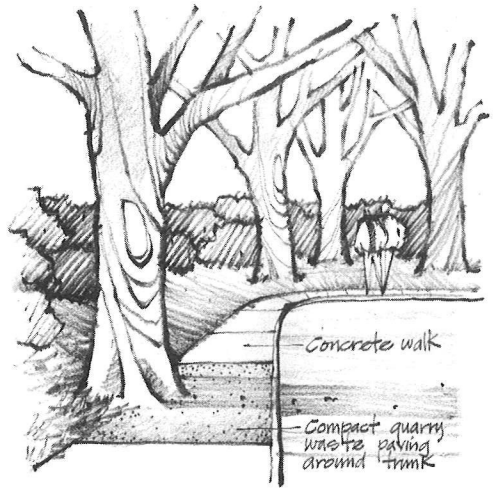


Pavement over entire root system cuts off air and water from roots and encourages parking too close to trunk.

Pavement over the entire root system up to the trunk creates an impermeable seal preventing air and water from entering the soil. The result is suffocation and possible dehydration during summer months causing weakening and gradual decline of the tree. Tree roots need air as well as water, both of which are carried to the roots in the open pore spaces of the soil. Compacted fill over the root zone can create the same problem. **Pavement should be held at least 5 feet back from the trunk and sections of perforated drain pipe should be inserted in the pavement around the dripline of the tree.**



Correct method of paving around mature trees in parking or other paved areas.

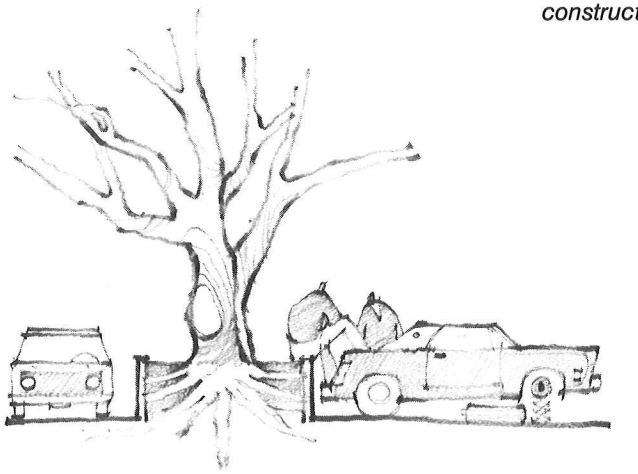


Alternative sidewalk paving to preserve mature tree.

In Lafayette sidewalks are being installed along many older streets which were not initially planned for walks. Mature trees, both native and introduced, frequently occur close to the street pavement. Fortunately these trees are not being cut down arbitrarily to accommodate the walk. Nevertheless, the question of how close to pave to the tree inevitably arises. **As a rule sidewalk pavement should be held back a minimum of 3 feet from the trunk. This allows for both trunk and root expansion. Where this is impossible or where trees lie in the path of the sidewalk, the walk should be "paved" around the tree for a distance of 6 feet or more with porous material such as compacted quarry waste (a type of fine gravel). This will allow for root and trunk expansion without destruction of the sidewalk.**

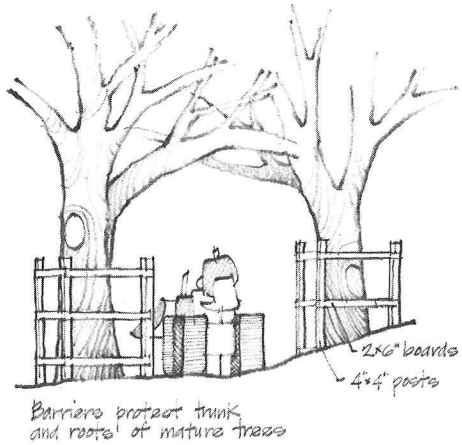
Excessive pruning (heading back) of large tree limbs creates an imbalance with the root system and permanently disfigures the tree. The result is the development of brushy growth along the upper trunk and remaining limb stubs. These shoots are weakly attached and if allowed to develop to a large size are subject to breaking and falling in the wind. **Normally the only top pruning necessary is to remove dead or damaged branches and light thinning to balance any root pruning.**

Extensive root removal caused by cutting too close to a tree during grading deprives the tree of water, food and air. Most roots are normally found in the top four feet of soil spreading radially out from the trunk. Removal of one or more large diameter (2 inches or more) roots removes a larger network of root tips causing an imbalance with the top foliage of the tree. Extensive dieback and sometimes death will occur in severly root pruned trees. **As a general rule, no extensive cutting (lower than one foot) should occur within the dripline of the tree. Any root pruning should be balanced with an equal proportion of top thinning.**



Incorrect grading–excessive root removal close to trunk.

