Lunch & Learn With The Masters

January 11, 2010

15 Steps to Proper Planting of Trees, Shrubs and Ornamentals

Presented by Joe Janak
Victoria County Extension Agent – Ag/NR

Roy Cook, President
Victoria County Master Gardener Association

Helen Boatman, Jolene Molder : Co-Chair
Lunch And Learn With The Masters

Partial credit to: Dr. Edward F. Gilman
Department of Environmental Horticulture
University of Florida

AgriLIFE EXTENSION
Texas A&M System
Improving Lives. Improving Texas.

Planting and establishing trees, shrubs and ornamentals

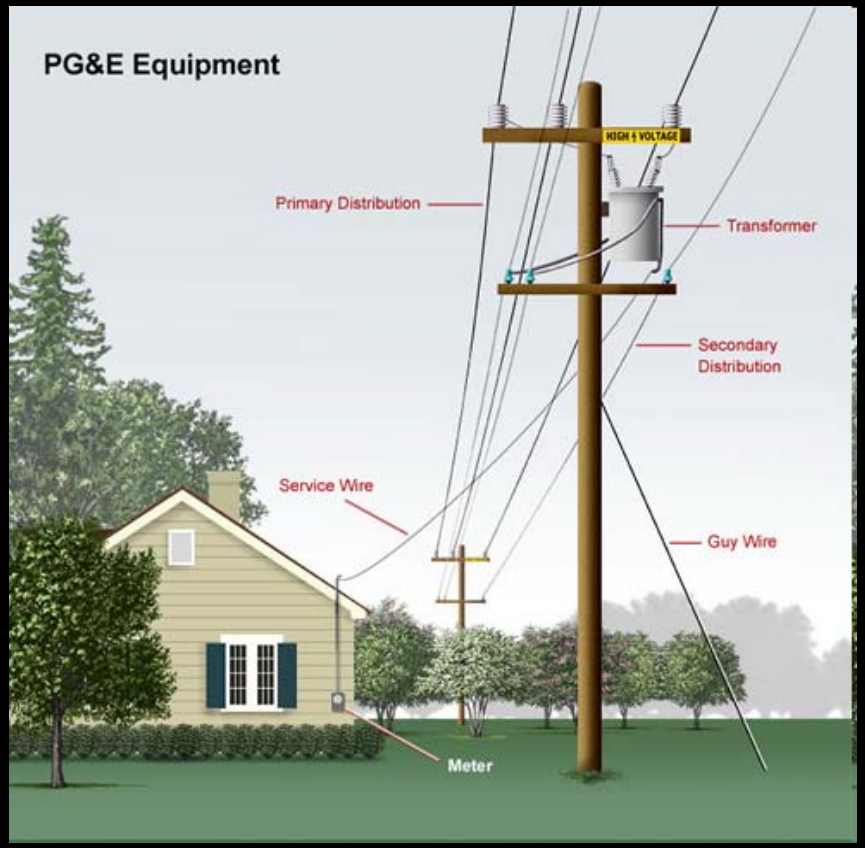
Planting shrubs and trees the Texas way!

Steps for proper planting

1. Call 811 "Call Before You Dig"

Steps for proper planting

1. Call 811 "Call Before You Dig"
2. Look up for wires/lights



Look up!

Be sure you have selected the right tree for the right place.

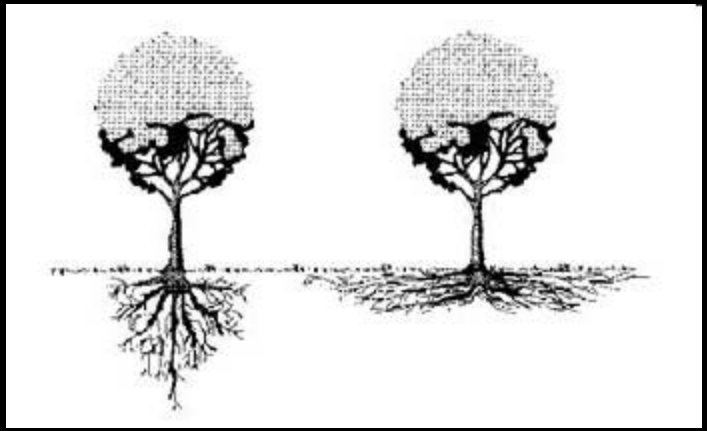
If there is a wire, security light, or building nearby:

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

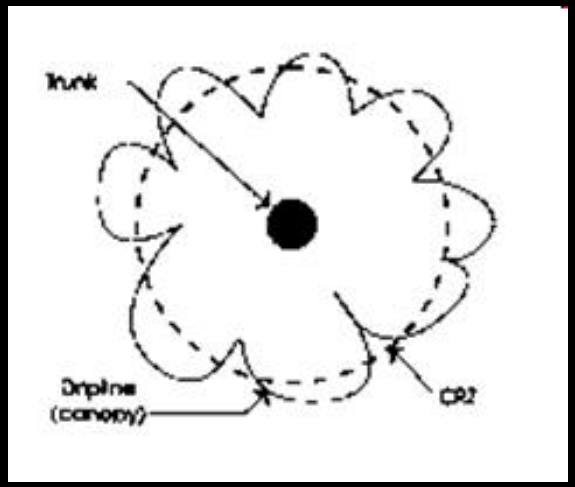
Steps for proper planting

1. Call 811 "Call Before You Dig"
2. Look up for wires/lights
3. Look down and around – plan for root growth

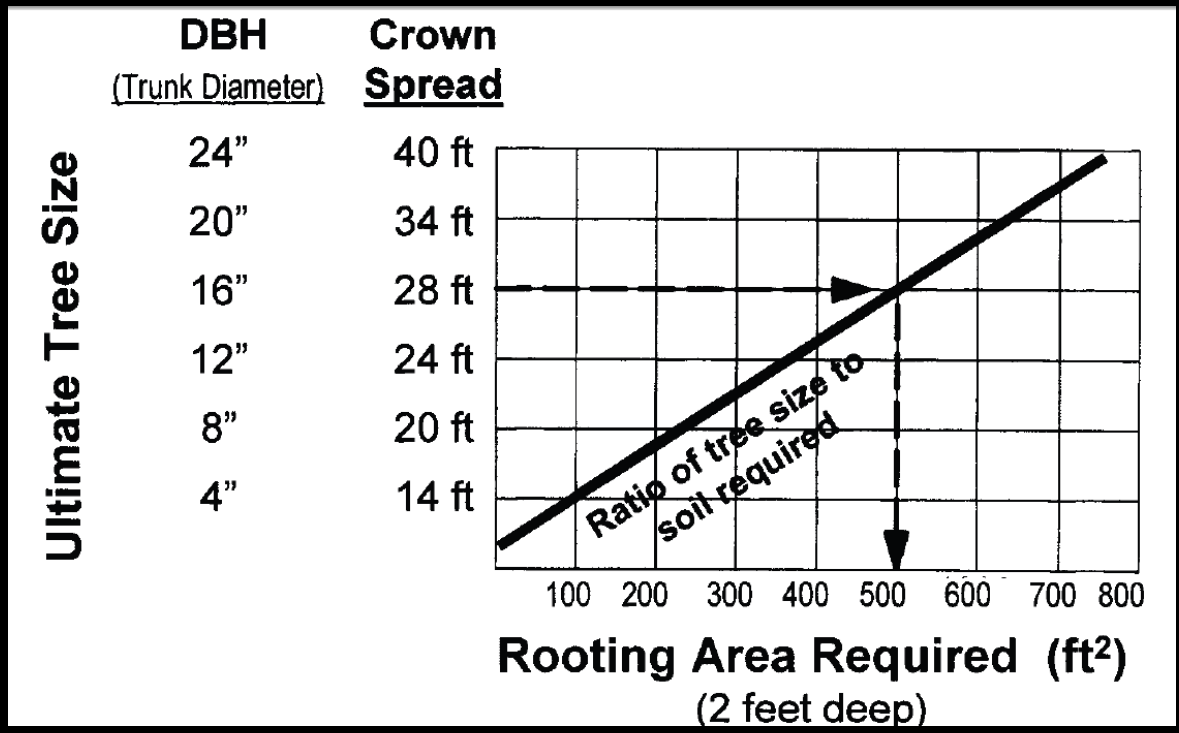
Roots don't grow deep!



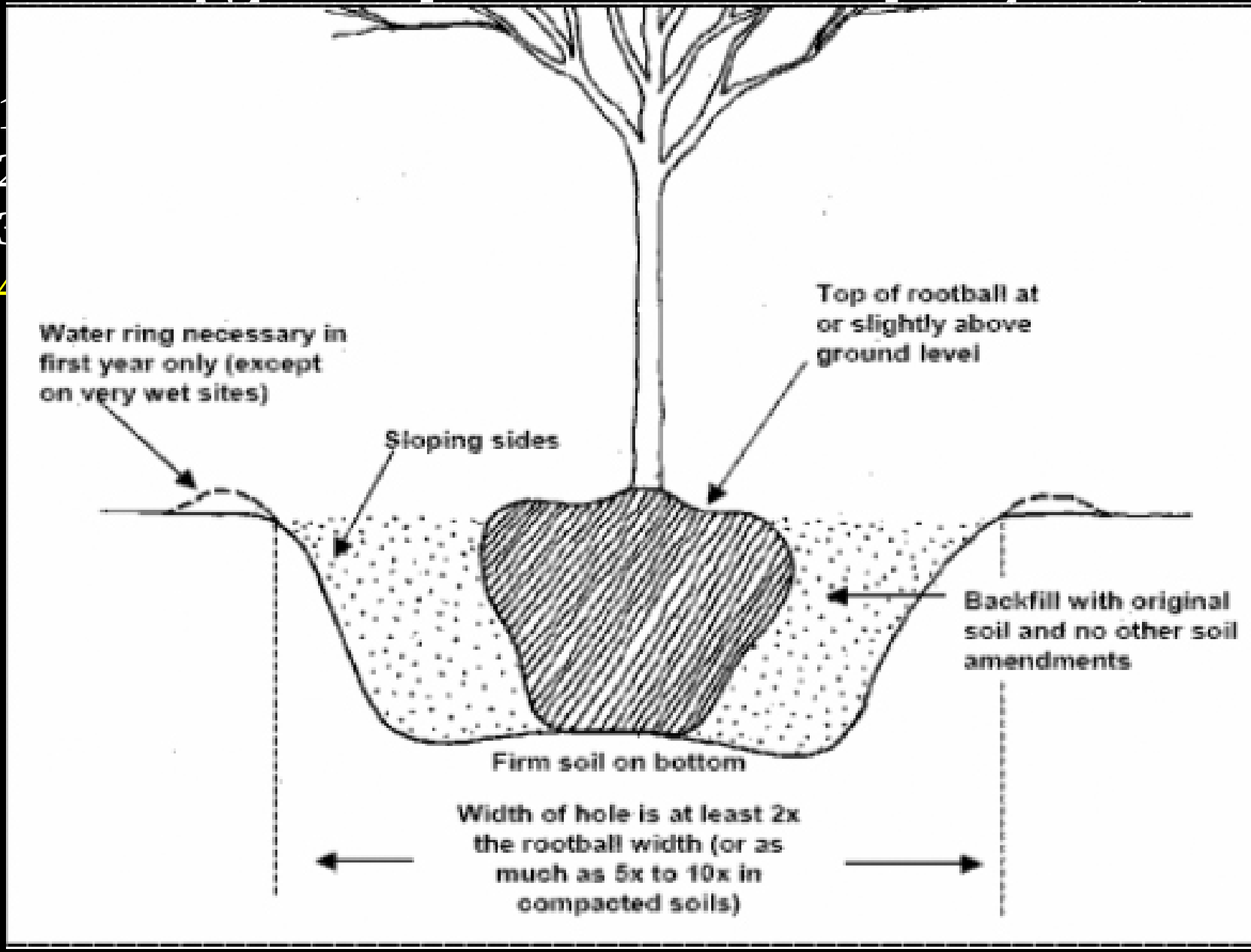
Roots grow away from the trunk.



