# Installation of Trees and Shrubs in the Landscape

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Original presentation combined from Auburn University, University of Georgia and Florida (special thanks to:Dr. Edward F. Gilman and Traci Partin of IFAS)

ALABAMA COOPERATIVE Extension SYSTEM

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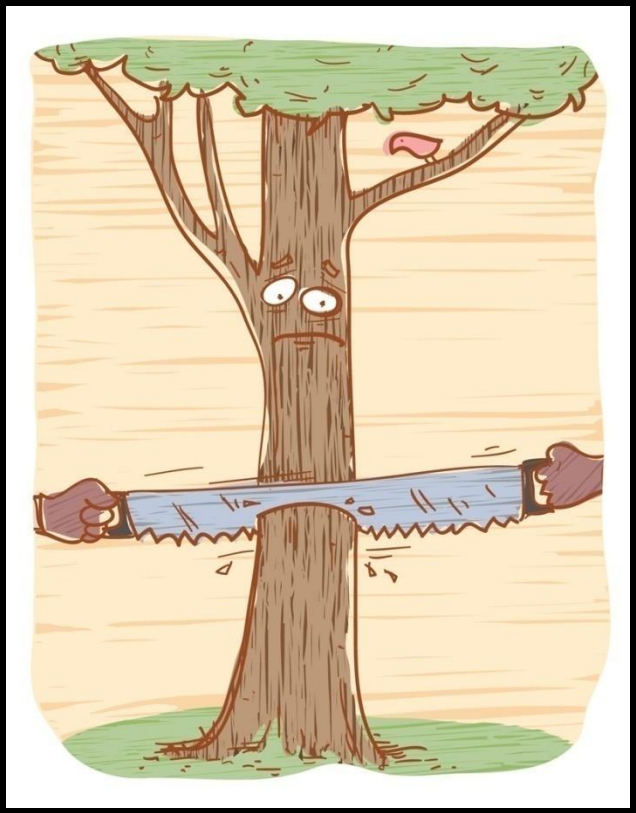
# Landscape Tree Facts

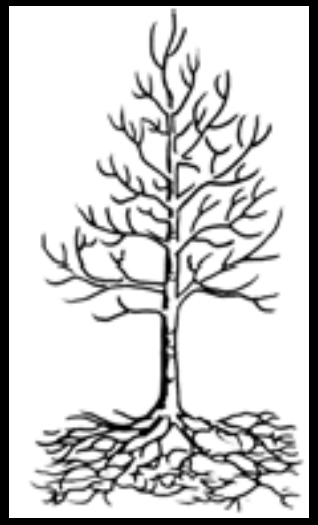
- Trees growing in commercial settings live  an average of 13 years
- Trees in residential areas average 37 years
- Trees in rural, undisturbed sites average 150 years
- Why?????



# Why do trees and shrubs struggle in the Landscape

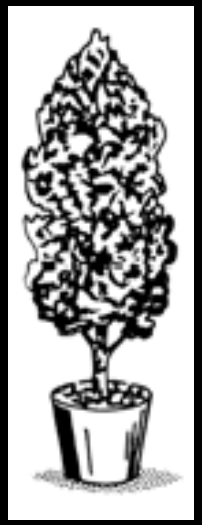
- Compacted soils
- No topsoil
- Limited space for roots
- Improper staking
- Mechanical  injuries
- Construction
- Pedestrian and vehicle abuse
- Adding/Removing soil
- Improper planting
- Over-pruning
- Improper fertilization

# Types of Tree Stock – Methods of Planting



Bare-Root

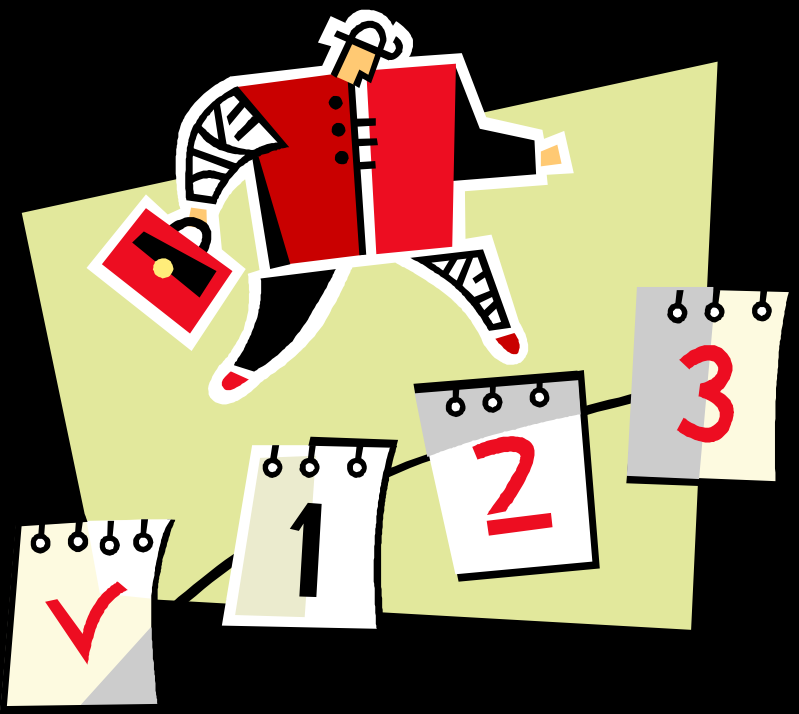
Ball and Burlap (B&B)



Container

Possibly you may run across Fabric Bag trees grown in the ground

# Steps for proper planting




What's wrong with this picture?

