RainScapes

Environmentally-Friendly Landscapes for Healthy Watersheds

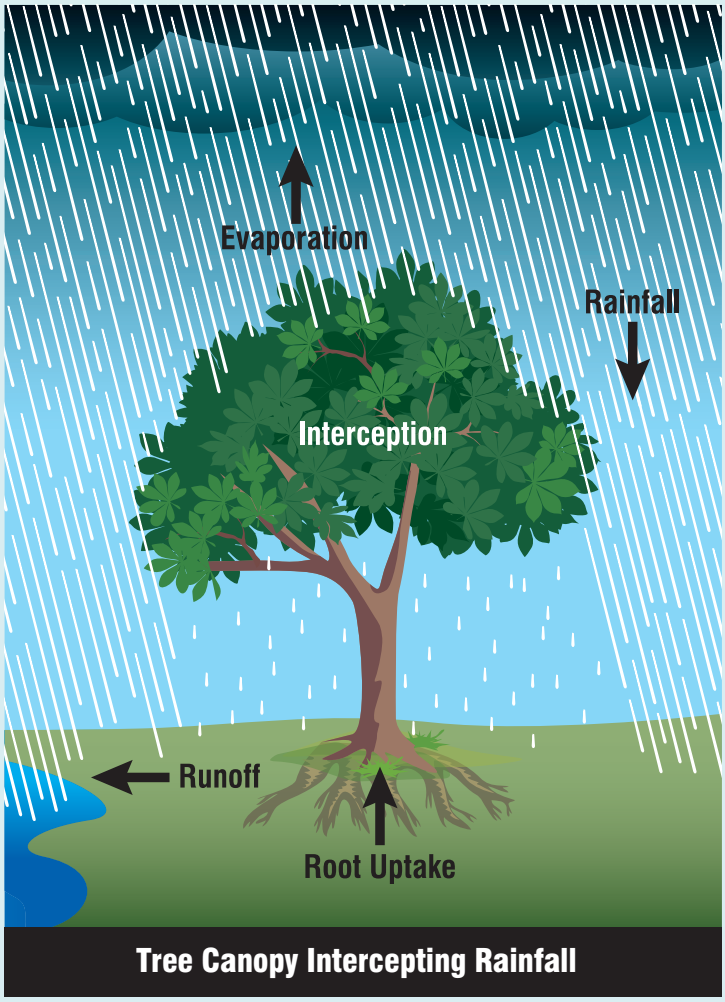
Tree Canopy

Why should I plant trees?

Planting trees is an easy, affordable way to benefit the environment. Tree canopies reduce stormwater runoff by absorbing and collecting rainfall on leaves and branches. Water evaporating off the surface of leaves returns to the atmosphere. Tree roots promote rainwater infiltration through the soil. Studies that have measured the stormwater benefits of trees found that over 700 gallons of rainfall can be captured each year by a single mature tree with a 30-foot radius crown.

What is a tree canopy?

A tree canopy is the crown of one or many trees that create an "umbrella" or cover of leaves.The leaves and branches shade paved surfaces, such as sidewalks, driveways, and patios, reducing the temperature of rainwater runoff. Tree canopy intercepts rainfall before the water hits the ground and becomes stormwater runoff. Trees provide many benefits to the health and well-being of communities. Often, trees can easily be added to the landscape to provide stormwater benefits.



Tree Canopy Intercepting Rainfall

What are the benefits and incentives?

Important benefits that trees provide for the environment and local community include:

- Reduced stormwater runoff
- Improved water quality
- Improved air quality
- Stream bank stabilization
- Enhanced wildlife habitat
- Perceived noise reduction
- Reduced energy costs as trees shade your home
- Wind breaks
- Increased property values and curb appeal

Trees also provide benefits that cannot be measured. Trees can improve community life and a person's overall sense of well-being.

