
09

09

Tips and Facts

When minor issues arise with a drip irrigation system, there is often a quick fix if you know how to spot the problem. In this section, we will cover the most common problems that emerge and what the solutions are. Additionally, we will cover the main terms that are used when describing the different types of irrigation systems, how they are measured and tips for keeping them properly maintains. Lastly, we will go over the benefits of using a drip irrigation system as opposed to a conventional sprinkler system.

What We Will Cover

- Maintenance: Potential Problems and Solutions
- Fact Sheet and Component Glossary
- Benefits of Drip Irrigation
- Quality of Water

Tips and Facts

Drip Irrigation

Troubleshooting

Problem	Potential Cause	Solution
Electric Valve Does Not Operate Properly	Wrong valve size, flow too low	Replace with correct size
	Valve diaphragm orifice is plugged	Clean or replace diaphragm
	Solenoid faulty	Check wiring, or replace solenoid
Battery Operated Controller Does Not Operate Properly	Check the battery; make sure the controller contact touches the battery	Replace battery or lift the battery clip upward with your finger
Pressure Regulator Leaking	Dirt inside the pressure regulator	Remove the regulator from line, remove the washer and wash with water or replace
Dripper or Micro Sprinkler Has Uneven or No Flow	Line broken, filter clogged, dripper clogged or faulty, pressure too high or too low	Clean or replace screen filter, replace or clean dripper or nozzle of micro sprinkler, check pressure regulator
Dripper or Micro Sprinkler Has Uneven or No Flow at the End of the Dripline	Too many drippers on the drip line	Make sure that you did not exceed the recommended maximum flow of 200 GPH
Clogged Drippers	The use of a proper filter should avoid clogging problems	While the water is on, hold your finger over the dripper outlet for a few seconds
Clogged Drippers at the End of the Line	The use of a proper filter should avoid clogging problems	Chances are there is a break in the line, check your 1/2" poly tube

Fittings Separating from Drip Tubing or Dripline	Fittings improperly installed	Tubing is not far enough inside the compression fitting
	Wrong fittings used with your drip tubing	Make sure you used the correct size fitting
Dripper or Micro Sprinkler Popping out of Drip Tubing	Pressure regulator is defective, drippers or micro sprinklers are installed improperly; faulty or worn punch	Replace pressure regulator, check or replace drippers or micro sprinkler, plug hole with goof plug, replace or clean punch
	Pressure is too high	Install pressure regulator or replace
No Water Flow from Drippers or Micro Sprinklers	The use of a proper filter should avoid clogging problems	Clean screen in faucet adapter or open the filter and clean the screen by washing with water
Drippers or Micro Sprinklers Have Calcium Deposits (white colored buildup)	Hard water	You can remove dripper or micro sprinkler from the line and soak for one hour in a chlorine solution
Plants Appear Stressed	Drippers near the plants are plugged	Replace drippers, check filter and clean
	Break in the drip tubing	Repair break using coupling
	Run time is inadequate for the plants	Adjust the controller program and add more time

Maintenance

- Inspect drippers, micro sprinklers and micro tubing periodically to insure that no drippers are clogged, or that none of the micro tubing is out of place.
- Filter screens should be flushed and cleaned at least once a month depending on water quality. Checking the filter one week after installation should give you an idea of how often to schedule cleaning.
- Drip tubing should also be flushed periodically; again, water quality will determine the frequency of flushing.
- During freezing weather, we recommend draining your poly tube or rolling it up and storing it.
- During freezing weather, we recommend removing the battery operated controller for the season.
- Remove end caps or open hose ends to flush the line once a year.
- As your landscape matures, you may need to add, change, or remove drippers or micro sprinklers.

Did you know

A mulch layer can inhibit certain plant diseases.

