



## Trees and Shrubs




Patrick Byers  
Horticulture Specialist  
MU Extension – Webster County




### Some Shady Facts...

- Strategically placed trees can reduce your AC bill by 25% and also reduce annual heating bills by 10-20%.
- A tree absorbs as much carbon in a year as a car produces driving 26,000 miles.
- Real Estate agents assign up to 25% of the value of the residence to the trees on the property
- Consumers typically spend up to 13% more at retail stores located near greenways.




### Outline

- Planting trees and shrubs
- Watering trees and shrubs
- Fertilizing trees and shrubs
- Mulching trees and shrubs
- Anything you would like to discuss




### Objective of Planting

- To plant a plant with good root growth potential into a soil environment conducive to good root growth



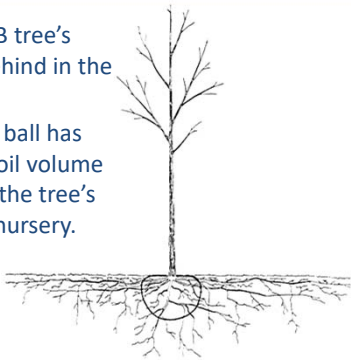

### The Planting Process

- Pre-plant handling
- Soil preparation
- The planting hole
- Setting the plant
- Pruning, Staking, Wrapping, Mulching
- Fertilization?



### Transplanting Stress

- 95% of a B&B tree's roots stay behind in the nursery.
- A typical soil ball has 25% of the soil volume occupied by the tree's roots in the nursery.



**When to Plant**

- If good horticultural practices are used...trees can be planted any time of the year.
  - Container-grown trees suffer minimal root disturbance during transplanting. If they are carefully watered after planting, trees can be successfully planted even in midsummer.
  - Bare root trees are generally not available for planting except in their dormant condition, during late winter and early spring. However, research at the University of Missouri has shown that bare root trees can survive summer planting in certain conditions. Bare root trees with up to 2 inches of stem caliper can be planted with excellent survival during the midsummer if preconditioned in a bed of irrigated pea gravel (called the Missouri Gravel Bed) for 10 to 12 weeks.
  - If harvested and stored properly, B&B trees can also be planted at any time of the year.
- However, since conditions during midsummer are often stressful to plants, most nursery professionals recommend planting in spring or fall.

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**The Planting Process**

- Pre-planting handling
  - Prepare the site in advance
  - Soak bare root nursery stock for 6-10 hours
  - Keep B&B soil ball moist, keep container plants moist
  - Try to plant as soon as possible!

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**The Planting Hole**

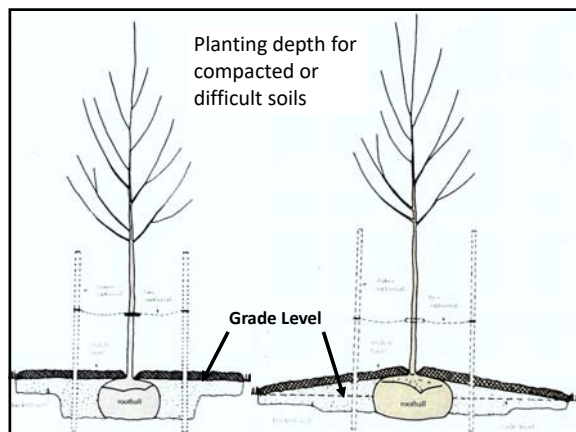
- **Never** deeper than the the ball
- 2-3 times as wide as the ball
- No more than 20% organic matter in the backfill

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**Find the Proper Planting Depth**

- Locate the trunk flare or the first set of roots that grow from the main trunk

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### The Planting Process

- Bare root plants
  - Prune broken roots
  - Spread roots over a mound of soil in the planting hole
- Container plants
  - Remove container
  - Cut any encircling roots
- Balled and burlap plants
  - Cut twine around trunk
  - Remove synthetic burlap, peel down natural burlap
  - Cut back wire baskets

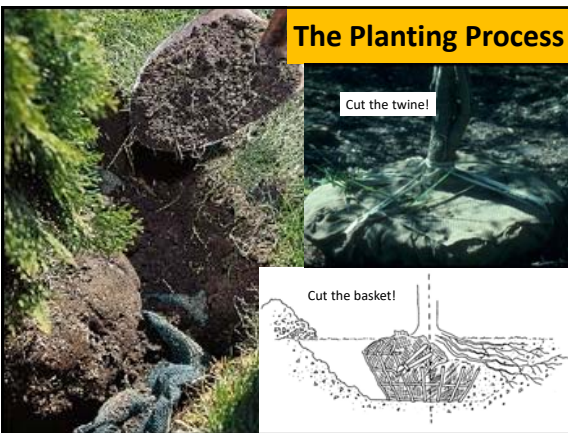
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### The Planting Process



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### The Planting Process



Cut the twine!

