Once upon a time

22 Jan 2015

Soil for wicking beds

This article is supposed to be about soil for wicking beds but stories are much more fun to read and write and are often more informative.

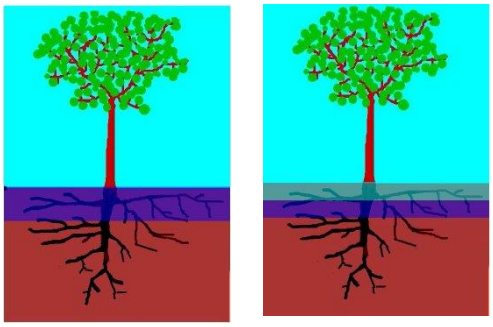
So stories start with - once upon a time there was a beautiful princess and a frog. Well we have plenty of frogs in Gin Gin but we are bit light on in the princess department.

So where do we start. It could be in the second world war while I was growing up and everyone grew their own food.

Or it could be when Australia had the great sandstorms in about 1978. I remember that very clearly thinking all this soil being lost - the world is going to run out of soil. I should work out how to manufacture soil - an obsession I have had ever since.

Now at this time I was running my company (Moldflow) which was into speculative research and I had my eyes open for new ideas so I started a major project on how to create soil. In fact it is quite easy - grow things and let the soil biology make it for you - but there is a snag - you need water.

When I got old (not recommended) and sold my company I decided to devote my retirement (what a joke) to soil and water. There is a problem I call the irrigators dilemma.



If you apply a shallow irrigation the water will only soak into the top layer of soil and the flow front will only wet the upper roots. But water evaporates very quickly from the surface so much of the water is lost.

If however you apply a deep irrigation the water may go past the roots taking with it nutrients so both water and nutrients are lost to the plant.

So how do you know how much water to apply?

I worked on a solution to this irrigator's dilemma and my solution was to use an underground irrigation system and a computer controlled irrigation system controlled by soil moisture sensors which would pulse the irrigation allowing time for the water to wick into the soil without loss. I thought it was great - but the farmers didn't - to them it was real nurdish.

I had been used to developing sophisticated computer flow simulation software which I sold to high tech companies. A ton of money down the drain. Lesson give the customers what they want not what the need.

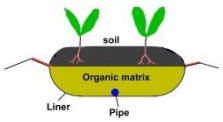
But because of my expertise in flow and irrigation I was invited to go to Ethiopia to see if I could develop a system for providing sustenance food in times of drought. Now if I had goofed with the farmers I was in for a shock in Ethiopia where the rich farmers may earn $2 a day.

Any solution had to be real simple and cheap and I mean **really real** simple and cheap.

My solution was to simply dig a hole and line it with plastic.

simple wicking bed

Now I was facing a nutrient problem as the land had been farmed for centuries and the farmers never applied fertiliser - there was no money. But weeds - while a pest - do fill a role, they can be extremely efficient in extracting the last bit of nutrient from the soil, much better than our food plants.



This was the birth of wicking beds almost twenty years ago. I refined the idea using little tricks like wings to catch any water and pipes to distribute the water along the bed.

This was never intended as a commercial operation I was happy to spend my time and money trying to help people without enough food so I put this up on my web to tell the world hoping other people would benefit.

The big big mistake

But I made a big big mistake. It may not sound all that bad but the consequences have spread around the globe. I used an agi pipe, you know the type with all the holes in and pretty quickly the pipe filled up with soil. I had solved this by putting a layer of cloth (just dish cloth) over the pipe. (Later I used pipe with slots in the bottom only with no cloth)

I am an engineer - not a graphic artist, web designer or film producer - this is not my skill set - I get by but that's about it.

But the wicking bed concept was picked up by people with much better skills than me in this graphic presentation but unfortunately their skill set did not include an understanding of the basic physics of how water moves through the soil. Also they though that using organic material was not a good idea as it would rot down. They also did not know much about soil biology.

The net result is that a system of using rocks or sand covered with a layer of cloth has virtually become the standard for wicking beds. Something I have battled with for years. Of course the stones and cloth system does work but not as well as it should.

Independent research

Recently a friend of mine decided to undertake some scientific test to get true experimental data. If you are interested in wicking beds you should really see his web site www.easygrowvegetables.net there is a lot of good information on this site but the section you really want to read is no – stones – no – cloth on the second tier header.

He did two really important experiments.

First he measured the water holding capacity of various soils, sand and stone mixes. He found that the soil mix actually held more water than the stones or soil.

But then he did another experiment which I find really stunning. He set up an aquarium based on my original wicking bed design and another using the stones and cloth system. Now he could see how the system was really working.

There was an air gap a the cloth interface which meant no wicking was actually occurring - no wonder I get so many questions about water reservoirs going putrid. But - and this in the interesting bit - the stronger roots were actually pushing through the cloth and sucking the water right out from the stones.

However the real eye opener was that the growth of the plants in the soil box was superior to the stones and cloth box - all that trouble putting in stones and cloth just to slow down growth and risk having a putrid water container.

It's all about health

Of course the stones and cloth brigade do have a point that the organic material in a soil based bed will decompose over time so the bed will need topping up.

My comment to that is why do people have a wicking bed anyway? For me it is to have vegetables with a nigh nutrient content. This comes from the soil biology breaking down insoluble mineral particles and making them available to the plants.

If you are growing crops and taking them out of the bed then you have to replace what you take out. Wicking beds are not some sort of magic porridge box that keeps on producing food without putting anything back.

Replenishing nutrients in the bed is just part of the cost of eating healthy food.

Final words

I regret that I did not make the best job of promoting the original wicking bed technology and sometimes wish I was a flash marketing type rather than dull boring engineer but that is the way I am made and it is too late to change me now. My next change will be turning me into compost I am afraid. So if you see a wicking bed with the sign 'Colin lies here' you know what has happened.

But while I am still alive and kicking my major current project is developing soils specifically for wicking beds. I now have soils with a much higher water holding capacity and wicking capacity than regular soils and way ahead of stones. They are also filled with minerals and biology to make them available to plants.

I plan to make these soils available to other wicking bed enthusiasts but this is an old man's hobby not some multinational organisation like Monsanto. If you want to learn more about this project then email me at colinaustin@bigpond.com