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Horticultural Tool & Supply Company

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Serving Nurserymen, Landscapers, Foresters, Arborists, Contractors, & Gardeners

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Installing Drip Irrigation

Drip irrigation is used to move the water from the water source to the plants.
Some benefits of drip irrigation over spray irrigation are:
1. It is not affected by wind direction or speed
2. It doesn't leave water on the top of the ground to evaporate
3. It doesn't over water low spots, and under water high spots
4. Places less water on leaves, leading to fewer fungal problems
5. It waters slowly, so the water is available to the roots for longer periods
6. There is no run-off of surface water
7. You put the water exactly where you want it, not outside the root zone, or on sidewalks and driveways
8. It uses less water, and uses it more efficiently
9. There is no compaction of clay soils by the impact of water droplets, which makes a 'soup' of fine particles that dry to a hydrophobic layer
10. You can either bury the lines, or leave them on top of soil.
11. OK to leave out all winter

Here is a hint to make installation easier. Have a cup of very hot water nearby, you can soak the tubing for a minute in it and it makes the connectors and emitters much easier to install

Click (or Ctrl-Click) on the pictures to view product at www.amleo.com

A complete drip irrigation system begins with Blue Stripe Solid Tubing, available in 100' and 500' coils. (Product Numbers PT-580 and PT-585.)

Step 1. Connecting Blue Stripe Tubing to your water source

1A. To fasten the Blue Stripe Tubing to a garden hose or spigot, you need an LC58H, which has a barb fitting on one end, and hose thread on the other end.	
1B. To fasten the Blue Stripe Tubing to ½" Female National Pipe Thread, you can use a LC58M.	
1C. To fasten the Blue Stripe Tubing to ½" Male National Pipe Thread, use a LC58F, which is a Barb x Barb x ½" Female NPT Tee Fitting.	
1D. To fasten the Blue Stripe Tubing to ½" PVC, you can use the LC58S, which is a Barb x Barb x ½" slip (glue) Tee Fitting.	

Step 2. Blue Stripe Tubing can be curved a little, but if the curve is too tight it will kink

2A. You can use LC58E Elbows to make angles:	
2B. You can use LC58T Tee Fittings to 'T' off multiple lines:	
2C. You might also want to have some LC58C Couplers in stock. These are used to fasten pieces of Blue Stripe Tubing together, or to repair it in case you have a mishap with equipment or rodents chew a hole in it:	

Step 3. You'll need to install Emitters at each place you want water to drip

3A. You have your choice of .5 (PCE 5), 1.0 (PCE 1), and 2.0 (PCE 2) gallon per hour.	

Some notes on selecting emitters: The Emitter you choose is based on the water VOLUME (not the pressure) that you have, how much water you would like to put on each plant, and how long you are willing to let the system run. You can have a lot of pressure but low volume, or high volume and low pressure. Pressure isn't important, as long as you have between 8 and 60 psi. (pounds per square inch). If you have greater than 60 psi, you'll need to regulate the pressure down before you use Blue Stripe Tubing. ('Normal' city water pressure is usually between 30 and 50 psi.)

An easy way to estimate the water volume you have is to see how long it takes you to fill a 5 gallon bucket, and multiply it out to figure gallons per hour. First, make sure your 5 gallon bucket is really 5 gallons, not 6 gallons. I use a regular 1 gallon milk jug and fill it 5 times, pouring it into my 5 gallon bucket each time. If the bucket isn't full, just mark the level of the water so you know where 5 gallons is.
Now, go to the location where you are going to start using emitters in the Blue Stripe Tubing. The volume of water at the source isn't important; it's the volume of water at the emitters you need to discover. You might be running hose, pipe, or Blue Stripe several hundred feet before you are actually installing emitters, and that can reduce the volume of water you really have to work with.

Turn on your water at the rate that you plan to have it running. If you are going to be having other things (like sprinklers) going at the same time, and they are tied to the same water source, that will reduce your volume, so turn them on too. See how long it takes

you to fill the 5 gallon bucket. For example, if it takes you 30 seconds to fill the bucket, you have 10 gallons per minute, or 600 gallons per hour (gph).

Now you can decide which emitters you can use. If you are installing 500 emitters, you can't use the 2 gph emitters, you don't have enough water. (500 x 2 gph = 1000 gph and we've just established in the example above you only have 600 gph to work with) The 1 gph emitter should work for your situation, but if you are planning to expand in the next year or two, you might consider the .5 gph emitter.

Location of the emitters is dependent on what area you want to keep wet, and the type of soil that you have. Water generally spreads in a 4" to 12" radius from the emitter. So, in a sandy soil you might have a diameter of 8-10", and it a clay soil it might be as large as 24". Water penetrates soil in a tear-drop shape, not straight down. So even if the surface of the soil around an emitter looks dry, dig down a couple of inches and you'll see the water spreads as it goes in the soil. You can test your soil by taking the milk jug that you used to figure your gallons per minute, and punching a small hole in the bottom. Make the hole really small, you can always make it bigger later. Fill the jug with water and make sure the water DRIPS out, (if it runs out, the water will flow over the top of the soil and distort your findings). Put the jug on dry soil, and let the water drip for a half hour or so. The jug should be somewhere between ½ and totally empty. Now take a hand trowel and dig down 8-12", and observe where the soil is wet, and where it is dry. This will give you a rough idea of where you need to put the emitters to get water to the roots of your plants.

