

require adequate watering for one to two years to become established. As a rule of thumb, trees require one year per inch of caliper before they are established.

- The desired water application rate for trees varies by trunk diameter and irrigation device.
- In non-overhead irrigated areas watering should be done close to the root ball and include the amended planting site. Watering needs will vary depending on the site. Most of the tree's absorbing roots will develop in the top 12 to 18 inches of the soil, depending on the soil type.
- In turf with over-head irrigation systems, check soil moisture before applying additional water.
- For watering details visit [www.springsgov.com/units/parksrec/saveourshade.pdf](http://www.springsgov.com/units/parksrec/saveourshade.pdf)

#### Fall and winter watering:

- During prolonged dry periods in the fall and winter (October-March) all species may need watering one to two times per month.
- Evergreens are highly susceptible to winter desiccation injuries. Watering should occur when temperatures are above 40 degrees and no snow cover exists. Research on anti-transpirants is inconclusive at this time. Winter watering should ensure consistent soil moisture to a depth of 12 inches throughout the root zone.

## MULCH

- Mulching is an excellent way to conserve soil moisture, reduce competition from other plants and prevent mechanical injury. Two to four inches of mulch is the appropriate depth for newly planted trees. Later applications to "refresh" the mulch should not increase the depth.
- Do not apply mulch close to the trunk. Avoid thick layers of mulch around the base of the tree (often called "volcano" mulching). Avoid grass clippings or leaves that

can mat down and create a hydrophobic (a water-repellent) layer.

- Mulch rings should be a minimum of feet in each direction or 4 feet in diameter.

## PRUNING

- Prune newly planted trees to remove dead, severely injured or broken branches.

## TRUNK PROTECTION

- Protect young trees, particularly smooth and thin-barked types, from sun scald during the establishment period. This injury, usually on the southwest side of trees, is caused by excessive temperature changes. Wrapping or shading the trunk in late fall will reduce the problem.
- Remove the wrap in spring to prevent insects and diseases from harboring beneath it. A good rule to follow is to wrap around November 1 and unwrap around April 1.

## STAKE AND GUY REMOVAL

- Remove all staking and guying material after the tree is stable and established, normally after the first year unless in a windy or extreme climate.
- Failing to remove straps from the staking or guying process can girdle and injure landscape trees within a few short years.

## FERTILIZATION

- As a general rule, do not use a quick release high nitrogen fertilizer during the establishment period—this promotes top growth at the expense of the root system.

## PESTICIDES

- Applications of pesticides may be warranted given local and current insect pressures.



# GreenCO Tree Planting Recommendations

Presented 2012

This recommendation is the result of collaborative work by industry professionals representing the Colorado Nursery & Greenhouse Association (CNGA), municipal arborists/Colorado Tree Coalition (CTC), American Society of Landscape Architects-Colorado (ASLA-CO), Associated Landscape Contractors of Colorado (ALCC), and Colorado State University (CSU).

The purpose of the project was to create

a single recommendation for green industry professionals that was based on respected sources and decades of hands-on experience by professionals involved in the growing, siting, installation, and care of trees. Current research in addition to the experiences of those on the committee was used in the development of the recommendation. The collective intent was to ensure the best possible outcome for the planting of trees in the landscape.

## COMMITTEE MEMBERS

- ALCC** – Ralph Bronk, Mark Kramer, Troy Tinberg
- ASLA-CO** – Don Godi
- CNGA** – Stan Brown, Matt Edmundson, Dan Wise
- CSU** – Alison O'Connor and Jim Klett
- CTC/Municipal Arborists** – David Flaig, Scott Grimes
- ISA/RMC** – Robert Brudenell

Sources used as the initial basis of the recommendation: ISA Tree Care Information, Colorado State University, ANSI A300 Part 6 Standard Practices, GreenCO BMP's, the CNGA Planting Guide, and ALCC Landscape Planting Specifications.

## PRE-PLANTING

This information assumes that the tree selection (B&B and containers) complies with the specifications in the Colorado Nursery Act and that the selection and site placement is correct. Consider soil testing and/or a percolation test prior to plantings. When selecting trees for the Front Range, Front Range Tree Recommendation Guide is recommended as a reference.

#### When selecting tree species consider:

- Soil type, site exposure, texture, slope of grade, possible microclimates, insect and disease susceptibility, hardiness, invasiveness potential, growth rate, water requirements, site use, litter potential (leaves, fruit, acorns, cones, or pods) allelopathic properties, allergic potential to property users, toxic plant parts, wildlife use/misuse, hazardous growth (thorns, prickly leaves) mature size relative to utilities, structures, and site conditions.
- Rooting space, soil type and texture, drainage, utility conflicts, hardscapes/structural conflicts, and purpose of tree.

#### When selecting nursery stock consider:

- Avoid trees with structural roots too far below top of rootball. Consider the season and source and acclimation.
- Check for diseases such as cankers on the stem/branches, insect problems on leaves and stems.
- Overall tree health and vigor should be examined including average stem elongation, deadwood, leaf size, amount of leaves

present on the tree, and leaf color.

- Select trees with structurally sound branching. Avoid trees with rubbing or crossing branches, witches brooms, lack of central leader, unbalanced crown, tip die-back, or mechanical damage to the ball, stem, and branches.

#### **Planting time for B&B and containers:**

- The optimal time to plant is before bud break; planting can occur successfully year round with appropriate care.
- Late fall planting of un-acclimated evergreens is discouraged.

