

Correcting YOUNG TREE Issues

(...while the trees are young)

for

LONG-TERM SUCCESS

By: Ken Menzer, Folsom City Arborist

Reasons to Correct Young Tree Issues

- Move or eliminate trees if the right tree is not growing in the right location – some problems start from the inception. Make sure that is enough space for the bole (upper above-ground portion of the tree) and the tree's root system. Determine if the plant zone is right, watering that will occur naturally or by an artificial system, sun/shade, soil, wind, speed of growth, and resilience to: vandalism, pests, insects, and/or disease. Too many of the same tree genus, species, or cultivar should not be planned to be located in one area. Planting trees too close to infrastructure (i.e.: sidewalks, curbs, paving, underground & overhead utilities, transformers, pools, retaining walls, sound walls, etc.) or structures can cause the demise of the tree if the roots or bole cause unacceptable damage. Usually the tree(s) loose if the damage or the potential of damage will be (or could be) too costly.
- Eliminate trees that will not likely survive and thrive to maturity – If the defects are too great, so that no amount of pruning, staking, or tree care is likely make the tree into one that is in reasonable condition to grow to maturity, then it should be removed and replaced with a similar species tree or a more appropriate selection for that location (may need approval to make change).
- Improve structural strength – Recognize and eliminate defects such as narrow branch angle of attachment and co-dominant leaders, trained trees are structurally stronger than untrained trees. Structurally stronger trees have a lower potential for failure.
- Reduce maintenance costs – Trained trees require less maintenance when they are mature. Typically, trained trees have fewer branches than untrained trees, which means less pruning. In addition, well-spaced branches provide easier access for arborists, and pruning can be accomplished in a shorter period of time. Finally, trained trees might not have structural defects that require correcting by cabling, bracing, canopy thinning, and co-dominant stem removal, which avoids substantial costs. **It is cheaper, easier, simpler, and better long-term results will result from early tree care while the trees are smaller and worked on every year for the first 5-years.**
- Increase tree longevity – Simply by remaining intact longer, trained trees serve as functional components of the urban forest for more time than untrained trees. Trained trees have a lower potential for failure than untrained trees. Failed trees and hazardous trees need to be removed. Trees that have sustained partial failure often need to be removed because they are a potential hazard, eminent hazard, or unsightly. **No tree can**

ever be made to be safe, but we can certainly reduce the hazard potential and make them safer.

- Monitor and improve the cultural condition where the tree is growing and should be growing into – Pruning, staking (or un-staking), or guying a tree might help if the tree is going to live and can grow fast enough to survive natural and man induced stress and other hardships. Rain, drought, sun, heat, animals, lawnmowers, chemicals, soil compaction, can be difficult for a tree, but also soil temperature, fertility, aeration, soil pH, lack of available organic material, and competition from other plants.

Steps for Correcting Young Trees Issues

1. **Identify the tree's species & cultivar (if possible), plus general plan for this tree at this location** --- Is this the right tree (the right cultivar too) for this location? Identification is very important. Different trees will have a certain shape, special health issues, insects that are beneficial and harmful, a carrier of larvae and/or disease at certain times of the year. Flowers and fruit at specific times of the year will appear in alignment and/or need of insects or birds to pollinate or protect them. Certain bacteria will only grow on certain cultivars. Powdery mildew grows easily on *Platanus x acerifolia* 'Bloodgood', but not on *A. x a.* 'Yarwood' or 'Columbia'. Think about "islanding" a group of trees to make mowing easier, plus to keep off a larger section of the root system (less soil compaction), and to promote a larger colony of *mycorrhiza* fungus that will benefit and support trees, shrubs, and perennials.
2. **Removal of dead and/or poor condition trees** --- If the tree is in too poor of structural shape, planted too low, scared trunk from lawnmowers or weed-eaters, has been broken, topped, girdled roots, sun scalded bark (on the south to west side of the trunk), or is simply dead...this is the time to remove it. Maybe it is still under warranty (by the developer, landscaper, or by a mitigation bond) and if possible, have the tree replaced by the responsible party. Maybe the best time to replace will be in the late-fall or early-winter.
3. **Review the location** --- If a tree is dead or on a downhill slide, look at all the symptoms and possible reasons for its demise. Is the location too wet or dry? Change the irrigation or drainage. Is it continually being hit by mowers? Change the position of the tree or "island" the tree into a group of other trees, bushes, and/or other plants. What other symptoms explain the condition of the tree? **Health + Structure = Condition**
4. **Remove broken, dead, dying (if you can tell), diseased (if you can tell), infested (if you can tell), or damaged branches** --- Inspect the canopy from all sides and remove or cut back these branches with proper (correct & sharp) tools and cuts. **WARNING: If the tree is infected with a disease, it can be spread to other locations on the same tree or to other trees via the pruners, loppers, handsaw, or chainsaw.**
5. **Select and establish a central leader** --- There should be only one leader for most tree species (not on all species, i.e.: Crape Myrtle, Saucer Magnolia, Chaste Tree, etc.). Select the strongest and most vertical stem as the leader and remove or suppress competing stems. Watch for opposite bud species of trees (mostly trees in the maple and ash family) for co-dominant leaders. Select one leader to retain and cut off the other... Do this as soon as possible, when the tree is young and the leaders are small. **If the competing leaders are over 3-4" then look at bolting, bracing, cabling, or removal of the tree and starting over.**

