

Soil v dirt

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Pick up any older book on soil science and it will focus on the physics and chemistry of soil e.g. range of and distribution of particles sizes in the soil, sand, silt or clays and the amount of the various nutrients N, P, K the secondary elements such as calcium and magnesium and the trace elements like chromium and selenium.

Now look at the modern literature on soil science and the focus is on soil biology as now we understand that it is the biology which turns dirt (that dead stuff) into living soil.

When I get my microscope out and peer into soil I have tended over the years I see I remarkable array of weird and wonderful creatures - some like the worms I don't even need a microscope, for the smaller ones like the nematodes I can see easily even at a low magnification but I have to use the maximum magnification to see the bacteria.

I don't have an electron microscope but I know there are even smaller life forms like viruses and phages which play an important part in how soil works.

This labyrinth of living creatures turns dead dirt into living soil - dramatically changing the structure of the soil creating numerous pores and channels giving a very high void content so it can hold a lot of water.

It is very easy to measure this void content simply by measuring the volume of water it takes to saturate the soil. It is much higher than in a pile of stones where the only space available is the spaces between the stones.

In a Wicking Bed this means **real** soil is a much more effective water storage than the commonly used stone and cloth system. So why do people still use the stone and cloth system rather than the more effective living soil?

It may well be that these people simply do not understand the importance of soil biology. For these people I would recommend watching the multitude of videos on YouTube by Elaine Ingham and read **Dirt - The Erosion of Civilizations** by David R. Montgomery - which must be one of the most challenging books.

Another explanation is that people just don't like to think about yukky things in the soil and prefer what seems to be a nice clean system like sterile stones. But this is a pity because those microbes are not just important for the soil, they are important for our health and those beneficial microbes can transfer from the soil, through the plants to our gut biome.

Much more fundamental is how eco-system works in practise. The soil and our guts are an eco-system. Most people are totally unaware that in their guts they almost certainly have the potentially deadly e-coli. This does not normally matter as our beneficial biology simply crowds out the harmful bacteria so it does no harm.

It is the same in the soil, there are harmful organisms like root eating nematodes which potentially could be a real problem - but they can be kept in check by beneficial organisms - fungal hyphae earn a few points by destroying these harmful nematodes.

But this balancing of beneficial and harmful organisms is contrary to the paradigm that the way to health is to kill off all the harmful organisms and maintain a sterile environment. This paradigm has been particularly harmful to human health - it is just not possible to just kill of the harmful organisms without damaging the beneficial - in practise it just opens the door for the harmful organisms to explode.

So while having a biologically active soil in a Wicking Bed may be the preferred system it is simply no good just filling the bed with dirt - it must be managed as an eco-system which means first inoculating the soil with microbes (if they are not already there) then creating the conditions where the beneficial ones will dominate which means ensuring they are well fed with food (organic material) and oxygen.

This means starting the beds with a layer of organic material in the base and a supply of worms, topping up the beds with mulch and letting the worms take it down deep into the beds and ensuring using a deep watering cycle - letting the plants use up the water before refilling and encouraging the roots to penetrate the full depth of the bed to assist in the deep cycle.

This is not just a more effective way of operating a Wicking Bed - it assists human health by propagating the biology beneficial to our health.