



Drip Irrigation System Installation



Image: <http://www.farmerstrend.co.ke> (Diagram 1)

Introduction

Drip Irrigation is the practice of applying small amounts of water uniformly across a specific area. The water drips directly to the root zone of the crop minimising loss of water through evaporation.

Components of Drip Irrigation

1. Source of water
2. Water tank
3. Drip Irrigation Components/ Materials



Source of Water

The source of the water can be canals, or ditches, shallow wells, rivers and boreholes. The water from these sources can be pumped directly to the drip system or into a water tank which provides water at a constant pressure to the drip system.

The Water Tank

The water tank is of 300–3000 liters capacity. It can be a plastic, concrete or any other suitable materials. It is always placed 1.0–1.5 m above ground level, so that the system will have enough gravity for water pressure. Filling the tank method depends on the particular situation, by buckets, by a hand pump or by electric/diesel pump from the source of water.

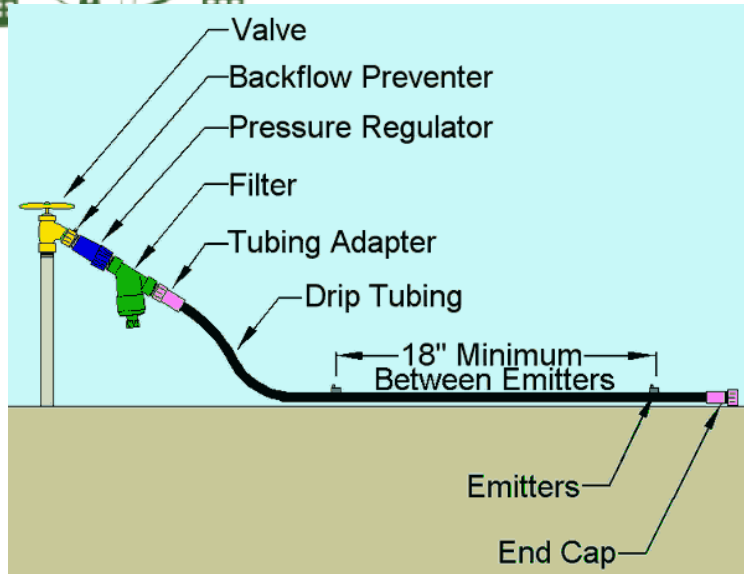
The Drip Irrigation Components/ Materials

The drip irrigation comprises the following components:

1. Valves
2. Filters
3. Drip Tubes/ Pipes
4. Drip Emitters
 - Non-pressure-compensating drippers:
 - Pressure-compensating drippers:
 - Adjustable sprayers:
5. Tubing Adapter
6. End Cap
7. Timer

image: www.irrigationtutorials.com (Diagram 2)

Note: Not all of the above components are in all drip irrigation systems. For example Pressure compensating drippers may not be necessary where water is applied from a water tank whereas it is very necessary where water is pumped directly from rivers



1. Valves

Enables you to turn water on and off from the water source. You need a valve with a **backflow preventer** and **pressure regulator** to prevent contaminated water from flowing back to the water source and also to make sure pressure is constant for uniform distribution of water.

2. Filters

They are installed between the water source and Irrigation line to prevent clogging of emitters. Filters are important especially if your water comes from unfiltered sources such as rivers and ponds.

3. Drip Tubes/ Pipes

Drip tubes/ Pipes carry water from the water source to the plants. Install thinner, flexible tubing to carry water from the main tubing line to each individual garden bed. Thinner lines with water emitters are often recommended for raised garden beds because they provide more precise watering.

4. Drip Emitters

Drip emitters release water to your plants from the mainline tubing. The emitters can be punched directly into the mainline or can be inserted into the end of a length of 1/4" tubing for plants that aren't close to the mainline. This is the most practical way to emit water to your plants when they aren't evenly spaced. Pressure compensating drip emitters deliver a precise



amount of water each time, even if there are changes in pressure. Emitters typically fall into three:

- **Non-pressure-compensating drippers:**

Flow rate varies with pressure. The lower the pressure, the lower the flow rate and vice versa.

- **Pressure-compensating drippers:**

Flow rate remains the same regardless of pressure.

- **Adjustable sprayers:**

Offers more variety in terms of watering individual plants on a single irrigation line.

N/B: adjustable drip emitters work well for most gardens since they provide individual flow and pressure options.

5. Tubing adapter

Any irrigation system must have connections. Adapters are used to connect the water source to the tubing line through various filters. It ensures that all connections are water tight. Adaptors are also commonly used between tubing and emitters to reduce water loss.

6. End cap

After you successfully connect the tubing and valves to the water source, place an end cap on the end of the tubing lines to stop water flow. This should be the same size as the tubing.

7. Timer

Look for a programmable timer that regulates the watering schedule for the duration needed

Installation

You will need a few more items before you can do the connections. These are:

A tape measure, A hose puncher (to attach emitters to the tubing), Goof plugs (to plug up any unwanted punch holes), Metal stakes and zip ties (to secure the drip lines where you want them) and work gloves.



Step 1: Connect tubing to water source

Connect the water source to the main water line tubing using a water valve. Connect the two with a backflow preventer valve to stop contaminated water from leaking back into the initial water source.

Step 2: Lay down the tubing lines and connect emitters

Once the water source is connected to the main water distribution line, lay the tubing in accordance with the layout of your farm.

Roll the tubing out around the garden beds, laying the line flush. Once the tubing is in place, use a punch tool to make a hole in the tubing line wherever an emitter goes. Position your emitters so they are close to the root zone of each plant. To punch the holes, use boiling water or a hair dryer to heat the tube, which makes it softer to make holes.

Once you have the tubing laid out and your emitter holes punched, secure the tubing into the ground with tubing stakes (which should be the same size or just slightly larger than the tubing circumference).

Step 3: Test the irrigation

Turn on the water and allow it to run freely for a few minutes to flush out any dirt or debris. Once you see the system runs properly, close the tubing with an end cap.

Please refer to the *diagram 2 to understand how to make connections*

Maintenance

Note: The system need to be maintained by:

1. Cleaning or replace the filters regularly to ensure optimal flow.
2. Checking soil wetness at rooting depth to adjust watering schedule and pressure
3. Check the timer battery and replace as needed.
4. Regularly check emitters for leaks and blockage.

Firms Involved in Installation of Drip Irrigation

If you need installation to be done by experts in your farm, please contact the following companies:



1. Sunculture: +254 (0) 700 327 002
2. Davis & Shirliff: +254-733 610085 / +254-711 079 000
3. Amiran: +254 (0) 719 095 000
4. Future Pumps Kenya: +254 (0) 715 539 911