Tree Planting & Care in Grand County

Based on notes by
Colorado Master Gardener[sm]
&
Edward F. Gilman
Department of Environmental Horticulture
University of Florida

Right tree, right spot.

Sun loving trees, sunny spot.

Shade trees, shady spot.

What grows naturally?

Montane zone elevation 8,000 to 9,500 feet

- Lodgepole pine
- Aspen
- Douglas-fir
- Ponderosa pine

Our woods at 8,600 feet

Naturally occurring

- Lodgepole pine
- Aspen
- Subalpine fir
- Blue spruce

Introduced

- Bristlecone pine
- Ponderosa pine
- Douglas-fir
- Engelmann spruce

Aspen

- Grows in a wide range of soils, clay, shallow rocky, sandy loam
- Needs good light
- Doesn‘t need much water once established
- May come in naturally in recently logged areas

Lodgepole Pine

- One of the most common trees in populated areas of east Grand County
- If sufficient cones are left after logging it should come back naturally in a few years.
- Some soil scarification is helpful
- Needs full sun for seeds to germinate
- Naturally regenerated trees will usually out perform transplants

Colorado Blue Spruce

- Needs some shade and water to get established
- Does best on moist north facing slopes
- Sun at elevation reflecting off snow can easily burn new trees
- Not all Blue Spruce are blue; they can go from silver-blue to blue-green

Ponderosa Pine

- Ponderosa has excellent drought tolerance and must have well drained soil.
- Ponderosa are found rarely in Grand County
- We have had success at 8,600 feet.

Bristlecone Pine

- It is an extremely slow grower
- Has excellent cold hardiness
- Does best in infertile, dry rocky soils
- We have had success at 8,600 feet

Douglas-fir

- Although it is considered drought resistant it does prefer moisture-retentive soils.
- Needs shade when young
- We had success with this species until the overstory lodgepole were removed.

Engelmann Spruce

- This tree is drought resistant
- It is intolerant of direct sun.
- We had success with this species until the overstory lodgepole were removed.

Climatic Adaptation

Trees grown in a different part of the country may experience some stress adapting to Grand County.

Site Evaluation

- Sunny spot or shady spot
- Natural soil condition
- Natural soil moisture
- Windy - calm
- Room for root growth
- Elevation
- Buildings, roads, steepness
- Care after planting

Tree Selection

- Mature size of tree
- Roots three times size of canopy, shape will conform and will share space
- Sun or shade loving species
- Proper zone
- Water needs
- Wind hardiness

Tree Placement

- **Specimen trees** – The individual tree becomes the landscape feature
- **Group plantings** – In group plantings, the trees as a unit become the landscape feature. Groupings are often, but not always, the same species. In group plantings, do not mix contrasting forms.
- **Mass plantings** – In mass plantings, individual trees lose identity and appear as one larger unit in the design. A group planting may grow into a mass planting as trees mature

Growing Space

- Size is a primary consideration in tree selection. Trees should fit in the available growing space without pruning. This is of primary concern under utility lines as the utility has the right-of-way.

Growing space

At planting, this Blue Spruce had only 12 inches of growth space until hit the building. This is poor landscape design. Plant for tree to reach full size without pruning.

Rooting Space

- Rooting space should be a primary consideration in tree selection. The mature size, growth rate and longevity of a tree are directly related to the available rooting space. In general roots grow to three times the width of the canopy; they can however be of much different shape to fit the available soil. Trees can share rooting space.

