

Chapter Three

Water You Doing?

I'm a California girl, and proud of it. Blessed as we are with our mostly Mediterranean-like climate and fertile soils, we are the nation's largest agricultural state, to the tune of over \$31B in products each year. We grow more than half of the nation's fruits, vegetables and nuts from less than four percent of the nation's farmland.¹²

But what California doesn't have in abundance is water. Now take out your pencils, it's time for a quiz. Recall the simplified photosynthetic reaction from the last chapter. How many molecules of water are required to produce each molecule of glucose? Anyone? Anyone?

The answer is six. So, is water important to growing food? (If you said "no," you flunked.)

You can see just how important water is to California agriculture by driving down Interstate 5 in the Central Valley region. Wending alongside as you travel past the many fruit and nut trees, grape vines, sheep, cows and field crops is a thin, concrete-lined ribbon of water. That's the California Aqueduct. Think of it as a giant straw, sucking fluid from the delta region in the northern part of the state outside of

¹² California, the Land of Fruits and Nuts! This state also produces 31% of the nation's dairy.

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Sacramento and drawing it all the way down to the Los Angeles basin, 444 miles south of there. Along the way, farms take what they need to make the deserts bloom.

To say that Californians are obsessed with water isn't quite right. "Obsessed" is just too mild a word. Here's how the pre-wedding scene in *Monte Python and the Holy Grail* between Herbert and his father would have played out if we'd made that movie:

Herbert: "But I don't like her!"

Father: "You don't like her? What's wrong with her? She's beautiful, she's rich, she's got ripe...*riparian rights*..."¹³

Ours is a constant tug of war to divide our water between the farms, the fish in the Delta Region and the burgeoning population of over 30 million people, and we're always short somewhere. That's why you'll sometimes see signs in public restrooms asking you not to flush unless you have a, um, solid reason.

I bring up all this about my home state for a couple of reasons. First, mine is not the only area where water is a precious commodity. Vast swaths of the Mid- and Southwest experience periodic severe drought as well, and in the rest of the world, literally billions of people are affected by water scarcity. I am fairly certain that wherever you are, conservation should play some part in your vegetable garden thinking.

Water is, not surprisingly, getting increasingly expensive. Home gardeners may start to wonder if they're really saving money on their grocery bill if their water bill gets much higher.

At the same time, water is not at all something your plants can skimp on without you losing a great deal of potential food. I can't stress this enough. All the fertilizer and sunlight in the world cannot make up for the lack of water. Here are some ways to water effectively and efficiently.

Water at the roots. There is no gain by spraying the leaves,¹⁴ which will either encourage molds and other blight, or evaporate away. Letting water run down the pathways and everywhere else

¹³ At the risk of making the joke not funny anymore, but understood, the term "riparian rights" refers to the system by which water source is legally allocated among nearby landowners.

¹⁴ Some gardeners do swear by foliar sprays, which are dilutions of fertilizers sprayed directly on the plants to be taken up by the leaves. I can't usually be bothered to do this, but I will mention a couple of them throughout this book if you'd like to give them a try.

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only benefits the weeds.

Water deeply, but less often. The idea here is that you want to encourage your plants to grow deep roots, where they will find more water for a longer period of time. To accomplish this, water until the moisture reaches a foot or so in depth. Check the soil again after three or four days. So long as the soil is moist several inches down, you're fine. Once the soil is almost dry at the same depth, you should water again.

Water consistently. Plants don't do well drowning one day and wilting the next. But far be it for me to suggest that you need to check constantly for water needs. Once you establish about how soon the soil will lose its moisture, establish a schedule and stick to it.

Mulch. Mulch is simply a cover of some sort over the dirt in your garden, the purpose of which is to block the dirt from the sun as much as possible. Mulch slows water evaporation from the soil. There are a number of different kinds of mulches, which is why it gets longer treatment later. But for now, consider it as a vehicle for water savings.

