Growing Food Crops in Pots

www.underthechokotree.com
Sustainable Living in the Suburbs

By Nev Sweeney

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1.0 Introduction

1.1 Pros and Cons of Growing Food in Containers

There are a whole stack of good reasons (and a few bad ones) why growing your food in containers is a great idea. In some circumstances it may be the only option, but it really makes sense. Here are some pros and cons to think about –

Pros

It is easy to start small – When I first came across the idea of growing food, I got very enthusiastic, way beyond my skill level and resources. I dug over a large area, planted it and then life stepped in and by the time I got back to it, it was a huge weed patch. Putting a toe in the water of food growing by assembling a few productive containers would have made much more sense! If you are just starting out, it will make sense for you too!

Perfect for small urban spaces – We are lucky in that we have a 600m2 block, and this is becoming increasingly rare (and expensive), but you don't need a huge area to grow your own food if you make the most of what space you have by growing your food in containers.

They can be moved easily – This pro has a number of points in its favour, because you can move your plants around to find the microclimate that suits them best, in and out of the sun (depending on temperatures and time of day), or to a damp or dry area. Growing your food in containers also means that you can take them with you when you move. This can be a huge advantage if you are renting.

Expands the range of plants you can grow – You are not limited by your soil type, or soil pH etc, you can alter your growing medium to suit the plants you want to grow, whether they need good drainage, or a more solid clay soil, neutral pH (as most veg does) or a bit more alkaline or acid (like blueberries). You can grow what you want by tailoring things to your plant's needs.

Ideal where soil is poor, or non-existent – If your soil is one of the three ‘C’s (Contaminated, Concrete or Crap) growing your food in containers is the ideal solution. Even if you choose to remediate your soil in the long run in the short term you still can produce homegrown food. The same goes if you only have a balcony to grow on, or a paved courtyard or roof top terrace, you don’t need access to soil to be able to grow food!.

They look nice and can be arranged artistically – If you want to grow food but also want the aesthetics to be right for you, growing in containers gives you the flexibility to arrange your crops so they look nice as well as being productive, then rearrange them if you are still not satisfied.

Plants with different needs can be grown side by side – Thirsty tomatoes can be grown beside drought tolerant mediterranean herbs, carrots can be grown in fine soil next to shallow rooted crops like lettuce or silver beet do well in a soil that retains moisture. You are not limited in they way you would be if growing in a veggie bed.

Plants that can take over may be kept in control – Some food plants can tend to take over the veg patch like Jerusalem artichokes, mint or garlic mustard, but by growing them in pots you can stop them escaping, moving into your house and kicking you out!

When plants finish cropping, they can be removed and replaced easily – there is no need to spend time and effort digging them out, just remove them from the pot, replace your potting medium and you are ready to go again.

Growing food indoors – In the right situation (plenty of light) some crops do very well when grown indoors in containers. Crops like tomatoes, eggplant and chillies (choose compact bush varieties and place near an open window – they are wind pollinated), herbs and some spices like lemongrass will thrive inside your house.

Crops in pots can be kept close to the house where you can keep an eye on them - checking regularly to see if they need watering or have developed any pest of disease issues is much easier, remember - 'the best fertiliser is the gardener's shadow'

They are easy to access – If you are, how shall I put this, more mature in years (like me), having easy access to your crops by growing them in containers with an elevated situation such as on benches, shelves or in a planter box on legs. This means you can plant out, harvest, water, weed, check for pests and diseases all without bending over. That must be a win!

Cons

Frequent Watering - Probably the biggest 'con' of growing food in containers is the need for frequent watering as they dry out more quickly than when grown in the soil. This is made worse if unglazed terracotta pots are used, because they are porous and can wick moisture from the soil and allow it to evaporate. Some fixes for this are mulch, self-watering pots, and small ollas.

The Growing medium can become hydrophobic – If the dryness is allowed to continue for some time, the soil can get to the point where it actually repels water, becoming hydrophobic. What this means is that when the container is watered the soil will not absorb the water but allow it to run straight through and out the bottom of the pot. This makes you think that it is well watered but it is, in fact, still dry. There are fixes for this, like totally soaking the pots in water, watering with an appropriate surfactant or growing in self-watering containers.

Need to keep a closer eye on the plants – Because the containers don't contain the soil volume you would get from growing in the ground, their circumstances can change quickly, like drying out, running out of fertility, overheating on a hot day or being blown over on a windy day. For these reasons they do require more attention than crops grown in the ground.

Insect pollinators may not make it to your pots – Depending on where you are growing, such as indoors or on a high balcony, insect pollinators may have trouble pollinating any of your crops that need insect pollination. A way around this is to hand pollinate, or grow crops that don't need pollinators to be productive.

Yields can be smaller – without a large mass of soil to draw water and nutrients from, plus other environmental factors like overheating, the yield from each plant may be reduced, so you might need to plant more of each one to make up for it.

Hopefully the 'Pros' have gotten you interested and the 'Cons' haven't put you off too much, to give growing your own food in containers where you live a go, it is totally worth it!

1.2 Basic Vegetables in Containers

If space in your yard is limited or if you live in a flat it is still possible to produce some food by growing vegetables in containers. My brother grew tomatoes , onions , lettuce , silver beet , broccoli and cabbage on the balcony of a one bedroom flat in Cabramatta. His main problem was lack of sunlight due to the position of his flat on the block. If you have any reasonable access to direct sunlight you can grow vegies. My daughter and son-in-law also grow veggies in the miniscule back yard of their town house in Emu Plains. They grow lettuce, tomatoes, herbs, onions and even watermelon, all in homemade containers.

THE CONTAINERS

There are many containers that can be used to grow vegies, the main considerations in their design are –

1. The container should be deep enough for the crop to be grown, preferably 20 centimetres minimum.

2. It should be strong enough to hold the mass of soil, water and vegetables and not fall apart. Needless to say it must also withstand being regularly watered so waxed veggie cartons won't work but polystyrene foam ones will.

3. There should be holes in the bottom to allow drainage. Although self-watering containers called Earth Boxes can be made that will allow water to be added to a reservoir which keeps the soil moist and the veggies happy. Earth Boxes are the subject of another article.

Some examples of potential veggie planters (some requiring drainage holes to be drilled) are –

-Plant pots, preferably 14 cm in diameter or larger .
-20 litre steel or plastic drums.
-Home made wooden boxes, or any other wooden boxes for that matter.
-Empty food tins.
-Garbage bins, plastic ones are lighter, cheaper, won't rust and will absorb some heat from the sun (Good in winter, bad in summer).
-buckets

THE SOIL

The soil used for container growing must retain moisture while being well drained and be fertile , if you don't want to have to keep feeding your plants with fertilizer . To obtain the best results any old soil is not good enough. Rich, friable garden soil is a good base though ,to which coarse sand and compost can be added. Try mixing together one part each but experiment to find the best mix for your situation. Other additives available from nurseries such as perlite for drainage and aeration or vermiculite for water retention can be incorporated as required. Cocopeat (horticultural coir) also helps with water retention and keeps the soil friable and free draining too.

If after all this effort , you do need to feed your vegies to get the best out of them , the best way is with small regular additions of liquid manure. Liquid manure is made by soaking chook, sheep, horse or cow manure (or a mixture)in a hessian bag in water for a couple of weeks in a closed container (think of it as an enormous tea bag!). The resulting brew is then diluted to the colour of weak tea, and then applied to the plants in your container garden and watered in . As previously mentioned the rule is : a little and often .

THE VEGIES

Most vegies can be grown in containers and half a dozen two metre high corn stalks on your balcony could look very decorative , but some varieties put up with it better than others . As far as possible only open pollinated (ie non-hybrid) varieties should be used otherwise you cannot grow from your own seed. Following are vegetables and varieties suitable to container growing.

CABBAGE - Earliball ; Sugar Loaf ; Golden Acre
CAPSICUM - Most varieties can be grown in containers and are non-hybrid.
CARROT - Baby carrots are most suitable eg. Baby Pak , Baby , Amsterdam Forcing or Thumbelina.
CHILLI - As for capsicum .
CUCUMBER - Bush varieties eg. Spacemaster
EGG PLANT - Most varieties eg. Short Tom or Long Purple.
LETTUCE - Cos eg Romaine or Cos Green
- Butter Head eg Buttercrunch or Green Mignonette
ONION - Any spring onion (shallot) variety.
PUMPKIN - Bush pumpkin eg Golden Nugget or Bush Butternut.
RADISH - All varieties are OK.
SILVERBEET - Fordhook Giant
SUMMER SQUASH - Bush varieties such as Early White Bush or Marrow , long white
TOMATOES - Small bush varieties eg Tiny Tim or Small Fry and "Egg" Tomatoes eg Roma.
ASIAN VEGETABLES - Many of these also lend themselves to container gardening for example Adzuki Beans; Pak Choi; Chinese Mustard; Mizuna; Mibuna and Chinese Broccoli.

2.0 Growing Food in Containers

2.1 How we grow potatoes

Back in 2017 when I redid and expanded the western veggie patches, I included a gravel area on the southern end that was in front of the shed, giving it a northerly aspect that I thought would be good to grow stuff, even in the cooler months. To make use of this area I needed to come up with some containers that I could grow crops like potatoes in. My original choice were white 20 litre containers but they were a bit narrow for what I wanted to do, plus over time they start to break down in full sun.

I looked around and found some black 30 litre tubs with a handle on each side at our local cheapo shop, so I grabbed four. These were more of the profile that I wanted, to allow the potatoes to spread out a bit, and because they were black, they would last for many years. In fact, they have been in place for seven years now and look almost no different from when I first set them up, just a bit faded.

Of course, they were tubs and not containers designed for growing things so I had to install drainage holes in the bottom so they would not fill up with water, but this was quickly and easily accomplished with my drill and 18mm spade bit.

I then half-filled them with a mix of compost and potting, placed a couple of seed potatoes, filled the pots up the rest of the way and then added some mulch to the top of the container. I have been growing potatoes in this way ever since, including through winter.

If you want to grow spuds 'up' by planting them in the bottom of the container, then adding more growing medium as they grow to get a larger crop, it is important to start out with a potato variety that is indeterminate as opposed to determinate. Indeterminate potatoes produce their crop along their growing stem, so that they need the developing stems to be covered as the plant grows to produce a bumper crop, they take longer to produce but because they grow up rather than out, they are better suited to small areas like containers.

Determinate potatoes grow to a set height and then produce their crop of tubers without needing the stem to be covered, the produce a faster crop but grow out rather than up so need more space.

Indeterminate potato varieties include ‘Brownell’, ‘Desiree’, ‘Dutch Cream’ (a favourite of ours), ‘King Edward’ ‘Nicola’, ‘Russet Burbank’, ‘Salad Rose’ and ‘Sapphire’
Determinate potato varieties include ‘Carlingford’, ‘Kennebec’, ‘Purple Congo’ and ‘Red Pontiac’.

2.2 Growing Capsicums in Cans

Capsicums do not fit well into our veggie pot rotation, they are slow growers and slow to fruit so by the time they get really going there is only a couple of months left of production time and the bed goes under the chook tractor – frustrating! So we do grow them in other areas of the garden, particularly in the wicking beds in the front garden, but I figured that a few beautiful and productive plants scattered around in recycled is the way to go. The pots will also allow us to extend the harvest by taking them into the greenhouse before the first frost.

We buy our vegetable oil in 3 or 4 litre tins and I decided a good way to recycle them was to used them as capsicum pots. The process was a fairly simple one –
Using a can opener I took the top off the can and washed it out with detergent to remove any remaining vegetable oil, then to make drainage holes in the bottom I used and old fashioned can piercer and pierced a hole in each corner of the bottom of the tin. If I didn't have the can piercer it would be just as easy to drill some holes in the bottom.

To ensure the drainage holes do not get blocked up I threw in about a centimetre of 20cm scoria I had hanging around from a previous project (any reasonable sized pebbles or even gravel would do).

I then filled the tin with my home made potting mix which consists of –

1 part coarse sand,

2 parts compost or worm castings (in this case I used compost), and

3 parts rehydrated cocopeat (AKA horticultural coir)

I use an old Chinese takeaway container of about 500ml but the actual size of the measure doesn't matter, it is the ration of the components that counts, and mixed it all up in the ever useful cat litter tray (bought new for the process, not pre-used by the cats!)

I filled the tin to the top and then dug a hole and planted one capsicum plant (raised in the greenhouse of course) in each tin. I firmed the potting mix down around the roots and added a layer of the scoria rock on top to act as mulch and for visual appeal (i.e. to pretty it up a bit!).

After giving the capsicum cans a good watering the work is done and I can look forward to a nice batch of capsicums in a few weeks, and for me the smell of cooking capsicums means pizza!

Note: It has pretty damn hot around here lately with temperatures getting up above 40C and the capsicums have not been happy. I suspect that the roots are getting a bit warm due to the steel pot so if this happens to you I suggest putting the capsicums under vegetation so that the pots are not fully in the sun, paint the pots white (a shame because I like how they look) or even place them so that they only get morning sun.

Good luck!

2.3 Growing Veggies in Our Courtyard

by Kevin Mechelmans

Why?

So why would you grow your own veggies and go through that much work?
For me personally there were several reasons, I always loved growing things, to ease the financial pressure of living in Sydney, and it's a relatively cheapish hobby which is quite rewarding in the end.

How?

While currently renting a home with a small courtyard the only option was to grow out of containers. To know what sort of containers you would need you will first have to figure out what sort of veggies or fruit you will want to grow. From there on set up can be as expensive or as cheap as you'd like. You can either buy containers or scrounge for them, 200l drums cut in half lengths ways also make excellent growing beds. Buckets are also good growing mediums and extremely cheap. The other alternative if you still want your courtyard to look presentable and if you're a little handy with tools you can make your own wooden veggie boxes. You will have to make sure there is plenty of drainage in whatever medium you use.

One of the first things we bought was a bokashi bucket, which while it works well enough, it fills up pretty fast and smells anyway, after 3 months we went looking for an additional way of composting our leftovers. At the time I was toying with 3 possibilities, a worm farm, another bokashi bucket or normal composter or something else. I decided to go with something else, as we were trying to save money the other two were expensive options. What we did was find a 50l container and added 20l of soil on the bottom, then added the bokashi contents in the container and whilst holding our breath we added another 20l of soil on top and left it to decompose for a further 2-3 weeks after which it will smell more like wet soil.

Soil?

Unfortunately, due to it being a courtyard we had to buy potting mix, I could've dug a nice big hole in my in-laws front yard but I suspect they would not be all that impressed. Because we already had the bokashi bucket we did not need to spend mega money on the premium potting mixes available and where able to use the cheapest stuff we could find. Generally, I do not mix the potting mix with the compost, I add in 1 inch of potting mix on the bottom, add in the compost, about another inch, and then fill the container up to about ½ inch from the rim.

What did work?

Wooden Veggie boxes: the wooden veggie boxes worked better than I had imagined basil, squash, thyme, capsicums and tomatoes grew quite well drainage if excellent.
Containers: currently growing several winter veggies in the containers and they seem to be going reasonably well, but at the moment it is still too early to tell for certain. The carrots on the other hand have worked out extremely well, and the radishes that I currently have in a 100mm deep container are growing like crazy.

We also currently have several fruit trees in self watering pots, a cumquat which I have had less than six months and it already has fruit which is almost ripe, a dwarf nectarine tree and an Irish strawberry tree, they are all growing faster than I thought they would considering they are confined to a pot, using the same soil mixture as the containers
Polystyrene containers: onions, carrots (small round variety) worked well.
Buckets: plastic buckets seemed to have a mixed result, my sole strawberry plant has tripled in size since I removed it from its original container, and our Basil seems quite content as well.