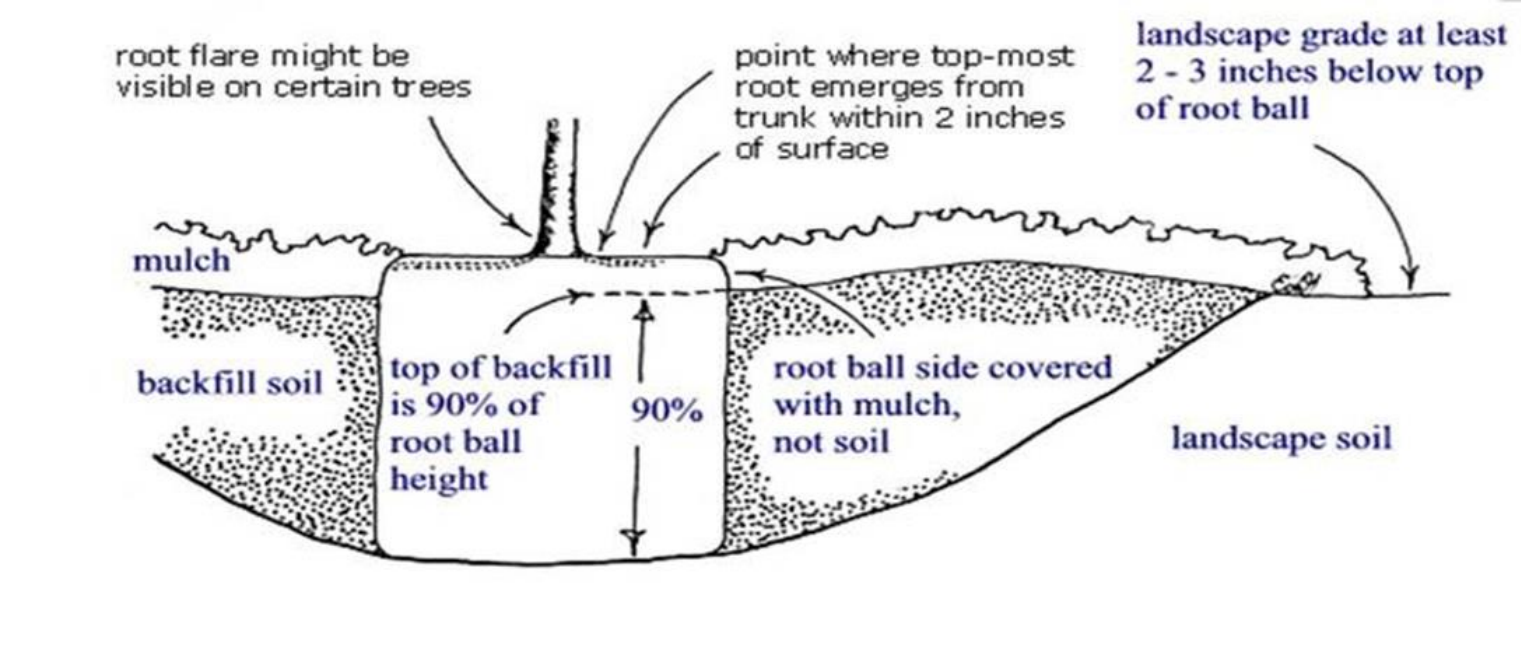
# Step 1: Look up!

This is your last chance to be sure you have selected the right tree for the right place.

If there is a wire, security light, or sidewalk/street/building too close:

- Plant elsewhere, or
- Plant a small-maturing tree

# Step 2: Dig Shallow Wide Hole




You should be able to illustrate how the planting hole should look using this as a guide

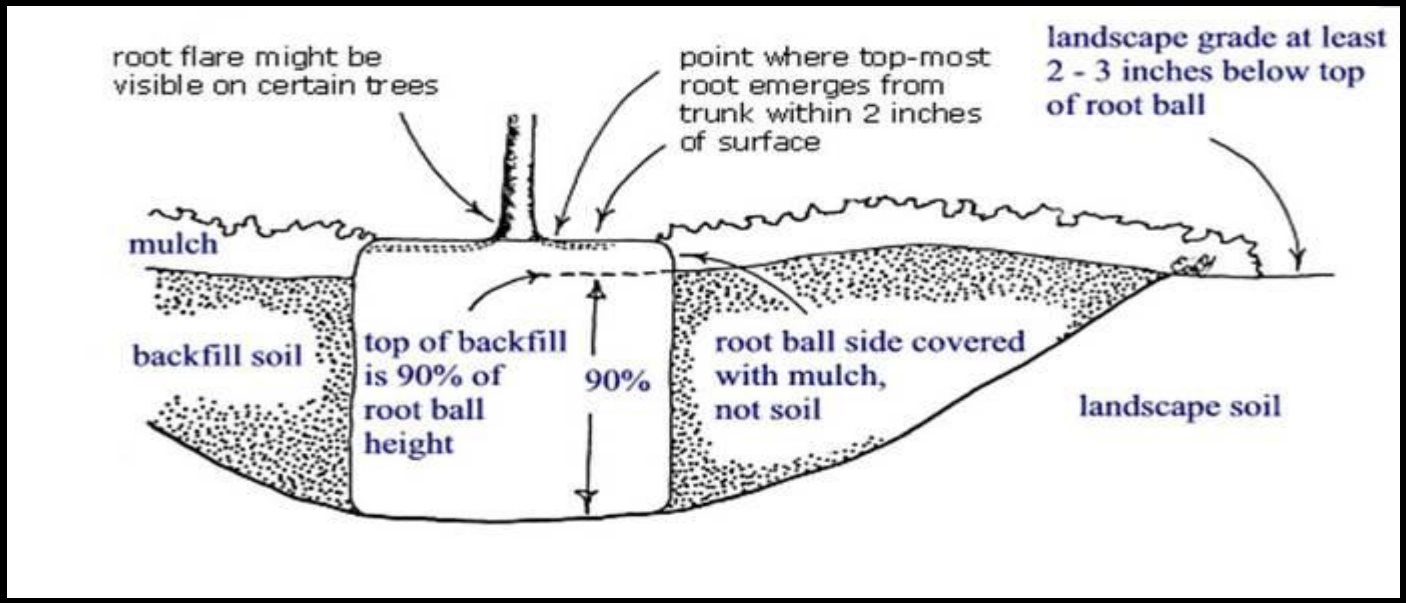
# Root Flare

- The point where the top-most root emerges from the trunk is at the surface. It is critical that you find the root flair before planting.

Measure the distance between the top most root and the bottom of the root ball.

