THE IMPORTANCE OF CARBON IN THE SOIL

The carbon cycle is a fundamental part of life on earth. 'Soil organic carbon' (SOC) – the amount of carbon stored in the soil is a component of soil organic matter – plant and animal materials in the soil that are in various stages of decay.

Soil organic carbon is the basis of soil fertility. It releases nutrients for plant growth, promotes the structure, biological and physical health of soil, and is a buffer against harmful substances.

Soil organic carbon is part of the natural carbon cycle, and the world's soils holds around twice the amount of carbon that is found in the atmosphere and in vegetation. Organic material is manufactured by plants using carbon dioxide from the air and water. Plants (and animals, as part of the food chain), die and return to the soil where they are decomposed and recycled. Minerals are released into the soil and carbon dioxide is released into the atmosphere.

Soil organic carbon accounts for less than 5% on average of the mass of upper soil layers, and diminishes with depth. According to the CSIRO, in rain-forests or good soils, soil organic carbon can be greater than 10%, while in poorer or heavily exploited soils, levels are likely to be less than 1%.

The amount of soil organic carbon present in soil can vary hugely according to soil and landscape types and can change in the same paddock over time depending on climate and farming methods.

Temperature, rainfall, land management, soil nutrition and soil type all influence soil organic carbon levels.

> Increasing soil organic carbon, improves soil health and fertility. Many management practices that increase soil organic carbon also improve crop and pasture yields.

Some of the practices that increase soil organic carbon include conservation farming (reducing or eliminating tillage and retaining stubble from previous crops), improving crop management (e.g. through better rotation), maintaining and improving tree/forestry management, improving grazing management and adding organic materials such as composts and manures.

https://www.futurefarmers.com.au/young-carbon-farmers/carbon-farming

https://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-Edition/Text-Version/Organic-Matter-What-It-Is-and-Why-It-s-So-Important/Organic-Matter-and-Natural-Cycles

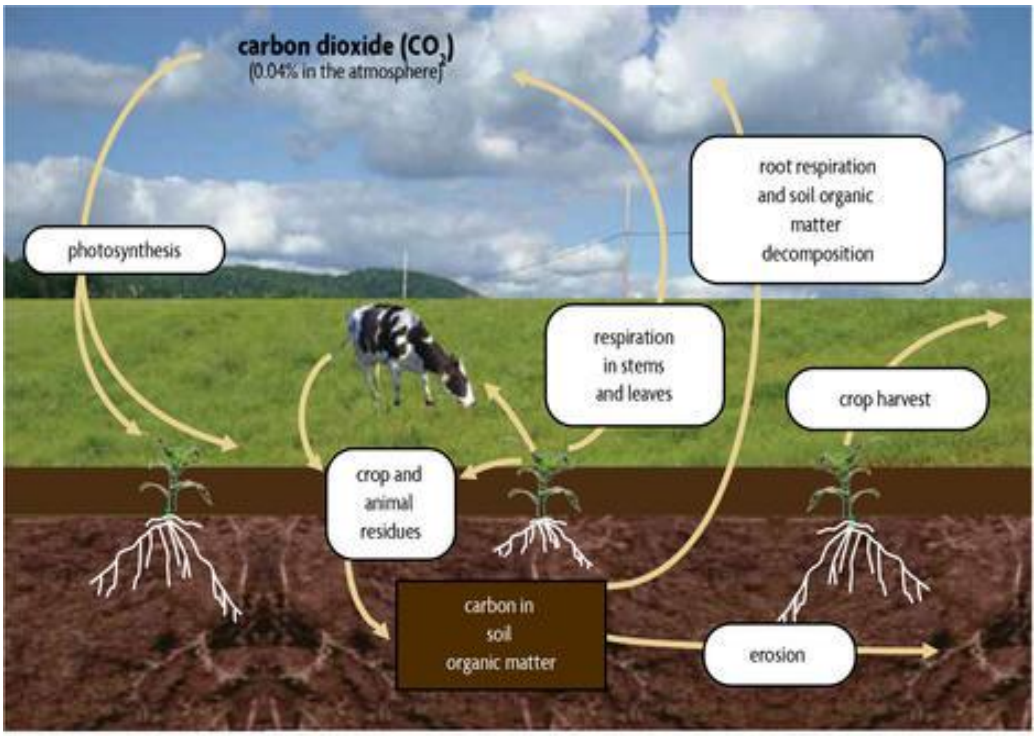

Figure 2.8. The role of soil organic matter in the carbon cycle.

A simple version of the natural carbon cycle, showing the role of soil organic matter, is given in figure 2.8. Carbon dioxide is removed from the atmosphere by plants and used to make all the organic molecules necessary for life. Sunlight provides plants with the energy they need to carry out this process. Plants, as well as the animals feeding on plants, release carbon dioxide back into the atmosphere as they use organic molecules for energy.

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