RAMA UNIVERSITY

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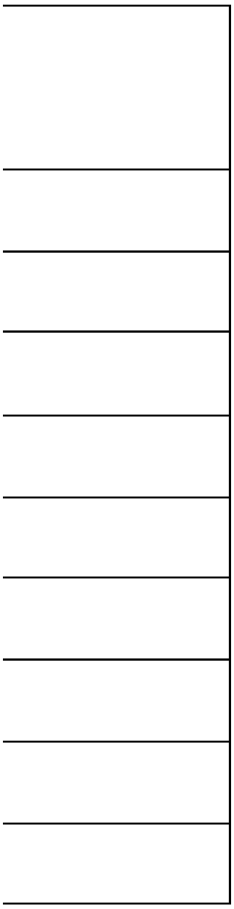
FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

I

SOIL PROFILE

A vertical section of soil through all its horizons and extending in to the parent material. A vertical exposure of the horizon sequence is termed as "soil profile".

Theoretical Soil Profile



O_i : Organic, slightly decomposed

O_e : Organic, moderately decomposed O_a : Organic, highly decomposed

A : Top Mineral layer, mixed with humus, dark in color

E : Horizon of max. eluviation of silicate clays, sesquioxides etc.,

AB or EB : Transition to B, more like A or E than B. BA or BE : Transition to A or E, more like B than A /E.

B : Illuviated B horizon, with clear expression BC : Transition to C , more like B than C.

C : Zone of least weathering, accumulation of Ca ,Mg carbonates, cementation, may be high bulk density

R : Bed Rock

A soil horizon is a layer of soil, approximately parallel to the soil surface, differing in properties and characteristics from adjacent layers below or above it.

Soil profile is an historic record of all the soil forming processes and it forms the unit of study in pedological investigations. Practically, soil profile is an important tool for soil classification which is applicable for thorough understanding of the soils.

Five master horizons are recognized in soil profile and are designated using capital letters O, A, E, B and C. Sub-ordinate layers or distinctions with in these mater horizons are designated by lower case letter e.g., a, e, i, t, k etc.

O Horizons:(Organic) It comprises of organic horizons that form above the mineral soil. They result from litter derived from dead plants and animals. 'O' horizons usually occur in forested areas and are generally absent in grassland regions.

A - Horizon: It is the top most mineral horizon. It contains a strong mixture of decomposed (humified) organic matter, which tends to impart a darker color than that of the lower horizons.

E - Horizon: It is an eluviated horizon. Clay and sesquioxides are invariably leached out, leaving a concentration of resistant minerals such as quartz. An 'E' horizon is generally lighter in color than the 'A' horizon and is found under 'A' horizon.

"B" – Horizon : (Illuvial) The sub -surface 'B' horizons include layers in which illuviation of materials has taken place from above and even from below. In humid regions, the B horizons are the layers of maximum accumulation of materials such as sesquioxides and silicate clays. In arid and semi-arid regions $Ca\ CO_3$, $Ca\ SO_4$ and other salts may accumulate in the B horizon.

'C' – Horizon: It is the unconsolidated material underlying the 'Solum' (A & B). It may or may not be the same as the parent material from which the solum formed. The 'C' horizon is out side the zones of major biological activities and is generally little affected by the processes that formed the horizons above it.

'R'- Layer : Underlying consolidated rock , with little evidence of weathering.

Sub – Ordinate Distinctions with in Master

Horizons: p: plough layer disturbance

h : illuvial accumulation of organic matter

n : accumulation of sodium

t : accumulation of silicate clays

s : illuvial accumulation of organic matter and sesquioxides

y : accumulation of zypsum

z : accumulation of soluble salts

Differences Between Surface and Sub -surface soils

SURFACE SOIL

Soil up to a depth 30cm

Physically loose and granular

Moreporosity

More organic matter content

Biological activity is more

Mostly manipulated zone

Root activity is more

It is completely weathered

most of the essential nutrients are present in available form

SUB-SURFACE SOIL

Soil layers beyond 30cm depth Comparatively compact

Less porosity

Less organic matter content Microbial activity is less Relatively un manipulated

Comparatively less excepting in cases of long duration / perennial crops

It is pa rtially weathered

Less content of essential nutrients in available form.