6. **Select and establish the lowest permanent branch** --- Look for a well attached branch at the desired height (determined by location and use, generally 7-8' above grade), and removed closely spaced and competing branches as they are larger than 1" in diameter. The diameter of the lowest permanent branch should be no more than one-half that of the central leader or trunk at the point of attachment. Smaller temporary branches should be left close to the lowest permanent branch. Larger temporary branches should be pruned back (suppressed) to 2-5 buds. Leaves on branches are very valuable to the tree to: shade the trunk (preventing sun scald), providing energy to the whole tree (for growth and protection), and specifically adding growth to the immediate area where the branch is attached (increasing trunk caliper). **Think of leaves like solar panels, if you want more power, you will want more leaves retained.**
7. **Select and establish the scaffold branches** --- Look to retain well attached branches above the lowest permanent branch that are no more than one-half the diameter of the central leader. Scaffold branches should be well spaced both vertically and radially. Vertical spacing should be 18 inches or more for large trees and 12 inches for smaller trees. Radial spacing should allow for balanced branch distribution around the central leader. Leave small branches close to scaffolds as temporary branches and cut back or remove larger branches. **Normal pruning, unless there is a serious reason to do something else, only remove a maximum of 25% of the foliage per year.**
8. **Select temporary branches below the lowest permanent branch** --- Some or all the branches below the lowest permanent branch can & should be retained as temporaries. If possible, leave the smallest branches and cut back or remove the largest branches. **RULE OF THUMB: Do no cut off unwanted branches until they are equal or slightly larger than your thumb in diameter (about 1").**

How Much to Prune?

Generally, no more than 25% of the canopy of a young tree should be removed in any one year. In some cases, removing only 5% to 10% will be sufficient to develop good structure and form. Particularly fast-growing trees or trees with significant defects, more than 25% may need to be removed. Minimal pruning as needed is best, so a tree can grow into its natural shape with the least amount of intrusion by cutting open the protective bark. **Don't just prune to prune, to keep busy.**

How Large of Pruning Cuts?

Some trees cover pruning wounds quickly (London Plane) and others more slowly (Purple Leaf Plum). Some wood is resistant to decay (Coast Redwood), while other wood is soft and pithy, so it decays quickly (Box elder). It is best to keep pruning cuts as small as possible, so that is why training should be done early in the tree live. Purchase well shaped trees. Reject poorly shaped trees (above & below ground). All trees must adhere to ANSI Z60.1 American Standard for Nursery Stock.

Our native oaks are slow to grow, slow to die, and slow to callous over a wound. Especially for our native oaks, cuts are to be kept small. The un-written rule for oak pruning in the world of arboriculture is called the 3" rule: **"A cut over 3" in diameter will generally start to decay and/or become infested with insects before it will completely callous over the wound"**

When is a Tree Permit Required in Folsom for Pruning?

