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WICKING BEDS

A water wise solution to growing your own vegetables

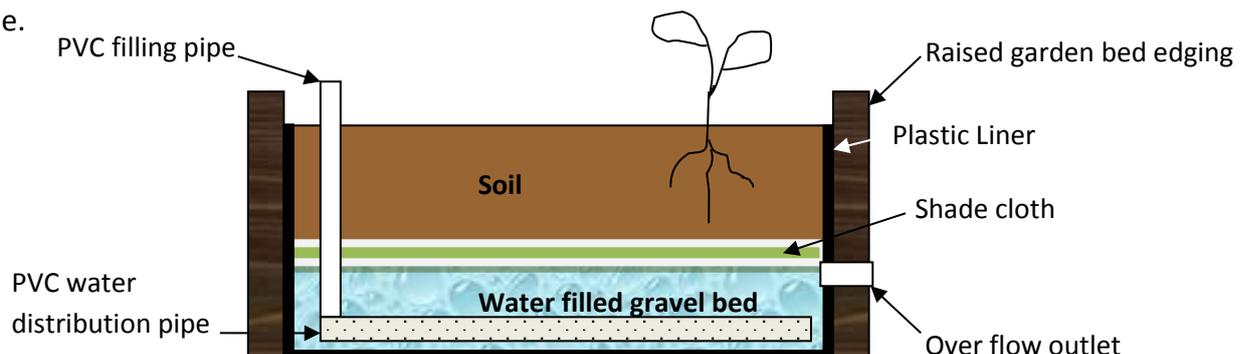
Wicking beds consist of a growing bed on top of a contained reservoir that is filled with gravel. You fill the gravel with water which then wicks up providing optimum soil moisture for the plants. The reservoir allows you to water less often allowing you to go away for a few days in summer without your garden dying. Wicking beds are suited to raised garden beds or containers such as wine barrels or foam boxes. Wicking beds avoid the water losses that you can experience with a conventional irrigated garden bed. Typically, 10mm of each surface irrigation is lost due to evaporation, watering from below prevents this. If too much water is applied from the surface it can pass beyond the root zone wasting water and leaching nutrients, wicking beds stop these losses as they are a contained system.

Why Wicking Beds?

- Significant increase in production
- The root zone is always moist but not too wet so roots have adequate oxygen
- Less frequent watering (allowing flexibility to leave the garden for a few days in summer)
- Water use reduced by up to 50%
- Reduced evaporation
- No water is applied to the surface, reducing weed infestation
- Prevents tree roots entering the garden bed
- Avoids water and nutrient loss past the rootzone
- Inexpensive and easy to build
- Ability to grow your own vegetables with low food miles

How Wicking Works?

The water molecule is like a magnet, one end is positively charged and the other is negatively charged. This means they are attracted to other water molecules as well as soil and organic materials. These surface tension forces account for capillary action. The water reserve in a wicking bed is filled with gravel, resulting in a very low surface tension. This allows the water to wick up to the layer of soil containing the root zone.



Types of Systems

Open Wicking Beds. The simplest version of a wicking bed. A trench is dug below the root zone and lined with a plastic sheet. Conventional irrigation is used but any water passing the root zone is now caught in the plastic and the soil will become saturated. This provides a volume of water that is not tightly held in the soil and will easily wick up to the root zone. Open wicking beds can also allow the water to wick up, then sideways and downwards outside of the reservoir. This might be seen as a downfall but makes it a suitable system for deep rooted plants such as fruit trees. It also allows microbiology and worms to enter the system.

Closed Wicking Beds. Soil is totally isolated from the surrounding soil, they are more suited for shallow rooted plants such as vegetables. The simplest form is a semi raised bed created by scooping out 20-30cm of soil, line the trench with plastic, place the distribution pipes, back fill with gravel then replace the top soil.

Water Capture wicking beds. A wicking bed can be modified to capture and amplify rain by simply adding wings. The wings are made from plastic covered in rocks angled into the bed so even small rains and dew can be harvested.

Above Ground Wicking beds. Made in some sort of container e.g a foam vegetable box, bath tubes, wine barrels or water tanks. Sleepers or corrugated iron can also be used to create a raised bed.

Depth

The depth of the water reservoir should be no greater than the height which water will wick upwards, this is generally 30cm. If you make the reservoir deeper than the soil layer above, there will be a stagnant pool of water remaining which cannot feed the root zone. A depth of 20cm for the reservoir and 30cm for the soil is commonly used. For the best results the soil needs to be friable sandy soil. If your soil is heavy then mix it with sand and mulch to make it more friable.

Watering

Irrigation is needed when the reservoir is empty. You can top up the reservoir before it is completely empty, however it is good to let it completely dry up occasionally to prevent the water becoming stagnant.

Adding a 'Bio Box'

The maintained soil moisture in a wicking bed is not only ideal for plants but also for microbial action. This includes mycorrhizal fungi that form beneficial relationships with plant roots, increasing the surface area by a thousand times. By adding a plastic tube or 'bio box' to the bed you can add food scraps and organic waste and allow bacteria, fungi and worms to breed up. This will also help to add nutrients into the system.



Useful Links

http://milkwood.net/2010/05/11/how_to_make_a_wicking_bed/

A short video of a wicking bed being constructed <http://www.abc.net.au/gardening/stories/s4010599.htm>

<http://www.urbanfoodgarden.org/main/wicking-beds/wicking-beds.htm>