Consider installing a "drip system." Also known as "watering systems," these are basically multiple small hose lines that very precisely dedicate a prescribed amount of water exactly where you want it, and nowhere else. There are pros and cons to using them, but if cost and time are considerations, the balance is mostly positive. They deserve more explanation than the space here; see below for more detail.

Use your water twice. Shampoos and soaps are not usually harmful to plants; in fact, most shampoos contain phosphates, which are good fertilizers. This means that the water from your shower (and washing machine) is ideal for use in your garden, if you can figure out a convenient way to get it there. Do not reuse water from your toilet; though your plants would be happy, the bacteria are a health hazard to you.

Get water for free. Run a search on the Internet and read about all kinds of clever water catch-and-storage systems for rain. I was particularly intrigued by the story of a plumber who kept a line of old water heaters along one side of his house. He then rerouted his gutters to fill them up when it rained. In the dry season, he could draw from them. He even painted the water heaters to match the house so the system wasn't too obtrusive.

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Stop leaks right away. That toilet that keeps running, the faucet that drips, and the leaky hose are all wasting an amazing amount of water, which translates to money down the drain. (Those of you with free, abundant well water can stop snickering now.)

Save household usage for the garden. Develop good, efficient water savings habits at home so you can devote more water for growing food. All the usual reminders are in play: Don't leave the water on when you brush your teeth. Save the water that you use when you're waiting for it to get hot. Take shorter showers. And so forth. And so on. You know all this. Now do it.

Even if you pay high rates for your water usage, you can save money growing your own food if you're careful. Certainly, some vegetables are more cost effective with the water issue versus others. Tomatoes, for instance, require only moderate amounts of water once they are established, and they cost so much at the store that it is very worthwhile to grow them. Carrots are less so, but even calculating for my high rates, I come out ahead. Water will be one of the more expensive inputs to your garden, so adopt as many conservation habits as early on in the process as possible.

As mentioned earlier in the chapter, the ultimate in water conservation for the garden has got to be a drip system. They are fast becoming the popular thing around here, even for shrubs. The advantages to these are legion:

There's that water thing again. You save a lot of water by bringing it directly to the specific places you want it, and nowhere else. If you take out plants and don't replant right away, then you can turn off the water to that particular area without affecting the other areas.

You can quantify exactly how much water you're using. Say your emitter allows 8 gallons of water per hour, and you water four beet plants per emitter for 20 minutes every three days until they mature at 45 days. If you pay \$.004 per gallon of water, how much does each beet cost you to grow?¹⁵ Now share your belabored calculations at the next dinner party you attend. Or not.

It promotes even watering, and metered watering for specific needs. Suppose you plant sunflowers, which need practically no water, next to peppers, which drink like fish. Put a very restrictive

¹⁵ Four cents. Now say the beets leave on a train to Chicago, going west at 55 miles per hour...

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emitter at the base of the drought-tolerant plant, and a large-capacity one at the base of the peppers. Now when you water, the right amount of water goes to each plant at the same time.

It saves time, too. Yes, really. If you set it up just where you need it every time you plant, then to water your garden, all you have to do is to turn it on. Walk away; do something else, and when you've watered enough, turn it off again. This sure beats standing around with a hose. Also, with some vine-like plants, it's hard to remember exactly where the roots are, so you end up having to water the whole area. With a static hose placed at the base, this is a non-issue.

It's reusable. These things are pretty sturdy. So far most of mine is still working after three years of use. When you're done with one crop, you can just move the hoses and emitters to another.

These things do have their disadvantages, too:

They cost money. I just did a quickie search and found a kit purporting to provide enough coverage for 220 square feet. It costs about \$50, including tax and delivery. So the question is, how much water would I have to save in order to make this worth my while? Well, I pay \$.004 per gallon, so the answer is 12,500 gallons. Hmm. That seems like a lot and therefore if the economic argument is the only one of interest to me, this may not be worth it.