Facts

Micro Irrigation	Low pressure, low-volume irrigation system suitable for vegetables, shrubs, flowers, and trees.
	Gaining attention because of its potential to increase yields and decrease water use, fertilizer, and labor requirements if managed properly.
	Low-volume irrigation systems that can be subdivided into three categories, according to uses: 1. Drip irrigation 2. Micro-sprinklers 3. Drip tape
Drip Irrigation	The low application of water directly to the plants' root zone in a predetermined pattern. Maintaining an optimum moisture level in the soil at all times results in less water lost to the sun and the wind. No water is wasted on non-growth areas, and the root zone is maintained at its ideal moisture level, combining the proper balance of water and air for a very efficient irrigation system.
Micro Sprinklers	Designed for placement in both new and existing landscape, agricultural areas, and are ideal for use on difficult terrain such as on slopes, in oddly shaped areas, and in orchards, greenhouses and nurseries. They operate at low pressure and have a wide range of flow rates (5 to 50 GPH) and diameters (3 to 30'). Micro-sprinklers have small droplets and a low application rate, and can prevent plant stress by maintaining low water tension in the soil.
Drip Tape	Flat tape with drippers pre-inserted spaced from of 12" to 18". The drip tape expands when filled with water and is ideal for use in vegetable gardens, row crops, or where total saturation of coverage is desired. It is used with special fittings, which are different in design from those used with drip hose in that they work with a twisting lock device rather than with compression.

System Layout

Facts

Micro Irrigation	Systems consist of a head or head assembly and a distribution network. The head or head assembly consists of a pump (if needed), controller, backflow device, valve, fertilizer injector, filter and pressure regulator. The fertilizer injector is optional, but highly recommended; the controller is necessary only if the system is to be automated.
	Drip Irrigation Valve Assembly consists of: battery-operated controller with hose or pipe thread, fertilizer injector, 150 mesh 3/4" filter, 25 PSI preset pressure regulator and 3/4" spin-lock swivel adapter. Fertilizer injector should be positioned downstream of the pressure.
	Micro-irrigation distribution networks consist of mainline pipes, usually made of PVC, sub laterals made of polyethylene (PE), PVC fittings, drip fittings (barb, compression or spin-lock), watering device such as drippers or emitters, micro-sprinklers, drip tape, and other accessories such as the hose end, goof-plugs, and punches.
	Drip irrigation line consists of 3/4" compression, 3/4" swivel adapter, 1/2" barb connector, PC dripper, 1/2" compression coupling, Netafim PC dripper, 1/2" spin lock connector, adjustable spray jet, nut-lock connector and 1/2" drip hose.

Glossary

Backflow Device	A device which keeps water that has passed through it from returning into the water source. A valve, usually plastic or brass, allows the flow of water only in one direction. It will prevent a backflow of water into the potable water supply and keep the water supply from becoming contaminated. Always try to use one. Some areas mandate the use of a backflow device in local building codes.
Filter	A plastic device with a screen element inside that installs at the beginning of the system and protects the small orifices of the drippers and micro-sprinklers from clogging. Periodically, the screen needs to be removed and rinsed to keep the filter clean. Filters are available with different types of screens, with mesh from as low as 40 to as high as 300.
Mesh	A filter screen is measured by how fine or small the water passages through the screen are. It is a measuring unit of how many holes the screen has per 1”; the higher the number of holes in the screen, the finer the screen is. A 200 mesh screen filters out smaller dirt particles than a 100 mesh screen.
Pressure Regulator	An adjustable device that controls the water pressure allowed into the supply line; a must have with a drip system.
GPH	Gallons per hour; used to measure the flow rate of low-volume irrigation drippers or micro-sprinklers.
GPM	Gallons per minute. Used to measure the flow rate of the entire irrigation system, or valve and sprinkler heads.
PSI	Pounds per square inch; used to measure water pressure.
Drip Emitter	Button or flag drip emitter devices will provide a preset flow at a recommended pressure of 15 PSI; in other words, the higher the pressure, the more flow the dripper will give, and the lower the pressure, the less flow the dripper will give.
Micro Sprinkler	A spinner-type watering device that is available in a variety of styles and configurations and, like drip emitters, operate at a low-pressure range of 15 to 30 PSI. Micro sprinklers are rated by flow rate and wetting diameter.
Micro Tubing	1/4” micro tubing, sometimes referred to as distribution tubing, serves as an individual feeder line to deliver the water to each dripper or micro sprinkler. Micro tubing is available in two basic materials, vinyl and polyethylene. The vinyl is soft and the poly is hard.
Pressure Compensating Dripper (PC Dripper)	Dripper that provides equal flow at any pressure between as low as 7 to 10 PSI to high as 50 to 60 PSI.

