How to start a drip irrigation system

We have made an outline below with what we think are the best steps to help you start your drip irrigation project. Please understand that all applications are different and we cannot make this section absolutely perfect for all situations. If you do not find the exact information that pertains to your application, read through this section anyway and you should be able to figure out what you will need to do for your particular needs.

Most of all remember this should be fun and relaxing so don't get stressed trying to figure out every little detail. Almost all of the components of a drip irrigation system can be taken apart and reused if you make a mistake. So relax and enjoy!!

Planning your System

- **Water Supply**
  - The first step in planning a system is figuring out the watering zones. To do this you must take inventory of the available water supplies which will feed your zones. (Each watering zone is a complete drip system connected to a water source. The zones may be connected to a multiple zone manifold)

    If you have a single water source on the back of your house and you need to supply water to 4 watering zones in the front of your house you will have to do some serious considering of your options. Most of the time you will have at least one or two water supplies fairly close to your planned drip system(s).

- **Rules of the Road**

  No matter what else we all have to obey the laws of physics so here we will explain the limitations you can run into.
  Obey these rules and you will never go wrong!

  - **Rule 1: You cannot exceed your water supply!**
    If you only have 100 gallons per hour (GPH) of water supply (example only) then you cannot make one system/watering zone that uses 200 gallons per hour (GPH). Just common sense! What you can do in this case is to make more than one watering zone from the same water source divide and concur!
  - **Rule 2: You must have some water pressure, but not too much!**
    Most homes have between 40 to 60 PSI (Pounds per Square Inch). This is just fine for a drip system, in fact it is more than you want but this is good! On a drip system you always want to have the pressure between 20 to 30 PSI and some preset pressure regulators.
  - **Rule 3: Only a certain amount of water can flow through a given size pipe at a set pressure!**

This one sounds serious but it is simple and one of the numbers/rules to memorize.

- **Rule 4: You cannot go an unlimited distance on a single polytube!** Even if you have a single dripper at the end of a line you cannot run any distance you want. This is where the laws of physics get in the way again! For every "X" amount of feet you run the polytube (or any pipe) you will loose a certain amount of pressure due to "Friction Loss." The maximum line lengths allowed are listed for almost all the drippers and microsprinklers. Check the individual products information page to see theseKeep these rules in mind and you should have no problems in planning you system.

- **Calculating your water supply.**
  - To plan your system correctly you will need to find out your available water supply (how many gallons per hour your system produces).
    To do this, follow these steps.
    1. Turn on the water supply all the way
    2. Place a 5 gallon bucket in the water flow for set amount of time. We will use 30 seconds as an example.
    3. At the end of 30 seconds take the bucket out of the water flow.
    4. Turn off the water supply.
    5. Check the bucket and estimate the amount of water in it. Or measure it with a gallon milk jug.
    6. We will use an example: Let's say 1/2 of the bucket is full, remembering that our bucket holds 5 gallons.....1/2 full must be close to 2.5 gallons. Take the amount of water in the bucket and multiply it out so you will know how much it would have been if you left the bucket under the water flow for a full minute. In our example we have 2.5 gallons in 30 seconds, or half a minute. Because we want the number of gallons per minute we use the calculation 2.5x = 5 gallons. If we had gotten 2.5 gallons of water in 15 seconds then we would have done 2.5 gallons x 4, because 15 seconds is _ of a minute.
    7. Take your answer from step 6 (above) and multiply it by 60. Our example would be 5 x 60 = 300. The 60 is for 60 minutes because we want to find the Gallons per Hour (GPH) total water available. In our example we have 300 gallons per hour (GPH) available for our system.

Examples:			
Gallons of water in the bucket	**Seconds the water ran for**	**To figure multiplier**	**Equation**
1/2 Gallon	5 Seconds	60÷5 = 12	(.5 x 12)(60) = 360 GPH

1 Gallon	10 Seconds	60÷10 = 6	(1 x 6)(60) = 360 GPH
1.5 Gallons	15 Seconds	60÷15 = 4	(1.5 x 4)(60) = 360 GPH
2.5 Gallons	30 Seconds	60÷30 = 2	(2.5 x 2)(60) = 300 GPH

Now be aware - if water was being used in another area from the same water source, we would have to anticipate that the actual available water supply will be a little less. This would be the case if someone takes a shower or washes clothes. Generally, this should not really affect us, but keep it in mind if you decide to take your system to the maximum. You should always allow some leeway here!

