

Drip Irrigation

Costas Lymbouris

March 2022

Agenda

- Introduction
- A small Courtyard Garden of pots using a kit with drippers – from £19
- 2 Small/Medium borders 5m x 1m using 4mm drip tube and 13mm supply tube; above plus £40
- 2 large borders 15m x 1m using 13mm drip tube £90

Intro - Why Drip Irrigation

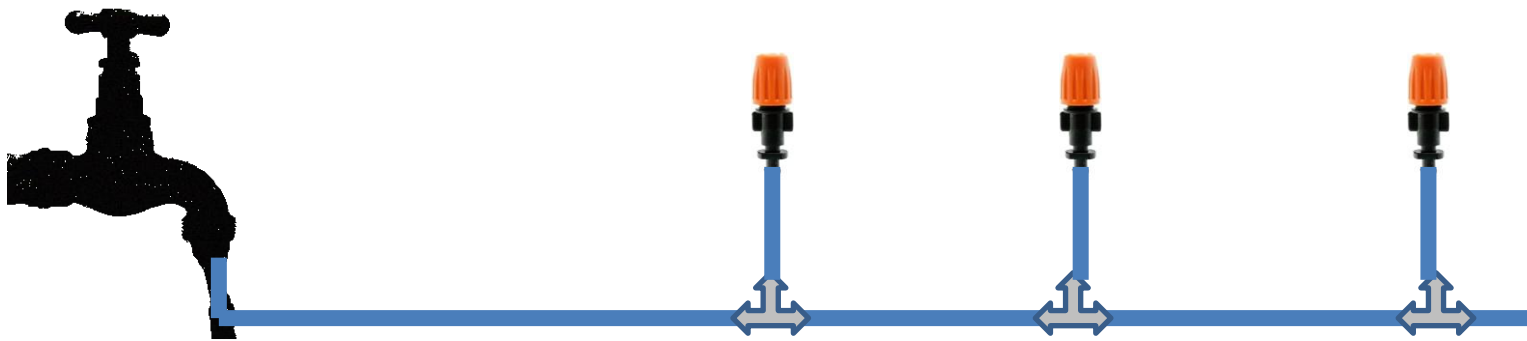
- Delicate & Precise Watering
 - Water your plants not the weeds (Hozelock)
 - (weeds now mainly grow along the drip tube - Costas)
- Overhead watering encourages fungal growth on wet leaves eg rose black spot, blight
- Can be automated, simple manual or battery controller

Irrigation

- Many incompatible irrigation systems
- For garden needs, concentrate on simple low cost easy to install solutions
 - Drip systems – precise and flexible with simple easy to install fixings and low maintenance/repair
 - Sprinkler systems – less plumbing but imprecise watering so wasteful

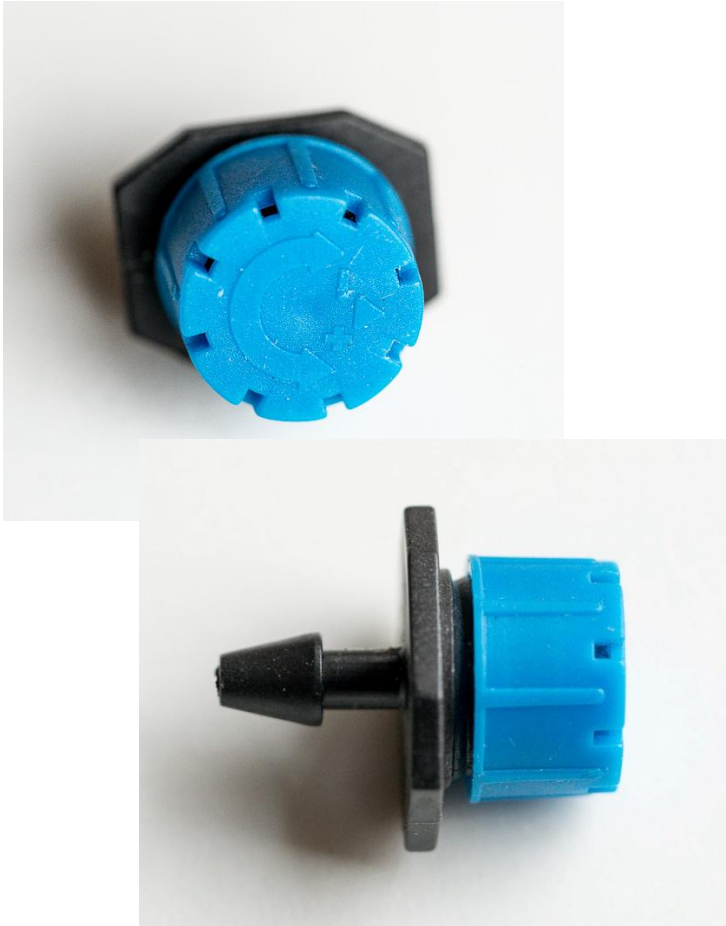
A Small Courtyard Garden

- You can use a kit using only 4mm hoses and drippers also called emitters (Same thing)
 - Good way of learning about drip irrigation
 - The 4mm tube is low volume but should be adequate, good for 25m (X2) reach
 - Not suitable for large borders but also good for watering individual shrubs and plants within borders