Houston Area Urban Forestry Council

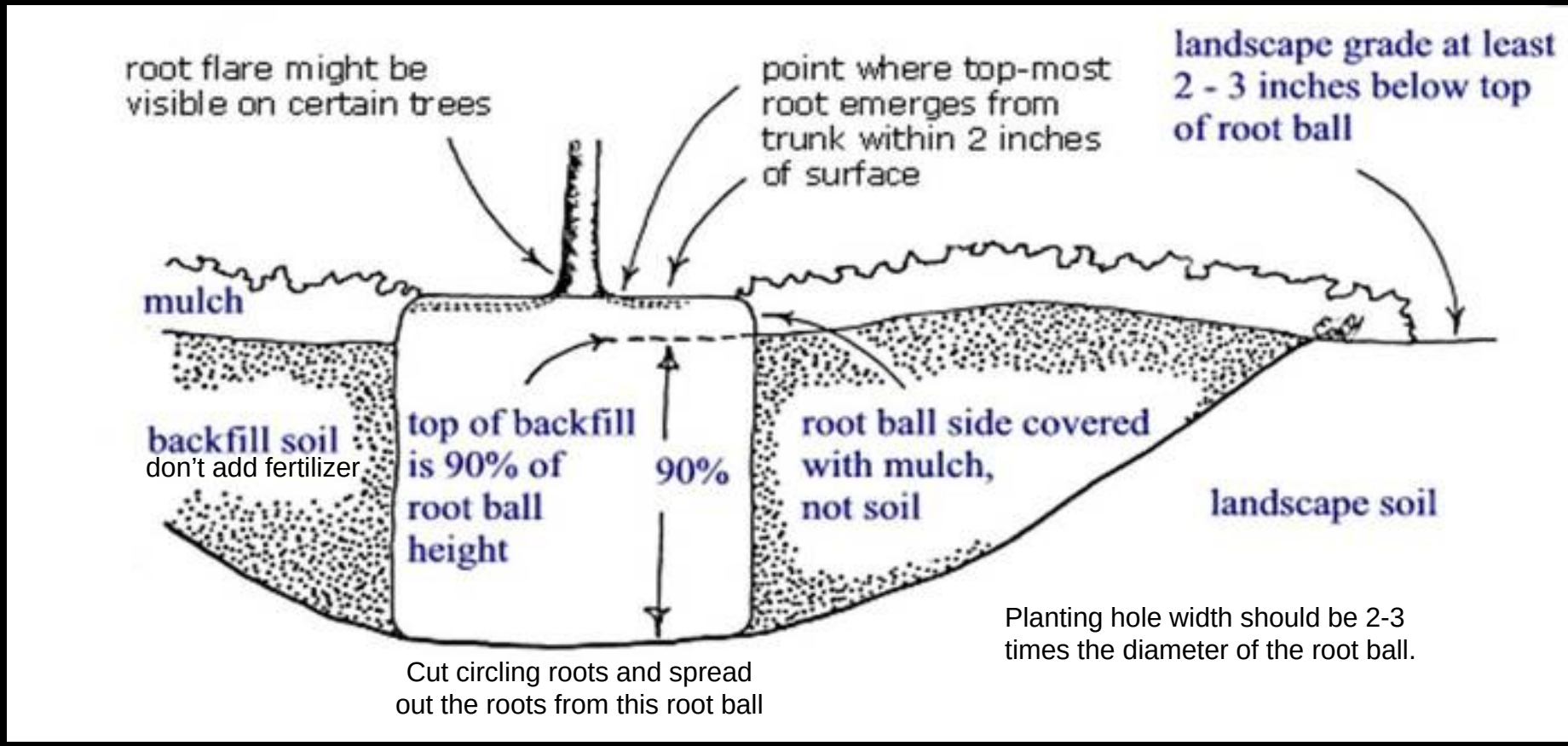


D. Whiting, J. Bousselot, R. Cox, and C. O'Meara1


Water ring necessary in first year only (except on very wet sites)
Top of rootball at or slightly above ground level
Sloping sides
Backfill with original soil and no other soil amendments
Firm soil on bottom
Width of hole is at least 2x the rootball width (or as much as 5x to 10x in compacted soils)

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.

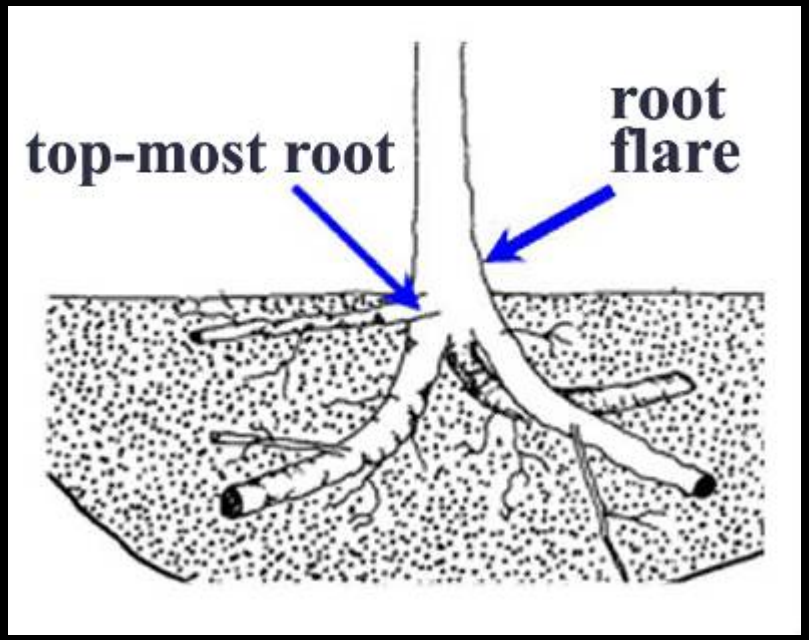


- The planting hole should be at least 1.5 times the diameter of the root ball. 2 times or > is better.
- This provides loose soil for the expansion of new roots.
- <u>Don't</u> put fertilizer, compost, etc. in the hole at planting!

Steps for proper planting

1. Call 811 "Call Before You Dig"
2. Look up for wires/lights
3. Look down – plan for root growth
4. Dig a shallow/wide hole
5. Find the top-most root to determine planting depth

