



ADVANTAGES OF ORGANIC MATTERS IN SOIL

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Introduction

Organic matter is a constituent part of the soil, very useful in maintaining both the health and the productivity of soil. It's made of decomposed plant and animal materials and is sometimes considered a "soul" of the soil because of its many advantages. In this article, you will know about the main benefits of organic matter in the soil and underlines its role in sustainable agriculture, environmental health, and ecological resiliency

Improves Soil Structure

Organic matter improves the soil structure. Organic matter favors the growth of soil aggregates, which enhance porosity and aeration. Proper soil structure enhances root penetration, water infiltration, and allows proper drainage. As Six et al. claims (2004), an increase in organic matter stabilizes the aggregates, thereby improving plant growth-associated physical properties.

Improves Water Retention

Soils with high levels of organic matter have stronger holding powers in water. Organic matter is a sponge-like condition that absorbs and holds water, thus beneficial for drought-prone areas. FAO (2015) states, increasing the organic matter content in soils leads to improvement in the water-holding capacity enhancing maintenance of adequate levels of soil moistures for plant growth; it reduces frequent irrigation.

Provides Nutrition

Organic matter is a reserve of all nutrients to plants. During decomposition, it provides the soil with macro nutrients such as nitrogen, phosphorus, and potassium, as well as micronutrients including iron, manganese, and zinc. In this study, Jansson and Hofsten (2008) reported that organic matter maintains soil fertility

as well as its ability to supply more nutrients to the plants. Organic matter also enhances the CEC of the soil, which means it improves in its ability to retain and supply nutrients.

Helps soil microbial activity

Microorganisms in the soil provide decomposition of organic matter while recycling nutrients in the soil. The several processes of breaking down organic matter to produce humus depend on a wide and very active microbial population. Healthy microbial activity is said to promote soil health as it provides easily available nutrients and suppresses diseases and pests of the soil, according to Huang et al. (2018).

Increases Soil pH and Buffering Capacity

Organic matter can buffer the soil pH, which minimizes vulnerability to fluctuations. It neutralizes acidic or alkaline condition hence improving the favourable environment for plant growth. According to the USDA Natural Resources Conservation Service (NRCS, 2018), organic matter keeps the pH range stable and contributes to the availability of nutrients as well as the health of the soil.

Reduces Soil Erosion

Organic matter can prevent soil erosion by adding more to the soil. This is because organic matter improves soil structure and aggregation. Such tendencies tend to stabilize soil particles from being washed or blown away. According to the United Nations Convention to Combat Desertification (2017), added organic matter may enhance soil stability and reduce erosion, both of which are critical in maintaining depth up to topsoil and preventing fertile land loss.

Mitigates Climate Change

The key role organic matter plays in carbon sequestration is curbing climate change.

High organic matter soils can hold substantial amounts of carbon, thereby reducing the emission of greenhouse gases. According to a study by Lal (2004), climate change-mitigating practices, such as cover cropping and reduced tillage, increase the organic matter of the soil, which can help sequester carbon in it.

Conclusion

Organic matter has various impacts in the soil and thus benefits the soil, particularly regarding agricultural productivity and environmental sustainability through impacts on ecosystem health. Organic matter improves the soil structure, water retention, nutrient availability, and microbial activity, hence being fundamental to healthy plant growth and building resilient ecosystems. The sustainable land management practice that fosters organic matter accumulation is essential for long-term health and agricultural viability in soil. In turn, incorporating organic matter into core soil health may lead to better agricultural results and a brighter future for the world.

Reference

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