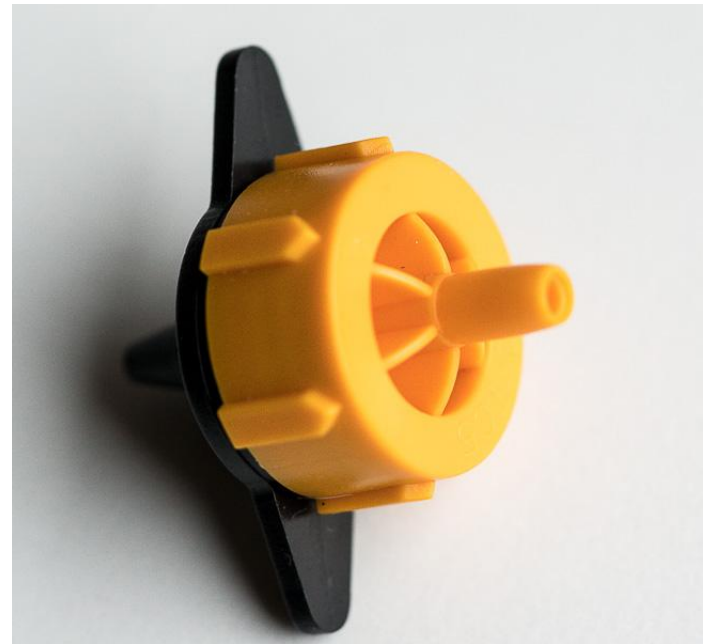


A dripper is required in each pot

Flow rate adjustable



Fixed flow rate eg 2 lph



[illegible]

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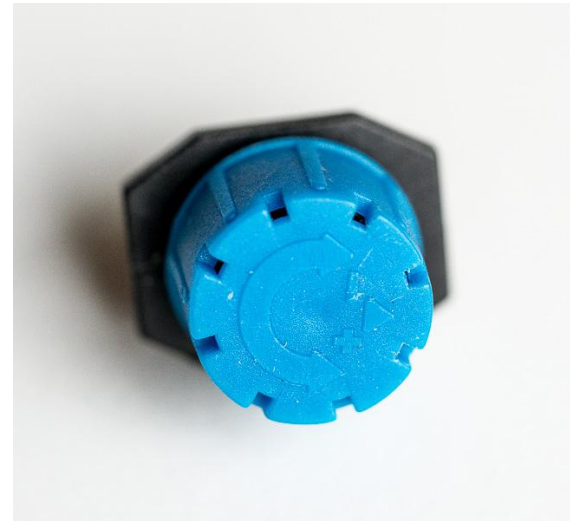
Tubes & Connectors

- You can buy individual components to meet your requirements, will be better quality but more expensive – check reviews, lots of low quality stuff
- Hose/Tube must be 4mm inner diameter 6 or 7mm outside – can buy 50m for £19 or 100m for £33
- Drippers should be pressure compensated but not usually stated - 50 for £9
- Barbed tubing connectors best with multiple barbs
200 mixed £9

Connectors

“Barbed T”

connects 3 hoses



Pipe should be heated before attempting to fit connectors



Tube

- Must heat the tube before inserting the connector



Drippers

- Every dripper will be on for the same amount of time so every pot watered for the same duration
- The drippers used here are adjustable so you set them for different size pots and planting density. Can have more than one dripper per pot if needed for larger plants such as shrubs

Connectors

Barbed T – for hoses



**Flat T – use for drippers (7)
in borders – not supplied**



Pipe Joiner – not supplied



End stop



Connecting to the tap

1. If outdoor tap conveniently close, then can connect tube to that
2. If you have some spare hose pipe, can use that to take water to the irrigation system. Does not have to be a permanent connection.
3. Will need an adapter for hose to 4mm connector (Amazon)



At The Tap

- Check thread specification carefully before buying anything, especially online
- In the UK we use - British Standard Pipe thread
 - Garden taps have a 3/4 inch **BSP** thread or **BSPT**
 - Hose fittings are typically 1/2 inch **BSP**
- Fittings sold online sometimes quote US pipe threads which are different and should be avoided; but can buy a converter

At The Tap - Non Return Valve

If replacing a garden tap use one with a built in Check Valve/ Non Return Valve ~ £12

or

use an in-line One Way Hose Connector £10



Water Pressure

- “drip irrigation” requires a pressurized water supply, so mains water
- Too high a pressure can make the fittings “pop out” so fit a pressure regulator or **“turn the tap down”**
- A pressure of 25psi to 30psi is optimum (I use a 27psi (or 2bar) regulator £7.50), ensures pressure always same, Hozelock £11
- The pressure required equals a 17m head of water so not going to work from a water butt or can use a (pond) pump

How Much Water ?

- You should only need to run the system for 15 minutes each time.
- It will depend on your water pressure and might even be 10 minutes or 20 minutes
- Frequency will be the same as when you hand water, so maybe 2 or 3 times a week but depends on weather
- Will discuss later how to measure

Feeding Pots

- Plants in planters need food as well as water
- Fertiliser 'insertion' can be built into the system but not time to discuss today
- Suggest you mix the recommended amount of slow release fertiliser granules into your compost (check packet), or sprinkle on surface and work in for established plantings.
- Can of course use a liquid feed if required for a flowering boost for annuals

Irrigation for Small / Medium border

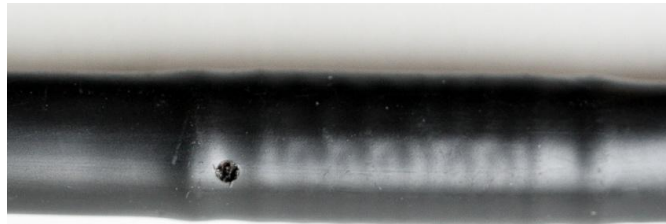
Moving up the scale

Irrigation for Borders

Moving up the scale



- Impractical and expensive to use drippers for individual plants in borders
- Instead we use pipe that has drippers/emitters built in along its length, drip pipe