Trunk and limb damage from equipment causes open wounds which are susceptible for entry of disease organisms or insects. Limbs can be torn with extensive strips of bark ripped down the entire trunk. Gashes in the trunk take years to heal and may set back the tree. Complete girdling will kill the tree. **All trees must be protected during construction by a barrier.**



Tree protection barriers for use during site construction work.

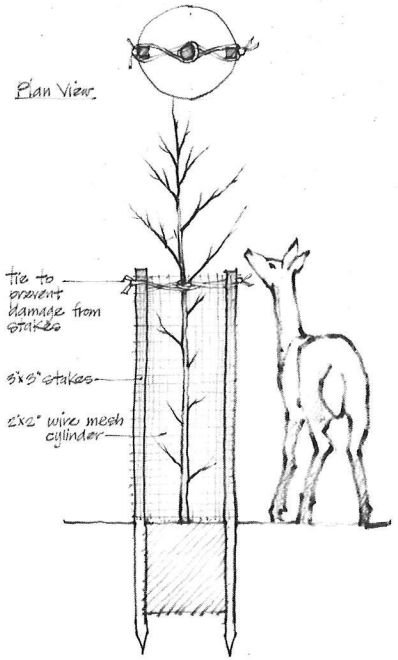
Changing the moisture level through the installation of an irrigation system establishes a moist soil environment conducive to the growth of plant pathogens. The most destructive are Oak Root Fungus *(Armillaria mellea)* and various types of Crown Rot organisms. Oak Root Fungus and Crown Rot organisms are always present in California soils. Trees subjected to excessive soil moisture at the base can be weakened by Crown Rot organisms which are directly favored by the moisture. Oak Root Fungus can then invade the weakened tree and combine with the Crown Rot organisms to speed its decline. Anything that weakens a tree increases its susceptibility to disease. This is true for physical damage to the root system as well as excessive soil moisture.

There is no effective means of chemical control of Oak Root Fungus. The only real preventative is to keep the soil around the tree dry during summer. Certain Crown Rot organisms can be controlled chemically, but the only permanent control is to keep the base of the trunk and at least three feet of adjacent soil dry.

There are other possible types of damage that can be caused either during construction or in the ensuing maintenance of old trees. Nevertheless, the above situations are the most common. Preventing the errors that lead to these types of damage will not insure the preservation of a mature tree. What is certain is that any one or a combination of these conditions can cause severe damage or death to the tree.

TREES FOR SPECIAL SITUATIONS

The trees listed in the foregoing sections of this Plan cover the primary trees recommended for use in Lafayette. There are a number of special situations or problems that are frequently encountered which deserve mention and recommendations. The question of what to plant in heavily populated deer areas is of primary importance to many residents. Fall color is another interest for those of us who have been transplanted from the East. These and other lists of trees are provided in this section as supplements to those already given. *The Sunset Western Garden Book* and various Agricultural Extension Service publications mentioned in the References give additional lists.



Tree protection from deer browse.

Deer Resistant Trees

With protection from fire, low shrubs and brush which are a natural deer browse vegetation grow taller and coarser. Deer accustomed to feeding on this chaparral can no longer forage there and seek more available and more succulent growth. Obviously, lush gardens provide the delectable feasts. In addition, deer populations have exploded because natural predators (primarily mountain lions) have all but disappeared and hunting is prohibited around urban areas. Thus we have a serious conflict when attempting to grow trees and especially lower growing shrubs.

Deer can damage trees in three ways:

- Eating the tender, young foliage;
- Stripping and eating the young bark;
- Rubbing the bark of young trees to remove velvet from their antlers.

The last two types of damage can girdle the trunk and kill the entire top of the tree. If this happens, the tree should be cut back to below the damaged area or to about 6 inches above the ground. Many trees will resprout and with the protection of a wire cylinder can quickly regain their original size. Selective removal of the weaker shoots can encourage one or more stronger sprouts.

Trees eventually grow beyond the browse level of deer, roughly up to 8 feet from the ground. Nevertheless, they must be protected from damage for the first few years. This can be accomplished by constructing a protective wire cylinder around the young plants.

There are some trees which are considered to be "deer-resistant." Actually, if a deer is hungry enough, he will eat almost anything. The following list is extracted from "Deer Resistant Plants for Ornamental Use" by Cummings, Kimbal and Longhurst University of California Extension Service Leaflet #167. It is not foolproof (the deer have not read it), but it can be used as a guide for tree selection in heavily browsed areas of Lafayette.

