



Introduction to Tree Planting & Pruning

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Why do so many newly planted trees die in the landscape?





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Humans have been planting trees for a long time




Bas relief showing men carrying trees in Hatshepsut's temple at Deir-el-Bahari. +3500 years old

Date palms have been in cultivation for at least 5000 years.

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Keys to planting success



All about the details

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When to plant

Fall planting

- October 1 to December 15

Why

- Avoids summer drought stress
- Though fall can also be dry

Spring planting

- March 1 to May 15

Why

- Usually wetter season to start
- Need to be very diligent about watering in summer

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Choosing stock types

Balled and burlapped



Containerized



Bare Root (no soil or packaging)



Balled and burlapped (B&B)

- Less likely roots will dry out
- Maintains soil-root contact
- Generally more species, sizes, availability
- Heavy
- Reduced root system after digging
- Hard to inspect root system

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Choosing stock types



- Container**
- Lighter than B&B
 - Good species and seasonal availability
 - Root system intact
 - Deformed & circling roots
 - Contrast between potting mix and new soil

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Choosing stock types



- Bare root**
- Cheaper
 - Easy to transport, move, plant
 - Most root system intact, easy to inspect
 - Roots susceptible drying, requires a lot of care
 - More limited species and size availability
 - Usually requires staking

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Container root ball prep

- Need to remove circling roots
- Short-term damage for long-term success
- Cut roots will begin growing outward



← wide, strong foundation for tree

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Container root ball prep

Why

Roots will continue to grow and get larger in circling patten



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Finding the root flare/collar

- Transition from stem bark to root bark
- Stem bark needs to be above ground

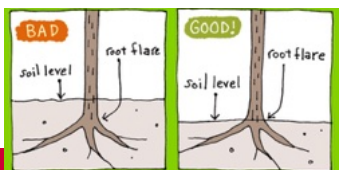


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Finding the root flare

Why

- Stem bark is adapted to be in air, will rot if moist for too long
- Some roots need to be at soil surface - quick access to resources



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Finding the root flare

Take the time to dig out extra soil until you find the root flare



Carefully use small hand trowel

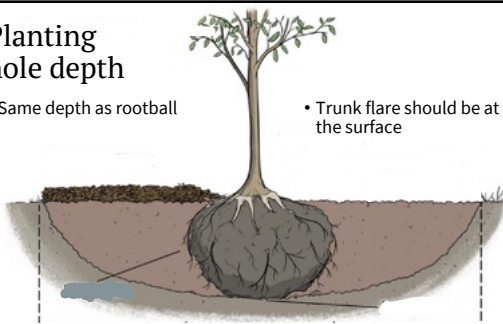


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Planting hole depth

• Same depth as rootball

• Trunk flare should be at the surface

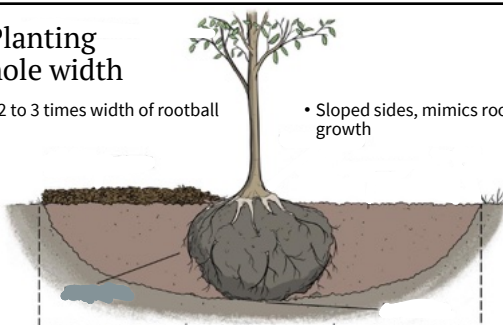


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Planting hole width

• 2 to 3 times width of rootball

• Sloped sides, mimics root growth



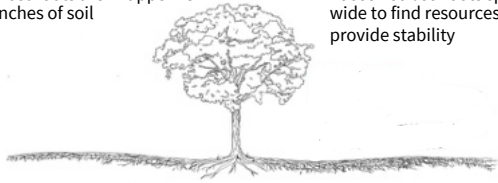
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Planting hole width

Why

Most roots are in upper 18 inches of soil

Loosen soil so roots spread wide to find resources and provide stability



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The wire basket debate

Leave it:

- Time-consuming to remove
- Keeps tree stable during planting
- Research: usually shouldn't impair tree growth



Remove it:

- See the roots & find flares, check for problems
- No worries about root growth
- Wire can poke out above ground
- Good contact between soil

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Removing most of the wire basket

- Newark: Remove top 2/3 of rope and wire
- DEFINITELY remove any plastic rope material that won't decompose
- Free the trunk from any materials



This will prevent trunk from growing (girdles tree)



^ Even biodegradable materials can keep trunk too moist

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Backfilling



- Return soil to planting hole
- Add water every 6 to 8 inches – helps soil settle, reduce very large air pockets
- Add 20 gallons of water total