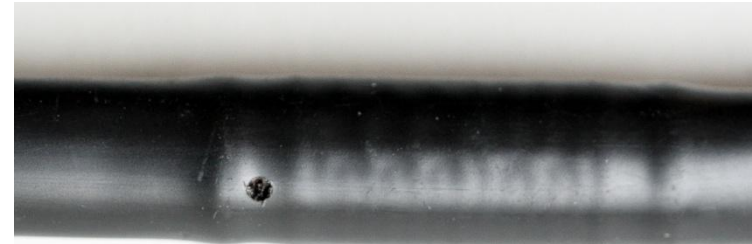


- Best to install before plants cover the ground

Hoses - 2 Diameters for Gardens

It's about reach

- 13mm inner size, 16 or 17mm outer similar to ½" garden hose but more flexible
 - Solid pipe reach about 200m
 - Built-in emitters reach 150m
 - 33cm spacing, drip rate 2 lph
- 4mm inner size, 6/7mm outer size
 - Solid pipe good for 25m reach
 - Depends on pipe quality (& pressure)
 - Built-in emitters – **max useful length 5m**
 - 30cm spacing, drip rate 2 litres per hour per dripper

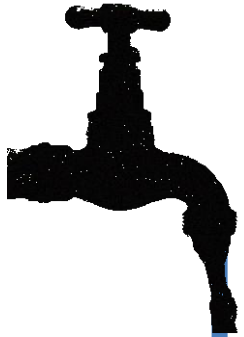


Drip Rate

- If drip rate 2 litres per hour
- In half an hour only 1 litre
- In 15 minutes $\frac{1}{2}$ litre = 1 inch of water over a 6 inch diameter
- Larger plants will be served by more than 1 dripper, maybe upto 3 - [illustration later](#)
- so run system for 15 to 20 minutes