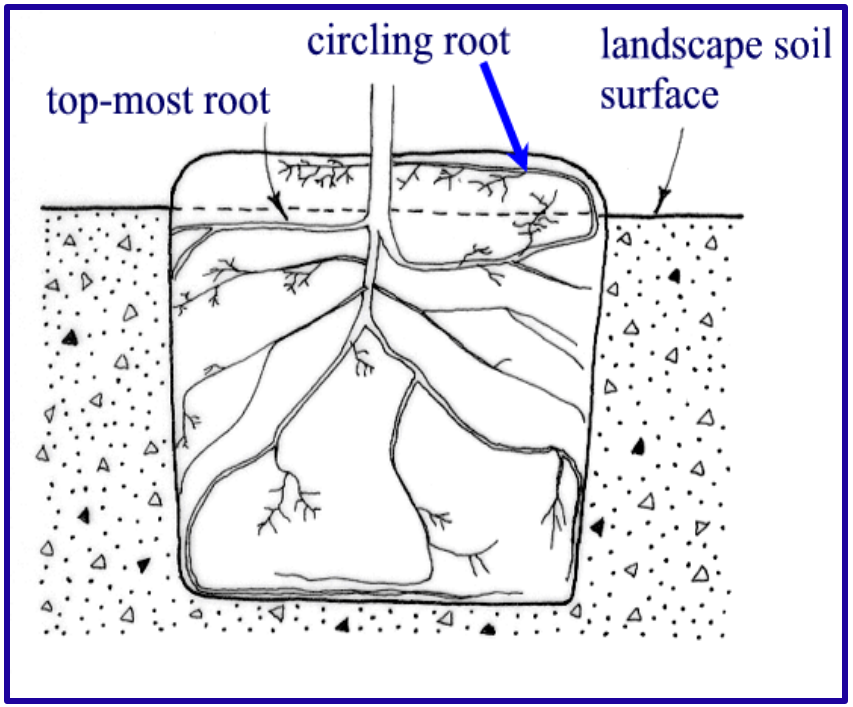
Introduction to root growth

- Roots are generally not as deep as you think
- Deep roots are typically under the trunk and under the canopy
- In the Colorado mountains the majority of roots are in the **top foot** of soil
- Roots are typically above the water table and above any hardpan
- Many of the small diameter roots are in the top 3 to 6 inches

Determine depth of planting hole consider the following before digging

- Check depth of the tree in the root ball. Do not assume that it was planted correctly at the nursery.
- At least two structural roots should be within the top 1-3 inches of the root ball
- Root ball should rise slightly above grade
- Avoid putting loose soil under the root ball

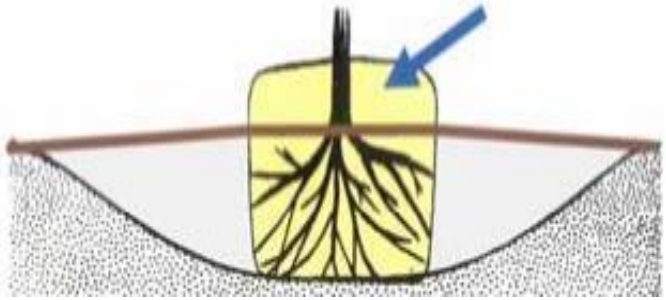
Planting trees that are too deep in the container



- Remove some soil next to trunk to see where first root emerges
- Cut or spread out any circling or kinked roots growing across main roots
- Position the top-most root about even with or slightly above the top of the landscape soil; plant even higher in soil that drains poorly

Roots at proper depth in the landscape

- Set the root ball at the appropriate depth in the landscape to establish plants quickly
- Trees set too deep in the landscape often become unthrifty soon after planting because
  - roots can not access adequate oxygen
  - roots can be cut off from adequate moisture
  - roots may remain too wet in poorly drained soils



Excess soil would be removed during the backfill process.

If the tree is planted too deep in the root ball, excess soil should be removed from the top in the backfill step of the planting process.
Adjust the depth of the planting hole to bring the root flare to the correct depth.