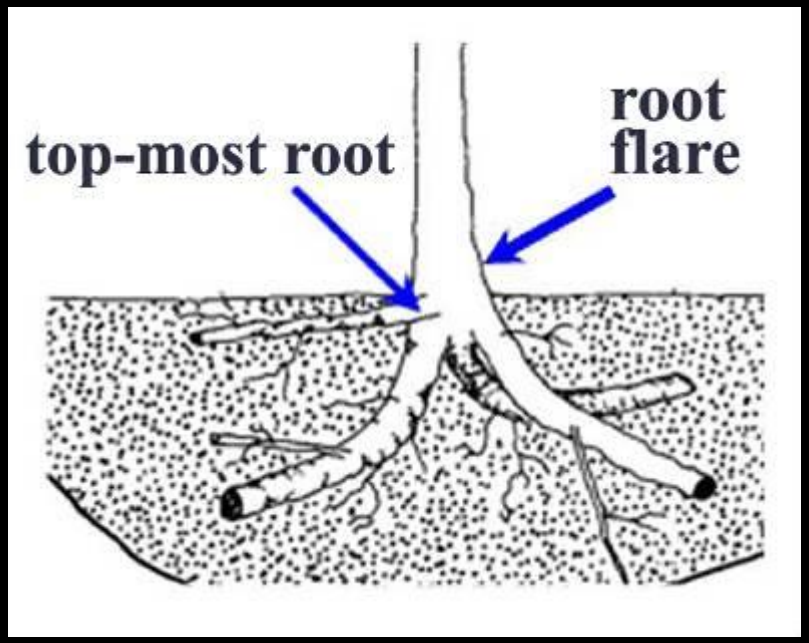
Dig the hole to about 90 to 95% of this depth. The hole should always be less deep than the root ball.

# Dig the planting hole as wide as possible



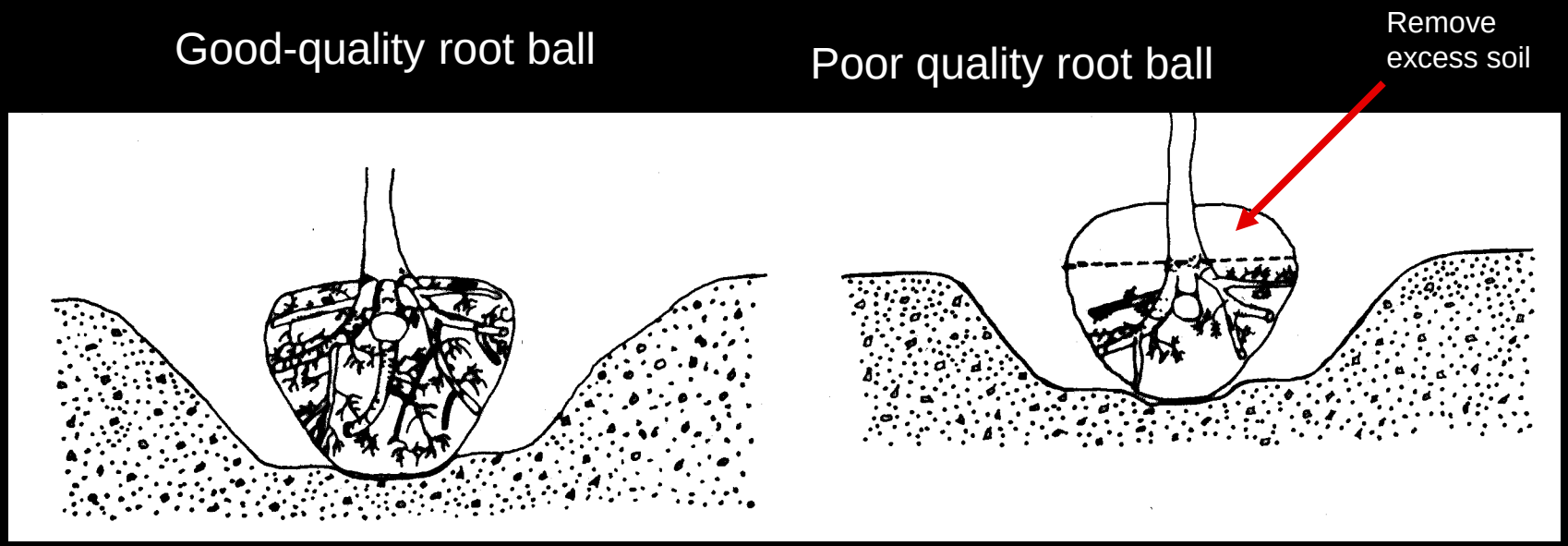

- The planting hole should be at least 2 times the diameter of the root ball or better yet till a larger area as far as possible
- This provides loose soil for the expansion of new roots.

# Step 3: Proper Depth Placement




- The point where the top-most root meets the trunk of the tree or shrub should be near the surface and certainly no more than 2 inches deep in the root ball. Wash the soil/bark away as much as possible. Note that the root flair is obvious.

# Root ball quality




- (RIGHT) Too much soil on top of the root ball can indicate a poor-quality root ball.
- (LEFT) Trees with the top-most root near the surface of the root ball have more of a root system.