Cut the basket!

### The Planting Process

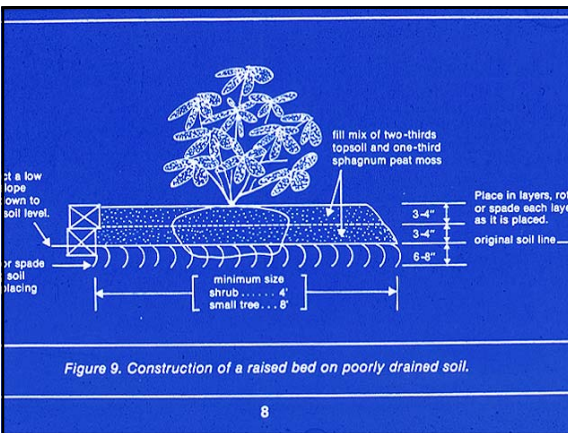




### Soil Amendments

- No more than 20% (volume) OM
- Volume loss from OM decomposition makes plants unstable
- Roots proliferate in amended soil, reducing volume of soil accessed
- Plants more susceptible to drought

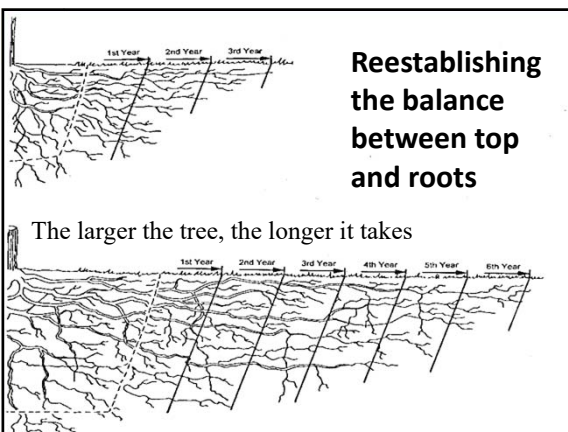
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### Transplanting Stress

- A woody plant is “established” when watering cycle can be extended to 2 weeks during warm weather
- This may take 2 growing seasons in zone 5-6.

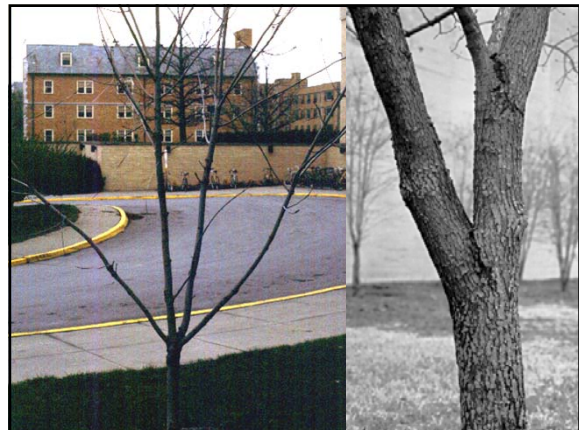
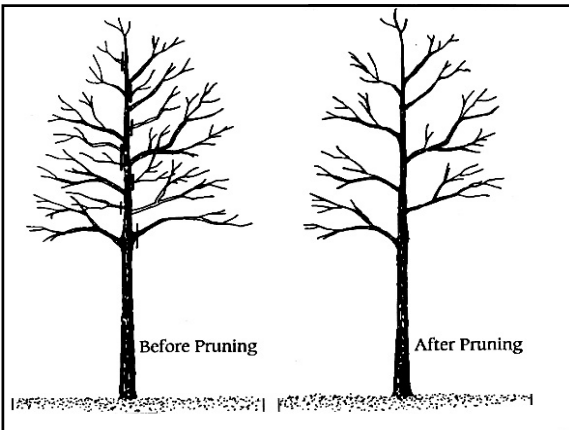
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### Pruning at Planting

- Avoid excessive top, root pruning
- Remove broken, crossing branches
- Correct serious structural problems like narrow branch angles

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### Fertilization at Planting