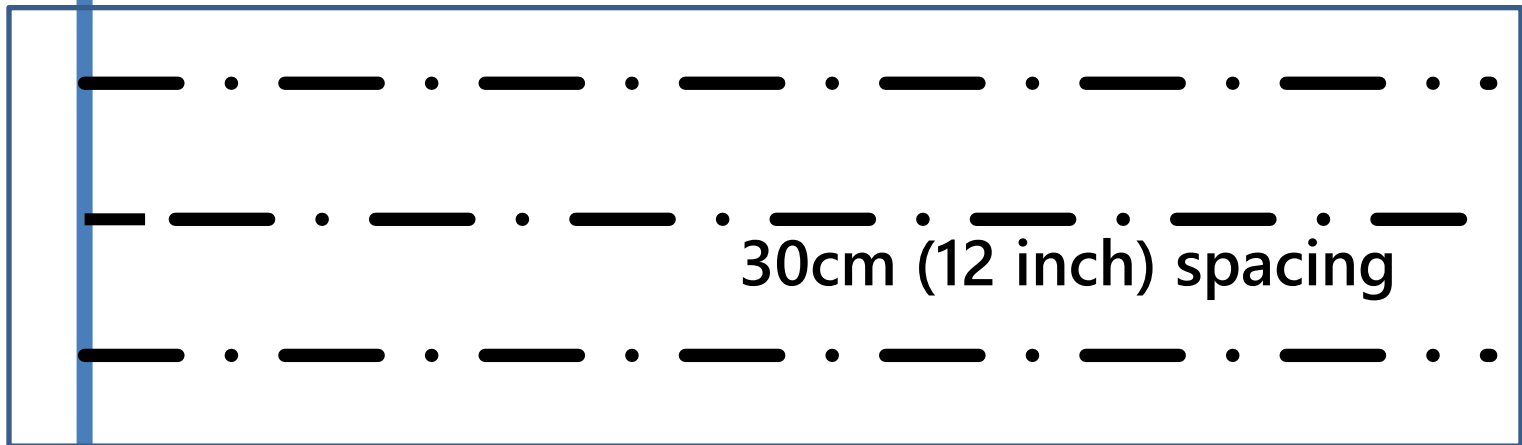
Basic Grid Irrigation Layout

Rectangular border example



< **Solid 13mm pipe – water supply**

4mm drip hose with built in emitters @30cm



30cm (12 inch) spacing

↑
1m
wide
↓

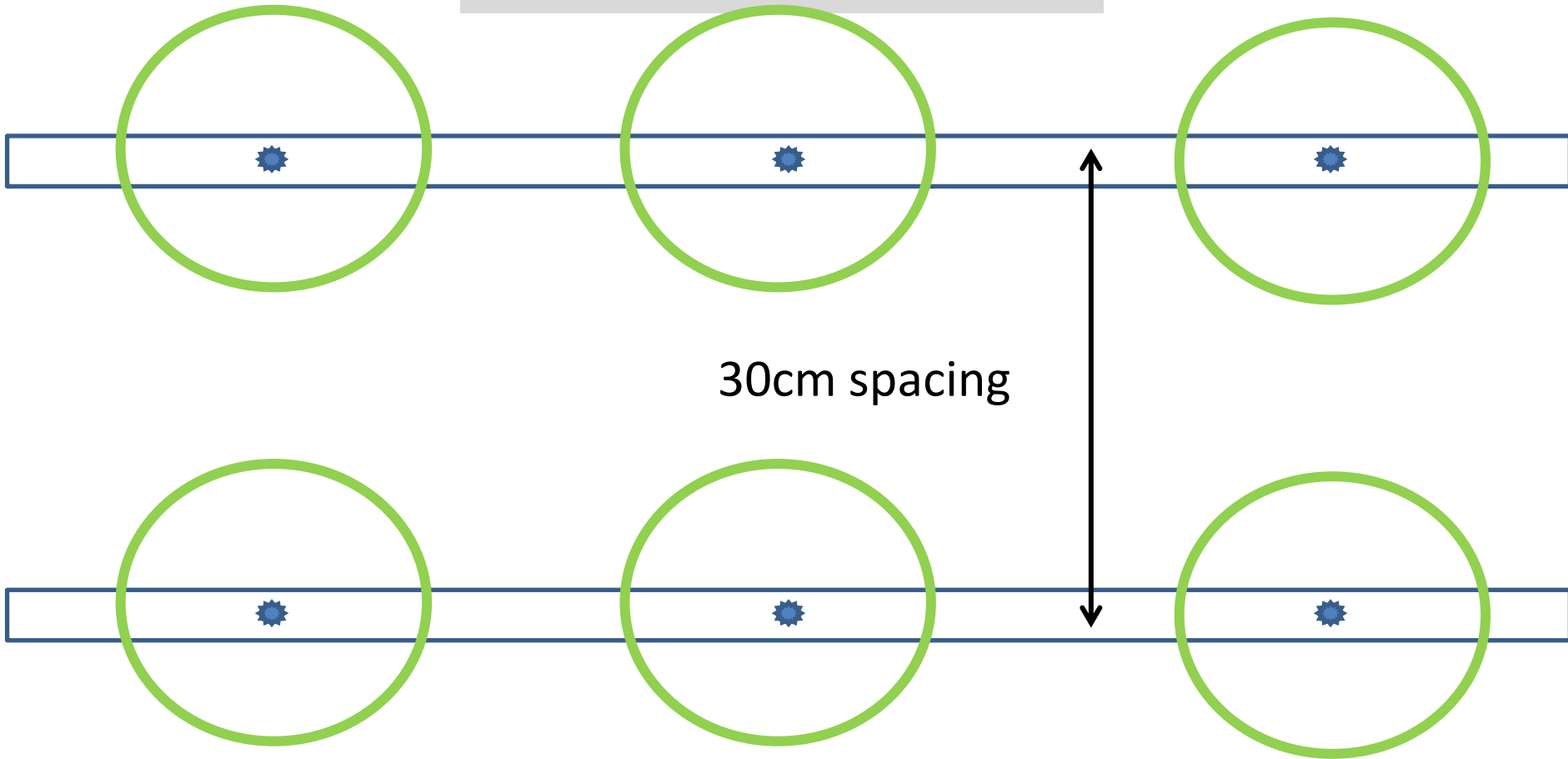
< to next border

The pipe / hoses

- Work with a friend, hose is cheaper in longer lengths
- Use 13mm solid pipe for water from tap ~£1 per m (short L)
 - Run supply through garden past everything you want to water
 - Use elbows, t-pieces and joiners to make a network
 - Can use wall clips and stakes to secure the pipe in place
 - The 13mm supply pipe can be buried up to 5cm or covered with mulch
- From the 13mm supply pipe use 4mm pipe to water plants
 - It is highly flexible and UV resistant and connects to the 13mm supply pipe with micro tube adaptors
 - Emitters (drip hose, drippers, sprinklers) connect to the 4mm supply
- Can also use 13mm drip pipe where extra capacity needed (as for the larger border - later)

