**Watering the garden:**

Many of the issues with garden plants, including stress, disease, bugs and failure in the garden, start with **irregular watering**. Once the plants go into stress from lack of water, all kinds of opportunity for harm can come to them. Unfortunately this is the case for many gardeners who rely on hand watering every day. Life tends to get in the way. We get distracted, and the watering gets overlooked. By the time you notice, the plants are already stressed out. It's actually much harder to keep a garden watered properly all season by hand than by drip irrigation.

I think your time is better spent **managing** the watering system. And checking on beds every couple days to ensure the watering is sufficient, but in my case, with sixteen beds, hand watering them would be a couple extra hours work each day, and frankly, a double-A battery and some T-tape can do the job better than I can.

Technically the hand watering and detailed attention that it requires can be very beneficial for plants, so if you like it, go for it. I'm just speaking to all of you out there who want to save time where you can, and know that you're not interested in forgetting to have someone come over to water your garden when you were away those four days in July and everything dried up.

Go ahead and look at the chapter on setting up the drip irrigation and ensure that your garden gets consistent watering without the worry.

**Other stuff on watering:**

To check on the soil moisture in any particular bed, go ahead and work your hand down into the soil about six inches. It should be wet down the entire way. If you have a layer of something that's blocking the percolation of the water to deeper layers, this simple test will show you when that's happening. It will also show you if you're watering with enough quantity each day.

Different plants will need different amounts of water during their life cycle. For instance onions and garlic have shallow root systems and grow close to the surface of the soil. When they're young, they need consistently wet soil so they don't go into shock. You can add a thin layer of mulch on these to help retain moisture their first month until they sort it out.

Tomatoes don't like to have their leaves wet for too long, especially at night. This goes for Peas, beans, melons and squash as well. Now this is unavoidable during rainstorms, but it **is** avoidable when you are watering the plants, or the drip system is. In this case, the plant variety actually benefits since the drip irrigation waters its roots and not the canopy. Tomatoes, peas, beans, melons and squash are

all vulnerable to leaf-born diseases that are less prone to take hold if the leaves are dry most of the time.

Cabbage family plants and others with deep tap roots require a deeper watering on occasion so they can send those tap roots even deeper into the soil profile. Once they get the taproots established they can tolerate drier conditions on the surface. Beets and carrots are similar, in that once they get through the delicate germination and small seedling stages they are less vulnerable to surface dryness. But in both cases they love deep watering to feed that taproot down low. What this means for a drip irrigation system is increasing the flow or the time to the lines that are feeding those plants. As plants get more mature they may require more quantity and deeper soakings. As a general estimate, running a drip line in the morning for 20 minutes or so can be plenty of water. There are many variables in drip systems however and you can find further details on flow amounts in the irrigation section.

All this watering detail is variable depending on where you live and what climatic zone you are growing in. Since I live in the high desert of the Southwest, I can't count on rain for long periods of time. So I rely on my automated drip system to keep plants hydrated and use water efficiently with little evaporation during irrigation. I use mulch and intensive plant spacing to also keep evaporation down, and conserve moisture in the soil. If you live in a zone with high rainfall and humidity, your watering may be less frequent since you can rely on more rainfall. In this case, as the irrigation manager, you simply turn off the main supply valve for the irrigation system and keep it off for a period until the rain stops for a while and it looks like the garden could use more water. Then turn the valve back on and the timers will continue with their daily watering. As a general rule your entire garden soil surface will need about an inch of water per week, either from rain or from your irrigation. In the case of tomatoes however, which are composed mostly of water, you may need a more steady supply. Drip irrigation can provide this kind of steady slow water source.

**Best time of day to water the garden**:
In general, watering in the evening can be tough for plants. They are more at risk of disease if the soil and the plant material is wet during the evening hours. It's better to water in the early morning so the leaves will dry during the day, and this also provides them enough water to get through the heat of the day with less shock. If a second watering is warranted, the best time for that is a couple hours after the heat of the day, up to a couple hours before sunset. This provides enough time to dry out by nightfall. This also gives them the extra water in the soil they will need during the evening hours when much of the plant growth occurs, without having wet leaves all night. So a mid-summer watering schedule in a hot climate may look like this:

6am: 20 minutes watering with drip system / or by hand
4pm: 20 minutes watering with drip system/ or by hand

If you're in a wetter climate you would adjust the amount of time on the watering system to accommodate extra moisture in the soil. Or you could just do the single watering in the morning.

When you keep an eye on your plants, they will give you clues as to whether or not they are getting enough water. If they droop over and the leaves start curling under, that's a sign of thirst. Most garden plants use capillary motion inside their stems and branches to create structure in the plant. If that water isn't available, the pressure is reduced inside the plant and it causes it to droop. When they have enough water, they stand up straight and leaves are spread wide. Some plants will have a natural leaf droop as a reaction to mid day sun. This is normal as long as when you check them in the morning they have bounced back and the leaves are outstretched. If they are still curled and droopy in the cool morning hours, then they're not getting enough water. Your job as the water manager is to adjust accordingly.

Often, as you are getting the hang of watering, you may have to jump in and water by hand to relieve plants in shock. Get used to using your hands to monitor the feeling of moist soil several inches below the surface, and use your eyes to look for the signals that plants will give you about their water needs.

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