"KEEP SOIL ALIVE,
PROTECT SOIL BIODIVERSITY"

CONTENT

Food and Agriculture Organization of the United Nations

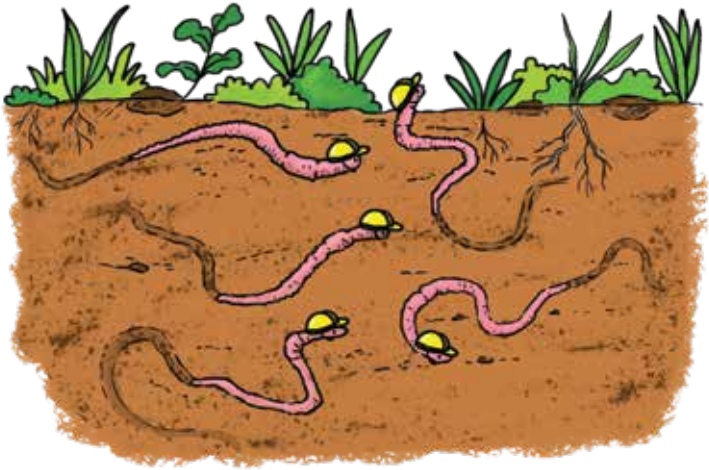
International Decade of Soils 2015-2024

World Soil Day

GLOBAL SOIL PARTNERSHIP

LIFE BENEATH THE SOIL SURFACE

Did you know that we share the land we live on with billions of other living things? But you might not notice many of these things, called organisms, because they live under your feet in the ground. If you dig a small hole in your backyard on a rainy spring day, you might find some reddish worms wiggling away back into the dark rich soil that they call home.



The worms eat leftover pieces of the soil, and when they go to the bathroom, their poop helps to stick together the ground they live in - the sand, clay, and organic matter left behind by living things - into something called soil crumb. A single earthworm can consume and poop out tons of soil particles in just one year, and this gives structure to the rich soil, which plants need to grow.

After seeing these wiggly worms, you might come across very tiny bugs like millipedes or termites running away in panic. They may seem strange, but they have the important job of helping the other organisms living under the ground. They build small tunnels so that air and water can move through the soil and get to the organisms that need them.

MAGIC IN A HANDFUL OF SOIL

Did you know that if you dig out a handful of soil, it has about as many small living organisms as there are people living on our planet? Wow! How could such so many living organisms fit into your hand? The answer is that they are very, very small.

BREATHING SOIL

If you stand close to a windowpane and blow onto it, the moisture from your breath will hit the window, which is colder than you. Some of it will turn into liquid and make steam on the window.

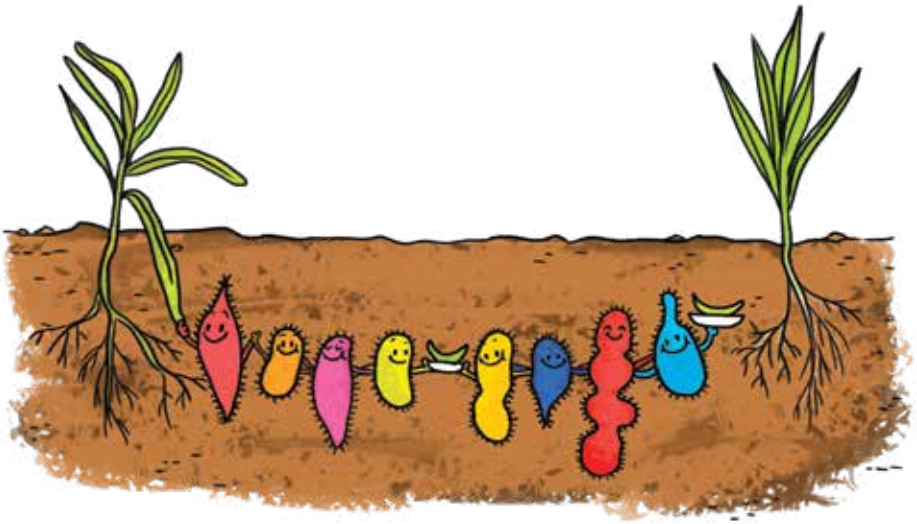
You can do the same thing with soil. Dig up a handful of soil and put it into a glass jar, take out all the organisms you can see, and then seal the jar tightly. In about two hours, you can see moist air - called water vapor - appearing on the glass surface inside the jar. That's the breath of many, many tiny living organisms. We call them soil microbes. Just like humans, soil microbes live together in big groups and have different ages, shapes, and colors. Microbes are just as useful and important as soil worms and bugs.

