



General Guide to How Much and How Often to Water California Native and Waterwise Plants in Southern California

Note: This is a draft document, and we want to be sure it is clear. Let us know what you think at design@cbwcd.org

How To Apply 1" of Water and Why is that Important?

What is 1" of water? This refers to a volume of water being applied to an area of landscape equal to 1" of rain falling on that area. It is just like 1" of solid water was somehow suspended in the air over that area, then allowed to trickle down into the soil. When 1" of water is applied, it will wet the soil much further down than 1".

How do I know *how long* to water to apply 1" of water?

If you connect a hose to a single sprinkler that covers a large area: Lay out a number of empty pint-size wide mouth mason jars or cat food / tuna cans and keep an eye on the water accumulating in them. These are like inexpensive rain gauges for your sprinkler. When there is about 1" (or whatever amount of water you are going for) in each of the jars/cans, you can stop watering. You may want to place a number of jars/cans out each time you water for adjustable (fan-type) sprinklers because each little adjustment can change the rate the water hits an area. Since the water is not applied perfectly evenly, having a number of jars/cans (3 or more) out each time helps you take into account that some areas may need a bit longer to receive 1" of water.

If you have permanent sprinklers: you can lay out a number of pint-sized wide mouth mason jars or cat food / tuna cans and time how long it takes for 1" of water to accumulate in the jars. The timing may be different for each can depending on the evenness of your sprinkler(s), so do your best to figure out the average. For in-ground sprinkler systems, if you want to be as accurate as possible, you can follow the step-by-step "precipitation rate" test at inlandvalleygardenplanner.org/howlongtewater .

If you have a drip irrigation system: It is a little bit harder to test, but it is still very do-able.

- **If you installed a “drip grid” system** (where you have parallel lines of drip tube with emitters that come already inside the tube, and each line is the same distance apart over the entire planting area): The drip tube package will have a “precipitation rate” chart which shows how many inches are applied per hour. For example, the most common drip setup we recommend for most soil types is for drip lines that emit 0.9 gallons-per-hour from each emitter, with emitters every 12” apart down each line. We recommend placing each line of the drip 18” apart over the entire planting area (not just around the base of each plant!). With that layout, planting areas will receive almost exactly 1” per hour of being run.
- **If your drip line set up is less consistent**, but you are still using drip tube where the emitters come regularly spaced inside the line, we recommend using the step-by-step test for drip at inlandvalleygardenplanner.org/howlongtowater
- **If your drip system has just one, two, or a few “button” or “point source” emitters per plant:** First, please know that this is not a good system to support the long-term health of most waterwise plants. Cacti and succulents may do okay, but this is not a good system for California native or Mediterranean plants because it keeps the water concentrated at the sensitive “root crown” of the plant where the main stem or trunk meets the ground. These systems usually do not water near the edge of the shrub or tree canopy where the roots can most efficiently gather moisture. That being said, the only way to figure out how much water, in gallons, a plant should receive for equivalent of 1” of water is to know how many gallons per hour each plant in the landscape will receive with the number and flow rate of emitters you have installed at each plant. Then you can use the chart on the last page of this document to determine how long to run the system to apply that much water. Again, realize that applying all that water directly all at the base of the stem or trunk of an established waterwise or native plant will likely cause plant health issues sooner or later.

If you connect a hose to a bubbler or just leave a trickle on individual plants:

Use the “gallons to apply 1” of water” chart at the end of this document and be sure to find some way to know how many gallons of water you are applying. We recommend using a hose-attached digital flow meter, easy to order online. It can be very hard to estimate how much water you are applying without some way of measuring, and many people apply much more water than they intend to when

watering by this method, which is otherwise a time-consuming, but inexpensive and plenty efficient way to irrigate. The meter lets you know when to move your hose. A “hose bubbler” is an inexpensive attachment that can help distribute the water coming out of a hose left to trickle to a wider area, which is a good thing. It is best to not just leave the hose in one place when watering shrubs or trees, but to move it to a number of locations near the edge of the shrub or tree’s branches / canopy until the gallons of water you are planning to apply is reached.

How often to apply water?

During establishment, especially immediately after planting, it is important to water both the existing root ball, and the soil a bit further out, to train your roots to spread wide and eventually have access to moisture in a wide area of soil. This may require a bit more water than stated on the chart below, up to 5 gallons or so for young shrubs when you water them.

