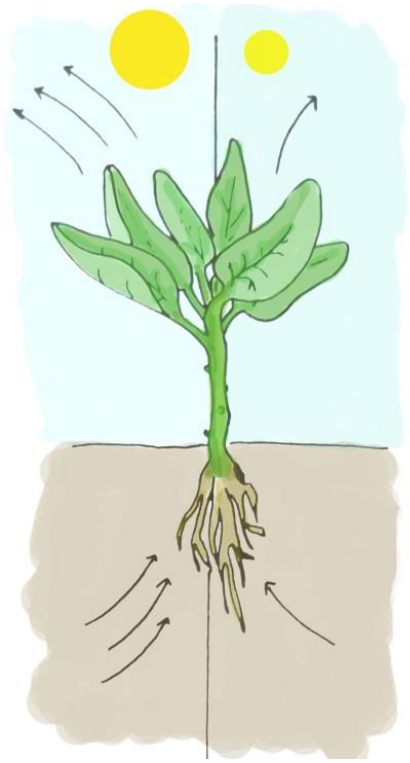
The DIRT Society

The Basics of Garden Water Supply

In an ideal world, all gardeners and farmers would have access to adequately draining soil, enough wildlife to prevent major runoff, a healthy water table below our plots, and clean, conserved water to replenish any areas that may dry out. In reality, soils vary greatly, ecosystems have been thrown off-kilter, natural clean water supplies are in decline, and very few modern-day consumers are informed about water conservation practices. This is why we must work to create watering regimens tailored to each garden; systems that match the needs of the plants with the character of their keepers.

Before you can build a regimen that's right for you and your crops, you must understand how plants utilize water, when it is needed, how best to apply it and what simple practices can conserve water the most effectively.

Plants use water in many ways. Water is required to facilitate photosynthesis; without which plants could not produce carbohydrates or oxygen. It is also necessary to move nutrients around the internal structure and cool the entire plant body via transpiration.



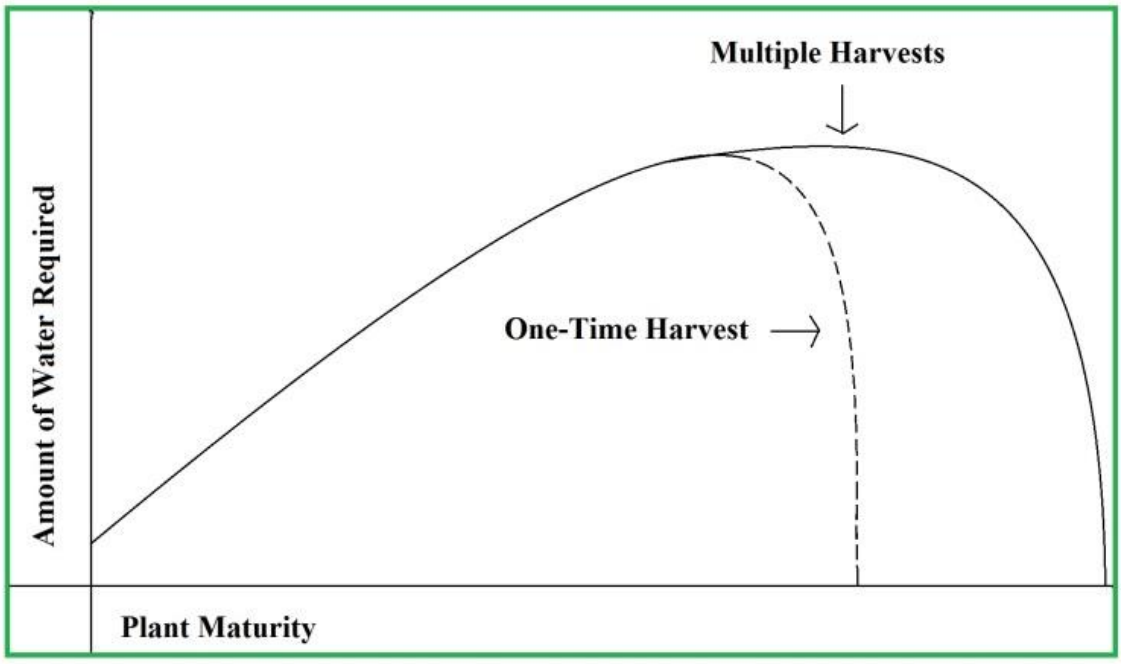
A plant will pull water up through its roots because it is losing water through its leaves. This creates a siphon; the external environment moves water from the plant's surface, causing a pull that reaches its root system and the water below.

