

Year End Report Summary

Advanced Landscape Tree Care for California Master Gardeners – a train the trainer approach

Principal Investigator:

Pamela Geisel

Farm Advisor

Co-Principal Investigator:

Loren Oki

CE Landscape Specialist

Program Staff:

Leslie Feathers

Summary:

Landscape trees are often ill cared for due to misinformation or inadequate knowledge of the homeowner. The goal of this project was to develop curriculum and educational materials for UCCE Master Gardeners statewide to use in outreach efforts to educate the homeowners about proper tree care in their respective county. To accomplish this goal we organized three landscape tree care trainings, a training manual, three tree care posters and a set of eight consumer tree care cards.

A survey to all Master Gardener Coordinators was sent out via email to solicit feedback on what tree care topics would be of interest to Master Gardeners, as well as what topics they had little or no previous training. Once the feedback was given, topics were selected. The topics for the training were:

- selecting quality trees
- tree selection
- avoiding damage during construction and other urban issues
- training young trees for structure and form
- pruning mature landscape trees
- hazardous tree evaluation and tree values
- benefits of trees
- abiotic and biotic disorders of landscape trees

University specialist, UCCE farm advisors and an industry professionals taught the workshops. All three trainings consisted of the same topics with a slight variation of instructors.

Each county was allowed to send only a select number of participants. This was determined by the number of Master Gardeners in each county program. The counties with more Master Gardeners were given more spaces. The Master Gardeners chosen to attend training were selected by each Master Gardener Coordinator. The training was free to all Master Gardeners.

On February 19, 2004, thirty-nine University of California Master Gardeners attended the first of three Landscape Tree trainings. This training was held in San Diego at the Marina Village Center from 9:00 am until 4:45 pm. Breakfast snacks and lunch was provided to each in attendance.

The second and third trainings were held on March 9, at the UC Davis campus and March 25, 2004 at the Air Pollution Control District office in San Luis Obispo. UC Davis campus training had seventy-six Master Gardeners in attendance and the San Luis Obispo training had twenty-six in attendance. The agendas for each training location are in the appendix.

A total of 141 Master Gardeners were trained. Each attendee received a manual and some manuals were sent to Counties who did not have a Master Gardener attending. The manual consisted of UC publications, International Society of Arboriculture publications, Center for Urban Forestry publications and other reputable sources. The manual index included publications on topics such as benefits of trees, tree selection, tree planting and staking, tree pruning, tree values and urban interface issues, trees and power lines, insect and disease problems, and suggested tree list from various counties. The manual was compiled into a 3” binder with a cover page. Each attendee received a landscape tree speaker resource list that consisted of 21 UC specialist and farm advisors who specialize in tree care. Each county received a UC video titled “Training Young Trees for Structure and Form”.

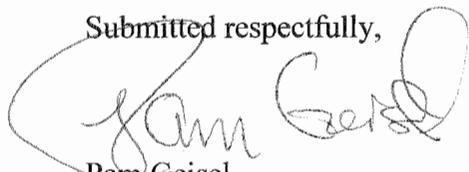
To aid the counties programs in outreach and to emphasis the key training elements, three 24” X 36” posters on tree care were developed (see attached sample letter size posters). The poster topics selected were tree planting and tree staking, mature tree pruning, tree selection. Will Suckow of Will Suckow Illustrations illustrated the posters and Laurie Ahlf of Design Styles provided design. City Press in Fresno did printing on a satin gloss book paper with 4 color processing. All thirty-three counties who have Master Gardener programs received a set of three posters. Extra posters were printed for future use and to be purchased by counties requesting more than one copy. Information on reordering the posters was given at each training. All artwork and text was given to program staff for future use.

To further aid the Master Gardeners in educating the public on landscape tree care, a set of eight consumer cards were developed and 1,000 of each card was given to each county program for use in outreach. Will Suckow Illustrations and Design Styles provided the artwork and design, respectively, for the consumer cards. City Press in Fresno printed 1,000 of each card for all thirty-three counties. The consumer cards topics are tree selection, tree planting, tree staking, trees and utilities, tree pest and diseases, tree pruning, training young trees for structure and form, and quality nursery tree selection. A review committee was made up of Michelle LeStrange, Pam Geisel, Loren Oki, Ed Perry and Brian Kempf and Leslie Feathers reviewed the consumer tree care cards. A complete set of eight cards is attached.

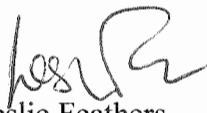
Master Gardeners have been conducting outreach in their respective counties since April 2004. To evaluate the outreach and to gain feedback from Master Gardeners on the outreach materials, a survey has been developed. It will be electronically distributed through the county coordinators. The survey is designed to gain insight about the usefulness of the posters and

consumer cards, gain feedback about the training and record their outreach efforts. The survey is in the appendix. After one year, a follow up survey will be conducted to evaluate the outreach efforts and evaluate the change in behavior or knowledge of participants observed by Master Gardeners conducting outreach.

Submitted respectfully,



Pam Geisel
Farm Advisor
Fresno County



Leslie Feathers
Tree Program Coordinator

UC Master Gardener Landscape Tree Training

February 19, 2004
Village Marina Center
1936 Quivira Way
San Diego, CA 92109
(619) 222-1620

Agenda

9:00 – 9:30 am	Registration and breakfast refreshments
9:30 – 9:45 am	Welcome and announcements
9:45 – 10:30 am	Selecting Quality Trees - Loren Oki
10:30 – 10:45 am	Break
10:45 – 11:30 am	Tree Selection – Janet Hartin
11:30 – 12:30 pm	Avoiding Damage During Construction & other Urban Issues – Dennis Pittenger
12:30 – 1:10 pm	Buffet Lunch
1:10 – 1:55 pm	Training Young Trees for Structure and Form – Brian Kempf
1:55 – 2:05 pm	Break
2:05 – 2:50 pm	Pruning Mature Trees – Brian Kempf
2:50 – 3:35 pm	Hazardous Tree Evaluation and Tree Values – Pam Gesiel
3:35 – 4:35 pm	Biotic and Abiotic Disorders – Jim Downer
4:35 – 4:45 pm	Wrap up and adjourn