Or use our 21HSS Soil Sampler. Insert this into the soil, twist a quarter of a turn, and pull it out. It will remove a core sample of the soil profile that you can examine to see the quality of the soil and where the moisture is going. Irrigation isn't a set-it-and-forget-it system, it needs to be regularly monitored to make sure that everything is working as designed, that lines aren't clogged, and the water is getting where you want it. The Soil Sampler is a 'must' if you want to see what is happening underground.	

Remember these three points about roots:
1. Unless your plants are in containers or quite small, the roots of an established plant go well past the branches and leaves, experts estimate at least 2-3 times as far.
2. Most of the feeder roots on a plant are in the top 8-12" of soil, even in old established trees. Unless you are in a drought situation where the sub-soil moisture has been depleted, this is as deep as you generally need to water.
3. Roots need to breath. Too much water can suffocate roots, or lead to root-rot problems.

Consider the soil and plant types. Clay soil absorbs water more slowly than sandy soil, but it also holds the water longer. You also need to consider the water needs of the plant.

You can mix emitters on the same line if you want. You might have water loving plants that you will use 1 gph emitters on, and plants that don't like 'wet feet' that will be happier with .5 gph.

Step 4. Installing emitters directly into the Blue Stripe Tubing

4A. If your Blue Stripe Tubing is running directly down your line of plants, or you use Elbows and Tee Fittings to layout your Tubing, you will probably be able to install the emitters directly into the Blue Stripe Tubing. Using a Hole Punch Tool, punch a hole where you want to install an emitter. We have two Hole Punch Tools available. If you are only punching a small number of holes, the MLA51 works great. This has the added advantage of including 8 'goof' plugs in case you make a mistake, or move a plant.	
If you are punching a lot of holes (over 50 for example), you might consider using the Miracle Punch Tool, ML-3. It will help to prevent sore hands. The Punch Blade that comes with this tool is the correct size to fit our emitters. There are replacement Punch Blades available and other sizes of Punch Blades available for this tool, sold separately.	
4B. If you are running the Blue Stripe Tubing as a 'water main', and are branching to different locations, you might consider using Micro Tubing (PT14-1, PT14-2) to get the water to your plants. For example, you could run the Blue Stripe Tubing between two rows of plants, and branch to the left and to the right with Micro Tubing. Or you could hang the Blue Stripe Tubing, and use the Micro Tubing to distribute to hanging baskets of plants.	
4B1. There are two ways to use the Micro Tubing; with an emitter at the beginning or at the end of each piece. To put an emitter at the beginning, you use one of the Hole Punch Tools to punch a hole in the Blue Stripe Tubing and insert the 'tapered' side of the emitter of your choice. Cut a piece of Micro Tubing to length, and slip it over the straight male end of the emitter. You can fasten the Micro Tubing down with Anchor Pins if you like. (616AP and 2420)	

4B2. The other way you can use Micro Tubing is to put the emitter on the far end of it. Punch a hole in the Blue Stripe Tubing and insert a BB14C Coupler. Slip the micro tubing onto the coupler and then put your emitter at the far end (insert the 'tapered end into the Micro Tubing), next to the plant or basket you are irrigating.	
Or insert BB14T Tee Fitting into the hole in the Blue Stripe Tubing, slip on your Micro Tubing, and insert the barb end of the emitter on the other end of the Micro Tubing. These two methods cost a little more (because you need to buy the extra Couplers or Tee Fittings), but the emitters at the far end of the Micro Tubing act as a bug shield, deterring the entry of insects.	

Step 5. Securing the end of each Blue Stripe Tubing line with Figure 8 Clamps

5A. If you are running a lot of Blue Stripe Tubing lines, the most economical option for securing the line ends is FG58 Figure 8 End Clamps. The Blue Stripe Tubing is inserted through one side of the Clamp, bent back on itself, and inserted through the other side of the Clamp, effectively crimping the Tubing. Sold in bulk bags of 100.	
5B. If you don't need that many Clamps, you can use the MJ50 End Fittings, which do the same job, but are sold individually:	

Step 6. Controlling your system with a timer

These timers will fasten directly to your spigot or garden hose, and directly to the LC58H fitting in Step 1, Part 1A.

6A. You can set some timers to shut your water off for you, so you don't forget. This 56600 Automatic hose End Timer shuts off water 15 – 120 minutes after you manually turn it on. No batteries required.	
6B. These Hydrologic timers allows you to run more than one line at the same time, or on different schedules. You can either use your garden hose while using your drip system, or hook up another drip system without having to unscrew the first system from your water source.	
6B. Other timers will turn the water on and off for you at programmed times, for designated run times. This 56607 timer has manual on/off button with a reliable solenoid. It waters up to 3 hours on a variety of intervals including every day, every two days, etc. Valve closes if battery is low. Easy to read large LCD screen with easy setup. Uses 2 AA batteries (not included).	
6C. Water up to 6 times a day with this easy-to-set 62056 electronic timer. Digital display, so you can review programs at a glance. Automatically starts and stops in increments from 1 minute to 2 hours, and from once a day to once a week. Use the manual On/Off feature to water for up to 30 minutes and automatically shut off without changing set patterns. Works well with low pressure drip and soaker hoses. Standard hose garden threads. Uses one 9-volt battery (not included).