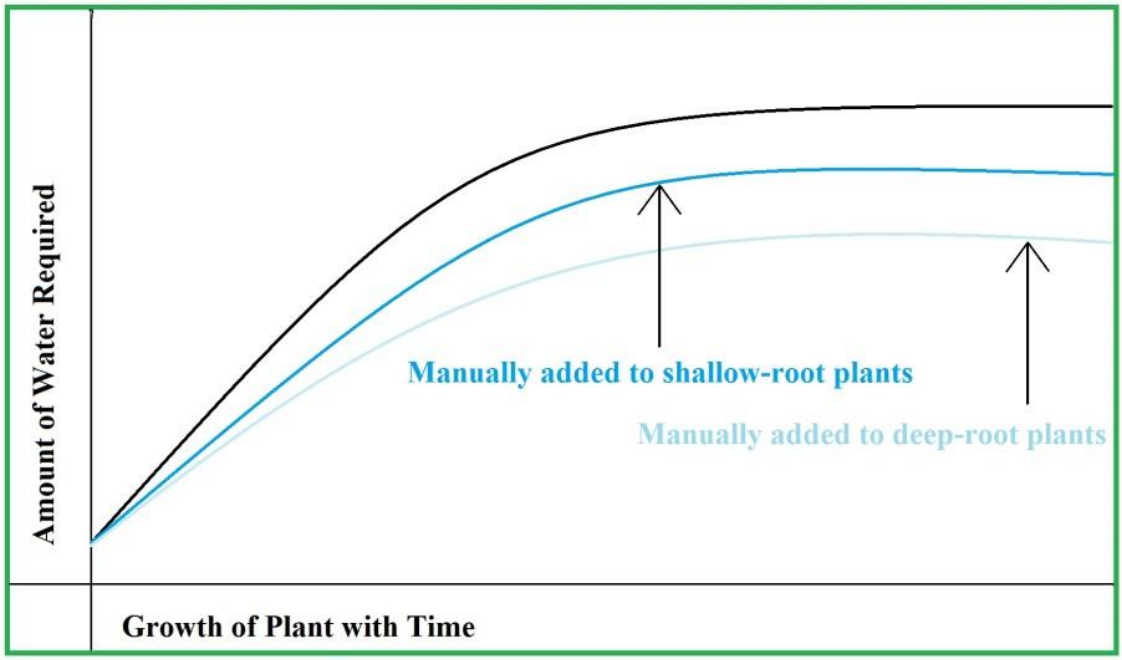
But how does the environment remove water from a plant? Part of the process is voluntary loss of moisture. Similar to sweating, a plant will cool itself by sacrificing some water and allowing it to accumulate on the surface of leaves and stems. The sun, heat, dry air or wind will then remove this moisture; effectively continuing the cycle of water uptake and release. This means that certain environments will remove more water than others. A crop grown in a dry, hot climate will need more water to function than a crop grown in a humid, cool climate.

Note: The plant regulates this process somewhat. Leaves may fold or turn when temperatures rise, reducing the surface area exposed.

