



Tips for Healthy Trees

Colorado State Forest Service, La Junta District

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It is important to understand how to keep your trees healthy. Grass can be replaced in a season—a 50 year-old tree will take 50 years to replace! A little knowledge of tree function and tree care techniques can provide the tree grower with a tool kit to help ward off drought and other stresses such as insects and disease.

In order to grow and maintain healthy trees, we need to begin at the bottom first: Roots.

Healthy Roots Healthy roots are the first element to a healthy, disease resistant tree. Roots are a tree's lifeline, performing many vital functions: They anchor the tree, absorb water, and wrest vital nutrients from the soil.

Tree root systems consist of larger transport and support roots, and smaller absorbing roots. Contrary to popular belief, tree roots do not "seek out" water with a large taproot (a large taproot only persists in very few species of trees, most of which are not planted in home landscapes). Absorbing roots, or feeder roots, are soft and non-woody and are necessary for extracting water and essential nutrients from the soil. Although they are much smaller than the large transport roots, they constitute the majority of the root system's surface area. The large woody transport roots keep the tree from falling over, and transport water from the absorbing roots to the tree. The large woody transport roots also store water, and store sugar starches (tree food) produced by the leaves. About 85% of a tree's roots are within the top 18 inches of the soil and usually do not reach a depth of more than 3 to 7 feet. They spread to where soil conditions provide essential elements such as oxygen and moisture. Roots grow from their tips, and can potentially extend from the trunk *two to three times the height of the tree!*

Figure 1: Area of Root Distribution vs. Crown Distribution

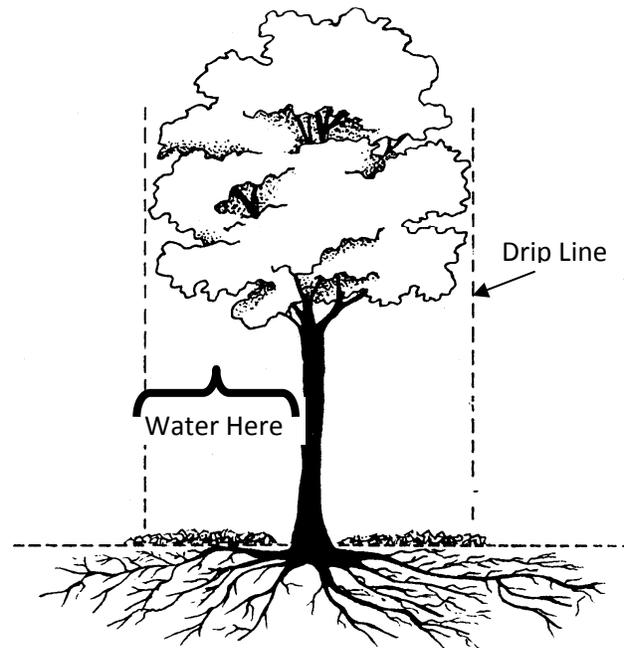
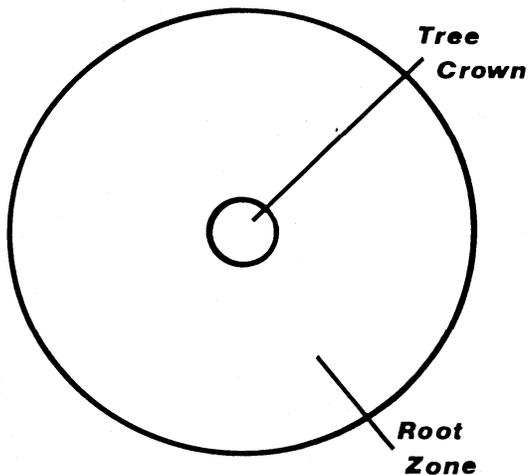


