Bundaberg Organic Gardeners
~working with nature~

BUILDING A WICKING BED FOR SCHOOLS

(Vs.2 - By Peter Van Beek – August 2024)

NOTE: Put ***only*** soil in wicking beds; do **not** use rocks or a plastic liner above the 90mm pipe to '*stop soil being washed into the pipe'*. That does not happen as the water moves out from the pipe, not into it. Excess rain seeps in, it does not flow in. Stones waste space that should be filled by soil and soil biology. Soil biology is what makes plants, and thus us, healthy.
See Info Sheet:***No plastic liners, bark or stones in wicking boxes, tubs and beds***.

1. Choose and prepare the site

- Try find a position that gets at least 6 hours of sunlight per day in winter (e.g. North facing), with easy access and near a tap. Make sure the ground is level, not sloping. Avoid windy areas or 'wind-tunnels'.
- Smooth the desired site. Remove sharp objects and/or use carpet or sand to ensure nothing will penetrate the liner. If nut grass is present, place a metal sheet under the bed.

2. Bed sizes

Two bed sizes are appropriate for schools:

- Wide bed: 1,200mm x 1,200mm, allows access from all four sides.
- Narrow bed 1,200mm x 600mm, allows smaller children easier access to the middle.

Wide beds at a school

3. Timber

- ***Frames.*** The timber allowed by the Queensland Education Department is Micro PRO Sienna treated pine. It comes in planks 2,400mm x 200mm x 50mm. Wide beds need 4 planks (all cut to 1,200mm), narrow beds 3 planks (2 cut to 1,200mm; one cut to 4 x 600mm). Request the seller to cut the planks to length for ease of transport.
- ***Joint covers***. ACQ treated decking timber is used to cover the joints and provide extra rigidity. Both sizes need 4 lengths 400mm long x 90mm wide. (Just visible at the corners.)
- ***Liner protector.*** H3 treated 75mm x 16mm pine fence palings to protect the top of the liner from the sun and little fingers, and make the bed look tidy. These are placed last, after the liner is in position. Wide beds need 2 lengths of 1,300mm and 2 of 1,100mm. Narrow beds need 2 lengths of 1,300mm and 2 of 550mm.

Narrow bed with top cover and healthy plants

4. Other materials

- ***Liner. C***oncrete underlay AS 2870 comes as a double layer of 200-micron (0.2mm) on 2,000mm wide rolls. Use it as double layer for ease of cutting and for extra thickness. It needs to cover the floor and the four sides. Wide beds need a single piece of 2,000mm x 1,900mm, narrow beds one of 2,000mm x 1,000mm.

- ***90mm PVC drainpipe and fittings:***
    - Wide beds: 2 lengths of 500mm, one of 900mm and one of 1,000mm, three elbows, one end cap and one screen cap (to stop mosquitoes);
    - Narrow beds: 1 length of 500mm and one of 900m, one elbow, one end cap and a screen cap.
- ***Outlet:*** one tank outlet, as used for metal water tanks.
- ***13mm poly pipe:*** 1 x 180mm length for inside the bed and 1 x 30mm length for outside.
- ***Batten screws:*** 16 screws size 18-8x100mm, and 32 screws size 10-8 x 40mm.
- ***30mm nails or screws:*** to nail/screw the liner protector in place.

5. Tools

- A piece of lino with one straight edge, a pencil, and an elastic band (to mark the pipes for cutting).
- A hacksaw (to cut the PVC pipes).
- A drill, a 60mm hole-saw (to cut the drainage holes in the PVC pipe), a 22mm drill bit (to cut the outlet hole in the timber), a 12mm drill bit (to cut a hole in the PVC pipe), and a 6mm drill bit (to pre-drill holes for the screws when assembling the timber frame).
- A small pair of pliers (to remove the cut-out bits from the hole-saw).
- A screwdriver (to put the frame together).
- A flat sander (to remove sharp edges, smooth the liner protector, ensure it is splinter-safe and for the bed to look good).
- A rats-tail file (to widen the 12 mm outlet hole in the fill-pipe to 13mm).
- A pair of scissors (to cut the liner).
- A pair of nail scissors (to cut the outlet hole in the liner).
- Clamps or masking tape (to hold the liner in place while filling the bed with soil).