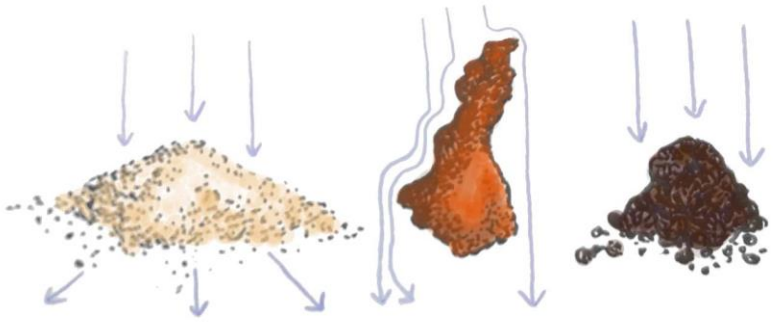
Crops vary as much as climates do, so there is no single rule that encompasses all water requirements for farms and gardens. In the US, a common practice is to ensure that your garden has received 1" of water every week. Cylindrical rain gauges will measure the amount of precipitation, but different gauges must be installed on hoses or irrigation systems to show manually applied water. All of this helps to understand the approximate amount of water distributed, but it is not an effective or comprehensive system. At best, it is merely a starting point from which gardeners can develop their own methods. The best way to gauge the needs of your farm or garden is to understand the crops and soil.

Plants with a greater surface area of exposed leaves tend to require more water. (A mature squash vine will need more water than a young carrot.) However, established plants will have deeper roots that can supply a more steady supply of water as needed. Seedlings, transplants, and some smaller crops will have shallow roots, and require a more frequent application of water on the soil's surface. As you water, keep in mind your crops' sizes and development.





Soil is another great indicator of water availability. The properly moistened soil will be neither wet nor dry; it will be spongy. This consistency is maintained by careful water application on healthy soil. To check and see if you have reached this desired texture, squeeze a bit of soil in your hand between waterings. It should hold its shape at first, but fall apart when agitated.



The "spongy" consistency is important, as it will ensure a proper distribution of water among the plants' roots. If the soil is wet, mold and disease could easily spread. If the soil is dry, water will cut straight through the ground to the water table below.

There are many efficient and simple ways to water your farm or garden. Each has its drawbacks and benefits, so it is best to determine which suits your lifestyle and plot.

The watering can: This simple hand-held tool must be refilled and carried to the garden. It is inexpensive, and easy to fashion out of recycled materials. It is best used in small gardens or containers. Because it will come in contact with plants as it is used, be sure to keep it clean to prevent the spread of disease, mold and fungus. The best watering cans will not pour or soak the plants, but apply water gently.

The garden hose: This is another option for gardeners or urban farmers tending a smaller space. To best utilize the hose, consider a nozzle with gentle spray settings to distribute water evenly across the soil. Keep the watering end clean to prevent the spread of disease, mold and fungus. Be sure that your hose doesn't drag across plants as you move, or pool water when not in use.

Irrigation: This is an ancient practice that made use of channels and pathways to redirect water to where it was needed. Over time, irrigation has been modernized, perfected and, in some places, abused. Irrigation can be adapted to fit any garden or farm, but requires some planning, construction and experimentation. You can design your own system out of household hoses and fixtures, buy customizable kits, or pay to have irrigation installed. This system can be as simple as diverting rain water into excavated dirt channels, or as complicated as a digitally timed and automated underground network of tubing.