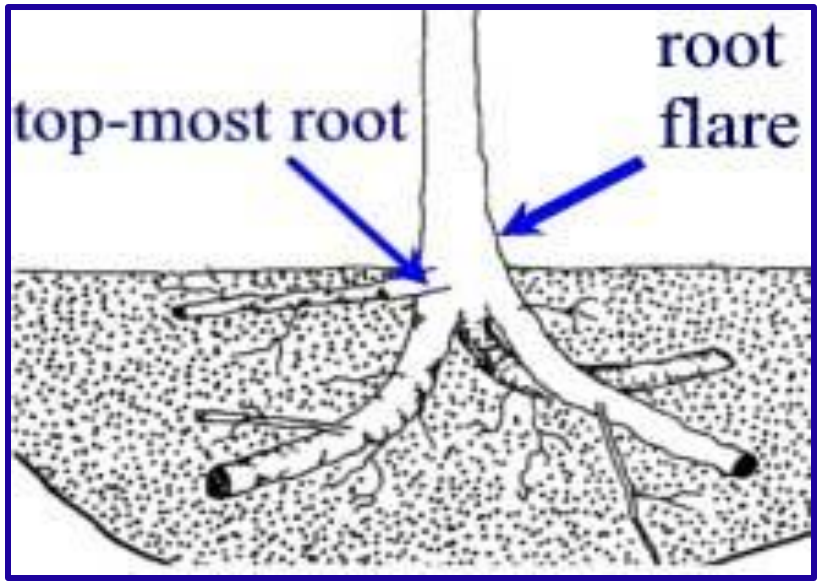
The objective

- When finished planting, the point where the top-most root in the root ball meets the trunk should be slightly above the surrounding landscape soil.

Locate the top-most root before planting

- The point where the top-most root in the root ball emerges from the trunk should be within two inches of the surface
- There should be no roots circling or crossing over the top-most roots in the root ball
- You might have to remove soil above the top-most root during the planting process in order to check for circling roots

Locate the top-most root before planting



Bare root or B&B tree

- The top-most root in this illustration may be adventitious in nature; if this is the case you might consider removing it, especially if it is small
- Then plant the tree so the three major original roots are closer to the soil surface

Dig saucer-shaped planting hole three-times root ball diameter

A labor saving technique is to wide the planting hole into the desired saucer shape, three times root ball diameter during the during backfill process.

Never improve backfill

A saucer-shaped planting hole three times the root ball diameter with sloping sides allows the root system to grow rapidly to 400% of the root ball volume before being slowed by the lower oxygen levels in the site soil.

Set tree in place, removing container/wrappings

- Container Grown
- Field Grown, Ball & Burlap
- Bare Root

Container Grown

- Lay tree on side in the planting hole or near the planting hole.
- Wiggle off or cut off the container
- If roots are circling shave off the outer 1-11/2 inches of the root ball with a pruning saw or pruners.
- Check depth of root ball in planting hole. If needed, remove tree and correct hole depth.
- Align vertically.
- For stability, firm a shallow ring of soil around the bottom of the root ball.

Field Grown, Ball & Burlap

- Remove extra root ball wrapping added for convenience in marketing (like a shrink-wrap and a container). However, do NOT remove the burlap (or fabric), wire basket and twine that hold the root ball together until the tree is set in place.
- Check depth of root ball in planting hole. If needed, removed tree and correct hole depth.
- Align vertically.
- For stability, firm a shallow ring of soil around the bottom of the root ball.

Field Grown, Ball & Burlap

- Remove all the wrapping (burlap, fabric, twine, wire basket, etc.) on the upper 12 inches or upper 2/3 of the root ball, which ever is greater.
- If root are found circling the root ball, shave off the outer 1-11/2” of the root ball with a pruning saw or pruners.
- Consensus from research is clear that leaving burlap, twine, and wire baskets on the sides of the root ball are not acceptable planting techniques. Burlap may be slow to decompose and will complicate soil texture interface issues.

