

Gravity fed irrigation system

Contributed by Mochyn's Old Chap

Downsizer.net member JonO wanted to know whether he could make an irrigation system with a water butt and perforated hose work without a pump - as always someone was ready to help. Mochyn volunteered her "Old Chap" to provide a guide to the "leaky pipes" that saved endless watering and helped produce a crop of tomatoes that lasted (frozen!) until spring....

Hello, I'm "the Old Chap" and as Mochyn mentioned, here is a brief description of the leaky pipe (soaker hose) system we have been using successfully in our polytunnel over the last two years.

Just to set the scene the polytunnel is 35' x 14' and is situated on a south facing slope with a drop of around 4' to 5' from one end to the other. The ground inside is divided up into five 1.5m x 1.5m raised terraced squares down the middle and two 7.5m x 0.6m long strips down the sides.

The polytunnel and tank from the East with the Old Chap for scale.

The irrigation set-up in the polytunnel (I'll get to the water tank supply later) for the last couple of years starts from a tap just inside the door at the top end from which we take water for use in the watering can or to which the leaky pipe system is connected using a basic HozeLock connector.

When connected to the tap inside the polytunnel (which is most of the time in July, August and September), the pipe system transfers water first through a solids filter (because we use mainly stream water to recharge the system, but a filter of some sort would also be advisable if you think solids may be a problem, or if you suspect the water to have a high iron content which could encourage bacterial growth or even if your water is hard) and then continues through solid pipe across the top of the cultivated strips.

The tap and water filter.

Three spurs then direct water down the length of the polytunnel, two of porous pipe down each of the 0.6m wide side beds (meandering from side to side to give good coverage) and one of solid pipe that passes alongside the five square beds down the centre of the tunnel. Five spurs of porous pipe then come off the solid pipe beside the square beds at points adjacent to the tops of each of the square beds (these spurs are around 5m long so the pipe can snake around each bed for coverage). The whole system has a number of in-line stop taps incorporated so that we can direct water to which ever compartment needs it most. (With careful planning and design you can address most problems of uneven watering caused by head related issues.)

Inside the tunnel from downhill, showing terraces and pipes.

As mentioned above we supply the leaky pipe system from a large tank (1300 litres) which is recharged from a stream (the capacity of the tank isn't necessarily important for the hydraulics so long as you have a reliable source of recharge, but the height of it can be). The base of the tank is probably about 3' higher than the highest part of the porous pipe, but there is always between 1' and 4' depth of water in the tank giving average heads of between 4' and 7' to the top of the porous pipe (but effectively probably significantly less after considering pressure losses through the intervening pipework and filter) and up to 10' to the lower end of the system.

An in-line tap controlling flow to one bed.

I can't give details for specific systems as these will depend on how extensive a system you have in mind, but given our experiences so far I would expect a 3' fall to be sufficient for a moderate system (water does not percolate from the porous pipe so quickly that it has all escaped in the first few feet). If it is to be laid outside the porous pipe will need covering with earth otherwise too much will evaporate. Also probably best to thoroughly wet the earth first so that the whole thing is in hydraulic continuity as soon as possible. Experimentation with a timer in the line is recommended, especially if precise control of soil moisture is required or if you are going to be away.

The beds from uphill showing pipe layout.

I have found that at the start of the irrigation season in the polytunnel the tank loses water at a pretty fast rate and then

slows down significantly once some sort of equilibrium (between soil moisture, plant needs and humidity) has been reached. In fact I sometimes think that insufficient water is being taken from the tank until I feel how moist the earth is in the polytunnel.

All in all when our polytunnel is stuffed full of tomato plants, cucumber plants and peppers we find that we use about 0.5 cubic metre a week through this system and everything is getting its fill.

In reality we are not at all scientific about it and simply connect the system into the tap and let it go. Occasionally the soil in certain compartments feels a bit too dry or a bit too wet so we use the stop taps to adjust accordingly. Not much to it really, just giving it a try and learning from experience. Suck it and see, as they say.