To see the requirements and submit the RainScapes Rewards Rebate Application, please visit www.rainscapes.org

Eligibility

The Montgomery County Department of Environmental Protection (DEP) supports expanding and improving the amount of tree canopy in our watersheds. Rock Creek, Little Falls, Anacostia, Cabin John, Watts Branch, Muddy Branch, and Patuxent watersheds are in greater need of tree planting than some of our other watersheds. If you are interested in seeing your area's current tree canopy, please visit

http://www.montgomeryplanning.org/canopy

In addition to Montgomery County's program, other programs may provide similar incentives for tree planting. See http://www.montgomerycountymd.gov/dectmpl.asp?url=/Content/dep/climatechange/treelaws.asp

To qualify for DEP's RainScapes rebate:

- Trees must be planted on private property. Rebates will not be awarded for trees planted in the public right-of-way (other programs exist for right-of-way trees).
- New trees must be:
  - » In a #7 pot (a container holding about 7 gallons of soil and the roots) or larger
  - » At least 8 feet tall
  - » At least 1 caliper inch (the trunk is 1 inch thick measured 6" above the base of the tree in the pot)
- Trees must be planted between September 15 and April 30

Large canopy tree above road pavement

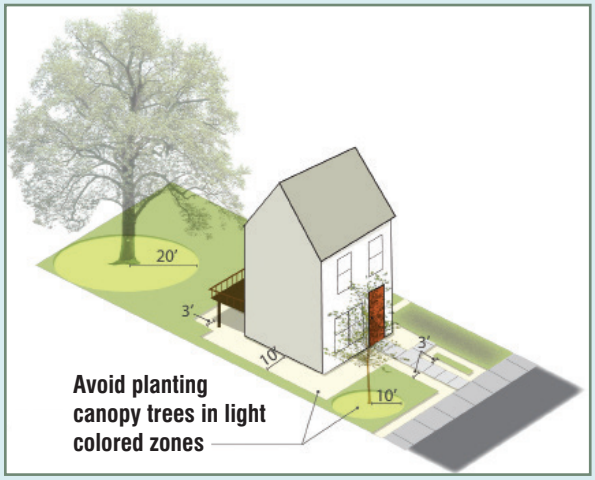
How to...

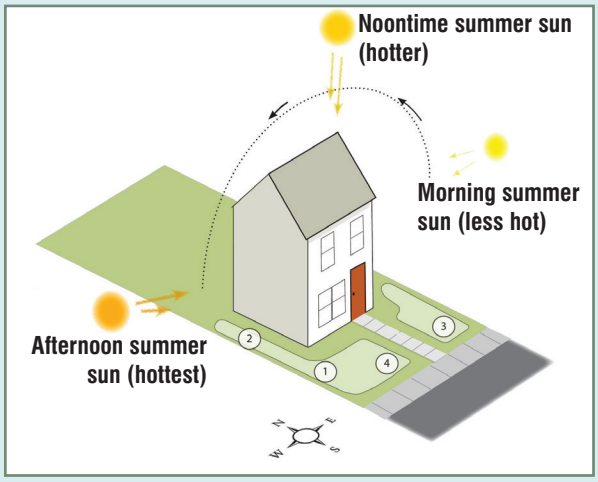
Assess Your Property

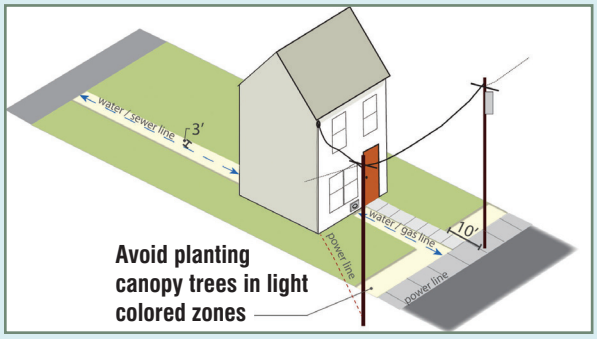
Follow these basic steps to identify the best location in your yard for a shade tree:

- **Identify Existing Utilities Before Digging**
  - » Mark underground utility lines by calling "Miss Utility" at 1-800-257-7777 or submitting an Internet Locate Request for homeowners: http://www.missutility.net/iticlite/
- **Avoid Utilities**
  - » Plant at least 3 feet away from marked underground utilities (Montgomery County requirement)
  - » Plant at least 10 feet away from main overhead utility wires
- **Accommodate Tree Growth**
  - » Dig the tree planting hole
    - ▪ 15 to 20 feet away from structures
    - ▪ At least 3 feet away from driveways, sidewalks, patios, and fences
    - ▪ At least 20 feet from other large trees
    - ▪ At least 10 feet from small trees
- **Maximize Shade Provided by Trees**
  - » Plant trees along the southwestern or western sides of your home to lower cooling costs by shading afternoon sun
  - » Plant along the southeastern or southern sides to shade your home from morning sun
  - » Plant in an area that will shade air conditioning units to help reduce energy use
- **Maximize Wind Protection Provided by Trees**
  - » Plant along the northern and northwestern sides of your home to block winter winds and reduce heating costs

Remember that the best place to plant a tree is near a hard surface such as a driveway, sidewalk, or patio. When the tree canopy is mature, it will shade the hard surface and rainfall will be collected by leaves and branches.







Illustrations: © Casey Trees 2009

How to...

Design and Plan

Once you have identified an appropriate site for your tree, choose the type of tree to plant.

The RainScapes Rewards Rebate program currently accepts rebate applications for the tree species listed in the table below. Other native canopy trees will be considered by DEP on a case-by-case basis. To find the types of trees that will work for your property, compare the soil type, space, and sunlight requirements. Additional information can be found at rainscapes.org.


Red Maple


Black Oak


Scarlet Oak

Common Name	Scientific Name	Mature Height (feet)	Mature Spread (feet)	Light Exposure	Soil Texture Tolerance	Soil Moisture Tolerance	Drought Tolerance	Pest Resistance
Common Baldcypress	Taxodium distichum	60–80	25–35	Full sun, partial sun or partial shade	Clay, sand, loam	Extended flooding, well-drained	High	Resistant to pests/diseases
Yellow Buckeye	Aesculus octandra	50–75	25–35	Full sun	Clay, sand, loam	Well-drained, occasionally wet	Moderate	Resistant to pests/diseases
Kentucky Coffeetree	Gymnocladus dioicus	65–70	45–60	Full sun	Clay, sand, loam	Well-drained	High	Free of serious pests and diseases
American Elm (Valley Forge or Princeton)	Ulmus americana	70–90	50–70	Full sun, partial sun, or partial shade	Clay, sand, loam	Extended flooding, well-drained	High	Sensitive to pests/diseases
Black Gum	Nyssa sylvatica	65–75	25–35	Full sun, partial sun or partial shade	Clay, sand, loam	Extended flooding, well-drained	High	Free of serious pests and diseases
Common Honeylocust	Gleditsia triacanthos	30–40	30–40	Full sun, partial sun or partial shade	Clay, sand, loam	Well-drained, occasionally wet	High	Sensitive to pests/diseases
Common Honeylocust	Gleditsia triacanthos	30–40	30–40	Full sun, partial sun or partial shade	Clay, sand, loam	Well-drained, occasionally wet	High	Sensitive to pests/diseases
Littleleaf Linden	Tilia cordata	60–70	35–50	Full sun, partial sun, or partial shade	Clay, sand, loam	Well-drained, occasionally wet	Moderate	Resistant to pests/diseases
Red Maple	Acer rubrum	60–75	25–35	Full sun, partial sun or partial shade	Clay, sand, loam	Extended flooding, well-drained	Moderate	Resistant to pests/diseases
Silver Maple	Acer saccharinum	60–80	40–60	Full sun, partial sun or partial shade	Clay, sand, loam	Extended flooding, well-drained	High	Resistant to pests/diseases