Pruning any "protected tree" with a cut over 2" in diameter requires a Tree Permit issued by the City Arborist. Removal of a protected tree (dead or alive) must be permitted. Protected trees are:

- 1) All native oaks over 6" in diameter, measured 4'-6" (DBH) above the average soil grade.

- 2) All native multi-stem oaks having an aggregate diameter of 20" measured at DBH
- 3) All "street trees", all species and all sizes planted within 12.5' of the property line, adjacent to a public street
- 4) Trees planted as Condition of Approval (parking lot shade trees and required screening or landscape trees)
- 5) Mitigation trees
- 6) Trees on City property

When to Prune?

Both deciduous and broadleaf evergreens should be pruned in the winter months. Conifers can be pruned at this time as well. Do not prune deciduous species until leaves have dropped in the fall. At the latest, prune well before buds swell and new leaves begin to develop. Pruning during the growing season may be needed to direct growth, remove diseased or infected parts, or to remove watersprouts or suckers. This pruning should be kept to a minimum, however. **The worst time to prune any size tree is in the spring just after bud-break.**

Some exceptional pruning problems:

- ◆ *Prunus* --- Flowering Cherry, Flowering Peach - prune after flowering
- ◆ *Pyrus* --- Flowering Pears - do not spread Black Spot or Fire Blight, clean pruners after each cut if infected
- ◆ *Pinus* --- Pines - do not prune when sap is flowing, late-spring to early-summer, due to borer attraction)
- ◆ *Betula* --- Birch - do not prune late-spring to early-summer, due to borer attraction

Staking and (just as important) Un-staking

Stakes should be placed far enough away from the tree, so the stakes will not be driven through the root ball and provide space for the tree to move with the wind. The support should not be needed for the top of the tree, but the real need for stakes is to keep the lowest part of the trunk and root ball still as the roots connect. The best type of ties are loose, so the tree can move with the wind and not hit the a second wooden stake, like the principal of low-impact aerobic exercise will allow lots of movement, but not to the extreme to cause injury

Staking, like a cast for a broken leg on a person, it meant to be there only short-term to provide temporary immobility while the new roots anchor into the soil. Also, like the cast on your broken leg, if you leave the cast too long, the bone will heal, but the muscles will atrophy and can cause other structural problems. If the stakes are left too long... the roots will not need to grow to anchor the tree, as the stakes provide the needed attachment to the ground. The trunk will not grow equally in diameter as compared to the bole (the canopy of the tree), making the trunk physically less able to whole top weighted tree.

Staking types:

- ❖ Two un-treated wood stakes with soft ties placed 18" minimally apart (or outside the rootball) and cut off just above the lowest ties.
- ❖ One metal stake that is specially designed as a tree support stake (like: Redi Stake) can work if it is installed correctly and continually monitored and modified if there is a problem with leaning, the tie system, or vandalism.

Staking season:

There is a best time to place and remove stakes. It becomes obvious that the best time to stake trees is when they are planted, but better is to buy nursery trees that were grown with the least amount of staking and should hopefully support themselves without stakes. When the stakes are initially removed the tree should not fall over. The stakes are to direct and encourage the trees to grow straight and protect the tree during transporting. Stakes can protect trees that are

newly exposed to more extreme winds (from nature or from vehicular traffic). Stakes can also protect trees from some forms of vandalism. Un-staking should occur as soon as a tree is well enough anchored, but not just prior to or during the highest wind season, which in our area is winter through spring. Removing stakes in winter or spring would be like a downhill ski racer that had a broken leg, to remove the leg cast the day of an Olympic ski race. The best time to un-stake is mid-June, which is usually at the beginning of the summer doldrums (as far as most winds) and corrective staking would start the end-of-October. **Staking season starts on Halloween and un-staking is best around Father's Day.**

Species Response to Training

Although species vary in their response to pruning and their need for pruning, these Young Tree Care principles can be applied to most deciduous and broadleaf-evergreen species. In research tests: young Raywood Ash, Norway Maple, Interior Live Oak, and American Sweetgum were pruned uniformly, yet they retained growth characteristics typical of the species. Un-pruned trees of the same species developed significant defects, such as weakly attached branches, codominant stems, dense canopies, and poor balance.

