Tree Installation and Establishment

Chapter 7
ISA Certified Arborist Study Guide

By Tony Dietz, Master Arborist
(also known as “Planting”)
Principles and Practice of Planting Trees and Shrubs

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Terminology

16 key Terms
Select high quality nursery stock

Stock should meet or exceed the American Standard For Nursery Stock, ANSI Z60.1
Minimum root ball specifications for various sizes

<table>
<thead>
<tr>
<th>Shade Trees Types 1 and 2</th>
<th>Trees Types 3 and 4</th>
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<tbody>
<tr>
<td>Caliper</td>
<td>Minimum Diameter Ball</td>
</tr>
<tr>
<td>Inches</td>
<td>Inches</td>
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<tr>
<td>½</td>
<td>12</td>
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<tr>
<td>¾</td>
<td>14</td>
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<td>1</td>
<td>16</td>
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<tr>
<td>1¼</td>
<td>18</td>
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<td>1½</td>
<td>20</td>
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<td>1¾</td>
<td>22</td>
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<td>2</td>
<td>24</td>
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<tr>
<td>2½</td>
<td>28</td>
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<tr>
<td>3</td>
<td>32</td>
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<tr>
<td>3½</td>
<td>38</td>
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<tr>
<td>4</td>
<td>42</td>
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<tr>
<td>4½</td>
<td>48</td>
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<tr>
<td>5</td>
<td>54</td>
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<tr>
<td>5½</td>
<td>57</td>
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<td>6</td>
<td>60</td>
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<td>7</td>
<td>70</td>
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<tr>
<td>8</td>
<td>80</td>
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</tbody>
</table>

Diagram: Minimum root ball dimensions
Measure at 6” above ground for trees up to 4” caliper and at 12” above ground for larger trees.
Avoid trees that are headed back at the nursery.
Watch out for kinked roots on container stock
Check root graft compatibility
Check root mass for root density
Select species that are adaptable to the climate

- Check plant zone hardiness charts
- pH tolerance
- Drought tolerance
- Assure the tree will grow in that area
- Select species that will fit the space available
Evaluate the site

- Analyze the soil
- Check for drainage
- Ensure enough root space
- Check overhead clearance
Analyze the soil

- Take soil samples from several locations and 6” deep
- Mix samples
- Place one pint in Ziplock bag
- Mail to lab:

USU Analytical Labs
4830 Old Main Hill
Logan, UT
84322-4830
$50
Check drainage

Fill sample hole with water and let drain for 1 - 2 hours
Cut through cliché perched water table and fill with course gravel.
Ensure enough root space
Check for overhead clearance

- Overhead utility lines
- Vehicles
- Pedestrians
- Vistas
When to plant

- Bare root trees; best to plant when they are dormant.
- Container trees may be planted any time of the year.
- Best in spring and fall when soil moisture is high and evaporation rates are relatively low.
Trees are available as:

- Bare root
- Containerized
- Balled and Burlapped
Number One Reason plantings fail:

- Planting too deep.
Digging the Hole

Only as deep as the root ball and 2-3 times as wide

Planting trees too deep is the leading cause of failure

Top of upper roots should be exposed with no soil covering them
Placing tree in the hole

- Top of ball should be at grade or 1-2 inches above grade
- Root flare should above grade
- Have firm base for root ball to sit on
- Taper sides of hole
- Top of roots should be exposed

Adjust tree to assure vertical trunk and so root graft junction faces northeast
Planting bare root trees

Bare root trees have best success rate: less interface

Bare root trees must be staked
Planting containerized trees

Cut circling roots to prevent problems with girdling roots later on

Make four vertical cuts 1-2 inches deep on each side and on bottom
Problems with Girdling Roots
Handle by container, not the trunk

Tap rim of container against firm object to loosen, then gently pull out
Container Grown VS Containerized

- Container grown trees from seedling to final sale
- Containerized have had trees in other containers, or balled & burlapped trees placed in final container
- Must remove twine and burlap inside container
Planting Balled & Burlapped Trees
Remove packing materials

→ Remove all twine and string
→ Remove all burlap, or at least the top half
→ Remove wire basket or at least top half
→ Remove all tags, trunk sleeves, and growing stakes