Find the top-most root

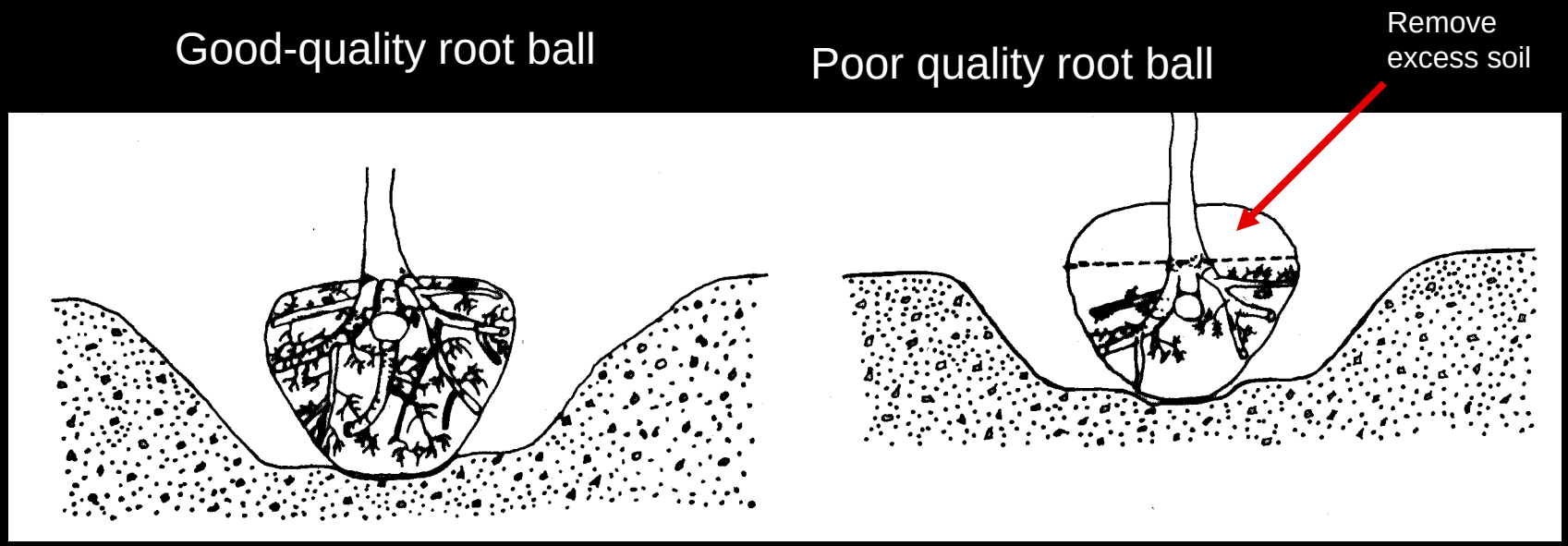


- The point where the top-most root meets the trunk of the tree should be no more than 2 inches deep in the root ball.

Desirable root ball

- The point where the top-most root emerges from the trunk is at the surface. Encourage nurseries to buy trees like this to make it easy to check for root defects like circling and girdling.

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.

Remove excess soil

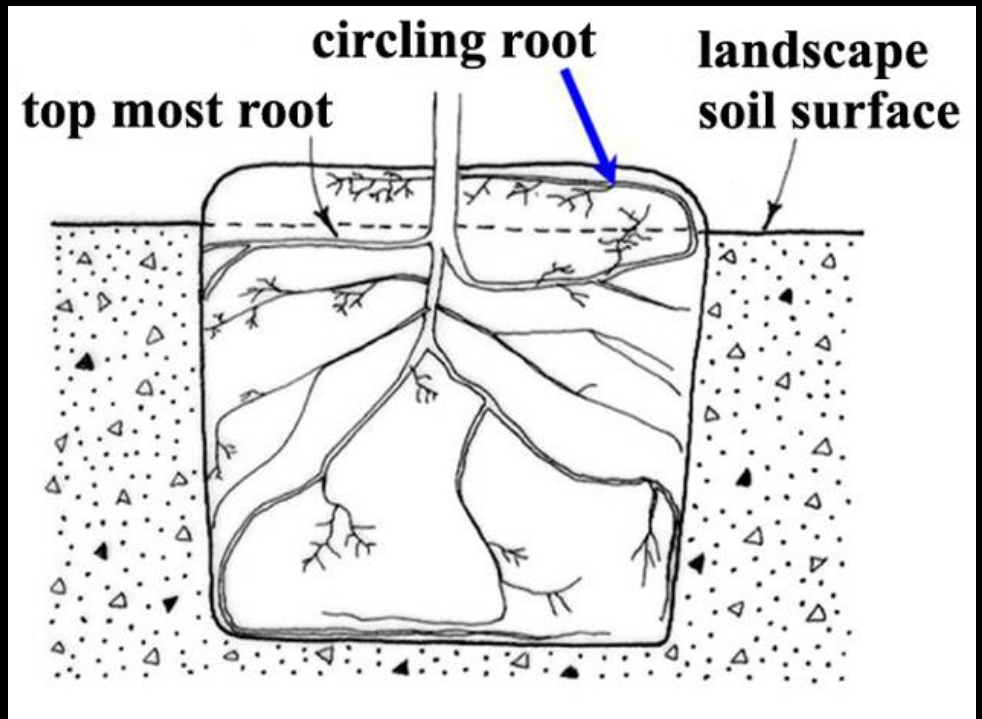
- Remove excess soil from the top of the root ball.

Three inches of soil and media were removed from the top of this ball.

Steps for proper planting

1. Call 811 "Call Before You Dig"
2. Look up for wires/lights
3. Look down – plan for root growth
4. Dig a shallow/wide hole
5. Find the top-most root to determine planting depth
6. Inspect root system; treat defects

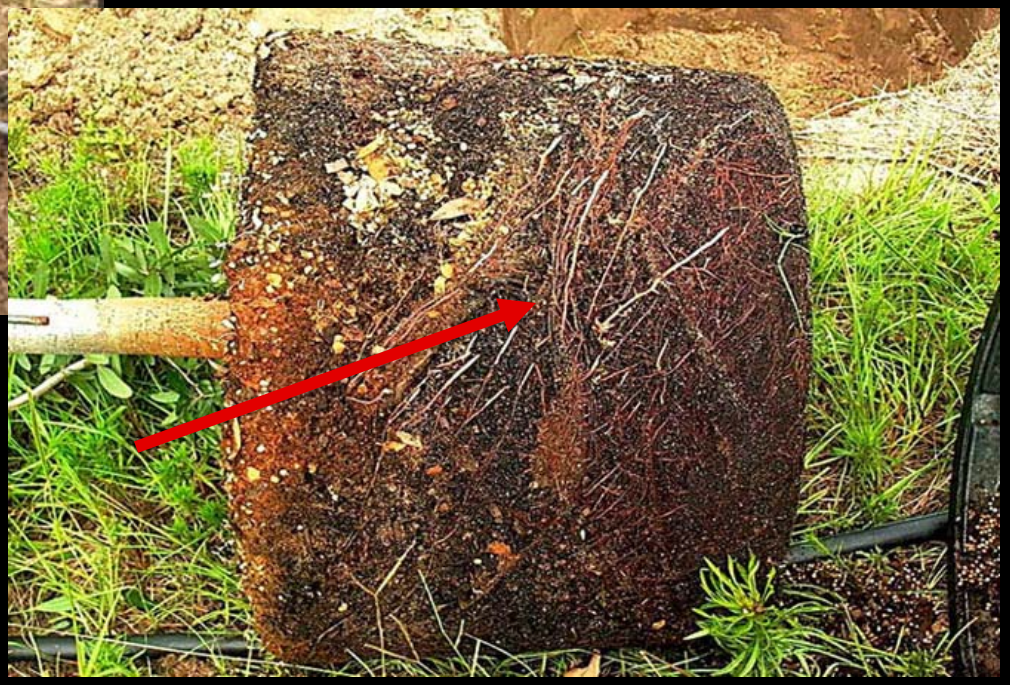
Cut or spread out any circling or kinked roots growing up above the top-most root.



Defects at top of ball

- Remove media 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.

Defects can be inside root ball

- Be sure to look for roots that circle when trees were in a smaller container
- These are difficult to cut because they are hidden in the interior of the ball.

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

Steps for proper planting

1. Call 811 "Call Before You Dig"
2. Look up for wires/lights
3. Look down – plan for root growth
4. Dig a shallow/wide hole
5. Find the top-most root to determine planting depth
6. Inspect root system; treat defects
7. Place tree in hole

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.