What didn't work?

Wooden Veggie boxes: the strawberry plant did not fare as well as the rest, mostly because it got overshadowed by the other plants, although I did get around 15 strawberries during the season which tasted great, or the one I could get my hands on before the ants did.

Containers: need plenty of drainage, but otherwise successful so far.
Polystyrene containers: I haven't had anything that didn't grow in the polystyrene containers.

Buckets: The tomato plants have grown slower than usual and have not born any fruit yet even after being in there for over the required time.

Good experiences

Fruit and veggies

We have plenty of small lizards scooting about the place eating caterpillars and the like acting as a natural pest control.

Bad experiences

Bloody caterpillars mostly cabbage moths but also a few hawk moths!! I haven't had any problems since I have been using a chilli, garlic and some dish washing liquid mix as a spray. Plenty of ants as well, haven't had any problems with aphids though

For seeds, instead of using a punnet full of seed raising mix I used normal potting mix but sprinkle seed raising mix over the seeds and then water. The punnets then get placed in my green house which in winter has a plastic cover and in summer 50% shade cloth.

If I plant seeds directly into the container where I expect them to grow I use the same principle, filling the container with the compost and potting mix but also sprinkling seed raising mix over the top after planting the seeds.

I also use 50% shade cloth for those containers in summer, late spring/autumn, in winter I tend to leave them open.

The greenhouse you can either make reasonably easily or buy, I got my two tier one from Bunning's

2.4 Growing Herbs in Recycled Containers

My elder daughter lives in a unit in western Sydney which has a large and a small balcony area. We did up a permaculture plan for the larger balcony but I left the smaller

one out because it is really small and only gets light at certain times of the day. A while back I gave her some recycled containers that I got from a friend, and she has gone full steam ahead and used them to create a herb garden on the smaller balcony.

The containers are white plastic ten litre ice cream containers, my friend runs a nursing home and they use this ice cream on a regular basis. If nobody has a use for them they are thrown out so I got hold of nine and kept three for myself (they are great for storing compostable materials before I toss them in the composter).

To create the herb garden all she did was drill a couple of 5mm drainage holes in the front, bottom of each container, then drill two holes in the back of each container near the top. Through these holes she threaded some thin rope and tied the buckets to the rail. The rope is sized so that back bottom of the containers are balanced on the edge of the bricks which make up the wall at the edge of the balcony and on which the steel

handrail is mounted. This creates a tilting effect so that the water runs forward to drain holes and supports the containers so that most of the weight is taken on the bricks rather than on the rope.

She filled each of the pots with a good quality potting mix and then planted each of the six pots with a different herb – sage, parsley, chives, thyme, basil and mint. With everything in place she has a space that is newly productive, herbs to use whenever she wants and it has been accomplished by reusing containers which would have been thrown out!

2.5 Setting up the Grape Vine

I have wanted to grow grapes for a while, but as usual, I found it difficult work out the right place to grow them. After some thought I decided to grow them up under the cover over the back deck, that way as well as grapes we would have shade in summer and sun in winter. There are some issues to be overcome with this approach, mainly around making sure the grape gets enough water without overflow or drainage staining the timbers of the deck. So this is how I got around it.

The Pot

Our local shops have some black 30 litre pots with rope handles which seemed ideal for the purpose. The black plastic is very resistant to the sun – witness the self-watering pots which have been in the back yard for 7 or 8 years and still doing great service – so black it was (not that there were any other colours…….but you know what I mean!) Normally I would drill 12mm holes in the bottom for drainage, but as mentioned above I didn't want it discolouring the deck timbers so I chose a the following approach.

I put in a drain about 25mm up the side of the pot by drilling a 22mm hole with a spade bit and inserting a 15mm male to female irrigation adapter and screwing onto it a 19mm barb x 15mm BSP female threaded elbow. This allows any excess water to run out of the pot to the side, without making a mess of the deck. To ensure drainage, I mounded up some pebbles on the inside of the pot, around the drainage hole so the growing medium would not block the drain hole.

Water Reservoir

To provide a water reservoir in the pot so that the grape has a plentiful and continuous water supply I made a buried capsule to go in next to the grape when I planted it into the pot. I got hold of a 20cm unglazed terracotta pot and similarly sized terracotta pot saucer with which to make the buried capsule.

To start I installed a fitting with a 19mm thread on one end and a 15mm BSP barb fitting on the other into the drain hole of the terracotta pot. (you need two per capsule). To help secure the fitting into the capsule I butchered a Garden Rain 15mm Female to Female Rural Poly Irrigation Coupling and to join the reservoir to the capsule a length of 19mm clear vinyl tubing. One fitting is screwed into the drain hole of the pot and then the vinyl tubing is used to secure the two barbed fittings end-to-end. (for more detail see **here**)

To complete the buried capsule I siliconed the pot saucer to the top of the pot, creating a watertight capsule which is filled with water through the open end of the fitting secured in the drainage hole. The whole assembly is then buried upside down, so that the fitting sits above the soil surface.

I then placed some potting mix into the pot, installed the buried capsule and the grape vine, and filled the pot with potting mix ensuring that the grape was buried such that the soil surface is the same in its new position as it was in the original pot.

Something to Climb On

The idea is that the grape vine will now climb up one of the deck roofing supports and then spread out under the deck roof. It does, however, need some way of climbing up the supporting timber. I cast around to find something which would do the job effectively (but hopefully cheaply) and found some lattice which was designed to be used horizontally as a fence (it was 1800mm x 300mm border fence). All I needed to do was trim off the two spikes which would be used to secure it into the ground if it was being used as a fence. I then screwed on a couple of supports and then screwed the supports onto the deck roof support, and there you have it!

It is still early days and it will be interesting to see how the grape vine develops. I am assuming it will take several years to get where I want it to go, but I have the time.

2.6 Growing a Pineapple from the Cut Top

Pineapples are a tropical fruit but with a bit of work you can even grow them here in temperate Sydney with the right microclimate. The easiest way to do this is to buy a complete pineapple (that is to say, without the green top bit removed as is so often the fashion these days) from your local organic shop or fruit & veg merchant. Make sure the green top bit (technical term) is complete and not damaged.

Then follow these steps –

1. Cut down into the pineapple making two diagonal cuts under the green top bit, taking about 2 – 2.5 cm of fruit, so it can be removed from the pineapple.
2. Leave it to air dry for a couple of days.
3. Get hold of some potting mix (standard potting mix is OK or use my 1 part sand, 2 parts compost or worm casting, 3 parts cocopeat formulation) and a clay pot big enough to take the circumference of the fruit attached to the green top bit. Add a pinch of iron sulphate or iron chelate into the potting mix before planting.
4. Plant it into the potting mix filled pot and then cover with a plastic bag, with some ventilation holes punched into it. This will keep the humidity high and keep the plant hydrated until it can grow some roots.
5. Place the pot in a well-lit spot, but not in direct sunlight.
6. Pineapples can absorb water and nutrients through their leaves, so watering with weak liquid manure solution every week or two is worthwhile.
7. Roots should develop in 6 – 8 weeks at which point the plastic bag can be removed.

8. Leave the plant in a well-lit spot and regularly spray the leaves to water and feed it. Add some more iron sulphate or chelate to the soil when the plant is starting to flower.
9. Commercially pineapples can take 1.5 to 2.5 years to crop, so don't get too impatient because in the less-than-ideal conditions of a backyard it may take even longer. Ripening fruit in proximity to the plant (eg apples or bananas) will emit ethylene which may stimulate the pineapple to flower.
10. When the plant is flowering, move into a sunny position to assist the fruit in developing.

2.7 Setting up a Strawberry tower

Unless you live on acres, there never seems to be enough room to grow everything you want to and that is particularly true in the urban/suburban setting. There are techniques, however, which help you maximise what growing space you do have. Vertical gardening is one technique, in this case by constructing a strawberry tower. I call it a strawberry tower because that is what I will be using mine for but it could just as equally be a herb tower, lettuce tower or tomato tower or a "whatever you want to grow in it" tower.

Raw materials

To make a tower like this you need a 205 litre plastic drum, preferably one that has not held anything nasty. The one I got hold of had been washed out well but even so it had

only contained sorbitol, a food grade sugar alcohol sometimes used as a sweetener in sugar-free gums. To be sure I also gave it a wash out with water too!

To keep things fertile over time I wanted to construct a worm tower in the centre so I got hold of a one metre length of 100mm plastic tubing to house the worms. I also needed something for the strawberries to grow in so I got hold of some potting mix, compost, wood ash and sulphur (more about these later). I needed some rocks to go in the bottom to ensure good drainage but had some scoria hanging around from previous projects so I decided to use that.

I also needed a lazy Susan bearing. The whole idea behind a tower of this type is that you can grow plants over its entire surface and being round most of it will get some sun at some time of the day. The trouble is that the quarter which faces south will get no direct sun, especially in winter, which for a fruiting crop is critical. I planned to get around this by placing a large, heavy duty lazy Susan bearing under the drum to make it easier to turn, and so far it is working.

I worked out where I wanted the tower to go so it would get sufficient sun and be reasonable accessible, which turned out to be the northern end of our front yard. Once I knew where it was going I grabbed a 600mm x 600mm concrete paver which was sitting doing nothing in the back yard. I used it to provide a stable base for the bearing to sit on, which would be where the drum would finally sit. The land slopes a bit so I had to dig out a bit of soil from the high end and check it with a spirit level to ensure it was level enough.

Constructing the Strawberry Tower

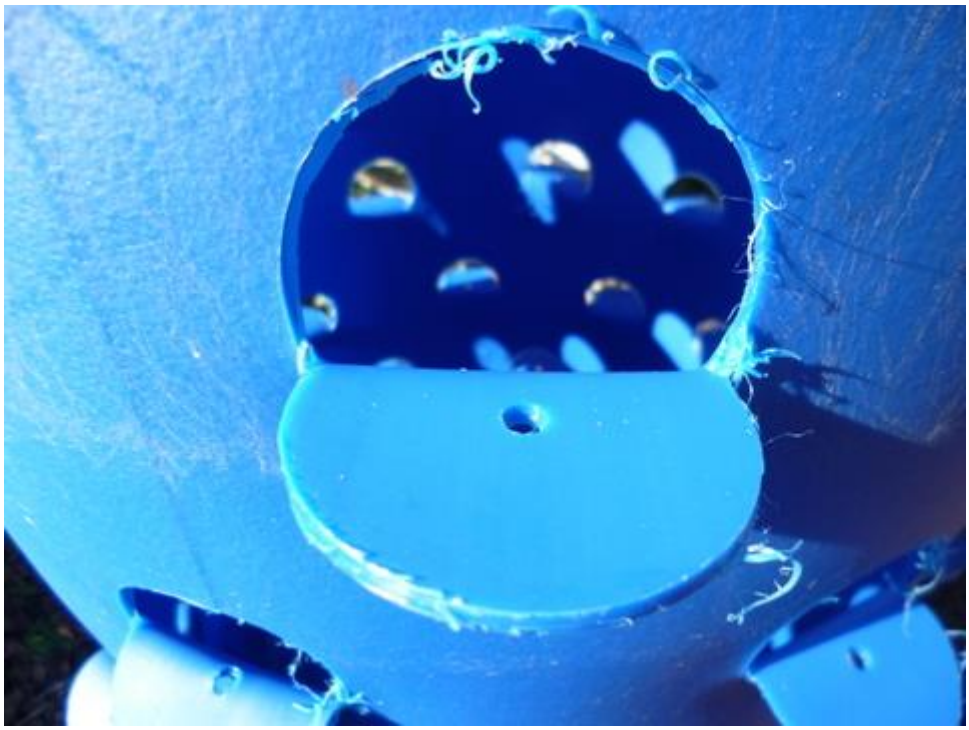
The first job was to remove the top of the drum, it was a closed head drum so it had to be cut off, but the drum being plastic made it easier. To remove the top I simply drilled a hole in the top at the edge the size of a jigsaw blade, then inserted the jigsaw and cut around the inside of the rim. Quick and easy, but it did create lots of small bits of blue plastic, which got, everywhere! I then turned the drum upside down and drilled some 12mm drainage holes around the edge of the bottom of the drum.

With top cut out and the drain holes in it was time to turn it back over and mark out and cut the holes where the strawberries are to go.

To mark it out, I ran some string around the circumference of the drum and then used some bits of tape to mark it off into 10 equal sections. I then used the string-and-tape to measure out 5 rows, about 200mm apart down the sides of the drum, then marked them with a dot of permanent marker. Using a small 1/8” drill I drilled a pilot hole into each of the marks.

To make the holes where the strawberry plants were to go I got hold of a hole saw, which I use with my drill. You can buy sets of hole saws and the largest one in the set is usually 50mm across, but sometimes bigger can be better and this is one of those times. I had a 70mm hole saw which I had bought to assist with a previous project so I used that. After getting the central drill lined up on the pilot hole, I drilled in then tilted the drill and hole saw up so that it only cut through the top half of the circle. The bottom half was still attached because I wanted to use it as a flap for the strawberry plants to grow out onto.

To form the flap I used my heat gun (looks like a hair drier but runs much hotter and is used to strip paint) to run hot air back and forth over the plastic until it was soft, then pushed the flap out and held it until it cooled down, it then remained fixed in place. Doing this took a couple of hours but was made easier by the fact that I had already mounted the drum on the bearing, making it easy to sit next to it and turn it around as required.



With the holes in place I made the worm “tower” for the centre. It was just a case of getting hold of the metre length of 100mm plastic tubing, drilling holes in it and then holding it in place while I filled the strawberry tower with growing medium.

Filling the strawberry tower

The first thing I did was to set up the worm tower in the centre of the drum so that I could fit the growing medium in around it. Then, to ensure good drainage I poured in scoria up to a level of 50mm to 75mm in the drum, then levelled it out with a hoe. With drainage assured I could put in the growing medium.

The growing medium was a mix of 50 litres of potting mix, 25 litres of compost and about 500mls of wood ash and about 150mls of elemental sulphur added in. The potting mix provides the basis of the mix with extra fertility provided by the compost, the wood ash is to provide extra potassium for good fruiting. The wood ash will, however raise the pH of the mix, but strawberries prefer the pH to more on the acid side so the elemental sulphur was included to drop the pH back a bit.

I made the mix up in my wheelbarrow, using a shovel and hand hoe to mix everything until it seemed to be pretty homogenous to me. To completely fill the barrel, I needed to make up 3 full mixes, with a bit of compost left to go on the top.

I filled the barrel up with growing medium until it was just level with the first row of holes for the strawberry plants. I then separated out enough plants so that I had one for each hole, then arranged them on top of the growing medium so that the roots were inside and the crown of the pant was level with where the growing medium would come to. I then shovelled in more growing medium, covering the roots of the layer below until it was just below the next level of holes. I repeated the process until the barrel was full and all of the holes were planted with a strawberry plant.

To finish of the process I filled up the last 100mm with compost and then added some sugar can mulch. To make sure that there were no spaces I watered everything in from the top until some water was coming out the bottom. The worms and veggie scraps will go in once things have had a chance to settle down.

Review and Lessons Learned - 2023

While it did work fairly well, it was not without its problems –

1. First off, there were too many holes/growing points. It would have been better to put in half as many and in the end I wound up using every second one.
2. While the lazy Susan was a good idea, just using the bearing meant that it filled up with dirt and rubbish and after a few months refused to turn. I wound up replacing it with a similar bearing, but this time I screwed a disk of 20mm plywood (pre-painted green) on each side of the bearing and this worked much better. It is still important to give it a turn or two every few days to keep it turning freely.
3. I installed it in the wrong place, there was not enough light for the strawberries due to the shade from the mulberry tree, plus it was not in one of the more travelled areas, so it reduced the amount of turning that it needed. So, I emptied it, transported it around the back and installed it on a plinth of sorts, right next to the back door, but now the bananas have overshadowed it. So back to the drawing board!