Figure 2: Where to Water

Other Sources for Tree Care Information:

www.righttreerightplace.com

www.arboday.org

www.treelink.org

www.isa-arbor.com

During Planting When planting a new tree be sure to remove containers (plastic or otherwise), and wrapping (i.e. burlap, wire, string). However, this must be done without breaking the soil loose from the roots or damaging the roots. For balled and burlapped trees, set the tree into the planting hole first, and then remove all twine, wires and burlap. Burlap can be cut into vertical strips and stuffed at the bottom of the planting hole. If containers are not removed, they will restrict root growth, causing decline of the tree and premature death. When digging a planting hole for a new tree make the hole wide, as much as three to five times the diameter of the root ball, but only as deep as the root ball. Make sure the root flare (the widening of the trunk where it meets the roots at the base of the tree) is visible after planting. This will ensure that the tree is not planted too deep and the small water absorbing roots will receive adequate oxygen exchange. The small fibrous roots of trees need oxygen to remain healthy—planting trees too deep will restrict oxygen availability to these roots.

During Yard Improvements Be aware that tree roots can exist all around your yard, and even into your neighbor's yard (refer to figure 1). Excavating soil can potentially remove or damage the larger transport and support roots, as well as the smaller water absorbing roots. Adding another layer of soil or installing asphalt, cement, brick, or *plastic* over the root system of new or existing trees inhibits oxygen and water availability to the roots, and can cause stress and eventual dieback.

Compaction Avoid compaction of the soil from the trunk out to the drip line (refer to figure 2). This reduces the amount of oxygen available in the soil. Tree roots *need oxygen* to survive and grow.

Herbicides Be very careful when choosing **weed control herbicides**. Herbicides often target broad-leaf plants, such as dandelions: Trees are a large broad-leaf plant. Read labels carefully, and understand that your trees can be severely damaged by some herbicides. Glyphosate (brand name Round-Up® and others) is fairly safe to use around trees to control weeds. Make sure to apply only when temperatures are below 80 degrees Fahrenheit, when it is not windy, and avoid getting the herbicide on the bark or leaves of the tree.

Water Focus on watering, maintenance, and planting techniques that will maximize your tree's uptake and utilization of water and nutrients. Again, please refer to figures 1 and 2. Keep in mind where the water absorbing roots are located; within the top 12"-18" of the soil. Watering every 7-10 days is ideal for most trees during the growing season. Deep water your trees: try to achieve 12-18 inches of soil moisture when watering. Avoid frequent, shallow waterings (such as running a sprinkler system everyday for 15-30 minutes). This can actually suffocate existing roots and/or cause sparse root development. Younger trees will need a higher watering frequency than older established trees. Trees also need watered during the fall and winter, especially when precipitation is low. Water only when air and soil temperatures are above freezing. A good rule of thumb is to deep water trees once a month through fall and winter.

Competition Trees planted in lawns experience competition from grass. Tree and grass roots exist together in the upper 6 to 8 inches of the soil. Laying high quality weed barrier that is water permeable, or fine wood mulch, in a six-foot diameter around the tree (especially younger trees and new plantings) can help eliminate some of this grass root competition. Mulch should be at a 3 to 4 inch depth and kept away from the trunk.

Healthy Bark If the bark of a tree is damaged, this will permanently stop water transport all the way up the tree from that wound. It also opens the tree to disease and insect invasion. Avoid weed-trimmer and lawn mower damage to the base of trunks and poor pruning practices.

Drought Tolerant Species Before planting new trees, assess your climate. Southeastern Colorado's climate is semi-arid, meaning we receive on average between 8-14 inches of precipitation per year, and we have definite, frequent drought cycles. Selecting trees that will tolerate these conditions is highly suggested. This will help eliminate stress and decline of trees, as well as conserve water. Visit the Colorado State Forest Service Website for a list of suggested trees for Southeastern Colorado: www.csfs.colostate.edu.

Soil Conditions Finding out the soil conditions of your property is also important in selecting the right tree. For example, alkaline soils and tightly packed clay soils are common in Southeastern Colorado. Many plants are not tolerant of these soil conditions and struggle to survive.