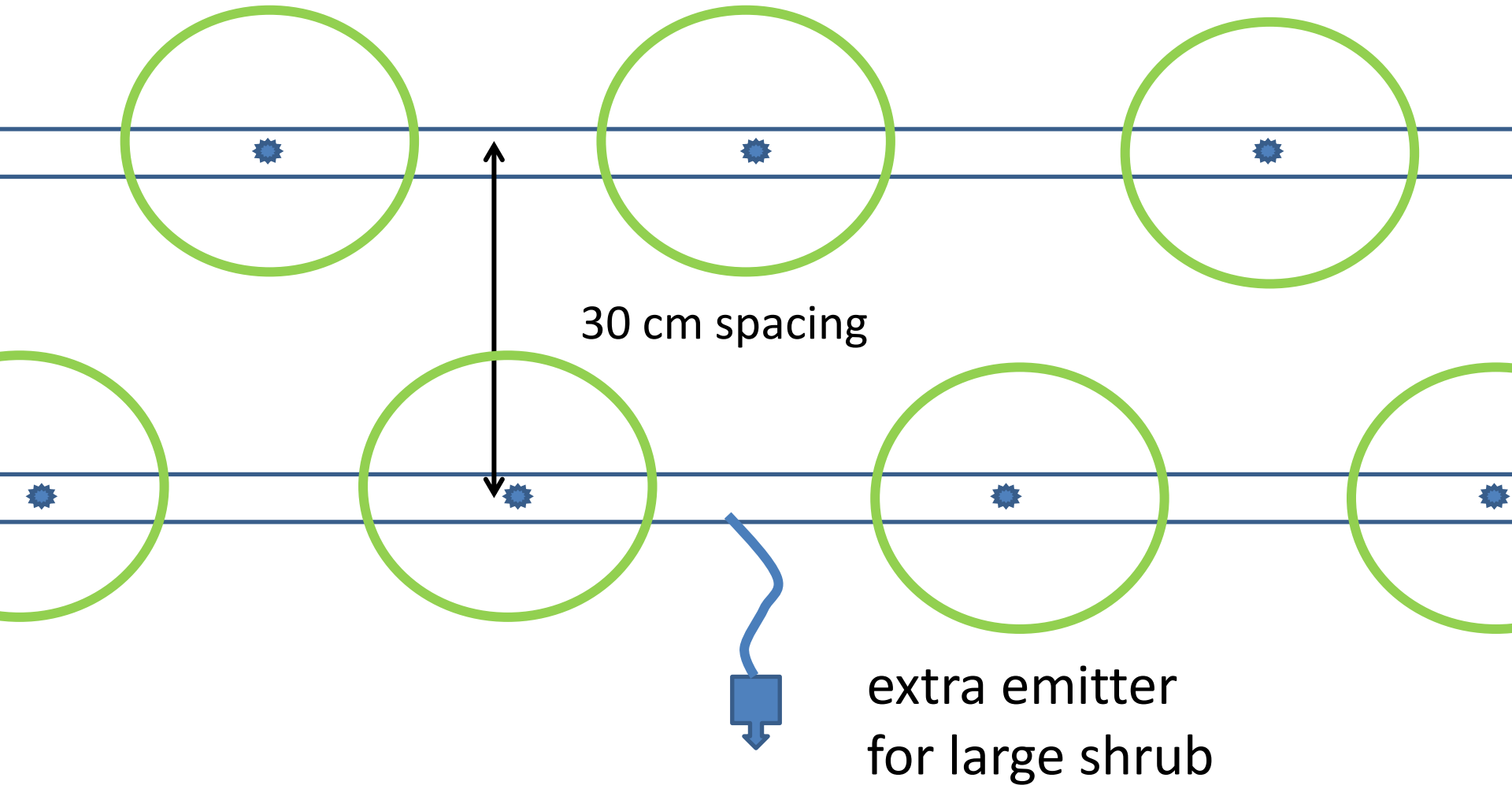
Drip Pipe Spacing

Poor Layout



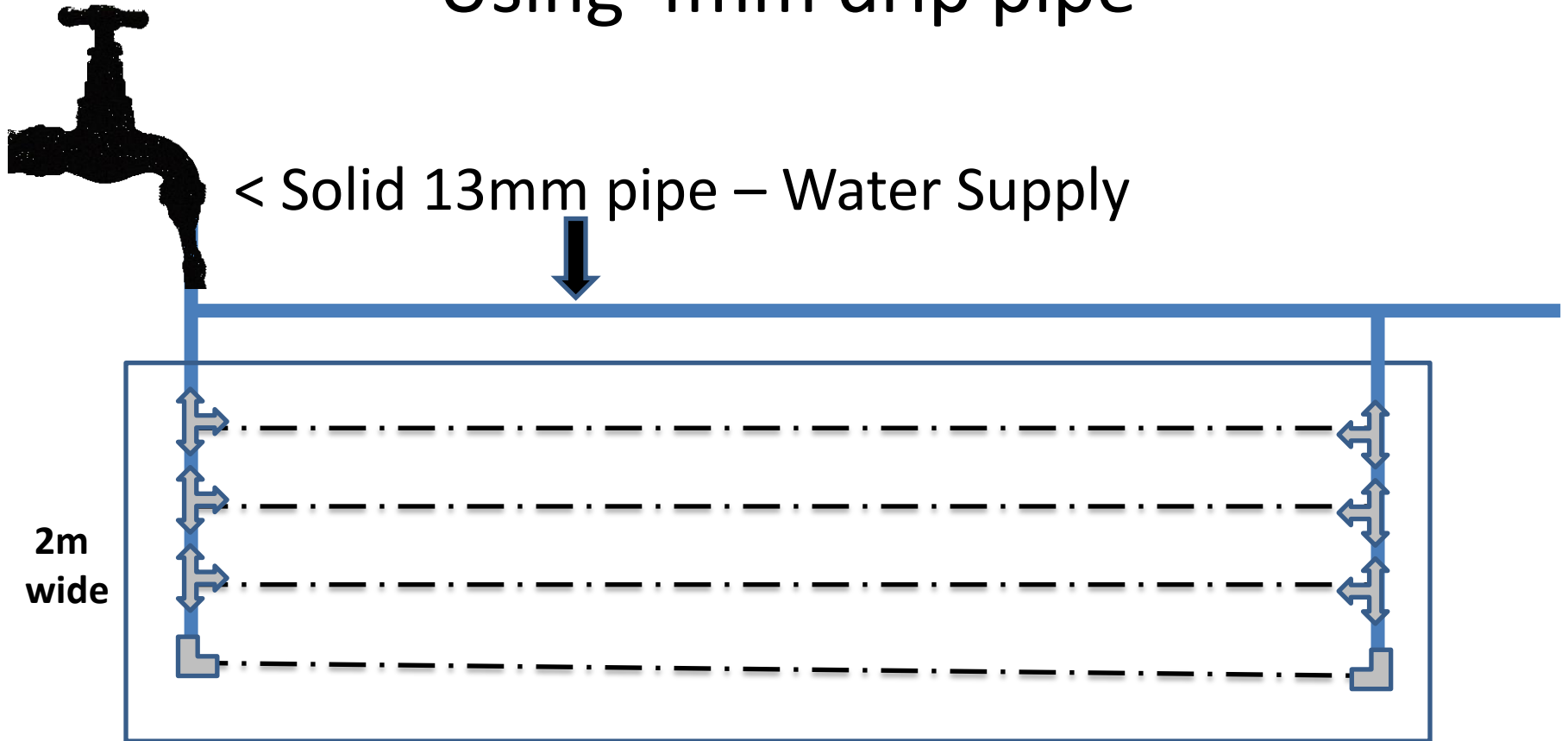
30cm emitter spacing, plant spacing average 30cm spacing