DEER RESISTANT TREES FOR LAFAYETTE

The asterisk (*) indicates a California native.

Plant Name

Albizia julibrissin—**Silk Tree**
Arbutus unedo—**Strawberry Tree**
Catalpa bignonioides—**Common Catalpa**
Cedrus species—**Cedars**
Celtis australis—**European Hackberry**
Ceratonia siliqua—**Carob**
*Cercis occidentalis—**Western Redbud**
Cornus capitata—**Himalayan Dogwood**
Cotinus coggygria—**Smoke Tree**
Crataegus species—**Hawthorns**
Diospyros virginiana—**Persimmon**
Eucalyptus species—**Eucalypts, Gums**
Ficus carica—**Edible Fig**
Fraxinus velutina—**Arizona Ash**
Ginkgo biloba—**Maidenhair Tree**
Ilex aquifolium—**English Holly**
*Lyonothamnus floribundus—**Catalina Ironwood**
Maclura pomifera—**Osage Orange**
Magnolia species—**Magnolias**
Maytenus boaria—**Mayten Tree**
Melia azedarach—**China-berry Tree**
*Myrica californica—**Wax Myrtle**
Nerium oleander—**Oleander**
Olea europaea—**Olive**
Paulownia tomentosa—**Empress Tree**
*Pinus species—**Pines (some species are not California natives)**
Platanus racemosa—**Western Sycamore**
Robinia pseudoacacia—**Black Locust**
Schinus molle—**California Pepper Tree**

In addition, all palm trees are resistant to deer browse, but are excluded as being visually incompatible with the natural woodland character of Lafayette.

TREES TO ATTRACT BIRDS

The asterisk (*) indicates a California native.

Plant Name	Features
Acer campestre **Hedge Maple**	shelter, nesting
*Aesculus californica **California Buckeye**	flowers
A. carnea **Red-flowering Horsechestnut**	flowers
Alnus cordata **Italian Alder**	catkins
*A. rhombifolia **White Alder**	catkins
Albizia julibrissin **Silk Tree**	flowers
*Arbutus menziesii **Madrone**	berries
Celtis australis **European Hackberry**	berries
Crataegus species **Hawthorns**	fruit, nesting, insects
Eucalyptus species **Eucalyptus**	flowers
*Juglans hindsii **Black Walnut**	fruit, insects
Liquidambar styraciflua **American Sweetgum**	seeds
Magnolia grandiflora **Southern Magnolia**	seeds
Malus species **Crabapples**	fruit
Photinia serrulata **Chinese Photinia**	fruit
Pinus species **Pines**	seeds, insects, nesting
Platanus species **Plane Tree, Sycamore**	seed clusters, nesting
Quercus species **Oaks**	acorns
Salix species **Willows**	nesting, insects
Ulmus species **Elms**	seeds

Trees to Attract Birds

Most of us are aware of the close relationship that occurs between birds and plants. We see Robins and Cedar Waxwings feeding on Pyracantha shrubs in the winter, sassy Scrub Jays robbing acorns, Hummingbirds flitting among flowering plants and Red-tailed Hawks soaring over the open hillsides. Many people are interested in attracting birds to their gardens and seek plant lists as a guide of what to plant. Plant lists concentrate on plants that attract birds either for food or nectar. Plants and planting can do far more.

In a recent graduate study of the relationship between birds and suburban development in Moraga Valley, Malcolm Sproul of the Department of Landscape Architecture at the University of California-Berkeley has discovered a number of interesting bird-plant relationships in addition to the obvious berry flower producing attractants. The habitats that various birds seek can be an influential part of any planting scheme or maintenance program. Cavity-nesters such as the Western Bluebird seek holes in dead trees to nest. Obviously elimination of all dead wood or trees will discourage such birds. Towhees seek the shelter of loose shrubs, but avoid the commonly planted Junipers. The Sparrow Hawk, Red-tailed Hawk and Meadowlark require open grassland. As these grasslands disappear or are allowed to develop into chaparral or woodlands, these birds will likewise disappear. The greater the diversity of vegetation, the greater diversity of birds. Some birds nest high in tall trees, others in small trees or shrubs.