UC Master Gardener Landscape Tree Training

March 9, 2004 – UC Davis Campus, Buehler Hall

Agenda

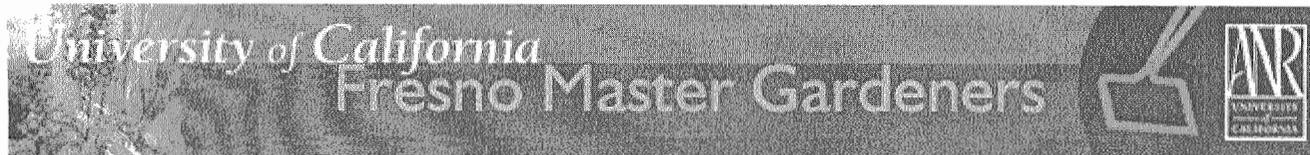
8:30 – 8:50 am	Registration and breakfast refreshments
8:50 – 9:00 am	Welcome and announcements
9:00 – 9:45 am	Benefits of Trees – Greg McPherson or Jim Geiger
9:45 – 10:30 am	Tree Selection – Janet Hartin
10:30 – 10:45 am	Break
10:45 – 11:30 am	Selecting Quality Trees - Loren Oki
11:30 – 12:35 pm	Biotic and Abiotic Disorders – Ed Perry
12:35 – 1:15 pm	Buffet or Box Lunch
1:15 – 2:00 pm	Training Young Trees for Structure and Form – Brian Kempf
2:00 – 2:45 pm	Pruning Mature Trees – Brian Kempf
2:45 – 3:00 pm	Break
3:00 – 3:45 pm	Hazardous Tree Evaluation and Tree Values – Pam Geisel
3:45 – 4:30 pm	Avoiding Damage During Construction & Other Urban Issues – Larry Costello
4:30 – 4:45 pm	Wrap up and adjourn

UC Master Gardener Landscape Tree Training

March 25, 2004
San Luis Obispo
Air Pollution Control District

Agenda

8:30 – 8:50 am	Registration and breakfast refreshments
8:50 – 9:00 am	Welcome and announcements
9:00 – 9:45 am	Benefits of Trees – Jim Geiger
9:45 – 10:30 am	Tree Selection – Janet Hartin
10:30 – 10:45 am	Break
10:45 – 11:30 am	Selecting Quality Trees - Loren Oki
11:30 – 12:35 pm	Biotic and Abiotic Disorders – Pam Geisel
12:35 – 1:15 pm	Buffet or Box Lunch
1:15 – 2:00 pm	Training Young Trees for Structure and Form – Brian Kempf
2:00 – 2:45 pm	Pruning Mature Trees – Brian Kempf
2:45 – 3:00 pm	Break
3:00 – 3:45 pm	Hazardous Tree Evaluation and Tree Values – Pam Geisel
3:45 – 4:30 pm	Avoiding Damage During Construction & Other Urban Issues – Larry Costello
4:30 – 4:45 pm	Wrap up and adjourn



Landscape Tree Survey

Question	Response
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Name:

E-Mail Address:

Position:

County:

UC sponsored training: Attended

Did you find the landscape tree training increased your knowledge of landscape trees?

- Yes
 No

Have your outreach efforts in landscape tree care increased since you received training?

- Yes
 No

How many outreach efforts related to tree care were conducted in your county between March through November 2004?

- 1-3
 3-5
 5-9
 9 or more

What type of Tree Care outreach efforts are most commonly conducted?

In your outreach efforts from March 2004 through November 2004 approximately how many people have you educated about tree care?

To whom have the majority of your outreach efforts been directed between March through November 2004?

Landscape Tree Care Posters

Is the design of the Landscape Tree Care posters eye catching for the public?

- Yes
 No

Is the information on the Landscape Tree Care posters appropriate and effective for display purposes?

- Yes
 No

For what purpose are you most commonly using the Landscape Tree Care posters?

Comments and suggestions regarding Tree Care posters:

Consumer Tree Care Cards

Is the design of the Landscape Tree Care cards suited to your outreach efforts?
 Yes
 No

Is the information provided on the Landscape Tree Care cards helpful in your outreach efforts?
 Yes
 No

For what purpose are you most commonly using the Landscape Tree Care cards?
Plant Clinics

Is the size of the cards appropriate for most of your outreach efforts?
 Yes
 No

Are the Landscape Tree Care cards easy to understand by the gardner with limited experienced?
 Yes
 No

What landscape tree care topics would you find helpful for additional card series?

What additional tree care outreach tools would you suggest in the future?

What are your impressions of changes in behavior or knowledge, relative to tree care, observed by program participants?
Increase in knowlege of proper tree care

Comments:

save information

Surveymaker: Edit Question

[return t](#)

Question

Required Users MUST answer this question to complete your survey. This does NOT work on yes/no.

Identifier

(Will appear in Excel document to replace long questions. If nothing is entered, entire question will be used)

Question Type

[add 5 more options](#)

- Option 1
- Option 2
- Option 3
- Option 4
- Option 5
- Option 6
- Option 7
- Option 8
- Option 9
- Option 10

[save information](#)

[copy this question](#)

Delete question (check box to verify) [delete](#)

TREE STAKING

Stake trees for protection, anchorage and support.

Considerations for staking depend upon trunk strength, expected wind and site conditions, and vehicular or pedestrian traffic. Many young trees can stand upright alone and grow straight, whereas others need support or protection until trunk taper and caliper can be developed to support the tree upright. Staked trees will typically grow taller, grow less in trunk caliper, become susceptible to rubbing and injury from stakes and ties, and take longer to stand upright when untied. Even though staking can be expensive and time consuming, if done properly can overcome associated problems.

Supportive staking of a newly planted tree whose trunk is not strong enough to stand upright or to return upright after being deflected is recommended. To determine if staking is necessary, remove the nursery stake. If tree cannot stand upright on its own, supportive staking is needed.



To properly stake a tree, follow these steps:

- 1) Two stakes should be placed into the ground outside of the root ball on opposite sides of the tree so the prevailing wind can blow through the two stakes. Remove nursery stake.

(see reverse for more steps)



2) To determine the height of the support tie, support the trunk with two fingers starting at 3 feet above the soil and move fingers upward until the tree is supported enough to stand upright. Place ties 6 inches above this point. Avoid attaching the ties too high on a young tree where the trunk is more succulent and prone to breakage.



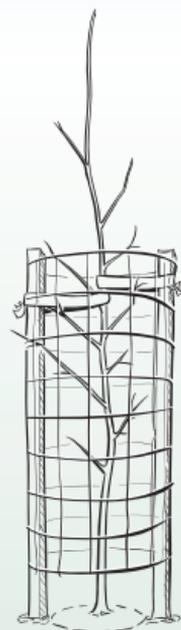
3) If using a wooden stake, cut off excess stake at 2 - 3 inches above the ties to avoid branch injury.

4) Protect trees from vandalism or vehicles if necessary. To aid in this, wrap wire caging around the tree stakes to anchor.



As a part of a regular maintenance routine, check the ties to avoid girdling or restricting of the trunk and for breakage. The stakes should be checked to insure they remain upright and do not damage the trunk or branches from rubbing. Remove the stakes and ties when the tree is able to stand upright on its own.

No staking is recommended for most conifers and other trees with branching close to the ground. These trees are usually shorter with sturdy trunks and root systems adequate to hold the tree upright.



