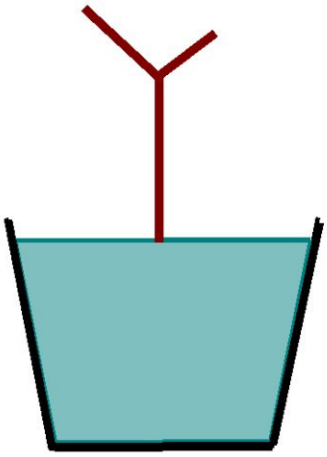
Evolution of the wicking worm bed and their future

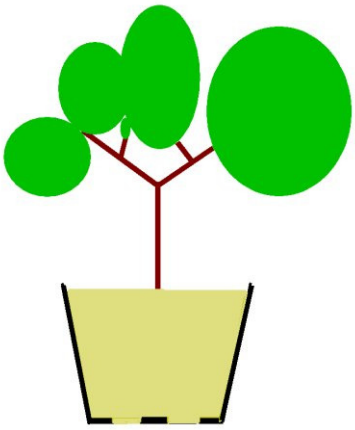
A look at their past and present and a peak into their future

Colin Austin 29 October 2013

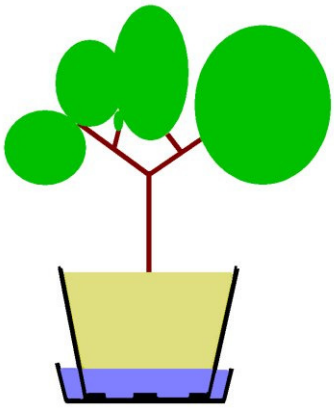


Way back in time, probably when cave men first learned to make clay pots someone would have tried to grow a plant in a pot. This would have been a total failure as the pot would have filled with water and the soil turned putrid and the plant died.

Plant roots need both water and air and most plants will simply die if there is no air in the soil.



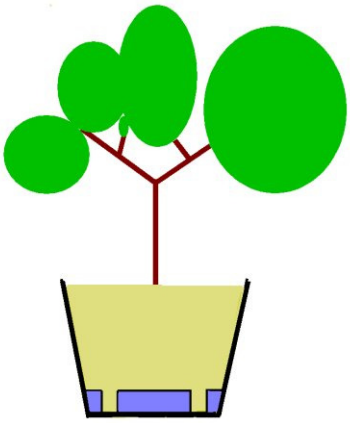
But probably by serendipity, the caveman tried to grow a plant in a cracked or leaky pot and found that with drainage plants will grow very well in a pot.



Much later someone would have realised that losing both water and nutrients through the drain holes was very wasteful (and messy) and simply put a saucer under the pot.

They may have been surprised to find that later the water in the saucer was being sucked up (by wicking action) back into the pot for the plant to use.

This was the very first self-watering or wicking pot.

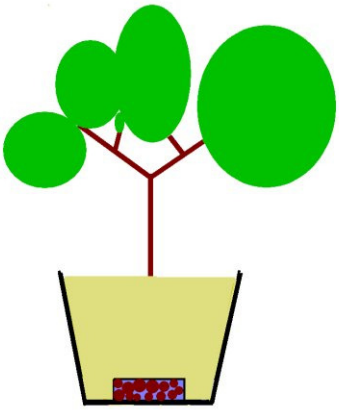


People then realised that they could make the water reservoir much larger by creating a separate chamber to hold the water. They had to find some way of getting the water to move from the container to the soil so they created fingers of soil going down into the water reservoir.

The water could then wick up through these fingers and into the bulk of the soil so watering the plant.

As people understood the nutritional needs of the plant they added N,P,K fertilisers giving excellent growth.

While these pots were very successful there size was limited by the need for a separate rigid water container.