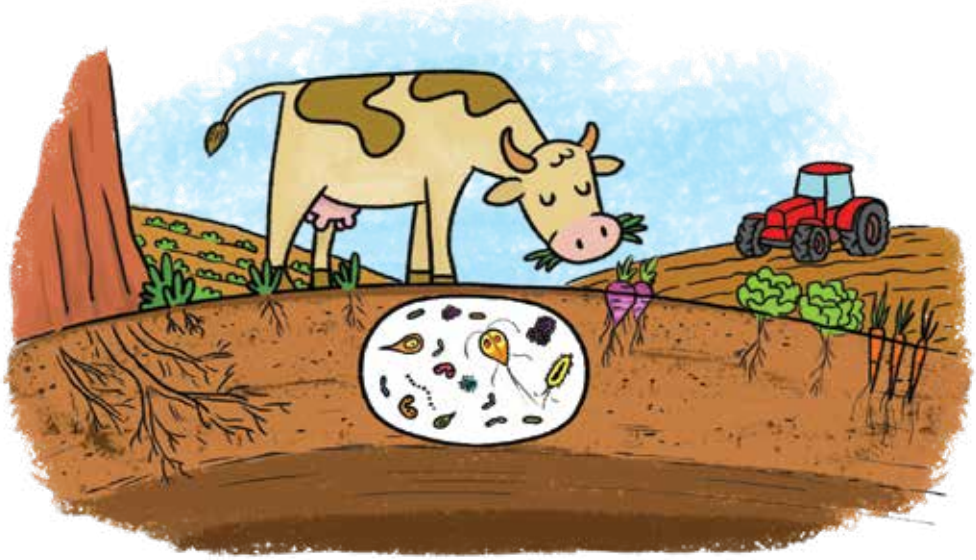
MICROBES IN THE SOIL

Most soil microbes make that sure other soil microbes and organisms can survive by making food. This important job begins when a leaf or an animal's poop falls to the ground. Tiny soil microbes called "fungi" climb to the soil's surface and start to feed on this plant or animal waste. By doing this, the fungi break down this waste into the soil foods that other microbes and plants living in the soil need to grow.

But you might wonder how soil fungi could do such a hard job across lands covering millions of acres. Well, just like spiders, soil fungi are excellent at weaving webs, but not in the air, but inside the soil, near plant roots. Like a giant fishing net, they spread their work across many kilometers. When they do this, tiny soil fungi can then distribute lots of food called nutrients to a large number of other microbes and plants. This is a very important natural process. Nature acts as a recycler of the building blocks we need to live, things like carbon and nitrogen, so that living beings can use them over and over again.

This rich hidden life of soil microbes isn't just about fungi. Have you ever heard the word "bacteria"? Bacteria are organisms that are microscopic - too small for your eye to see - ranging in shape from balls to rods to spirals. They are everywhere, and millions of them are actually living in the soil just like soil fungi. Many bacteria and fungi are living and working together either on plant and animal waste or in small spaces and tunnels in soil. They help each other to break down organic materials entering the soil, which then makes soil food. This soil food is then ready for other soil organisms and plants. When old bacteria or fungi die, they are also used as food by those that are still living. This endless work, known as the nutrient cycle, is a perfect example of cooperation among microbes in nature.



