



## Editorial

# SOIL ORGANIC MATTER: THE LIVING SOIL SPONGE

**H**ealthy soils are the foundation of sustainable farming and role of organic matter in keeping soils healthy and productive is undeniable. Soil organic matter, a mixture of living and non-living components, although represents a small part of soil, has a significant effect on almost all soil properties. While plant residues, living microbial biomass and detritus contribute to the soil fertility, the stable fraction of the soil organic matter 'humus' improves the physical, chemical and biological properties of the soil along with darkening the soil.

Soil organic matter plays vital role in the environmental cycles such as carbon (C) cycle, nitrogen (N) cycle and water cycle. The increasing climate change events and its association with emissions of greenhouse gases like carbon dioxide (CO<sub>2</sub>) and nitrous oxide (N<sub>2</sub>O) have increased the local and global importance of C cycle and N cycle in recent years. As organic matter is a major C pool and soil can act both as source and sink of C depending upon land management practices, enriching soils with organic matter is essential.

Organic matter content of soil can be improved through adding organic materials like crop residue, animal manure, compost etc. to soil and also by growing cover crops and perennial grasses. A good amount of organic matter not only provides available forms of plant nutrients abundantly in soil but also prevents their leaching loss by storing and gradually releasing them to the soil solution to support healthy plant growth.

By facilitating the formation of soil aggregates, organic matter improves water retention capacity of soils. Studies on conservation agriculture-based systems show that undisturbed agriculture soils are less compact with high porosity due to high organic matter content. It is also estimated by researchers that for each 1% increase in soil organic matter, cropland can store around 94635 L to 128704 L of soil water per acre, depending upon the soil type.

Contributions of soil organic matter to the environment, agroecosystems and human society are countless and this makes farming methods which emphasise on less disturbance to the agricultural soil such as conservation agriculture and other resource conserving technologies are gradually entering into the farmlands of developing countries like India where smallholders are prominent.

The current issue of *Harit Dhara* covers topics like greenhouse gas methane, nutrient mining, conservation of soil and water, recycling of crop residue and water hyacinth through composting, management practices to improve soil carbon, use of nanoparticles for managing drought and irrigation techniques in India.

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