Field Grown, Ball & Burlap

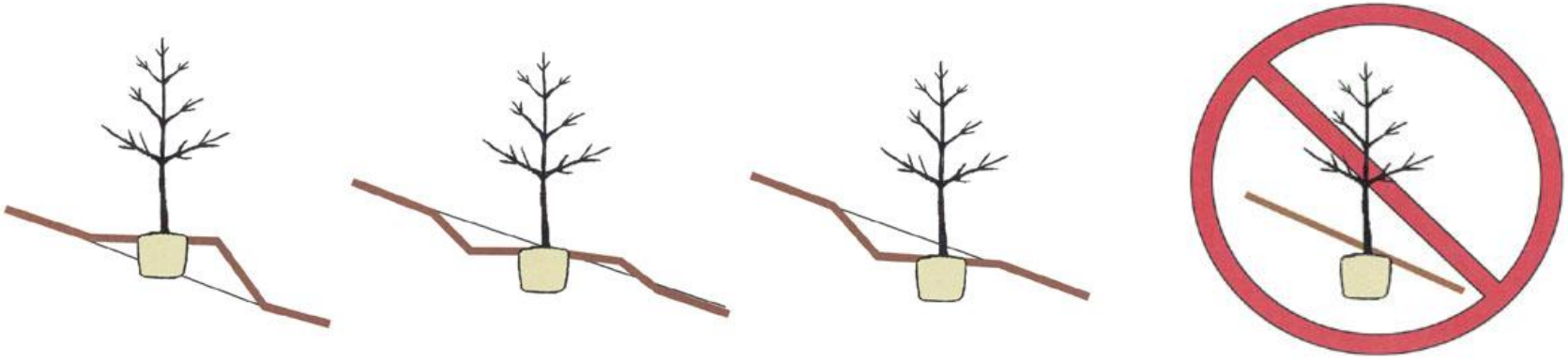
- Burlap that comes to the surface wicks moisture from the root ball, leading to dry soils.
- Jute twine left around the trunk will be slow to decompose, often girdling the tree.
- Nylon twine never decomposes in the soil, often girdling trees several years after planting. Wire baskets take 30 plus years to decompose and do interfere with long-term root growth.
- With tapered wire baskets, some planters find it easier to cut off the bottom of the basket before setting the tree in the hole. The basket can still be used to help move the tree and is then easy to remove by simply cutting the rings on the side.

Bare Root

- Soak the roots for a couple of hours never more than half a day
- Roots to air as short a time as possible
- Spread roots as much as possible within the planting hole
- Make a mound and spread the roots over the mound

Planting on a Slope

When planting on a slope, plant "out-of-the-hill" by adjusting the grade around the planting hole as illustrated.



When planting on a slope, adjust the grade to plant "out-of-the-hill". When planted "into-the-hill" roots on the uphill side will be too deep, slowing root establishment and growth.

Backfill
Do not improve the backfill soil

Be careful not to over-pack the soil reducing large pore space (soil oxygen levels). A good method is to simply return soil and allow water to settle it when irrigated. Soil “peds” (dirt clods) up to the size of a small fist are acceptable in tree planting. In clayey soils, it is undesirable to pulverize the soil, as this destroys large pore space.

Backfill

Changes in soil texture (actually changes in pore space) between the root ball soil and the backfill soil, create a *soil texture interfaces* that impede water and air movement across the interface. To deal with the interface, it is imperative that the top of the root ball comes to the surface (that is no backfill soil covers the top of the root ball). Backfill soil covers the root ball knees, gradually tapering down.

Backfill

Water to settle soil

In larger root balls it may be wise to backfill half way water in and then backfill the rest.

Final grade

With the wide planting hole, the backfill soil may settle in watering. Final grading may be needed after watering.

Mulch

- Do not place wood/bark chips up against the trunk.
- Do not make mulch volcanoes.
- On wet soils, mulch may help hold excessive moisture, being undesirable.
- On newly planted trees, do not mulch over the root ball.
- On established trees, keep mulch back six inches from the trunk.