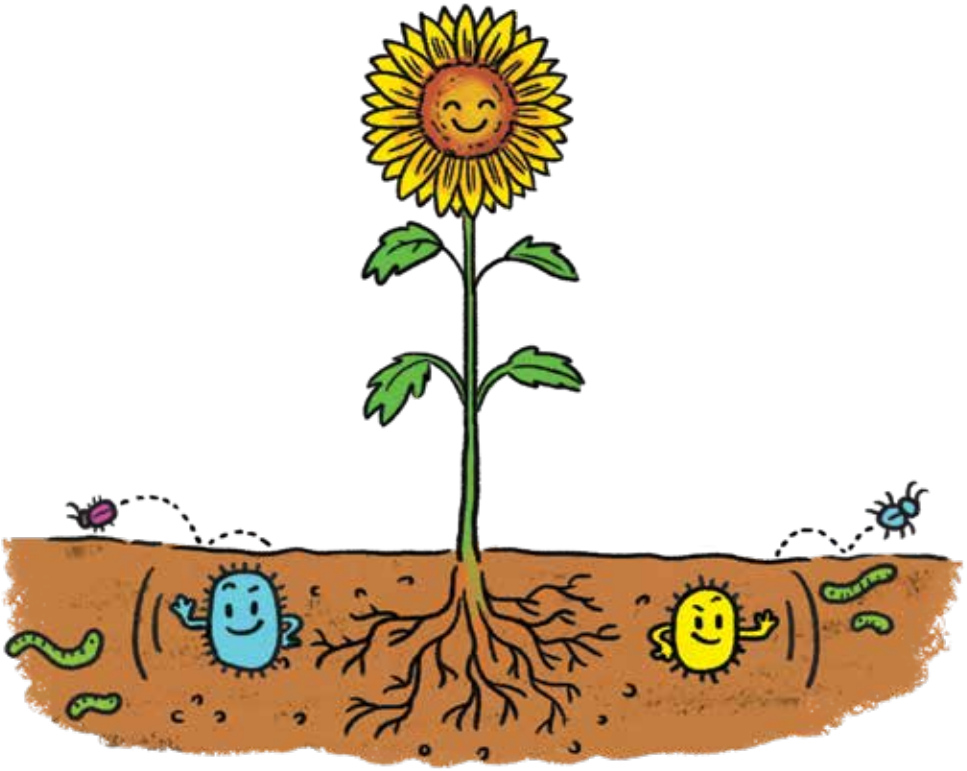


Soil organisms have different kinds of relationships with each other. Maybe the most common and important one is cooperation, in which the same or different organisms help each other to survive in the soil. Most of these organisms are responsible for important processes such as the forming of soil and soil organic matter, nutrient cycles, and controlling disease. Without all this, there would be no wildlife, no farms, no plants, no food, and no life.

BENEFICIAL AND HARMFUL MICROBES

There are also many harmful microbes (both fungi and bacteria) around us. We call these microbes "pathogens." Pathogens are why we get sick and in some cases need to see a doctor or go to the hospital. Pathogens can be anywhere, but are mostly found where people are. There are a lot of them living in the soil, but they do not usually directly infect people.

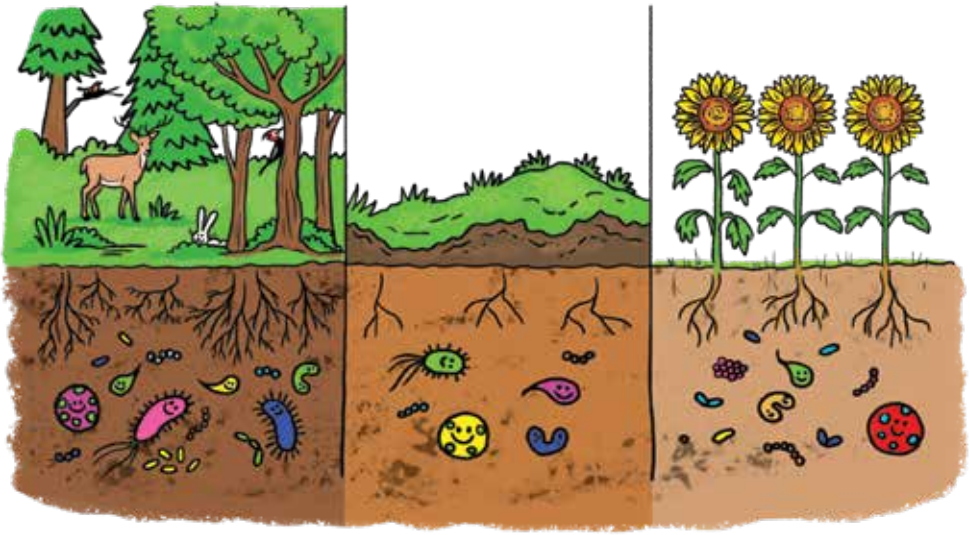
Pathogens can also cause plant diseases to come through the soil. When pathogens attack and enter the roots of plant species that we like to grow and eat, they may make those plants sick or even die.



Luckily, this does not happen all the time, because there are many beneficial bacteria and fungi. They work like superheroes living around the root of the plant to beat back the harmful pathogens. They make plant diseases that come through soil weaker.

SOIL BIODIVERSITY

This rich variety of life and processes is called soil biodiversity. There are many different soil ecosystems with different names, like forests, grasslands, tundra, wetlands, deserts, and farmland. In each environment, soil is the most important piece of the puzzle, because it produces food, like a factory, for plants, animals, and humans. Soil biodiversity is like the battery the factory runs on. It guides the distribution of nutrients between environments above the ground and those below it. Soil is healthy and fruitful as long as there is diverse life inside of it. This means we must protect soil biodiversity, not only for the good of farming and harvesting food, but for all life on Earth to continue.



Unfortunately, in many countries, rich soil is facing serious threats due to ever-growing numbers of people and their activities. Their demands for more food, energy, and housing have resulted in humans occupying larger and larger areas of land. But our planet is not getting any bigger, and there is a limited amount of soil for us to use. We cannot create our own soil, as it takes nature hundreds of years just to make a layer of soil a few centimeters deep. Expanding cities and growing agricultural and industrial areas also produce more and more waste and garbage. Water carries small pieces of this waste and garbage to farmland and wildlife soil, where it piles up. This is known as soil pollution. Dangerous chemicals in waste particles can hurt fragile soil organisms and even cause them to disappear over time, hurting our important soil biodiversity. Soil contains many things, both living and non-living. At first glance it may look lifeless, but it provides a safe home for billions of organisms working to create soil biodiversity. We share the planet Earth with them, and we need them to survive. They are friends beneath our feet!

Ways to help the soil

- Plant grass, flowers and trees
- Grow your own vegetables
- Pick up and recycle trash
- Dispose of hazardous waste correctly
- Create a compost pile

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