

# Irrigation Practices

Plants need average to ample water to perform. Many plants are drought tolerant and/or drought resistant. Even these, however, prefer average to ample water to perform the following:

1. Germinate from seed.
2. Get established following transplant.
3. Grow.
4. Bloom, and or set fruit.
5. Produce viable seed or good quality fruit.

There are certain plants that can thrive with less than average water but the majority of plants will, at minimum, stop growing. Many drought tolerant plants in Nature will only grow, flower and reproduce following a significant rain event or an unusually wet season.

In an established garden that is 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.

You cannot train roots to grow deep. Roots will grow as deep as they can breathe. A UC Davis study of root depth in an Almond orchard subjected to deep, infrequent irrigation compared to light, frequent irrigation gave (at least to the researchers) unexpected results. Daily, light irrigations resulted in a deeper root system.

In general the soils in Orange County absorb water at the rate of  $\frac{1}{4}$ " to  $\frac{1}{8}$ " per hour. If using sprinklers the longest times each zone should be on to avoid runoff and/or uneven absorption is only 4-5 minutes, less if watering a steep slope. Each zone can be watered more than once per day (at least 1 hour apart) as required.

There are areas in Southern California where the coarse soils can absorb water at a tremendous rate. Many of these 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. I am not yet convinced that plants would rather have their weekly rationing of water applied all at one time rather than small portions throughout the week.

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.

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 rebar 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 rebar 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 require 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 the temperature is above 80°F. Sensors and computers would establish how much water is used during the last hour. They were able to save 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.

With all plants the amount of water they use increases with size. 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 producing plants there is little net loss of water when plants are irrigated mid-day 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.