



J&L Garden Center

The All Season Gift
and Garden Center

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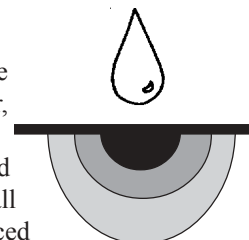
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Drip Irrigation

What is Drip Irrigation?

Drip irrigation is the slow application of water to the soil through emitters. Most emitters are placed on the surface of the ground, but they can also be buried for protection. Water slowly enters the soil, from each emitter, and then moves down in the soil and horizontally through the soil (beneath the soil's surface).

Drip irrigation can be traced back to the early Roman aqueduct period when broken clay pipes distributed water along the plant rows. It was not until the formation of modern Israel that the concept of placing a small amount of water, at an exact rate, along the root zones, began to be developed commercially. The Israelis were faced with an inadequate water supply, which was often quite salty, and a lack of good agricultural land. Hundreds of thousands of money-producing crops are now being irrigated exclusively by drip irrigation in Israel and throughout the world. Commercial agricultural, ornamental and greenhouse growers raise their plants with drip irrigation systems very successfully. The experience gained through agriculture has made it possible for homeowners to better irrigate their trees, shrubs, flowers, vegetable gardens, ground covers, potted plants, hanging plants, and even lawns. The use of drip irrigation has dramatically increased as we have been faced with rising cost of water and the scarcity of water. Drip irrigation has many pros and cons. You need to weigh the options to decide if drip irrigation is best suited to your needs.



Pros

1. Water conservation is perhaps the biggest advantage of using drip irrigation. The volume of soil wetted by drip irrigation is usually much less than that of other forms of irrigation. Drip irrigation can cut the amount of water needed to grow a crop up to 50%

a. Furrow or Flood Irrigation: Plants use about 50% of the water applied. The remaining 50% either runs off, evaporates, or leaches out through the soil.

b. Sprinkler Irrigation: Plants use about 75% of the water applied. The other 25% either evaporates, runs off, or leaches out through the soil.

c. Drip Irrigation: Plants can use up to 95% of all the water applied.

(Note: all percentages are averages, and will vary according to the climactic conditions, soil types, soil textures, length of application, type of drip emitters, etc.)

2. Uniform soil moisture. Drip irrigation helps to maintain a more uniform soil moisture and helps to increase the yield of plants.

Cons

1. The initial cost of a drip irrigation system can be very expensive. However, over the long run, the cost can be very inexpensive because drip irrigation supplies last for many years.

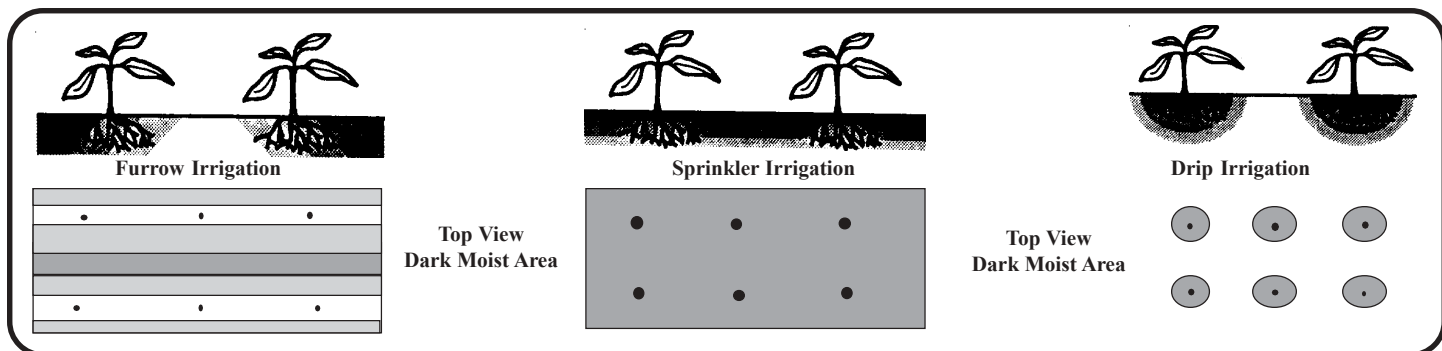
2. Storing the drip tubing. If you don't bury your tubing, you will need to coil it up in the fall and lay it out again in the spring.

3. Deterioration of the pipe. If drip tubing is left on the soil surface, exposed to the ultraviolet rays of the sun, the tubing will last about 5 years. If, however, you cover the tubing with 1/2 inch of soil or mulch, the tubing can last up to 15 to 20 years.