Therefore planting of berried trees and shrubs or flowering plants is only a small part of enriching our environment with bird life. Preserving natural habitats, foraging grounds and hunting areas is equally important. Space here does not permit a detailed investigation of this subject. The important point is to encourage a community-wide consciousness of the importance of preserving diverse habitats. This means protecting the natural woodland—both riparian and hillside—as well as open grassland. Where replanting is done the use of as many trees and shrubs native to Lafayette should be encouraged. Channelized creeks will eliminate large populations of birds. Replanting with riparian plants along modified streams will encourage the return of birds that enjoy that habitat.

Three trees stand out as supporting the most diverse bird populations year 'round—California Black Walnut, Valley Oak and Coast Live Oak. Woodpeckers seek insects in the bark. Scrub Jays feed on the walnuts and acorns in summer; the numerous insect feeders inhabit the high foliage canopy.

The accompanying list suggests a few additional trees to consider and the type of attraction they afford. Lists of shrubs can be obtained from other references such as the Sunset book, *Attracting Birds to your Garden.*

Trees for Fall Color

Because of the special semi-continental nature of the climate of Lafayette, many deciduous trees can be grown that display outstanding foliage color in the fall. The following list comprises the trees most suitable for public and private plantings. Some of these trees are not mentioned on other lists, but are suitable for private gardens.

Frost Tender Trees

Winters vary in Lafayette. During some mild winters, temperatures rarely go below about 22° F (14° C). However, in December 1972, lows were recorded between 17° F (11° C) and 19° F (12° C) intermittently for a week and many mature trees were killed.

A number of subtropical evergreen trees commonly grown west of the East Bay Hills are unsuitable for Lafayette because of tenderness to cold temperatures (32° F or 0° C or below). Many of these trees are hardy to only 25° F (16° C) for short intervals. These will almost certainly be killed in Lafayette during one winter or another and should be avoided. Another group of trees are damaged about 20° F (12.5° C). These are considered marginal here and should not be depended upon for permanent plantings. The accompanying list is included to help prevent costly mistakes in tree selection.

TREES FOR FALL COLOR

The asterisk (*) indicates a California native.

Plant Name

Gold-Yellow Foliage

*Acer macrophyllum—**Bigleaf Maple**
*Acer negundo—**Boxelder**
Fraxinus velutina 'Modesto'—**Modesto Ash**
Ginkgo biloba—**Maidenhair Tree**
Gleditsia triacanthos inermis 'Shademaster'—**Shademaster Honeylocust**
Koelreuteria paniculata—**Goldenrain Tree**
Liquidambar styraciflua (selected cultivars)—**American Sweetgum**
Liriodendron tulipifera—**Tulip Tree**
Morus alba 'Fruitless'—**Fruitless Mulberry**
*Populus fremontii—**Fremont Cottonwood**
P. nigra 'Italica'—**Lombardy Poplar**
Salix babylonica—**Weeping Willow**

Orange to Orange-Red Foilage

*Acer circinatum—**Vine Maple**
Acer palmatum—**Japanese Maple**
Crataegus phaenopyrum—**Washington Thorn**
Diospyros species—**Persimmons**
Lagerstroemia indica—**Crape Myrtle**
Liquidambar Styraciflua (selected forms)—**American Sweetgum**
Oxydendrum arboreum—**Sourwood**
Pistacia chinensis—**Chinese Pistache**

Red-Scarlet-Burgundy Foilage

Acer rubrum—**Red Maple**
Cercidiphyllum japonicum—**Katsura Tree**
Crataegus lavallei—**Carriere Hawthorn**
C. phaenopyrum—**Washington Thorn**
Fraxinus oxycarpa 'Raywoodii'—**Raywood Ash**
Liquidambar styraciflua (selected forms)—**American Sweetgum**
Nyssa sylvatica—**Sour Gum**
Prunus cerasifera 'Atropurpurea'—**Purpleleaf Plum**
Quercus coccinea—**Scarlet Oak**
Q. rubra—**Red Oak**

FROST TENDER TREES TO AVOID

Plant Name	Marginal in Lafayette	Avoid Altogether
Acacia longifolia— Sydney Golden Wattle	•	
Casuarina stricta— Beefwood		•
Citrus species— Lemons, Oranges, Grapefruit	•	
Dodonea viscosa— Hopseed Bush	•	
Eucalyptus citriodora— Lemon-scented Gum		•
E. ficifolia— Scarlet-flowering Gum		•
E. lehmannii— Bushy Yate		•
E. globulus— Blue Gum	•	
Grevillea robusta— Silk Oak	•	
Jacaranda species— Jacarandas		•
Leptospermum laevigatum— Australian Tea Tree		•
Leucadendron argenteum— Silver Tree		•
Melaleuca styphelioides— Prickly Melaleuca		•
M. quinquinervia— Cajeput Tree		•
Metrosideros excelsa— New Zealand Christman Tree		•
Myoporum laetum—		•
Persea americana— American Avocado		•
P. indica— Indian Avocado		•
Pinus canariensis— Canary Island Pine	•	
Pittosporum undulatum— Victorian Box		•
Podocarpus gracilior— Fern Pine	•	
Schinus molle California Pepper	•	
S. terebinthifolius— Brazilian Pepper		•
Syzygium paniculatum— Australian Brush Cherry		•
Tristania conferta— Brisbane Box		•