Why

Settled soil gives new roots stable growing environment

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Backfilling

Newark Recommended Topsoil

- ~5% organic matter
- pH 6-7.5
- <25% rocks
- Sand: 40-70%
- Silt: 10-50%
- Clay: 20% max



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Staking

Leave on for one year max

Why

Growing stem will be damaged by ties



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Staking

- Two stakes with soft, stretchy ties
- Recommended Arbortie

Why

Softer, less damage to trunk



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Staking

Lightly tie less than half height of tree

Why

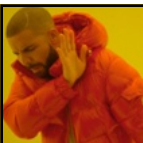
Stem needs to move a little to stimulate growth of strong wood and roots



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Staking No Thanks



- Wire
- Non-stretchy materials
- Hose

Why

More likely to damage bark and impeded growth



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Too Tight

Tree didn't have enough room to move so it broke



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Mulch

Why

- Protects soil from erosion
- Reduces soil water loss
- Adds organic matter to soil (good for soil critters)
- Slows weed growth



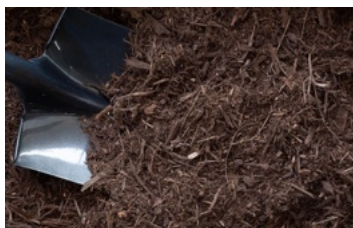
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Mulch

Newark's Requirement

- Shredded bark mulch
- 3 inches deep
 - Deeper decreases rainfall getting to soil
- 2 inch gap between mulch and tree trunk
 - Mulch in contact with trunk can cause rot



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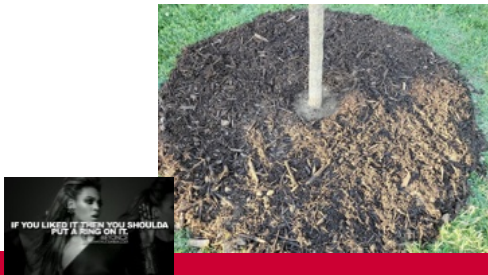
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No Volcanoes!



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Mulch ring or donut



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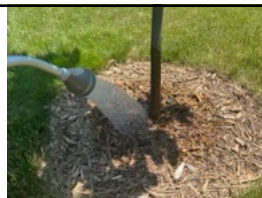
Watering

At planting: Minimum 20 gallons of water

Newark: 20 gallons per week (weather permitting)

Why

- Tree's root zone has been reduced so limited ability to access enough water on it own
- Trees get a lot of water in the nursery



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Gator Bags

- Slow release of water
- Only as good as keeping them full
- Risk of retaining moisture against trunk
- Preferable to put bags on stakes to protect trunk and put water where we want roots to grow



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Fertilizing

- Usually not necessary in first few years

Why

- Usually not the limit on tree growth
- Can be harmful after transplant by overstimulating growth while tree struggles to get water



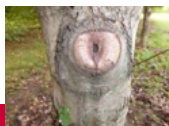
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Pruning

- At planting: only necessary to remove broken or dead branches after planting
- Cut back to node and decrease size of exposed bark

Why

- Reduces risk of infection
- Tree needs all of its branches and leaves for energy to grow



< A good pruning cut seals over nicely

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Tree Planting Summary

- It's all about the details
- Space for roots to grow
- Enough water
- Proper mulch

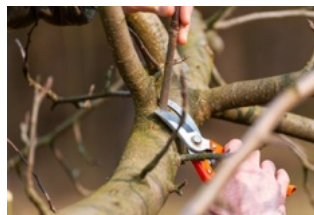
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Pruning

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Why do we prune?

- Decrease risk
- Provide clearance
- Improve tree structure, health, and appearance
- Meet client needs



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Pruning Objectives

*The things you want to achieve by pruning.
Influences HOW you prune.*

- Improve structure
- Reduce risk
- Provide clearance
- Managing crown size
- Reducing crown density
- Restore structure
- Rejuvenate shrubs



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Pruning Systems

Natural = informal style to promote characteristic form



Topiary = pruning (shearing) to a specialized shape



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Pruning Systems

Pollard = regular removal of young shoots to a common point (pollard head)



Espalier = grow plant into a two-dimensional plane, usually along a fence or wall



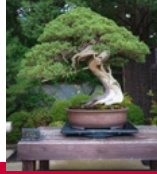
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Pruning Systems

Pleaching = interweaving branches horizontally to form an arbor, wall, arching tunnel



Bonsai = maintaining container-grown trees at a small size



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Other considerations

How often will you get to prune the tree?