Set tree in the hole

Steps for proper planting

1. Call 811 "Call Before You Dig"
2. Look up for wires/lights
3. Look down – plan for root growth
4. Dig a shallow/wide hole
5. Find the top-most root to determine planting depth
6. Inspect root system; treat defects
7. Place tree in hole
8. Position top root 1-2 inches above landscape soil

Position the tree in the soil

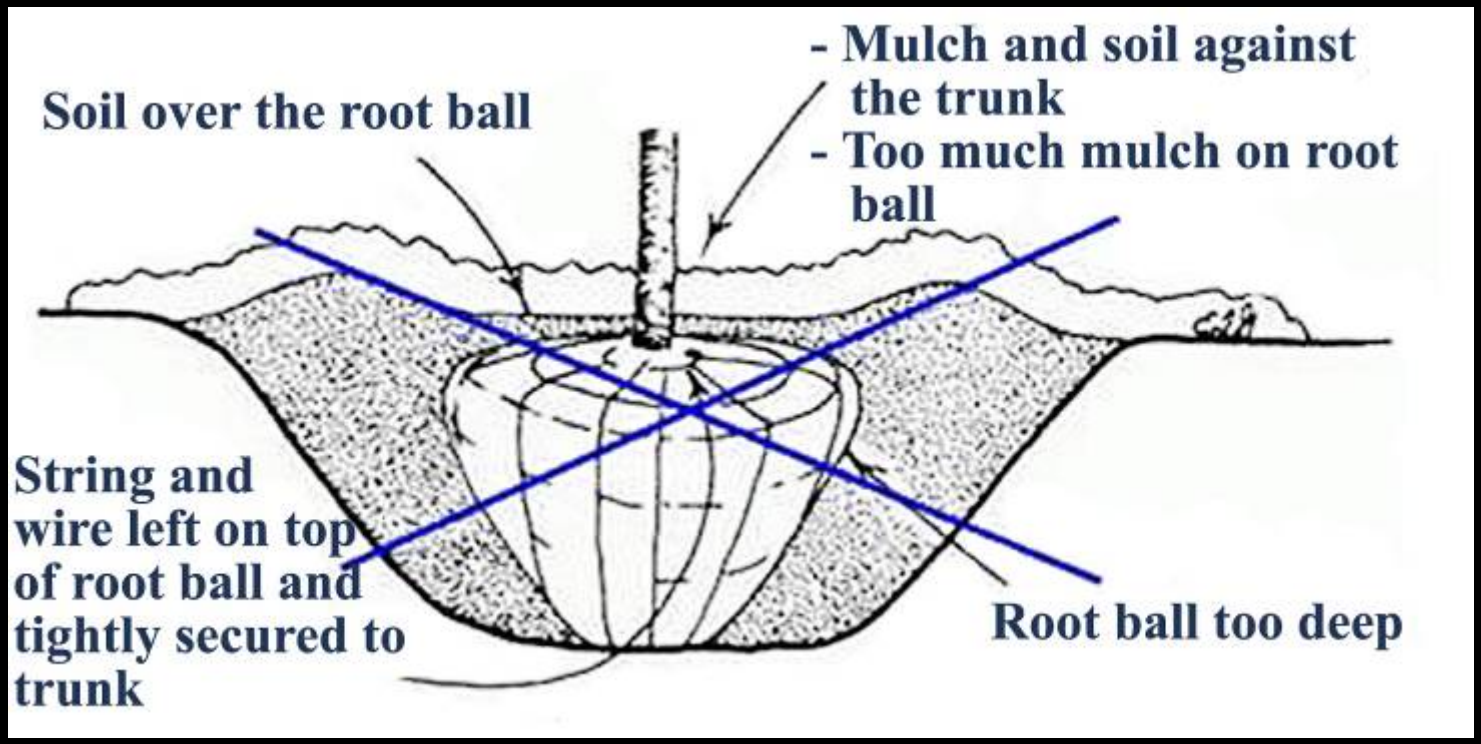
- Many professionals agree that it is better to plant the tree a little high than too deeply.

- 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.

TOO DEEP! - add soil to bottom of hole

Improper planting steps cause stress after planting

- Covering with soil - intercepts water meant for the root ball causing roots to dry out.



Steps for proper planting

1. Call 811 "Call Before You Dig"
2. Look up for wires/lights
3. Look down – plan for root growth
4. Dig a shallow/wide hole
5. Find the top-most root to determine planting depth
6. Inspect root system; treat defects
7. Place tree in hole
8. Position top root 1-2 inches above landscape soil
9. Straighten the tree

Straighten the tree

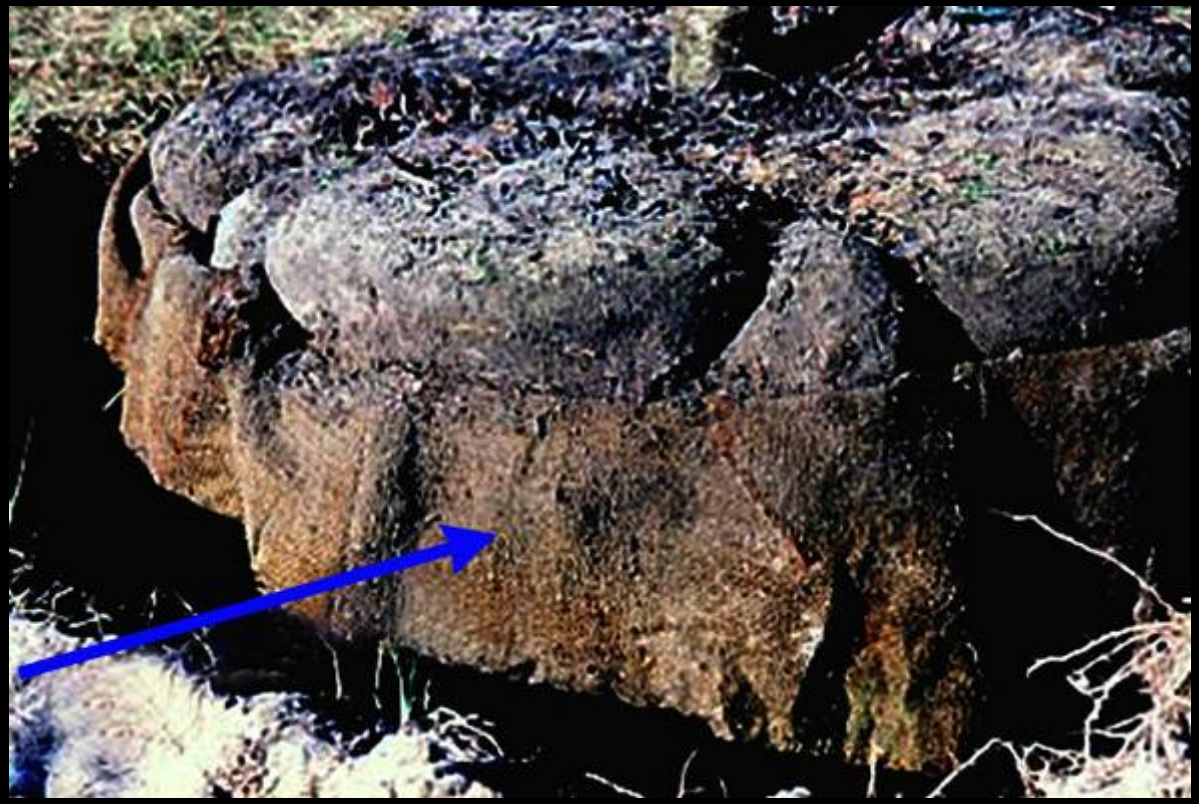
- Before adding backfill, be sure to check that the tree is straight by looking at it from two perpendicular directions.