GLOSSARY OF TERMS

The various specific terms used throughout the text are arranged in similar groupings relating to their use.

Tree Types

Broadleaf Evergreen—evergreen tree having more or less broad leaves similar to those of deciduous trees; leaves remain on branches for two or more years.

Coniferous Evergreen or Conifer—what most people call "evergreens"; any tree with narrow needle-like leaves that bear cones or conelike structures (Cedar, Pine, Fir). Not all conifers are evergreens (Dawn Redwood, Bald Cypress).

Deciduous—a tree that sheds all of its leaves annually.

Semi-deciduous or Semi-evergreen—a tree that retains some of its leaves during a mild winter (Evergreen Pear); it may lose all of its leaves during cold winters.

Vegetation Types

Chaparral—a general name for the dense, shrubby, evergreen vegetation; from the Spanish meaning "place of the Scrub Oak."

Riparian—a general term for the vegetation found growing along streams and creeks.

Horticultural Terms

Balled and Burlapped (B & B)—a type of nursery plant stock in which the plant has been field dug and the rootball wrapped with burlap and tied with string. Plants are available in this form for a very brief period during the winter, usually conifers in this area.

Bare Root—another type of field dug tree (always deciduous); soil is absent from roots, therefore root defects are easily detected. Also available for short time in winter months.

Container Tree—trees grown and sold in a container according to container size—5 and 15 gallon cans, various sized boxes from 16 inches up to 4 feet.

Dripline—a line you might draw on the ground around a tree directly beneath its outermost branches where rain water tends to drip. The term is used in regard to grading around trees.

Hardiness—refers to the cold tolerance of a tree, not its ability to withstand abuse or difficult growing conditions. A "hardy" tree is one that tolerates temperatures below freezing or to about 15° F in Lafayette.

Mildew—a fungus disease usually made visible by a powdery or chalky substance on the leaves (the fruiting and growth structures of fungus).

Organic Matter—organic soil additive or conditioner such as peat moss, sawdust, manure or compost; used to make humus which results in more friable, porous soil.

Pruning Terms

Heading Back—one of two types of pruning cuts in which a branch is cut back to a bud to increase bushiness or limbs cut back to reduce the size or height of a tree. For the other type of cut see **Thinning Out.**

Lateral Branch—a branch arising from a bud on the side of the main trunk or leader; grows in a horizontal or upward angled fashion.

Leader—the vertical, central, upright branch which ultimately forms the trunk.

Scaffold Branches—the permanent branches of a tree that form its structure. Branches do not increase in height as a tree grows and always remain in the same position on the tree.

Standard Tree—a shrub that has been pruned up into a tree (Oleander); a normally multi-trunked tree that has been pruned into a single trunk (Olive).

Sucker—very vigorous shoot arising from the base of a tree; should be removed to prevent a brushy tree form. See also **Watersprout.**

Thinning Out—the second type of pruning cut in which entire branches—large or small—are removed back to a lateral branch or the main trunk. The objective is to develop a more open tree canopy or lighten a top-heavy young tree.

Watersprout — long, vigorous shoot arising from a main limb or just behind a pruning stub; should be removed to prevent crowded branching.

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"Staking Landscape Trees" (AXT-311), Harris, Leiser and Davis, University of California Agricultural Extension Service, 1972.

"Pruning Landscape Trees" (AXT-288), Harris, Hamilton, Davis and Leiser, University of California Agricultural Extension Service, 1969.

"Direct Seeding of Woody Plants" (AXT-n27), Harris, Leiser and Chan, University of California Agricultural Extension Service, 1971.

The first five references are generally available in local bookstores except for the Chevron Chemical Company booklet which can be obtained from:

Chevron Chemical Company,
200 Bush Street,
San Francisco, California 94120.

Agricultural Extension publications may be obtained from the Agricultural Extension Service by writing to:

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Division of Agricultural Sciences,
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