



Commercial rockmelons grown in the Hydrotray Single Autopot Systems.



Warrnambool

Commercial tomatoes grown in the Hydrotray double Autopot Systems.



Hydrotray Single is also ideal for growing large types of Cymbidium orchids.



A 2 year old Babaco tree growing healthily in a unit of Hydrotray Single 12' pot.

Hydrotray Single Instruct / Updated Friday, August 01, 2008



# HYDROTRAY SINGLE 12"

## Operation Instruction



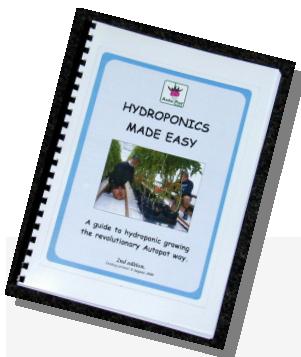
## BOOK AVAILABLE

"*Hydroponics Made Easy*" was written in response to the many requests from users of the Autopot Systems.

Some wanted a good understanding of why Autopot Systems is so different to conventional hydroponics.

Others wanted to know how we managed to avoid many of the trials and tedious procedures that are basic to conventional hydroponic systems such as flushing.

The rest, simply wanted to know how to get the best out of their Autopot Systems and only a couple of existing books explain it.



## Autopot Systems

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Braeside, Melbourne, Vic 3173, AUSTRALIA.  
Ph: 03-9701 8811, Fax: 03-9701 8822  
Email: autopot@bigpond.com

## Hydroponic Solutions

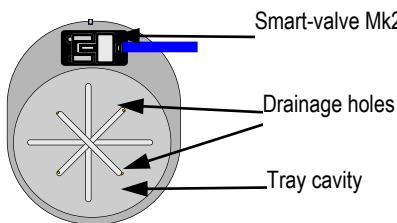
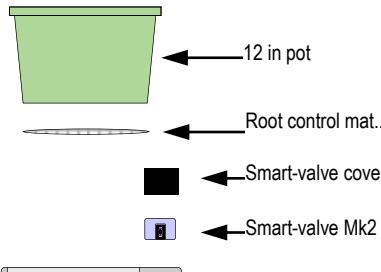
Unit 1, 1928 Beach Rd  
Malaga, WA 6090, AUSTRALIA.  
Ph: 08-9248 1901, Fax: 08-9248 1902  
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## THE MAKE UP OF HYDROTRAY SINGLE

The Hydrotray Single 12 inch comes installed with the following parts:-

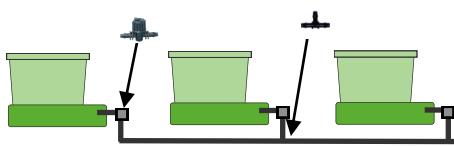


- the tray
- the Smart-valve Mk2 and cover
- the Marix root control mat glued to the cavity
- a short length of 4mm tubing and a tap
- a 12inch pot with a piece of Marix root control mat.



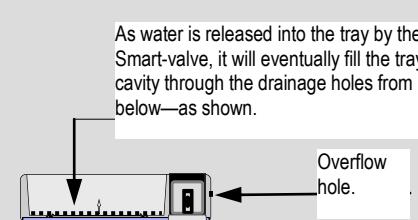
## Setting Up The Hydrotray Single

Extending the system is simple - several units can be fed from a single reservoir. We recommend to feed not more than 4 units from a 30 litre Hydrotank.



## HOW THE HYDROTRAY SINGLE WORKS

It is important to know how the Hydrotray Single 12 inch works so that it is used correctly and that you will get years of good outcome from its use.

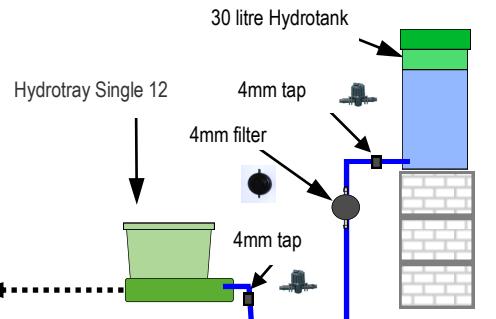
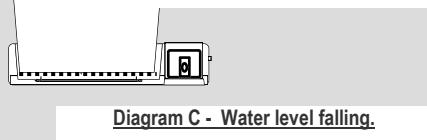