Steps for proper planting

1. Call 811 "Call Before You Dig"
2. Look up for wires/lights
3. Look down – plan for root growth
4. Dig a shallow/wide hole
5. Find the top-most root to determine planting depth
6. Inspect root system; treat defects
7. Place tree in hole
8. Position top root 1-2 inches above landscape soil
9. Straighten tree
10. Remove synthetic materials

Balled-in-burlap trees

- Burlap should be removed from the bottom of the trunk and the top of root ball.



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 or strangled.

- 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.

Steps for proper planting

1. Call 811 "Call Before You Dig"
2. Look up for wires/lights
3. Look down – plan for root growth
4. Dig a shallow/wide hole
5. Find the top-most root to determine planting depth
6. Inspect root system; treat defects
7. Place tree in hole
8. Position top root 1-2 inches above landscape soil
9. Straighten tree
10. Remove synthetic materials
11. Add backfill soil and firm the root ball

Cut into the backfill

- Slice a shovel into the soil at the edge of the hole to enlarge the hole.
- Push this soil against the root ball.

Enlarged hole and loosened soil

Moderately pack the backfill soil

Water the backfill to settle

Ready for mulch

- About two inches of the root ball should remain above ground after all the backfill soil is added.
- This ensures the top-most root remains above ground, even if the root ball settles.

Steps for proper planting

1. Call 811 "Call Before You Dig"
2. Look up for wires/lights
3. Look down – plan for root growth
4. Dig a shallow/wide hole
5. Find the top-most root to determine planting depth
6. Inspect root system; treat defects
7. Place tree in hole
8. Position top root 1-2 inches above landscape soil
9. Straighten tree
10. Remove synthetic materials
11. Add backfill soil and firm the root ball
12. Add mulch; add a berm if needed

Mulching

- Apply a 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, but keep it at least 10” from the trunk

Mulching

- Mulch as large an area as possible to allow the tree roots to expand without competition from turf roots.

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 damages trunk

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. Trunk girdling roots form from this on some trees.

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.

- Prevent soil from washing over the root ball by covering berm with a 3 to 4-inch layer of mulch, or by constructing the berm entirely from mulch.

Steps for proper planting

1. Call 811 "Call Before You Dig"
2. Look up for wires/lights
3. Look down – plan for root growth
4. Dig a shallow/wide hole
5. Find the top-most root to determine planting depth
6. Inspect root system; treat defects
7. Place tree in hole
8. Position top root 1-2 inches above landscape soil
9. Straighten tree
10. Remove synthetic materials
11. Add backfill soil and firm the root ball
12. Add mulch; add a berm if needed
13. Stake and prune if needed

