

# Drip Kits and The Futurepump SF2

## What is drip irrigation?

Drip irrigation is a type of micro-irrigation which aims to reduce 'hit-and-miss' watering by delivering water directly to the roots of plants. It does this by using specialised hose pipes with emitters (small holes or nozzles) along it that 'drip' water out. It is designed save water and nutrients by minimising evaporation and run-off.

## Types of drip irrigation

The components required for drip irrigation are:

- A pump or pressurised water source (e.g., raised tank)
- Distribution lines (drip tape)
- Emitters to manage the flow of water from the pipe



Drip irrigation systems vary depending on the water source, distribution pipe sizes and the types of emitters fitted on the drip lines.

Most common are drip lines which emit 1-2 L/hr. These require a minimum pressure of 2m head (0.2 bar) to operate.

## Drip kits with the Futurepump SF2

It is common for people to use drip irrigation with their SF2. Either coupled directly to the pump, or with a raised tank.

With a typical drip system, you can expect to irrigate up to 300m<sup>2</sup> in one go or 900m of drip line with an SF2 coupled directly. This will give enough water to your crops in 0.5 to 1 hour depending on the sunshine levels and specific plant water requirement.

Although the SF2 works well coupled directly to drip irrigation we also recommend using drip irrigation in combination with a raised tank. This



set up allows more flexible timing of irrigation (not dependent on the sunshine) and an equal amount of pressure given to the drip system. You can use your solar pump to fill the raised tank then run the drip from the tank tap.

If you do use a direct connection between the drip system and the SF2 pump, please be aware that changes in solar radiation will cause fluctuations in the pressure and output of the emitters.

## Calculating drip system size

We wanted to show an example of a drip system calculation, you will see this below. To work out your own system size requirement, you will need to know:

1. Distance between emitters
2. Dimension of beds
3. Drip lines per bed
4. Pump or tank flow rate

Example:

On a farm, drippers are laid on planting beds – we have the following information:

- Bed dimension: 20m x 1m = 20m<sup>2</sup>
- Drip lines per bed: 3
- Distance between emitters: 30cm
- Using SF2 directly, flowrate: 3000L/hr

You can determine the number of emitters per bed by multiplying the bed size by the number of drip lines and then dividing by the distance between the emitters.

$$\frac{20m \times \frac{3 \text{ lines}}{\text{bed}}}{0.3m/\text{emitter}} = 200 \text{ emitters/bed}$$

The flowrate of the SF2 at 2m head is 3000L/hr – this is suitable for 3000 emitters (assuming 1-2 L/hr per emitter). This means the number of beds that can be irrigated is this divided by the number of emitters needed per bed:

$$\frac{3000 \text{ emitters}}{200 \text{ emitters/bed}} = 15 \text{ beds}$$

The total area that can be covered by this drip system directly coupled to the SF2 on this farm is 20m<sup>2</sup> x 15 beds = 300m<sup>2</sup>.

## Drip System Case Studies



*Peter in his greenhouse full of strawberries*

### Peter – Irrigating a greenhouse, Kenya

Peter uses the SF2 Solar water pump to fill a 10,000-litre tank, which takes about 4 hrs. He is irrigating a  $\frac{1}{4}$  acre greenhouse with 2200 strawberry and capsicum plants, via 2200 emitters. Each emitter on his drip lines emits 6 L/hr, which drains the tank in about 45 mins.

His farm has three overhead tanks and a total of three acres under drip. He uses the SF2 for the greenhouse and an electric pump for the rest of the farm.

### Ann – Irrigating vegetables, Kenya

Ann has about  $\frac{3}{4}$  acres of land and is using drip lines to irrigate her vegetables. She has four tanks, two x 3000L tanks and two x 1000L tanks.

A 3000L tank fills in about two hours. She is almost constantly filling and emptying the tanks via 10 blocks of drip lines controlled by valves. One block is 30m \* 8m = 240m<sup>2</sup>. The water is drained from the 3000L tank in about one hour for one block. During the day she irrigates two greenhouses, while during the morning and evening she irrigates the plants in the open field.



*Left: overhead tank and greenhouse; Right: Cabbages set on beds*

## Aduda – Irrigating strawberries, Kenya

Aduda has about an eighth of an acre of land, where he is growing strawberries. He had divided his land into three blocks for his drip irrigation, each controlled by a valve.

It takes about two hours to fill up his 3500L tank with the SF2 solar water pump. He irrigates the blocks each for 20 mins which drains the tank in an hour and each plot is irrigated.



*Strawberries irrigated with drip lines on Aduda's farm*