Better layout



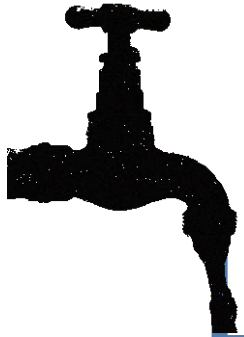
Border upto 10m

Using 4mm drip pipe

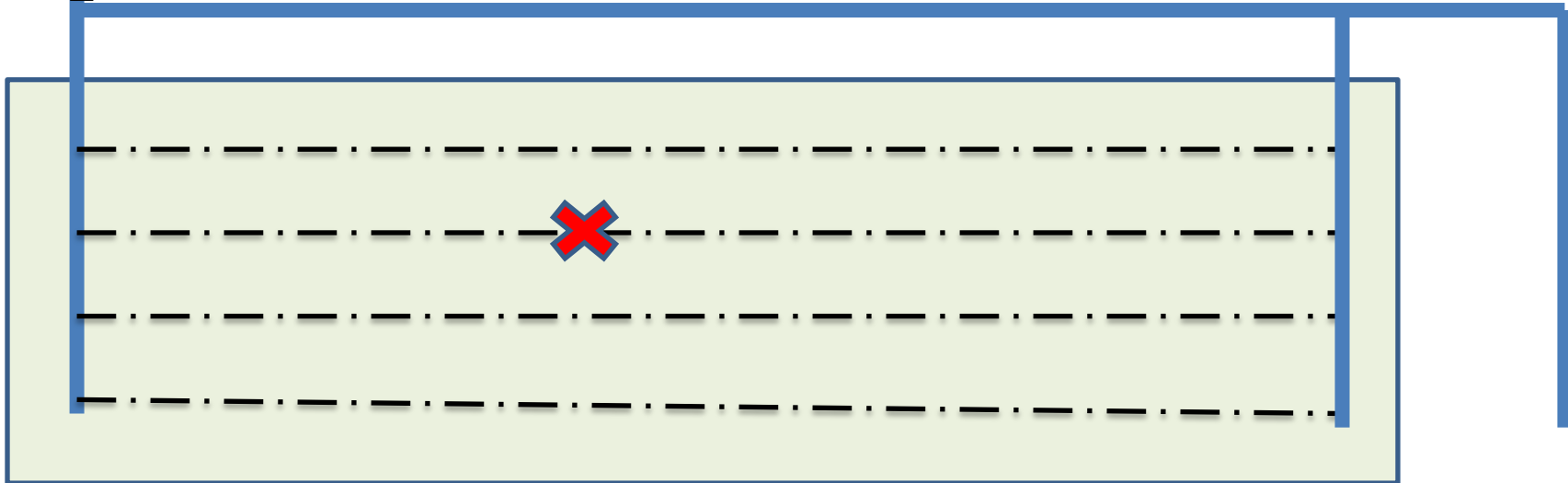


Use supply pipe to feed both ends
and equalise water pressure in all pipes

Looping the pipe balances water pressure
and overcomes blockages



2m
wide



13mm Supply – 4mm Drip in grid



Far End Loops Back



Using 4mm Drip



Three loops of 4mm drip
(now 4 loops but covered with mulch)



Hole Punch £2 - Demo



Hole Punch



Hole Punch £8.99



Note – Extra ‘hand watering’

- Seedlings and some vegetable plants will need to be watered daily for a short period
- Also newly planted shrubs and perennials , especially in hot/dry conditions
- Additionally annuals and some repeat flowering perennials will need regular feeding in addition to watering

Connecting to a garden hose

Also need garden staples to hold tube in place

The 13mm pipe can be connected to a standard garden hose

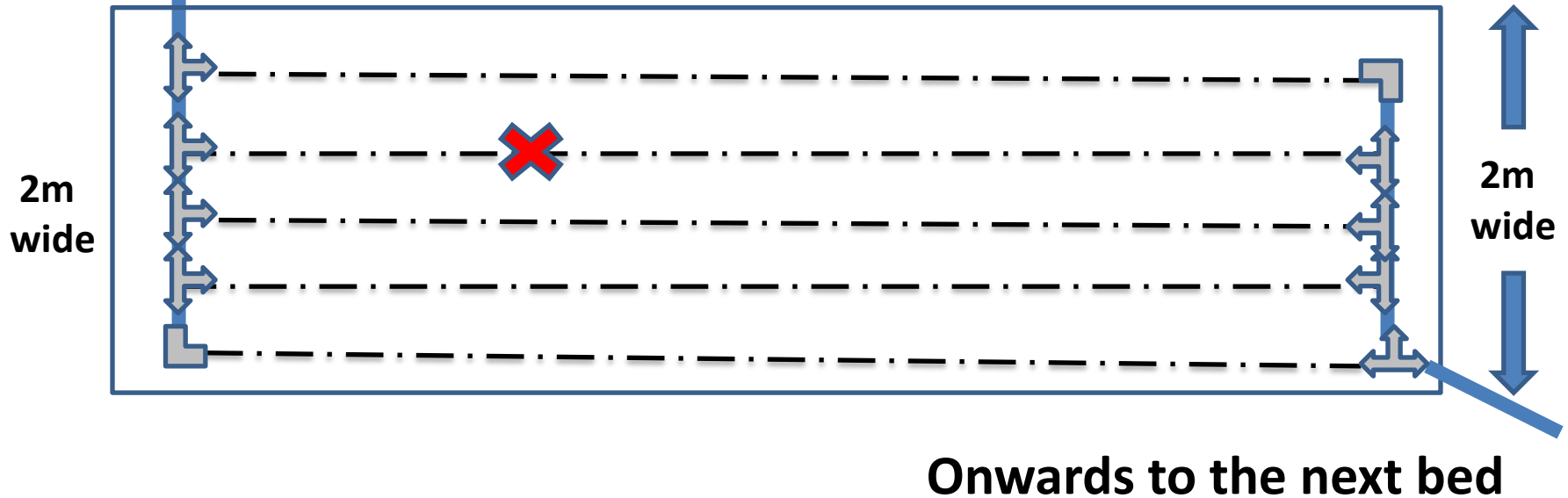
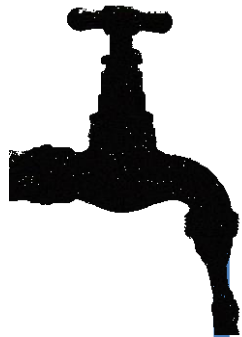
Permanent fixing
or plug in