2.8 Growing Okinawa Spinach

About a year ago, a Chinese friend of ours gave me some Okinawa spinach (hung tsoi or hong tsoi in Chinese), which I have been able to propagate, and it goes really well in any of the leafy vegetable recipes in our **recipe section**. It can be eaten raw or cooked, but it can go a bit slimy if overcooked.

Okinawa Spinach (*Gynura crepioides*) is a fast growing and productive perennial leaf crop which can grow up to 0.7 metres high, but it can become invasive if left to its own devices. It has green leaves with a purple underside so that as well as being productive it is also quite an attractive plant.

It is a tropical plant and so is very frost tender, but we have found that growing it next to a brick wall of the house with morning sun has allowed it to survive what has been

for us a fairly hard winter with frost down to -3°C. My daughter also grows it and she has found, that even if the foliage is killed by the frost, it will re-sprout from the base of the plant when the weather warms up a bit. If all else fails you could use it as a perennial grown as an annual in areas where they temperature dropped too low in winter and just replant it every year. It likes moist, well drained fertile soil (what doesn't?) with a pH of 6.0 to 6.5.

It is ridiculously easy to propagate from cuttings. Prune the cuttings to about 150 – 200mm long and remove the leaves from the bottom half of the cutting. Place the cuttings in water and renew the water if it starts to get cloudy. I did not use any stimulant (honey, willow water) for the cuttings to rapidly produce roots. The cuttings will send out roots and then can be planted into the soil in spring or summer. We planted ours into a found concrete pot with an olla made from two small terra cotta pots in the centre to allow easy watering and to keep the plant moist in hot dry weather.

Okinawa spinach can be grown in full sun if the water is kept up to it but also likes partial shade. As previously mentioned, our pot of spinach gets morning sun up until roughly midday then is shaded by the house in the afternoon.

Okinawa spinach seems to be affected by few pests or diseases but can be subject to attack from aphids on occasion, but if you can put up with that for a while and let the ladybirds breed up, they will keep the aphids in check.

2.9 Growing Upside Down (USD) Tomatoes

It's a new thing, or at least it is to me.....grow your tomatoes (or actually several other crops like chillies and capsicums as well) out the bottom of a pot. You can even buy specific upside down (USD) pots designed so that you can grow plants out of the bottom of them, and I am as susceptible to such things as the next man, so I bought a couple. The reason I want to grow upside down tomatoes, rather than for any novelty value or supposed improvement in yields is to increase the area left for other crops in

my standard veggie beds and more tomatoes growing on fences means more room in beds – simple really.

There is also the issue of sustainability, because that is what this website is all about, and while the specific purpose pots are comparatively cheap at $8-10 they are fairly thin walled and so don't look like they will last long to me and like lots of stuff today they are imported from China and have lots of transport miles on them. There must be a better way, and indeed there is! Remember the 20 litre plastic buckets, the recycled cheese curd containers that I obtained from a local hardware for $3.50 each? They were the star of the 20 litre self watering container article.....anyway you can make your own based on a recycled 20 litre bucket rather than outlay for a new specific use pot.

The Commercial USD Pot

The commercial one (As seen on TV! yes I need to get out more....) is comparatively simple to use and hanging it up makes it even easier to work with. We got hold of a couple of brackets that sit over our fence to hold the pots up and I hung the commercial one on it and grabbed a tomato seedling (Roma, if you must know). The kit had a lid to the pot, which needed to be removed and a sponge circle to hold the seedling in place. It is just a case of pushing the root ball through the hole in the bottom of the pot and then through the hole in the sponge disk to support it. If you take a bit more of the

stem through the hole it is not a bad thing because extra roots will grow from the stem and help the tomato establish.

Once the tomato seedling is in place you need to hold the stem to support it and add your potting mix, I just used a mid priced commercial potting mix, using a container to add small amounts at a time rather than tipping in the entire bag, otherwise you can dislodge the root ball. Once the pot is filled to within 5cm of the top, water it in well; this will cause the potting mix to settle, so once again top up to within 5cm of the top replace the lid and you're done!

The Home-Made USD Pot

This is also reasonably easy, particularly of you have a 50mm hole saw because the main bit of engineering required is to cut a 50mm or so hole in the bottom of the 20 litre container. If you have a hole saw (and I do!) this is the way to go but if you don't then a Stanley knife will also do the trick although there is some risk of being cut so wear sturdy leather gloves just in case. The other bit of modification required is at the handle end and is really only needed if you want to stop it slipping around on the support hook. All I did was remove the plastic hand hold from the handle using my band

saw (or you could use the Stanley knife again). Then once the plastic was removed I put the wire over a mandrel, in this case the handle of one of my engineers vices and gave it a solid tap with a hammer so that it had a bend that would sit over the hook and keep it stable.

With the engineering work completed I cut out two disks of newspaper slightly smaller than the diameter of the bottom of the 20 litre container and then put a 5cm slit in the middle and placed it in the bottom of the container. I was then ready to install the tomato! That was a similar process to the commercial USD pot in that I threaded the root ball into the hole in the bottom of the pot and then through the slit in the newspaper. Once in place and while holding the root ball to stop it being dislodged I carefully filled the container with potting mix and watered it in and bingo, we're done.

The one major difference between the commercial and home made USD pots is that you can easily grow something else in the top of your home made pot and while I haven't done anything yet I have been considering some nice basil to go with the tomatoes. Tasty!

Final Thoughts

While I found this to be an interesting experiment, I can't say that it was particularly productive!

3.0 Self Watering Containers & Other Irrigation Strategies

3.1 Introduction

The idea of a self-watering container is similar to a wicking bed, in that there is a water reservoir that some of the growing medium is allowed to go down into and water from the reservoir wicks upwards by capillary action to keep the plants watered. They are a great idea and work to fix one of the biggest problems with container growing – the containers can dry out very quickly. The plant roots need water to be able to take up nutrients and oxygen, keep the plant from wilting and be productive. The problem I have with commercial self-watering pots is that the reservoir is usually much to small, so the answer: make your own!

3.2 Making a Self-Watering Container

Growing veggies in containers is a good way of growing your own food if you are pushed for space, don't own where you are living and may need to move or have difficulties with the planting, cultivating and harvesting at ground level. Container growing has a lot to recommend it, but it also has a downside in that the containers will dry out much more quickly than veggies in the ground, one hot afternoon and they are wilt city!

So what is the answer? The self-watering container, originally marketed in the US as an Earth Box and now available in Aus, but you can also make them yourself. In principle, they are a container with a layer of growing medium on top and a water reservoir in the bottom and a structure that allows the growing medium to contact the water and wick it up to the plants in the growing medium by capillary action.

A good container to start with are those rectangular storage containers on wheels, you can buy them almost anywhere these days, I used ones 542mm long x 310mm high x 385 mm wide , 280mm high from bottom of growing chamber to top of rim and a volume of 55 litres. It is best to get the opaque ones made of black or dark blue plastic rather than the clear ones which suffer horribly from degradation due to the sun's

ultraviolet light. The clear ones will turn very brittle in about 12 months whereas the black ones I used have been in use in the back yard for over 5 years and show no signs of falling apart.

To make a self watering container I followed the process below and got to the point where it only took me an hour to whip one up –

1.Cut out the inner part of the lid to form the base of the growing chamber – use a jig saw by drilling a 6 mm hole and inserting the blade or starting the saw on an angle and slowly bringing the saw blade down into contact with the plastic. As you cut the rim off, stay as close to the outer rim as you can and when you are finished retain both parts.

Note: This process is noisy as buggery so wear hearing protection at all times when using the jig saw and where there is any chance of flying materials always wear eye protection.

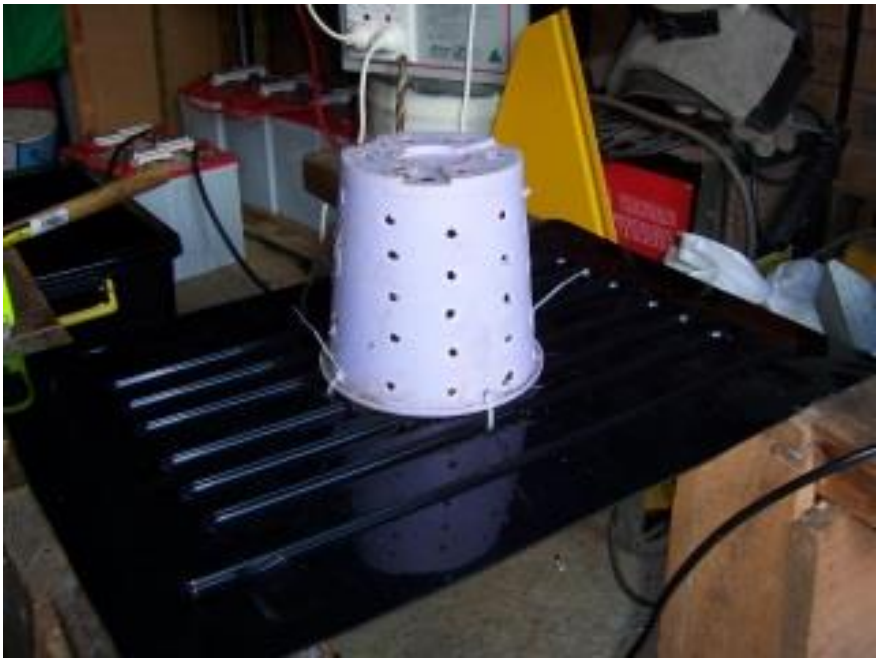
2.Use a Stanley knife or equivalent to trim off any plastic waste from the base.

3.Select the flower pot that you are going to use as your capillary well, one about 125 +/- 5mm is a good size. To allow water access to the material in the pot it needs to be perforated. This may be done by a drill, but it is probably quicker to use a pad punch and a hammer with the pot placed over a piece of scrap timber secured in a vice. The holes should be around 6mm in diameter and placed in rows up and down the pot.

4.Measure the diameter of the pot and mark a circle slightly smaller than the pot (say about 2cm smaller than the pot diameter) using a pair of dividers on the top of the base that you just cut out.

5.Drill a 6mm or so hole just inside the scribed line, insert the jigsaw blade and cut out the scribed circle. It is important to be aware of what you are cutting onto…….if the

saw gets hard to push you may be disfiguring your table or saw horses. (I'm speaking from experience here!)

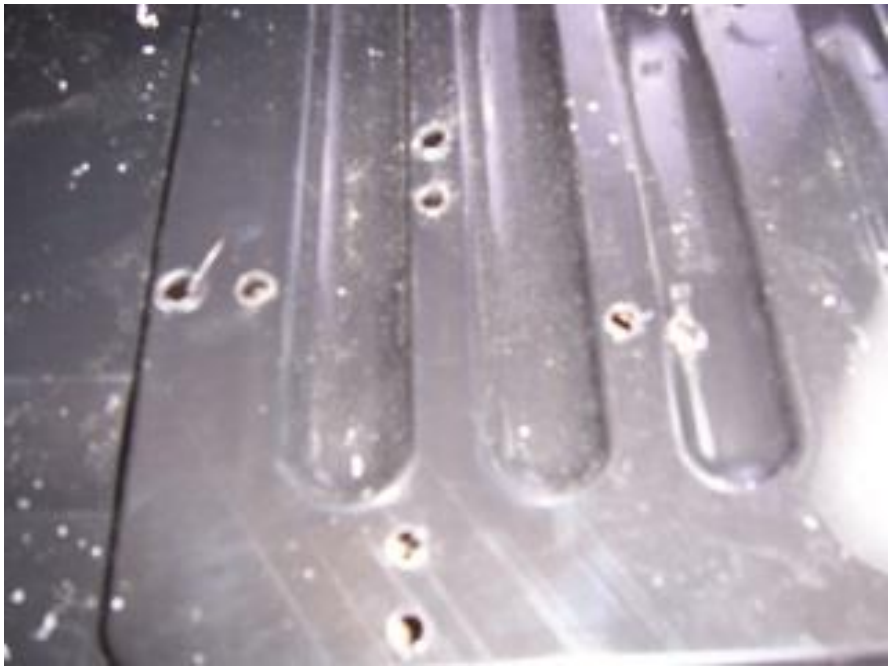


6.Drill or punch four holes equidistant from each other around the top of the pot. Place the pot top down on the base and over the hole you just cut out. It should be resting on the surface that will become the underside of the base. Drill four 6 mm holes in the base so that they line up with the holes in the top of the pot. Attach the pot to the base using four cable ties (I used 100mm x 2.5 mm cable ties, you will need 20 for each earth box you plan to build.) and then using side cutters, cut off the end of the cable ties.

7.It's now time to attach the supports so that the base that will support the growing medium won't wind up filling the water reservoir. I used 80mm diameter PVC pipe, because that is what I had but other things, even more pots if they are the same height, could be used.

8.Measure the height of the pot and then cut off 4 lengths the PVC pipe, I found a little band saw works very well for this but there is no reason why a hand saw would not do as good a job.

9.Drill the 4 equidistant 6mm holes again, around 6mm from one end of the cut pipe and then place the pipe on the base and drill a corresponding hole in the base and attach each piece of pipe with the cable ties. The base should now sit in the box and be stable. You should now drill a series of holes, say 6mm (1/4") through the base to allow transfer of oxygen and rainwater to drain into the reservoir below, I drilled them around the perimeter of the base and between each of the stiffening ribs.



10.In one corner of the base drill a 25mm hole using a speed bit or auger to fit the 25mm outside diameter plastic filler tube. Cut a length of tube so that when the tube is resting on the bottom of the box, it protrudes 25mm or so above the top of the box. Then chamfer the lower end of the filler tube so that one side is cut away, allowing water to be run into the bottom part of the box as needed.

11.Place the base into the box and drill two drain holes (around 6mm diameter is fine), one in the middle of each of the long sides of the box just below the level of the base, the idea being that when the water reservoir in the bottom is full, it will announce this fact by spurting water out of the drain holes.

12.The box is now ready to assemble by placing the base into the box and filling the top section of the box with potting mix, planting the veggies and then putting mulch on top.

Normal hay, straw or other organic mulch can be used or black plastic may also be used by putting it on top of the box then re-fitting the rim of the cut-out lid and making cross cuts in the plastic where each of the plants is to go. The black plastic will maximise solar heat in winter and keep weeds down but will not break down and add fertility to the box.

Almost any veggie can be planted in the completed box – a half a dozen brassicas, or eight lettuces, or a dozen shallots or you could fill it with herbs, the possibilities are endless. This year we grew ginger in one and had the best ginger crop ever!

You can also put liquid manure into the water that you fill the reservoirs with to water and feed your veggies at the same time. To fill the reservoir, I just run a stream of water from the hose into the filler nozzle until water gushes out the holes in the side, or top them up with a watering can and with a full reservoir you don't have to worry about going away for the weekend or a week.