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Biological Consequences of Pruning

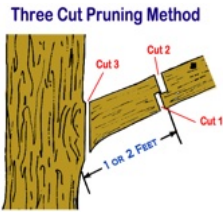


- Removes stored resources
- Decreases ability to photosynthesize
- Increases risk for decay and pathogens
- Long-term alteration to tree structure
- New sprouts, possibly in unwanted places

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Pruning to Minimize Damage

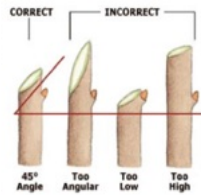
3-step cut when sawing



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Pruning to Minimize Damage

Cut angle



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Pruning to Minimize damage

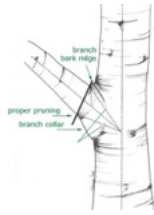
Size of branches

- In general, smaller is better
- Try to minimize >4" to reduce risk of exposing heartwood
- Ideally branch to trunk aspect ratio should be 50% or less

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Pruning to Minimize Damage

Branch collar = swollen area around base of branch union, often represents a strong union.
 Branch bark ridge = raised strip of bark above branch union. Sign of denser, intermingled wood grain which strengthens the connection

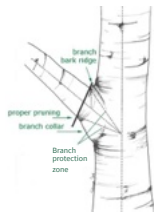


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Pruning to Minimize Damage

Branch protection zone = Cone shaped area within the branch union. Contains chemical deposits that slow or block the spread of decay.

Avoid cutting the ridge, collar, and protection zone so wound can seal over faster.



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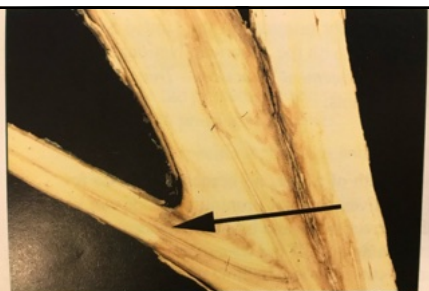


FIGURE 8.2 The branch protection zone has chemical and physical properties that retard the spread of decay into the trunk.

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Pruning to Minimize Damage

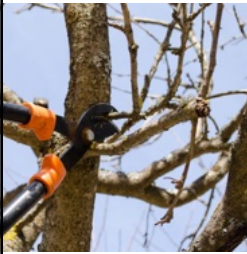
Sharp tools!



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Structural Pruning

A method for training young trees to develop strong structure and form.



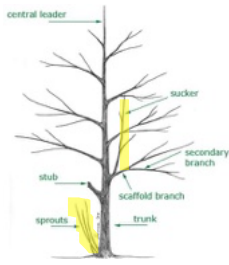
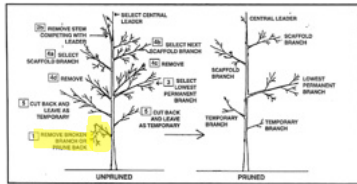
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Structural Pruning

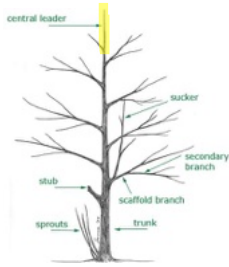
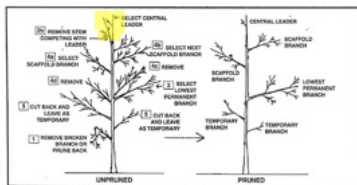
1. Remove broken, dead, dying, diseased, damaged, crossing branches.



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Structural Pruning

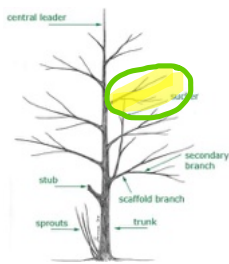
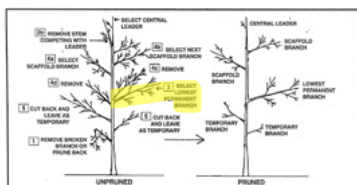
2. Select and establish a dominant leader.



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Structural Pruning

3. Select and establish the lowest permanent branch.



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When to prune?



It depends ...

- Weak, diseased, dead – generally any time
- Late winter/early spring prior to bud swell maximizes wound closure
- Just after first flush of growth – try to avoid

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When to prune?

- Showy flowers – depends if they bloom on current season growth or last season's growth
 - Current season = prune in winter (e.g. crape myrtle)
 - Last-season = prune after blooming (e.g. many fruit trees, lilac)



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Pruning Summary

- Always begin with defining WHY you're pruning
- Less is more
- Work with the biology of the tree
- Think about the tree in the future

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End of Class Survey – Friday March 13



Thanks!