# Root Washing B&B plant

This was the soil line of the rootball

Photo by: Jim Flott, Spokane Wa. Urban Forester

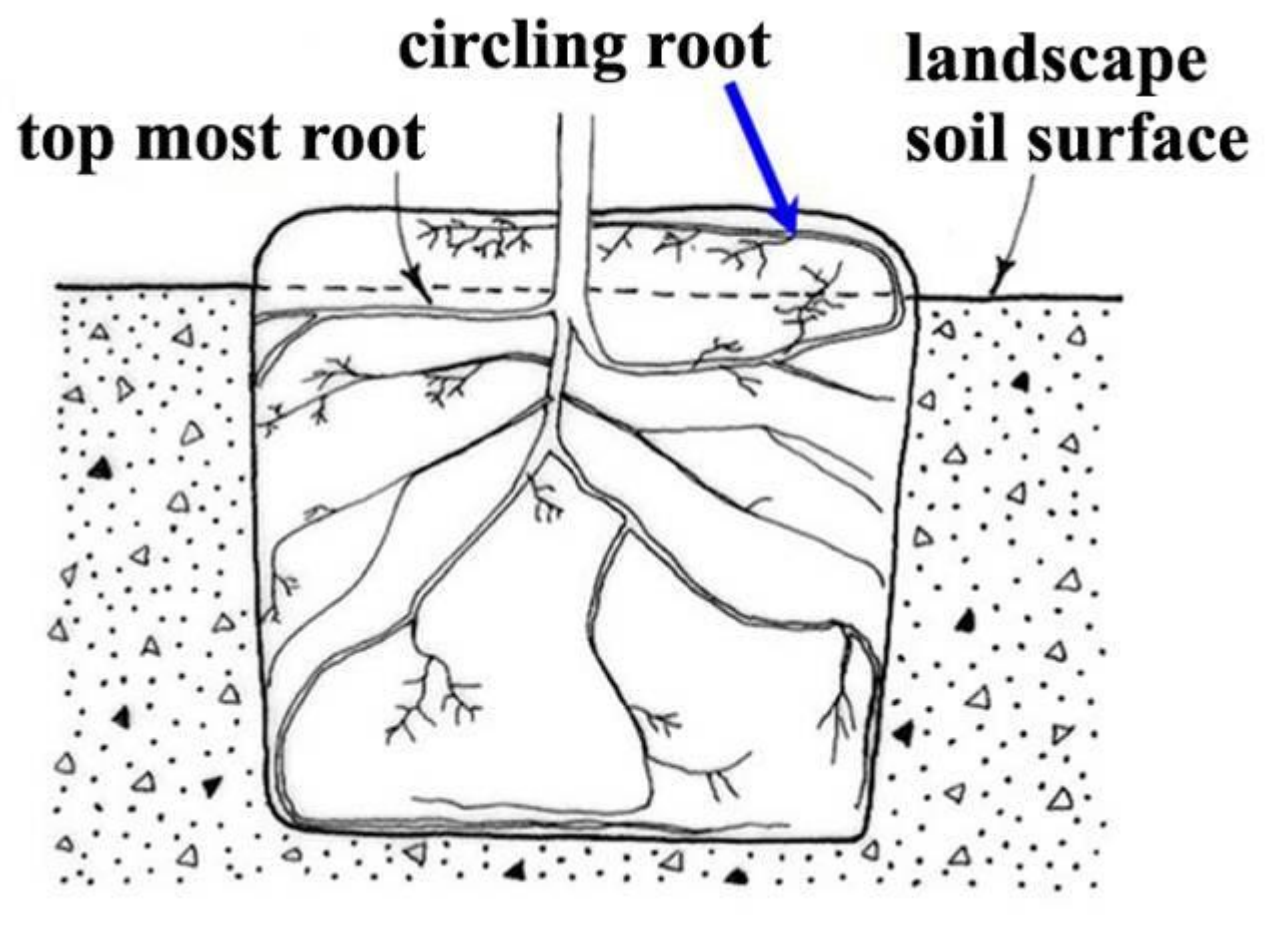
# Container grown plants

- Remove excess soil from the top of the root ball at minimum.
- Either score or separate root bound plants (or remove all bark)

Three inches of soil and media were removed from the top of this ball before upper roots were located

# Treating root defects

- Cut or spread out any circling or kinked roots especially growing up above the top-most root.



# Defects at top of ball

- At minimum remove soil/bark from top of root ball and cut circling and crossed roots

# Circling roots – cut them, or tear up the edge of the root ball to spread roots out

# Cutting circling roots

- New roots will grow quickly into backfill soil following cutting and stem girdling roots are less likely to form.

# Even Better When Time Allows

- Remove all the soilless medium from container plants

Trees with circling root defects are often found leaning or fallen after a storm.

# Step 4 – Placing Large Trees

# Lifting tree into the planting hole

- To avoid damage when setting the tree in the hole, lift the tree with straps or rope around the root ball, not by the trunk.

# Step 5: Position the tree in the soil

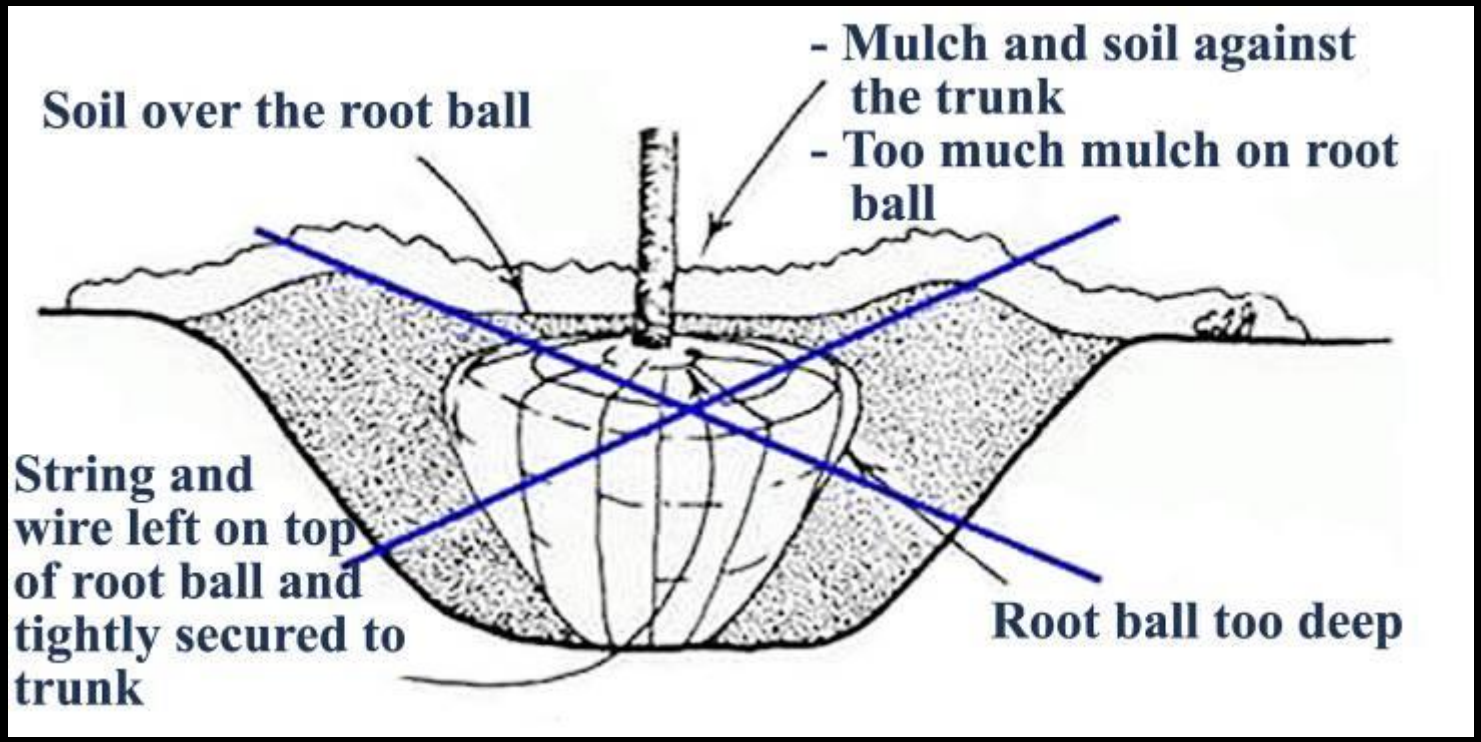
- Many professionals agree that it is better to plant the tree a little high rather than too deeply.