2017 update

The self-watering containers are still working well in our backyard, some seven or so years since I put them together, and I thought I would mention what I have learned in the interim –

- Leave the plastic mulch off! It only cuts down on oxygen transfer between the atmosphere and the soil. Regular organic mulch works much better in the long run.
- Unless you have intentions on pulling things to bits regularly, cable tying everything together is not necessary. It can help to keep the central pot in place, but if you get a pot with a lip and then cut the hole so it is a bit smaller than the lip, it will support itself.
- Just to re-iterate – you really do need the black containers, preferably labelled as shock resistant or some-such. I was reading a garden book the other day where they talked about making these self-watering containers, but the pictures were of the translucent ones. Seems to me they had written the book from a theoretical rather than a practical experience perspective. (just sayin')

3.3 Revamping the Original Self-Watering Containers

17 years later……

In 2005 I put together 4 self-watering containers to grow various crops in the back yard. To access the article I originally wrote about how I did it, see above.

While I started out growing all sorts of things in them, I eventually settled down and used three of the four to grow members of the Zingiberaceae family, that is to say ginger, turmeric and galangal, and they have all been very fruitful. The fourth one has been a bit varied, with its occupants including, at various times, spring onions; tomatoes and cotton, among other things. Now I have decided to grow another of the Zingiberaceae clan: cardamom, in the fourth container but that is a tale for another time!

I must admit that it has been many years since I pulled them down, removed the growing crops and inspected the containers themselves as well as refreshing the potting mix, so it was not before time that I decided to do it this winter just gone (2022).

To start the process I cleared the area and put down a tarp to take the plants and spent potting mix, then attacked each container in turn, it took a few days.

The first part of the process was to remove any vegetation still growing from the rhizomes with secateurs, but because it was late winter here they had died back to the soil surface (except for the galangal for some reason).

The next trick was to tilt the container up on one end to allow any remaining water in the reservoir to drain out, which only took a few minutes. I then tipped the container fully over onto the tarp, face down so to speak and then removed the container from around the plant mass. At this stage the barrier between the growing area and the reservoir, the pot allowing the water to wick up and the supports for the barrier were totally enclosed within the plant mass in what should have been the water storae reservoir in the bottom of the container.

After a bit of rummaging around it was a simple matter to remove the supports (Plastic tubing), the pot and the root mass from the reservoir area of the container. One point of note was that when I originally built this set of containers I used cable ties to secure the pot and the supports to the underside of the barrier, although in later builds I figured this was unnecessary. It seems it really was unnecessary because the ones in place securing the supports and the pot were mostly broken and no longer effective, only one or two in each container were still intact.

With the bottom stuff removed, this left the barrier, firmly secured to the plant mass by roots and looking somewhat distorted by the weight of the plant mass such that the edges had a distinct downturn. To remove it from the plant mass was not as difficult as I expected and I removed all the roots from the side I had access to, then peeled it off the plant mass, leaving a whole stack of roots and rhizomes of the main plant, plus some weeds!

The deformation of the barrier needed to be fixed before replacing everything in the container so that all the new potting mix didn't get immediately dumped into the reservoir of the container around the deformed sides of the barrier. I did this by placing the black plastic barrier between a thick pane of glass and some fibre board, in the sun. The sun went through the glass and heated up the plastic barrier, softening it. The weight of the glass then pushed down on it, flattening it out again. Job done!

On inspection, the outer containers were in pretty good nick for being out in the weather for over 15 years, the only issues were caused by me falling over the *@%&*! things while carrying some stuff and walking backwards (don't ask!). Anyway a bit of silicone at the time and they were good as new.

It was then a fairly simple matter to replace the supports and plant pot in the correct area and replace the barrier so that the container could be refilled with potting mix. Unfortunately, the containers had bowed out a bit at the sides, which would have allowed some potting mix to fall into the reservoir area. To prevent this, I still had a bit of the plastic which goes around the top of the container spare, so I cut some lengths and placed them in the sides of the container to fill the gap.

I then refilled the container with potting mix, and after freeing some suitable (decent size reasonable root growth) rhizomes from the plant mass I replanted them in the potting mix and mulched them all with sugarcane mulch. Once the weather warms up they will have plenty of space and nutrients to regrow, while I process and/or pass on to others some of our sizeable rhizome harvest.

YouTube video on making self watering containers is available **here**

3.4 Making a Self-Watering Container from a 20 litre Bucket

The rectangular self watering containers described in another article work very well for growing a number of veggies in the one container, but if you want to grow one larger plant like say a tomato, capsicum or eggplant then the 20 litre bucket (or buckets) may be the one for you. They are also quicker, cheaper and easier to construct and so are a good way to start out, plus you can make up as many as you want to plant the number of crops you want to grow. Needless to say recycled buckets are the way to go, cheaper and more environmentally friendly; we get ours from a local hardware that gets them from the delicatessen next door. They have been used to ship and store cheese curd so they are food grade and can also be used to store dry goods such as flour, grain, sugar or pasta etc if you want. Herbicide or pesticide buckets should not be used for this purpose (obviously).

For each container you will need –

- Two recycled plastic 20 litre buckets (complete with lids if possible, although you will only use one lid per container).
- One small plastic pot approximately 90mm (or a bit less) high by 100mm wide.
- One 500mm length of 20mm wide plastic pipe as a filler.
- Two cable ties.

- 20 litres or so of good quality potting mix, homemade if possible.

Plus the following tools –

- Hand or electric drill plus –
    - One 6mm or ¼ inch twist bit (roughly, a bit bigger or smaller is OK)
    - One 20mm spade bit (or at least a spade bit slightly larger than your filler tube)
    - One hole saw, large as you can manage but 50mm is good.
- A jig saw with a blade designed to cut plastic
- 6mm (or so) hole punch and hammer
- Side cutters or scissors
- A black permanent marker

To make your container –

1. Take the container you intend to be the inner one and mark out where the pot is going to sit by placing it directly in the centre of the outside bottom of the container and drawing around it with your permanent marker. As luck would have it I could leave out this step because there was a raised plastic circle on the bottom of my containers that was more or less the same size as the opening of the pot I was using.

2. Then drill a whole stack of 6mm holes in the bottom to allow exchange of air and water where required and drill one hole on the inside of your marked line so that it is just touching the inside of the line or raised circle as it was in my case. Be sure to drill two holes on opposite sides of the centre circle to allow fitting of the pot. Also allow a 50mm or so area of the bottom of the container to be free of holes so you can drill the filler tube hole there.

3. Take the jig saw and poke the blade through the hole you drilled next to the centre circle and cut along the inside of the inner circle so that it is entirely removed and discard the bit you cut out, or throw it at your kids, either is good.

4. Using the hole punch, punch a few holes around the sides of the pot and two at the top, on opposite sides of the top. Using a hole punch in this case is generally easier than a drill of the pot has very thin walls like mine did.

5. Fit the pot on the bottom of the inner container by placing it over the large hole and fixing it in place by running a cable tie through each of the holes at the top of the pot and then through the holes you drilled each side of the 100mm hole in the bottom of

the container. Pull them up tight and cut the excess off with scissors or side cutters etc.

6. With the spade bit, drill a hole in the bottom of the container about 25mm in from the side in the area you left for it when you were drilling the 6mm holes. At this point you can also drill a 20mm hole in the lid for the filler tube to pass through.

7. Take the filler tube and saw one side away at the bottom on an angle of about 30 degrees to the side so that water being run into the filler tube can get out into the reservoir quickly.

8. Insert the inner container (now full of holes and complete with fitted pot) into the outer container. Drill a 6mm overflow hole in the side of the outer container at the level where the bottom of the inner container sits. You can measure down or just take the whole assembly out in the sun and look for the shadow that the bottom of the inner container makes on the side of the outer one.

9. Fit the filler tube into the inner container. It should be long enough to travel down to the very bottom of the outside container and still stick up a centimetre or two above the lid when it is in place. In my case 500mm was perfect and allowed me to get two filler tubes from one 1 metre long section of tube.

10. Drill your 50mm or so hole in the very centre of the container lid using the drill and hole saw, if you are lucky there will be a mould mark at the exact centre of the lid on either the inside or outside. If you are unlucky, draw two lines at right angles across the diameter of the lid and drill where they intersect.

11. Fill the inner 20 litre bucket with your potting mix and plant your tomato, capsicum or whatever in the centre of the container so that it will come out of the central hole drilled into the lid. And then fit the lid so that the filler tube is also protruding from the top of the lid.

12. Fill the water reservoir in the bottom of the pot by pouring water down the filler tube until water can be seen coming out of the overflow hole – and you're done!
This style of self watering container does not have as big a reservoir as the rectangular type so you will need to top it up a bit more often, particularly initially as the water wicks up into the potting mix, unless the potting mix was very damp to start with.
Despite the number of steps, these containers are much quicker to build than the rectangular ones and I set up a small production line and made five of the things in less than half a day. They are well worth a go, and will make veggie growing simpler and easier for you, as well as making it easy to move your crops around to catch the best sun, even with a full reservoir they are easily portable by trolley.

Update December 2010

You can't say I only talk about successes on this site, because here is one of the failures. The bulk potting mix that I used to fill up the 20 litre buckets seems to be somewhat deficient in nutrients and so the resulting tomato crop has been more than a little disappointing (insert swear words appropriate to your area here). The next trick will be to get hold of some good quality bagged potting mix and replant with new seedlings. In the words of a well known philosopher - "bugger!".

3.5 Making a Self-Watering Pot from a PET Bottle

One of the great ideas that has been developed in recent years to help us out with the long hot summers is the concept of self-watering pots. That is to say, pots for growing plants which have a built-in reservoir of water, which keeps the plants hydrated. As usual, the idea has been latched onto by pot manufacturers but they seem to have missed the point. The commercially available self-watering pots have a very small reservoir and tend to be gimmicky, rather than a serious alternative to standard plant pots.

However, it is possible, even desirable to make your own and in other articles on this website you can find out how to make an earthbox and how to use two recycled 20 litre buckets to make a self-watering pot. Now you can use PET drink bottles to make a self-watering pot too!

1. To start out you will need a bottle that has enough volume for the roots of the plant to grow, so use at least a 1.25 litre bottle, although a 2 litre or 3 litre bottle would be even better! And don't throw away the lid, you will need it.

2. Using a sharp knife (and wearing a solid leather glove on your non-dominant hand, I'm just sayin') cut around the bottle about two thirds the way down towards the base. The top will be the growing space and the bottom will be the reservoir, and now you just need to connect them. This will be done with some wicking material, I use synthetic rope. Natural fibres can also be used but will rot down in time.

3. Nylon or polyester braided rope is ideal (polyethylene is hydrophobic and so not a good choice). Unfortunately quite often the material which the rope is made from is not put on the label, in which case you could ring or email the company to find out or just use one which is labelled if you can find one. I was able to find some labelled as being polyester where other types from the same manufacturer were not labelled.

4. Cut sufficient length for your wicking material to go from the bottom of your reservoir up to a least half the way up your growing area. If you are using a synthetic wick, apply a bit of heat to one or both ends to melt them, it will stop the wick fraying and make it easier to get though the bottle lid. Since the material is a wick and not a tube, this will not affect its ability to conduct water.

5. Drill a hole through the centre of the lid approximately the same size as the wick you are using, I used 6mm wick so I drilled a 6mm hole. Push the wick up into the growing

area, ensuring you leave enough length for it to get to the bottom of the reservoir and coil around a bit.

6. Fill the top section with growing medium and the bottom section with water, assemble you pot and install your plant!

There will be no more coming home after a weekend away at the beach (well, it's hot, right?) to find all your beloved pot plants have dehydrated and died.

3.6 Making Small Olla's More Efficient

There are occasions, such as when planting into pots or other planting spaces with restricted areas where the usual size ollas just won't work. In this case I wanted to plant into 'self watering' hanging pots but the alleged reservoirs built into the pots were tiny. So I decided to add some small ollas with a base measuring 75mm, a top of 120mm and holding about 1350mls when full, to improve the water holding capacity of the pots. Also, near the mint in the herb spiral I used an even smaller olla composed of two pots that were 50mm across the base, 80mm across the top with the completed olla holding 500mls when full.

My concern has been that the hole on the top (formally the bottom of one of the pots) was only about 8mm for the herb spiral olla or 11mm for the hanging pot ollas and getting the water in through a hole that size can be slow. I do have a small funnel which exactly fits the filler holes but allowing air to get out as the water gets in is what takes the time. I decided that one possible fix was to drill a small hole beside the main filler hole that would allow the air to escape as the water flowed in. I was unsure how to do it without completely wrecking the olla, but figured a small tungsten carbide tipped concrete drill might be worth a go.

After searching around I found a 3mm one which looked like it might work, I gave it a go on a piece of terracotta pot, and it worked perfectly. I lined it up on the top of the herb spiral olla and, again, it worked perfectly. The hanging pot ollas were already installed so I had to take down each pot and then drill each of the holes individually.

With all the ollas installed/reinstalled I tried filling them using my funnel and the water went straight in, only taking a couple of seconds to fill each olla until it came rushing out the breather hole. The experiment was a success!

It works!!!!

3.7 Bottle and Wick Irrigation for Pots

Self-watering pots are a wonderful idea! They reduce the amount of work you have to do to keep your precious plants watered and they are very water efficient, providing a reservoir so the plant stays hydrated but with a minimum of evaporation. Unfortunately my experience with the commercial models is that the reservoir is way too small for the size of the pot and resultantly the size of the plants being grown. I prefer the homemade variety described earlier in this eBook, because you can make them to your own specifications.

The downside is of course that no matter whether your self-watering containers are store bought or home builds, it would be somewhat expensive to convert all potted plants over to this style of watering. This is especially true for those container-growing enthusiasts amongst us. So what is the answer?

I'm glad you asked!

The answer is to convert all of your existing growing containers over to the “bottle and wick” watering system. It is cheap, very water efficient and reasonably easy to do, especially at repotting time.

The idea is that a synthetic rope wick of the right type connects an external reservoir to the root zone of the plant in the pot, the water travelling down the wick by capillary action. This allows a large reservoir to be connected to a standard pot so that it will have all the advantages of a self-watering b pot, but without the expense.

How To

The first thing is to get hold of some material to use as the wick. Nylon or polyester braided rope is ideal (polyethylene is hydrophobic and so not a good choice). Unfortunately in many cases the material the rope is made from is not put on the label, in which case you could ring or email the company to find out or just use one which is labelled if you can find one. I was able to find some labelled as being polyester where other types from the same manufacturer were not labelled.

Cut the rope to size allowing enough length so that the rope will go to the bottom of the reservoir and coil around, run between the reservoir and the pot and still have enough rope left over to coil around the inside of the pot.

To keep down evaporation from the wick between the reservoir and the plant pot some plastic tubing, just a bit bigger than the rope, will also be needed. I got 6mm rope and 8mm tubing, although larger diameter rope would allow more water to be transported. Cut the tubing to size so that the rope will be covered from where it leaves the reservoir to where it enters the soil surface at the pot.

To make it easier to thread the rope into the tubing, apply a small flame gently to the free end of the rope so that it melts down a bit, this keeps the core and outer layers of the rope together and makes passage through the tubing easier. I used a needle to thread some cotton through the free end of the rope, then holding the pre-cut tube vertically, allowed the needle to act as a weight and pull the cotton through the tubing from end to end. I could then grab the cotton and use it to pull the rope through the tube so there was rope hanging out each end of the pre-cut tubing.

To make the reservoir, I recycled a two litre plastic milk bottle. I cut a cross up near the top of the bottle and inserted through it enough of the rope so that it went down to the bottom of the bottle and coiled around a bit. I then inserted the plastic tubing around the rope so that it fitted through the hole leaving no rope exposed.

