

biological and chemical soil properties

WHAT ARE

PROPERTIES

WHAT IS IT?

WHY IS IT IMPORTANT?

BIOLOGICAL

Soil organisms (biota)

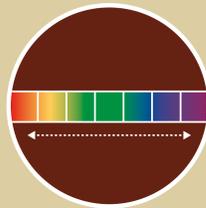


Soil organisms represent a large fraction of global terrestrial biodiversity. Some examples include macroorganisms, earthworms, millipedes and microorganisms such as bacteria and protozoa.

Soil organisms play a big role in: breaking down organic matter, recycling nutrients, creating humus, soil structure, fixing nitrogen, promoting plant growth, and controlling pests and diseases.

CHEMICAL

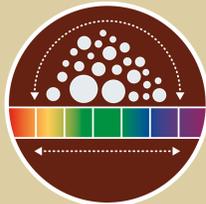
pH



Soil reactivity is expressed in terms of pH and is a measure of the acidity or alkalinity of the soil.

The effect of pH is to remove from the soil or to make available certain ions. Soils with high acidity (<5.5) tend to have toxic amounts of aluminum and manganese. Soils with high alkalinity (>8.5) tend to disperse. Soil organisms are hindered by high acidity, and most agricultural crops do best with mineral soils of pH 6.5.

Cation Exchange Capacity (CEC)



Cation-exchange capacity (CEC) is the maximum quantity of total cations, including nutrients, that a soil is capable of holding, at a given pH value, available for exchange with the soil solution.

CEC is used as a measure of fertility, nutrient retention capacity, and the capacity to protect groundwater from cation contamination.

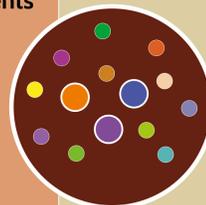
Salinity



Soil salinity refers to the amount of dissolved salts in the soil solution, and when soluble salts accumulate in the soil, the process is known as salinization.

The accumulation of salts can have negative effects on plant growth.

Macro and micronutrients



The macronutrients include Nitrogen (N), Phosphorus (P), Potassium (K), Calcium (Ca), Magnesium (Mg), and Sulphur (S). The micronutrients include Iron (Fe), Zinc (Zn), Manganese (Mn), Boron (B), Copper (Cu), Molybdenum (Mo) and Chlorine (Cl).

These nutrients are essential for plant growth and living organisms in the soil.

Soil Organic Carbon



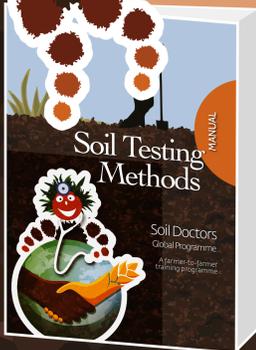
The carbon that is fixed by plants is transferred to the soil via dead plant matter including dead roots and leaves.

Soil organic carbon is a major factor in overall soil health. It improves the physical properties of the soil, increases the cation exchange capacity (CEC) and the water-holding capacity and it contributes to the structural stability of soils by helping to bind particles into aggregates. It also holds a great proportion of nutrients, cations and trace elements that are of importance to plant growth. It prevents nutrient leaching and is integral to the organic acids that make minerals available to plants. It also buffers soil from strong changes in pH.

LET'S TAKE A LOOK AT SOME BIOLOGICAL AND CHEMICAL SOIL PROPERTIES



DON'T FORGET TO CHECK OUT "WHAT ARE PHYSICAL SOIL PROPERTIES" POSTER AND THE SOIL TESTING METHODS MANUAL



IT'S IMPORTANT REMEMBER THAT SOIL PROPERTIES ARE INTERCONNECTED AND INTERACT WITH EACH OTHER, ALLOWING SOILS TO FUNCTION



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