

## SOIL – THE UNIVERSE UNDERGROUND

We know that soil is built by shattered stones. What we do not learn in our textbooks is that soil is also built by the microcosm, that recycles all the tailings and trimmings from plants and animals and lives supportively with them. Once we grasp this, it changes how we farm, how we feed ourselves, how decisions are made in policy, and how our world is going forward.

Soil together with water and air make life possible on Earth. According to the Joint Research Centre of the European Community, in the soil live almost 1/3 of all living organisms, but just 1% of them have been detected and the relations between them are not completely understood. In one teaspoon of healthy soil, there are more organisms than there are people on planet earth. **A healthy soil is one where there is life!** — and these living organisms are earth worms, insects, bacteria, fungi, protozoa and nematodes.

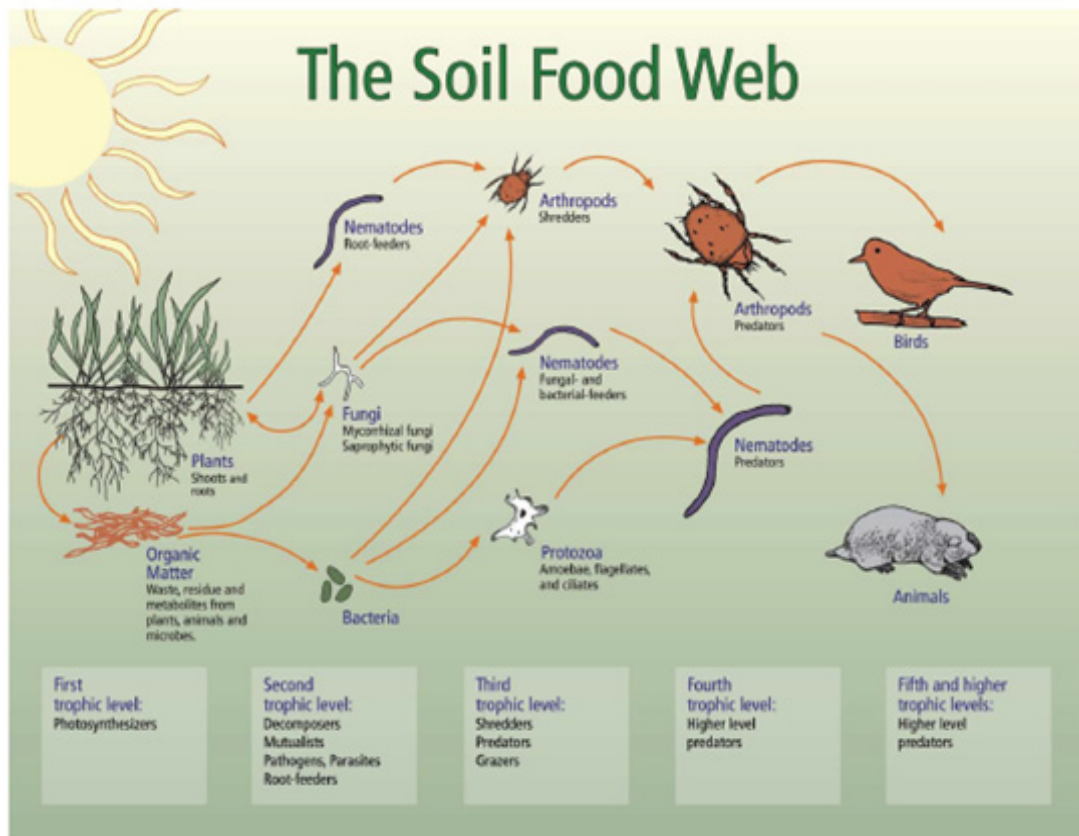


Diagram by Elaine R. Ingham

Plants are the ultimate carbon sucking machines. Plants absorb carbon dioxide from the atmosphere and water from the earth, and using solar energy they perform the amazing function of photosynthesis, i.e. they break down  $H_2O$  and  $CO_2$  and through complex chemical reactions, they offer oxygen in the air to breathe, and produce sugars, carbohydrates. Plants use these sugars to grow. They also attract beneficial soil organisms by releasing some of the sugars

through their roots. Those molecules of carbon that were once harmful greenhouse gases become tied up in the bodies of microbes, and stored underground.

However, plants need minerals and trace elements (iron, phosphorus, calcium, magnesium, copper, zinc, etc.), which are found in the soil in the form of various compounds, but they cannot absorb these compounds as they are.

Microorganisms in turn gather around the roots to feed and create a layer that protects the roots from harmful bacteria. At the same time, they decompose a large portion of the soil organic matter, releasing the minerals and trace elements that the plants can now absorb through the water. They also store carbon in the soil as accumulated humus. Humus is the dark organic matter that forms in soil when dead plant and animal matter decays. Humus has many nutrients that improve the health of soil. At the same time the microorganisms create many complex compounds. With the sticky substances produced by microorganisms, they create soil lumps, leaving air passages for both themselves and the plants. In this way, they make the soil light and also give it the ability to absorb rainwater, but also to retain it.