I place some potting mix into the pot so that it was about a third full, then took the free end of the rope and ran it down onto the soil surface. I placed the plant in place and then filled the pot with potting mix, ensuring the rope wick is fully covered with soil. I then filled the bottle with water. Make sure the bottle lid is not on so tightly as to cause a vacuum as the water is drawn from the bottle, otherwise the water will stop flowing. The water should move along the rope wick by capillary action, and you can see the progress of the water through the clear tubing. It took a few hours to move along the 40cm or so of the wick I made, and you could see the progress of the water through the clear tubing.

4.0 Box Gardens

4.1 A Box Fulla Veggies – Making a Box Garden

In this article we will be talking about how to grow a load of seriously tasty veggies in a recycled polystyrene veggie carton, and some soil and stuff of course! Why a recycled polystyrene veggie carton? They are a good size, readily available quite often for free and they are light and easy to move around so it makes sense to use polystyrene boxes if you can get hold of them.

Reasons why you might want to make one of these little white marvels include –

- A veggie box is a good way to start small if you are new to veggie gardening, and
- You can add more boxes as your confidence and interest grows,
- They are a great project to do with the kids, you never know they might be the start of a lifetime of gardening,
- They make a great present for a family member or friend who isn't a veggie gardener,
- If you are in rented premises you can pick up and take your veggie garden with you if you have to move, or the landlord won't let you dig up the lawn.

The Process

The process is simplicity itself!

1. Get hold of the polystyrene box and make sure that it has sufficient drain holes to precent water logging. If there are no drain holes, like with a broccoli box then cut or push some through using a hot wire or hot soldering iron etc. Holes can be drilled into the polystyrene but it creates a whole stack of little white balls that get EVERYWHERE!

2. Half fill it with grass clippings and weeds making sure that none of the weeds have a seed head that will create problems afterward. It would also be better to leave out things like wandering jew or couch grass runners unless they have been left to dry out in the sun first, just in case. The weeds will decompose slowly and provide nutrients for the veggies so to get a better result use a mix of weeds providing a mix of nutrients.

3. Get hold of or make some good quality potting mix. If you want to make it you could try the 1 sand: 2 worm castings or compost:3 cocopeat mix or if you are buying it in get some middle of the range stuff (not too el cheapo) that is designed for growing veggies. Fill the box right to the top, the soil surface will drop somewhat as the weeds decompose.

4. Plant appropriate veggie seeds or seedlings , these may include –

BROCCOLI - Mini; broccolini

CABBAGE - Earliball ; Sugar Loaf ; Golden Acre

CAPSICUM - Most varieties can be grown in containers and are non-hybrid.

CARROT - Baby carrots are most suitable eg. Baby Pak , Baby , Amsterdam Forcing or Thumbelina.

CHILLI - As for capsicum .

CUCUMBER - Bush varieties eg. Spacemaster

EGG PLANT - Most varieties eg. Short Tom or Long Purple.

LETTUCE - Cos eg Romaine or Cos Green; Butter Head eg Buttercrunch or Green Mignonette

ONION - Any spring onion (shallot) variety.

PUMPKIN - Bush pumpkin eg Golden Nugget or Bush Butternut.

RADISH - All varieties are OK.

SILVERBEET - Fordhook Giant

SUMMER SQUASH - Bush varieties such as Early White Bush or Marrow , long white

TOMATOES - Small bush varieties eg Tiny Tim or Small Fry and "Egg" Tomatoes eg Roma.

ASIAN VEGETABLES - Many of these also lend themselves to container gardening for example Adzuki Beans; Pak Choi; Chinese Mustard; Mizuna; Mibuna and Chinese Broccoli.

5. Mulch any seedlings with a light mulch such as sugar cane but don't mulch areas where seed is planted, particularly small seed like carrot or it may have difficulty breaking through once it is germinated.

Keep your box 'o' veggies in the sun, but near at hand so that you can harvest them when you need them. Even if you are an experienced grower it can be nice to have salad veggies or herbs in a box near the back door when it is cold and raining.

4.2 Making a Wicking Bed Box Garden

In the previous section you will read how to make a "Box Fulla Veggies" box garden out of a Styrofoam veggie box using some weeds and a bit of potting mix, it is ideal for almost any area I thought, until I met a lady who had problems with the water draining out of it when she watered. It appears that she lived in a second storey flat and only had the balcony to grow her veggies on and while she gave it a go, she had to keep apologising to the folks below for raining on their parade. The answer of course was to put together a box garden that did not need to drain by turning a Styrofoam broccoli box into a wicking bed.

The wicking bed is also very water efficient so if you veggies are without care for days at a time and/or you live in a hot area you may consider this as a more water efficient alternative to the standard veggie box garden. We use a Styrofoam broccoli box because it is light, available and cheap - there are some things that are totally undervalued by our society and in my opinion the Styrofoam veggie box is one of them. The process is simple –

Get hold of a broccoli box, a bag of potting mix or similar growing medium, some material to support the potting mix such as wood chips, gravel, perlite etc. (gravel is heavy and perlite is expensive so I go with the wood chips) and a length of filler pipe (I used some 55mm OD PVC because it is what I had hanging around and it is wide enough to allow you to see the water level).

1.Cut the filler pipe so that it is several inches longer than the depth of the box and then using a band saw or hand saw, cut a vee shaped notch out of the bottom of the tube to allow water to fill the support material

2.Place the filler tube into the box and then half fill the box with the support material.

3.Using a hot electric soldering iron punch a hole through the side of the box roughly level with the surface of the support material. This will be the overflow hole.

4. Place your growing medium into the box up to the level of the rim or slightly lower and then place organic mulch such as sugar cane mulch (bagasse) on top.

5.Plant your seedlings through the mulch then fill up the water reservoir through the filler tube until water comes out the overflow hole.

Once you have your box put together but before you add the water I suggest you position it roughly where you want it to go because putting in the water is likely to add another 8 to 10 kilograms of weight and moving it around after that will definitely be a two person job.

To keep up the fertility of your box garden apply a liquid fertiliser every two weeks. By making multiple boxes you will be able to produce all sorts of veggies and can even use crop rotation by not planting veggies from the same family successively in each container. The level of the growing medium will drop over time and need to be topped up.

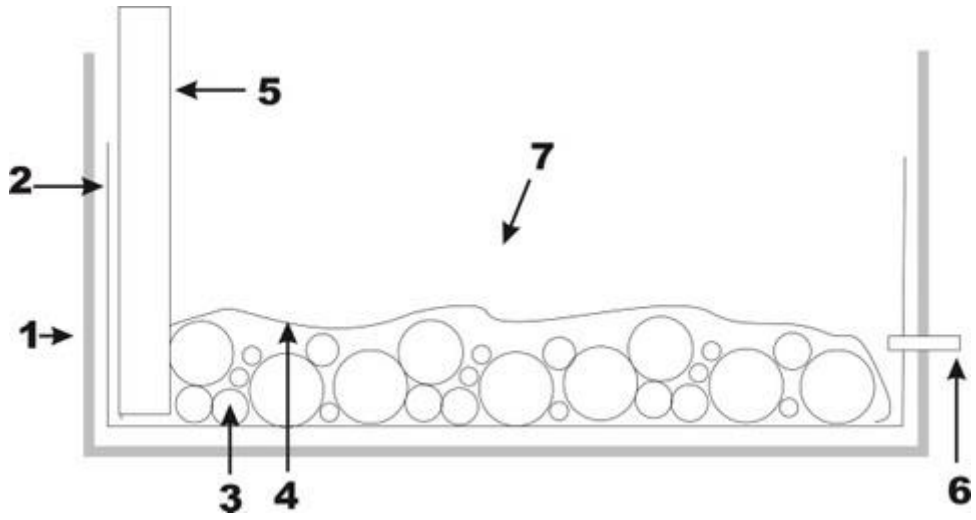
This is another project that is good to involve the kids with; it's fun and will teaches them something about growing their own food, so give it a go!

4.3 Making a Wicking Bed Box Garden – Another Take

- By Elaine Seaman

This article was written by Elaine Seaman, It is a novel way to make self-watering containers completely from discarded/recycled materials.

Basic Elements of the Wicking System



1. A container—large or small, anything from a large pot or half barrel, to a polystyrene box, to a raised garden bed. For small containers a depth of about 30-40cm is perfect, 6-8cm for water and 20-30cm for soil.
2. A plastic liner, unless your container is already watertight. A large carrier bag, a piece of polythene packaging, etc. If necessary, buy some of the thickest builders' plastic from Bunnings. This should come up at least 6-8cm in the box, though if it comes all the way to the top that's fine too.
3. Something to put in the water reservoir that leaves plenty of space for water, and will hold up the soil above. Gravel, empty plant pots, old milk cartons—you get the idea, be inventive here.
4. Something to stop the soil above from falling into the reservoir below. A piece of geotextile is ideal, but an old T shirt would work for a couple of years, until it starts to break down.
5. A tube so you can fill the reservoir with water without disturbing your plants. A scrap piece of drainpipe, a juice bottle with slits near the base, you're beginning to understand where I'm coming from, aren't you? With drainpipe cut an uneven bottom edge so it doesn't form a seal against the polystyrene. You want water to flow out of it easily.
6. Possibly the most important part of the design, an overflow. This can be as simple as a hole about 1cm across melted in your poly box, and a corresponding hole in the liner. You can pretty it up with a piece of tubing but it's not necessary.
7. Fill up with good quality potting soil, or a mix of compost and soil, and then add your plants or seeds. Only plant seeds if you are sure you can keep the surface moist until they can get their roots down a few centimetres.

Water will wick up from the reservoir into the soil above, keeping the plant roots moist. The top layer of soil can get quite dry, but below that will always be damp.

What can I Plant in my Box?

- 6 or 8 lettuces from a punnet.

- 1 tomato or cucumber in the middle of one edge, and a few basil plants. To stake the tomato/cue, put a stick right down the inside edge of the box, but be careful not to disturb the reservoir or pierce the liner/base of the box.
- A selection of herbs—and keep the box close to your kitchen door for easy picking.
- 1 small variety pumpkin, or zucchini—allow it to trail over the edge and you can fit a few herbs or lettuces in as well.
- A dozen pea plants or climbing beans, make a stick wigwam for them to climb, but be careful with the sticks as above.

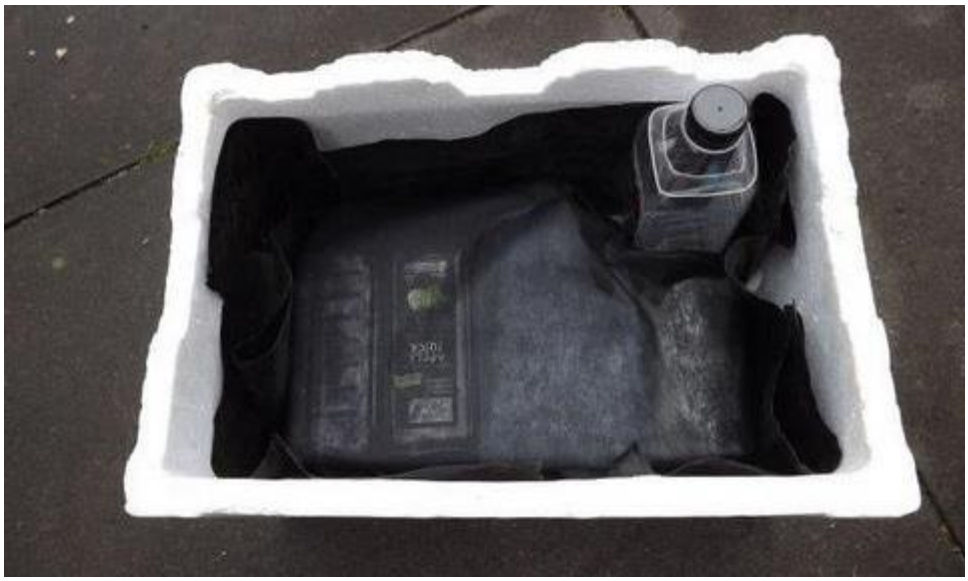
Don't forget your box will need plenty of feeding to keep your plants growing well. Liquid feeds like worm juice can be added straight into the reservoir via the fill tube. When you harvest some of your plants, just pop new ones in to take their place.
Keep an eye on the water level in the reservoir. Bigger plants will use more water and need watering more often.
It's good to mulch your box with about 2cm depth of sugar cane waste or chopped straw or similar, which helps prevent evaporation—it breaks down and feeds the plants, too.

How to make a planter that waters itself, from a polystyrene box

Poly box with plastic liner, and bottles to form the reservoir. I have poked/melted holes in the bottles to allow the water level to rise and fall easily.

Close up of fill tube—this gives a larger hole than the bottle neck to make it easy to fill, and the top of another similar bottle, cut slightly larger, sits over it to keep the mozzies out. The rest of that bottle is in the reservoir.

Close up of the overflow—a piece of the liner cut out to coincide with a hole already in the poly box, at about the height of the top of the infill. If you have a water-tight box, just melt a 1cm hole, 6-8cm above the base.



A piece of weed mat or ideally geotextile is tucked down around the bottles. This box is ready to fill with compost.

The base of the fill tube. I have melted several slots to let the water flow out easily into the reservoir.

The compost is in and the reservoir filled with water until it started to overflow (at the overflow!). Here you can see the water level just by looking; with a narrower tube you can use a dipstick to check it. Ready for planting!

The finished product!

5.0 Growing Vertically with Containers

5.1 Hanging Pots

Hanging baskets/pots are great because they increase the amount of food you can grow, particularly if you only have a small space, make unproductive spaces productive and are good for amenity (they look nice). Over the years I have tried them with varying levels of success mainly because they have one significant downfall – the dry out quickly, particular if exposed to the hot dry winds of a western Sydney Summer.

I am always on the lookout to increase the area we can use to grow productive plants and just recently have been re-evaluating some of our vertical spaces. I have not done anything with hanging baskets for years and certainly not since the new back deck was constructed. So I took some time to have a look at what we could do.

Where to Hang them?

Just to refresh, our deck is on the western side of the house, to reduce the amount of sun hitting the back wall of the house and making it more tolerable on those really hot days, without having to run the air con 24/7. It was a great place to install productive

hanging baskets, but I had a bit of a dilemma. If I installed the hooks on the outside end of the rafters, the baskets would get lots of sun in the cooler months but they may overheat in the full heat of summer, If I put them inside the protective blinds and under the shadecloth covered area they would not get enough light, particularly at the start of the growing season before the plants started to spill over the edge and trail down over the pot. What to do?

After much consideration, and to illustrate that light shines through to even the dullest places at times, I had my answer. As they say in the taco commercial - “Por que no los dos!” ie, why can’t we have both? So that is what I did, I installed two sets of hooks for each hanging basket so that they could be hung in the outer sun drenched area or the inner more protected area as required.

What Pots?

The next decision was which pots to use. I wanted hanging baskets that were a decent size and after some looking around I found a brand that offered 340mm wide, 8 litre plastic self-watering hanging pots which were Australian made, so I bought half a dozen. I am not a huge fan of commercial self-watering pots because I find that the reservoir is usually too small and they are more of a gimmick than serious gear, but in this case I figured every little bit helps.

Mind you, I had no intention of leaving them like that. Before I put soil into the pots I made up an olla composed of two 12cm unglazed terracotta pots connected with silicon sealant, and with the same sealant blocking up the drainage hole of the bottom pot. This will give me a reservoir capacity of a bit over a litre, plus whatever is in the self-watering pot reservoir itself.

What plants?

This one was fairly easy. I wanted to grow productive plants which would trail over the side of the pot and look nice and jungle-y, so I chose cherry tomatoes and cucamelon, plus maybe a bit of luffa and Lebanese cucumbers as well.