(continued on page 5)

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Common Name	Scientific Name	Mature Height (feet)	Mature Spread (feet)	Light Exposure	Soil Texture Tolerance	Soil Moisture Tolerance	Drought Tolerance	Pest Resistance
Black Oak	Quercus veluntina	50–70	35–50	Full sun	Clay, sand, loam	Well-drained	High	Resistant to pests/diseases
Northern Red Oak	Quercus rubra	60–70	50–60	Full sun	Clay, sand, loam	Well-drained	High	Resistant to pests/diseases
Scarlet Oak	Quercus coccinea	60–75	45–60	Full sun	Clay, sand, loam	Well-drained	Moderate	Resistant to pests/diseases
Shingle Oak	Quercus imbricaria	40–60	40–60	Full sun	Clay, sand, loam	Extended flooding, well-drained	High	Resistant to pests/diseases
Swamp White Oak	Quercus bicolor	50–70	50–70	Full sun, partial sun or partial shade	Clay, sand, loam	Extended flooding, well-drained	Moderate	Resistant to pests/diseases
Willow Oak	Quercus phellos	60–75	40–50	Full sun	Clay, sand, loam	Extended flooding, well-drained	High	Resistant to pests/diseases
Tulip-Poplar	Liriodendron tulipifera	80–100	30–50	Full sun	Clay, sand, loam	Well-drained, occasionally wet	Moderate	Resistant to pests/diseases
American Sweetgum	Liquidambar styraciflua	60–75	35–50	Full sun, partial sun, or partial shade	Clay, sand, loam	Extended flooding, well-drained	Moderate	Resistant to pests/diseases
American Sycamore	Plantanus occidentalis	75–90	50–70	Full sun	Clay, sand, loam	Extended flooding, well-drained	High	Sensitive to pests/diseases
The following trees will be considered at this time, but are not commonly found at local nurseries in large sizes:								
Bigtooth Aspen	Populus grandidentata	50–75	25–35	Full sun	Clay, loam	Well-drained, occasionally wet	Moderate	Sensitive to pests/diseases
American Beech	Fagus grandifolia	50–75	40–60	Full sun, partial sun or partial shade, shade tolerant	Clay, sand, loam	Well-drained	Moderate	Resistant to pests/diseases
Pond Cyprus	Taxodium ascendens	50–60	10–15	Full sun, parital sun or partial shade	Clay, sand, loam	Extended flooding, well-drained	High	Resistant to pests/diseases
Mockernut Hickory	Carya tomentosa	50–75	35–50	Full sun, partial sun or partial shade	Clay, sand, loam	Well-drained	Moderate	Sensitive to pests/diseases
Pignut Hickory	Carya glabra	50–65	30–40	Full sun, partial sun or partial shade	Clay, sand, loam	Well-drained, occasionally wet	High	Resistant to pests/diseases
Bur Oak	Quercus macrocarpa	70–90	60–80	Full sun	Clay, sand, loam	Extended flooding, well-drained	High	Resistant to pests/diseases
Overcup Oak	Quercus lyrata	30–40	30–40	Full sun, partial sun, or partial shade	Clay, sand, loam	Extended flooding, well-drained	Moderate	Resistant to pests/diseases
White Oak	Quercus alba	60–100	60–80	Full sun, partial sun or partial shade	Clay, sand, loam	Well-drained, occasionally wet	Moderate	Resistant to pests/diseases
Kentucky Yellowwood	Cladrastis kentukea	30–50	40–50	Full sun, partial sun or partial shade	Clay, sand, loam	Well-drained, occasionally wet	Moderate	Free of serious pests and diseases

Data adapted from “Northern Trees” tree selector developed by the U.S. Department of Agriculture (USDA) Forest Service Northeast Region with Rutgers University and the University of Florida [see “For More Information” section on page 9].

Can I do this project myself?

Yes. You can use this section as a guide. You will need the appropriate tools, site assessment, and physical ability.

