



MAINTAINING YOUR STREET TREES

You've scouted your site, picked your trees, and planted, so now what? Now it's all about caring for your tree.

SO WHAT *SHOULD YOU DO?*

The rest of the packet will address this in different segments. Here is a brief outline of what will be addressed:

- 🌳 **Fertilization**
- 🌳 **Trees and Lawns**
- 🌳 **Water**
- 🌳 **Mulching**
- 🌳 **Pruning** – This section will be abbreviated for space reasons. Please feel free to visit www.treesaregood.org for more information or call your local International Society of Arboriculture (ISA) Certified Arborist.
- 🌳 **Winter Care**

FERTILIZATION

Trees require certain nutrients (essential elements) to function and grow. Urban landscape trees are often grown in soils that do not contain sufficient available nutrients for satisfactory growth and development. In these situations, **it may be necessary to fertilize to improve plant vigor.**

Fertilizing a tree can improve growth; however, if fertilizer is not applied wisely, it may not benefit the tree at all and may adversely affect the tree. Mature trees making satisfactory growth may not require fertilization. When considering supplemental fertilizer, it is important to know which nutrients are needed and when and how they should be applied.

Soil conditions, especially pH and organic matter content vary greatly, making the proper selection and use of fertilizer a somewhat complex process. When dealing with a mature tree that provides considerable benefit and value to your landscape, it is worth the time and investment to have the soil tested for nutrient content. Professional arborists can arrange to have your soil tested at a soil testing laboratory and can offer advice on application rates, timing, and the best blend of fertilizer for your trees and the rest of your landscape.

Mature trees have expansive root systems that extend from 2 to 3 times the size of the leaf canopy. A major portion of actively growing roots are located outside the tree's drip line. There is a long-standing inaccurate belief that trees must be "deep root" fertilized. This notion is associated with the myth that a tree's root system is an underground mirror of the crown. Because most of the absorbing roots are actually in the upper few inches of soil, it makes little sense to place the fertilizer deeper. It is important to understand this fact when applying fertilizer to your trees as well as your turf. Understanding the actual size and extent of a tree's root system before you fertilize is necessary to determine how much, what type, and where to best apply fertilizer.

If you are fertilizing your lawn and trees are occupying the same area, the trees might not require supplemental fertilization. The key to any fertilization program is to base the application of the fertilizer based upon the plant's needs.

TREES AND LAWN

Maintenance practices for trees and turf are different. Because tree and grass roots exist together in the upper 6 to 8 inches of the topsoil, treatment of one may damage the other. Fertilizer applied to one plant will also be absorbed by the roots of a nearby plant. Normally that is good, but excessive fertilization of either trees or turf can result in tree crown or grass blade growth greater than desired.

Chemical treatments- Herbicides, especially broadleaf weed killers, are often used on lawns. It is important to remember however, that most trees are broadleaved plants and can be injured or killed if high enough doses reach them. Homeowners must keep in mind that "weed and feed" fertilizers contain herbicides, which can damage trees.

Lawns, water and trees- Watering can be beneficial to trees and lawn if the watering is done correctly. Trees need, on average, the equivalent of one inch of rain every seven to ten days, depending on the species. Tropical rain forest trees may require more. Frequent, shallow watering does not properly meet the needs of either trees or turf and can be harmful to both, deep and slow watering 1-2 times a week to meet the amount needed is preferred.

Mowing and Line-Trimming- Turf growing under or near trees should be mowed at the top of its recommended mowing height. Mowing off no more than one-third of the grass blade's height and letting the clippings remain on the lawn helps to ensure a healthy and vigorous lawn. In an ideal situation, tree and turf maintenance would be handled by the same individual in order to maximize the benefits of all maintenance practices.



Most people don't realize the degree of damage that can be caused by the bumping of a mower or the whipping action of a nylon string trimmer. A tree's bark can only provide so much protection against these devices. Young, thin-barked trees can be damaged almost immediately. ***In the worst-case scenario, the trees may die. Those that are not killed will be***

stressed (weak and susceptible), and wounds may serve as entry points for diseases, borers or other insects.