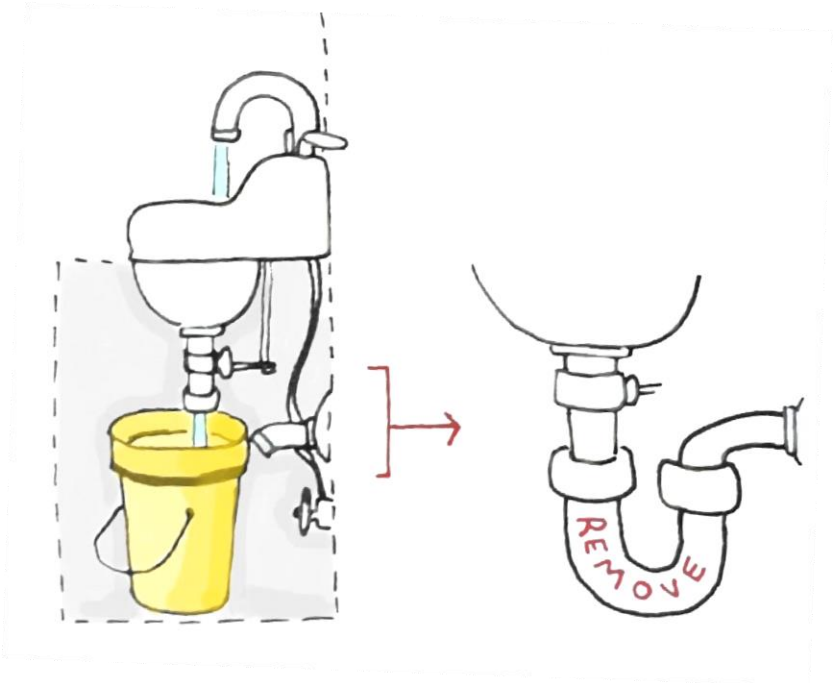
The self-watering container: There are many designs for containers that will feed water to your plants' roots as the soil moisture level drops. The gardener need only pour water into a holding chamber every week or so, and periodically check to be sure that the system is working effectively. These containers can be purchased or made out of recycled materials. This method is best suited to urban gardens, porch gardens or balcony gardens. Large operations are better formed into beds, rows and plots.

In today's environmental and political climate, fresh water is priceless. Too often, it is grossly overused and under-appreciated by those developed societies who live on top of a quickly-declining water table. It will take continued experimentation, creativity and development to restore our lost water resources below-ground, but a single gardener can make a huge impact by simply improving the way they work.

One of the most critical losses of water in developed areas is preventable; the wasted rain that is funneled into drains and moved across concrete. As underground water levels deplete, and as natural watersheds become polluted with urban run-off, more and more consumers should be taking the time to redirect water where it is needed. That is to say: **Catch the water before it goes into a drain, and put it on the parched soil instead.**

To capture this otherwise wasted water, consider assembling a simple rain barrel and positioning it over a concrete drive or walkway. Another common practice is rerouting the water that runs through gutters along the roof by attaching a vessel to your downspout. Collected water can then be used; either by attaching a hose to your barrel or by manually filling a watering can. By doing this, you've conserved water and prevented the spread of chemicals and minerals that wash off of pavement.

Another enormous waste of water occurs indoors. Water used to bathe and wash laundry can be used in gardens with very simple technology. A gray-water system can be installed, which will effectively collect the otherwise wasted water from your washing machine, shower and bathroom sink. This water is then stored in a chamber and ready to use in the garden. The only lifestyle change required is a switch to gentler soaps and detergents.



If you'd like to conserve water immediately, or lack the freedom to install or manipulate utilities at your residence, there are still ways to utilize the wasted water in your home. By detaching a piece of pipe below your bathroom sink, you can capture lost water in a bucket before allowing it to mix with household sewage. This can be used in the garden, and the pipe can be reattached in seconds. A bucket could also be kept within reach of the shower, allowing you to catch the water otherwise wasted as you warm it up before getting in.

Finally, as a gardener or farmer, it is important not to waste water as you supply it to your garden. Too much moisture will prevent the roots from growing downward and could create an environment for disease, mold and fungus to flourish. Furthermore, roots and soil need air. If the soil becomes water-logged, it could compress, and valuable networks of aeration could be lost. Some crops are even spoiled by over-watering; tomatoes are rumored to taste better if grown slightly dry. **Know how much water is needed, and try not to encourage speedier growth or greater fruit production at the cost of root health and environmental preservation.**

To prevent water loss by evaporation, consider applying an organic mulch after watering your soil. Mulches come in many shapes and sizes, but all of them trap water before it is lost in warm, circulating air.

The more familiar you are with your crops, soil and climate, the better equipped you are to provide adequate moisture with minimal waste. As you develop an understanding of plants and your garden, watering will become a simple, routine task in all but the most extreme conditions.