Too much mulch over the root ball

encourages development of stem girdling roots

Can result in the following problems:

- keeps trunk tissue too wet
- increases rodent damage on the buried portion of the trunk
- intercepts rain and irrigation meant for the roots
- keeps poorly drained soils too wet
- encourages surface roots

Mulch—around trees

- Wood/bark chip mulch is great for trees and shrubs, protecting trees from lawnmower damage.
- Wet chips piled up against the trunk can cause bark problems and interfere with the natural trunk taper, making the tree more prone to wind throw.
- Keep the mulch back at least 6” from the trunk.

Benefits of Mulching

Depending on materials used, mulches have many benefits, including the following:

- Reduces evaporation from soil surface, cutting water use by 25-50%
- Organic mulches promote soil microorganism activity, which in turn, improves soil tilth and helps lessen soil compaction.
- Stabilizes soil moisture
- Prevents soil compaction

Benefits of Mulching

- Controls weeds, which rob soil moisture
- Moderates soil temperature extremes
- Controls erosion
- Gives a finished look, improving aesthetic quality
- Trees with a mulch ring typically have 20% more early growth this is due to the lack of competition with the grass/weeds.

Wood/Bark Chip Mulch—Benefits

- Wood or bark chip mulch is great around trees.
- Wood/bark chip mulch creates a favorable environment for earthworms and soil microorganisms.
- Over time, this helps reduce soil compaction.
- When placed on the soil surface as mulch, wood/bark chips do not tie-up soil nitrogen.

Wood/Bark Chip Mulch—Problems

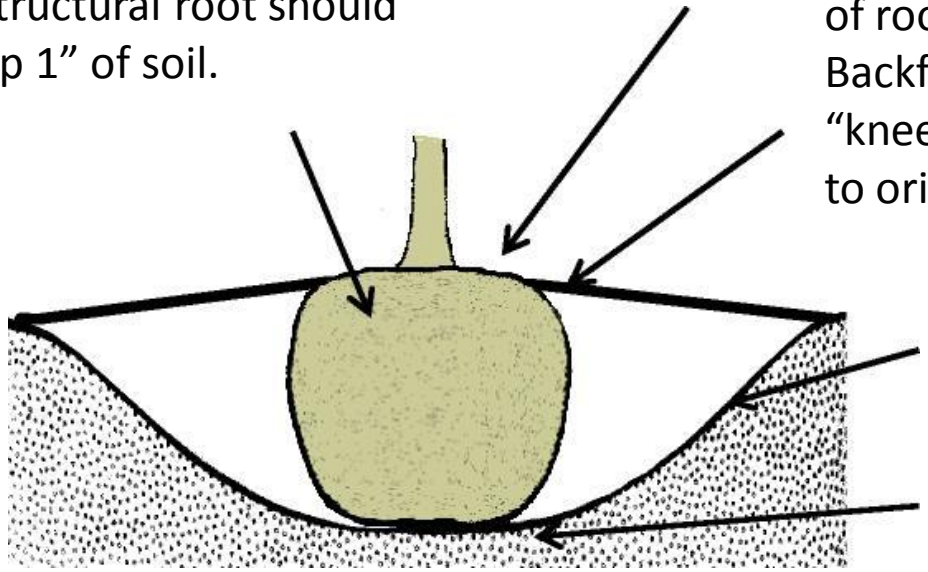
- Mulching over the root ball of newly planted trees.
- Mulching two close to the trunk of the tree can cause damage to the trunk
- Cause rodent damage.
- Keep small amounts of rainfall from reaching the roots.
- Wood/bark chips move in strong winds.
- Wood/bark chips also float, and are not suited to areas with standing water or heavy surface runoff during heavy rainfall.

Planting Summary

Generally, at least two structural roots should be within the top 1-3” of the soil surface, measured 3-4” from the trunk. A noted exception is for species prone to circling roots where the top structural root should be within the top 1” of soil.