demonstrate

Irrigation for larger borders

Using 13mm drip pipe bridge ends, to form loops to overcome blockages

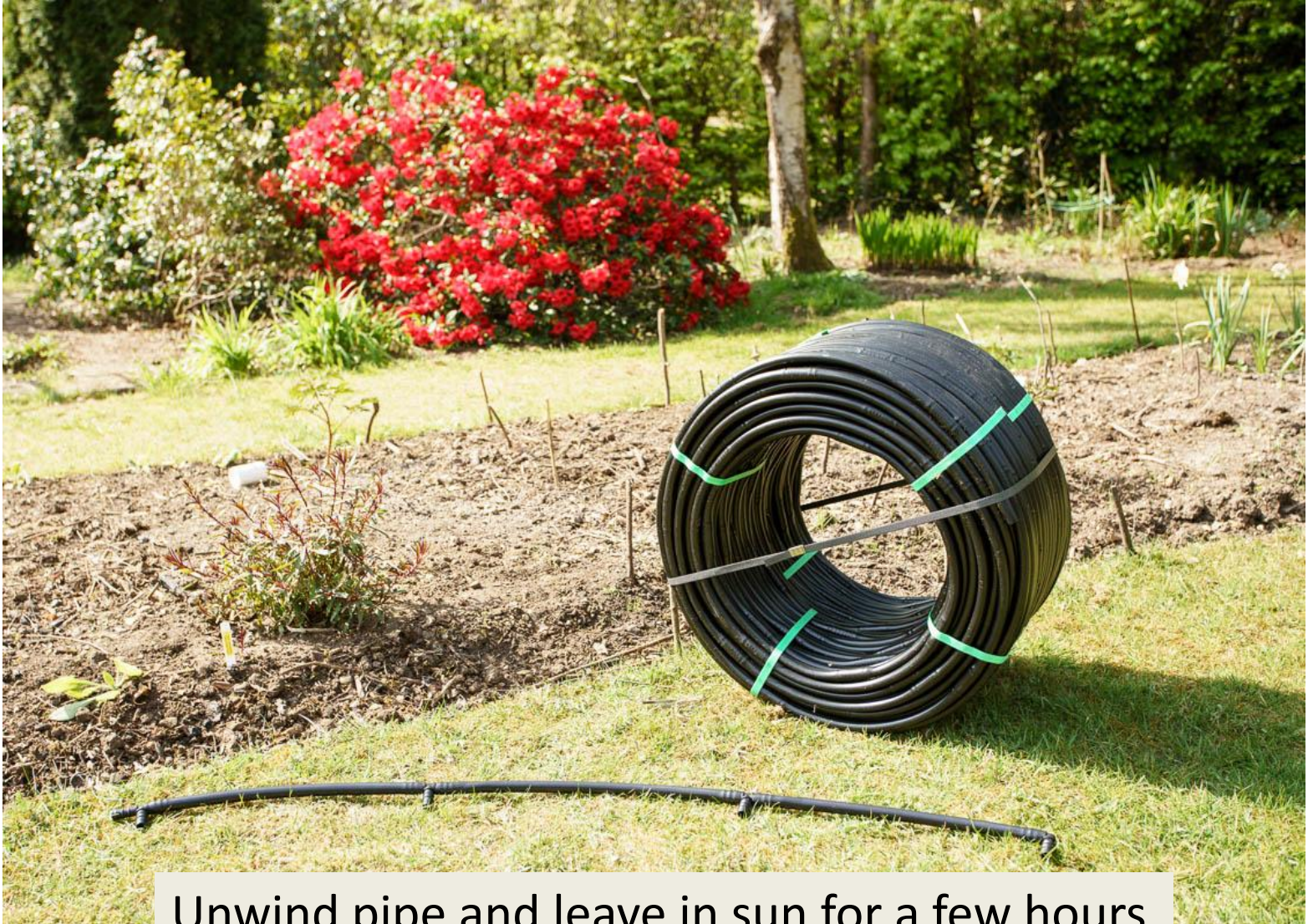
< Solid 13mm pipe – Water Supply



8m by 2m wide border



13mm Drip Hose



Unwind pipe and leave in sun for a few hours

Pipe ends should be heated before attempting to fit connectors





12th April 2020

When complete can hide pipes with mulch

The planting in the border a 5th tube



Watering for 15mins twice a week OK
but needed 3 times during August heatwave

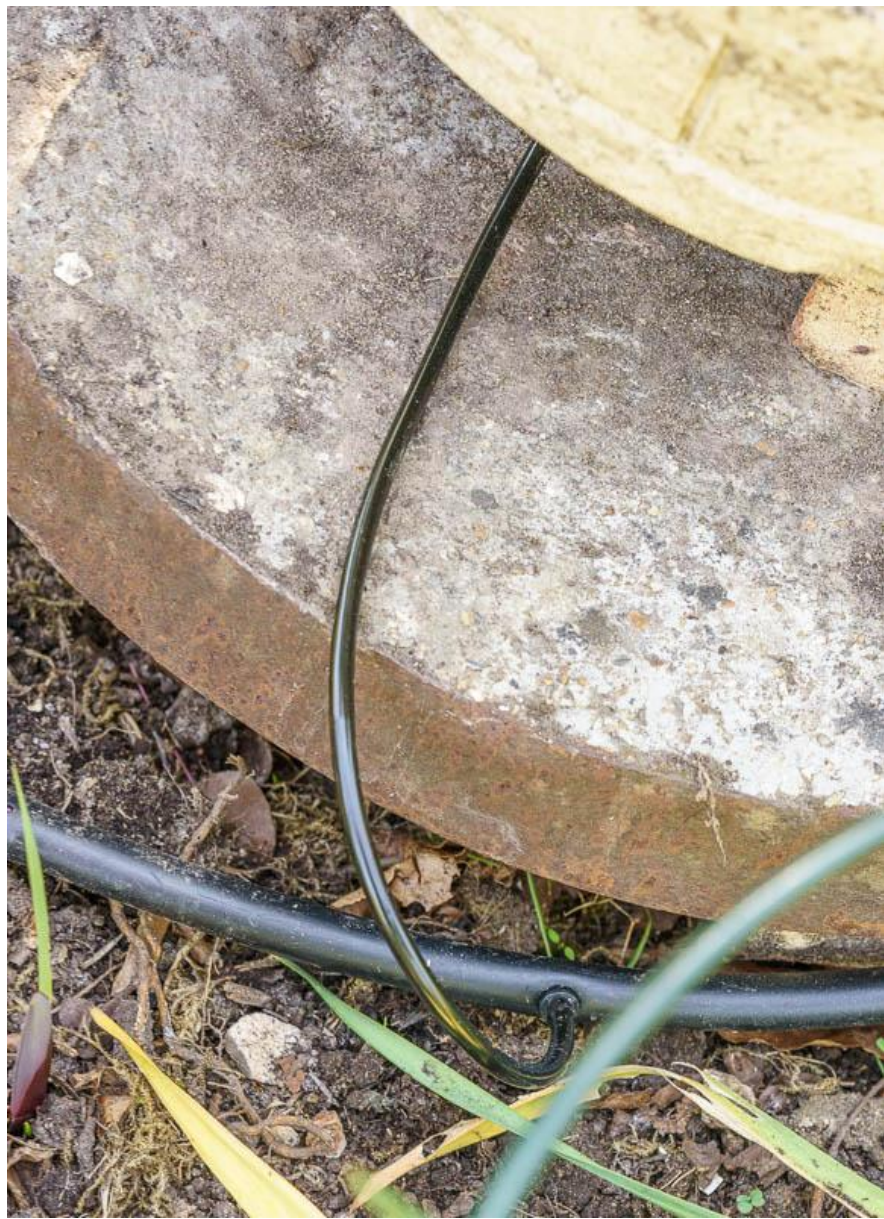


24th July 2020

Pots



Run 4mm blank hose through pot drainage hole and attach drip hose with emitters around pot edge



Drip pipe in pot



I used a loop with 3 emitters so 6 lph – needed 4

The Pot in Early July

The 3 emitters provided enough water initially to keep the plants growing on 2 waterings and a weekly feed



The Pot in August

By mid July the pots were not receiving enough water and needed daily watering. Pots dry quicker than borders



Watering Pots in Borders

- Generally, pots are going to need watering more frequently than borders
- Ideally you would connect them to a separate irrigation loop that can be run independently of the border irrigation
- Pots in borders provide height and additional interest from dense planting; attaching these to the border irrigation was simple and saves me doing 2 or 3 pot waterings a week.

Emitter for Hosta 'Sun Power' needs extra moisture



Trees and Shrubs



Where trees and shrubs are too far from a drip line or need extra water, run emitters on 4mm hose from 13mm supply tube