Pruning for light penetration- Pruning to increase light penetration for the lawn may be considered, keep in mind that it is usually not a permanent solution. That's why a rule of thumb is not to remove more than one-fourth of the tree's foliage-bearing crown in a single pruning. If a tree is thinned too much, it will be stressed, and will probably produce many water-sprouts (suckers) along its branches to compensate for lost foliage. This process defeats the purpose of pruning to allow more light penetration. It may help to "raise" a tree's crown to improve light penetration. Crown raising involves the removal of lower branches on trees, and most tree species are quite tolerant of this pruning practice.

Root Control- Some trees tend to form surface roots, which can be a major problem in lawns. Homeowners always want to know to what extent they can prune or remove tree roots without killing the tree. Because cut roots tend to develop more roots, root pruning is generally not a solution.

SPECIAL TREE AND LAWN SITUATIONS

-  **Placing fill dirt around existing trees.** Fill dirt changes the ratio of oxygen to carbon dioxide around tree roots and the roots may subsequently die. This is not recommended.
-  **Establishing lawns around existing trees.** Preparation of a seedbed for lawns requires disruption of the upper 4 to 6 inches of topsoil. This soil contains the feeder roots of trees. Damage to tree roots often results in declining tree tops.
-  **Lawn watering.** Homes are sometimes built in woodlots. Excess water at the tree trunk encourages growth of fungi that can kill trees.

WATER! GIVE YOUR TREE A REFRESHING DRINK

So why water? Trees will die under drought stress if they do not get adequate water. *Young or newly planted trees require a minimum of 5 gallons of water each week.* Older, established trees have more extensive root systems, but may not find

enough water during a drought to stay healthy. Trees do not go dormant during drought periods, like grass, and once brown will stay brown when the rains resume!

Trees are worth the investment. They provide us with shade to cool us and reduce glare on sunny days; 5 gallons is the same as one toilet flush and well worth the little bit of extra money spent on the water bill.

TIPS ON WATERING:

- **Long and slow** soaks are the key to tree watering- this allows the water to penetrate the root zone deeply without running off over the soil surface, which wastes water and doesn't give adequate water to the tree's roots.
- An easy and inexpensive way to do water is to drill 2-3 small holes (1/16"-1/8") into the bottom of a 5 gallon bucket, set the bucket near the tree, fill with water one-two times a week, and you are all set!
- Soaker hoses, ice blocks, and hose end devices that control water speed can even be used.
- **Using overhead sprinklers for watering trees is expensive and ineffective. As much as 70% of the water is lost into the air before falling to the soil!** Lawn irrigation systems also do not deliver enough water for trees.

MULCHING

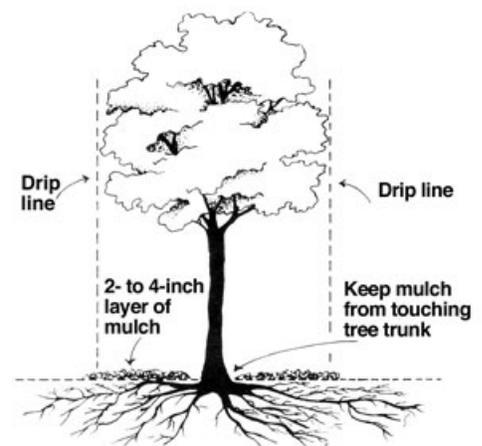
Why mulch at all? Mulch is any material applied to the soil surface for protection or improvement of the area covered. Organic mulches are made of natural substances such as bark, wood chips, leaves, pine needles, or grass clippings. They decompose over time and need to be replaced. Urban landscapes are typically harsh environments with poor soil conditions, little organic matter, and big fluctuations in temperature and moisture - all "unfriendly" growing situations for trees. When applied properly, mulch helps maintain soil moisture, control weeds, improve soil structure, and inhibit certain plant diseases. Mulch also protects plants and trees from "weed whacker" damage and "lawnmower blight" in addition to giving planting beds a uniform, well cared-for look.

