

Managing Trees During Drought & Water Restrictions



Drought and water restrictions are a part of life in the Western States. Arborists must cope with these adverse conditions by offering clients drought survival strategies when water budgets are implemented and irrigation is curtailed.

The west is an arid region. Although Hawaii enjoys greater rainfall in many areas, prolonged drought and water restrictions are still an issue.

Large trees are an easy target when water is restricted. However, the benefits trees provide usually pay back the water they use. Trees protect water sources by reducing topsoil erosion and intercepting rain and reducing runoff during storms. Tree roots capture nutrients and act as pollution filters. Couple that with additional tree services of energy reduction, air quality improvement and aesthetics and these tree benefits "pay" for the water applied.

SURVIVING WATER RESTRICTIONS

Many water districts offer incentives to remove turfgrass, often around mature trees. This has led to the decline of tree canopies in some urban areas.

Depending on the tree species, symptoms of drought can be slow and subtle or quick and deadly. Symptoms include wilted, yellowing and/or scorched leaves. Whole branches can die back, usually starting at the top. Drought stress can cause secondary disease and insect infestations that can accelerate decline.

Large trees can thrive even with turf removal if they receive adequate irrigation. Drip or low-flow irrigation can keep trees healthy with little or no water waste.

A **drip (or "low flow") irrigation system** is comprised of a valve, pressure regulator, filter, delivery tubing or piping and emitters. New technology in drip emitters can prevent clogging and pressure loss, two major drawbacks in a drip system.

Subsurface irrigation tubing has emitters built in at regular intervals. These can be installed in spirals, radial patterns or grids around trees. Subsurface systems can provide good uniformity using less components and labor.

Drip systems are capable of providing adequate water for tree health with little or no waste, but caution must be used. Too many times, only one or two emitters are installed. On a new installation, the tree can decline and fail just as it is reaching a beneficial size. On retrofits, using too few emitters can lead to rapid decline and death.

Traditional irrigation systems, using PVC pipe and bubblers, are still a viable choice. Since they are above-ground, it's easy to see if they are functioning properly. They are also less prone to breakage and clogging.

START WITH SELECTION

The best way to deal with drought is to select trees that are well adapted to the site. Start with native trees. Keep in mind, though, that just because a tree is native to your state, it does not necessarily mean it is the right choice for your particular location. Obviously, a coastal or riparian tree is not a good choice for an inland, high elevation, exposed location. Improper tree selection requires more applied water.

When selecting trees, matching them to the soil and exposure of the site is critical. Trees from similar geographic regions can be a better choice than "natives" that may prefer a very different climate zone and soil texture. Plant lists for specific regions are available from several sources. Try your local water district, Cooperative Extension or even the local utility.

SMART SCHEDULING

Once a new tree has been properly planted, sound irrigation practices are critical to its survival and how well it can handle drought in the future. **Newly planted trees need their existing rootballs to be evenly moist, with the surrounding soil irrigated to encourage rooting.** As the tree matures, the wetted area should extend past the canopy to ensure that its water needs are met.



Dieback is an advanced symptom of drought. Photos courtesy: Russ Thompson

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Arborists need to be familiar with two key concepts of irrigation—frequency and duration. As irrigation frequency (the number of times a day, week or month the system is run) decreases, the duration (amount of "run time") should generally increase. Run times cannot be standardized because soil textures and the depth of soil also determine the amount of potential wetted area and potential soil water content and thus the run time.

Care must be taken when scheduling to be sure that water does not runoff, especially in heavy clay or "tight" soils. Tree berms may be required to minimize runoff.



Be sure that a tree's entire root system will be wetted when using drip irrigation.
Photo courtesy: Joseph Fortier

PRUNING AND FERTILIZING

Once trees are established, providing adequate soil moisture is still one of the most important factors in their health. Pruning and fertilization, while viable, are not as much of a concern.

In times of drought, fertilization, especially with high nitrogen levels, should be reduced if not eliminated. As soils dry out the concentration of salts increases. Fertilized trees are more susceptible to salt burn during drought. If water is in limited supply, eliminate fertilizations. Try to apply longer run times less frequently to move salts lower in the soil profile.

Pruning can also encourage release of dormant buds and stimulate new growth. Heavy pruning can leave branch and bark tissue exposed to the sun and elements, resulting in sunburn of exposed stems. **Prune only to remove dead wood, remove crossing competing branches and to maintain**

overall health. Light thinning (no more than 25% live foliage) that removes foliage will also cut transpiration and prevent water loss from water-stressed trees.

MULCH MATTERS

Another important tool for droughty times is mulch. The benefits of mulching are well established. Mulching a young tree will save about every other irrigation once established in the site soil. Mulching trees after turfgrass removal will help prevent water loss from the soil surface, but will not take the place of applied water. Mulched trees still need irrigation.

Organic mulch is preferred. As it decomposes, it improves soil quality. Tree trimmings run through a well-maintained chipper makes an ideal mulch. Avoid diseased or infested materials. This mulch can be laid up to a depth of up to 12 inches; it will rapidly compress and meld to form a "mat" that will retard moisture loss while also allowing rain and irrigation to reach the soil surface and prevent runoff. Mulched soils also take water in at a higher rate, so irrigation can be applied with higher flow if necessary; useful when irrigation time and days are restricted.

Organic mulches should be replenished annually. Avoid composts; because of their fine texture they hold moisture, allow for weed germination, and can also promote water loss from underlying soils. The best mulches are coarse chips.

Inorganic mulches are a popular option in desert landscapes. Rock, gravel and decomposed granite are used to a depth of one to three inches. Although they are durable and can be aesthetically pleasing, they can also reflect heat, driving up temperatures.

In times of drought, arborists must acquaint themselves with the numerous benefits trees provide. Unfortunately, sometimes trees lose the battle, and replacement is the only option. Mature trees in arid climates that were planted when water was plentiful might not survive water restrictions. In that case, arborists can provide safe removal and offer options for replacement using water-efficient trees. 🍂

Further Reading/Links:

Managing Trees During Drought (Dr. Ed Gilman)
<http://hort.ifas.ufl.edu/woody/drought.shtml>

Tree Irrigation Overview
http://www.snwa.com/land/install_drip_trees.html