

Watering

Gardening requires lots of water, most of it in the form of perspiration.

~ Cecil Roberts

Water is the most basic plant growth requirement.

Plants use a lot of it! It comes in through the roots and exits the plant through small openings in the leaves. A plant is like a big vacuum, continually sucking water from the ground and depositing it into the atmosphere. When water is limited, the plant responds by growing less and producing less. Without enough water, garden plants will ultimately die.

Know your soil type.

Soil type has a big impact on how water moves and how much is available for uptake by the plant roots. In a sandy soil, water moves quickly and vertically. In a loam soil, it moves at a moderate speed and flows both downwards and sideways. And in a clay soil, water moves very slowly and as far horizontally as vertically and may take a long time to penetrate deeply.

Water thoroughly and deeply.

When you irrigate, make sure water soaks the soil well below the surface into the zone where the roots are growing. Depending upon the plant type and growth stage, this may be either a few inches or several feet down. Deep, thorough irrigation encourages roots to grow even deeper, increasing their ability to mine water and nutrients and anchor themselves firmly.

Once plants are past the seedling stage, water more thoroughly and less often, rather than more frequently and less thoroughly.

How do you know if your plants need more water?

Visually checking on them is the first step. If you see the leaves looking **dull** or less vibrant, that can be the first sign that plants need more water. **Wilting** indicates that water is seriously limited. These could also be symptoms of damage caused by a pest or disease, so you should also check the soil moisture. How it appears on the surface is no indication of what is available to the roots, so use a trowel or soil core to get below the surface where the roots are.

The squeeze test can also help you determine whether the soil needs water. Dig down a few inches and grab a handful of soil. You need to water when

- sandy soil won't retain its shape when squeezed into a ball
- loamy soil looks dry and won't form a loose ball under pressure
- clay soil won't form a ball unless squeezed.

Three general methods of irrigation

When you choose an irrigation method, remember to consider the growth stage of your plant, your soil type, and the resources (supplies, water source, funding, people) you have available.

1. Sprinkler or Overhead

This refers to any method that deposits a spray or mist to the plant and soil surface. You can achieve this with a watering can, a fan sprayer attached to a hose, an oscillator (lawn sprinkler) or various other sprinkler or mister systems. This method can be fun and satisfying for the young gardener. It's also great for seed beds or small transplants with shallow roots. However, in California's dry climate, this is generally not the best method for a thorough, regular, irrigation on mature plants. Also, when using any sprinkler system, be aware that water may be falling in paths or other non-crop areas and causing weeds.

2. Furrow or Flood

This is any method where water is applied in large quantities and slowly soaks into the soil. This is a workhorse for much of California's large-scale crop irrigation where you can see water moving down long furrows across huge fields. This method can be used to good effect in a garden setting as well to provide deep thorough irrigation. It generally requires moving soil to build dirt berms (walls) to create a basin or contained area that holds the water until it soaks into the soil. Water typically comes from the end of a garden hose. This method requires very little in the way of material resources, but a goodly amount of people and kid power to set up and manage, and is more effective in silt or clay soils rather than sandy soils.

Flood or furrow irrigation can provide a great project for upper elementary and middle school kids to give them a chance to work with soil and water flow. It's also a great way to study ancient civilizations, as most early agriculturalists relied on some version of flood or furrow irrigation.

3. Drip

This refers to systems that slowly drip water onto the soil surface at roughly the same rate as it soaks into the ground. This is the method with the potential to effectively provide the majority of water needs in garden settings. It is efficient and allows for thorough irrigations. Systems are easily designed to keep water out of non-crop areas prevent future weed problems.

The challenge of drip is that it generally requires more knowledge, confidence and supplies to set up initially than the other two methods. The simplest drip system is a "leaky" or soaker hose run through a planted area, attached to a garden hose. A more complex system waters several beds and can include drip-line, filters, pressure regulators and system timers.

Tips for watering with kids

Watering is a garden activity that many students enjoy. Before sending them out with a watering can or hose, make sure they understand a few watering basics:

- It's best for the plants if students make many passes with a gentle spray of water, rather than flood an area.
- Teach them to check that they have watered to the level of the roots rather than just the surface.
- If you have a large garden, it is not suggested to rely on watering cans as your primary means of irrigation.

Additional Resources

- More tips on watering, including a chart with the rooting depth of various crops. <http://zzyx.ucsc.edu/casfs/publications/gardenideas/watersave.html>
- Saving Water Partnership. Free downloads on watering and soaker hoses and drip systems. <http://www.savingwater.org>
- Be Water Wise. Guide created by Southern California water agencies. A great collection of watering resources with online tutorials. <http://www.bewaterwise.com>
- Contact your local municipality district to inquire about irrigation resources/support.
- DripWorks. <http://www.dripworksusa.com> offers free drip irrigation design service and 15% discount on all purchases for school gardens.
- *Gardens for Learning*, 69 – 75