For more information about tree planting and staking, refer to ANR publication #8046 available for free downloading at <http://anrcatalog.ucdavis.edu>, call your local UC Cooperative Extension office, or consult

a certified arborist.

Funding for this project made possible from the Elvenia J. Slosson Endowment Fund.



QUALITY NURSERY TREE SELECTION

The quality of a nursery tree for planting can be as important in its success as the maintenance and species selected.

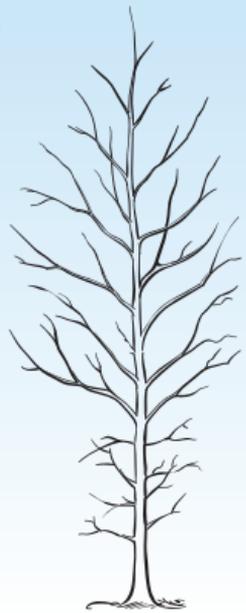
When selecting a tree from a nursery, take into consideration its overall health. Check over the roots, top to trunk characteristics, foliage and branch distribution and be sure it's free from injury and pests.

Root Structure:

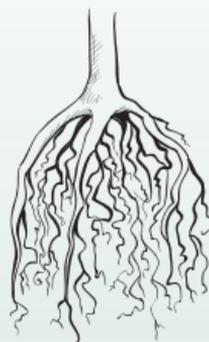
Root characteristics have the greatest influence on the survival, vigor and health of a tree.

To check for healthy roots, wash or push away the surface soil to examine the root flare.

Roots should flare out evenly from the trunk. Checking for other root deformations is difficult without washing away the soil.



Poor root structure



Better root structure

Remove the nursery stake. If the trunk falls over or is loose at the soil line when pulled upwards, it indicates root deformities. These are often not repairable so avoid planting. Then, also examine the periphery roots. If roots appear to be heavily matted, it is overgrown. Overgrown container trees may have poor root structure with kinked or girdling roots.

(continued on reverse)



Trunk characteristics:

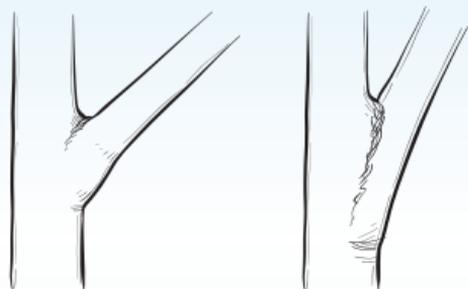
The trunk should have a gradual taper and caliper appropriate for its height. Taper is the decrease of the trunk diameter (caliper) with increasing height. Following are suggested caliper at 6" above soil surface:

<u>Container Size</u>	<u>Trunk Diameter</u>
5 gal	0.5" to 0.75"
15 gal	0.75" to 1.5"
24" box	1.5" to 2.5"

Trees with taper and appropriate caliper are better able to withstand wind load and stand upright unsupported.

Foliage and branching:

The tree should have healthy foliage free of pests and diseases with good leaf color, size and appearance. The canopy should be free of dead or broken branches. A central leader should be evident and free of co-dominant stems. Branches should be well spaced with appropriate distribution both radially around and vertically along the trunk. Branch diameter should be no larger than $\frac{2}{3}$ the diameter of the trunk at 1" above the branch. Temporary branches should be retained on the upper $\frac{2}{3}$ of the trunk to aid in trunk development.



Good scaffold

Bad scaffold

Freedom from injury, stress and pests:

The tree trunk, branches and leaves should be free of wounds, lesions, diseases, bleeding, insects, and sunburn. The tree should appear free from water stress. The container should have even soil moisture. Some signs of inconsistent soil moisture are root discoloration, shriveling, and foul odors.

When selecting a nursery tree, knowing what is normal for the species is of value. Refer to nursery personnel and other tree resources to assist in selecting a tree.

For more information on tree care refer to the ANR website at <http://anrcatalog.ucdavis.edu>, your local UC Cooperative Extension office or consult a certified arborist.



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TREE PEST AND DISEASES

Sometimes trees become susceptible to pest, disease or cultural problems.

Many plant disorders once diagnosed can be managed.

Plant disorders are separated into two categories: biotic (living; e.g., insects, fungus, bacteria) and abiotic (nonliving; e.g., watering, temperature, nutrient deficiency). Biotic disorders



Borers
(adult and larva)

are caused by living organisms affecting the health of a tree and are most commonly fungi, bacteria and insects. Insect pests are characterized by their mouthparts: sucking, piercing or chewing. Typical symptoms are holes in leaves or bark and distorted growth or stippling of the leaves. Also, what these insect leave behind can be diagnostic including: honeydew, cast skins, fecal pellets.



Aphids

Fungi fruiting structures (e.g. mushrooms) can often be seen in landscapes. Most fungi are saprophytic feeding on dead organic matter and are beneficial to the environment.

Damage-causing fungi produce toxins and enzymes that disrupt normal plant growth. Plant



Armillaria
(mushrooms)

symptoms include darkened, necrotic or sunken lesions, yellow or brown spots, distorted foliage, masses of powdery spores, droopy leaves or shoots and profuse twig growth. Many can stay alive in a dormant state for months, so garden sanitation is important in disease prevention.



Powdery mildew



Bacteria infect host plants by entering through wounds or natural openings. The symptoms are very similar to damaging fungal diseases and also include galls, vascular wilt and cankers. They can spread by water, insects or human activity.



Anthracnose

Accurate diagnosis is essential to proper disease management. Careful examination of all aspects of the plant symptoms, location, plant history, past and present weather conditions and maintenance practices are necessary for accurate diagnosis. Correct plant identification is essential to recognize natural characteristics that may resemble a plant problem.



Redhumped caterpillars

Most plants can tolerate some level of injury from a pest or disease.

Treatment is only needed if a plant's health is affected or symptoms are aesthetically unfavorable.

Not all plant problems are caused by a pest or disease. Many problems are abiotic in nature and may result from poor plant selection or improper maintenance practices. Such disorders can be caused by too much or too little watering, nutrient deficiency or toxicity, intolerable soil pH, drastic temperature changes, excessive soil salt concentration, poor soil texture, air pollution and mechanical injury that may lead to secondary pest disorders.



Spider mites and webbing

To avoid plant problems, select plants that are known to be resistant to pests or diseases. Avoid plant species not suited to the chosen location, soil conditions or climate zone.



Scales

Consult a trained diagnostician, industry professional or UCCE Master Gardener for a proper diagnosis and recommended treatment plan or for further information on specific plant problems.

For more information about tree pests and diseases, refer to the ANR website at <http://anrcatalog.ucdavis.edu>, the IPM website at www.ipm.ucdavis.edu, call your local UC Cooperative Extension office, or consult a certified arborist.



