Life in the Soil, Dig Deeper

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When most people see soil, the first word that pops into their mind is usually “dirt.” The images that come to mind when you think about ‘dirt’ are not very appealing. However, that’s not what I think when I see or touch soil. When I hold the damp soil in my hands, I feel the rocks, the grains, and most of all, life. I also feel glue; no, not the white Elmer’s glue we had the urge to eat when we were younger. Soil creates life but it is also the glue that holds said life together. It is the best of both worlds, but the average person doesn’t know that. Society today is uneducated on the importance of soil and doesn’t understand how threatened this natural resource is.

When I was younger, I remember spending time with my grandpa Parkes in his garden. I always helped him pick the juicy tomatoes and plant tomato plants into the ground. I always picked up some soil in my hand to examine it. If I was lucky, I found a few worms. One spring day, I remember asking Grandpa “Is dirt just used to grow things?” He vaguely responded with “Oh it is not dirt. It is soil, and it is much more than that.” My grandpa has influenced me to learn more about agriculture, and the same soil I spent planting tomatoes in all of those years ago.

Soil is primarily made up of four components: water, air, mineral matter, and organic matter. One could talk for ages about each of these components and their influences. For instance, the minerals in soil “influence the soil’s ability to retain important nutrients,” water helps to transport nutrients within the soil, oxygen is needed “for root and microbe respiration, which helps support plant growth,” and organic matter, though it is the smallest, is the most diverse component of the soil (Climate-Woodlands). According to the Soil Science Society of

America, only 1% of soil microorganisms have been identified (Soil Science). It's unbelievable to think that if one of these components isn't present, the whole soil living system could be wiped out completely.

After I learned the basics of what soil is and its components, I was able to research more about what exactly soil can do. When I say that, I don't mean the plants that can grow in soil; I wanted to dig deeper to find the things soil does that the normal person doesn't realize or see. Soil is at the very bottom of the food chain, most people don't even bat an eye at it, yet in reality, soil is "the cornerstone of life" (Soil Science). This cornerstone is most literally larger than life. Just one small handful of soil can contain millions of organisms such as fungi, bacteria, earthworms, mites, and insects (Soil Science). Here's a riddle for you: how are the oceans and the Earth's soil system similar? A person not educated in soil would most likely look at you like you were insane if you asked them that question. But in fact, soil is just like the ocean. We have barely touched the surface of exploring the ocean, and the same goes for the soil. 99% of the organisms in the soil haven't even been discovered yet. That small handful of soil I played with as a kid could have had hundreds of unidentified organisms in it.

Soil may be decades away from being completely understood, but we do know one thing: soil equals life. One thing that (hopefully) all humans know is that soil gives us food. You can trace almost everything humans eat back to the soil. Soil also allows us to live due to its carbon dioxide absorption. The soil holds more carbon then all plant life and the atmosphere combined. The atmosphere holds 800 billion tons of carbon while soil holds 2,500 billion tons (Rainforest). It's hard to even fathom that notion. If we didn't have soil, life would be impossible.

Scientists have begun to think outside of the box, or sphere if you will. Soil scientists are experimenting and learning on how to grow life in space. Take Mars for example, Martian soil is covered in volcanic debris and has no living components. However, scientists have taken a liking to the soil bacteria called Rhizobia, which they believe could be utilized on Mars with the combination of legumes. The Rhizobia affects the roots of legumes and helps to form root nodules. These nodules can take nitrogen from the very thin atmosphere of Mars, and create a more useful stream of nitrogen that can help to thicken the atmosphere, as well as being the first step to making Martian soil viable. Soil scientists are hoping to have a breakthrough with Martian soil by the mid-2030's, just in time for the first colony sent to Mars (Bedord). If scientists cannot figure out how to transform soil to be viable on different planets, there's little to no hope for humans to be able to colonize other worlds. It's amazing to think how soil on Earth gave us life, and now we're finding ways to utilize the soil to give other planets life themselves (Cameron).

A large majority of humans have no idea the importance of soil to our lives. Soil not only gives us life and food, but it can help to catch criminals, discover things about the past, and even filter our water and absorb a large amount of toxic carbon dioxide that would be lethal to us and the atmosphere if released (Konkel). Soil does all of these very important things, however, soil is not a renewable resource that could be depleting. Thousands of years of soil formation is being swept away in a matter of minutes due to erosion from wind, water, and poor agricultural practices (Cranmer). Chris Arsenault stated in an article in *Scientific American,* that we may only have 60 years of farming left if soil degradation continues; he also stated that one-third of the Earth's soil has already been degraded (Arsenault). After learning more about soil and how

important it is, this statement was very scary. However, Danielle Cranmer wrote ways we could help slow this process down. She stated that “practices like woodland regeneration, manuring and compost application, and cover cropping not only pull carbon out of the air and lock it underground, they restore degraded soil and even increase crop yields.” Soil can offset over 15 percent of the world’s fossil-fuel emissions, and it can be the key to reversing a growing problem in the world: climate change.

When you think of a superhero, you may think of Superman or the Flash; however, soil is a superhero too. A superhero that gives us life and has the ability to create it. Unfortunately, this material that does so much for us, is going to be completely gone one day. This is why we need to dig deeper and educate the public on why it is so important to protect this natural resource. Soil has so many hidden powers that many do not realize. Just because it is common, does not mean it’s boring. Soil is often overlooked, but it could be the key to saving our planet. Soil does not just contain life, it is life.

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