

Low cost drip irrigation manual

LOW COST DRIP IRRIGATION

Drip irrigation is a water efficient irrigation system, where water is dripped to individual plant roots zones at low rates at about 2.25 l/hour from emitters embedded in small diameter plastic pipes. The technology can be established in February and March for pre-monsoon vegetables and during September and October for winter vegetables.

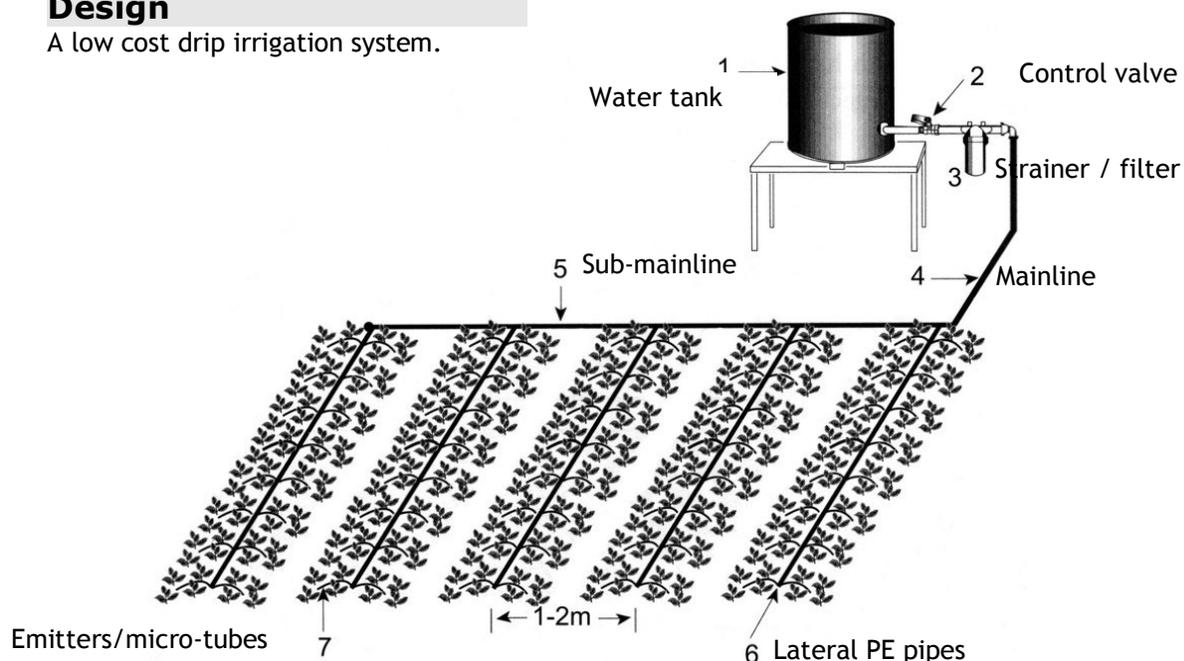
A simple drip irrigation uses low-cost plastic pipes cut to the appropriate lengths laid on the ground to irrigate vegetables, field crops and orchards. Small holes in the hose allow water to drip out and keep the base of the plant wet without wasting any water. A simple drip can consist of a 20 litre bucket with 30 metres (100 feet) of hose or drip tape connected to the bottom of the tank. The bucket is placed at least 1 metre (3 feet) above the ground so that



gravity provides sufficient water pressure to ensure even watering for the entire crop. Clean water is poured into the bucket daily through a filter/ strainer. The water in the bucket fills the drip tape and is evenly distributed to 100 watering points. A multi-chambered plastic drip tape is engineered to dispense water through openings spaced at 30cm (12 inches). The bucket kit is the smallest type of drip irrigation technique.

Design

A low cost drip irrigation system.



Description for low cost drip irrigation systems:

1) Water source, an overhead tank (minimum of 1 m above ground level) can be used for smaller systems up to 400 m² area. 2) Control valve: valve made of plastic or metal to regulate pressure and flow of water into the system 3) Filter: Strainer filter to ensure that clean water enters into the system. 4) Mainline: 50 mm PVC (Polyvinyl chloride) or PE (Polyethylene) pipe to convey water from source to the sub-main. 5) Sub-main: PVC/PE pipe to supply water to the lateral pipes which are connected to the sub-main at regular intervals. 6) Lateral: PE pipes along the rows of the crops on which emitters are connected directly. Pipe size is 12-16 mm. 7) Emitters/micro-tubes: Device through which water is emitted at the root zone of the plant with required discharge. Farmers can simply make pin holes in the plastic tube for water to pass. Space between emitters is variable, commonly 1.2 m (between plants, within and between rows). There is (usually) one emitter for each plant. Different sizes of valves, mainlines, etc, can be used, depending on flow rate of water in the system. Additional components are joints (connectors) and pegs (used to hold the lateral and micro-pipes in place).

Establishment activities

Major activities are;

- Uniform leveling of land for equal water distribution.
- Constructing a raise platform (1m) for placing the storage tank.
- Installation of water pipes along the beds; check the spacing of drip holes by turning on the system and note where the drips fall, then select the particular drip point for sowing the vegetable seedlings.
- Fill the tank with water at desired intervals and introduce liquid manure (cattle urine) as an when necessary.

Maintenance;

Maintenance usually involves repairing leakages in the pipes and joints with help of adhesive and clearing blockages in the drip holes with apin.

Benefits;

- Improved water-use efficiency (reduced loss - through evaporation)
- well directed, selective - and targeted irrigation
- ensures constant water supply in the crucial phase of germination
- Improved ground cover: better crop growth, greater area under irrigation.
- Higher yields, better quality, higher germination rate, lower incidence of pest attack; facilitates pre-monsoon sowing.

References; WOCAT

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