Extending the system



4mm drip hose wrapped around a Ginger plant at "leaf extant" provides water. Avoid watering the trunk or stems of shrubs and trees – fungal spores

Cost for the 2 beds

- **13mm System**

5 x 8m drip = 40m

100m drip pipe £52

(I got 200m 13mm drip £80)

Hozelock Supply Hose 25 m £20

bought 100m £60 with 50 fittings

- **4mm System**

5 x 5m drip pipe = 25m

30m 4mm drip pipe £15

(I bought 300m 4mm £29)

For rest buy a kit (Amazon)

£20



How Much Water? How Often ?

- Use of a pressure regulator ensures the water from each emitter is always at the same rate, but not important for small borders, but turn tap down halfway
- There is some folklore that watering should provide an inch of water over the root ball

How Much ? How Often ?

- On the Hozelock website, it says
 - many plants need an inch of water when watered
 - and they need this twice a week to thrive

How Much Water? How Often ?

- On the Hozelock website, it says
 - many plants need an inch of water when watered
 - and they need this twice a week to thrive
- On my poor soil when very hot, some plants need watering every other day or even every day
- I only water the plants when they are in flower and the soil is dry

- How long to run the system for depends on your soil and the weather but 15 minutes is a good starting point, will give 1 inch of water per 2 litre dripper
- Turn tap on for 15-20 minutes twice a week watering done !

Water is the driver of Nature

Leonardo da Vinci

Questions