4. Vulnerable to vandalism or accidental damage. You can bury your drip tubing and emitters to prevent any chance of children playing with them. If you bury drip tubing be sure to bury it deep enough that you won't cut it while tilling or spading your garden.

Tubing left on the surface helps facilitate cultivation

continued on back



Pros (continued)

a. Drip irrigation eliminates the plant growth-stunting cycles of irrigation (too wet and too dry conditions)

b. Drip irrigation improves the water penetrating ability and the water retention properties of the soil.

c. Drip irrigation helps control run-off, puddling, and leaching. Drip irrigation moistens only the root zone.

3. Weed control. Only a small area of the soil surface is wetted. The dry soil surface reduces the ability of weed seeds to germinate.

4. Labor saving. The entire drip system can be turned on all at once and can be left on without supervision. Fewer weeds also means less hand cultivation or less chemical sprays, to control weeds.

5. More usable land. Land that would otherwise be considered unusable can now be irrigated efficiently (very sandy soil and hilly land.)

6. Erosion control. Steep slopes can be irrigated without fear of erosion, thus promoting better growth on these slopes. Furrow irrigation can erode a considerable amount of soil each year- even on flat ground.

7. Less water pressure. Drip irrigation systems can operate efficiently at 10 to 40 psi, while most other irrigation systems require 50 to 80 psi to work properly.

8. Disease control. Helps decrease plant disease by keeping water off the leaves.

9. Efficient fertilization. Fertilizer can be injected directly into the water supply and put directly into the root zone of each plant, instead of fertilizing the entire garden.

10. Salty water. Gardeners can use water that is fairly

salty just by keeping the soil consistently moist. Don't let the plants dry out or the salt will burn the roots.

11. Automation. Drip irrigation can be totally automated by using soil potentiometers and automatic valves. These devices will determine when to water and how long the water should stay on. You don't even have to turn the system on and off, once you set up the parameters.

Cons (continued)

and tilling. Surface installation makes it easier to change your garden layout from year to year. Surface installation also makes it easy to see that all emitters are working properly. If you leave your tubing on the surface be sure to cover the tubing with at least 1/2 inch of soil or mulch to prevent the chance of accidental damage.

5. Too much pressure. Drip irrigation pipe is made of very flexible pipe and will rupture if too much pressure is applied. Use a good pressure regulator to control the pressure.

6. Dirty water. Of all the problems this is perhaps the most troublesome. Dirty water can plug emitters rapidly. A filter of 150 mesh or better is required. Flushing the pipes occasionally is also recommended to help flush any mineral deposits or algae deposits that might also occur. Filters must be cleaned and maintained periodically (daily, weekly, monthly, etc.)

7. Dirty plants. Drip irrigation does not wash the dust off the plant's leaves. You should occasionally wash the leaves to keep the plant's leaves clean. Some insects thrive in dusty conditions.

Other Considerations

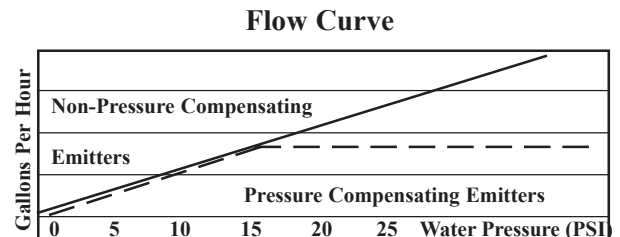
1. Irrigation must be frequent. This means daily or alternate days during the peak growing season. Plant deplete the water fast in the small root area that is wetted. The rate of water movement by capillary action decreases as the soil dries, making it hard to re-wet the soil if it becomes too dry. You may have to supplement with sprinkler or furrow irrigation if the soil becomes too dry.

2. Water should be applied slowly. Apply water slow enough that it will be absorbed and not run-off. You may need to supplement with sprinkler or furrow irrigation if the plants need water faster than the drip system can supply it.

3. Watering schedules will change. The application duration should be the time needed to apply water consumed since the previous irrigation. The application time may range from 1 to 16 hours. If more than 16 of every 24 hours are regularly needed to water, the number of emitters should be increased. The duration should not extend beyond the time when puddling or run-off

starts. You may need to split the application time into segments, rather than trying to apply all the needed water at one time if the water runs-off.

4. Emitters should be checked. Check each emitter visually each week for proper flow. As their performance builds confidence, the intervals between checking may be increased. Take precise measurements at least twice each year by catching the flow from a number of emitters. Problems of emitter performance or pressure control can be revealed in the manner.



5. Inconsistent water pressure. Water pressure affects the output of most emitters. Many types of emitters are pressure compensating, within limits, to maintain a constant outflow of water. Pressure control is generally necessary, and must be consistently checked.