

National Landcare Program: Smart Farms Small Grant – Fruit Growers Victoria

FACT SHEET 3 Soil Organic Matter and Fertility

Soil Organic Matter (SOM), its stable humic substances, and its transient components, can strongly improve nutrient availability to plants. Soil Organic Matter also strongly affects nutrient storage. For nitrogen (N), sulphur (S), and in many soils for phosphorus (P), soil organic matter is the main pool of nutrient storage. In the case of micronutrients, especially iron (Fe) and copper (Cu), and zinc (Zn), soil organic matter determines the availability of these micronutrients to plants by increasing the water soluble and exchangeable forms of micronutrients in soil which further increase the uptake of micronutrients.

SOM comprises an accumulation of decomposed plant and animal residues and other organic compounds synthesized by the soil microbes as the decay occurs (Brady, 2016).

Soil organic matter is a surrogate for soil carbon and may be measured as a reflection of overall soil health. When monitored for several years, it gives an indication whether soil quality is improving or degrading.

Soil Organic Matter is important to a wide variety of soil chemical, physical, and biological properties. As SOM increases, so does CEC, soil total N content, and other soil properties such as water-holding capacity and microbiological activity.

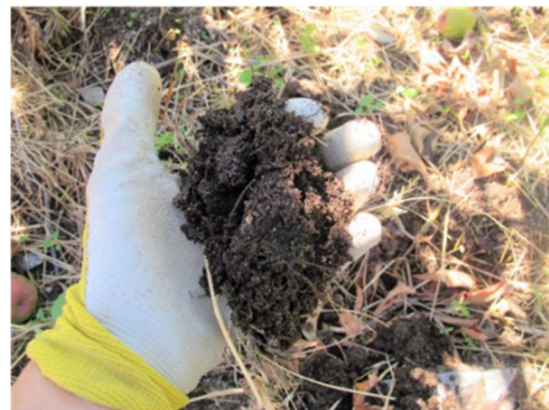
SOM is in equilibrium with climate, soil mineralogy, and environment, providing limitations to capacity to accumulate organic matter. A 2 percent increase in soil OM (e.g., from 1 to 3%) would be considered a large change and the maximum likely for most situations.

SOM content is not a quantitative indicator of the capacity of soil to supply plant-available nitrogen for plant growth even though a soil with more SOM contains more total N. The timing and amount of nutrient released from soil organic matter is dependent on soil temperature, moisture, and many other soil management factors.

Observations

Soil Organic Matter measured during the project indicates a wide range of SOM accumulated in orchard soils.

Management practices such as the use of manures, compost and high biomass cover crops are methods growers may employ to improve the SOM in orchard production systems.



Further, incorporation of organic materials at planting time, can be of significant benefit and thus require smaller additional inputs over the life of the block.

Calculations of the nutrient inputs from the applied organic material need to be considered by your agronomist.

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Orchard soil with high organic matter. Photo credit T. DuPont, WSU Extension. Accessed Feb 2024