#### **Utility Locates:**

- Follow the most current guidelines provided by the Utility Notification Center of Colorado available at [www.uncc.org](http://www.uncc.org) or by calling 811.

#### **Delivery and Holding:**

- Keep the tree root ball moist and protected at all times.
- Root ball should be protected and handled gently to prevent damage to the root ball and tree.
- Plant material should be covered during transportation.

#### **Planting Depth:**

- For B&B trees with an obvious root flare: In clay or clay loam soils, the root flare should be 2" to 4" above the adjacent grade.
- For sandy soils, the root flare should be 1" to 3" above the adjacent grade. Adjacent grade is defined as the top level of soil in turf area or in a mulch bed.
- For container plants - Plant with root flare 0" to 1" above adjacent grade. Cut circling roots prior to planting.
- Structural root depth – In the absence of an obvious root flare, structural roots can be found by carefully probing the root ball with an instrument such as a surveyor pin or screwdriver. Systematically probe the root ball 3-4" out from the trunk to locate structural roots and determine their

depth. On some species it may be more difficult to locate the structural root(s). Careful removal of the soil immediately surrounding the trunk of the tree at the top of the root ball is another method can be used to determine the location of the first structural root(s).

- Planting at the higher end of the suggested planting depth is recommended. If you cannot find a visible root flare then use the structural root depth as defined above.

#### **Planting Hole Size:**

- Dig a saucer shaped hole that is two times greater than the width of the root ball, when planting in well drained soils. This assumes that there is enough unobstructed area for a hole this large. When planting in compacted and heavy clay soils that are not free draining, the hole should be wider and not as deep. In either case, the sides of the holes should be roughened.
- Set the plant on firm undisturbed soil. Don't dig the hole too deeply. If the hole is dug too deeply (see Planting Depth) back fill and compact existing soil.

### **SOIL, WIRE BASKET, AND BACKFILL**

#### **Soil:**

- When planting in established landscapes where site preparation has been completed, examine excavated soil from the planting hole to assess its quality. Remove debris from excavated soil before thoroughly incorporating amendments (as detailed below).
- In established landscapes with mature plant material, there is often a good amount of organic material in the top layer (from decomposed turf roots, mulch, leaves, etc.) – in this case, amendments may not be necessary.
- Newer landscapes often have low amounts of organic material in the top layer of the soil and a soil test should be considered. A small amount of thoroughly mixed organic amendment (around 10 %

by volume of backfill) is recommended to create a transition zone from the rootball of nursery soil to the unaltered native soil outside the planting hole. Amendments to the surrounding soil, if possible is also recommended.

- For sandy soil, add 10 to 20% by volume of organic material.
- Another consideration is the type of plant material Western native plants, and other plants adapted to lower water conditions generally do not do well in a soil that is rich in organic material (due to increased water holding capacity of compost/peat/ etc.). If choosing this type of plants, drainage is far more important. Loosening compacted soil and grading for drainage away from the plant's root zone is key; avoid organic amendments.

#### **Wire basket and backfilling:**

- Before placing the root ball in the planting hole remove all plastic from the tree.
- Gently set the root ball in planting hole and confirm proper planting depth and tree orientation.
- After the root ball is in the planting hole, backfill the bottom half of the hole for stabilization.
- Cut and remove the top 1/3 to 1/2 of the wire basket and burlap, and all the twine from before finishing backfilling.
- Return the existing or amended soil to the hole, breaking up any clods larger than fist-size before returning them to the hole. Add water as backfill is replaced. Return the remaining backfill, using a shovel and water to remove any air pockets until soil is level with the grade of the rootball.
- Return to recheck for settling after several hours. In heavier soils in many parts of Colorado, it can take a long time for the water to move through the planting hole. Air pockets can appear later and create voids around the rootball – add more backfill and compact, if this occurs.
- The research on the benefits of incorporating fertilizers and mycorrhizae in the backfill is on-going at this time.

### **STAKING**

- When trees are properly planted and set on firm, undisturbed soil, most trees in the landscape do not require staking or underground stabilization.
- Studies have concluded that un-staked trees produce more and stronger roots than staked trees.
- Staking or underground stabilization may be needed in windy areas, with loose root balls, or larger trees
- The most common method is using two stakes with flexible tie material on the lower half of the tree that will hold the tree upright, provide flexibility, and minimize injury to the trunk. In any staking system, it is best if the tree trunk has some flexibility. Some wind movement encourages root growth and trunk taper development.
- Stakes should only be left on the tree one to two years, depending on size.
- Remove stakes after one year or inspect straps and adjust to prevent girdling and then re-inspect/remove after one more year.

### **ESTABLISHMENT WATERING**

- Proper watering is the most important practice after planting and critical in the successful establishment of the tree.
- The amount and frequency of watering should be determined based on the ideal moisture content of the soil and root ball, which can be determined by a moisture meter, soil core, or hand "soil ball" test at a depth of 4-6 inches; see [www.mt.nrcs.usda.gov/technical/esc/agronom/soilmoisture/index/html](http://www.mt.nrcs.usda.gov/technical/esc/agronom/soilmoisture/index/html). Wilting can be caused by too little or too much watering. Too frequent or excessive quantities of water are common problems in the establishment of trees especially in clay soils. It is also important to keep in mind that too much water will cause a decrease in the amount of oxygen in the soil.
- Trees and other woody plants typically