



# The Science of Planting Trees

## *Right Plant, Right Place*



## References / Reading

### Colorado State University Extension

#### *CMG GardenNotes*

- #631 Tree Placement: Right Plant, Right Place
- #632 Tree Selection: Right Plant, Right Place
- #633 The Science of Planting Trees
- #634 Tree Staking and Underground Stabilization
- #635 Care of Recently Planted Trees
- #636 Tree Planting Steps

#### Books

- *Principles and Practice of Planting Trees and Shrubs* by Gary W. Watson and E.B. Himelick. International Society of Arboriculture. 1997. ISBN:1-881956-18-0
- *Woody Landscape Plants for the High Plains* by D.H. Fairchild and J.E. Klett. Colorado State University Cooperative Extension Bulletin LTLB93-1. 1993. To order call the CSU Cooperative Extension Resource Center toll-free at 877-692-9358.
- *Manual of Woody Landscape Plants* by Michael A. Dirr. Stipes Publishing. 2009. ISBN-10: 1588748685.

#### Web

- **Dr. Ed Gilman's Tree Planting Site at University of Florida:**  
<http://hort.ifas.ufl.edu/woody/planting.shtml>
- **Front Range Tree Recommendation List** at  
<http://www.ext.colostate.edu/pubs/garden/treereclist.pdf>

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## Learning Objectives

At the end of this training, the student will be able to:

- For a given home landscape situation, discuss *Right Plant, Right Place* considerations for tree placement.
- For a given home landscape situation, discuss *Right Plant, Right Place* considerations for tree selection.
- Plant a tree for rapid root establishment.
- Describe post planting tree care.

## Review Questions

### Right Plant, Right Place

1. What is the average life of a newly planted landscape tree? Why is it so short?
2. What five categories of plant care play in the success of tree plantings?
3. Describe functions of trees in landscape design.
4. Define a specimen tree, group planting, and mass planting.
5. For energy conservation, where should trees be placed to maximize summer shading and to maximize winter heating?
6. What percent of the sun's radiation will a tree block on a clear summer day?
7. What percent of the cooling effect of trees comes from evapotranspiration? How do drought and irrigation restrictions influence this cooling?
8. In order, list the four priorities for summer shading.
9. For energy conservation, what is the goal in urban forestry as to tree canopy cover?
10. For noise abatement, where should trees and shrubs be placed?
11. List benefits of shade trees.
12. What is the meaning behind "right plant, right place?" List examples of criteria to consider in selecting a tree species for a site.
13. Explain the criteria for above-ground space and below-ground rooting space in tree selection.
14. What happens when the root system cannot escape the root vault area?
15. Give examples of soil- and water-related considerations in tree selection.
16. Give examples of maintenance-related considerations in tree selection.
17. List factors that play into a tree's hardiness. What does a hardiness zone map tell about hardiness? Explain how hardiness changes through the winter in relation to weather.
18. Explain how the microclimate around a home influences plant selection.
19. Give examples of other criteria in tree selection.
20. Explain the rule of thumb for what it takes to move a tree with a 2-, 3-, and 4-foot wide root ball.
21. Where do you find standards (regulations) for plant-size-to-root-size relationships for various types of nursery stock?
22. What are the advantages of selecting a small-caliper tree? A larger-caliper tree? Which will be the largest size five years after planting?
23. Types of stock: Define the following terms and list advantages and limitations of each as indicated on the lecture slides.
  - a. Container-grown
  - b. In- ground, fabric grow bag
  - c. Field-grown – B&B
  - d. Field-grown – Balled and Potted
  - e. Bare-root
24. To avoid purchasing problems, list key points in the selection and inspection of nursery plants.
25. List key points in pre-plant handling of nursery stock to minimize post-planting stress.

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26. What is the most limiting factor on a tree's root growth potential?
27. Compared to a field-grown, B&B tree or container-grown tree, what percent of the fine absorbing roots will be found in the nursery stock root ball?
28. What is meant by the "science of planting trees"?
29. What is the proper depth of a tree in the root ball? How can you tell if it is planted at the correct depth? What should be done by the planter if the tree is planted too deep in the root ball?
30. What is the proper depth of the root ball in the planting hole? Why should the tree sit on undisturbed soil? What should be done if the planting hole is accidentally dug too deep?
31. Explain the benefits of the saucer-shaped hole three times wider than the root ball. Explain the concerns about it filling with water.
32. If the planting hole is dug with an auger, how can it be readily modified so the tree has the benefits of a saucer-shaped hole?
33. Be able to diagram and label the routine planting specifications, including depth of tree in the root ball, depth of root ball in planting hole and planting hole depth and width.
34. How are the recommended planting criteria modified for the following planting situations?
  - a. Wet soil
  - b. Compacted/clayish soil
  - c. Planting on slopes
35. For container-grown nursery stock, discuss considerations in removing the container and setting tree in place.
36. For field-grown, B&B nursery stock, discuss considerations in setting tree in place and removing the wrappings.
  - a. For B&B materials, why is the wrapping material removed after setting the tree in place and packing soil around the bottom?
  - b. What about the packing materials on the bottom? Explain why it does not interfere with root growth.
  - c. What packing materials should be removed from the sides? How far down?
  - d. Do wire baskets interfere with root growth?
  - e. Will burlap decay fast enough to not interfere with root growth?
  - f. How fast do synthetic burlap, fabric grow bags, nylon twine, and wire baskets decay?
37. What should the planter do if the root ball has circling roots? What should the planter do if the root ball has roots sticking way out from the root ball?
38. Explain the statement that unamended backfill soil is not the same as unmodified backfill soil. Discuss the issue of amending the backfill. What criteria should be used to determine what criteria are appropriate for a given site?
39. List the four types of above-ground staking. Describe criteria for each.
40. Describe techniques used in below-ground stabilization.
41. Describe criteria for mulching around a newly planted tree.
  - a. How deep should the mulch be applied?
  - b. What about mulch up against the trunk?
  - c. What is the problem with "mulch volcanoes"?
42. Describe steps in planting bare-root nursery stock.

## Care after planting

43. Describe the plan for watering newly planted trees based on size. How much should be applied? How often? For how long?
44. How should a tree in the establishment phase be fertilized?
45. What is the rule of thumb on how long the establishment phase lasts?