6. Water storage

Parts of the watering system (wide bed)

- Measure and mark the lengths of PVC pipe. Wide bed: 1 of 1,000mm; 1 of 900mm, 2 of 500mm.
  Narrow bed:1 of 900mm, 1 of 500mm.
- The cuts need to be straight. Cut with a drop saw if available.
- If cutting by hand, mark the line as shown in the photo by wrapping the piece of lino around the pipe at the marked distance and mark the circle. When cutting along the line, role the pipe towards you.
- Mark the centres for the 60mm holes on the long lengths. Centre the first hole 150mm from one end, then the other holes 300mm apart. (The pliers may be needed to ease the cut-out bits from the hole saw.)

Marking pipes

7. Prepare the liner

- On a flat, clean surface, fold the underlay inwards 400mm along two opposite sides and 450mm along the other two sides to fit the bed floor area. Folding it first makes placing the liner much easier.

8. Prepare the overflow

Cut facing down

- Cut a 45-degree angle at one end of the 180mm length of the poly pipe.
- When inserting the angled end into the overflow hole make sure the cut is facing down to prevent it intercepting water when filling the bed.

9. Putting it all together

The frame

Wide bedframe put together

- Place the first four timber lengths on a level surface with the inside frame measures 1,200mm x 1,100mm [wide bed] and 1,200mm x 500mm [narrow bed].
- Pre-drill the screw holes, two per log, and screw together.
- Place the second row of timber lengths on top of the first, and screw together.
- Screw the vertical 400mm x 90mm pieces at each end of the long sides to provide rigidity across the joints.
- Drill a 22mm outlet hole through the timber on the side closest to the inlet pipe (where the infill the beds with water). Centre the hole 140mm horizontally from the inside corner and 110mm vertically from the bottom.

The water storage

Overflow hole

- Wide and narrow beds: Place an elbow at each end of one 500mm length which is the fill pipe.
- Drill a 12mm hole in the elbow of the fill pipe for the overflow drainpipe. Centre this 95mm above ground level. Use the rats-tail file to widen it to get a tight fit.
- Connect this pipe/elbow vertically to the 900mm pipe.
- Connect the PVC pipes. Wide bed: to look like the photo. Narrow bed: join the 500mm and 900mm length.
  Make sure the holes in the pipes are facing down.
- Place the end cap. Wide bed: on the 1,000mm length of pipe, at the opposite end to the first hole; narrow bed: at one end of the 900mm length.
- Place the mosquito screen cap.

Liner and overflow

Overflow complete

- Place the folded liner inside the fame and use clamps or masking tape to hold it up against the sides. Fold any excess over the top of the timber.
- Remove the nut and the O-rings from the tank outlet. (The O-rings are not needed.) Push the outlet through the hole in the wooden frame from the outside and mark the centre of a 23mm hole on the liner.
- Use nail scissors to cut the hole in the liner.
- Push the tank outlet through the liner and screw the nut on the inside of the frame. (It's easiest to tighten the outlet from the outside.)
- Place the watering system in the bed.
- Push the square end of the poly pipe onto the tank outlet and the angled end into the inlet hole in the pipe with the cut facing downwards.
- Insert the 30mm poly pipe from the outside to keep outflowing excess water away from the timber.

Top liner protector

- Nail or screw the four lengths of the top liner protector in place.
- Sand any sharp edges and smooth the surface.

10. Add the soil

Your bed is ready to fill. If you already grow vegetables, use soil from your existing beds. If you have to buy soil, see the companion Info-sheet '*Water and soil in wicking beds*' for how to prepare good soil for best growth.

Happy growing – may your pupils have lots of fun growing and eating healthy food.

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We welcome visitors and enquiries.