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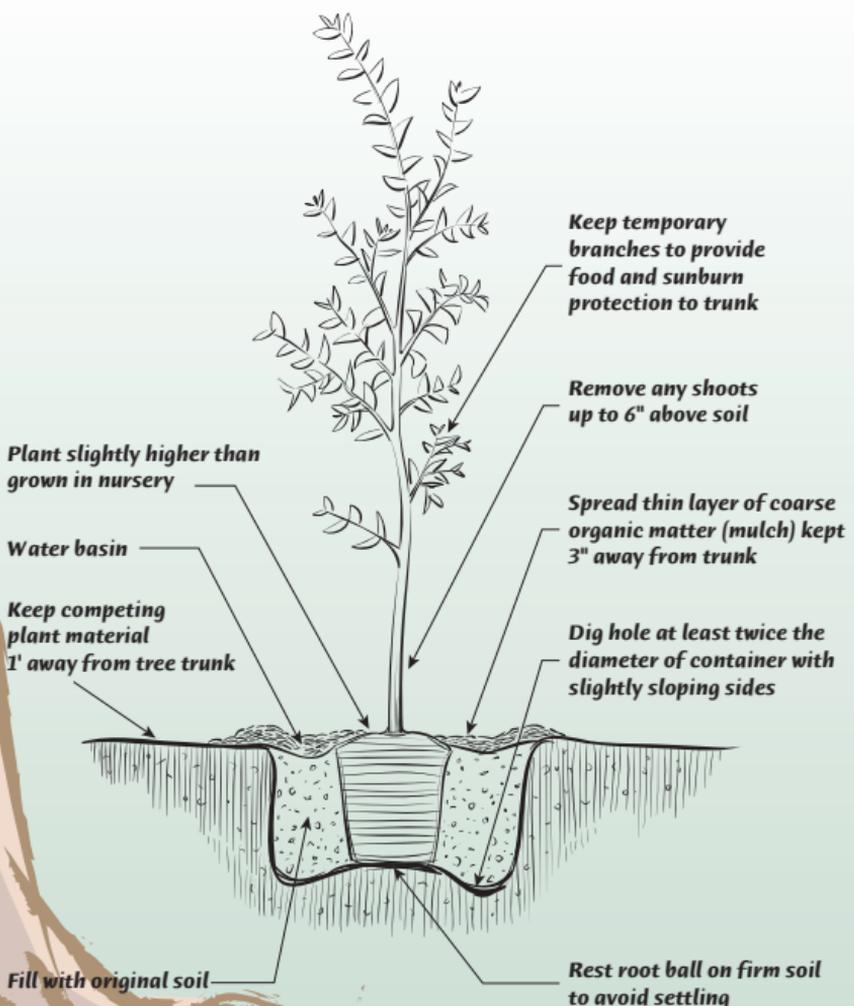


TREE PLANTING

Proper tree planting will insure a young trees survival.

- F**all is the best planting season.
- ▶ The soil temperature is warmer
 - ▶ More soil moisture is available through fall into spring
 - ▶ Plants will transpire less due to shorter days and cooler temperatures
 - ▶ Roots have more time to establish before warm summer temperatures arrive

Prior to planting, evaluate the site. Identify any soil problems. A common site problem is soil compaction or impervious layers. If compaction is shallow, tillage will aid in loosening the top layer. If there is an impervious layer, such as hardpan, drainage can be improved by breaking through the layer to allow water movement and rooting into the layers below.



(see reverse for instructions)



If soil is either too sandy or clayey, modify management practices to accommodate the soil characteristics, such as more frequent irrigation in sandy soils or deeper but less frequent in clayey soils.

Prepare the planting hole:

- ▶ Hole should be at least twice the diameter of the root ball and as deep as the root ball. Plant "high" in all but sandy soils.
- ▶ Roughen the sides of the hole with a shovel to aid intermingling of backfill soil with existing soil to provide easier root penetration.
- ▶ Be aware of the location of underground utilities and pipes prior to planting.

After removing the tree from the nursery container, remove, cut or shorten matted and/or circling roots at the periphery of the root ball.

Place tree into the prepared hole on firm soil to avoid settling. Face the crook of a grafted union away from the afternoon sun to reduce possibility of sunburn. Once tree is positioned as desired, backfill with original soil. Do not put fill soil on top of the root ball.

When container grown trees are transplanted, the available water in the root ball moves into the surrounding soil. Water thoroughly, paying attention to wetting the potting mix as well as the surrounding soil. Mulch planting area with a coarse organic matter to retain soil moisture, but avoid piling against the trunk.

Fertilization is not recommended at planting. Avoid planting within a 12" diameter around a tree. Many turfgrass and broad leaf plants compete with young tree roots for water and nutrients and may have allelopathic effects on growth. Keeping plant material away can also help avoid damage to the trunk from string trimmers and mowers.

Only minor pruning to favor the development of basic branch structure is recommended at planting.

For more information about tree planting and staking, refer to ANR publication #8046 available for free downloading at <http://anrcatalog.ucdavis.edu>, call your local UC Cooperative Extension office, or consult a certified arborist.



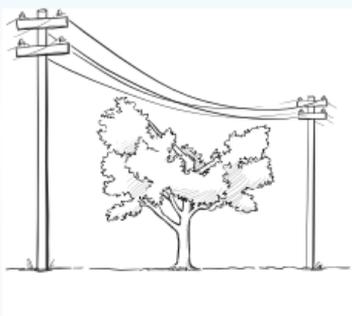
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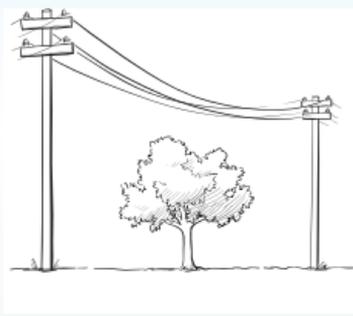
TREES AND UTILITIES

Selecting the right tree for the right place in the landscape is an important decision.

Proper tree selection and placement around utilities can eliminate potential public safety hazards, reduce expenses by utilities and their rate payers, and improve the appearance of landscapes. Planting a tree in an inappropriate location can mean future repeated tree pruning, tree interference with utility service or even tree removal. So, remember to look up and down prior to selecting an appropriate tree and location.



or



With today's consistent service, we often take for granted this service will be uninterrupted. Service is delivered to our homes by overhead or underground distribution systems. Overhead lines can be electrical, telephone, cable or television. Underground lines include services such as water, sewer, and natural gas. These systems impact the proper selection of tree species and selection of planting site.

Planting trees under utility lines can pose a hazard to humans by electrical shock and to personal property from fires. In California, one of the leading causes of power outages is tree interference. These outages can affect public safety, cause business losses and residential inconvenience. In addition, millions of dollars are spent on removal or clearance of vegetation.

