



Comparative Study of Soil Analysis at Surface Level and at Different Depth

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Abstract:

Physico-chemical study of soil was done to quantify and make comparative analysis of the soil sample at different depth of local area of Chandrapur district (Bamani, Th :Ballarpur). Soil at the depth of 15ft, 70ft, 110ft were analysed to determine the major soil physical and chemical parameters and compare variation of soil properties with respect to the soil at surface level. Analysis of soil sample parameters were done by procedure of statistical analysis system. After comparison of soil sample at surface level and different depth pH, Ca, Mg and moisture and salt content varies.

Keywords: Physico-chemical parameter, soil samples, conductivity Meter, pH Meter, Kjeldahl assembly.

Introduction:

The word soil is derived from the Latin word *solum*, which means earthy material in which plant grows. Soil study is commonly referred to as soil science or pedology (pedos-earth) or edaphology. Soil can be defined as weather layer or earth crust with living organism and their product of decay. Soil is the uppermost part of the earth crust and is a mixture of organic as well as weather rock and materials. Soil is a complex physio-biological system providing water, mineral, salts, nutrients, dissolved oxygen etc.

A dynamic natural body on the surface of the earth, in which plants grow, composed of minerals and organic materials and living forms. The purpose of soil analysis is to assess the adequacy, surplus or deficiency of available nutrients for crop growth and to monitor change brought about by farming practices. The conversion of rocks to soil is known as soil formation. Soil is store house of minerals, a reservoir of water, a conserver of soil fertility, a producer of vegetative crops, a home of wild life livestock. Soil is actually formed as a long term process of complex interaction, disintegration and decomposition of rocks due to weathering. Process of soil formation involves two stages weathering and pedogenesis. Composition of soil is minerals 45%, organic matter 5%, soil water 25%, soil air 25%. The element associated with living organism are C,H,O,N,P,S,Cl,I,Ca.MgAg etc.

Various factors that have to study under soil analysis are N, pH, Ca, moisture etc. A sample normally comprises around 1 kg of soil which is taken to represent an entire area or field, which contains around 2,000 tons of soil per hectare to a plough depth of 20 cm (8 inches). Soil analyses at surface level are generally done. What changes in the result if we collect the sample at depth below 100 feet? .For that soil sample are collected during digging the bore well.





Materials and Method:

Collection of Sample:

Sample are collected from Bamni [Ballarpur region] during digging of bore well, in month of Feb. 2014. Sample were collected at depth of 15 ft, 70ft, 110ft. colour of sample were black surface soil, [15 ft] yellow, [70ft,], reddish brown [110ft] cement colour.

Experiment:

Drying of Soil Sample:

Samples are dried at room temp before that moisture was finding.

Determination of Nitrogen: [Kjeldahl Method]

0.15 gm of sample was taken in kjeldahl flask, 0.2 gm CuSO_4 and conc. H_2SO_4 solution heated for 3-4 Hr. Above digested solution is distilled. 40% NaOH is added, evolved ammonia gas is absorbed in 0.1% H_2SO_4 containing methyl red indicator and titrated with NaOH.

Determination of Moisture; [Gravimetric Method]

A weight of sample was taken before and after drying at oven at 110°C for 2 Hr. Difference in weight gives % of moisture.

pH: pH is measured by pH meter.

Determination of Electrical Conductivity.

By conductometer Determination of Calcium by Versenate Method:

Result and Discussion:

After all chemical analysis of soil samples from local area of Ballarpur (Bamani) at different depth shows that following results have to be put forward. Generally soil sample at surface level are analyzed by number of researcher. But what results we get to the parameters if we analyze the soil sample at below 50 feet down. It is our short comparative study for the soil at surface level and at different depth.

The above study shows that ..

- Percentage of Nitrogen decreases and totally absent as depth increases.
- PH of soil decreases as depth increases.
- Electrical conductivity increases as depth increases.
- Percentage of Calcium and Magnesium increases as depth increases.
- Percentage of Moisture increases as depth increases.





Table. 1-

Sr No	parameter	Surface soil	Soil at 15 feet	Soil at 70 feet	Soil at 110 feet
1	Nitrogen	10.26	0%	0%	0%
2	Moisture	6.38	8.69%	11.12%	12.04%
3	pH,	7.86	7.22%	6.36%	6.70%
4	Electrical conductivity	0.42miliemohs/cm	0.68miliemohs/cm	0.76miliemohs/cm	miliemohs/cm
5	Calcium	4.02 meq/lit	meq/lit	meq/lit	meq/lit
6	Magnesium	1.20 meq/lit	meq/lit	meq/lit	meq/lit

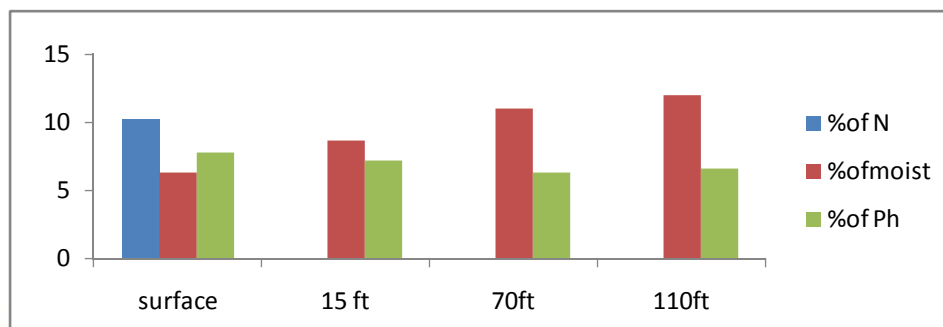


Figure. 1

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