

Irrigation Protocol



“A drop of water, if it could write out its own history, would explain the universe to us.” – Lucy Larcom

Water is the vehicle that carries dissolved nutrients and minerals into all living plants. Without water every plant will wither and die, too much and the same will result. Soil disturbance either from commercial farming or domestic manipulation changes how water flows into and out of the soil. Some of the most disturbed soils can be found in our own landscapes. How much water is required to keep our plants healthy and growing at their best will be different from property to property and sometimes even within the same property. All healthy soils have some capacity to hold water from being totally dry to supersaturated. As with most things we want to avoid the extremes. Most plants do best when the soil is moist and well drained, but what does this mean? Irrigation, in this context, is the artificial application of water to the soil. We want to irrigate so as to moisten the soil to a depth of six inches or more and then have moisture slowly used, drained, or evaporated over a period of five to ten days. Our objective here will be to determine how often and how long to irrigate so that we hit this magical target. The protocol that follows will answer this question.

The Experiment

1. Within the zone to be tested set out four to ten containers, evenly distributed throughout, to collect the applied water. The containers should have an opening at the top the same diameter as the container's bottom. A good example would be a cake pan or any can with the same diameter top to bottom.
2. Start a stopwatch and begin irrigation at the same time turning the water off at 30 minutes.
3. Pick up the containers and place them on a flat surface without spilling any of their contents. Then measure and record the depth of water in each container. Note, if water begins to run off your area before you have reached 30 minutes stop irrigating and record the amount of time elapsed before run-off began. Check below for tips to prevent run off.
4. Find for the average depth of water collected. For example, if five containers were used you might find the average as follows. $.25'' + .55'' + .3'' + 1'' + .5'' / 5(\text{number of containers}) = .52''$ or about a half inch.
5. Use a shovel or soil probe to check the moisture depth and record your findings. It can be helpful to sample in several areas and average your findings again.
6. Our goal is to wet the soil to a depth of 6". Using your findings calculate how long to irrigate to meet this goal depth. If you attained more than 6" in 30 minutes without runoff rerun the experiment using a 20 minute application.



Frequency

Now that we have determined the duration to irrigate our zones the next question should be how frequently to irrigate. Of course, frequency varies depending on humidity, temperature, and wind. So there is no set amount of fixed time. Instead look for clues in the landscape, it will tell you when to water we have but to listen. Turf is a great indicator species. Walk across the grass and look for your footprints, do they stay for several minutes or disappear in a few seconds? If your footprints persist for a while, it is probably time to irrigate again. Another area to look is with your non-woody plants, if they are beginning to wilt then it's that time again. Warning! The symptoms of not enough water can look just like too much water. For the first couple times use your shovel again to check for moisture, if it goes in easily then you have too much water but if it is difficult to insert then it is likely dry. The frequency is likely to fall between five and ten days but could be more or less.

What to do if you have runoff

1. Monitor the irrigation zones and check to see if water is running off site. If it is this means you are applying water too fast to be absorbed. Note how long the irrigation period was when runoff began.
2. In areas where the runoff occurred stop irrigating at the previously measured amount of time.
3. Allow the site to dry for 30 minutes to an hour.
4. Continue irrigation for the remaining amount of time calculated in the previous experiment to wet the soil six inches deep. It is better to get all the watering done in a single day than to spread it over several days.