(see reverse)



Underground utilities should be located prior to tree planting. Locate underground lines by requesting an Underground Service Alert (USA) by calling 1-800-227-2600. This simple and free service ensures safety for the excavator, and homeowner and prevents damage to underground utilities.

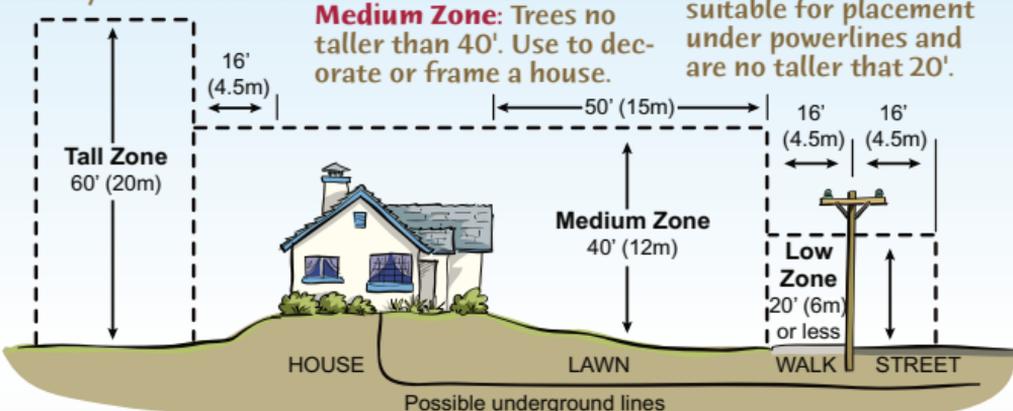
Although many roots and lines exist underground without incident, be aware that many tree roots extend over twice the diameter of the canopy. Root damage can occur during digging which may affect a tree's health.

When planning for a tree, consider the mature tree height and the available space overhead and underground. To aid in identifying tree placement, divide your landscape into three areas; tall zone, medium zone and low zone.

Tall Zone: Tall or large canopy tree. Place well away from structure.

Medium Zone: Trees no taller than 40'. Use to decorate or frame a house.

Low Zone: Trees that are suitable for placement under powerlines and are no taller than 20'.



Inappropriate trees planted under utility lines require annual pruning, which often leads to an unnatural shape, structural weakness, and greater stress that increases susceptibility to disease and insect invasion.

Homeowners should not attempt to prune trees near power lines. Call a certified utility tree worker or your local utility company. Ask a local certified arborist or UCCE Master Gardener for a recommended tree list.

For more information on tree care refer to the ANR website at <http://anrcatalog.ucdavis.edu>, your local UC Cooperative Extension office, consult a certified arborist, or call your local utility office.



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TREE PRUNING

Prune Mature Trees Properly for Optimum Tree Health

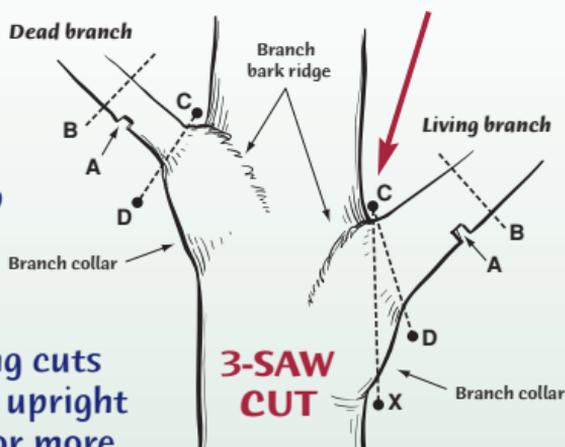
Proper tree pruning removes dying, diseased or injured wood, crossing or crowded branches and restructures tree shape or reduces tree height. Proper thinning of the tree's canopy can increase light and air circulation within the canopy, reduce the occurrence of some diseases and reduce wind resistance. Pruning also influences the degree of vegetative growth and flower bud formation.

There are two types of pruning cuts: thinning and heading. A thinning cut removes a branch at its point of origin. When thinning to a lateral branch, the branch needs to be large enough to assume the terminal role. Ideally, the diameter of the retained lateral should be $\frac{1}{3}$ or more the diameter of the branch removed. Trees pruned with thinning cuts are more open, retain natural shape and allow more light penetration within the canopy.

Heading cuts remove a growing branch back to a bud, remove a lateral back to a stub or cut a lateral not large enough to assume a terminal role. Heading cuts result in vigorous, upright growth from one or more buds just below the cut. These shoots are from latent buds and are weakly attached.

To remove a limb use a 3-saw cut to ensure a clean, proper cut. See diagram. Avoid heavy pruning. Make pruning cuts just outside of the branch collar. Avoid making large pruning cuts, e.g. 3" or larger.

Do not cut along line C-X



- 1) Cut part way through the branch at A
- 2) Cut it off at B
- 3) Make the final cut along C-D



Do not leave stubs. Stubs allow pest and diseases to invade.

(see reverse)

Pruning is encouraged during winter or dormant months.

Do Not Top Trees!!

Start out right by planting trees appropriate for available space at tree's maturity. Prune a young tree for structure and form during the first 3-5 years.

Thinning vs. Topping



BEFORE PRUNING

TOPPING, NO!

1 year later

The topped tree is stubbed and only a remnant of a lovely tree remains.



3 years later

Vigorous upright sprouts emerge. Sprouts are weakly attached and prone to breakage. They are abnormal, grow rapidly, and cause the tree to lose its natural shape.



When severely pruned, a tree branch will form many vigorous upright sprouts. These sprouts are weakly attached and look unsightly over time.

6 years later

A topped tree is as tall as the pruned tree yet far bushier and more prone to limb failure than originally.



THINNING AND CROWN REDUCTION, YES!

1 year later

If pruned properly, corrective thinning and crown reduction cuts occur but beauty and form are retained.



3 years later

Growth of thinned branches is spread evenly throughout canopy, maintaining its natural shape.



6 years later

A properly pruned tree is safer with strongly attached branches, more beautiful in form and its size better controlled.



For more information, refer to the ANR website at <http://anrcatalog.ucdavis.edu>, call your local UC Cooperative Extension office, or consult a certified arborist.



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TREE SELECTION

Careful and well planned tree selection can ensure the future health of a tree.

It is important to match tree characteristics with the site and intended purpose of the planting. Well-chosen trees can increase property values up to 10% by adding curb appeal, especially when big specimen trees are present, and save up to 15% in energy cost.

First determine the function of a tree. Is it for shade, windbreak, privacy, aesthetics, or architectural elements? Then choose the best location in the landscape. The site should have enough space for the tree at maturity. Trees too large for the site can lead to future increased maintenance cost and possibly ruin the desired effect.



Shape and form

Trees selected for their architectural elements should have interesting leaf/flower color and



Colorful flowers

Leaf shape or fall color



shape, bark patterns and branching characteristics. When considering these characteristics, avoid placing a tree where flower petals, fruit, and leaf or bark litter falls on walkways or in ponds or pools.