Every site is different, but in general, most waterwise plants will thrive in our area on the following irrigation schedule:

When you plant: water, water, water! It is hard to water too much immediately after planting! You want to ensure that the root ball and the soil all around is saturated down to at least 1.5'. This may require building a soil “watering ring” and will require applying water to each plant multiple times with a hose. Anticipate filling watering rings at least three times immediately after planting.

Establishment period (appx. one year, possibly longer): In general, during the warm season, expect to water plants once per week-ish during establishment. When you water, apply about 1” of water to the landscape area. Some plantings do well with less, so if things seem to stay too wet, you can experiment. With providing less water or watering less often. You will likely need to provide an absolute minimum of 0.5” of water every week or so during establishment. If it rains sufficiently, you can skip watering. In the weeks following planting, check both the surrounding soil AND the nursery soil root ball of the plant. If the root ball seems dry, you may need to water even if the surrounding soil still has moisture because the roots may not have grown out into that soil yet.

Check the soil before watering again and dig down a couple inches or so. If there is still significant moisture within the top two inches, and the root ball does not seem dry, you can wait a bit longer before watering. Depending on the weather in the fall

and spring, if plants have already started to root into the soil around them (which you can normally determine by the presence of some significant branch or stem growth), you might not need to water quite as often as every 7 days, potentially going 10-14 days in between waterings if the plants and soil look good.

After establishment: While every landscape is different, below is what we find to be a generally reliable starting point for the irrigation of established waterwise or California native plants in our area. However, since every garden and site is a bit different, always rely on your own observations and adjust as necessary:

- **For California native plants:** Many California native plants from dry areas can survive in local gardens with no supplemental water after the establishment period, but they may go dormant in a way that does not look good to many people. To keep plants looking nicer and to reduce flammability for those in fire danger areas, most waterwise California native plants will thrive with a deep soak of approximately 1" of water applied every approximately 3-4 weeks during the months when it does not rain at least 1". Watering much more often than that can be bad for the health of many native plants. For more information about watering needs and tolerances of individual native plants, see their profiles at inlandvalleygardenplanner.org or calscape.org.

A few common native plants, particularly small perennials such as Margarita BOP Penstemon, Red Buckwheat, Yarrow, Hummingbird Sage, etc. when grown in full sun will usually survive watering at this frequency but may look "better" in the warm months with some supplemental watering with a hose connected watering wand or hose-attached bubbler in between the full irrigation events that water the entire garden area. Some gardeners will prefer the natural semi-dormant look and water savings achieved by not providing this extra water, while some gardeners will prefer the lush look of providing the extra irrigation to the perennials in between main waterings. The choice is yours!

If it rains more than an inch, you can generally wait another month before watering again. If it has been a very dry winter, consider an extra deeper watering or two in the early spring to help recharge the soil before the warm season. Depending on your exact situation and soil you may benefit from watering a bit more or less than 1" or a bit more or less often, but 1" every four weeks is a good starting point for established plantings,

switching to every three weeks if things seem to dry out too much. Depending on soils, sun exposure, etc, certain sites may perform better with up to 1.5" of water applied during watering events. Extremely rocky soils may benefit from watering a bit more often, but even the most gravelly of sites probably will not need watering more than every two weeks. Sites with heavy clay soils may be able to go longer than four weeks after a deep soak. It is important to let the soil dry down significantly in between waterings in warm weather.

You also never want to have to water during the middle of a heat wave because hot and wet soil is not good for native plants. To avoid needing to do so, if you expect you will need to water and a heat wave is coming, be sure to water a couple days ahead of the heat wave so the top inches of soil, which get the warmest, can dry down a bit before the high temperatures.

- **For Mediterranean climate or general waterwise plants:** Most of what is written above in the section for California native plants applies, but general waterwise or Mediterranean plants thrive often do their best in gardens being watered a little more often than many California native plants. Established Mediterranean or general waterwise plants often look best with 1" of water applied every 2 weeks, possibly every 3 weeks depending on selected plants and soils.

Approximate number of gallons to apply 1" of water to different plant sizes:

width of plant in feet (diameter)	Gallons to apply 1" of water
2	2
3	5
4	8
5	13
6	18
7	24
8	32
9	40
10	50
11	60
12	71
13	83
14	96
15	111
16	126
17	142
18	159
19	177
20	196
25	306
30	441
35	600
40	783

This chart can be used when using a trickling hose (with some sort of water meter) or drip systems that apply water to individual plants instead of a whole planting zone (again, those types of drip systems are not recommended, but are what some people already have and might not be able to be replaced immediately).