

# FEB NEWSLETTER

## Soil Organic Matter



Soil organic matter (SOM) refers to the organic materials found in soil that are derived from the decomposition of plant and animal residues, as well as microbial biomass. It is composed of a complex mixture of organic compounds in various stages of decomposition, including carbohydrates, proteins, lipids, lignin, and humic substances.

SOM originates from plant and animal residues that undergo decomposition by soil organisms such as bacteria, fungi, earthworms, and insects. These organisms break down organic materials into simpler compounds through processes like mineralization, where organic matter is converted into inorganic forms of nutrients, and humification, where complex organic molecules are transformed into stable humus.

The amount and quality of soil organic matter can vary depending on factors such as climate, vegetation, soil type, land management practices, and the input of organic materials. Generally, soils in natural ecosystems tend to have higher levels of organic matter compared to cultivated soils due to reduced disturbance and continuous input of organic materials from vegetation.

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Soil organic matter plays a critical role in soil health and ecosystem functioning due to its numerous functions, including:

1. Nutrient Cycling: SOM serves as a reservoir of nutrients such as nitrogen, phosphorus, sulfur, and micronutrients, which are gradually released into the soil solution as organic matter decomposes, providing essential nutrients for plant growth.
2. Soil Structure: SOM contributes to soil aggregation and stability, improving soil structure by enhancing soil porosity, water infiltration, and aeration, which in turn supports root growth, nutrient uptake, and soil resilience against erosion and compaction.
3. Water Retention: SOM improves the water-holding capacity of soils by increasing their ability to retain moisture, reducing water runoff, and promoting soil moisture availability for plant growth.
4. Biological Activity: SOM provides a substrate and energy source for soil microorganisms, supporting diverse and active microbial communities involved in nutrient cycling, organic matter decomposition, and soil nutrient transformations

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