- When the top-most root is too deep in the root ball, set the top of the ball several inches higher than the landscape soil to adjust as shown above. If you don’t see the root flair hedge your bet by placing high and mounding soil to the flair.

# TOO DEEP! - add soil to bottom of hole

# Effect of planting depth on stress after planting

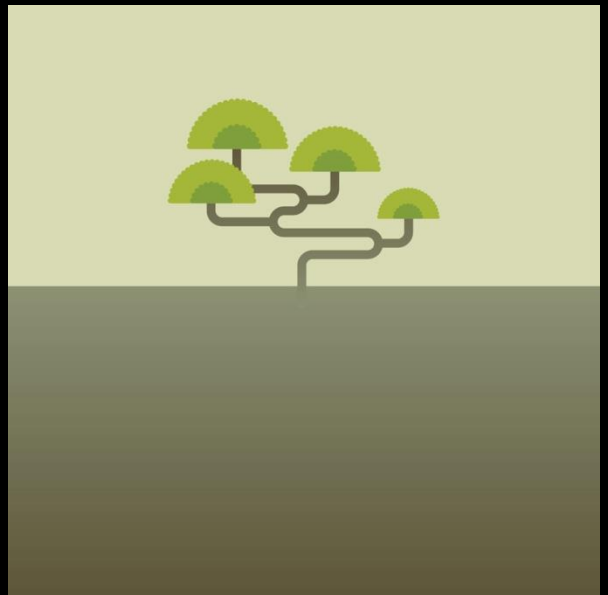
- Soil intercepts water meant for the root ball causing roots to dry out.




Be able to identify the problems illustrated here

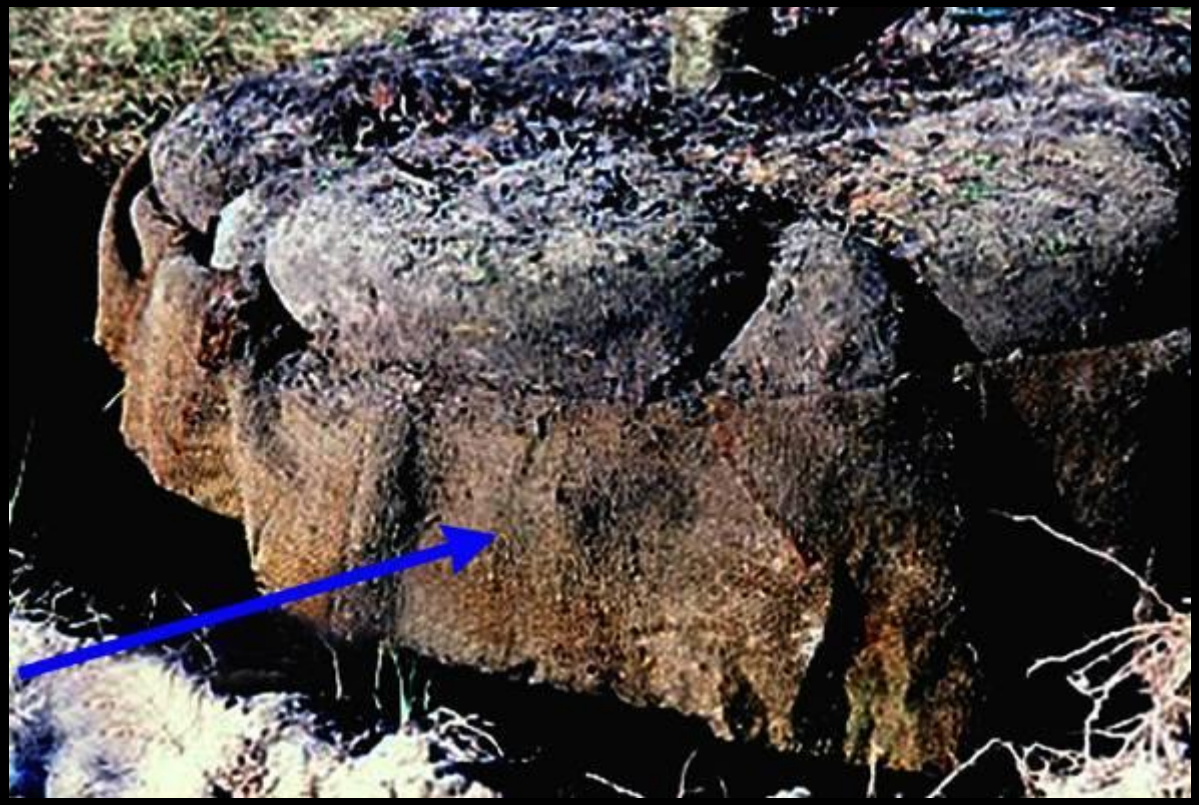
# Step 6: Straighten the tree

- Before adding backfill, be sure to check that the tree is straight by looking at it from two perpendicular directions. It is easier to correct now while equipment is on site.