5.2 Shed Wall Container Growing

This was an idea that I stole from my mate **Salman**, it used recycled materials and allows you to grow food vertically with a minimum footprint, so what is not to like?

We go through a reasonable amount of milk and until recently bought it in 2 litre bottles, but it was brought to my attention that the 3 litre bottles are made from thicker stronger plastic and can be repurposed to make all sorts of interesting things. One of the interesting things that can be made is a vertical veggie garden. However small containers like these have a tendency to dry out pretty quickly on a hot western Sydney summer afternoon so I have made them "self-watering" by using the same method as used in the wicking beds.

Making the Containers

I found it easiest to save up a load of milk bottles and then convert them to plant containers all at once. After washing them out I made a cut just in front of the handle and then down and around the neck so that the main area of the body was intact but there was enough of an opening for a plant to grow out. I used my small band saw to make the cut but you could probably use a Stanley knife (with a leather glove on the other hand!) or a coping saw, or perhaps even a jig saw would do the job.

Once the bottles were cut I got hold of a bag of 12mm scoria left over from a previous project and poured 20 to 30mm into the bottom of each bottle, then drilled a 6mm hole in the side at the surface level of the scoria. That way the bottom 20-30mm acted as a reservoir and turning the bottle into a self-watering pot or verrry small wicking bed.

Once the scoria was in place it was just a case of topping up the bottles with potting mix and then plating a seedling in each. With the containers now ready to go, it was time to mount them on the side of the shed.

Mounting the Containers

I needed strapping of some description to wrap around the handles and secure them to the side of the shed and after a bit of looking around I found “Abey” brand builders strapping, used to join timbers together in construction work. The particular strap I used was 25mm wide x 0.6mm thick and at $4.50 or so for a 6 metre length it was pretty good value and it was pre-drilled with 6mm and 4mm diameter holes to make fitting even easier.

Having found my strap I cut off 10 x 90mm lengths using tin snips, one for each milk bottle, and bent them around in a U-shape with the ends flared out slightly to go over the rib in the shed wall. The shed is a Colourbond steel prefabricated shed with stiffening ribs formed vertically in the walls and by taking the strapping around the handle and down each side of the rib, I could put fastenings through the strap and into the sheet metal rib. This gave the bottles a secure attachment.

I must admit my first thought was to drill and pop rivet the straps to the shed wall, but it occurred to me that if I wanted to take the bottles down for any reason, like replace the potting mix, replant them or even replace the whole bottle I would need to drill out the pop rivets first. So after a small amount of consideration, I decided to drill the ribs and then use self-tapping screws, put in with my cordless drill.

It didn't take long to put them up with the minimum of dropped screws and swear words. Although there were times when I was holding up the bottle, holding the strap in place, holding the screw on the end of the driver while driving it home, where a few extra hands would have been useful. As you could see I tried to be a bit artistic in mounting them, well I tried!.

I have been putting them up in the middles of a pretty hot summer and while the seedlings are staying wet enough, they are still suffering from the strong sun and are not particularly happy. I need to give them a bit of protection with some shade cloth or better yet, plant earlier in the year and give them a bit of time to grow on before the real hot weather hits.

Jan 2014 Update

While the veggies seemed to do OK, the hot weather really took it out of them. The containers are too small and too exposed to maintain a steady and reasonable temperature for good growth. The best thing would be to get them well and truly established earlier in the season before the hot weather came and to install them in a less exposed position where they have some relief from the midday summer sun.

Another problem has reared its ugly head. The containers are starting to fall off the wall because UV embrittlement of the plastic means they can no longer support their own weight, so about 12 months is the best you can expect from the untreated containers. If you want to try this method I suggest painting the containers first with a non-toxic outdoor paint to put a barrier between the plastic and the UV. Again, a more sheltered position would probably extend their life too.

5.3 Repurposed Potato Sack Vertical Container Garden

- By Angie Sweeney-Bas

I have a balcony on my apartment. This is the only “land” I have to work with to grow veggies. Because of this a vertical garden on the side of a wall helps to grow on all areas of the balcony. I have used mine to grow salad greens, but you could use it to grow smaller veggies or herbs.

Materials:

Potato sack or old clothes

Sewing machine

Scissors

Pins

Hooks

Plants

Mushroom Compost or nice soil

Method:

I chose a potato sack for a few reasons. Firstly it re-uses something, Secondly it already has the sack look to it which does some of my work for me and lastly the thread in the material is woven loose enough to hold the soil but still pass water through.

1. Mark out where you will sew the sack. I marked it out into 9 equal squares, but you could make them bigger and make 6 squares or 4 squares. I would not go smaller than 9 though.
2. Sew along the pins to sew both pieces of fabric together. It should look like the side of a rubix cube but stretched a little. My boxes were 6 inches by 10 inches.
3. Sew again over the squares but use the zig zag stitch to make it stronger.
4. Sew around the outer seams with zig zag stitch to strengthen them. Just make sure you do not sew the top together.
5. Sew buttonholes into the back piece of fabric at the top of each box, or as many as you feel it might need. At this point you could also use eyelets. I used 3 buttonholes at the top of my sack. This was one per pocket since I had 3 pockets at the top. You could do more, but I would not do less than 3.

6. Cut the tops of each box to create a pocket. At this point you could hand blanket stitch across the top of each pocket to stop fraying and make it stronger.

7. Use cup hooks to hold it onto your wall or a door. This is what I did, but you could use lots of things to hang it and it depends what you will hang it to. You could use wire, coat hangers, 3M hooks, string.

I read somewhere that planting the plants into Mushroom compost is best so this is what I did. It could be that it holds better in the material as Mushroom Compost is coarser. Might have nothing to do with nutrients. I also used Seedlings. Use seedlings if you are going to plant into Mushroom compost. Otherwise, you can plant seeds into nice potting soil.

So far it has seemed to work well. The bag seems to hold the water too to keep the plants moist. I feel like the eyelets would be sturdier, but it has not fallen down so far. I have planted it on a wall that gets lots of sun so it should work well.

6.0 Microgreens

6.1 What on Earth are microgreens?

Have you ever grown sprouts? If you haven't the I recommend you read the other articles on this website about how to do that, if you have you will know where i am coming from. Sprouts are seeds that have germinated and put in a bit of growth, then we eat them. Microgreens are the next step along the plant growth continuum, in that the seeds are plated into a growing medium, germinate, produce roots and a couple of leaves – then we eat them.

Why bother?

A reasonable question! If you are a flat or apartment dweller but still want to grow fresh veggies, if you want to include home grown fresh harvested veggies in your diet, if you want to improve (I resisted using the word "supercharge" here, otherwise I may give the impression I watch too much crappy TV) your diet by including the vitamins and minerals that fresh veggies provide; microgreens may be for you.

They don't need lots of space, fertiliser or water and are easy to grow; if you put together your microgreen set up the way we describe in this article they will need even less care and you won't have to worry about going away for a couple of days to a week and leaving your microgreens without water, you will still be producing fresh vegetables.

Mircrogreens can save you money as well as reduce your environmental impact by reducing those food miles (or kilometres) down to just feet, and if you can't get to the shops for any reason, you will still have a supply of fresh greens for the table. Let's face it; you would have to be utterly crazy NOT to get stuck into microgreens. OK, OK so I do get a bit carried away.....read the article though and then give it a go, you won't be sorry.

A Word of Caution

You just knew that there was a fly in the ointment somewhere, didn't you? At least this one is a small one. In the same way as you would when getting seeds for sprouting, make sure that they are designed for sprouting and/or microgreen production or consumption directly by people in some form. This is to make sure that they have not been contaminated with fungicides or other pesticide to reduce losses when sown in the ground, because these chemicals could make you sick. Also, with some vegetables such as tomatoes, the plant is actually toxic and so not suitable for growing as a microgreen (although the fruit is fine obviously) but if you stick with the plants in this article you will be fine.

Where do you get the seeds?

One obvious place to get your seeds are from a seed supplier that supplies sprouting seeds, preferably one that specialises in open pollinated, organic and/or heritage seeds because these are people worth dealing with. As mentioned in other articles, I tend to buy most of my seeds from Eden Seeds in Queensland, their website is in the links area. That is not the only avenue though, you can pick up packets of seeds that are destined for human consumption directly but that will still sprout; for example the old "blue boiler" dried peas that are used to make mushy peas with. The can be bought from the likes of Woolies and Coles in the soup section, quite cheaply and have a very good germination rates. Think about sunflower seeds in the same way, even if they do come from the bird seed section.

If you have Asian food shops near you, there are a number of seeds that are used to make curries and other dishes that can be bought quite cheaply and will germinate to give you wonderful microgreens. Examples of these seeds include onion, mustard, fenugreek and mung beans, available in comparatively large amounts for a few dollars, good value in anyone's language.

If all else fails, or you want to be that much more sustainable/self sufficient, you can save your own seed and grow microgreens from that. There are circumstances where you might have produced seed that you don't want to use, say if you have a number of

different varieties of brassicas flowering at the same time. Brassicas are notoriously promiscuous and the seed you save from an individual plant may not breed true to the parent you harvested it from. With microgreens you are only going to grow it up to a few leaves before consuming it, it won't matter if was a cabbage or broccoli or a cabboli (a cross between cabbage and broccoli....), at that stage it will look (and taste) the same.

What plants are suitable for growing as microgreens?

The following plants can be grown as microgreens for human consumption –

Herbs such as – rocket, basil, coriander, mustard
Vegetables such as – Asian greens (mizuna, mibuna, tatsoi, pack choi) Beets, brassicas (broccoli, cabbage, kale), celery, garden cress, endive, lettuce, peas, radish.
Grains such as – barley, oats, wheat, linseed, buckwheat, sunflower

How do you do it?

Get hold of –

• A seedling flat - Seedling flats are available from nurseries and if you have bought lots of seedlings in the past you may have a couple floating around the house or garden, I sure did. Otherwise you can buy them new or make your own out of wood, the commercial ones are usually 350mm long (outside measurement) by 290mm wide (outside measurement) by 60mm deep and this is a handy size for lots of reasons.
• A kitty litter tray - these are available very cheaply at junk shops and are usually around the following dimensions – 290mm wide (inside measurement) by 400mm long (inside measurement) by 75mm high, so they will fit your seedling flat inside them.
• A piece of timber the same size as the flat, with a handle to act as a press.
• Some coarse river sand.
• Some growing medium – I use the same mix that I make for seed raising mixture basted on 3 parts cocopeat, two parts of worm castings and one part of coarse river sand.
• Scissors for harvesting.
• The seeds you want to grow into microgreens.

The process –

1. Take your kitty litter tray and put one to two centimetres of the coarse river sand into the bottom of it and smooth it over so that it is reasonably form and level, then put water in so that it sits a few millimetres above the surface of the sand.

2. Take the seedling flat and fill it with your growing medium and tamp it down to a firm, flat surface in which to sow your seeds.

3. Sow your seeds thickly but evenly over the top of the seedling flat, this will be easy with the big seeds but a bit more difficult with the smaller seeds. There will inevitably be some unevenness in your sowing and some of this can be evened out by spreading areas too thickly sown out with a finger or adding a bit more seed in areas too thinly sown.

4. Using your press or tamper, tamp down the surface of your flat to ensure good soil to seed contact and cover the seed with either a thin layer of growing medium or newspaper to reduce evaporation.

5. Now place the sown flat into the pre-prepared kitty litter tray. The water in the kitty litter tray will wick up into the growing medium in the flat to keep the seeds moist without water logging them, the coarse sand will support he flat and act as a water reservoir so that there is less chance of your microgreens drying out. Also, by watering directly into the litter tray rather than the flat you won't be washing smaller seeds out when you water.

6. If you do elect to use the newspaper, lift it up every day and check on the germination of your seeds, remove it totally once they have germinated.

7. Once the seeds have germinated and grown to the point where there first two true leaves as opposed to their cotyledons or seed leaves they can be harvested. This is done by cutting them off at just above soil level with a pair of scissors, then once they are harvested wash them and remove any soil, seed coats or rotten leaves before placing them into a container ready to go into the fridge.

The freshly harvested microgreens can be used in salads, sandwiches, on top of soup as a garnish or almost anywhere you would use salad leaves, but they will give you a much greater variety of flavours and textures. You could even develop your own microgreen mixes by combining different brassicas, different Asian greens or a mix of vegetables and herbs; whatever takes you fancy to make your own personal microgreen mix.

Good luck and bon appetite!

6.2 Another take on Microgreens

If you have already sampled my comments in the previous microgreen article you will know what a wonderful, practical and tasty source of nutrition microgreens are as well as having a reasonable idea of how to produce them. If you haven't, go read it first, I'm not going to repeat it all, except the production bit!

Producing microgreens in large amounts can be a good thing if you are using them heaps but what if you like small amounts of variety? I was wandering through our local Salvation Army shop when I came upon a round, plastic microwave cooker that was divided up into three equal "wedges" (for want of a better term). It looked perfect for raising microgreens and for the vast price of $1.50 I was able to purchase it; and for

another $1.50 I was able to get a plate to go under it to catch any water draining after irrigating them. It was big enough to produce three loads of microgreens neatly separated from each other and the lid was high enough to allow germination and some growth before it would need to be left off. It was also decorative enough not to look out of place in the kitchen. Perfect, reusing at its best.

The first trick when I got it home was to grab hold of a very sharp 6mm or so drill and drill a whole stack of drain holes in the bottom to stop the microgreens getting wet feet. The plastic is quite brittle and I figured could easily break up even though it was reasonable thick, so I used a very sharp drill bit and was comparatively restrained in the pressure I applied to the drill, letting the bit do the work. In the end all was well and I was able to drill in all the required holes without destroying the container.

It appeared to me fairly obvious that, due to the shape of the container, a simple rectangular lump of wood to press down the growing medium, seeds etc was not going to work, so I fished out a piece of 10mm thick ply wood and sketched the shape of one of the wedges on it. After cutting it out using my small band saw (it could just as easily have been done by hand with a fret saw) and sanding it back to smooth of the rough edges I tried it in place. It fit! Not bad for someone almost without manual skills. I found an old knob off a cupboard door, screwed it on for use as a handle and we were away.

Using the same growing medium that I always do (1 measure of coarse river sand; 2 measures of worm castings and three measures of cocopeat) I filled up each of the wedges to the top and then pressed them down with the little wedgie press. I then sowed the seeds on top quite thickly, one type in each wedge – fenugreek, mung beans and lettuce – covered with another layer of growing medium and again pressed down to ensure good soil to seed contact. I then watered the whole shebang with a sprinkle nozzle on a PET drink bottle, replaced the clear lid and stood back to await the fire works!

And they weren't long in coming! Unfortunately the top layer of growing medium at about 5-6mm thick was a little too thick and well tamped down so that when the thickly sown seeds germinated, rather than push through the top layer as I expected they lifted it up in one solid layer. It looked a bit weird but in the end it was only a minor inconvenience and after being broken up with my fingers and watered in, all was well.

Things were moving along quite well and all of the microgreens were growing strongly but we had to go away for the weekend and, with nowhere else to put them, they stayed on the side of the sink in the kitchen with the curtains closed. This resulted in them not getting enough light so they became rather long and leggy, but this did not seem to interfere with their flavour. The lettuce did take the longest to recover, the other two being thicker with nicely flavoured stems.

This was a great way to grow a variety of microgreens in a small area, right in the kitchen where they were going to be used. Sometimes it can be a pain to have to walk down to the greenhouse to harvest some microgreens for a meal, but my lovely partner in the sustainable life would not be enthused over numerous flats full of growing things cluttering up the kitchen either. This way we could have a happy household and microgreens too.