Select tree species with genetic resistance to local common pest problems. Avoid selecting trees susceptible to root or crown rots. Inquire about pest resistance at local cooperative extension offices, retail nurseries or a certified arborist prior to selection to aid in best tree selection.



Interesting bark pattern

(see reverse)



Planting slow growing trees among fast growing trees can add longevity to a landscape. Typically slow growing trees live longer than fast growing ones that can be weak wooded and subject to limb failure. By mixing fast and slow growing trees, an instant landscape effect can be accomplished while slower growing trees add longevity.



Selection of a large deciduous shade tree on a west or south side of a house can provide shade and reduce utility costs by up to 15%. Trees placed to shade large areas of pavement reduce reflective heat making patios, walkways and streets cooler. Remember large trees have wide growing root systems and should be placed at least 15' away from a permanent structure.

Trees provide a habitat for wildlife by giving shelter and providing food. Selection of a fruit or nut tree can provide spring flowers, autumn leaf color and a harvest for wildlife and humans.

When choosing a tree, research local recommendations and consult with industry professionals for species options. Parks, botanical gardens, arboretums and private plantings can provide a close up look at a mature tree, which is helpful to get a realistic vision of a tree and its characteristics.

For more information refer to the ANR website at <http://anrcatalog.ucdavis.edu>, your local University of California Cooperative Extension Master Gardeners or consult a certified arborist.



Funding for this project made possible from the Elvenia J. Slosson Endowment Fund.



TRAINING YOUNG TREES FOR STRUCTURE AND FORM

A well-trained tree is easier to maintain than an untrained tree.

Trained trees have good structure, such as a strong central leader, appropriate vertical spacing between branches, branches that are well spaced radially around the trunk, and strong branch angle attachments.

By providing training during the first five years, a tree will be easier to maintain at maturity, live longer, be more structurally sound, and have a lower risk of branch failure. Untrained trees are more likely to have structural defects possibly decreasing their life and an eventual loss of benefits to the urban forest. In addition, there is the loss of invested time and money.

How to Train Young Trees

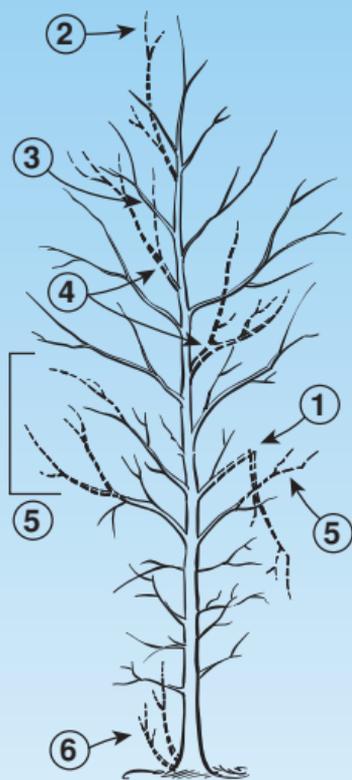
Recommended 5 step process:

1. Remove broken, diseased, dying or dead branches.
2. Select a central upright leader and remove or head back competing upright shoots.

(see reverse for training steps)



3. Select the lowest permanent (scaffold) branch. This branch is the lowest branch that will remain on the tree through its life. This is determined by the use and location of the tree. Remember a branch at 4' will always be at 4'.
4. Select primary scaffold branches and cut back or remove competing branches. The scaffold branches should be radially spaced around the trunk and vertically spaced 12 - 15" between branches. Select scaffolds with strong branch attachment with diameter being no more than half the diameter of trunk.
5. Select temporary branches below the lowest permanent branch. Remove branches that have a diameter greater than $\frac{1}{3}$ the trunk.



No more than 25% of a young tree's canopy should be removed in one year. Training is recommended during the dormant season or winter months.

Each year apply these steps to a young tree until good structure and form is achieved.

For more information about tree pruning contact your local University of California Cooperative Extension office, the ANR publications website at <http://anrcatalog.ucdavis.edu>, or consult a certified arborist.