**Diagram A - showing rising water when the Smart-valve Mk2 is opened.**



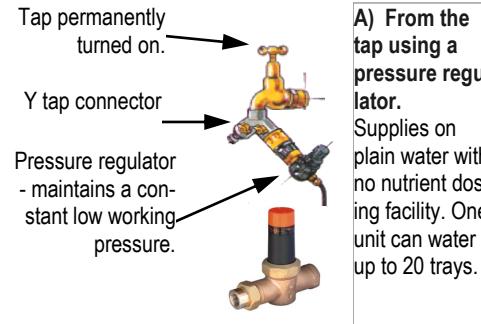
**Diagram B - showing maximum water level is reached and the Smart-valve Mk2 is closed.**

As water is used up by the plant, the water gradually declines while the Smart-valve Mk2 still remains closed until the water level falls below the bottom of the tray cavity (as shown in diagram A).



## DIRECT WATER SUPPLY

You have two other options in getting water supply to the trays :-



## PLANTS YOU CAN GROW

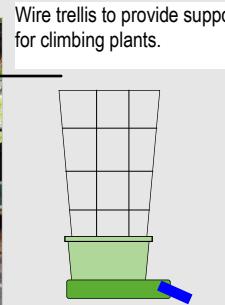
You can grow as many

Hydrotray Single is well suited for growing larger trees or root crops.

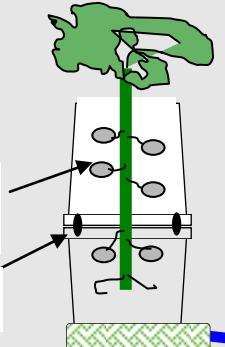
You can grow almost any plant in the Autopot Systems.

To name a few:-

- carrots (up to 50 in a pot)
- corns (up to 8 plants)
- large Cymbidium Orchids
- tree ferns (Cyathea)
- Calla Lilies
- Geraniums & Perlagoniums
- Cane begonias
- Dwarf fruit trees.



## GROWING POTATOES USING THE AUTOPOT 12" TRAY.



## FILTER SERVICING

It is recommended that the filter to be back-washed every 2-4 weeks. More often if water quality is poor.

To disconnect the filter from the tubing, soften the ends of the tubing with hot water or a lighter to make the job easier. **Caution – Forcibly removing filter from the tubing without heating will cause damage to the filter.**

To back flush, use your garden hose to feed water through the filter from either direction. Spares are available from your supplier.

## Root Interference

The Marix root control mat should prevent, for most plants, roots from growing out of the bottom of the pot. However, if the roots still grow through the pot, you can cut off the roots only when necessary. Root pruning will not cause any harm to the plants.

The Marix root control mats also keep the tray free of particles such as perlite entering the tray.

## FLUSHING THE POTS

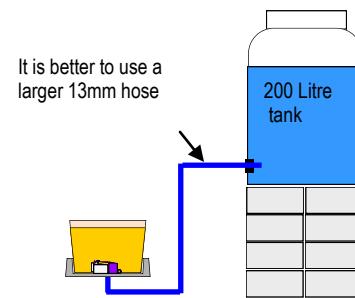
Auto-Pot Systems is different from others when flushing is concerned. It is better not to flush within a crop cycle. There will be salt built up in the growing medium but this is only confined to the top 20mm. This zone is too dry for the roots to survive and as such salt built up here has no effect on the plant.

Should you decide to flush, it must be done regularly (with 2 litres of water per plant) at fortnightly intervals. Or else, flushing say after two months of growth will cause severe root damage to the plant. This is because salt from the top 20mm of the growing medium had been washed into the root zone. Replace growing medium after each crop.

## TAKING A LONG VACATION

A week away is no problem but if you are planning an extended vacation you may wish to take special precautions.

Use a large tank. Say a 200 litre (50 gallons) tank would be ideal.



## WATER CONSUMPTION GUIDE

Water consumption of a plant varies from day to day influenced by the weather conditions. A full grown tomato plant, in a normal Summer day, consumes around 1.5 litres of solution a day. This can increase to 4 litres on a day when it is very windy with air temperature in the 40's. If you have two mature tomato plants growing in a Hydropak kit, be prepared to expect that a full reservoir tank of 30 litres of solution may lasts only 4 days!