**Soil health is measured by the percentage of carbon it has.** The international initiative "4 per 1000" (<https://www.4p1000.org>) was based on this finding, which means that **if we increase the carbon content of soil by 4p1000, every year, through regenerative farming practices, we can reduce the CO<sub>2</sub> that has accumulated in the atmosphere and at the same time have a healthy soil, capable of producing nutritious food.** A safe guide is taste. When a fruit tastes good and has a wonderful smell, that means it contains all the necessary nutrients. If not it has nothing to offer us.

According to Rodale Institute "The way we farm and the way we eat are inextricably linked, and the rising prevalence of unhealthy diets has paralleled the rise of industrialised agriculture. Beginning in the 1800s, farming shifted away from small, diversified operations to consolidated entities focused on maximising yields of a few crops that are easy to ship, store, and process—in particular cereal grains—while increasing its use of chemical inputs to improve crop yields.

The toxic byproducts of our conventional farming systems have made their way into the food we eat, the air we breathe, and the water we drink, correlating with an increase in cancer, autoimmune diseases, and antibiotic resistance. Additionally, industrial agriculture has depleted the nutrients in our food, contributing to "hidden hunger." The focus on cereal grains has allowed for the cheap, abundant processed foods that make up the Standard American Diet, while very little U.S. agriculture is focused on fresh, whole foods like fruits, nuts, vegetables, and legumes."

As early as 1992, the Rio de Janeiro Summit found that mineral depletion rates in cultivated land had reached 85% in the United States and Canada, 72% in Europe, 76% in Asia, and so on. According to the Food and Agriculture Organization of the United Nations, **if land depletion and pollution continue, we will not be able to produce food in 60 years from now!** The World Health Organization states that **60% of total mortality is due to chronic diseases caused largely by nutritional deficiencies.**

**Industrial agriculture has removed almost the same amount of carbon from the soil as deforestation**, says a new study by the National Academy of Sciences, USA

“Historically, I think we have underestimated the amount of emissions from soils due to land use change,” said lead study author [Jonathan Sanderman](#), an associate scientist with the Woods Hole Research Center, a climate change research organisation based in Massachusetts.

The researchers suggest that the findings could be used to help target the places around the world that have lost the most soil carbon, and where restoration efforts — which aim to help store carbon back in the ground through sustainable land management — might make the greatest difference. It is a strategy many scientists have suggested could be used to help fight climate change.

**“This Is Why When You Talk About Climate Change, You Can’t Ignore Agriculture”**

The coexistence of plants, animals and microorganisms is a wonderful but also self-sufficient life process that through biodiversity, contains all the divine wisdom and harmony and provides for the nourishment, development and healing of all. As long as man respects and participates in this process, he enjoys proper nutrition and healing. The abolishment of this harmony causes very soon inappropriate food and illness. A well-maintained soil also reduces the risk of flooding and protects groundwater reserves because it breaks down and filters out pollutants. But the issue is even more important, as the UN has stated: **“Without regenerating the soil, we will not be able to deal with the greenhouse problem.”**

Rodale Institute emphasises that **farming is an act of Climate Activism. Planting a garden is a powerful act.** It gives each of us with access to a little dirt the power to feed ourselves healthy food, as well as something we can do about the threat of climate change.

Many climate activists promote expensive technologies that pull carbon out of the air and inject it into deep pockets underground. [Plants already do this for free](#) through photosynthesis. This ability to capture greenhouse gases is why many experts believe [regenerative agriculture](#), also known as carbon farming, could play an important role in [fighting climate change](#). Experts say that **regenerative farming, if adopted broadly, could help slow the rate of global warming**. With better management, global croplands could store an additional 1.85 gigatons of carbon each year, or as much as the entire transportation sector emits.

Cultivating even a little patch of soil, in pots or in your backyard, matters. Eric Toensmeier, author of [The Carbon Farming Solution](#) estimates that his own tiny carbon-rich backyard garden, about a tenth of an acre, can offset the carbon emissions of one American adult per year.

So what if more of us started gardening in our own yards? What if a community of citizen gardeners joined together to grow good food?

**The Sai Prema estate in Markopoulo, Attica (Greece), part of which belongs to the Sathya Sai Organisation of Greece**, is one such development site for regenerative agriculture, where production is organised on the basis of the Natural Cultivation System, inspired and developed by the Japanese scientist Masanobu Fukuoka. Fukuoka has been involved in the development of an organic farming system for many years in order to exclude plowing, pesticides, fertilisers,

herbicides from the crop and to minimize weeding. Fukuoka's system resonated around the world and made him a pioneer in sustainable agriculture.

Watch: Rodale Institute, Regeneration International, Acres USA, Dr. Joseph Mercola, Dr Elaine Ingham - Soil Microbiologist - Founder of Soil Foodweb Inc  
video: The Roots of Your Profits - <https://www.youtube.com/watch?v=x2H60ritjag>.