

DEFINITION of SOIL

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1.1 SOIL

SOIL SCIENCE is "The science dealing with soil as a natural resource on the surface of the earth, including Pedology (soil genesis, classification and mapping), physical, chemical, biological and fertility properties of soil and these properties in relation to their management for crop production"

Soil Science has six well defined and developed disciplines.

1. Soil fertility : Nutrient supplying properties of soil
2. Soil chemistry : Chemical constituents, chemical properties and the chemical reactions
3. Soil physics : Involves the study of physical properties
4. Soil microbiology : Deals with micro organisms, its population, classification, its role in transformations
5. Soil conservation : Dealing with protection of soil against physical loss by erosion or against chemical deterioration i.e excessive loss of nutrients either natural or artificial means.
6. Soil pedology : Dealing with the genesis, survey and classification

VIEWS ON SOIL (SCIENCE)

The term SOIL was derived from the Latin Word "SOLUM" Means FLOOR

1. For a Layman soil is dirt or debris
2. For an Agriculturist soil is a habitat for plant growth (to grow crops)
3. For a Mining Engineer soil is a debris covering the Rocks
4. For a Civil Engineer soil is a material on which road bed or house bed is formed
5. For a Home Owner soil is a mellow or loamy or hard material

DEFINITIONS

Joffe (1936): "Soil is a natural body of mineral and organic constituents differentiated into horizons - usually unconsolidated - of variable depth which differs among themselves as well as from the underlying parent material in morphology, physical makeup, chemical properties and composition and biological characteristics".

Jenny (1941): Soil is a naturally occurring body that has been formed due to combined influence of climate and living organisms acting on parent material as conditioned by relief over a period of time

Whitney (1892): Soil is a nutrient bin which supplies all the nutrients required for plant growth.

Hilgard (1892): Soil is more or less a loose and friable material in which plants, by means of their roots, find a foothold for nourishment as well as for other conditions of growth"

Dokuchaiev (1900): Russian scientist - **Father of Soil Science** - Soil is a natural body composed of mineral and organic constituents, having a definite genesis and a distinct nature of its own.

As soil provides nutrients, water, air and anchorage and supports life on Earth, it can be called as **Soul Of Infinite Life (SOIL)**

Soil as a three dimensional body

Soil is a three dimensional body having length, breadth and depth. They form a continuation over the land surface and differ in properties from place to place. Its upper boundary is air or water and lower boundary is the rock lithosphere.

Composition of soil on volume basis

Composition		%
Mineral matter	:	45
Soil water	:	25

Soil air	:	25
Organic matter	:	5

Composition of Earth crust (% by weight)

Oxygen	O^{2-}	46.60%
Silica	Si^{4+}	27.72%
Aluminium	Al^{3+}	8.13%
Iron	Fe^{2+}	5.00%
Calcium	Ca^{2+}	3.63%
Sodium	Na^{+}	2.83%
Potassium	K^{+}	2.59%
Magnesium	Mg^{2+}	2.09%
Others	-	1.41%

Eight elements are abundant - 98.6%

SOIL CAN BE COMPARED TO VARIOUS SYSTEMS OF ANIMALS

Digestive system : Organic matter decomposition

Respiratory system : Air circulation & exchange of gases

Circulatory system (blood) : Water movement within the soil

Excretory system : Leaching out of excess salts

Brain : Soil clay

Colour : Soil colour

Height : Soil depth

APPROACHES OF SOIL STUDY

Two Concepts: One treats soil as a natural body, weathered and synthesized product in nature (Pedology) while other treats soil as a medium for plant growth (Edaphology).

Pedological Approach: The origin of the soil, its classification and its description are examined in Pedology. (from Greek word *pedon*, means soil or earth). Pedology is the study of soil as a natural body and does not focus on the soil's immediate practical use. A pedologist studies, examines and classifies soil as they occur in their natural environment.

Edaphological Approach: Edaphology (from Greek word *edaphos*, means soil or ground) is the study of soil from the stand point of higher plants. Edaphologists consider the various properties of soil in relation to plant production. They are practical and have the production of food and fiber as their ultimate goal. They must determine the reasons for variation in the productivity of soils and find means for improvement.