WATERING TREES

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Trees constantly lose water to the atmosphere. Water is the single most limiting essential resource for tree survival and growth. Water shortages severely damage young and old trees alike, and set-up healthy trees for other problems. Drought conditions can lead to tree decline, pest problems, and non-recoverable damage. Supplemental watering can greatly assist in maintaining tree health during droughts – both during the growing season or during the dormant season.

Trees can be old and valuable. They are usually considered non-replaceable beyond 10 inches in diameter. Many associated landscape plants are low cost and easily replaceable. If these plants are damaged or lost to drought, the landscape can be corrected quickly and relatively cheaply. Large, drought-killed trees can not be replaced in two human generations. Please emphasize watering trees during droughts.

HOW

Ideally, irrigation should automatically begin when soil moisture reaches some critical measure determined by a moisture probe or soil tensiometers. Trees should be zoned apart from turf and other landscape plants. Careful tuning of irrigation systems are needed to prevent over-watering trees.

Manually, the best ways to water trees are by soaker hose or trickle (drip) irrigation which you turn on and off. Sprinklers are less efficient for applying water to trees than soaker hoses or drip irrigation, but are easy to use. Even a garden hose, moved often, can provide a good soil soaking. Use a light organic mulch to conserve moisture and apply water over the top of the mulch. Do not concentrate water at the base of the trunk as this can lead to pest problems.

Deep watering a tree with a pipe or wand stuck into the soil 12-24 inches is not as good for trees as surface applications. Most of the tree's absorbing roots are in the top foot of soil. Applying water deeper than this level misses the active roots and allows water to drain away from the roots, wasting efforts and water. Apply water across the soil surface and let it soak into the soil. Surface soaking allows tree roots more chances to absorb any water, helps maintain soil health, and helps maintain essential element cycling and transformations in the soil.

WHERE

Lay-out water hoses or applicators out to the tree crown edge (drip-line). Try to water the soil areas directly beneath the foliage and shaded by the tree. Do not water beyond the drip-line and do not water closer than 3 feet to the trunk base on established trees. Be sure the water soaks in well. Use

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mulch and slow application rates on slopes, heavy soils (clays), and compacted soils to assure water is soaking-in and not running-off. If the tree is surrounded with other landscape plants, or by turf, deep soaking water applications will benefit all. Do not spray tree foliage when applying water. Water droplets on tree leaves can lead to pest problems and destruction of leaf tissue through sun damage. Try not to wet the trunk if possible.

Young, newly planted trees need additional watering care. Water does not move sideways in a soil. You must apply water directly over where you need water in a soil. For new trees, concentrate water over the root ball, as well as the planting area, to assure survival.

Old, large trees can be extensively watered over the entire area under their foliage. Another method in watering large trees is to select roughly 1/3 of the area whin the drip-line for concentrated water applications. The whole area below the foliage can be watered occasionally.

WHEN

The best time to water is at night from 10 pm to 8 am. Trees relieve water deficits (refill) over the night time hours. Watering at night allows effective use of applied water and less evaporative loss, assuring more water moves into the soil and tree. Night time application hours, when dew is already present, does not expand the foliage wetting period for understory plants. This watering cycle minimizes pest problems.

The next best time to water is when foliage is dry and evaporation potential is not at its daily peak. This watering period is late afternoons. Be sure to allow applied water to dry-off of foliage surfaces before the evening dew appears. This dry gap between watering and atmospheric condensation helps minimize pests which require longer wetting periods. This is especially critical where turf surrounds a tree.

Because trees lose water from day to day, month to month, and season to season – dormant season watering during winter drought is important, especially for evergreen trees and juvenile hardwood trees that have not lost their leaves. Because of temperature and relative humidity interactions, much less water is required in the dormant season, but water is still needed. Do not water when the soil surface is less than 40^{o}F.

For every 18^{o}F increase in temperature, the amount of water lost by a tree and the site around it almost doubles. This feature of water loss must be factored into applying supplemental water to a tree. Trees surrounded by pavement and other hot, hard surfaces can be 20-30^{o}F warmer than a tree in a protected, landscaped backyard. Water use rapidly climbs with increasing temperatures, and so should water application volumes.

HOW MUCH

Depending upon soil texture, bulk density, daily temperatures, and rainfall amounts, 1-3 inches of water per week should keep a tree healthy. Trees in limited rooting areas, in containers or pots, or on major slopes, need additional care to assure water is reaching the root system in adequate amounts and not suffocating roots from lack of drainage. Five gallons per square yard is about 1 inch of water.

Fine soils (clays) require careful attention to prevent over-watering and root death. Sandy soils can be severely droughty because water runs out of the rooting zone quickly. There are some water

holding compounds that are commercially available for keeping water near roots. In addition, composted organic material additions and organic mulch covers on the soil surface can help hold and prevent rapid loss of applied water.

HOW OFTEN

Trees should be watered once or twice a week in the growing season if there is no rainfall in that particular week. A few heavy (high volume) waterings are much better than many light, shallow waterings. A greater proportion of the applied water is utilized by the tree with heavy watering. Also, light waterings encourage shallow rooting which can lead to more severe drought damage. Once you begin watering you should continue to water until rain comes.

OTHER THINGS

Many plants in a small area can effectively compete within the soil to use available water. This water competition can be severe. Remove excess plant competition from around any tree to decrease water stress. Use mulch to conserve water and prevent weed competition. Careful applications of herbicides can also reduce weed competition for water, but severe drought conditions can lead to unexpected results.

When landscape watering is not allowed because of water-use restrictions, “gray water” could be used. Gray water is waste water from household bathtub, shower, sink, dishwasher, and/or washing machine. Gray water use is approved in only a limited number of counties. You must check to see if it is legal in your county or city. Gray water will play a greater role in water conservation in the future. Sodium-based exchange-softened water should not be applied to soils.

Xeriscaping, or developing water-efficient landscapes, is becoming more important. There are a number of concepts involved in developing a water-efficient landscapes, when integrated wisely, will conserve water while providing a functional and aesthetically pleasing landscape. Trees are a critical part of any water-efficient landscape.