# Step 7: Balled-in-burlap trees

- Burlap should at least be removed from the bottom of the trunk and the top of root ball.  Even better if removed entirely – some “burlap” is synthetic and will not rot.



# Remove all synthetic burlap

- Synthetic burlap melts into a plastic goo while real burlap flames and turns to ash when lit.
- If burlap is synthetic, be sure to remove all of it with a pruner, knife or other sharp blade.

# Synthetic burlap can girdle roots

- Roots grow through artificial burlap with little difficulty, but as the roots attempt to expand in diameter, they become girdled.

- Each of these roots is very easy to break off at the burlap because there is very little wood that developed through the burlap.

# Wire baskets

- Baskets made from heavy gauge wire are often used to help keep a root ball intact during shipping and handling.
- There is no research documenting the detrimental effects of wire baskets on trees but this can’t be good.
- If it does not void warranty remove or bend over the top row of wire at minimum.

# Step 8: Backfill – do not amend

- Use the same soil taken out of the hole as backfill.
- Firm the soil against the root ball.
- Water as you backfill.

- Slice a shovel into the soil at the edge of the hole to enlarge the hole or better yet till a large ring around planting hole.
- Use the same soil taken out of the hole as backfill.
- Firm the soil against the root ball.

# Moderately pack the backfill soil

# Water again when filled to settle

# Step 9: Add mulch

- A minimum of two inches of the root ball should remain above ground after all the backfill soil is added.
- Mulch sides and water trench area but do not mulch directly over the root ball – except for possibly a 1” aesthetic layer.

# Mulching

- Apply a 2-3-inch thick layer of mulch to at least an eight-foot diameter circle
- Apply a thinner 1” layer of mulch over the root ball if necessary for aesthetics, but keep it off the trunk

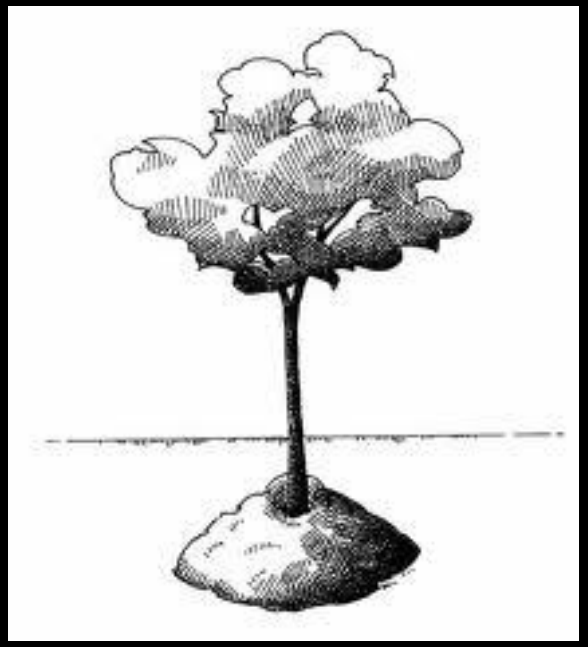
# Long Term: Mulching

- Mulch as large an area as possible to allow the tree roots to expand without competition from turf roots.
- What would you do differently than pictured here?

# Improper mulching

- If turfgrass grows up to the trunk, trees often perform poorly.
- Turf and weeds rob trees of moisture and nutrients and some produce chemicals that inhibit tree growth.
- Lawn mowing equipment or weed eater damages trunk (no matter how careful you are)

# Improper mulching



- Never pile mulch in a volcano-like manner against the trunk. This can rot the trunk, cut off oxygen to roots, keep vital irrigation and rain water out, and can keep roots too wet in poorly drained soils. Stem girdling roots form within the mulch on some trees. Also, voles like the mulch.

# Too much mulch over time

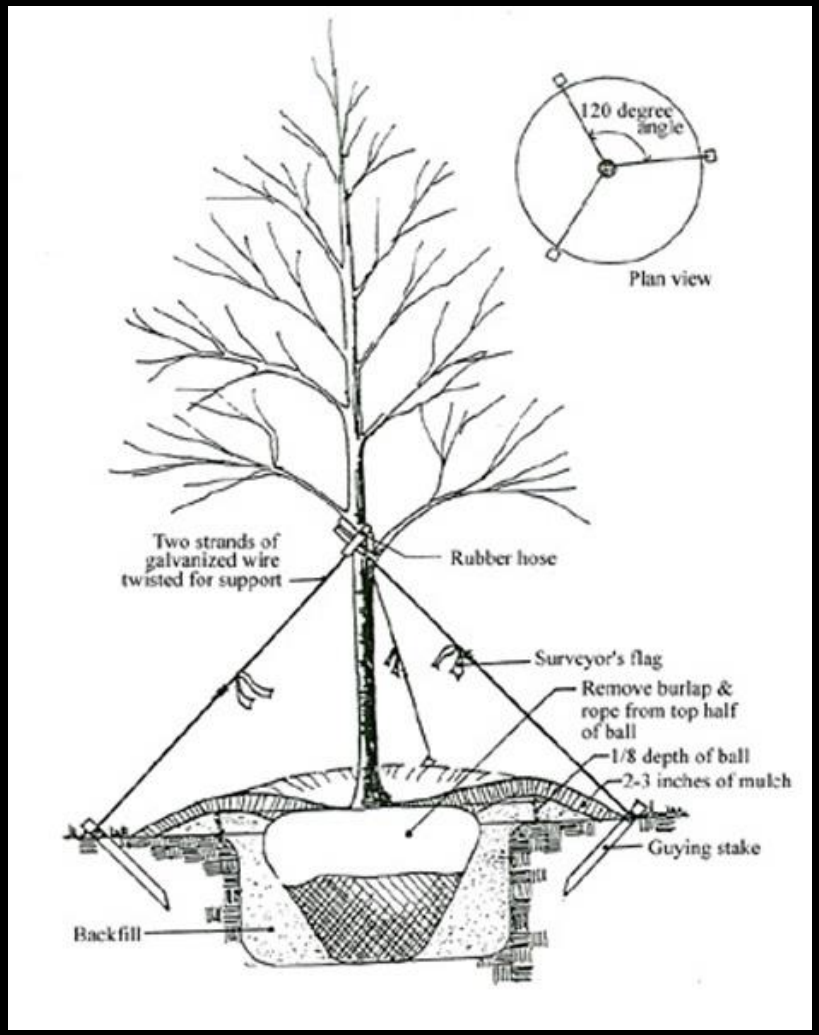
- These hollies were dying one by one – quickly
- Landscape fabric was used 10 years prior at planting
- Mulch was added each year