6.3 Experiments with Baby spinach

We have seen a couple of recipes recently that required baby spinach leaves, usually to go in wraps and the like. I refuse to buy the over-packaged stuff but figured it was just another type of microgreen so I would have a go at growing it myself. When I came to do a bit of research on it, there was remarkably little specific data on how it baby spinach be grown in a home-based setting, either on the 'net or in my books. It seemed to me it was time for a bit of experimentation!

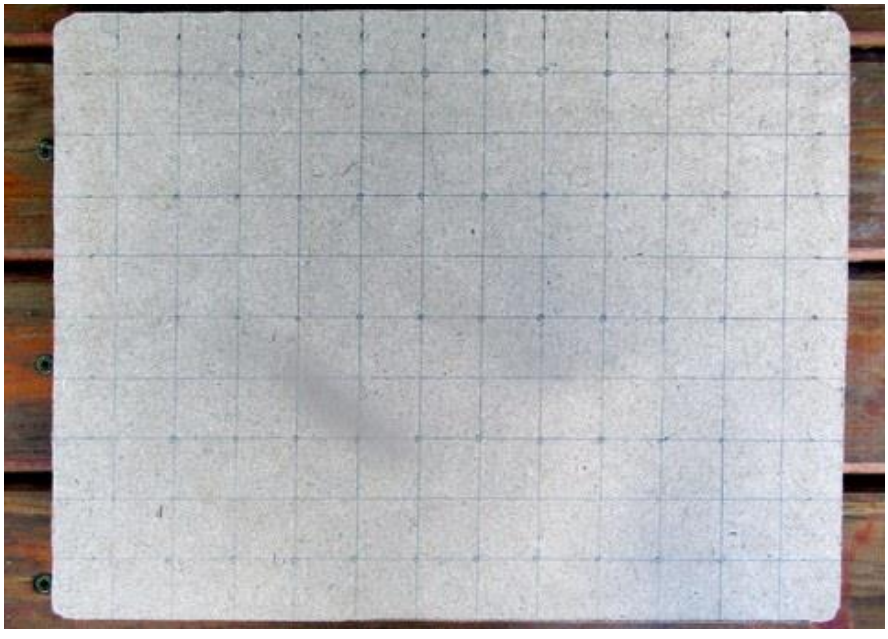
My thoughts were to use a seedling tray (348mm x 290mm x 55mm black plastic seedling trays used by nurseries, hardware's etc to hold seedling punnets), fill it with my standard seed raising mix and then plant it out. Once the tray was prepared I would

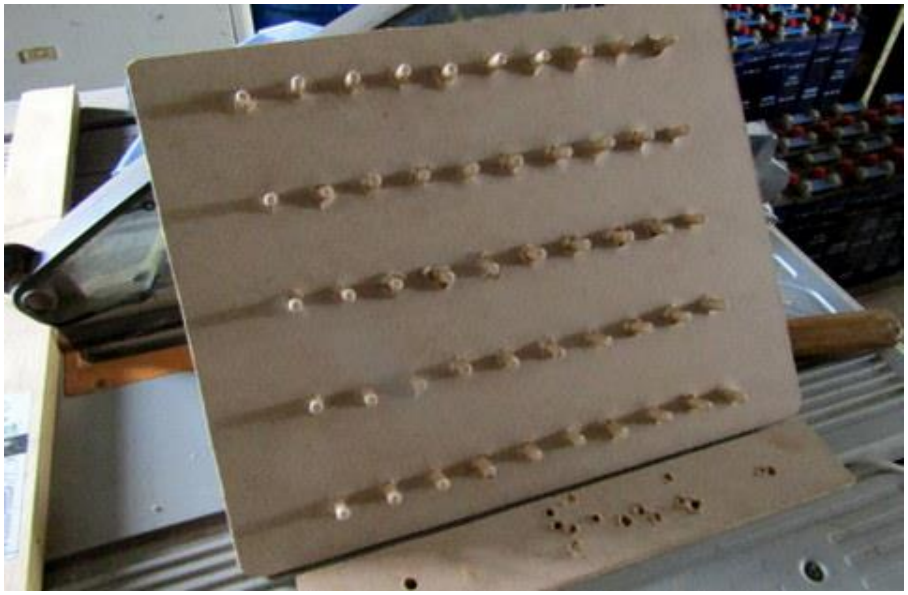
sit it one of my sand filled cat litter watering trays to keep it damp for germination and growing.

It all seemed to make sense, but I really had no idea how close of far apart or even how deep to plant the seeds, as information either wasn't there or was conflicting. So what I decided to do was make up an adjustable rig to put holes into the seed raising mix at a pre-determined points to see what worked. That way, what I was doing would be reproducible once I worked out how best to do it.

Making the Sowing Rig

I had some 6mm MDF (and, yes, it was left over from a previous project!) so I cut it to 325mm long by 250mm wide and rounded off the corners so that it would fit more neatly into the top of the seedling tray. To cut it I used a hand saw but used my small band saw to round off the corners. I then sat down and did some calculations (clearly not my strong suit) and worked out I wanted to try to fit 100 baby spinach into the seedling punnet. I ruled up one side and one end into 25mm graduations with a pencil then ruled up the back of the MDF into 25mm squares. The idea was that a seed would be placed at the corner of each square. At 130 total squares this meant I could leave some room at each end of the seedling tray.





The next challenge was to work out how I would arrange it so that I could push a hole into the seed raising mix at the appropriate places, into which I would then plant a seed. For years I have had a pack of 50 fluted timber dowels (6mm in diameter x 32mm long) which were designed to be used in timber joinery but I hadn't used for anything. Only 50 you say? When I needed 100? Well I had an obvious answer, I would use the aforementioned band saw to cut them evenly in half!

Have you ever tried to cut a whole stack of 6mm x 32mm cylinders, exactly in half, without losing a finger in the process? Anyway, through an amazing coincidence after recalculation it turned out that the best spacing for the seedlings meant I would only need 50 of the dowels. Thankfully the original pack actually had 54 dowels so I was able to carry out some (mostly bloodless) practice with the band saw but still have enough dowels left over to complete the job properly.

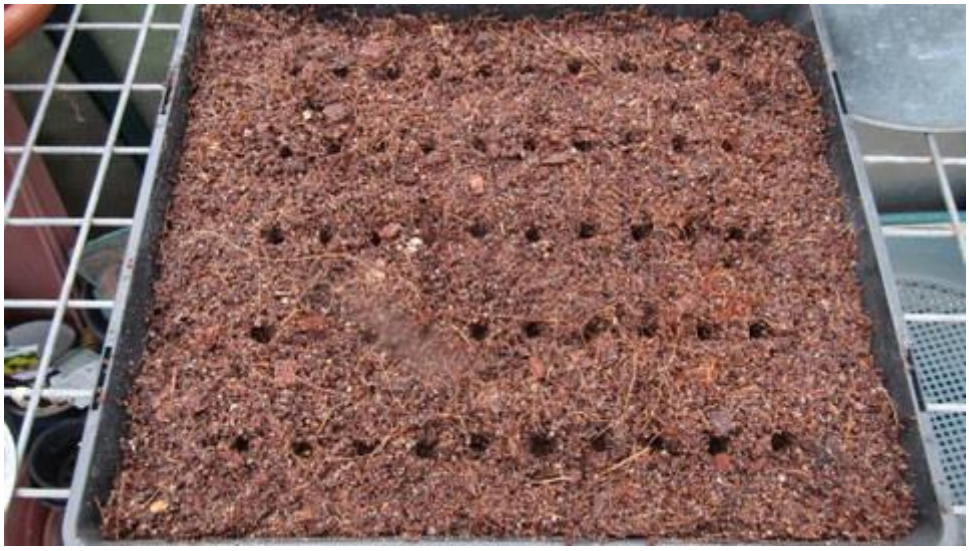
I drilled 50 7/32" holes (sorry, I have had my drills for many years, and they are pre-metric) into the MDF board at designated places. Drilling 7/32" holes for the 6mm dowels gave me a firm enough fit that they would stay in place without glue, but not so tight that they couldn't be tapped in with a hammer. I have a bench drill and used that so that the holes were as close to 90° to the surface of the board as I could get them, pretty much. The new deal actually worked out better than my original idea of gluing

the dowels into the holes, because it meant that the length of the dowel (and hence the depth of the planting hole) was adjustable.

In some of my reading it had appeared that the spinach seeds needed to be sown 12mm deep, which seemed a bit deep to me, but anyway. By placing the rig on a flat surface and applying a hammer gently to the back I was able to set the dowels all at 12mm.

The Set Up

I made a batch of my seed raising mix up, which is covered elsewhere but for simplicity is basically a mix of 1 part coarse sand, 2 parts worm castings and 3 parts cocopeat (horticultural coir) all by volume, I use a 500ml plastic take-way food container as the measure. I mixed it around, making sure it was nice and damp then loaded it into the seedling tray and levelled it out a few mm below the level of the rim, then pressed the sowing rig down on top, to flatten and compress the seed raising mix and press in the holes. Then into each hole I dropped a spinach (English medamia) seed and covered each seed with a bit more seed raising mix.



The seedling tray, seed raising mix, seeds and all, was then placed into one of the cat litter trays three quarters full of sand and water, to ensure the seed raising mix was damp, but not sopping. I kept the water up in the cat tray manually, the seedling tray was too large to allow me to put the upturned bottles in as I usually do in capillary beds to provide a water reservoir.

Results

The seedlings started to emerge about a week later, just not as many as I had hoped for. We got a total of 17 plants out of the 50 seeds of which 14 plants made it to harvestable size, about 2 and a half weeks after the seedlings emerged.

It is amazing what you find out when you do things for yourself! I had assumed that the baby spinach would be harvested in the way that most microgreens are – once they have achieved the required size you take a pair of scissors, cut them off and serve them up in true MasterChef style, followed by dumping the growing medium and starting again from scratch.

Not so! We don't have a huge number of plants but I have been able to harvest half a dozen, to a dozen leaves every day or two to have on our lunch since they got to harvestable size. The supply doesn't seem to be slowing down yet either!

The future

I am going continue and see how long we can push the harvest for but also about a week ago I set up another seedling tray, but this time I modified the sowing rig so that the seeds would be sown closer to 5mm – 6mm deep.

The new tray has been remarkably productive (see above) with a hugely increased germination rate and continued cropping. It seems that the sowing depth of 5 – 6mm is the way to go, but to be fair, even the original tray is still producing on a regular basis a couple of months later. Another difference was I didn't put as much sand in the kitty litter tray the spinach tray is sitting in. This makes watering easier, into the gap between the two trays, and also allows some liquid ferilisation to go in with the water. I think this has been a great proof-of-concept, if you don’t have much space and want a regular, if small, harvest then this is one way to get it!

7.0 Resources - Books about Growing food in Containers

7.1 Container Growing General

The Edible Container Garden (Fresh Food From Tiny Spaces) – Michael Guerra – Gaia Books Ltd (UK) 2000 ISBN 1 85675 089 2 – Good general book on container gardening, how to make and use containers as well as details on individual vegetables, it even makes reference to Permaculture. Chapter one covers getting started, including – design principles, watering strategies, choosing containers, low maintenance gardening. Chapter two talks about growing spaces including: tools, garden structures, pruning and training, weeds, pests, diseases and companion planting. Chapter three discusses the best vegetables, herbs, fruits and flowers for small spaces. Lots of colour photos.

Patio Produce – Paul Peacock – Spring Hill (UK) 2009 ISBN 978 1 905862 28 3 – Lots of good stuff about growing individual vegetables, fruit and herbs on your patio or small outdoor space as well as how to plan and get the best out of your patio farm. Obviously, the section on the patio gardener's year needs to be adjusted to fit in with the seasons here in Aus. Chapter one covers the environment of the patio including why bother, what pots and containers you will need, the best way to grow patio plants, finding novel places to grow and how much you can grow. Chapter two covers planning including tools, trays and propagation, planning crops and growing fruit. Chapter three covers the differences between growing in pots and growing in the ground. Chapter four covers the gardener's year, Chapter five covers the intricacies of growing 39 vegetables. Chapter six covers 15 varieties of fruit and chapter seven covers 24 herbs. The book has no photos and only a few line drawings.

Incredible Vegetables from Self Watering Containers – Edward C. Smith – Storey Publishing (US) 2006 ISBN 978 1 58017 556 2 – This book covers how to make and use self-watering pots, what potting soil to use and which vegetables to plant in them to get the best yield. Although the emphasis seems to be on using commercial self-watering pots, the data is good just team it up with the information on self-watering pots on this site and you're away! The book has three parts, part one covers growing

veggies in containers, containers, growing media, tools and accessories. Part two is called 'Putting it all Together' and talks about getting started, sowing seeds, designing for containers, caring for container gardens, pests and diseases, harvesting and actions prior to (US) winter. Part three contains a review of 43 vegetables (from 1 to 3 pages each) talking about the type of container to use, how to grow it, how to eat it and pest and disease issues. Also covered are 20 herbs and 7 edible flowers. The book has lots and lots of colour photos.

From Container to Kitchen – D.J.Herda- New Society Publishers (CAN) 2010 ISBN 978 0 86571 665 0 – This one bills itself as the "complete guide to the no-yard garden". It covers, among other things, selecting the right container and location, optimising soil nutrients, managing light, water and humidity, choosing fruit & veggies and treating pests and diseases. While not being a big book, it has lots of good information. There is a group of colour photos in the centre of the book, with black and white photos scattered throughout the book where appropriate.

Crops in Pots (Part of the "Green Guides" series of books) – Rachelle Straus – Flame Tree Publishing (UK) 2011 ISBN 978 1 84786 719 3 – This book has a small amount of information on a lot of subjects. It covers why you would want to grow food in containers, how to get started, what to grow and how to grow it, harvesting the produce, pests and diseases. There are also sections on the specifics of growing vegetables, salads, fruits, herbs and edible flowers as well as a section on frugal gardening. There are lots of colour photos.

Grow Your Own Vegetables in Containers (Also called "Organic Crops in Pots") – Deborah Schneebeli-Morrell – Cico Books (US) 2009 ISBN 978 1 907030 06 2 – The book starts out with general principles of organic gardening and how to get started and then goes into specifics of how to set up over 30 different types of gardens in pots. Some examples are sweet basil in a clay pot, red lettuce and shiso in metal tins, potatoes in woven sacks and eggplant in a rubber bucket, lots of colour photos

Grow Your Own Crops in Pots – Kay Maguire – Michael Beazley (Royal horticultural Society) UK 2013 ISBN 978 1 84533 686 8 – The book is broadly broken up into sections covering fruit, vegetables, herbs and edible flowers. The book starts with a discussion of general planting techniques, planning, nurturing and protecting your crops in pots. It follows with a comprehensive listing the plants in each section, how to plant them in containers and how to keep them happy. Each plant only gets a page or two but there are a large number of plants covered. Lots and lots of colour photos.

Permaculture in Pots (how to grow food in small urban spaces) – Julie Kemp – Permanent Publications (UK) 2012 ISBN 978 1 85623 097 1 – This book is also set out on the one-month-per-chapter principle. The stat of the book covers general principles and techniques of organic growing and permaculture. Then each chapter/month starts out with what is growing on her balcony that month and what food growing related things can be done during the month. Following is a few pages of discussion about a specific technique or project and the chapter is wound up with a page on the "herb of the month". Lots of colour photos.