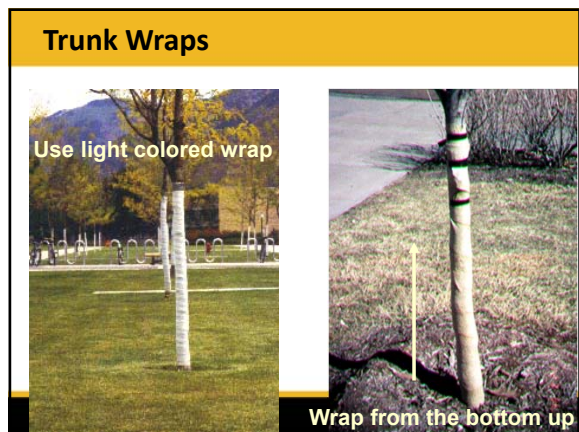
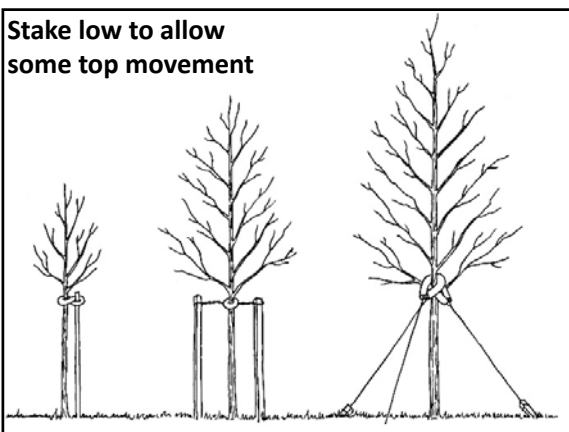
- Over-fertilization can slow establishment
  - Promote Excessive Top Growth
  - Promote localized root growth
- Fertilize one month after planting or use 1/2 rate of slow release fertilizer mixed uniformly in backfill
- Surface application of nitrogen after planting is effective and efficient

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### Staking

- Disadvantages
  - Promotes vertical growth
  - Decreases stem diameter
  - Reduced root growth
  - Tree Less Stable after removal
- Advantages
  - Prevents mower blight
  - Keeps tree vertical
  - Reduces root breakage from movement

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### Planting Problems

- Planting too deeply
- Drying of soil ball after planting
- Wicking
- Girdling - trunks, roots
- Trunk Scald

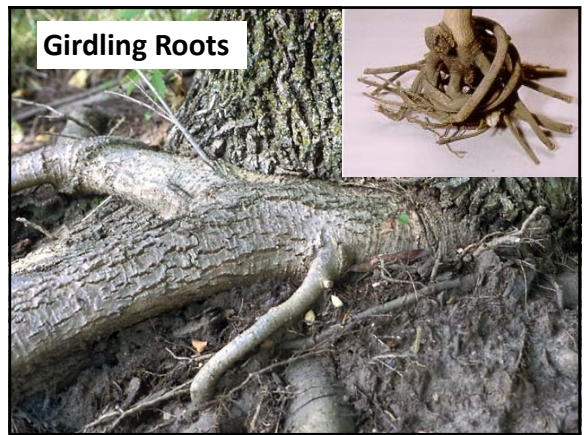
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Planted too deep!

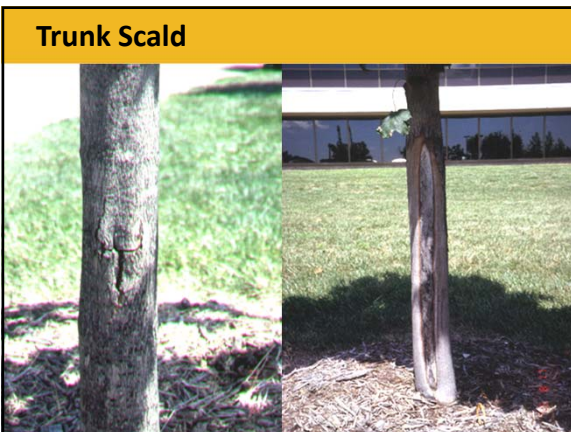


Nylon Carpet Backing "Burlap"

Girdling Roots



### Trunk Scald




### Caring for Woody Landscape Plants

- Watering
- Fertilizing
- Mulching
- Pruning



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### Watering



- Watering recently planted plants
  - Improper watering is the #1 cause of death of newly planted trees and shrubs
  - Water frequently with small quantities for first month after planting
  - Soil ball can become dangerously dry in 1 day
- Methods of watering
  - Overhead
  - Drip



### Watering





### Watering


### Watering

- Watering established plants
  - Useful to estimate water needs
    - Evapotranspiration
    - Soil water holding capacity
  - Rule of thumb – 2 inches every 8 days
  - Deep watering is best, but don't overwater!