Most roots were on top of the fabric in the mulch

# Adding a berm

- A 3 to 4-inch berm could be constructed at the edge of the root ball to prevent water from running off as seen here.

# Step 10: Staking and guying



# Traditional staking methods

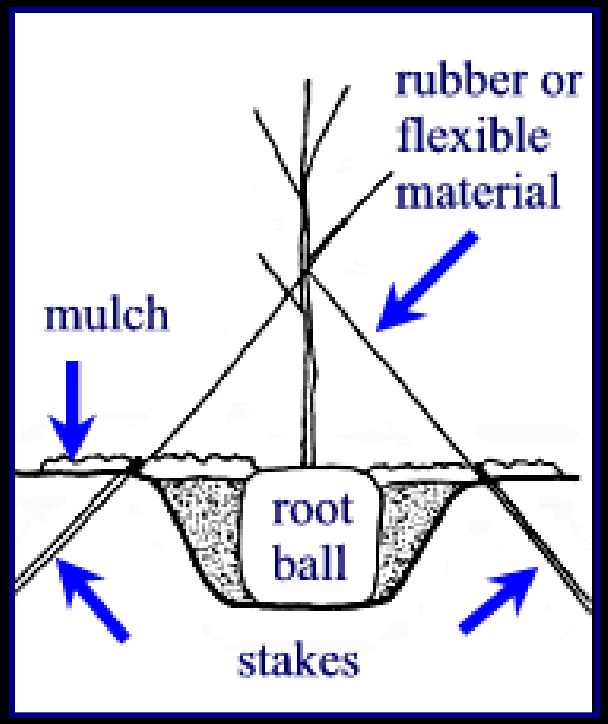


Figure 1

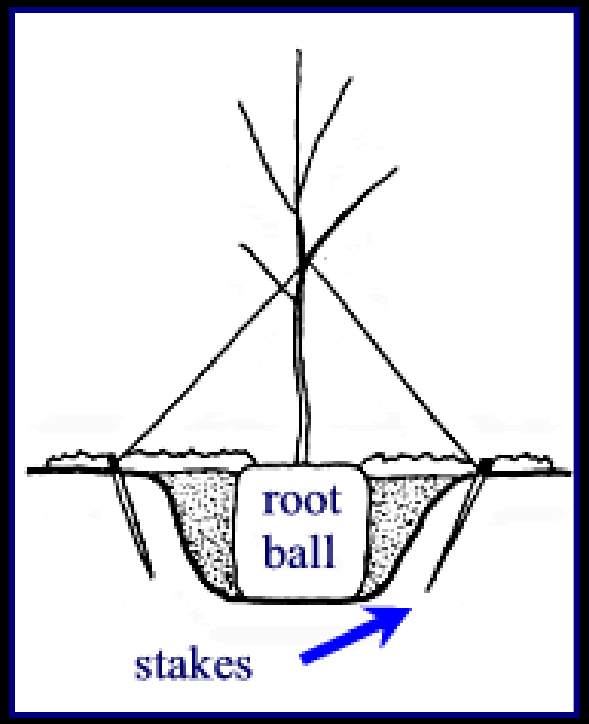


Figure 2

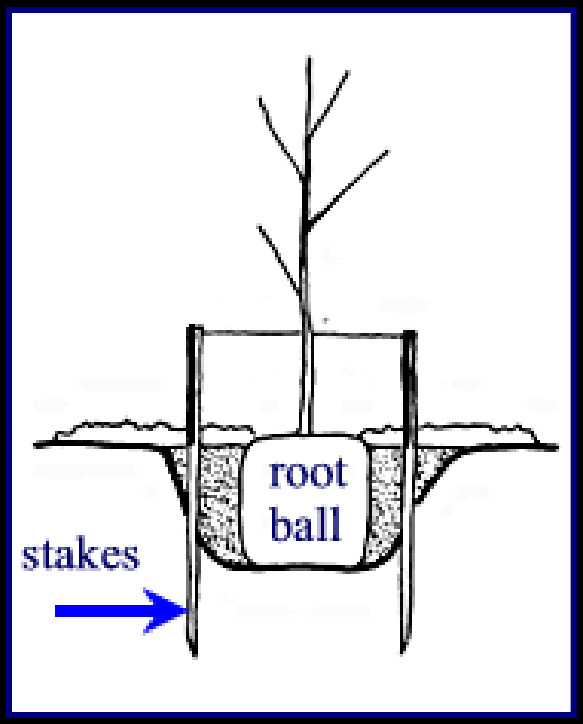
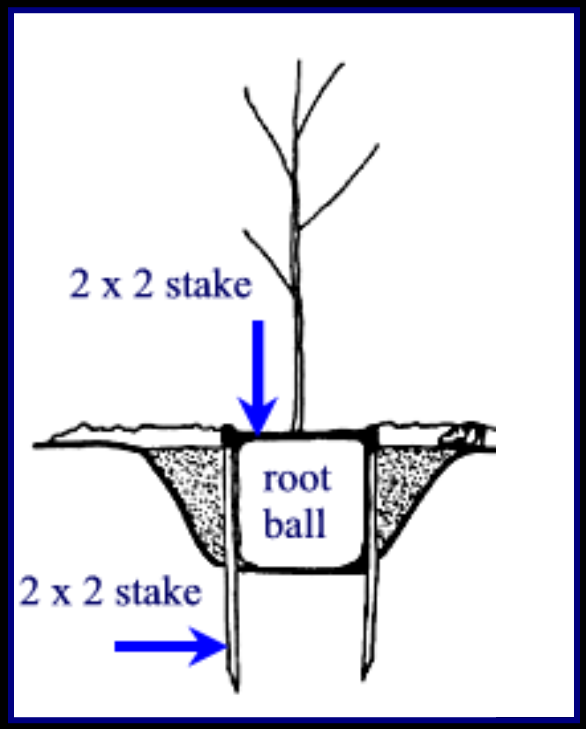