## TROUBLE SHOOTING

Very little can go wrong with the new Smart-valve Mk2. It has undergone years of testing before we finally arrived at this design – which is a new invention in its own right.

If the valve does not allow nutrient to flow, the most likely problem is a blockage in the valve. To clear blockages, remove the valve from the Hydrotray. Take the bottom float out and clear off all debris that have accumulated over time.

Clear the orifice with a small piece of wire and hose the dirt off, preferably under some pressure.

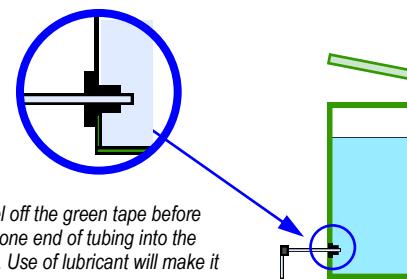
## STEP BY STEP INSTALLATION

### 1. Positioning the tray

Keep the tray level. The growing unit can be located under cover or outdoors. Most plans will prefer full sunlight.

### 2. Connecting to the Smart-valve Mk2

The unit comes with the Smart-valve Mk2 and cover installed in position. All you need to do is to connect the free end of the 4mm tubing to the filter and the tank.



### 3. Positioning the tank

Ideally, the tank should be placed more than 2 feet higher than the tray at a convenient height for refilling.

### 4. Connecting to the filter

Cut the tubing about 6 inches from the tank and push fit the filter. The filter works either way and so it can be connected to either end. It is recommended to connect a 4mm tap after the tank before the filter and another one before the tray.

## GROWING MEDIUM

With the AutoPot Systems, you are not confined to Perlite as the sole growing medium. You can use anything from perlite to vermiculite, potting mix, rock-wool etc or the above mixed at different ratios.

If a tray system that is out in the open affected by regular rainfall, it will benefit from a surface dressing of fertilizer (as as slow release fertilizer like Osmocote or poultry manure) to counteract the diluting effects of rainwater on the nutrients in the pots.

Use whatever material (preferably available locally) that gives you the best results.

## FILLING THE POTS



First insert the MARIX root control mat to the bottom of the pot before filling it with growing medium. The use of other types of pots are not recommended as they tend to have large drainage holes which allow the growing medium to get through. This can cause problems.

## PLANTING

First, saturate the growing medium in the pots with 1 litre of nutrient solution drained from the tank.

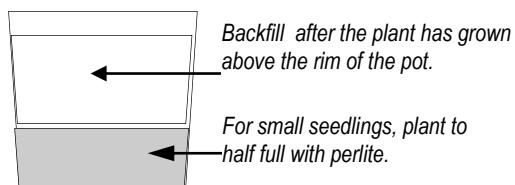
Plant as deep as possible. If the seedlings are too small, use half the amount of growing medium and then plant. Backfill later as the plant have grown taller.

With the Auto-Pot Systems, there is no need to remove potting mix from the roots of the seedlings before planting. They will recover faster as the this practice minimizes root damage.

The nutrient solution will not be affected by the presence of potting mix in the growing medium simply because Auto-Pot Systems is a non-recycling system.

After completion of planting, replace the lid on the tray.

**NOTE: When connecting or disconnecting 4mm tubing to the joiners, always soften the tubing ends with warm water or use a lighter.**



## PREPARING THE NUTRIENT

Follow the instructions on the labels of the nutrient bottles. For standard mix - 5ml of part A and 5ml of part B nutrients in one litre of water.

Fill the tank to half way before adding the nutrients to the tank as recommended and mix thoroughly. Top up the tank to the 30-litre mark.



**CAUTION – DO NOT MIX THE PART A AND PART B NUTRIENTS UNDILUTED TOGETHER. THIS WILL CAUSE THE CHEMICAL REACTION TO TAKE PLACE AND THEREBY RENDERING THE NUTRIENT USELESS.**

For best results, use Autopot nutrients.

## STEP BY STEP CARE GUIDE

### REFILLING THE TANK

Keep a check on the consumption of the nutrient water. It is best to clean it out when it is nearly empty to reduce wastage. If you are going away, top up to the maximum – 30L mark.