If I decide to hire a contractor, what should I ask?

- What experience do you have planting trees?
- Are you certified with any nationally recognized organizations such as the International Society of Arboriculture or the National Arborist Association?
- Can you supply references from previous clients?
- Are you insured?
- What is included in your services?
- How long do you expect the project to take?
- Do you offer a guarantee for your work?
- Are you available to perform ongoing maintenance of the trees if needed?
- How much will your services cost?

If you buy your tree at a nursery, remember to cover the tree with a tarp or blanket during transportation to protect it from wind damage. If you bought your tree at a nursery that offers a warranty or guarantee, be sure to follow the nursery planting instructions.

Large spreading canopy intercepts up to 1/4 inch of rain in leaves (Casey Trees)

How to...
Build and Implement

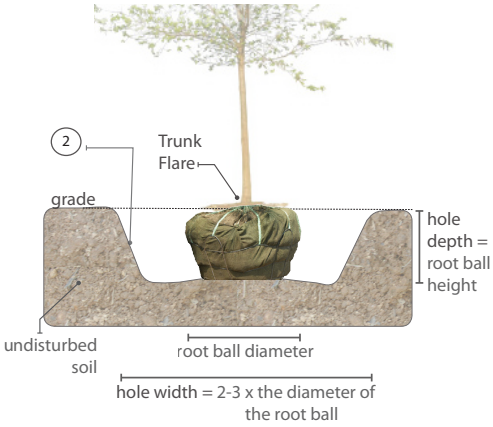
Planting a Balled in Burlap (B&B) Tree on Flat Ground

1) Digging the Planting Hole

HELPFUL TOOLS for DIGGING

1. Dig planting hole no deeper than the root ball height. Excavate hole 2-3 times the width of the root ball diameter.
2. Roughen the sides of the planting hole.

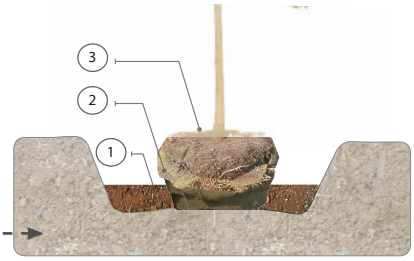
3. Before placing the tree in the planting hole, prune only dead or broken branches and remove any tree wrap, tape, string, and tags from tree trunk and branches.
4. Gently lower the tree into the hole so that the trunk flare is at or slightly above the original grade.



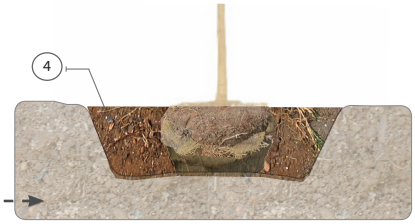
2) Planting the Tree

HELPFUL TOOLS

1. Backfill 1/3 of the planting hole with original soil to stabilize root ball and keep tree upright.
2. Cut and remove top 2/3 of the wire basket
3. Cut and remove top 2/3 of the burlap from the root ball



4. Completely backfill hole with original soil and add soil amendment if needed



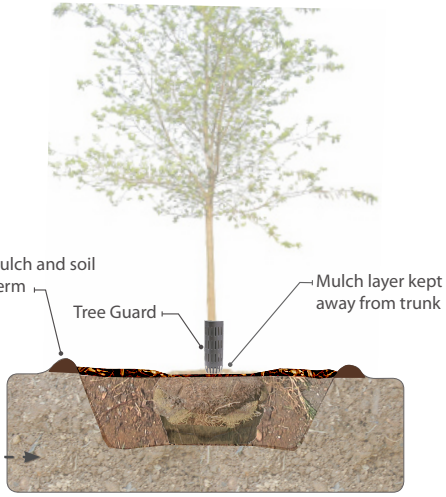
3) Mulching and Watering

HELPFUL TOOLS

Please See Opposite Side for Staking Tools and Directions

1. Create a mulch ring around the tree and a 3-6" high soil and mulch berm at the edge of the hole. Keep mulch away from the trunk.

2. Water the tree thoroughly at planting and 15-25 gallons per week after the planting.



How to...
Build and Implement

Planting and Staking a Containerized Tree on a Hill

1) Choosing Where to Plant

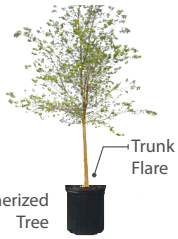
HELPFUL TOOLS

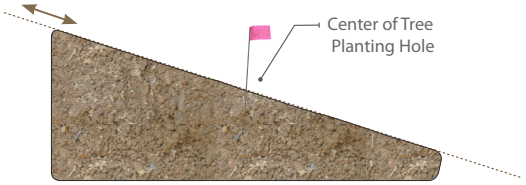

Gloves


Shovel


Pick-Axe

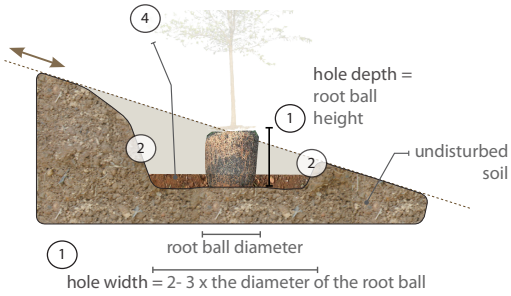

Tarp





2) Planting the Containerized Tree

1. Dig tree planting hole to depth of root ball so that the trunk flare is level with original grade. Excavate hole 2-3 times the width of the root ball diameter.
2. Roughen the edges of the hole.
3. Carefully remove the tree's root ball from the container, and untangle and prune any circling roots.
4. Gently lower the tree into center of the hole so that the trunk flare is at or slightly above the original grade. Back fill 1/3 of the hole with original soil to stabilize root ball and keep tree upright.
5. Completely backfill hole with original soil and add soil amendment if needed. Add soil to the downhill side to help level the soil area around the tree.



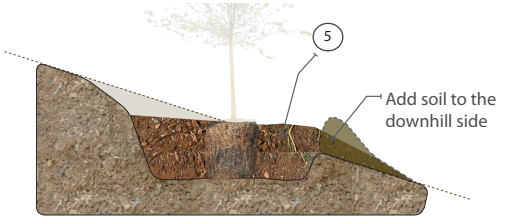
HELPFUL TOOLS


Scissors


Hand Pruners

Rake


Soil Amendment



3) Mulching and Staking the Tree - for trees on flat *or* sloped ground

HELPFUL TOOLS


Mulch


Stake Driver

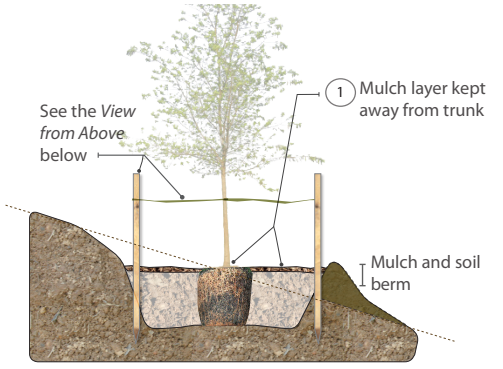

2 or 3 6' Hardwood Stakes


Tree Tie

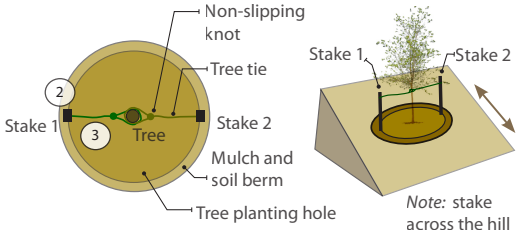
Please See Opposite Side for Watering Tools and Directions

1. Create a mulch ring around the tree and a 3-6" high soil and mulch berm at the edge of the planting hole, particularly on the downhill side. Keep mulch away from the trunk.
2. Decide if stakes are necessary to help the tree remain upright. If so, drive stakes two feet deep into the soil at the edge of the hole.

3. Secure tree trunk with tree tie with at least a 6" wide loop snuggly around the tree trunk - tied with a non-slipping knot.
4. Stakes should be removed after one year.



Views from Above



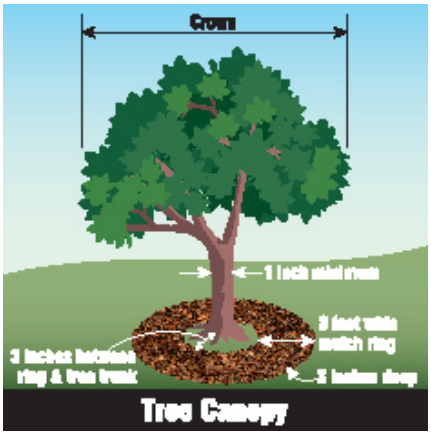
Costs

Cost will vary depending on the type and size of the tree you choose. Typical prices for 8- to 12-foot trees are $75 to $200 per tree for a do-it-yourself installation.

Maintenance

Trees require a few maintenance activities, which include:

- Mulch
  - » Place 2 to 4 inches of mulch in a 3-foot wide ring of mulch around the tree, but make sure that mulch does not touch the trunk
  - » Re-mulch annually, and rake the mulch to prevent hardening
- Water trees*
  - » Keep soil moist, but not soaked
  - » Water trees once a week (less frequently if it rains and more often when it's hot and dry)
- Provide wind protection (using stakes for added stability during the first year)
- Rake leaves in the fall
- Properly prune limbs (to protect nearby structures)
- Use pest control if necessary
- Use tree-wraps to protect trees from deer rub if necessary



To avoid trunk damage, do not use a weed whacker around trees.

Additional maintenance tips and a schedule to care for your trees can be found in ***The Tree Owner's Manual*** on DEP's Web site: http://www. montgomerycountymd.gov/deptmpl. asp?url=/content/dep/Forest/plantandcare_trees. asp#carefortrees.

* Newly planted trees require extra water in the summertime when it is hot and dry. Be sure to water young trees at least once a week if it doesn't rain, especially in July and August. While big trees rarely need extra water besides the rain, watering in the heat of July and August will help them too. Please visit the DEP Web site: http://www. montgomerycountymd.gov/deptmpl.asp?url=/content/dep/Forest/wateringtrees. asp for instructions on how to water "slow and steady" to best care for your trees and conserve water.

For More Information

Maryland Native Plant Society's List of Sources of Native Plants, *Identifying Local Nurseries/ Landscapers and Native Plant Materials:* http://www. mdflora. org/publications/nurseries. html

National Arbor Day Foundation Tree Store: http://www. arborday.org/shopping/trees/trees.cfm

Reforestation, Nurseries, and Genetics Resources Plant Materials Directory: http://www.rngr.net/Applications/directory

Casey Trees, General Reference Materials: http://www.caseytrees.org/planting/ Seasonal Maintenance Guidance: http://www.caseytrees. org/planting/how-to/tree-care/documents/Almanacposter3010609.pdf

Using a "Tree Benefits Calculator" to quantify your trees' annual economic and ecological benefits: http://www.treebenefits.com/calculator

USDA Forest Service Northeast Region, Rutgers University, and University of Florida's Database for Northern Trees: http://orb.at.ufl.edu/TREES/index.html

Watershed Forestry Resource Guide, *Planting and Maintaining Trees:* http://www. forestsforwatersheds.org/planting-and-maintaining-trees/

USDA Forest Service, *Urban Watershed Forestry Manual – Part 3: Urban Tree Planting Guide:* http://www. forestsforwatersheds. org/storage/Part3ForestryManual.pdf

CREP, Maryland's Conservation Reserve Enhancement Program http://www.fsa.usda.gov