Traditional staking methods

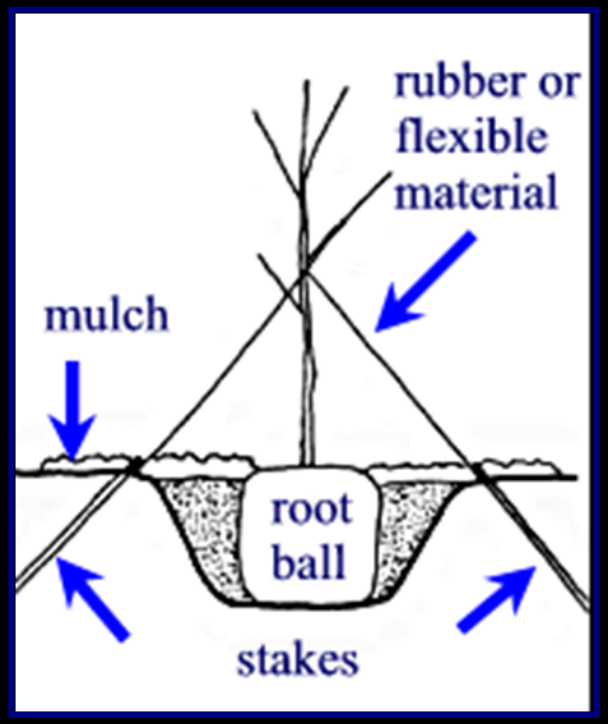


Figure 1

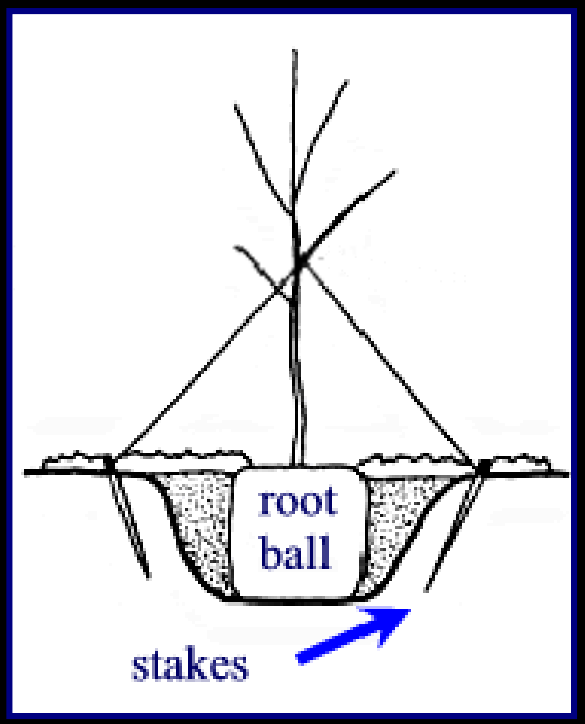


Figure 2

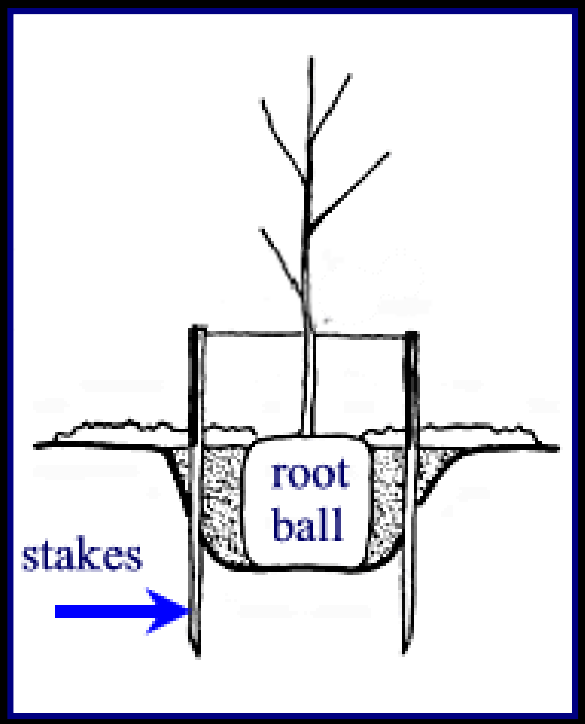


Figure 3

- All these systems require removal within one year of planting.

Alternative staking methods

Figure 4

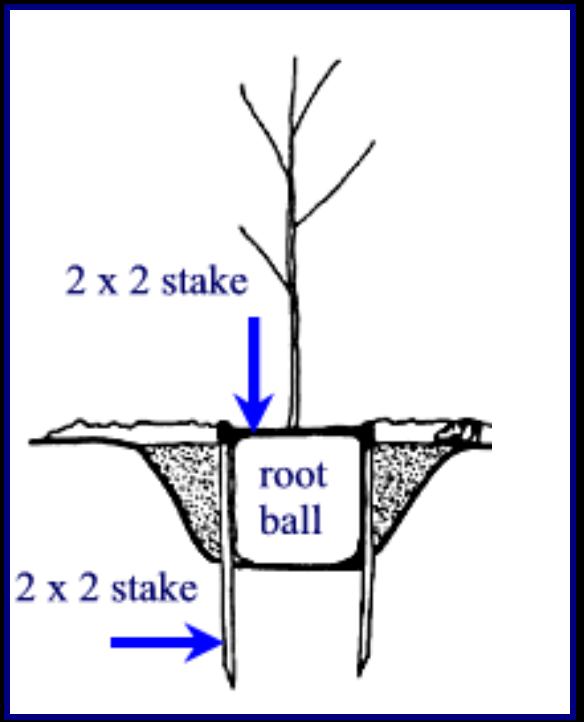


Figure 5

- This inexpensive alternative staking system does not need to be removed because they simply decay in a few years.

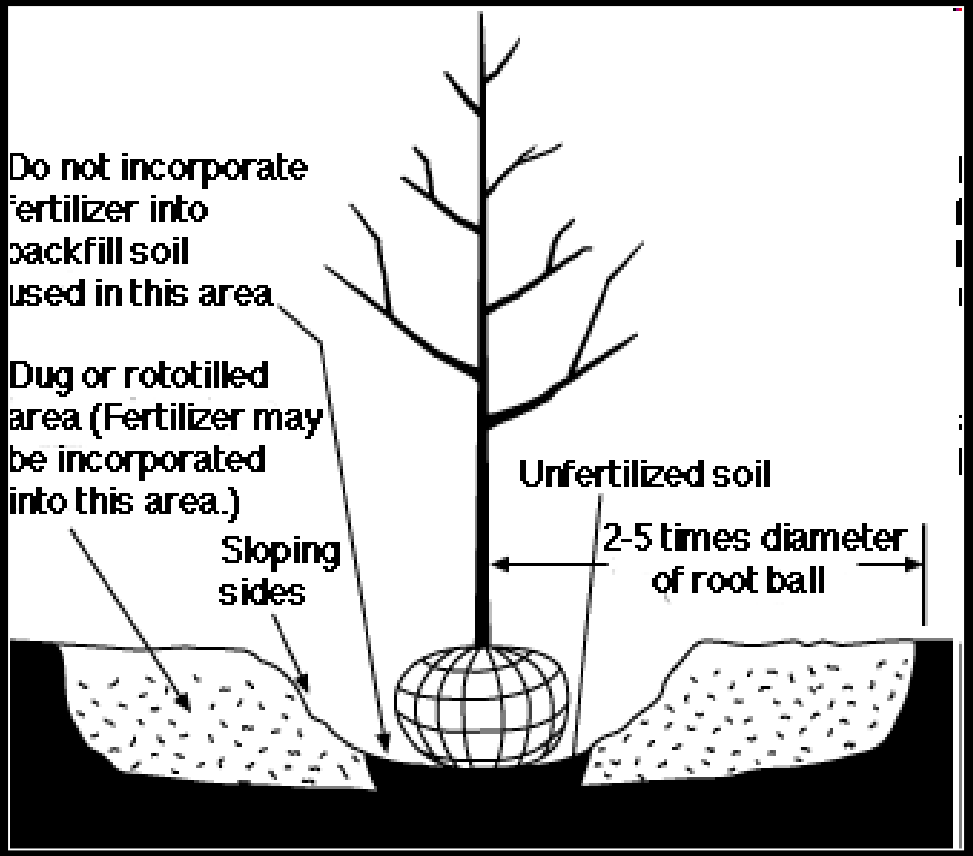
Prune to finish the job

- Remove broken branches.
- Perform structural pruning if needed.
- Do not prune to compensate for root loss, except for bareroot trees/shrubs.

Steps for proper planting

1. Call 811 "Call Before You Dig"
2. Look up for wires/lights
3. Look down – plan for root growth
4. Dig a shallow/wide hole
5. Find the top-most root to determine planting depth
6. Inspect root system; treat defects
7. Place tree in hole
8. Position top root 1-2 inches above landscape soil
9. Straighten tree
10. Remove synthetic materials
11. Add backfill soil and firm the root ball
12. Add mulch; add a berm if needed
13. Stake and prune if needed.
14. Don’t fertilize at planting

Don’t fertilize at planting!



- **Not necessary –** fertilizing at planting time is not likely to improve survival or growth. A small benefit might occur in very poor soil.
- **Soluble fertilizers** could burn roots if too much is applied, which could injure or kill the tree.