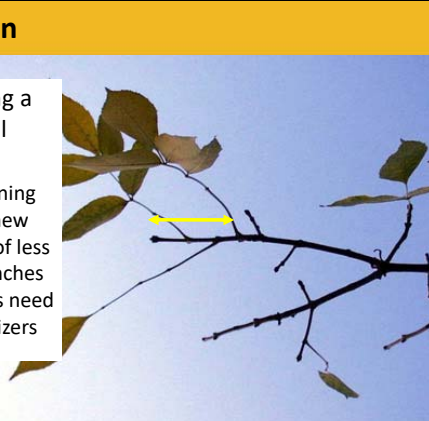

### Nutrition

- Goals of nutrition program
  - Maintain health and vigor
  - Control growth and size
  - Aesthetics
- Unique features of woody plant nutrition
  - Perennial plants
  - Storage of nutrients in stems and roots
  - Yield is “aesthetics”



### Nutrition

- Developing a nutritional program
  - Determining need – new growth of less than 8 inches indicates need for fertilizers

### Nutrition

- When to fertilize
  - Avoid late summer fertilization
  - Fall application can be applied when leaves are coloring
  - March and mid-June are generally good times
  - Avoid rapid growth period

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### Nutrition

- The proper rate and type of fertilizer depends on:
  - Soil test
  - Plant type, age, size
- Conduct soil tests regularly
  - Pre-plant
    - to assess need for P, K, pH adjustment, micronutrients
  - Maintenance
    - Prevent deficiencies
    - Avoid nutrient imbalances

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### Suggested Levels of Nutrients

pH	P lb/A	Ca	Mg	K
6- 6.5	35	1600	240	150

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### Nutrition

- Fertilization method
  - Surface application
    - Treated area = drip zone, where drip zone area =  $3.14 \times r^2$ , and where  $r$  = radius of drip zone
    - Example – a large maple with a drip zone radius of 15 feet would have a drip zone area of  $3.14 \times 15^2 = 706 \text{ ft}^2$
    - Fertilizer recommendations are often based on lb / 1000  $\text{ft}^2$  basis

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### Nutrition

- Fertilization method
  - Hole method
    - Holes 1-2" dia, 6-12" deep
    - 2 feet apart over 1.5 x drip zone
    - Starting 2-3 feet from trunk
    - Distribute fertilizer amount from surface method among holes
  - Soil injection

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### Nutrition

- Correcting pH-related chlorosis
  - 100 lb sulfur/ 1000 ft<sup>2</sup> incorporated into the soil will drop the pH of a clay loam soil from 7.5 to 6.5
  - 30 lbs FeSO<sub>4</sub> per 1000 ft<sup>2</sup> watered in thoroughly

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### Mulching

- Pros
  - Moisture
  - Temperature
  - mower blight
  - OM, nutrients
- Cons
  - Dormancy delay
  - Surface rooting
  - Nitrogen issues
  - disease



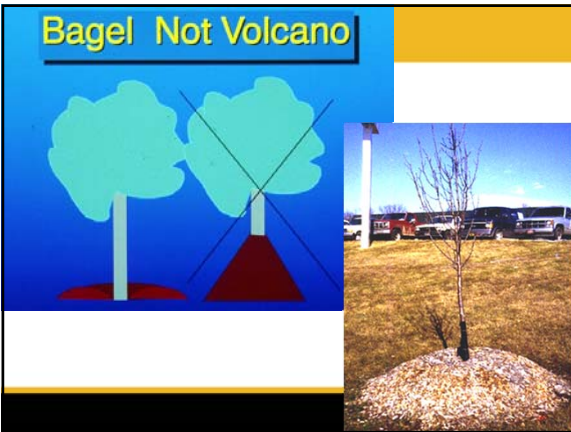
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### Mulching Decisions

- Tips on application
  - Apply coarse, natural organic mulches and stones 3-4 inches deep over the entire area to be mulched
  - Apply straw, dried leaves, other similar materials 4-6 inches deep
  - Apply grass clippings 1 inch deep or less
  - Consider a weed barrier fabric beneath permanent mulches
  - 1 cubic yard of mulch will cover 80 square feet to a depth of 4 inches

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**Pruning**

- Reasons to prune
  - Plant health
  - Training young plants
  - Controlling growth
  - Flowering and fruiting
- Pruning equipment
  - Hand pruners
  - Loppers
  - Saws

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**Pruning Deciduous Trees**

- Make cuts above a node
- Remove weak branches, narrow crotches
- Remove dead, dying, diseased wood
- Remove crossing limbs
- Enhance tree structure and appearance

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### Pruning Deciduous Shrubs

- Remove old stems from multistemmed shrubs
- Remove dead, diseased, damaged branches
- Remove crossing limbs

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### Pruning Needled Evergreens

- Pines and related species
  - Prune back “candles” to make tree fuller
  - Do not cut back beyond one year wood
- Junipers, yews, and others
  - Prune within the needled portion of the plant

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### Pruning Mistakes

- Avoid topping trees and shrubs
- Prune at the proper time
  - Early spring for most
  - Spring flowering shrubs and trees – prune after bloom period
  - Late pruning – winter dieback likely
- Avoid pruning paints

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### Any Questions?

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