Glossary Continued

Compression Fittings	The type of fitting into which the drip tubing fits. The fit is tight and when the water is turned on, the pressure helps push the tubing against the fitting, which increases the holding power. The fitting itself will have a sharp edge inside which is angled backward, keeping the tubing from being pushed out by the water.
Drip Tape	A thin wall drip line with drippers pre-inserted into the line at various spacing, or with water passages along the line.
Laser Drilled Hose	A 1/4" polyethylene micro tubing with laser drilled holes at preset spacing.
MHT	Male hose thread configuration of a fitting or device.
FHT	Female hose thread configuration of a fitting or device.
NPT	National pipe thread configuration of a fitting or device.
1/2" Poly Tubing	Use as the main line for drip systems into which the drip emitters, micro sprinklers, or 1/4" micro tubing are inserted.
1/4" Micro Tubing	Serves as the feeder line from the 1/2" poly tubing to the plant area into which the drip emitters and micro sprinklers are connected.
Compression Fittings	Used to connect or extend the 1/2" poly tubing using a simple wrist action. The tubing is "walked" into the fittings for a very tight fit. No tools, glue or clamps are required.

Irrigation System Tips

- Check existing sprinkler systems for efficiency. Adjust heads to spray onto planted areas only. For new and old systems, make sure that you have uniform coverage so that you don't have to drown one spot to get enough water on another. If areas with different requirements, such as lawn and shrubs, are utilizing the same valve as a drip system, install a separate valve and operate in cycles.
- Periodically check your valves, pipes, sprinkler risers and drip connections for leaks. Leaks are likely to occur outdoors where they often go undetected. Even a small leak can waste hundreds of gallons of water in a single day.
- Separate irrigation zones based on landscaping needs and requirements. For example, turf, shrubs and groundcover should be in different irrigation zones.
- Install a drip system with a fertilizer injector to feed your plant roots. Drip systems minimize run-off, encourage root growth, and are excellent for watering and fertilizing shrubs and trees. Coil the drip hose around the tree and insert a few drippers for good coverage.
- If you have high pressure, use a premium pressure regulator with your valve zone to lower the pressure to the recommended pressure suggested for drip irrigation or spray heads.
- Convert your manual valves to automatic operation by using an AC or DC controller and solenoid valve, or a battery-operated controller. Automating the irrigation system will allow you to water in the early morning, when evaporation and wind are lowest. Be sure to check the irrigation frequently to see that the right amount of water is being applied and make adjustments as needed.
- Install a rain shut-off device with your automatic controller to avoid watering during a rainfall.

Ways to Save Water in Your Garden

The Benefits of Drip Irrigation

Drip irrigation (sometimes referred to as micro irrigation, low-flow irrigation, or trickle irrigation) is an irrigation method in which water is applied slowly and in precise amounts directly to the plant roots using low flow drip emitters. With proper irrigation schedules and selection of the correct drip emitters, along with proper installation methods, drip irrigation can maintain an optimum moisture level in the soil, combining the proper balance of water and air. This will result in less water lost to evaporation, wind and runoff, as well as deeper root zone development and better growth conditions, all while minimizing weed growth.

Water Efficiency

Drip irrigation applies water only where it is needed. Studies using drip irrigation systems have resulted in up to 60% more efficiency than sprinkler systems.

Landscape Maintenance

Reviewing and upgrading your sprinkler system can lead to better irrigation uniformity, resulting in water savings and a flourishing garden. Proper maintenance and use of efficient irrigation systems are key principles in reducing irrigation requirements in any landscape. Maintenance practices such as mulching can greatly impact the water efficiency of any landscape, as well as the landscape's ability to survive a dry season. An area of un-mulched soil may lose much more water to evaporation than the same area of mulched soil.

Did you know

Of all the water on earth, only .003 percent is available fresh water that is not polluted, trapped in soil, or too far underground.