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TREE CARE

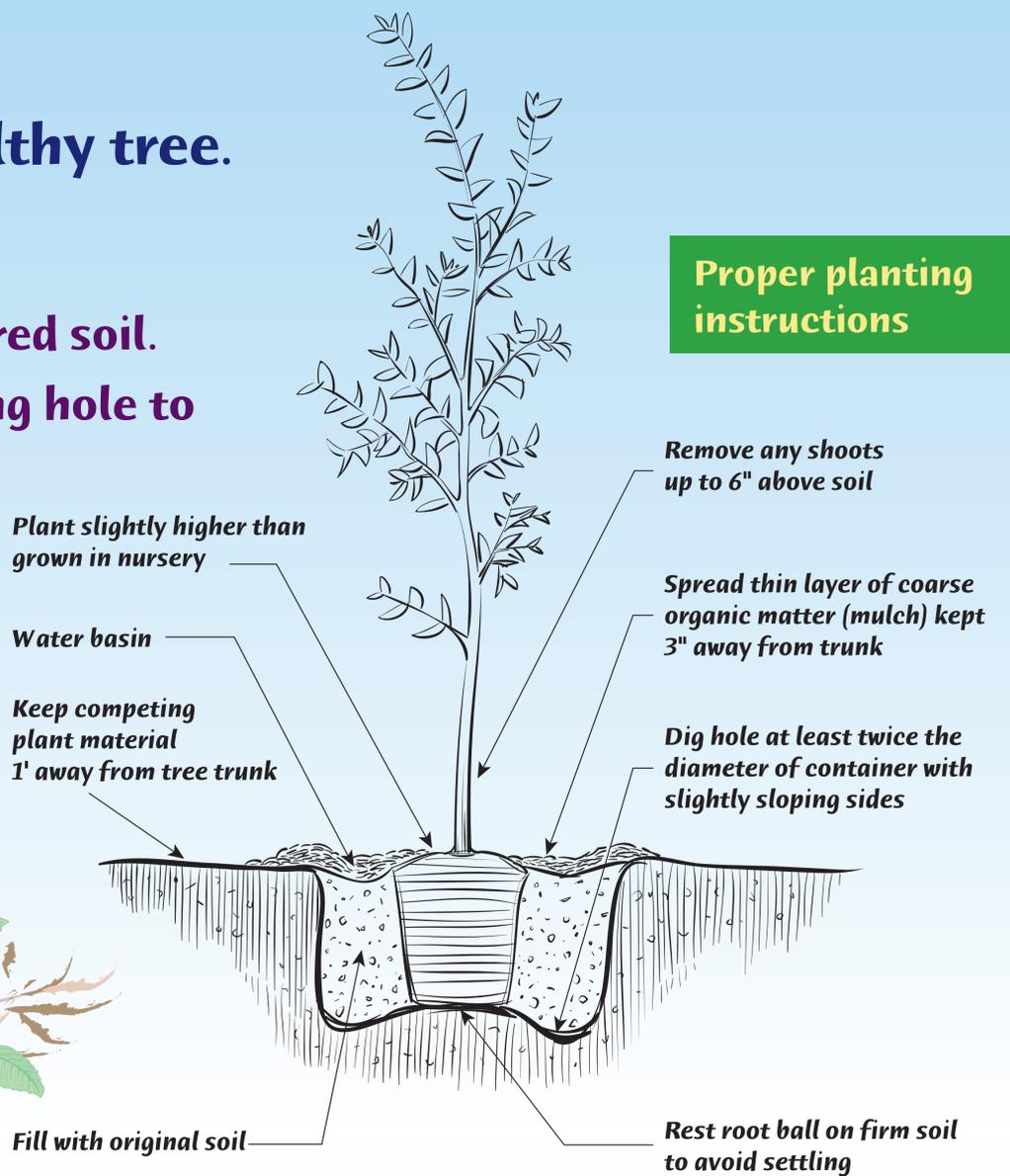
Proper Planting

Proper planting = a healthy tree.

Prepare site:

- ▶ Break up compacted or layered soil.
- ▶ Roughen the sides of planting hole to avoid glazing.
- ▶ Backfill with native soil.
- ▶ Water, and allow to settle for 2 weeks prior to planting.

Proper planting instructions



Proper Staking

Stake trees for protection, anchorage and support.

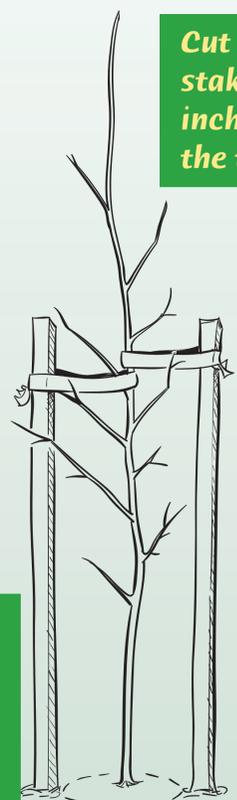
Proper staking instructions:

- ▶ Support the tree by moving fingers upward along tree trunk.
- ▶ Once tree is upright, place ties 6" above fingers.
- ▶ Remove nursery stake.
- ▶ Trees should not be staked if they do not require protection or support.

Cut off excess stake at 2 to 3 inches above the ties.

Nursery stake should be removed at planting.

Maintain lower temporary branches until they reach a 3/4" diameter and then remove.



TREE CARE

Mature Tree Pruning

Pruning mature trees properly for best tree health:

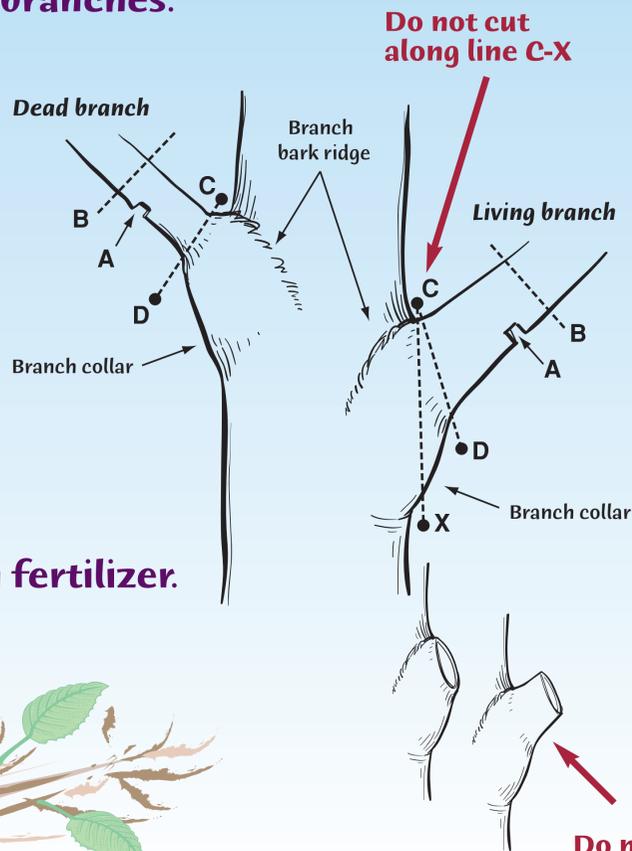
- ▶ Removes dying, diseased or injured wood.
- ▶ Removes crossing or crowded branches.
- ▶ Restructures tree shape.
- ▶ Reduces tree height.

Do Not Top Trees! Instead:

- ▶ Start out right by planting trees that will fit your available space at maturity.
- ▶ Prune young trees for structure and form during the first 3 - 5 years.
- ▶ To slow growth, avoid nitrogen fertilizer.
- ▶ Prune properly and regularly.

Proper pruning principles:

- ▶ Use thinning cuts instead of topping by cutting back to lateral branches or to the trunk.
- ▶ Make cuts just outside of the branch collar.
- ▶ Avoid large cuts.
- ▶ Do not use sealer.
- ▶ To remove large limbs use a 3-saw cut:



- 1) Cut part way through the branch at A
- 2) Cut it off at B
- 3) Make the final cut along C-D.

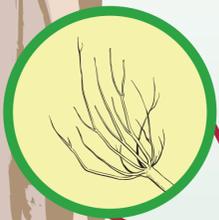
Thinning vs. Topping

BEFORE PRUNING

TOPPING, NO!



THINNING AND CROWN REDUCTION, YES!



When severely pruned, a tree branch will form many vigorous upright sprouts. These sprouts are weakly attached and look unsightly over time.



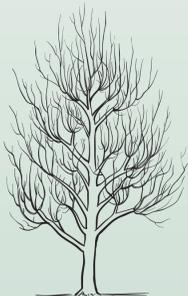
1 year later

The topped tree is stubbed and only a remnant of a lovely tree remains.



3 years later

Vigorous upright sprouts emerge. Sprouts are weakly attached and prone to breakage. They are abnormal, grow rapidly, and cause the tree to lose its natural shape.

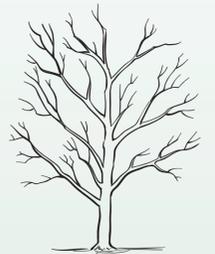


6 years later

A topped tree is as tall as the pruned tree yet far bushier and more prone to limb failure than originally.

1 year later

If pruned properly, corrective thinning and crown reduction cuts occur but beauty and form are retained.



