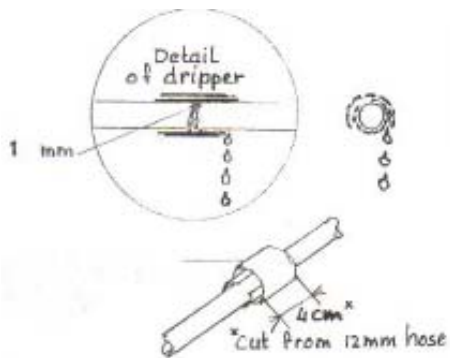


2. Heat the pointed nail over a fire and make small holes (1 mm) on the same side of the pipe. The distance between the holes depend on the plants to be irrigated.



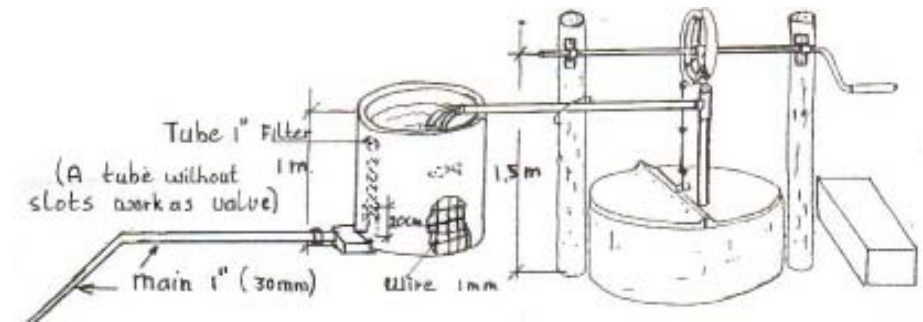
3. Cut two, 4 cm long pieces of pipe for each hole. Cut them up lengthwise and place the first over the pipe without covering the hole. Place the other “sleeve” over the first one, but the second one covering the hole. This system lets water seep out of the hole and enter the soil close to the plant roots.

4. Plant 4 plants around the pipe where each hole is.

Another advantage of this irrigation system is that nutrients can be added directly to the tank and in this way enter directly into the soil around the plants. A manure “tea” can be made from animal manure or green plants. This liquid should be thinned in order not to burn the plants. This system gives the nutrients directly to the roots and much less nutrients are washed away by rains or transformed by microorganisms. The result is better use of the nutrients.

## DRIP IRRIGATION

### How to build a water tank and set up a drip irrigation system



### Save water with a drip irrigation systems

Drip irrigation systems use much less water per kilo of food produced. Trials in South Africa have shown that up to 25 times less water is used when compared to flooding irrigation - depending on the crop. To make a drip irrigation system one needs a tank to hold the irrigation water and a system of drip tubes.

Production of vegetables is often determined by the availability of water. A simple drip irrigation system increases considerably the amount one can produce with the same amount of water for irrigation.

Drip irrigation systems use much less water per kilo of food produced. Trials in South Africa have shown that up to 25 times less water is used when compared to flooding irrigation - depending on the crop. To make a drip irrigation system one needs a tank to hold the irrigation water and a system of drip tubes.

## Production of a water tank

### Materials:

- cement
- sand
- 1 or 2 straw mats
- 10 m thin steel wire
- 2 pieces of PVC pipe 20 cm 1" or smaller
- tubes for irrigation (12 mm - 3/8")
- rubber to tie the drip pipes to the PVC
- piece of foam as a filter in the PVC pipe

### Tools:

- shovel
- bucket (or any other container)
- large painting brush - can be made of grass
- trowel

### Tank production

1. Take the materials to the place where the tank will be made. It should be a place where it is easy to fill it with water. It should also be placed higher than the

irrigated garden so that the water can trickle out of the holes.

2. An (old) straw mat is formed in the shape of a drum. It should form a double layer. One can split the mat to form a small cylinder. Or use two mats to make a larger tank.

3. Reinforce the cylinder with three circles of steel wire.

4. Mix 1 part cement with 5 parts of sand and small stones (if stones are available) and water to make the bottom of the tank.

5. Place a 20 cm PVC pipe through the wall at the bottom of the cylinder. This tube is for draining the tank. Place the other PVC pipe 20 cm over the bottom of the tank. This one is the water outlet.



6. Mix cement and water to form a thin solution and use a



large brush to "paint" this on the inside and outside of the cylinder. Cover if it is in the sun and let it dry for half a day.

7. Mix 1 part cement, 3 parts sand and water. Place the mixture on both sides of the cylinder as thinly as possible - in total 3-4 cm.

8. Where the PVC pipes are the layer should be stronger - in total 7-8 cm.

Reinforce also where the walls are joined to the bottom.

9. Let the tank dry for 10 days, keeping it humid by watering every day and keeping it covered with grass or leaves.

## The drip irrigation system

### Materials:

- Pipe of hard plastic (polypropylene - black plastic) - preferably with diameter of 12 mm
- system to make "T" joint if more lines are required
- rubber (cut from bicycle tubes) to join the pipes

### Tools:

- sharply pointed nail
- cloth or other thing to hold the hot nail
- knife

1. Place the pipes in one or two lines.