Top of root ball rises 1-2” above grade.

No backfill soil covers top of root ball.
Backfill soil covers root ball “knees” and tapers down to original soil grade.



For best root growth potential, make saucer-shaped planting hole three times root ball diameter.

Saucer-shaped planting hole

Tree sits on undisturbed soil

Treatment options for deep planting

Option one:

- The best treatment for trees planted too deeply is to replant at the proper depth
- Dig the tree as you would transplant it, remove soil and surface roots growing above the root flare, and set at the proper depth

Treatment options for deep planting

Option two:

- Soil can be removed from the root flare
- Remove soil that is on top of the main surface roots
- Remove roots that circle or cross over the main roots
- Create a saucer 8-12 feet wide
- Add a 2-3” of mulch

Care of Recently Planted Trees

Root Establishment Phase

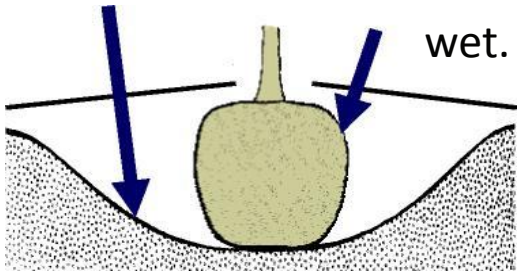
- During the establishment phase in a tree's life cycle, primary growth occurs in the root system with minimal growth in the canopy. With poor planting techniques and/or poor soil conditions the establishment phase may take many years. It is common to observe trees that never establish, but rather simply hang-on for a few years and gradually decline. A significant increase in annual twig growth indicates that roots have become established and that the tree is shifting into the growth phase.

Watering

Regular irrigation after planting encourages rapid root development essential for tree establishment. In sites without ideal irrigation management, smaller-sized nursery stock would be preferred since they establish faster. In watering non-established trees, check the soil frequently and water according to need. Soil could be dry in the root ball and wet in the backfill, or wet in the root ball and dry in the backfill.

Compacted undisturbed soil can create a basin that collects water.

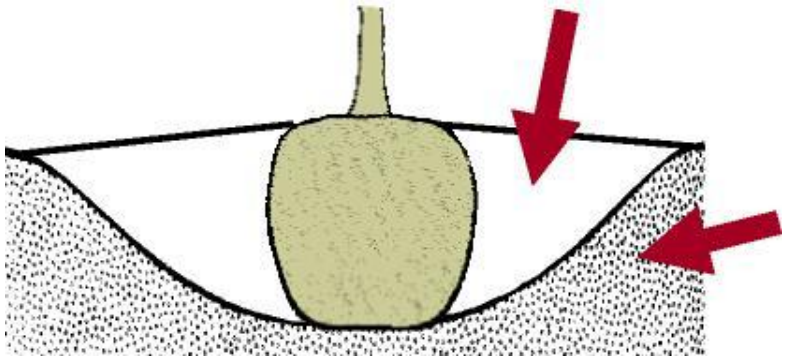
Depending on the texture interface between the root ball and backfill soil, one may be dry while the other is overly wet.



On non-established trees, check the water needs in the root ball and back fill soil frequently. Water according to observed needs.

Watering the first few years

With good planting techniques, it takes at least a growing season for significant water uptake from the backfill soils.



It takes 2 plus years for significant water uptake from the site soil beyond the planting hole.

Check water needs in the root ball soil and the back fill soil.

It is very possible that a smaller tree will establish quicker and thereby out perform a larger tree. Root ball size, planting and care make the difference.

Other helpful hints

- In most cases fertilizer is harmful to newly planted trees.
- Pruning should be limited to the removal of dead and broken branches and minimal pruning to maintain a single leader.
- Structural training for the tree continues in the growth phase (after the roots establish and the canopy show significant annual growth).

There are two great times to plant trees: the first was 20 years ago—the other is now.

Further questions?
email treemandon@q.com