But too much mulch - be it layers deep or piled high against tree trunks - can cause major problems for homeowners, including:

- Excess moisture in the root zone, which causes plant stress and root rot;
- Insect and disease problems;
- Micro-nutrient deficiency or toxicity;
- Weed growth;
- Smelly planting beds, caused by anaerobic conditions and "sour" mulch;
- Habitat creation for rodents that chew bark and girdle trees.

The Basics of Mulching - To ensure the health of your trees and plants, follow these practical mulching tips to landscape, like the pros:

- For well-drained sites, apply a 2- to 4-inch layer of mulch. If drainage problems exist, use a thinner layer.
- If mulch is already present, check the depth. Do not add mulch if there is already a sufficient layer (2 to 4 inches) in place. Instead, rake the old mulch to break up any matted layers and refresh the appearance
- Avoid placing mulch against the tree trunks.
- If mulch is already piled against the stems or tree trunks, pull it back several inches so that the base of the trunk and the root crown are exposed.
- Mulch out to the tree's drip line or beyond if possible. Some plants may benefit from the use of slightly acidifying mulch such as pine bark.



- 🌿 Organic mulches are preferable for their soil-enhancing properties. Be sure it is well aerated and composted to avoid sour-smelling mulch.
- 🌿 Avoid using un-composted wood chips that have been piled deeply without exposure to oxygen. Use composted wood chips instead, especially when they contain a blend of leaves, bark, and wood

PRUNING

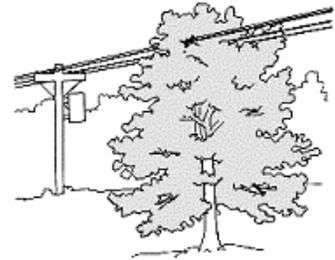
Why Prune? The removal of *dead, diseased, or damaged branches* (the three D's) helps to reduce the amount of stress on a tree and keeps it growing. Branches that are weak or interfere with things like traffic signs should be trimmed to avoid possible injury to people or property.

Some simple rules to follow when pruning:

- Prune with a purpose- Remove *the three D's*, provide clearance, or improve structure.
- Use proper technique-Improper cuts can cause long-term damage.
- Make small cuts- this creates less damage to the tree than large cuts.
- Make cuts just outside the branch collar- this allows for faster wound closure. (see below for illustrations).
- Do not leave stubs.
- Only use sharp and clean tools.

AVOID TOPPING!!! TOPPINGS BELONG ON ICE CREAM SUNDAES-NOT TREES!

At times, a tree or plant needs to be pruned to avoid interfering with utility lines, buildings, or other aspects of the urban environment. In these cases, ***it is important to avoid the practice of topping*** - the removal of all parts beyond a certain height with no consideration of the plant's structure or health. While many believe **topping** will reduce a hazard, it actually **makes the tree more hazardous in the long run**, and it is a **temporary and ineffective solution**.



The destructive effects of topping include:

- 🌿 "Starved" trees - Topping often removes 50-100 percent of the leaf-bearing crown robbing the tree of food-creating leaves.
- 🌿 Creation of weak shoots- As a defense mechanism, a tree will quickly grow (up to 20 feet in one year) food-producing shoots that are weak and prone to breaking, resulting in a more hazardous tree.
- 🌿 Added stress for the tree- If a tree does not have enough stored energy it will not be able to produce the chemicals required to defend the multiple wounds from a disease or insect attack.
- 🌿 "Sunburned" trees- The leaves within a tree's crown absorb sunlight. Without this protection, branches and trunks are exposed to high levels of light and heat which can burn the tissues beneath the bark.
- 🌿 Poor aesthetics- Topping removes the ends of branches often leaving unsightly stubs, and destroying the natural form of the tree. A tree that has been topped can never fully regain its natural form.
- 🌿 Higher maintenance costs- Trees that have been topped will need pruning more often, or may die and need to be removed. Topped trees are potential liabilities and can reduce property value.

JUST AS THEY SAY...TIMING IS EVERYTHING – WHEN SHOULD YOU PRUNE?