Crape “Murder”

This is an easily cured problem. Either leave the tree alone or just prune off the seed heads as soon as the flowering is completed. There are non-murdered cultivars of Crape Myrtle, *Lagerstroemia* hybrids that will mature at 8' tall x 6' wide ('Pecos' & 'Hopi') to 25'+ tall x 12'+ wide ('Natchez' & Muskogee') and *L. indica* cultivars that can be as small as 2' tall ('Pink Blush') when fully grown, then up to 3' tall ('Centennial', 'Chica red or Pink', 'Louisa', or 'Dwarf Purple'). It is also presumed that if the landscape architect wanted a smaller tree, then a specific sized tree would have been selected and approved by the City Arborist for the City of Folsom. Many of the median and entry trees were selected to provide summer colored flowers, fall colored leaves, winter bark interest, and shade. Shade may even be a requirement for parking lots (40% within 15-years). Heading cuts also called “topping” and round-over (see “round-over” in glossary) is not acceptable pruning technique for these trees. The bad practice is also called “poodle cut”, “lolly-pop”, or “lion's tail” and should not be utilized in Folsom.

Conifers

The same **Correctly Training Young Tree** steps can be applied to conifers with some modifications. Damaged branches and (most important) competing leaders need to be removed. The normal shape for most conifers is excurrent when young. Some trees like the Italian Stone Pine, *Pinus pinea* will have a decurrent large multi-stemmed top “head”. When side clearance is needed for vehicles, equipment, or people, then plan to slowly remove the lower branches, as the crown is raised.

Watering

This is a huge problem in Loomis and especially in new subdivisions. Roots need air as much as they need water, but all new trees need more frequent watering than most established trees. When the pores in the soil are filled with water then there is no room for air in the soil. If the pores are completely filled with air, the roots will dry out. Either way the new tree will die. Most commonly most people kill trees by over-watering. A general watering schedule I am recommending is (depending on the soil type and porosity in each location of a property, the daily evapotranspiration rate, ectomycorrhizae colony that has been established, mulch depth and type, plus lots of other contributing factors):

If the temperature is in the 60's ° F or less in Folsom, no watering is needed

If the temperature is in the 70's ° F in Folsom, water 1 time / week

If the temperature is in the 80's ° F in Folsom, water 2 times / week

If the temperature is in the 90's ° F in Folsom, water 3 times / week

If the temperature is in the 100's ° F in Folsom, water 4 times / week

Never water every day or you will kill most trees with root rot diseases or other decay problems. If you believe your trees, lawn, or other plants need more water, ...increase the duration time, not the frequency of watering.

Wood Mulch

This organic layer of chipped wood is not to be confused with compost. Compost is mixed with the soil and is composed of fairly well decomposed organic material (usually leaves, sawdust, vegetable waste, etc.); whereas wood mulch is usually not very decomposed and rough chipped wood, leaf, bark, and twig material that is laid on top of the soil to act as an artificial duff layer. This mulch layer will support a beneficial colony of *mycorrhiza* fungus, cool the soil, promote root growth ...all summer (without heat-dormancy), trap water, reduce run-off, prevent soil erosion, and increase the likelihood of "live soil" (see Glossary below), which will aid soil aeration, and porosity.

Field Practice

It is very important to practice and understand the details of how to train young trees on a continual basis. Review the steps with a co-worker before making cuts, removing stakes, or removing the tree. Discuss reasons for your selections, and step back to look at potential impacts on tree form and size. After you are confident of your selections, make your cuts. Again, step back from time to time to assess impacts on tree form.

Remember that species and conditions vary considerably, and you will always need to use good judgment. Make sure that you can identify the species and if possible, also identify the cultivar of a tree. This will tell you a lot about how the tree is supposed to grow and what is needed by the tree. Always look for the overall condition of the individual tree in that location and then start to know the species and cultivar requirements to make that tree thrive (not just survive).

Understand the reasons for the minimal, but proper pruning, and then make reasonable adjustments in the field. You are on your way to becoming an arborist or improving your knowledge of trees, weeds, disease, insects, biology, pests, fungus, pruning tools: care and usage, irrigation, aeration, soils, root growth, pruning techniques, tree shape, dendrology, silviculture, and arboriculture.