However, more math helps here. The claim is that with a "properly installed" drip system, you'll save upwards of 55% of your water. Okay, then. I'll assume I could grow 220 plants, one for each square foot, and keep the plot in constant cultivation for nine months out of the year.¹⁶ I'll further assume that I'd water through 8 gallons-per-hour emitters for 20 minutes, every three days, over those 270 days, for a total of 90 gallons per square foot. 90 gallons times 220 square feet equals 19,800 gallons. If, as the "experts" claim, I'd waste that much over again without a drip system, then the \$50 investment will save me almost \$80 in water in just the first year. Furthermore, in my experience, I only need to replace about \$5 in original equipment each year, so I come out way ahead.

Buyer beware! If you shop on-line or in a hardware store, it's easy to get taken in by all the gadgets and doodads available for these systems, and before you know it, you've blown your whole food budget. Keep the basics in mind. You want something to attach

¹⁶ I'm in Zone 9, so that's not off-base.

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to your faucet or hose that will split the water into several smaller sources. You want tubing. And you want whatever will get the water out of that tubing the best way for the plants you will grow.¹⁷ Not everyone needs pressure regulators, backflow preventers, sensors and other spiffy stuff. Start small. You can always grow from there.

They take time to set up. Whole books are written on how to plot, plan, diagram and research your watering system. I avoided doing it for a couple of years, put off by the perceived complexity alone. Then, in a moment of clarity, I grabbed one end of a three-quarter inch hose, screwed on a hub with eight separate one-quarter-inch outlets, pushed one-quarter inch tubing onto each one, and I was good to go.

I then moved the tubes to the plants, and wherever I encountered one, I cut the tube, reattached the ends on either side of an emitter and there was my water source for that plant. Rocket science this is not, but to read some books or to look at all the equipment choices, you'd think it is. Still, initially making all those cuts and attaching all those emitters is a pain. The good news is that when you set it up next year, you can just put your plants where the emitters are, not the other way around.

They can, and probably will, leak. With my high water pressure, I sometimes get one of the tubes popping off of the hub. Also, at the juncture of the hub and hose or faucet, I'll sometimes get leakage. Buy a fresh roll of plumber's tape each year.

They break. Most parts are pretty sturdy, but they're in the elements practically all year long, so anything made of hard plastic eventually cracks, especially the ends of emitters. Also, the screw valves that turn the water off and on for individual tubes on the top of the hub are often made of this cheap, soft plastic that get wrecked if you turn them too much. Grrrr.


Drip systems actually can be a way to save time and money when growing your own food, but they take an investment in time and money to accomplish that. Still, if you want to grow a vegetable garden as cheaply and effortlessly as possible, consider at least a

¹⁷ Drip systems also sell short pieces of plastic tubing for the express purpose of holding a crimped watering tube. Buy a few of these. Rubber bands for holding the crimped tube rot in short order, and then you're hosing water out of the end instead of through your emitters, d'oh! However, these pieces of tube that hold the crimp work just as well at half their length, so cut them to size and save some money.

simple drip system.

Soaker hoses, those hoses that leak all over on purpose, are not as precise and cost almost as much as a drip system. However, if they're laid at the roots of a row of plants, they'll direct water where it's needed.

In the "olden days," I'd do what some farms still do: run water down furrows alongside the plants. While that ultimately does get some of the water to the roots, the furrows need constant maintenance to repair breaches of the lines. They also take up valuable garden space.



Plumber's tape is a thin, non-sticky waterproof tape that comes in a roll sort of like bandage tape. Roll a couple of thicknesses of this stuff on the threads of wherever there is leakage, then screw it back together, and that usually seals the leak, at least for a while.

Water is also lost through gravity through the soil.

As in the previous chapter, the main objective here is to think through how the critical inputs to the garden will be adequately supplied. Last chapter, the concern was enough sun; in this chapter it's water. The next chapter covers the last vital input: soil. These are the three legs that hold up a garden. Understanding the basics of each will save you much frustration later.