Most routine pruning to remove weak, diseased, or dead limbs can be done at any time of the year. Growth is maximized and wound



closure is fastest if pruning occurs before the spring growth flush - when trees expend a great deal of energy to produce foliage and early shoot growth. Heavy pruning immediately after growth flush can stress the tree. Avoid pruning during active disease transmission periods (such as early and mid-spring and early fall). A few tree diseases, such as oak wilt, can be spread when pruning wounds allow spores to access a tree.

Summer flowering occurs on the new wood produced in the spring, while spring flowering occurs on the wood produced during the summer growth. Pruning for summer flowering plants and trees should take place in the winter or early spring to establish a healthy growing environment for new buds. Pruning for spring flowering plants should take place after the plants have bloomed in early spring. If the tree or shrub is less than two years old, only light pruning is needed.

HOW MUCH SHOULD BE PRUNED?

Think of your pruning as a tight, closely monitored budget that is not meant to be over-extended; pruning too much is like going into the red.

The amount to remove depends on the tree size, species, and age, as well as pruning objectives. *Younger trees tolerate the removal of a higher percentage of living tissue better than mature trees do.* Removing just one, large-diameter limb can create a wound that the tree may not be able to close. An important principle to remember is that a tree can recover from several small pruning wounds faster than from one large wound.

Mature trees should require little routine pruning. A widely accepted rule of thumb is *never to remove more than one-quarter of a tree's leaf-bearing crown.* In a mature tree, pruning one-quarter of a tree's leaf bearing crown could have negative effects. The pruning of large mature trees is usually limited to removal of dead or potentially hazardous limbs. The older and larger the tree, the less energy it has to close wounds and ward off decay or insects.

A common mistake is to remove too much inner foliage and small branches. It is important to maintain an even distribution of foliage along large limbs and in the lower portion of the crown. Over-thinning reduces the tree's sugar production capacity and can create tip-heavy limbs that are prone to failure.

PRUNING TOOLS

When pruning trees, it is important to have the right tool for the job. For small trees, most of the cuts can be made with hand pruning shears. The scissor-type, or bypass blade hand-pruners, is preferred over the anvil type; they make cleaner and more accurate cuts. Cuts larger than one-half inch in diameter should be made with lopping shears or a pruning saw.

Never use hedge shears to prune a tree. Whatever tool you use, make sure it is kept clean and sharp. Diseases can be spread with tools.

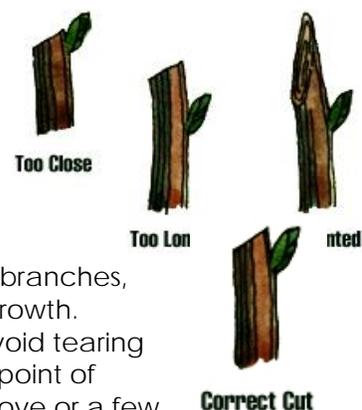


MAKING THE CUT! HOW TO MAKE PROPER PRUNING CUTS

Where you make a pruning cut is critical to a tree's response in growth and wound closure. Make pruning cuts just outside the branch collar. Because the branch collar contains trunk or parent branch tissues, the tree will be damaged unnecessarily if you remove or damage it.

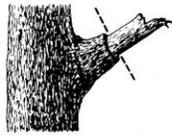
In fact, if the cut is large, the tree may suffer permanent internal decay from an improper pruning cut. If a permanent branch is to be shortened, cut it back to a lateral branch or bud. Internodal cuts, or cuts made between buds or branches, may lead to stem decay, sprout production, and misdirected growth.

When removing a large limb, first reduce its weight to avoid tearing the bark make an undercut about 12-18 inches from the limb's point of attachment. Then make a second cut from the top, directly above or a few inches further out on the limb.

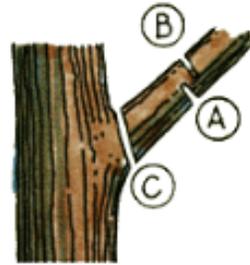




Pruning cuts should be made just outside the branch collar.