Burlap left on will wick water out of root ball
Orient tree as it was at the nursery

- If grafted, turn so graft junction is facing the northeast
- If no graft junction, turn so lean is to the southwest
- This reduces chance for sunscald/frost cracks, and transplant shock
Backfilling the hole

- Amend soil with no more than 5% organic matter
- No not add sand to a clay soil - makes concrete
- Pack down lower half of backfill
- Water lower half of backfill
- Provides a base for the tree
- Loosely fill top half
Create berm for water

- Build 3 inch berm outside of top of root ball
- Water on both sides of the berm
- Remove after 2 or 3 years
Add mulch

- Place 4 inches of composted organic mulch around tree for 3 to 10 feet
- Keep from making contact with trunk
- Replace annually back to 4 inch depth
Advantages of mulch

- Eliminates grass competition
- Reduces weed whacker/lawnmower damage
- Reduces sunscald / frost cracks
- Conserves moisture
- Provides nutrients to the tree
- Makes for a healthier tree
Eliminates lawn mower/weed whacker damage
Roots under grass / mulch
Tree Wraps

- Not recommended
- Blocks photosynthesis under the bark
- Causes greater temperature differential
- May harbor insects and disease
* Rocks don’t provide nutrients
* Remove shipping sleeves
Watering

- Water before, during and after planting
- Install irrigation to cover all roots
- Apply water during summer months at the rate of one inch per week
Pruning at the time of planting

✗ Never balance cut roots with cut top
✗ Only prune dead, broken, rubbing branches, or sprouts
✗ Prune in following years for form
Staking

➢ Only stake when necessary
➢ Set two stakes in parent soil at right angles to the wind
➢ Use wide, flexible material
➢ Remove after one growing season
Problems with staking
Guying

- Used for large trees
- Problems with wire in hose
- Anchor with stakes, hand anchors, deadmen
- Remove after one growing season
Transplanting

- Best in winter
- Root prune prior
- Taper ball
- 10” diameter for each 1” in caliper
- Drum lace over burlap
- Handle by ball
Tree spades

- Convenient
- Tend to glaze soil
- May mangle roots
- Hand widen hole
- Roughen hole sides and sides of root ball
- Assure tree is straight
Post planting care

❤ Assure adequate watering
❤ Remove stakes / guy wires
❤ Replenish mulch
❤ Fertilize after one or two years
❤ Prune for form
❤ Check branch elongation
1. Bare-root trees are normally planted when ________, before buds begin to grow.
2. Pre-digging to create a more densely rooted ball is called **root pruning**.
3. The planting hole should never be **deeper** than the root ball.
4. Planting holes should be dug two to three times the width of the root ball at the surface, with the sides sloping down to the diameter at the base of the root ball.
5. Tree wraps are not recommended as they tend to block photosynthesis in the **cortex** layer under the bark.
Sample Test Questions

1. Staking or guying when planting a tree
   a. is done only for bare-root trees
   b. is not necessary for trees greater than 6 inches in diameter
   c. is not always required or necessary
   d. promotes a larger and stronger root system and better trunk taper
2. When planting in a compacted, clay soil

a. the backfill should be modified 50 percent with peat
b. the tree should be planted slightly shallow (with the top of the ball a few inches above ground level)
c. the hole should be dug 6 to 8 inches deeper than the ball and soft fill added
d. the tree should be planted deeper to discourage surface root growth
3. **Placing gravel in the bottom of the planting hole in a clay site**
   
a. will improve drainage

   b. will prevent the formation of girdling roots

   **c. will restrict soil space and create a perched water table**

   d. will improve aeration and water infiltration
4. When planting a container-grown tree

- separate and tease apart the roots to reduce girdling root formation
- place soft fill in the bottom of the planting hole to encourage taproot growth
- Backfill the hole with a soilless growth medium to encourage root growth
- none of the above
5. The most important reason to prune a tree when transplanting is

a. to compensate for root loss
b. to invigorate the tree
c. to reduce growth at the tips
d. to remove structurally weak or damaged branches
Questions?
Contact the U of U Campus Tree Committee for advice!