

## Experiences With Drip Irrigation

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In the early 1980s we decided to change our nursery from a field growing to a container growing nursery. One of the decisions we had to make was what style of irrigation to use. Some of the factors affecting this decision were:

- 1) The amount of available water. One dam and the town water supply. The dam was not enough for our needs and the town supply too expensive for overhead irrigation.
- 2) Plants are generously spaced making overhead watering very wasteful.
- 3) A system of rows and blocks of plants made a drip system easy to design.
- 4) The length of time plants remained in one position was a minimum of 18 months.
- 5) Use of a large polybag container suited the use of drippers.
- 6) Although it was much more costly to install drip irrigation, it meant that water was not a limiting factor.

One block was set up as a trial simply connected to the town water and manually turned on and off. This worked well apart from, as you would expect, the manual on/off. An automatic controller was added and from then on we have been continually developing our system. At present the system consists of:

- Two concrete tanks which fill from the town water supply, each holding 22,000 litres.
- Two 1000-litre poly tanks for nutrient solutions.
- Two controllers each covering half of the nursery.

Valves at each station open and close by hydraulic lines to solenoids positioned near the controllers inside a shed. Our site is prone to lightning strike which caused problems with wiring and solenoids when they were in the field. Valves are set above the ground making repairs and maintenance easy.

A fertiliser injector is connected to two poly tanks. Operation is manual at present with the return of clean water going back into the main tank.

Each station has 5000 outlets which are fed from a central manifold with 20-mm poly lateral mains. Tees connected to the dripper by 3/5 poly tube deliver the water to the plant. Drippers are rated at 2 litre h<sup>-1</sup> but this will vary depending on the pressure of the system. Our output is 2.6 litre h<sup>-1</sup>. As you may expect, irrigation times vary with plant species and season. Our range would be from 3 min once a day to 8 min twice a day.

All systems need to be maintained if you expect results. With overhead irrigation blockages or timing problems are very apparent. This is not the case with drip irrigation. Often it takes some time to see a problem. The mix may become very dry, particularly if the dry plant is hidden by those around it. Particular attention needs to be given to the following:

- Replacing blocked drippers. If staff are observant and carry some drippers when doing their regular work this can be carried out as part of their daily routine.

- The 3/5 poly tube can sometimes become brittle and break. These breakages are repaired before the line is put back into use. The main trouble we have had with this tube is that rabbits love to bite it off. They don't just bite one either, they can bite up to 100 in a small area. This not only effects the immediate plants but also reduces the pressure in the whole block. Many hours can be spent repairing this damage, as it is more difficult to make repairs in between plants.
- When bringing lines back into use it is important to flush first and then water test to find any leaks or blockages.
- Filters must be cleaned on a regular basis or the pressure in the system will be low and plants will be under stress. This is more of a problem if you are on a sloping site. The higher end of the block will be under stress from too little water, while the lower end will suffer from water logging. Maintaining the pressure at the appropriate level will keep this problem to a minimum. Filters must be cleaned more often if nutrients are delivered through this system. Since we began liquid feeding it has become increasingly important to chlorinate the system to reduce algal buildup. Self cleaning filters would save time and may be a better option.

Many things must be considered when deciding how to irrigate your plants. Along with those I have outlined in this paper, run-off from nursery sites is becoming an important environmental concern. Drip irrigation can help greatly if you have trouble collecting run-off from overhead systems. It is worth considering drip when you next have to design an irrigation system or are planning an extension.