Figure 3

- All these systems require removal within one year of planting.
- This is the system to use if you remove soil/media as described earlier

# Alternative staking methods (no staking if possible)




- This inexpensive alternative staking system does not need to be removed because they simply decay in a few years.
- Use this method on B&B plants that are not very top heavy and at least 3” caliper – deciduous trees planted in the fall/winter

# One last step: Prune to finish the job

- Remove broken branches.
- Perform structural pruning if needed (but leave all foliage possible for the first year).
- Do not prune to compensate for root loss (water instead).

# Fertilizer at planting?

- **Nitrogen not necessary –** fertilizing at planting time is not likely to improve survival or growth. A small benefit might occur in very poor sandy soils.
- **Soluble fertilizers** could burn roots if too much is applied, which could injure or kill the tree.
- You may adjust pH and/or add P and K according to soil test report prior to planting.

# Establishment

**Establishment period:** the time it takes for a tree to regenerate enough roots to stay alive without irrigation.

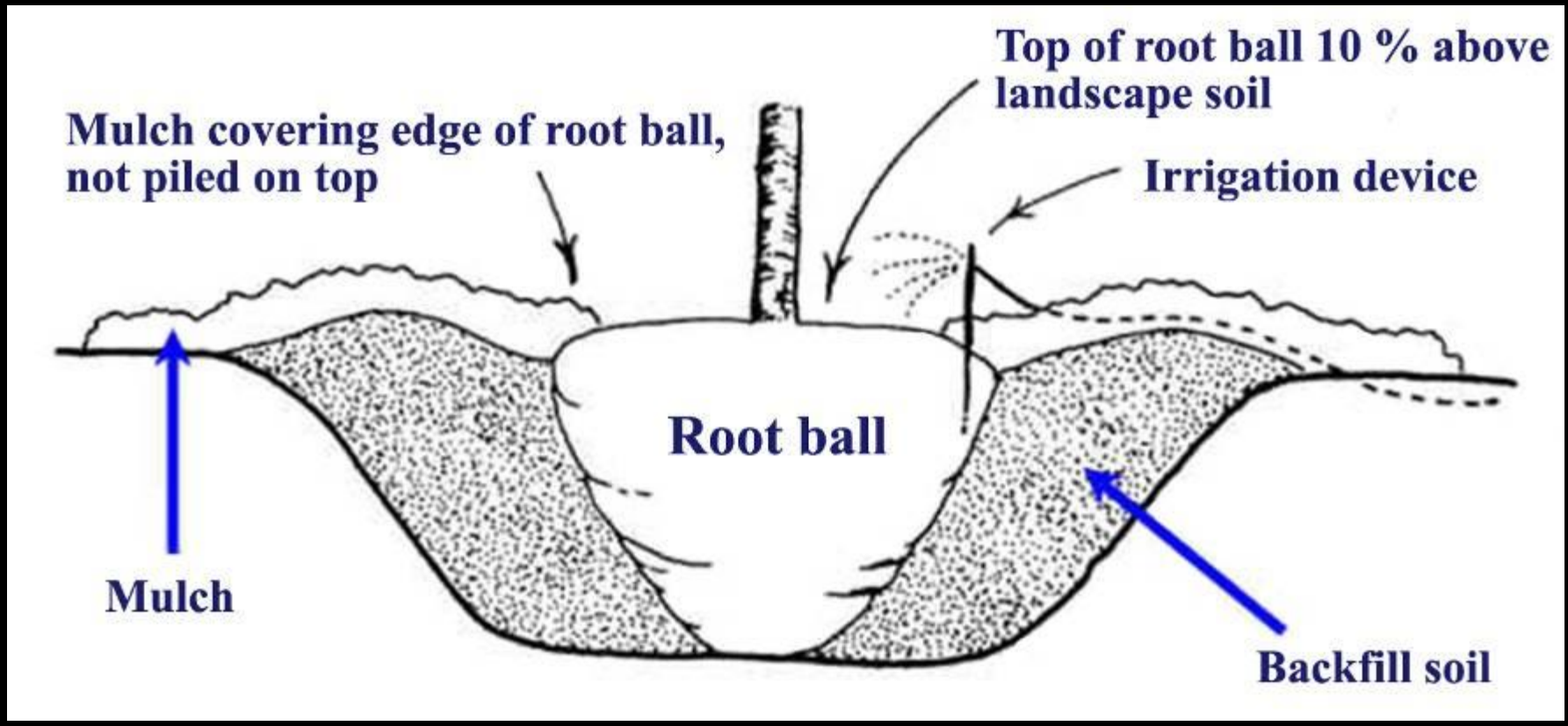
- Roots grow to pre-transplanting size/quantity (hard to know)
- Trunk and shoot growth match pre-transplant rate (hard to know)
- Time: about 3 - 4 months per inch trunk caliper is a likely a more useful estimate

# Irrigation: is it volume or frequency?

- **It's frequency!**
- Experiment done on 4-inch hardened-off B&B trees where 1.5, 3, or 5 gallons of water were applied per inch trunk caliper.

➡ Results show that volume did not matter (in the range tested) but frequency did.

# Summary of proper planting




**For more information on related topics…**

Visit the website here for more details:
http://hort.ifas.ufl.edu/woody/

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