Proper Pruning Pruning is perhaps the least understood aspect of tree care. Proper pruning cuts are CRITICAL for tree health! Improper pruning opens up a tree to insect and disease problems and causes decline. Prune for strong structure early in the life of a tree. Choose one main trunk and select permanent branches that are attached to the trunk at close to a 90 degree angle “L”, and remove branches that form a “V” shaped union, or that appear to be squeezed against another branch (called included bark). “V” shaped unions and included bark unions are VERY weak and are more likely to break in heavy snow or wind. When trees are pruned for structure when young, pruning wounds are kept small and growth is easier to direct. Avoid pruning within the first year of planting, however, as trees need to allocate their energy to root development during that time.

Remember the rule of “3’s” when pruning. When removing a branch, try to select branches that are a least 1/3 of the size of the stem that it is being removed from. In general, only prune 1/3 of a tree’s living mass annually. If more than this is removed, it causes tremendous stress on the tree. Proper pruning cuts create wounds as well and the tree has to expend large amounts energy to compartmentalize and “heal” over wounds. If more than 1/3 of a tree’s living mass is removed at one time, decline is very likely to follow.

Prune dead and diseased wood at any time of the year. Pruning in the winter time is a good rule of thumb as the tree is less active and it is easier to see branch structure and defects. Avoid pruning during freezing weather conditions.

Avoid pruning during drought conditions. Again, pruning cuts demand energy from a tree, and if it is already water stressed from drought, pruning will only add to the stress and cause more decline.

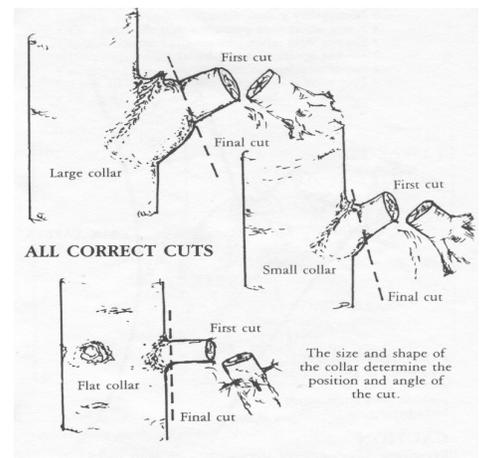
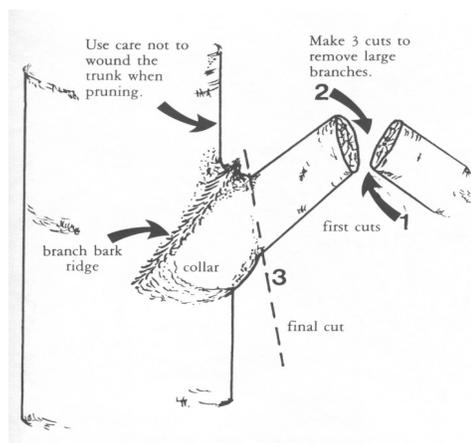
Always keep your pruning tools sharp and clean. When dull tools are used, cuts are jagged and trees cannot easily “heal” over wounds.

A note on “healing”: trees cannot actually heal tissue. They build walls of cells around wounds to compartmentalize decay. If pruning cuts are made improperly, this defense mechanism is disabled and decay can then travel throughout the entire tree. This is why **trees should never be topped!** Topping also causes weakly attached branches to re-sprout from topped areas. These branches are not only growing from a branch that will quickly begin to decay, but they typically form “V” shaped unions, which are very weak and more likely to brake in wind or heavy snow. For more detailed information on why not to top trees, please visit <http://www.arboday.org/trees/NineNum1.cfm>.

The National Arbor Day website also has an excellent interactive pruning lesson that teaches proper pruning techniques at <http://www.arboday.org/trees/pruning>.



Please, Never Top Trees!



The Basic Pruning Cut Cut as close as possible to the branch collar; do not damage or remove it. The collar contains the “defense” cells that compartmentalize decay, and if the collar is removed, it opens the tree up to decay. Do not leave stubs and do not paint the wound. Wound paint closes off oxygen exchange and can actually facilitate decay.