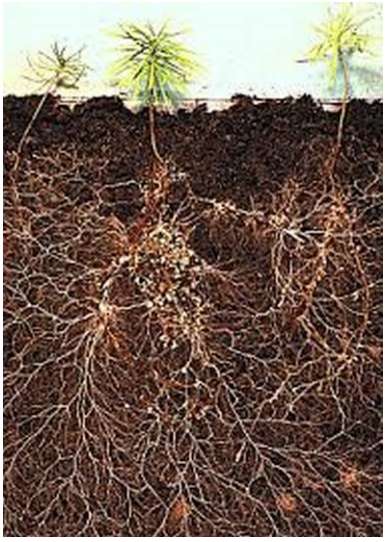
This problem was overcome by using a pile of stones covered with a layer of cloth to separate the soil from the water and keep the roots out. The water reservoir was the spaces in between the stones.

This meant that much large beds could be made at a reasonable price. All of these beds had the features of a separate water container and some means, either a cloth or small holes, to separate the soil and the roots from the water reservoir.

We learned that plants grow very fast using nutrient rich N,P,K fertilisers. Meanwhile medical research was advancing, and we learned that humans needed much more than bulk carbohydrates, they needed complex chemicals which were produced by plants (phytochemicals). The British Navy were the first to appreciate the benefits of vitamin C in limes in warding off scurvy, hence the nick name ‘limeys’.

A diet based on simple carbohydrates leave people full but unsatisfied, hence the epidemics of obesity, diabetes, heart decease and other modern ailments. Medical research is continuing to discover critically important chemicals for human health which are produced naturally by plants.

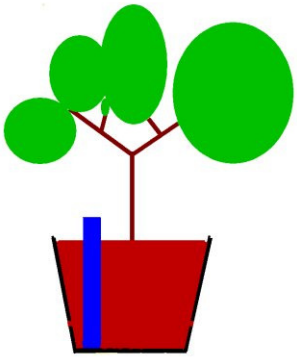
However to produce these important phytochemicals plants need a wide range of minerals. These may be relatively abundant on the earth particularly from volcanos but in the form of insoluble rocks. In the natural state soil biology, particularly the fungi with their fine hyphae which exude enzymes, have the ability to dissolve these mineral and make them available to the plant.



But fungi, by themselves are not enough, worms transport the spores throughout the soil, but worms need bacteria to break down the vegetable matter which provides the food and energy for the entire system.

We now understand that this complex soil biology is critical to human health. But soil biology needs a precise moisture level to flourish. This has led to the next generation of wicking beds in which the **primary aim is to maintain the moisture level for the soil biology** not just too simply water the plants.

At first glance they look like a badly managed stone type wicking bed in which the stones have been replaced by organic material, but the similarity is superficial.



In a stone type wicking bed the cloth separates the soil from the stone water reservoir which is biologically inert. If the stones were replaced by organic material in anaerobic conditions it would soon go putrid. But in the wicking worm bed there is no separating cloth so the plant roots are free to explore the entire volume. They draw out the water which is then replaced by the air which is sucked in giving the equivalent of breathing.

Drain holes part the way up the bed ensure the bed is never totally saturated even when filled.

The composition of the soil is important, it must contain the minerals which we need for our health, but it must also contain a broad spectrum of biology and plants to release the minerals. They also make the soil porous and increase its water holding capacity. These can be introduced by a BioPack which contains the fungi, bacteria, worms and plants and which act as an inoculant for the entire bed with the plants providing the green organic material which powers the whole process.

But in Australia most of us are lucky with a reasonable sized garden where we can grow useful amounts of food from reasonably sized wicking beds. But now around the world most people live in cities often in high rise apartments. Their food is typically produced miles away with the emphasis on production quantity rather than nutritional value.

As a source of energy this is fine but may well be lacking in the crucial phytochemicals essential for health. Only small amounts are needed but they are essential.

However small wicking boxes will fit into a veranda, and will provide supplementary food to provide the small but critical quantities of nutrient rich food. It also provides a way of recycling all the waste food which is an ever increasing problem.

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