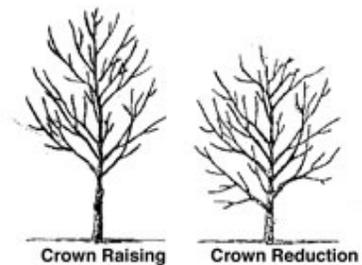
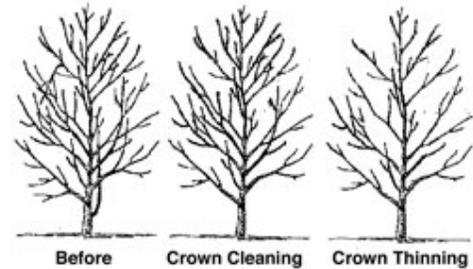
On a dead branch that has a collar of live wood, the final cut should be made just beyond the outer edge of the collar



PRUNING TECHNIQUES

There are specific types of pruning that help trees stay healthy, safe, and beautiful.

- ✂ *Cleaning* removes dead, dying, diseased, crowded, weakly attached, and low-vigor branches from the crown of a tree.
- ✂ *Thinning* selectively removes branches to increase light penetration and air movement through the crown and reduces weight on heavy limbs to retain the tree's natural shape.
- ✂ *Raising* removes lower branches from a tree to clear space for buildings, vehicles, pedestrians, and views.
- ✂ *Reduction* trims the height or spread of a tree by pruning back the leaders and branch terminals to lateral branches that are large enough to assume the terminal roles (at least one-third the diameter of the cut stem). Compared to topping, this helps maintain the form and structural integrity of the tree.

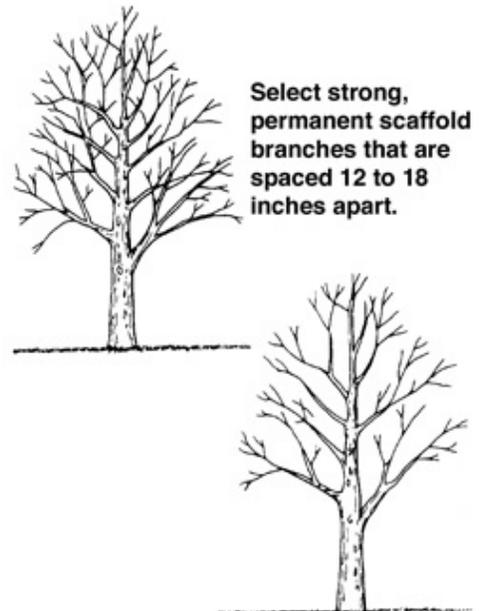


PRUNING YOUNG TREES FOR THE FUTURE

Proper pruning is essential in developing a tree with a strong structure and desirable form. Trees that receive the appropriate pruning measures while they are young will require little corrective pruning when they mature.

Keep these few simple principles in mind before pruning a tree:

- ✂ Each cut has the potential to change the growth of the tree. *Always have a purpose* in mind before making a cut.
- ✂ *Proper technique is essential.* Poor pruning can cause damage that lasts for the life of the tree. Learn where and how to make the cuts before picking up the pruning shears.
- ✂ *Trees do not heal the way people do.* When a tree is wounded, it must grow over and compartmentalize the wound. As a result, the wound is contained within the tree forever.
- ✂ Small cuts do less damage to the tree than large cuts. For that reason, proper pruning of young trees is critical. Waiting to prune a tree until it is mature can create the need for large cuts that the tree cannot easily close.



Select strong, permanent scaffold branches that are spaced 12 to 18 inches apart.

ESTABLISHING A STRONG SCAFFOLD STRUCTURE

A good structure of primary scaffold branches should be established while the tree is young. The

scaffold branches provide the framework of the mature tree. Properly trained young trees will develop a strong structure that requires less corrective pruning as they mature.

The goal in training young trees is to establish a strong trunk with sturdy, well-spaced branches. The strength of the branch structure depends on the relative sizes of the branches, the branch angles, and the spacing of the limbs. Naturally, those factors vary with the growth habit of the tree. Pin oaks and Sweetgums, for example, have a conical shape with a central leader. Elms and live oaks are often wide-spreading without a central leader. Other trees, such as lindens and Bradford pears, are densely branched. Good pruning techniques remove structurally weak branches while maintaining the natural form of the tree.