Glossary of Commonly Used Terms

Apical dominance – condition in which the terminal bud inhibits the growth and development of the lateral buds on the same stem formed during the same season

Callous tissue – special tissue formed by the cambium, usually as the result of wounding or pruning

Central leader – dominant upright stem that forms the main trunk

Codominant leader – stems or trunks of approximately equal size, growing at about the same rate and attached to one another; typically, the attachment is structurally weak

Crown – foliated portion of the tree from the lowest branch to the tree top, *synonymous with canopy*

Decurrent – spreading or round-headed tree form; scaffold branches codominant with central leader at maturity

Double leader – two codominant stems more or less in the center of the tree and jointly assuming the role of the leader

Excurrent – conical tree form; strong central leader is present to the top of the tree when mature, leader development is dominant over scaffold development

Flush cut – pruning cut through an/or removing the branch collar, causing unnecessary injury to the trunk or parent stem (also see *stub cut*)

Included bark – pattern of development at branch junctions where bark is turned inward rather than pushed out; contrast with branch bark ridge and synonymous with embedded bark

Lateral – secondary branch arising from scaffold limbs

Live Soil - soil that contains vast quantities of living microflora (algae, bacteria, fungi, and actinomycetes) and macrofauna (vertebrates, arthropods, annelida, mollusca, protozoa, and nematodes), which continue to live due to favorable temperature, air, moisture, and organic nutrient conditions.

Lowest permanent branch – lowest scaffold on the tree, height is determined by tree use and location

Major Pruning - the removal of any live branch and/or root tissues greater than 2” (two inches) in diameter from a protected tree. Pruning shall conform to the most current ANSI A300 standards for Tree Care and the companion ISA Best Management Practices (BMPs). Major pruning must be done by an arborist (see: Arborist) or under the direct supervision of the on-site arborist during the pruning.

Minor Trimming - the cutting from protected trees of any size dead wood and live limbs and/or root tissues less than 2” in diameter; and not to exceed 25% removal of live tissue over a one-year period. Pruning must conform to the most current ANSI A300 standards for Tree Care and the companion ISA Best Management Practices (BMPs).: (1) dead or diseased limbs or twigs; (2) parts which may result in damage to a dwelling; (3) parts which must be removed for safety or public utilities; or the pruning of protected trees to promote health and growth. Trimming which substantially reduces the overall size or density of the tree or destroys the existing symmetry or natural shape of the tree is not considered minor trimming.

Pollard – pruning technique by which young trees are initially headed and then re-headed annually without disturbing the callous knob

Photosynthate – carbohydrate produced by leaves and other chlorophyll containing tissues during photosynthesis

Protected Tree (in Folsom) - native oak trees, heritage trees, street trees, landmark trees, required parking lot shade trees, mitigation trees, and Condition of Approval trees.

Round-over – to reduce tree size by heading back all stems on the periphery of the canopy by an equal amount, not a recommended pruning practice, also see topping

Scaffold branch – a branch that is part of the main structure of the crown; scaffolds arise from the central leader or main trunk

Stub cut – pruning cuts made too far outside the branch ridge or branch collar that leave branch tissue attached to the stem

Sucker – a vigorous, upright epicormic shoot that arises from latent buds below the graft union or soil level

Suppression – to restrain a natural flow of energy to a part of a plant, to check or hold back a branch, limb, stem or tree by removing a portion of its twigs and leaves

Temporary branch – a branch that remains in the tree for a limited period of time and is not a part of the main structure of the crown; temporaries can occur on the central leader, trunk, or scaffold branches

Topping – inappropriate pruning technique to reduce tree size; cutting back a tree to buds, stubs, internodes, or laterals not large enough to assume apical dominance

Tree Protection Zone (TPZ) in Folsom - means the zone around a protected tree's root system to adequately protect the root system from damage. This is delineated as an irregular full circle around a protected tree, with a radius equal to the protected tree's longest horizontal dripline measurement, plus 1 foot.

Watersprout – a vigorous upright shoot that arises from latent or adventitious buds above the graft union on older wood