

## GROWING ORGANIC VEGETABLES AN EASY WAY

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Growing organic vegetables during the summer months in Queensland has always been difficult. This is due to high temperatures, high water needs of the plants, weeds, insects, diseases and sometimes long periods of rain. I have overcome these challenges by a system of “wicking beds” placed inside enclosed 6x4m shade houses. The shade house frames are made from poly-pipe placed over star-pickets, and connected by ceiling battens. The frames are covered by 30 per cent shade-cloth.

Collin Austin’s (1) concept of “wicking beds” is described by Marcus Goddefroy in *Grass Roots* Dec 06. Mine are 45 cm deep and 80 cm wide (which is as far as I can reach). They can be any length as long as each bed is level. The key aspect is that watering these beds is from the bottom up. The soil sucks the water up like a wick in a candle, hence the name. The bottom of a bed is a sheet of plastic on smoothed-out ground with the edges raised to 15 cm or more to form a “bath”. The sides of the beds are a frame of stakes, wire netting and hay. Above the “bath” is a zone of about 30-35 cm where the soil is never too wet or too dry for the plants, provided I fill up the “bath” regularly. This method has nearly 100 per cent water-use efficiency. And the height of the beds means I don’t have to kneel!

To spread the water evenly, agricultural drain-pipe was cut in half lengthwise to run the length of the bed, face down, so that it formed a channel. I covered this with bagasse, a waste product from sugar mills, but coarse sand could also be effective. At one end of the drain-pipe I placed a PVC upright and at the other end I pushed the plastic in one spot down to 10 cm to make an overflow. Watering is done by sticking a hose in the upright till the water trickles out of the overflow.

I have filled my beds with a 70/30 mixture of black soil and worm cast, but any suitable soil mix can be used. Make sure it has worms or buy some, worms are essential as they do the digging and fertilising. I placed a complete organic mineral supplement at the bottom of the soil and also worked some into the top layer as insurance. Most Australian soils are low in many minerals. A cover of bagasse was spread over the top to reduce evaporation and suppress weeds, but any good mulching material can be used. As the bagasse also feeds the worms, it needs to be replenished regularly.

I sprayed “compost tea” (an extract from top quality compost) over the soil to enhance the micro-biological life in the soil needed for healthy soil and plants. I caught some spiders and put them in the shade house. They rapidly increased in numbers and seem able to control most of the smaller insects that come through the shade-cloth. The shade-cloth keeps the larger ones out.



The existing shade house with 12 different vegetables.



Filling up beds in the second shade house.

(1) <http://www.waterright.com.au>

I spend two to three hours per week mainly watering, some weeding, transplanting, harvesting, and pollinating the cucumbers by hand. Some crops such as cucumbers, beans and peas are sown directly. Others are grown as seedlings in a small seedling house and transplanted when about 5–10 cm tall. When transplanting, I water the seedlings once or twice from the surface until their roots connect with the moist soil below. After that their roots can select the level of wetness that suits them best. I only water a bed when I cannot see water at the bottom of the upright.

The shade house has 20 square metres growing space. The one I have used till now has provided me with nearly half my vegetables plus some to swap for eggs and fruit. Most people have commented how much better these vegetables taste. At a guess I save more than \$1,000 per year in buying vegetables. And they are free from artificial chemicals, fresh, better quality and no fossil fuel is used. Hence almost no green-house gasses!

#### Details and costs

The 6x4m frame was made from 5 cm poly-pipe placed over eight star-pickets. (I smoothed the sharp tops of the star pickets with a grinder to stop them from cutting into the poly-pipe.) The poly-pipe was connected by nine lengths of 6 m long ceiling battens (“top hat”). The three in the centre are 85 cm apart to allow for overlap of the shade cloth, the rest are spaced at 90 cm. Wooden supports were attached with metal strapping under the centre of the end-arches. A third support was needed for the door frame. Wire netting can be put along the ends as trellis for climbing crops.

The frame was completely enclosed by shade cloth of 30 per cent density (50 per cent was too dark). The poly-pipe arches were 7.15 m as the shade cloth is 3.6 m wide, allowing for 5 cm overlap. So two lengths of 6.2 m shade cloth covered the frame lengthwise and allowed for wrapping around the poly-pipe at both ends. One length of 4.2 m was used for the closed end, and about 2.2 m was used for the door end. I tied the shade cloth to the battens with cable ties (the top and bottom of the shade cloth only), stapled it to the poly-pipes with a stapler and glued the ends to the poly-pipe with sealant. I covered the bottom of the shade cloth with soil to stop animals from wriggling their way in.

The beds along the sides are 80 cm wide; the one in the centre is wider. The beds are level from side-to-side as well as lengthwise. Sand spread over the ground prevents stones from cutting holes in the plastic. Wooden stakes were driven into the soil, spaced at up to 75 cm apart. 60 cm high wire-netting was rolled out on the inside of the stakes, partly covering the sand, and nailed to the top of the stakes. The stakes and wire netting together with the weight of the soil hold the bed together. Plastic was then laid down with upright edges of no less than 15 cm on all sides to hold the water. Virtually no water drains past the root zone and is wasted. The plastic also keeps the roots from any nearby shrubs out.

The agricultural drain pipe (cut in half lengthwise) was placed on the plastic and a 60 cm PVC upright was tied to the wire netting. A cover of bagasse was spread over the bottom of the bed; deep enough to cover the pipe say 5–10 cm, but I expect that sand can be used as well. To hold the soil in place, hay was spread along the wire netting and the soil mix was shovelled into the bed.

The second shade house took about three days to build and cost about \$650: eight star-pickets of 1.68m (\$45); four 7.15m lengths of 5 cm diameter poly-pipe (\$60); nine lengths of 6.05 m battens (\$70); 19m of shade cloth (\$142); a second-hand door, hinges and latch (\$40); three timber uprights of 2.4 m (\$20); three lengths of 30 cm metal strapping; a 100-packet of 300 mm cable ties; some clouts and screws (\$40). (The poly-pipe, plastic and shade cloth were bought in rolls.)

For the wicking beds: 10 m 0.2 mm concrete underlay (AS 2870) cut lengthwise into three strips (except the centre bed which needs a double width) (\$19); 11 m agricultural drain pipe cut in half lengthwise (\$32); 27 m of 60 cm high vermin proof wire netting (\$13); 50 wooden stakes of 60x5x2.5cm as used by concreters (\$55); five 90 mm PVC uprights of 60 cm (\$28); one bag of

“Extraphos and potash” (\$26); two bales of grassy hay; four cubic meter of bagasse and a trailer load of worm casts (\$60, Kookaburra Worm Farms 0427573424) and worms (\$35, KWF or Bunnings).