Tips and Practices That Can Save Water

- Check your sprinkler system frequently and adjust sprinklers to avoid overspray.
- Water during the early morning hours when cooler temperatures and less wind minimize evaporation.
- Use automatic irrigation controllers and if you have a sprinkler system, use the controller's watering program to set more than one start time per day to help reduce runoff, allowing better water percolation.
- Change the controller's watering schedule from every day to every other day or even every 2 to 4 days; this can help the plants develop a deeper root zone.
- Add a rain sensor to the controller to eliminate unnecessary watering when it is rainy.
- Reduce the size of the grass area in the garden and plant native plants.
- Cover the drip system and the plant area with mulch. Good mulch preserves soil moisture, prevents soil compaction, keeps soil temperatures more moderate and reduces weed growth.
- Use of drip irrigation on trees, shrubs, flowerbeds and vegetable gardens can help in reducing weed growth.

Issues That Affect Our Water

Drought

Drought is caused by too little water over a relatively long period of time and can happen almost anywhere. When rainfall becomes relatively infrequent, it can disrupt the normal balance between the processes of precipitation and evaporation. Drought can also be defined as a moisture deficiency that has serious adverse effects on communities, usually by reducing food production or surface water supplies. Drought is sometimes called a "creeping phenomenon" moving slowly but steadily into an entire region and lingering for long periods of time. To deal with drought effectively, it is crucial to determine when it started, how severe it is, and when it is likely to end.

Use Drip Irrigation

If a sprinkler system is used in your yard, you may be losing water to runoff, wind, and watering of non-plant areas. You may also have poor uniformity due to improper mix of sprinklers, or inadequate sprinkler coverage or spacing. Drip irrigation, on the other hand, avoids these problems by installing drip outlets close to the plant root area, delivering water directly to plants' root zones.

By reducing the lawn area and replacing the sprinklers near trees, shrubs, groundcover and flowerbeds with drip irrigation, the amount of water used can be significantly reduced.

Quality of Water Use with Drip System and Suggestion

Water sources for drip irrigation can include municipally treated water, wells, ponds, reservoirs, streams and rivers. Clean water is especially important to successful drip irrigation. The small orifices found in all drip emitters can be clogged easily by physical and chemical contaminants found in the water source. Groundwater from wells is generally of good quality and should be used, when possible, although it may contain sand or chemical precipitates. Surface water can be used but often contains bacteria, algae and other aquatic life. In any drip installation, a screen filter or disc filter and chemical treatment of surface water is generally required. Usually, fast moving water contains higher levels of suspended particles while reservoirs or ponds contain relatively small amounts of these particles. For small drip irrigation operations, the water source does not have to be excessively large. Most small systems require only 2 to 5 gallons per minute per system and can use a 3/4" to 1 " filter and a small fertilizer injector.

Algae and Mold

To remove algae and mold from a drip system, you can inject chlorine (household bleach-sodium hypochlorite or swimming pool chloride-calcium hypochlorite) during the last 30 minutes of an irrigation cycle (or time required to fill all lines) so that 1 ppm of free residual chlorine remains at the end of the line. 1 ppm is equal to 2.6 ounces of household bleach in 1,000 gal of water.

Hard Water

Sodium hypochlorite is preferred over calcium hypochlorite for hard water to reduce calcium carbonate precipitation in the lines. Keep the pH down to 7.0 by using a metering pump or one of our injectors to inject an inexpensive acid like a food grade phosphoric acid. Acid injection for a short duration, followed by a rinse period has not been found harmful to drip system. The frequency of this treatment will depend on water quality and contaminant levels.

This information provided by the North Carolina Cooperative Extension Service.

09

Chapter in Review

Maintenance

To maintain a successful drip irrigation system, it is important to know how to spot minor issues and quickly fix them. We hope that you've discovered how to keep your drip system properly maintained in this chapter. Use the checklist to the right to be sure that you have checked all of the potential problem areas.

If you ever have any questions regarding maintenance, you can always call our Customer Care team at The Drip Store. We're available Monday through Friday, 7 a.m. - 4 p.m. (PST) at 760-597-1669 or toll free 877-597-1669.

My Maintenance Checklist

1) Add seasonal reminders to your phone or calendar

2) Assign tasks to family members to encourage participation

3) Check existing sprinkler systems for efficiency

4) Review your water bill to see your savings

5) Adjust watering as plants flourish