Steps for proper planting

1. Call 811 "Call Before You Dig"
2. Look up for wires/lights
3. Look down – plan for root growth
4. Dig a shallow/wide hole
5. Find the top-most root to determine planting depth
6. Inspect root system; treat defects
7. Place tree in hole
8. Position top root 1-2 inches above landscape soil
9. Straighten tree
10. Remove synthetic materials
11. Add backfill soil and firm the root ball
12. Add mulch; add a berm if needed
13. Stake and prune if needed
14. Don’t fertilize at planting
15. Care during establishment period

Care during establishment period

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

Requirements:

- Roots grow to pre-transplanting length
- Trunk and shoot growth match pre-transplant rate
- Time: About 3 - 4 months/ inch trunk caliper
  i.e. 2 inch trunk takes 6 – 8 months care

Establishment rate is influenced by a variety of factors

Encourages growth	Limits growth	Little or no effect
Loose soil	Compacted soil	Peat or organic matter added
Proper irrigation	Little or no irrigation	Water absorbing gels
Mulch up to 8’ around planting hole	Grass and weeds close to trunk	Root stimulant products
Root flare above soil surface	Planting too deeply	Adding spores of mycorrhizae *
Leaving shoot growth intact	Excess fertilizer, pruning at planting	Fertilizing at planting

Care during establishment

- **Irrigate**
  - 2 – 3 times weekly until established
  - 1-2 gallons per inch trunk caliper on root ball
- **Mulch**
  - Control weeds
  - Increase mulch diameter over time to keep pace with root growth
- Minimize soil compaction
- Remove stakes, protect lower trunk

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 but frequency did.

Frequency of irrigation based on tree size

Size of nursery stock	Irrigation schedule for vigor	Irrigation schedule for survival
< 2 inch caliper	Daily*: 2 weeks Every other day: 2 months Weekly: Until established; 3-6 months	Twice weekly for 2-3 months
2 – 4 inch caliper	Daily*: 1 month Every other day: 3 months Weekly: Until established; 6-9 months	Twice weekly for 3 – 4 months
> 4 inch caliper	Daily*: 6 weeks Every other day: 5 months Weekly: Until established; 12 months	Twice weekly for 4 – 5 months

* Daily use 1-2 gal/inch trunk caliper except in winter, cool climate or during rainy season. Never irrigate if root ball is wet.

15 Steps for proper planting

1. Call 811 "Call Before You Dig"
2. Look up for wires/lights
3. Look down – plan for root growth
4. Dig a shallow/wide hole
5. Find the top-most root to determine planting depth
6. Inspect root system; treat defects
7. Place tree in hole
8. Position top root 1-2 inches above landscape soil
9. Straighten tree
10. Remove synthetic materials
11. Add backfill soil and firm the root ball
12. Add mulch; add a berm if needed
13. Stake and prune if needed
14. Don’t fertilize at planting
15. Care during establishment period

Tree set too deep!

Tree is set correctly

By the way this tree is being planted correctly…

This tree we looked at through this entire slide show is being planted too deep!

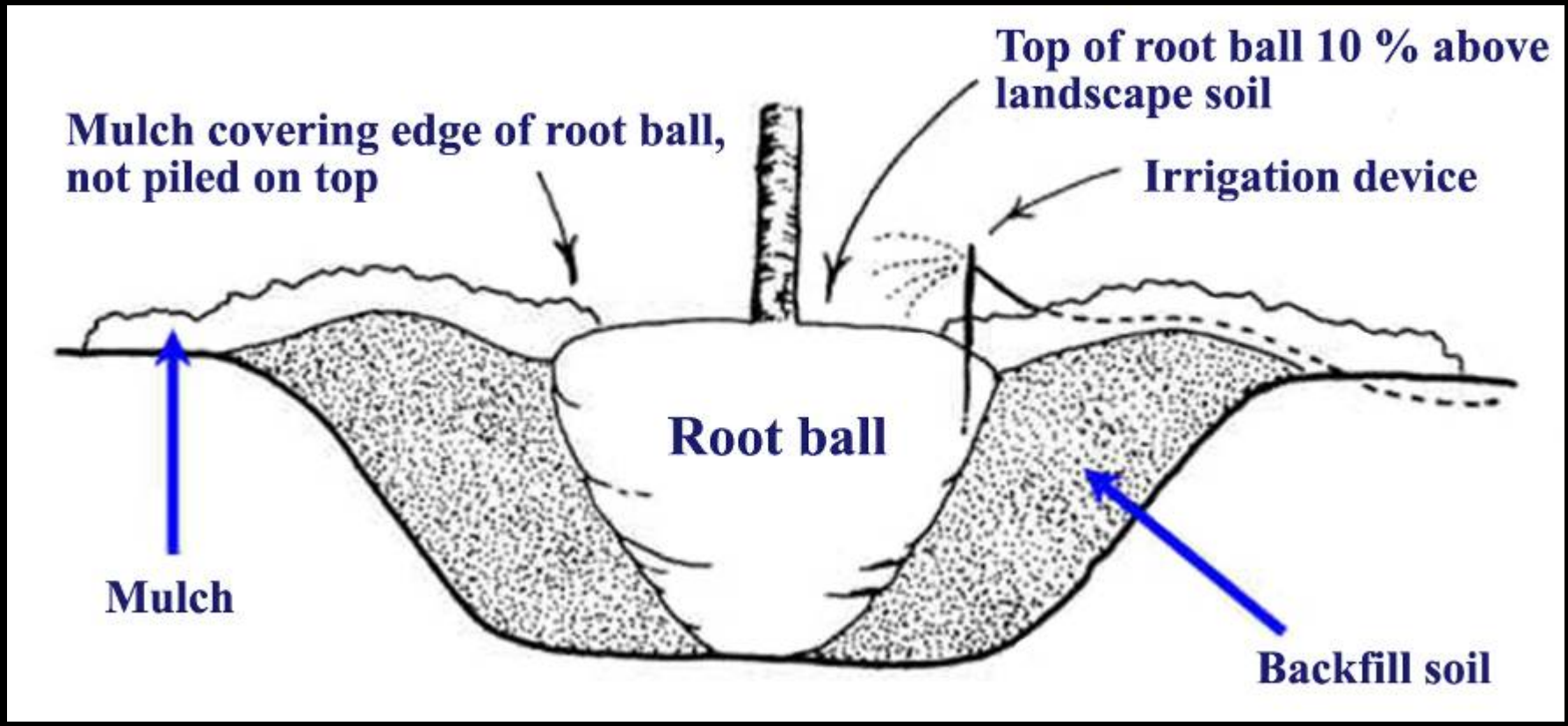
Dying verses health Post Oaks!

Both had Roundup sprayed around the trunk.

The left one had fill dirt applied to raise the soil level, note no trunk crown compared to the tree on the right.

Improper fill; scale damage

Summary of proper planting



For more information on related topics…

Visit the website **Trees and Hurricanes**:

http://treesandhurricanes.ifas.ufl.edu

15 Steps to Proper Planting of Trees, Shrubs and Ornamentals

Joe Janak
Victoria County Extension Agent – Ag/NR

--- in 2 weeks---

Roses and Their Care
January 25, 2010

Jerome Janak
Victoria County Master Gardener

AgriLIFE EXTENSION
Texas A&M System
Improving Lives. Improving Texas.