When plants are growing vigorously, fruiting or flowering, you can increase the strength of nutrient by 20 %.

Avoid dissolving powdered nutrients directly into the tank. Most do not dissolve completely thereby leaving some residuals which can cause blockages.

### CLEANING THE TANK

Drain the tank and wash out with a hose. Fill with water, add a common laundry bleach (eg. White King) and leave it for 10 minutes. Drain and rinse well. Refill with nutrients as described earlier.

Repeat this after each crop. More often if you do not have good quality water.

### CLEANING THE TRAY

The tray need cleaning when it gets dirty over a period of time. To clean the tray, it is necessary to take the Smart-valve and cover out of the tray for cleaning and re-install it back to its original position.

## HOW TO SERVICE THE SMART-VALVE

First, remove the Smart-valve from the tray. This is how it is done:



Use a sharp object like a knife to wedge the Smart-valve cover out of the tray. You need to pry on opposite sides to several times.

When more than half of the Smart-valve cover is being wedged out, it can be removed by hand.

Once the cover is removed, you now remove the Smart-valve from the tray.

Reinstalling the Smart-valve and its cover into the tray.

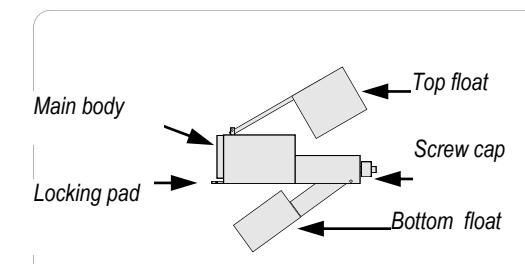


First push the 4mm tubing out of the tubing hole and position the Smart-valve just above the valve cavity of the tray.

Then place the cover over the Smart-valve and grip the cover edge to be able to hold it in inside the cover.

Then push fit the cover into the cavity. You must make sure the Smart-valve has not dropped out of position while the cover is being put in place.

## CARING FOR THE SMART-VALVE



**Smart-valve Mk2**

The valve is a sensitive mechanical device. With careful and correct usage, it will ensure that it works properly for years.

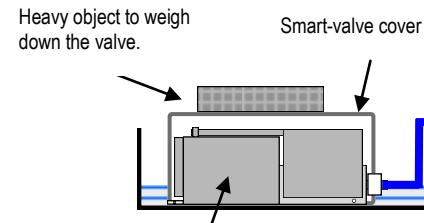
The valve should not be totally submerged in water. Total immersion might cause the valve to overflow due to the possibility of water entering the top float.

### TESTING THE SMART-VALVE Mk 2

You can test the valve yourself to determine if it is working properly.

- get hold of a shallow (around 2 inch deep) container
- remove the Smart-valve and its cover from the tray.
- then place the Smart-valve with its cover into the container and have it weighted down with a heavy object.
- then turn on the 4mm tap and allow the water to flow from the reservoir tank
- after several minutes, the Smart-valve will stop further inflow of water in the container once the water level in the container has reached to a height of 30mm.
- if there is no more flow, then the valve is working

Heavy object to weigh down the valve.



Once 30mm water level is reached, the flow will stop.

## How does the Smart-valve work

It is important to have an understanding on how the Smart-valve works.

The Smart-valve is the heart of the system. It is small enough to fit on the palm of your hand. Its appearance is simple but its performance is incredible. Being simple enables it to be a low cost item making it practical to have one valve for each individual container and this is the very crux of the system's versatility. It is different from a conventional ball cock float valve because it allows total reduction of the fluid level before it refills. To be able to perform such tasks automatically without any electrical or electronic component is truly amazing

When connected to a water supply (either from a pressure-reduced mains, a gravity tank or a pressure pump) the valve opens to allow water to flow and fill the bottom of the growing container to a pre-determined and pre-set depth (about 30 mm). The valve then closes thereby shutting off the water supply from the tank. The plants intake of the water is absorption by capillary action that naturally occurs in the growing medium. Once the water has been used to the extent that the film of water under the valve has gone, the valve re-opens and allows another supply of water to enter the hydrotray. This is concludes one wet and dry out watering cycle controlled by the plants.