PERMANENT BRANCH SELECTION

Nursery trees often have low branches that may make the tree appear well-proportioned when young, but low branches are seldom appropriate for large-growing trees in an urban environment. How a young tree is trained depends on its primary function in the landscape. For example, street trees must be pruned so that they allow at least 14 feet of clearance for traffic. Most landscape trees require only about 8 feet of clearance.

The spacing of branches, both vertically and radially, in the tree is very important. Branches selected as permanent scaffold branches must be well-spaced along the trunk. Maintain radial balance with branches growing outward in each direction.

A good rule of thumb for the vertical spacing of permanent branches is to maintain a distance equal to 3 percent of the tree's eventual height. Thus, a tree that will be 50 feet tall should have permanent scaffold branches spaced about 18 inches apart along the trunk. Avoid allowing two scaffold branches to arise one above the other on the same side of the tree.

Some trees have a tendency to develop branches with narrow angles of attachment and tight crotches. As the tree grows, bark can become enclosed deep within the crotch between the branch and the trunk. Such growth is called included bark. Included bark weakens the attachment of the branch to the trunk and can lead to branch failure when the tree matures. You should prune branches with weak attachments while they are young, if possible.

Avoid over-thinning the interior of the tree. The leaves of each branch must manufacture enough food to keep that branch alive and growing. Removal of too many leaves can "starve" the tree, reduce growth, and make the tree unhealthy. A good rule of thumb is to maintain at least half the foliage on branches arising in the lower two-thirds of the tree.

TRUNK DEVELOPMENT

For most young trees, maintain a single dominant leader growing upward. Do not prune back the tip of this leader. Do not allow secondary branches to outgrow the leader. Sometimes a tree will develop double leaders known as co-dominant stems. Co-dominant stems can lead to structural weaknesses, so it is best to remove one of the stems while the tree is young.



Branches should be well spaced radially and along the trunk as shown in the tree on the left.



When co-dominant stems develop, bark may become "included" in the crotch. It is best to prune one of the stems while the tree is young.

The lateral branches growing on the sides contribute to the development of a sturdy well-tapered trunk. It is important to leave some of these lateral branches in place, even though they may be pruned out later. These branches, known as temporary branches, also help protect the trunk from sun and mechanical injury. Temporary branches should be kept short enough not to be an obstruction or compete with selected permanent branches.

WOUND DRESSINGS

Wound dressings were once thought to accelerate wound closure, protect against insects and diseases, and reduce decay. However, research has shown that dressings do not reduce decay or speed closure and rarely prevent insect or disease infestations.

HIRING AN ARBORIST

Pruning large trees can be dangerous - it usually involves working above the ground and using power equipment. Ensure your safety, and that of your trees, by hiring a professional arborist.

WINTER TREE CARE

The most simple maintenance recommendation is also the most important. Mulch if you haven't already! Mulching the root area of a tree is one of the least expensive but most beneficial things you can do to enhance tree health and minimize competition with turf. Mulch groups of trees together and extend the mulched areas as far out as practical.



1. Put composted organic mulch under your tree in the fall or early winter to help retain water and reduce temperature extremes. A thin layer of mulch will act like a blanket and give the tree's roots a little extra winter protection.
2. Prune your trees. Winter is actually one of the best times to prune because it is easier to see the structure of trees without their leaves. But limit pruning to deadwood and poorly placed branches in order to save as many living branches as possible.
3. Prevent mechanical injuries. Branch breakage or splitting can be caused by ice and snow accumulation, or chewing and rubbing by animals. Prevent problems from occurring on young trees by wrapping the base of trees in a hard, plastic guard or a metal hardware cloth. Wrapping trees with burlap or plastic cloth also can prevent temperature damage. Just remember to remove the wraps and guards in the spring to prevent damage when the tree begins to grow.

QUESTIONS?

If you have any questions that aren't addressed in this packet, please feel free to call Tacoma's Urban Forester, Ramie Pierce, at 253.591.2048 or trees@cityoftacoma.org, consult your local ISA Certified Arborist or a tree care or garden center professional for assistance.

Information was gathered from (and more can be found at) the following:

