



## FAQs for Helping Your Trees Survive during a Drought

By Hank Stelzer and Bert Cregg



### *How can I tell if my tree is under drought stress?*

Symptoms of drought injury to trees can be sudden or may take up to two years to be revealed. Drought injury symptoms on tree leaves include wilting, curling at the edges, and yellowing. Deciduous leaves may develop scorch, brown outside edges or browning between veins.

Evergreen needles may turn yellow, red or purple. They may also turn brown at the tips of the needles and browning may progress through the needle towards the twig. In early summer conifers under drought may exhibit wilted or drooping leaders.



Drought injury symptoms on tree leaves include wilting, curling at the edges, and yellowing. Deciduous leaves may develop scorch, brown outside edges or browning between veins. Conifers under drought may exhibit wilted or drooping leaders.

In continued drought, leaves may be smaller than normal, drop prematurely or remain attached to the tree even though brown. Often times, drought stress may not kill a tree outright, but set it up for more serious secondary insect and disease infestations in following years.

### *How often should I water my trees and what is the best method?*

How much water your tree should receive depends upon the tree size. A general rule of thumb is to use approximately 10 gallons of water per inch of trunk diameter for each watering. You can easily determine trunk diameter by measuring the circumference of the



Agricultural Disasters



Families & Communities



Hazards & Threats



Human Health



Disaster Watch

tree at knee height and dividing by 3 (or 3.14 for you math purists).

If you do not want to measure out 10 gallons, a general rule of thumb is: tree diameter x 2 minutes = total watering time. Example: When you hand water using a hose at medium pressure, it will take a approximately 2 minutes to produce 10 gallons of water. If you have a 4" diameter tree, it should receive 40 gallons of water - multiply by 2 minutes to equal total watering time of 8 minutes.

All size trees should be watered three times per month, April through September according to the guidelines below. All trees should also receive adequate water during the winter months, too. For more information on winter watering, see below.

Water should be distributed evenly under the dripline of the tree.

The best watering method depends upon whether you have a small (1-7" diameter), medium (8-15" diameter) or large sized (16"+ diameter) tree.

### Small Trees

Newly planted and smaller trees can get adequate water within the existing watering restrictions by hand watering with a soft spray hose attachment as a separate zone on your designated day.

Small trees are best watered using the following methods:

- Automated drip irrigation system/soaker hose.
- End of the hose using a soft spray attachment at medium pressure 5-gallon bucket (with ¼" holes drilled in bottom) or watering bags – filled and set under the dripline.

### Medium Trees

Medium sized trees are best watered using the following methods:

- Soaker hose coiled several times under the dripline of the tree.
- End of the hose with a soft spray attachment to disperse the flow – use a medium pressure.

### Large Trees

Healthy mature trees should be able to withstand a short-term drought. Large trees are best watered using the following method:

- End of the hose with a shower like hose attachment to disperse the flow, use medium pressure.





Small- to medium-size trees can be irrigated economically with slow-release watering bags, like the Treegator® (left) or with inline emitters (center) or a soaker hose attached to your faucet and controlled with a simple battery-operated timer (right.)

### ***Are there other sources of water for my trees besides my garden hose?***

In times of tight watering restrictions you may need to get creative to find water for your trees. For example, you can use the water when you drain your kids' pool and pour under a tree. Or, redirect water from your rain gutters toward your trees. And if you are really hardcore, you can keep a bucket by your shower and reuse the water you save waiting for the shower to warm up!

### ***How far away from the tree trunk should I water?***

Deep watering to a depth of 12" inches below the soil surface is recommended. Saturate the soil around the tree within the "dripline" (the outer edges of the tree's branches) to disperse water down toward the roots.

For evergreens, water 3'-5' beyond the dripline on all sides of the tree.

The objective is to water slowly, dispersing the flow of water to get the water deep down to the trees roots. Watering for short periods of time only encourages shallow rooting which can lead to more drought damage.

Don't dig holes in the ground in an effort to water deeply. This dries out roots even more. A soil needle/deep root feeder attached to a hose is acceptable to insert into the ground if your soil is not too hard and compact.

Overhead spraying of tree leaves increases water lost to evaporation and should be avoided during drought conditions.

***If my community is restricting outdoor water use, should I water my trees or my lawn?***

During drought, trees must be given top watering priority over your lawn. However, caring for trees requires different watering methods than your lawn. During water restrictions, irrigation systems designed to water turf do not sufficiently water your trees. Lawns can be replaced in a matter of months whereas a 20 year old tree will take 20 years to replace.

***If my community is restricting outdoor water use, how should I prioritize which trees to water?***

The first trees to consider watering are those that will be most vulnerable and affected by dry conditions.

Newly planted and young trees (1-7" diameter) are not yet established and have a limited root system. These trees generally need supplemental water even when we are not experiencing drought conditions. Generally it will take one full year per inch of trunk diameter to get established. For example, it will take 3 years for a 3" caliper tree to become established.

Trees growing within a restricted root zone. Examples are trees adjacent to a driveway or house, growing within a landscape strip between your sidewalk and the street, growing in a median or traffic circle.

Trees that have recently received root injury due to construction work will need supplemental watering because the root system has been compromised.

***Should I mulch my drought-stressed tree?***

By all means, Yes! Mulch around your trees with 4 inches of organic mulch to reduce moisture loss. You can use wood chips, shredded bark, leaves or evergreen needles as mulch. We recommend the 'doughnut technique'; leave a few inches around the trunk bare rather than piling up mulch around



Mulch around your trees to reduce moisture loss. Distribute the mulch in the shape of a donut (left), with about two inches of mulch near the trunk increasing to around four inches at the perimeter of the mulch ring. Do not pile up mulch around the tree trunk like a volcano (right).

the tree trunk like a volcano. Avoid the use of stone or rock near trees as this increases air temperatures and moisture loss from leaves and stems.

***Do I need to water my trees during the winter?***

Even in years when drought is not a concern – winter watering is crucial, especially with evergreen trees! Well-timed fall and winter watering may allow a tree to survive on less water than a regime of plentiful water applications during the growing season. Tree roots continue to grow throughout the winter and need moisture to survive. Generally, water one to two times per month October through March on a warm day when the ground is not frozen. Use the same amount of water as during the summer months.

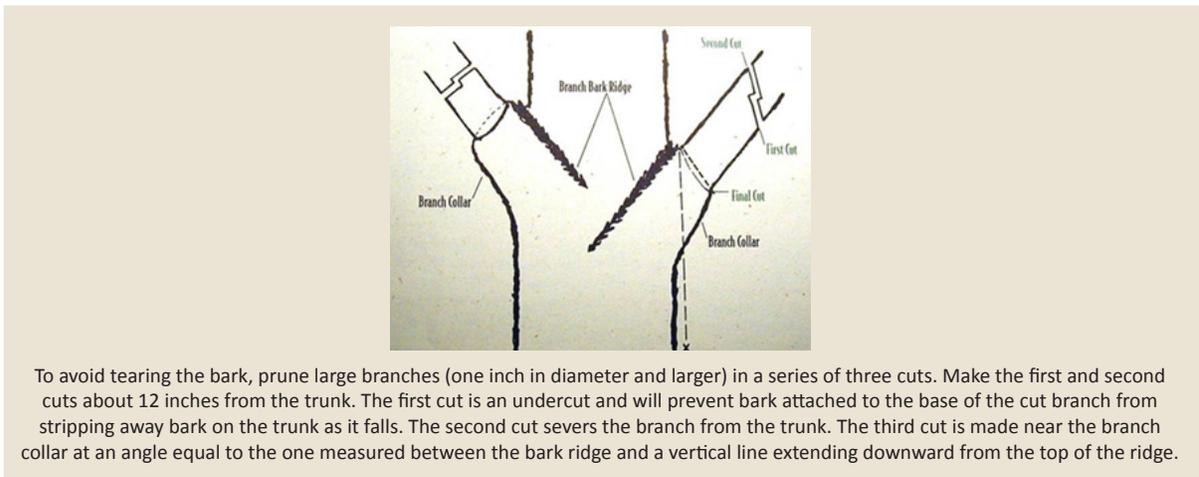
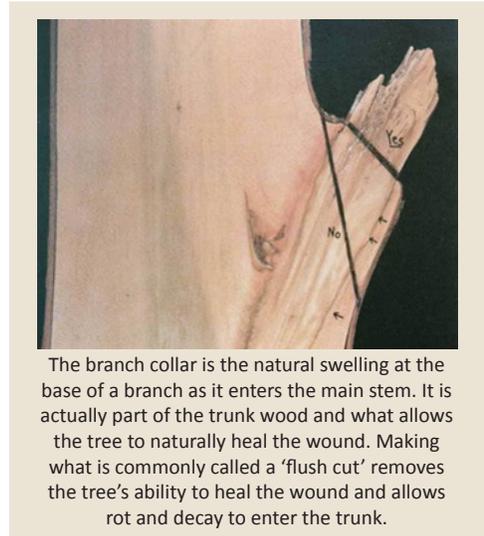
***Should I fertilize a tree that is under drought stress?***

Salts in fertilizer may burn roots when there is not sufficient water. Fertilizers may also stimulate top growth resulting in too much leaf area on the plant for the root system to maintain during periods of limited soil moisture.

***Can I prune a tree that is under drought stress?***

Leaving broken, dead, insect-infested or diseased branches can further weaken a tree during drought and set the tree up for deadly secondary insect and disease problems.

Should you decide to prune, make sure you leave the ‘branch collar’ (the donut-shaped swelling that encircles the branch where it enters a larger branch or tree trunk) intact. If you make what is called a ‘flush cut’, you take away the tree’s natural ability to inhibit future decay into the stem.



To avoid tearing the bark, prune large branches (one inch in diameter and larger) in a series of three cuts. Make the first and second cuts about 12 inches from the trunk. The first cut is an undercut and will prevent bark attached to the base of the cut branch from stripping away bark on the trunk as it falls. The second cut severs the branch from the trunk. The third cut is made near the branch collar at an angle equal to the one measured between the bark ridge and a vertical line extending downward from the top of the ridge.

In some instances where the tree in question is an oak, you should wait until the dormant season to prevent the potential infection of the oak wilt fungus, a deadly oak disease.

### ***Can I use herbicides on my lawn around a tree that is under drought stress?***

Most herbicides require active plant metabolism in order to effectively control weeds. Since your weeds will likely be dormant during the drought, applying herbicides then is wasting money. Wait until the lawn is actively growing and follow the manufacturer's label to ensure a safe and effective application.

### ***Some of my trees and shrubs look pretty crispy. How do I know which are 'goners' and which may recover?***

Leaf scorch and leaf shedding are common in trees under severe drought. In fact, leaf shedding is a common means for many trees to conserve water and tolerate drought. The best general advice in determining if a severely stressed tree will recover is, 'wait and see'. Some deciduous trees may begin to recover and produce new leaves after fall rains or repeated watering; some may not show re-growth until the following spring. Evergreen conifers, such as pines, spruces, or arborvitae usually won't recover if all their needles have browned. Nevertheless, unless there is a compelling reason to take them out, homeowners may want to leave them in place until spring- just in case...

### ***Author Contact Information***

#### **Dr. Hank Stelzer**

University of Missouri-Columbia  
State Forestry Extension Specialist  
Phone: (573) 882-4444  
Email: stelzerh@missouri.edu

#### **Dr. Bert Cregg**

Michigan State University  
Associate Professor of Horticulture  
Phone: (517) 355-5191 ext. 1335  
Email: cregg@msu.edu

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write to:  
USDA  
Director, Office of Civil Rights  
1400 Independence Avenue, S.W.  
Washington, DC 20250-9410  
800-795-3272 (voice) or 202-720-6382(TDD)

USDA is an equal opportunity provider and employer.