

Irrigation

Plants need average to ample water to perform. Even though many plants are drought tolerant and/or drought resistant they prefer average to ample water to perform the following:

- Germinating from seed
- Establish following transplanting
- Grow
- Bloom, produce viable seed or quality fruit

There are certain plants that can thrive with less than average water but the majority of plants will, at minimum, stop or slow growth. Many drought tolerant plants in nature will grow, lower and reproduce only after a significant rain event or an unusually wet season. In an established garden, composed mostly of foliage plants, keeping the soil somewhat dry during the summer can be beneficial because of less pruning. Lawns, flowering plants, vegetables and fruit trees require average to ample moisture. Be aware that mature bushes and trees can have extensive roots that can capture water over 100 feet away and therefore give the appearance of being drought tolerant.

Roots will grow as deep as they can breathe. A study of root depth in an almond orchard UC Davis scientists subjected plants to deep, infrequent irrigation compared to light, frequent irrigation. This study produced results that were surprising to the researchers. The daily, light irrigations resulted in a deeper root system.

Generally, the soils in Orange County absorb water at the rate of 1/4" to 1/8" per hour. To avoid runoff and/or uneven absorption longest times each sprinkler zone should be on is only 4-5 minutes, less if watering a steep slope. Total water amount being equal, it is more effective to water more than once per day (at least 1 hour apart). There are areas in Southern California where the soils are more coarse these areas can absorb water at a tremendous rate. Irrigation should be adjusted accordingly. Many gardens can get by with one long irrigation period per week. Be aware that irrigation is less efficient if the water percolates much deeper than the

root system. Our experience shows that plants prefer their weekly rationing of water applied in small portions throughout the week rather than applied all at one time.

For grass lawns the average number of minutes of sprinkler irrigation per week is as low as 4 minutes in winter to as many as 50 minutes in summer. During the hottest summer weather a lawn may require 3 watering periods per day. Most shrubs and trees require about 1/3 less water than lawns. You can utilize an old farmer method in order to measure moisture in the ground (if the water is being applied to the surface). A 4' long piece of re-bar or similar metal rod is pushed by hand into the ground. The depth to which you can push it is directly related to the depth of moist soil. It is very difficult to push a stick or rod into dry soil. If you can push the re-bar into the ground 12" the soil contains ample moisture to 12" deep. Locally most plant roots live in the top 12" of soil. Grass lawns prefer 12-18" of moisture. Most grasses start looking stressed at less than 8" and show browning at 6". A Tall Fescue lawn goes totally dormant at less than 4". Brown patches on lawns in summer are commonly due to lack of moisture, resulting from not watering frequently enough usually accompanied by applying water faster than it could be absorbed. Dormant (brown) lawns are not necessarily dead. Research shows that all grasses commonly used as a lawn can be dry and dormant for at least a 3 month period, and recover fully when moisture is restored. This capability can make grass lawns valuable where drought is eminent, since they can be left all summer without irrigation.

In agriculture the goal is a consistently moist soil. With many types of fruiting plants a wildly fluctuating moisture level results in small fruit or cracked fruit. There is a vineyard in California's Central Valley that irrigates with an underground

drip system up to 18 times per day, each hour that the temperature is above 80 degrees F. Sensors and computers establish how much water is used during the previous hour. They saved about 30% on water without any loss of crop. Most modern orchards water daily during hot weather. A current theory of orchard irrigation is to "top off the tank" rather than allow the soil to run dry.

As plants increase in size the amount of water they use increases. A full size Citrus in the middle of summer will commonly use 50 gallons of water per day, mature shade trees can use 100 gallons of water per day. Apparently, with actively growing or fruit producing plants there is little net loss of water when plants are irrigated midday compared to mid-night. A lawn evaporates water (transpires) faster than a pool of water covering the same area. Watering a plant at mid-day will cool it tremendously and significantly lower the transpiration rate for a short period. Water evaporating off the ground near plants also lowers their transpiration rate.

Leaves and flowers that stay wet for long periods (3 hours or more) can get diseased (leaf spot, foliage blight, rust). If you have a choice it is best have the sprinklers go on when the foliage will dry quickly. During hot weather this can be any time day or night. During mild weather the watering should be done between mid morning and noon.

Plants react in different ways to dryness. With most plants the leaves will lose turgidity and wilt with the foliage color appearing less green and/or glossy. Some plants will fold or roll their leaves. If kept dry over an extended period the leaves tend to develop dead, dry tissue either at the leaf tip or between the veins. Dryness is usually expressed over the entire plant evenly, although areas most exposed to heat usually show the strongest symptoms. If dry foliage is only seen on a few isolated branches the problem is usually due to disease.