Participating Homeowner Instructions

Using Auxiliary Watering Devices to water Common Area Trees

Park Plazas, Santa Fe, NM

Prepared by Emergency Ecology Solutions
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At the request of the Manager, Richard White, and Landscape Committee Chairwoman Nora Haskins, EES has been asked to prepare a simple primer for efficient watering of landscape trees in the PP common areas that may be undertaken, on a voluntary basis, by cooperating individuals.

Certain styles of moveable watering devices, sprinklers, wands, rotating gear-drive rotors, etc., are preferable for this type of deep watering, needed to sustain and improve the overall condition of trees adjacent to individual homes.

The critical areas around these trees is actually minimal in size, extending no more than five feet in any direction outside the drip line (the furthest extent of the lowest branches from the trunk) of any tree. It is easy to measure this distance, either pacing it off with individual walking steps (+/- 3 ft.), or using a retractable tape.

Most trees are radial in shape, some are densely branches near the base, and others have branches that are in excess of six ft. from the ground. It is necessary to get water near the trunk base, and outward, to an area five ft. extended beyond the drip line. This is the underground area where the tree's feeder roots and anchoring roots are found. They often extend much further, but for rescue purposes, this area will suffice.

Deep Watering

Several years of in situ experimentation by EES has concluded that trees respond best and most rapidly when watered slowly, deeply, and infrequently. This requires a watering pattern and volume that allows for slow and steady penetration into the top 24-40 inches of topsoils. To do this without wasteful runoff, a mechanical application is required that will achieve the above goals.

A golf course, ratched-type sprinkling device is discouraged, since it throws out a significant volume across a wide area. Bubblers or simply throwing down an open hose is horrible. Better devices are a simple flat sprinkler head that throws a trellis shape vertically up and outward.

A second device that is very efficient is the typical arching wand that rotates across an arc that can be adjusted between 20-180 degrees, and throws a soft band of water up and out in a rectangular pattern.

A third device is a gear-drive rotor that rotates horizontally across an adjustable circular pattern, between 20-360 degrees of rotation, and has varying size delivery nozzles to adjust the volume of water released.

EES will provide free advice on how/where to find these devices.

Measuring the Area of Ground to be Watered

Once a device has been selected, it is critical to know exactly how much water, per minute, can be delivered by the device. This is relatively easy, and requires only a five-gallon bucket, garden hose, sprinkler device, and a simple timer, available on most cell phones. This measure is important to know, since gallons per minute (gpm) translate to gallons per hour (gph) and will reveal the total volume of water put down across the square footage of the tree soil to be watered.

Once the hose, watering device and area to be watered have been determined, the actual measure of water in gpm can be discovered. Simply measure the area around the tree, five ft. beyond the drip line on all sides, and mark it with a few rocks, or sticks, or flags or tape.

Determine the total square footage by either measuring the two sides if a rectangle (length x width), or measure the radius if using a circular sprinkler, and use (radius squared - N x N - times 3.14). *Examples - the rectangular length is 20 ft. X the rectangular width is 20 ft., equalling 400 sq. ft. Sometimes the tree will yield a square, other times a true rectangle. Or, the radius of the water zone is 15 ft., so 15 squared is 225, times 3.14, equaling 700 sq. ft.*

1 - Put the watering device on any one side of the tree, and turn on the water, watch the area that is covered, and turn up or down the water volume to match the area needed to be watered. Most times all trees can be watered with only two locations of the sprinkler device, placed either near the trunk and sprayed outward, or at the outer edge of the watering zone and sprayed inward to the trunk.

Once this is determined, take careful note of the total number of turns of the faucet handle that controls the water flow. You can simply have the water flowing at the correct dimension, then count the turns as you turn off the faucet. Remember the number of turns, and use this as a guide. *(An easier way to keep this measure is to use an in-line shut off device after the faucet, turn it to the desired location, leave it there, and turn on/off the water at the faucet.)*

Determining the Volume of Water per Minute from the Sprinkler

Measure your bucket into four equal distances from the bottom to the top, and mark with a Sharpie or other indicator. With the water turned off, put the entire sprinkler device inside the bucket, or fully on top with the water flow pointing into the bucket. Have someone hold the device steady while

you quickly turn the faucet handle to the previously measured number of turns needed to water the tree.

Begin to measure, in seconds, the water going into the bucket, for 30 seconds, then quickly turn off the water.

Check the level of the water in the bucket. Each of the four lines represents 1.25 inches of water. Determine the approximate volume based upon the lines, and then multiply by 2x. This is your volume of water per minute (gpm) delivered by the sprinkler.

Watering Times Needed and Water Volume Used

PP is a heavily clay soil area of SF. Clay absorbs water slowly, but it also holds absorbed water very well, and stores vast amounts of water per cubic measure of soil, as compared to sand or rock or some combination of leaves, needles, sticks, etc. that occupy the top layers of dirt.

So clay at PP needs time to absorb the water to the depth needed, and once achieved, will hold that water in storage quite well.

Turn on your sprinkling device and run it for one half hour - 30 minutes. Carefully observe what happens on the top of the dirt. With a shovel, dig in the watered area and measure how far down the water has penetrated. *If there is puddling and runoff outside the needed area, run the water less time. Keep track of the time until puddling/runoff is observed.*

All soils are somewhat different, even within a homogenous area, so knowing the water depth for each 30-60 minutes is important. To achieve a water depth of 24-36 inches may require several waterings of 1 - 4 hours to achieve saturation.

The water absorption rate should remain fairly constant, especially if you water slowly, give the soil a chance to absorb all the water, then wait perhaps 12 -24 hours, and then water again.

How Often to Deep Water

Once achieved, the weather - temperature, wind, cloud cover, even relative humidity - will help determine the time intervals between waterings. You can observe the effect of the deep watering on the trees by watching the new twig/leaf/needle growth that forms, probably within 10 days to two weeks.

You also will note the vigor of leaves, twigs, stems improve. The tree will droop less, increase its intensity of green chlorophyll, be steadier and more resistant to violent breezes, and perhaps form suckers on the base or the trunks.

EES regularly waters pinon, juniper, cottonwood, Russian Olive, New Mexico Olive and fruit trees using the deep water technique. It is not uncommon for good vigor and recovery to last a month or more before more water is needed, depending upon any ambient rainfall that occurs.

Water Usage

If you know how many gpm/pgh you are watering with, and the time periods you water, you will know how many gallons per tree, per watering cycle, you use. If you have a budget you need to follow, this will help you determine the extent of your tree rescue plan. You can check with the water company to determine the cost for each 1000 gallons you use.

To give you a real-world example, EES can water a 30 ft. radius (2900 sq. ft.), using an 8 gpm nozzle, for 4 hr. and apply one inch of precipitation. That equals about 2000 gallons of water.

EES will be available to consult with you, and come to your home and help you set up this Tree Rescue Program. Call Mick at: 505-930-0238.