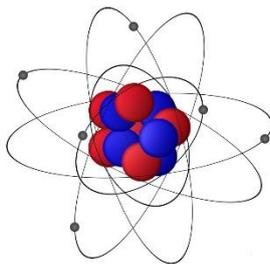




What is the soil organic carbon and why is it important?

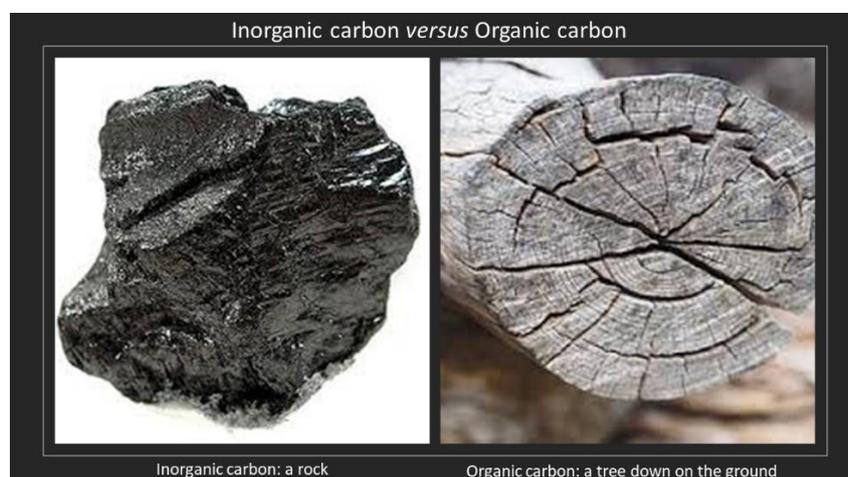
Nowadays, we often hear about carbon. Most of the comments and news talk about carbon dioxide in the atmosphere, which is a greenhouse gas that increases the global temperature and creates climate change. Well, while this may be partly true, the big picture is not like that. Carbon is essential to life, and we can find carbon not only in the atmosphere, but also in the soils, all living beings, and dissolved in the water.

Most of the carbon that we can find on Earth is fixed, as in the rocks. However, some other carbon is circulating around, in the ecosystems. See this example: a farmer plants a lettuce seed, which takes carbon from the atmosphere to growth and being a growth-up lettuce. After, we ate that lettuce in our salad, and the carbon is now in our bodies. A beautiful sunny day we decide to go for a walk in the forest, and while there, some of our hear gets stuck on a tree branch so we cut it and leave it there. The hear falls, now the carbon is on the ground. Some blows with the wind and falls in a nearby stream. The carbon is now in the soil and the water. This is a delicatessen for a worm passing by, which eats it and then burps of satisfaction like a baby. The carbon is now back in the atmosphere. We have completed a cycle of the carbon cycle. And so forth.



Carbon is needed to create life, essential to keep the natural Earth cycles working and to build ecosystems. The carbon is a molecule, is not a good or a bad boy. If I have to pick a role, I will go for the good one. Just, we cannot leave it alone unsupervised or will run wild and will mess up.

I want to write a detailed post about the soil carbon cycle to share with you all, but I am afraid that day has still not yet arrived. For now, you can read this comment on **soil organic carbon**. **Why organic?** To tell it apart from the mineral carbon, the one that form the rocks. The mineral carbon is considered unchangeable and irremovable. Actually, it could stop being part of the rock and break free, but that may happen in a million of years thus we consider it unchangeable from our human scale perspective. On the other hand, the organic carbon can move, and it is in fact the one that circulates in the carbon cycle.

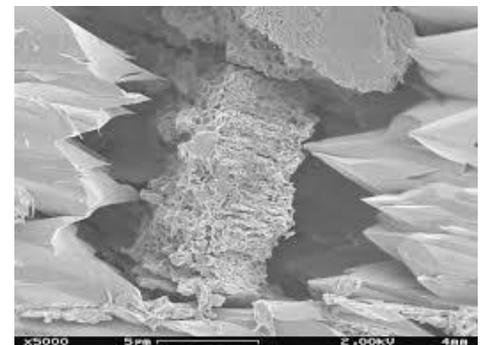




The organic carbon is part of the organic matter that falls on the ground and is also found in the soil aggregates (such as clays). It can be there for days or up to a couple of centuries. This organic carbon goes into the soil when some parts of living things die, split for the main body of the individual, and fall. Those are mainly plant parts, for example, litter from the trees or roots from a daisy flower.

When those ex-living parts arrive in the soil, they start to decompose. What does this mean? Bacteria and soil micro-fauna use those plant residues to feed themselves. They use that food to grow and generate energy, as we humans do. During those processes, the tiny micro-organisms will excrete gases that contain carbon molecules, such as carbon monoxide or methane. This will be the case for about 80-90% of the carbon that goes in the soil. So, that carbon goes back to the atmosphere in the form of a gas in a short period of time. This is what we call decomposition, which is no more complicated than soil micro-organisms eating plant parts and putting back in the atmosphere some components in the form of a gas.

Yet, there is still a 10-20% of the carbon that can stay in the soil for a longer period. Some of that carbon may go away soon, for example on a stream when it rains. But some other will stay, and the way that carbon will remain in the soil is by sticking itself to other soil components, mostly clays. The clay, apart from being useful to create a vase for mother's day, is a key component of the soil. The clay is formed by small lumps that stick to each other, and if we put some water, they agglutinate more (as happens with the vases).



In general, if the soil is not in good condition, it is quite likely that not much carbon can be stored. A good soil is a soil with minerals, bacteria, fungi, other micro-flora and micro-fauna, well-aerated and where water can move through. This soil is dark, sometimes almost black and when it rains it smells good.

The thirstier for carbon a soil is, the more carbon will hold back. That may be the case after years of crop cultivation. Those crops have taken minerals from the soil, and now the soil is hungry. If after cultivation the area is restored, for example by planting trees, that soil is going to soak up carbon during the first ten or twenty years. During this time, communities of soil bacteria will be developing, and the soil will turn darker. Once that soil has achieved its maximum capacity to absorb carbon, it will retain less carbon as the one it took after being converted into a forest. But that soil will keep the carbon very well, safe, and for longer. The soil of a forest is going to store more soil organic carbon than the soil of a cultivated field.

In conclusion, **having soil organic carbon in the soil is essential to have a healthy soil, thus plants can grow, forests can be strong, and crops will give good quality fruits.** Besides, all this carbon that is buried underneath is not in the atmosphere. So, if we manage to keep that carbon hidden under our feet, we will be reducing the quantity of greenhouse gas in the atmosphere and will be sowing our seeds for a greener planet.