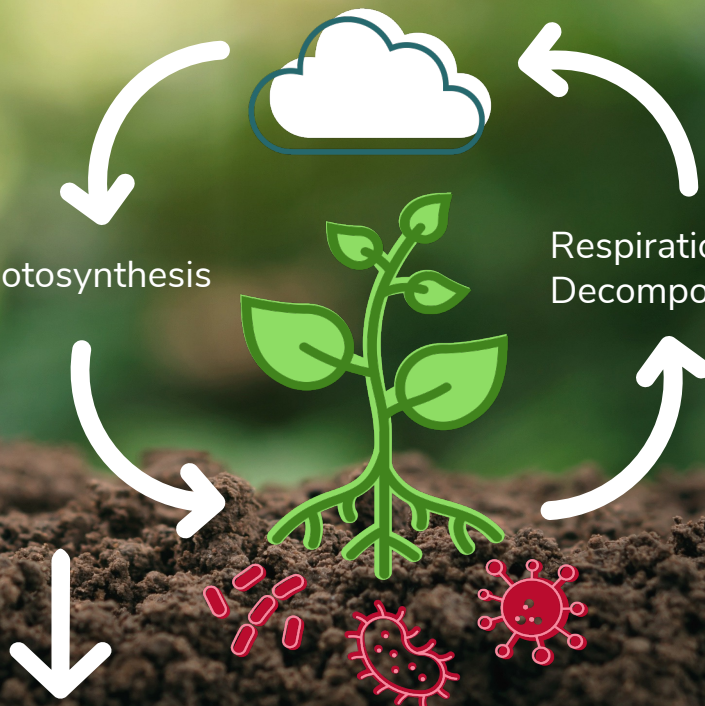


CO<sub>2</sub>Soil Organic Matter  
(Root & Microbial Biomass)

Photosynthesis

Respiration &  
Decomposition

## What is the Carbon Cycle?

The carbon cycle is a complex system involving, in particular, carbon dioxide (CO<sub>2</sub>) and organic matter. Atmosphere, vegetation, soils and the ocean are primary reservoirs of carbon.

Plants and soil sequester carbon from the atmosphere. Photosynthesis plays an important role as plants absorb CO<sub>2</sub> from the atmosphere and convert it into organic compounds, creating a carbon sink.

Soils can sequester carbon from root and microbial biomass, and other organic matter inputs. Other chemical processes can capture carbon in soil in carbonates (inorganic carbon).

Plants and soils release carbon back into the atmosphere through respiration and decomposition, influenced by tillage and crop-residue management.

Waterways and the ocean receive carbon from up-stream systems, later releasing some of it through decomposition and respiration. Ocean sediment can sequester carbon as well.

### Fast Carbon Facts

- **Carbon sequestration** describes the processes that **capture carbon long term** in the soil, rocks or aquatic systems.
- **Tillage** increases both decomposition and mineralization of organic matter by disturbing the soil structure. **No-till farming practices** and **crop, residue, and manure management** can increase soil carbon sequestration.
- **Fossil fuel emissions**, such as those from **fertilizer production and farm operations**, contribute to the increasing atmospheric CO<sub>2</sub> concentration.
- **Ruminant animals** release methane (CH<sub>4</sub>) into the atmosphere. **Sustainable livestock management practices** and **modified feed** can reduce the amount of CH<sub>4</sub> that livestock emit.

# How does farming influence the carbon cycle?



Soils are a **significant carbon reservoir**. Farmers can potentially enhance soil carbon sequestration by **practicing no-till farming, adding organic matter (compost, crop residues, manure), planting cover crops**, and other **soil conservation practices**, all of which promote carbon storage and soil health.



Through photosynthesis, plants absorb atmospheric CO<sub>2</sub>, converting it into organic compounds and biomass, a carbon sink. Farmers can impact this process through **enhancing productivity, crop choices**, and **targeted management practices**.



Fertilizer production and farm operations release carbon dioxide and other greenhouse gases into the atmosphere. Farmers can positively impact the cycle by **curbing farm equipment emissions, embracing renewables**, and **implementing carbon offset strategies**.



Oceans and waterways receive carbon inputs from the farms. Agricultural runoff can also introduce excess nutrients into aquatic systems, leading to algal blooms. Carbon and soil loss to aquatic systems can be reduced by **soil conservation practices**.

*This handout is funded by a grant from the Foundation for Food & Agriculture Research (FFAR)*



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