

Effective Soil and Plant Management Practices for Increasing Soil Organic-Carbon Stocks

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Abstract: Due to its multifunctional characteristics; soil organic matter has great importance not only for soil fertility by providing many plant nutrients, increasing plant available water and microbial activity, but also for structural improvement of soil by creating stable aggregates. However, the existence of this valuable resource is rapidly decreasing in Turkish soils, as in many other geographical regions of the World, mainly due to land use/land cover changes and high rates of soil erosion. In terms of drought and desertification, which are the most obvious negative effects of climate change, Türkiye is among the high-risk countries. One of the most important threats to soil functions, which are directly related to climate change-related crop production, is the loss of soil organic matter. Soil degradation due to organic matter loss that threaten the food, energy and water security of human beings in today's world, carries the risk of becoming more prominent and destructive on the axis of global-scale climate change and oppressive and unsustainable management practices on natural resources. However, it is clear that with the sustainable management of soil, which is known as the biggest organic carbon stock pool of terrestrial ecosystems, it plays a key role in minimizing the negative effects of climate change. The carbon storage capacity of soil depends on the local climate and existing land cover at the upper scale, but it also affected by solum depth, soil parent material, soil moisture and soil temperature regime, and the most importantly by soil and plant management practices. In other words, the factor that creates variability and has the opportunity to change is the human-induced soil/plant management factor. Increasing organic-C stocks in the soil is directly related to the balancing of land degradation and the effectiveness of the implementation of sustainable land and forest management strategies. In this context; minimizing erosion losses for all land use types and preventing misuse of lands, and especially in agricultural areas where organic carbon loss is manageable, dissemination of ecosystem-oriented - regenerative agriculture and climate-friendly agricultural techniques, application of reduced, minimum or zero tillage systems, adding plant residues and organic inputs into the soil have very important places. This paper describes the effective ways of increasing soil organic carbon stocks in soil with different aspects.

Keywords: Sustainable soil management, Organic-C stocks, Ecosystem oriented agriculture.