- **Making your watering zones**
  - Now that you know what amount of water supply you have and the basic rules of physics that limit you you're ready to start planning your watering zones.

    As we touched on above, a watering zone is a single drip system supplied by a water source. You can have multiple watering zones supplied by one main water source. This is accomplished by using a manifold to regulate each individual watering zone. You will have to determine if you can open and run more than one watering zone at the same time by how much water supply you have on the water source feeding the manifold. Most times you will want to open/run only one watering zone at a time. From your water supply or manifold, your single watering zone will be limited by the amount of water that can flow through the size polytube you use.

    Now to see how much of an area you can water with your single watering zone, you must step back and take a look at how you will water each plant or area. It is a good idea to make a drawing of your plants and their location (roughly). Mark next to each plant on the drawing in pencil the flow rate of the dripper(s) or microsprinkler you plan to use.
    In this way you can then add up groups of plants and make sure the total flow needed will not go over the amount you can supply.

    One of the other factors to keep in mind when planning your zones is the watering duration. We will not get too deep into this right now, but it does matter when setting up zones.

    Each zone will be watered for a set amount of time. With this in mind it is wise to plant your plants in zones based on their similar water needs. Plan out the different zones as close as possible so they make sense to you.

    Also make sure to look at the next section which will help you decide on either using of microsprinklers or drippers.

- **Drippers or Microsprinklers?**

  We need to start this section off by letting you know it is up to you and what your plants like. There is no exact answer on whether to use microsprinklers or drippers on particular plants. We will suggest what is most common, but the last word is yours and that of the plants. We know of growers that only use drippers on palm trees (we are in San Diego, of course) but one of our employees has found that on his property some grow better with microsprinklers.....go figure!

  - **Common usage is as follows.**

    Shrubs, larger plants and some trees do better with drippers while ground cover, smaller flowers, flowerbeds and some trees with shallow root zones like microsprinklers.

  - **The good and the bad**

    The good thing about using microsprinklers is that they cover a large area all at once without having to place a ton of drippers in polytube.
    The bad thing is that they can water more area than you need, which can promote weed growth.

  - **About Drippers.**

    Drippers come in two basic styles: pressure compensating (PC) and non-compensating.

    Pressure compensating (PC) drippers will give you the same amount of water flow within a range of pressure. A dripper will be rated something like this: will give 1 GPH between 15 and 55 PSI. Pressure compensating (PC) drippers are made in a way that they can automatically flush themselves out during startup and shutdown, to a certain degree of course. This equates to a longer lifespan and more constant flow during the lifetime of the dripper. These drippers should be used on larger systems where the goal is to maximize the amount of polytube length and total drippers on a single line while maintaining a very close flow from each dripper. They are also better if slight elevation differences occur in the system. These drippers are more expensive than other types.

    Non-compensating drippers will give you the same amount of flow depending upon the pressure at each dripper. In other words the higher the pressure the more flow the dripper will give. The lower the pressure the less flow the dripper will give. These drippers cannot self flush and need very good filtration to work well over a longer period of time. The life span is less than the compensating drippers and elevation differences cause pressure differences that will cause drippers to give slightly different

flows. These drippers work well for smaller systems where water quality is good and no elevation differences occur.

- **About microsprinklers**

  Microsprinklers are rated by the water flow, the wetting area in diameter or radius and also the degree of spray it gives. The diameter is the distance across a full circle. The radius is the distance from the center of the circle to the edge. The degree of spray is the portion of a full circle it will water. a 360° sprinkler is a full circle. A 180° is a half circle and a 90° is a quarter of a circle.

  Microsprinklers come in all different flow rates and diameters from the very small to the very large, along with various degrees of spray. You will have to match up the microsprinkler with the area you wish to water by evaluating the diameter and the degree of the spray it gives plus the amount of flow needed for the plant.

  Note that some microsprinklers have a set degree of spray and some have interchangeable heads to adjust to other degrees or spray patterns.

Tutorial from www.dripirrigation.com