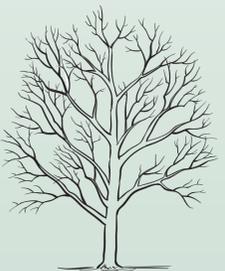
3 years later

Growth of thinned branches is spread evenly throughout canopy, maintaining its natural shape.



6 years later

A properly pruned tree is safer with strongly attached branches, more beautiful in form and its size better controlled.



Tree Selection

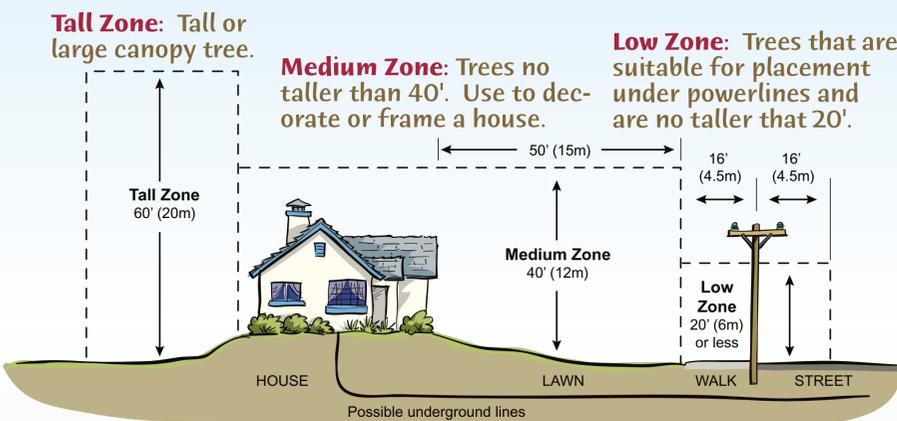
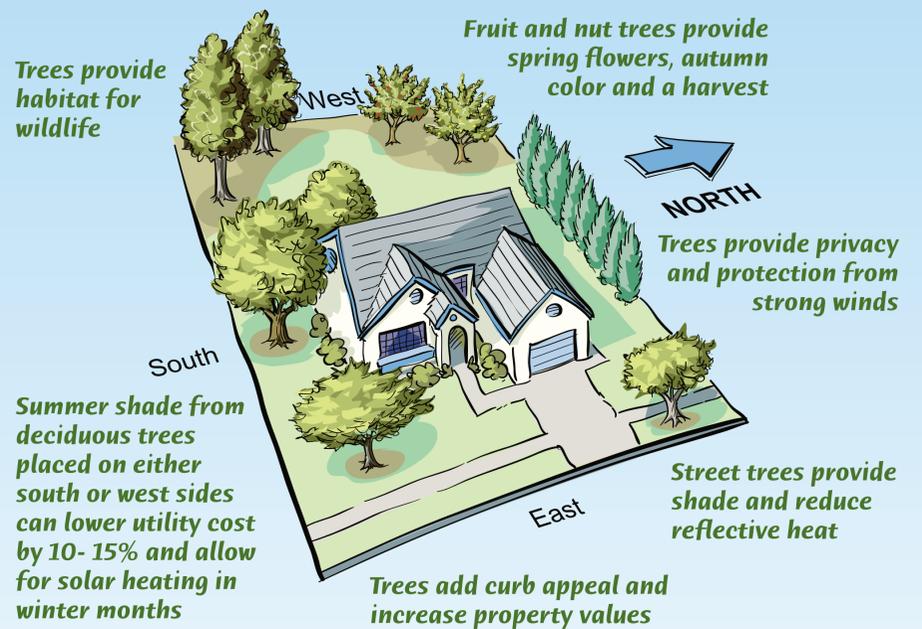
TREE CARE

What will be the purpose or function of your tree? Consider prior to selecting:

Mature size and site conditions:

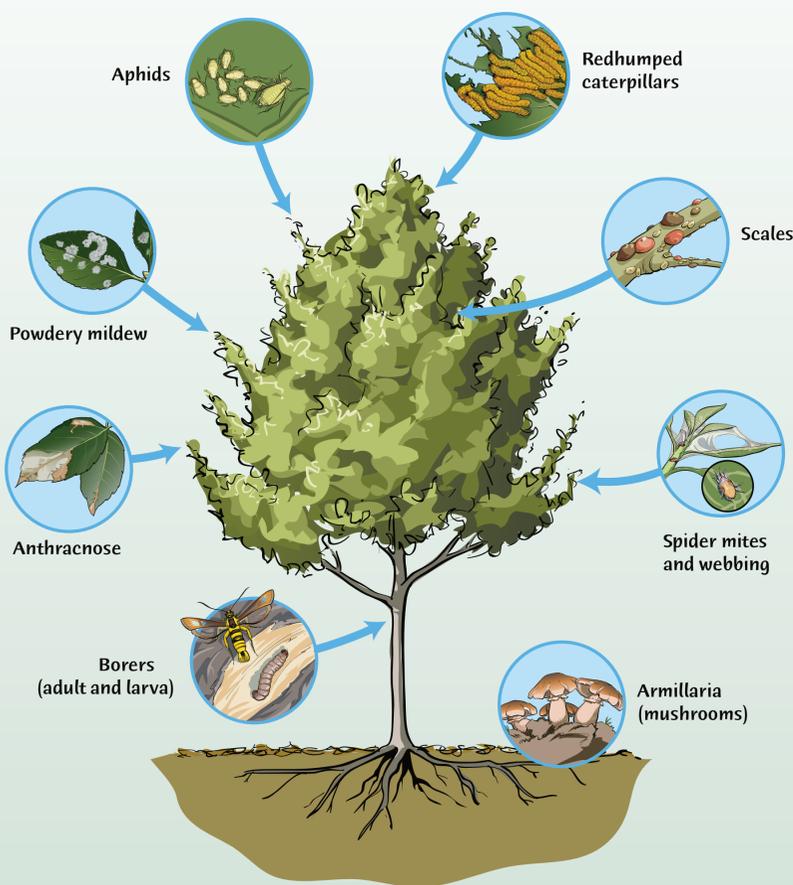
- ▶ **Look Up!** Do not plant any tree that at maturity will come within 10' of a power line.
- ▶ Avoid planting in close proximity to underground utilities.
- ▶ Plant 15' away from permanent structures.

Tree placement:



Personal preferences and aesthetics:

- ▶ Consider tree characteristics such as shape, bark patterns, leaf and flower color.
- ▶ Consider possible leaf and flower litter.
- ▶ Select a tree that will fit your personal taste and landscape needs.



COMMON KEY PESTS AND DISEASES



Pest and disease resistance:

- Trees vary in pest and disease resistance.
- ▶ Select trees that have known resistance to key local pests.
 - ▶ Examine trees regularly for pests.
 - ▶ Do not plant species highly susceptible to root and crown diseases in poorly drained soil.

Remember there is no perfect tree. Select the best tree for the location.

Trees Live for Decades, Plant for Tomorrow.