Pot It, Grow It, Eat It – Kathryn Hawkins – New Holland Publishers (UK) 2010 ISBN 978 1 84773 665 9 – The start of the book covers the practicalities of container gardening and getting started (seeds, tools required, feeding and watering, pest control). The main part of the book is made up of monographs on over 45 vegetables, herbs and fruits. Each monograph discusses varieties and general comments, how to plant and where to site seedlings, maintenance requirements, potential problems such as pests and diseases that may be a problem, harvesting, storing and freezing the produce. At the end of the book there are 25 recipes using produce discussed earlier. The book has lots of colour photos.

Crops in Pots – Bob Parnell – Hamlyn (UK) 2007 ISBN 978 0 600 61551 4 – The book is set out like a recipe book, the first section being 'getting started' followed by 'starters', 'main courses' and (of course!) desserts, with a final section entitled 'what to grow'. The first section covers the basics like why do it, siting and grouping containers, choosing containers and compost, propagation, watering, mulching, feeding, pests and

diseases. Each section covers a page or too so not vast amounts of details. The rest of the book covers a series of small scale growing projects (12 starters, 26 main courses and12 desserts) and the information on each project is set out over two to three pages, with a list of what is needed to construct the project ('ingredients') and construction details ('method') and at least one colour photo. The last 'what to grow' section gives a paragraph on various vegetables, fruit, herbs and edible flowers. The book has lots of colour photos.

Window-box Allotment – Penelope Bennett – Frances Lincoln Ltd (UK) 2012 ISBN 978 0 7112 3173 3 – After a short introduction on how window boxes can grow veggies, fruit, spices and herbs and how they are perfect for the elderly, children and the disabled, the book is broken up into twelve chapters, one for each month of the year. Chapters vary in size between 6 pages (September) and 14 pages (October). The content of each month varies, but generally contains information on seeds and plants grown during the month, details on thinks like wormeries and stores of the authors experiences. The book has no photos, but some coloured line drawings.

7.2 Container Growing Plus (small plots, raised beds etc.)

Grow Your Own Fruit and Veg in Pots, Plots or Growbags – Steve Ott, Emma Rawlings & Roxanne Warwick – Foulsham Books (UK) 2008 ISBN 978 0 572 03494 8 – This is set out as an A to Z guide to growing vegetables, fruit and herbs with 1 or 2 pages per plant including varieties, growing tips ie how to sow, plant and grow on. Entries cover 37 vegetables, 13 herbs and 15 fruits. How to grow the plant in question in containers plus preparation and cooking, storing and freezing and a recipe or two is covered. Good for what it is bearing in mind it is written for the UK experience so that planting times will need to be adjusted. Lots and lots of colour photos.

Vegetables for Small Gardens and Containers – Peter De Vaus – Hyland House Publishing (AUS) 1991 ISBN 0 947062 37 8 – This book covers location and planning of veggies, tools, crop rotation, preparation and planting, pest and disease control and harvesting and storage of your veggies. A good book for small scale growers and one of

the first to cover container growing veggies seriously. There are sixteen chapters between two and fourteen pages long. Chapter one covers why do it, chapter two planning, chapter three tools required, chapter four understanding soils, chapter five feeding plants, chapter six mulches and watering, chapter seven crop rotation and chapter eight seed sowing. Chapter nine covers seed and seedlings, chapter ten pests and diseases, chapter eleven, protecting your plants, chapter twelve weeds, chapter thirteen gives general comments on growing vegetables in containers and chapter fourteen gives an A to Z of how to grow 67 vegetables. Chapter fifteen discusses harvest and storage; Chapter sixteen gives a series of sowing guides applicable to Aus. The book has 5 sets of colour plates distributed throughout the book plus some B&W photos and line drawings.

Crops in Tight Spots – Alex Mitchell – Kyle Books (UK) 2019 ISBN 978 085783 592 5 – Alex has a number of books out, some of which also reside in my library such as 'Rurbanite', 'The Edible Balcony' (not to be confused with Indira Naidoo's book of the same name) and 'Gardening on a Shoestring'. The main part of the book provides a series of projects, plan and information on individual edible plants designed around: Ledges and Sills; Terraces and Courtyards; Roofs and Balconies; Small Gardens, and Other Awkward Spots. There is also a chapter on 'Which Crop Where' and one on pests and diseases. She does refer to Permaculture at a number of points in the book. The book has lots of colour photos.

Edible Spots & Pots – Stacey Hirvela – Rodale Press (US) 2014 ISBN 978 1 60961 959 6 – The book has six chapters, The first one, Edible Pots, talks about growing vegetables in containers and chapter two, Edible spots, talks about growing crops in raised beds. Chapter three, Spots & Pots Gardening School' covers the basics like seed raising, watering crops, fertilising including composting, staking and pruning, pests and diseases. Chapter four, Spots and pots projects gives details of a series of projects under the headings 'bamboo' eg making a bamboo trellis & tripod, 'Fabric' eg making a fabric grow bag & planting hammock, 'Metal' eg making a mesh tower & tomato ring, and 'Wood' eg making a deck corner shelf and stacked pot planter. Chapter five 'Thriller, Filler, Chiller and Spiller' list different combinations of plants that can be grow

together. Chapter six is a' Plant Encyclopedia' giving information on 24 annual vegetables, 5 perennial vegetables, and 27 herbs and edible flowers. Each vegetable entry covers the plant's growing habits, how to start it off, the season it grows (in the US), when to harvest, water and light requirements, recommended varieties, space-to-yield ratio, plot free pointers and garden role. The plant has no photos but lots of line drawings.

Vegetable, Fruit and Herb Growing in Small Spaces – John Harrison – Constable & Robertson Ltd (UK) 2010 ISBN 978 0 7160 2245 9 – This is a small book, slightly larger in size than a standard paperback and 143 pages plus glossary and index and it does not contain a great deal of detail. The first chapter, What to Grow Where, provides various ideas for growing food in small spaces, like containers, raised beds and grow bags. Chapter two covers succession planting, chapter three covers composts and fertilisers including chemical fertilisers and chapter four covers buying seeds. Chapter five covers watering and tools, and chapter six covers a few pests and diseases. Chapter seven provides comments on common annual vegetables, chapter eight does the same for growing fruit and chapter nine does the same for herbs. The book has no photos, but some line drawings.

A Little Piece of Earth – Maria Finn – Universe Publishing (US) 2010 ISBN 978 0 7893 2027 8 – A great little book covering growing fruit and veggies indoors, in window boxes, on terraces and balconies in borders, patios and pergolas. The book is unusual in that it includes section on rooftop gardening, foraging and community gardening. Chapter one covers indoor and window box edibles with things like potting soil and starting seeds and unusual stuff like bananas, vanilla orchids and mushroom logs. Chapter two covers hanging gardens terraces and balconies including containers for small spaces, espaliers and the native wildlife terrace. Chapter three covers rooftop gardens including plants for the windy roof, mediterranean lounge garden and French intensive gardening. Chapter four is about the spaces between: borders, patios and pergolas, including a kids garden, an Asian mixed veg planter and an outdoor kitchen with edible walls, Chapter five is foraging and chapter six is community gardening.

There are also recipes and DIY scattered throughout the book. No photos but some line drawings.

7.3 Indoor Growing

The Apartment Farmer (The Hassle Free Way to Grow Vegetables Indoors, on Balconies, Patios, Roofs and in Small Yards) – Duane Newcombe – J.P. Archer Inc. (US) 1976 ISBN 0 87477 047 5 – If you can get hold of, this is a good one. Lots of info about growing under lights and in containers and good detail on individual vegetables. The book starts out with what apartment farming can do, why it is worthwhile, where you can find the space and planning things out. This is followed by a chapter soil, water and planting considerations, then moves on to growing in particular areas: the windowsill, balcony, patio, rooftop, and then indoors using artificial lighting. The last four chapters discuss the fruits, vegetables and herbs suitable for this approach. The book has no photos, but lots or really good line drawings.

Escarole in the Bedroom (Growing Food Plants Indoors) – Jack Kramer – Little, Brown and Co (US) 1977 ISBN 0 316 50314 2 – As well as some good detail on how to grow individual food crops, this book provides some interesting information on areas to grow the plants indoors, using artificial light and what sort of containers to use. Chapter one covers the fundamentals of growing food indoors (watering, feeding pests and diseases), chapter two covers seed sowing, chapter three gives some insight into where to grow plants indoors, room by room and chapter four talks about containers that can be used, pots and recycled containers. Chapter five covers using artificial light for indoor growing. Chapter six talks about sprouting and some herbs, chapter seven talks about growing summer veg and chapter eight covers fruit and autumn plantings. Chapter nine covers processes for growing plants in the (US) winter and chapter ten talks about food plants that can be grown all year round including 10 herbs, 4 sprouts 12 vegetables, 11 fruit and some other miscellaneous crops. Each entry gives an introduction, summary of growing info (spacing, germination, how to grow, harvesting, varieties etc.) and with some there are recipes. There are no photos but lots of line drawings.

Indoor Kitchen Gardens – Elizabeth Millard – Cool springs Press (US) 2014 ISBN 978 1 59186 593 3 – After an introduction, the book is broken up into three main sections. The first section, growing edibles indoors, talks about planning your approach, working out where to grow your indoor crops taking into account space, light, humidity, pets and pests, working out what containers and growing medium you need, plus lighting and air movement, what seeds you need, problems you may face like mould and pests and having the right attitude around indoor growing. The second section provides information on growing sprouts and microgreens, herbs, wheatgrass and mushrooms. The section is quite detailed, giving an oveerveiw of production techniques, requirements and likely problems and how to deal with them. Section Three, in a similar process to section two discusses growing radishes, carrots, tomatoes, leaf crops, potatoes and capsicums indoors. It is a well written and informative book with lots of colour photos.

Indoor Edible Garden – Zia Allaway – DK Penguin Random House (UK) 2017 ISBN 978 0 2412 4897 3 – The book has six chapters and in general terms there are so many (very attractive) colour photos that the actual amount of information on each page adds up to a few paragraphs or less. Chapter one covers planning the indoor edible garden, and talks about where to grow edibles including detail on identifying sunlit, partial sunlit and cool zones, best indoor edibles and choosing a container. Chapter two gives details on growing herbs and edible flowers, chapter three covers sprouts, leaves and roots including sprouts and microgreens, mushrooms, leaf and root vegetables. Chapter four gives details on fruiting vegetables eg tomatoes, cucumbers and capsicums, chapter five covers fruit including curry leaves, strawberries and peaches and nectarines. Chapter six provides 'Expert's Tips' on indoor growing, including planning, watering, pruning and training, pests and diseases. As previously mentioned, the book has lots of colour photos.

Edible House Plants – Laurelynn G. Martin & Byron E. Martin – Storey Publishing (US) 2023 ISBN 978 1 63586 678 0 – The book is divided up into the introduction and five parts, The introduction provides a small colour drawing off all of the plants referred to

in the main part of the book. Part one covers 15 citrus fruits, part two covers 'the rest of the tropical fruit basket' or 23 tropical fruits including avocado, banana, fig, miracle berry (?), peanut butter fruit (??) and pineapple. Part four covers coffee, tea and chocolate (4 plants) and part five covers sugar and spices (4 plants). Each plant entry is two pages long and introduces the plant, suggested varieties and plant particulars such as size, bloom season and fruiting season, followed by short notes on growing conditions, care and potential problems (ie pests and diseases), the rest of the two pages being taken up with large colour photos. Part five discusses plant care including getting started by choosing your containers and repotting, followed by maintaining plants by feeding and watering, pollinating and pruning, after which is a more in depth discussion of pests and diseases and a troubleshooting guide. As mentioned previously, there are lots of colour photos.

7.4 Re-Growing from Plant Material

The After Dinner Gardening Book – Richard W. Langer – Collier Books (US) 1971 ISBN 0 89815 450 2 – This is a quirky little paperback about how a bloke in an apartment in New York grew his own productive jungle from planting material he got from his local greengrocer. There are twenty four chapters and most tell the story of his working to grow a plant in his apartment and what he learned eg 'the inscrutable Chinese Gooseberry' and 'lots of yams please, I am not on a diet . The author is a great storyteller and has other books on growing plants out there, plus several on using a bread baking machine! No photos but the odd line drawing.

Don't Throw it, Grow it! – Deborah Peterson and Millicent Selsam – Storey Publishing (US) ISBN 978 1 60342 064 8 – Similar in thrust to the After Dinner Gardening Book above, the by-line says it all – 68 windowsill plants from kitchen scraps. Chapter one covers growing techniques including what plants need to grow and caring for new plants/ Chapter two is about regrowing 13 plants from common veg like beets, onions and radishes. Chapter three is about regrowing 15 plants from fruits and nuts like fig, feijoa and pineapple. Chapter four is about regrowing 9 plants from herbs and spices like anise, dill and fennel. Chapter Five is about regrowing 10 plants from Latin America

including choko!!!! And Chapter six covers 14 plants from Asia including arrowhead, ginger and taro. No photos but lots of line drawings.

Plants from Pits – Holly Farrell – Mitchell Beasly (Octopus Publishing) (UK) 2015 ISBN 978 1 78472 103 9 – As the name suggests, the book is about how to extract seeds from kitchen scraps and grow them on in pots to produce food. The book has four chapters, chapter one deals with how plants grow from 'pits' contained withing their fruit. Chapter two covers growing the pits successfully including what to grow where, basic tools required, which ones grow indoors and which grow outdoors, sowing watering and feeding them. Chapter three discusses the method of growing from 36 separate plant pits and chapter four covers looking after the plants as they grow including issues such as repotting, planting out, keeping plants to size, supporting tall plants, pests, diseases and other problems. The plant has lots of colour photos and some line drawings.

65 House Plants From Seeds, Pits and Kernels – Ralf Efraimsson – Woodbridge Press Publishing Company (US) 1977 ISBN 0 912800 40 2 – The book is divided into two parts, Part 1 – the basics, covers what is a plant, what is a seed or pit, requirements for growing (pots, soil, fertiliser, water air) and techniques for planting, transplanting, pruning, artificial lighting, pests and diseases. Part 2 provides the details for each separate plant, bit not a huge amount of detail, 1 to 2 pages per plant including bananas, beans, cherimoya, coffee, guava, hazelnut, lemon, melon, onion, orange, pepper, rice, rose apple and walnut. No photos, some line drawings.

No Waste Kitchen Gardening – Katie Elzer-Peters – Cool Springs Press (US) 2018 ISBN 978 0 7603 6160 3 – The book is divided into an introduction and 5 chapters, the intro covers why you might want to do it and chapter one covers how it works, discussing the parts of a plant in some detail, how plants grow and ways to regrow them as well as tools and materials required and plant propagation techniques. Following chapters cover individual plants and how they may be regrown, in simple steps. Chapter two covers how to regrow roots and underground stems in soil eg potatoes, carrots and turnips; chapter three covers regrowing stems and modified stems in soil such as garlic,

shallots and leeks; Chapter four covers growing seeds in soil and water including pumpkins, citrus and tomatoes; and chapter 5 covers regrowing whole plants and stems in water including lettuce, celery and green onions. Lots of colour photos.

7.5 Microgreens

Microgreens – Eric Franks and Jasmine Richardson – Gibbs Smith (US) 2009 ISBN978 1 4236 0364 8 – This is a good all-round book on microgreens covering the how and the why with a detailed 10 point description of the process. There is a very detailed section on the types of plants suitable for raising as microgreen and recipes at the end of the book. Commercial production is covered as well as home production.

How to Grow Microgreens – Fionna Hill – David Bateman (NZ) 2010 ISBN 978 186953 765 4 – Another good microgreens book from a bit closer to home it covers the subject more from a home growers perspective and covers a number of techniques for growing microgreens. The author covers a wide range of plants suitable along with growing instructions and information on troubleshooting in the event of problems and she also includes some recipes at the end of the book.