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Physicochemical Studies of Soil from Some Farms of Ghatanji Region

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ABSTRACT:

The soil is the most important constituent to fulfillment of all the basic needs of human beings. Soil is an important component of our farming. Thus the physico-chemical study of territory is very significant because both physical and chemical properties which bear upon the soil productivity. The quality of soil and availability of water are essential factor for the good yield of the crop. Hence it is necessary to analyze some quality parameters of the soil to determine the quality of soil.. The present work has been carried out to study some parameters of soil samples collected from Ghatanji Taluka region District Yavatmal. The soil characterization was carried out for the parameters like pH, Conductivity, TDS, organic carbon, available nitrate nitrogen, calcium and magnesium. The variation of values were observed in the different parameters due to the soil quality in different places.

Keywords: Parameters, Conductivity, TDS, Organic carbon.

INTRODUCTION:

Soil is the most important materialfor human being**.** The soil word is derived from Latin word, "Solum' meaning the earthy material in which plant growth occurs. Soil is the natural material spread in different layers. It differs in physical, chemical and mineralogical characteristics.[1] Soil is mixture of minerals, organic matter gases, liquids and myriad of micro and macroorganisms, that can support plant life. Soil as a general term usually denotes the unconsolidated thin, variable layer of mineral and organic material usually biologically active that covers rest of the earth land surface. Soil properties that are sensitive to changes in the management can be used as indicators. In India now a day's large numbers of fertilizers are used intend of manures. Due to his the crop productivity is increases speedily but the quality of soil support decreases. So it becomes essential to analysis the soil parameters. It is a real time to carry out the physicochemical analysis of soil because as with the increasing use of chemical fertilizer to the soil, it is difficult to control the adverse effects of the chemical fertilizer to the soil, plants, animals and human being[2]. The status of available micronutrients in the soil and their relationship with various physicochemical properties havebeen attempted by several investigators.[3] soil test based nutrient management has emerged as a key issue in efforts to increase agricultural productivity and production since optimal use of nutrients, based on soil analysis can improve crop productivity and minimize wastage of these nutrients.[4] In generallyYavatmal district and hence in Ghatanji Taluka region, this soil is not getting polluted as their is no industrial waste problem in the region. All samples were collected in summer season. Analysis of soil in carried out for the studies of various parameters like pH. Conductivity, TDS, Organic Carbon, Available Nitrate Nitrogen, Calcium and Magnesium.

MATERIAL & METHODOLOGY :

The soil samples were collected from Ghatanji Taluka in the month of March-April 2022 from different sampling stations. Soil samples V_1, V_2, V_3, V_4, and V_5 were collected in the depth of 0-30 cm from

the surface of soil from Sakhara, Shiroli, Pandhurna, Murli, Manoli villages were collected for analysis as shown in the table 1.

Table 1: Soil samples from different sampling stations

Sample Site	Name of Village
V_1	Sakhara
V_2	Shiroli
V_3	Pandhurna
V_4	Murli
V_5	Manoli

The soil samples were preserved in polythene bags for further analysis. The chemicals and reagents used for analysis were of A. R. grade. Method use for Estimation of parameters physicochemical analysis were carried out in the laboratory of department of chemistry, collage of Engineering & Technology District, Akola, (M.S), India, are shown in the table 2

Table 2: Method use for Estimation of Some Parameters.

S.N.	Parameter	Method
1	Colour	By viewing Soil
2	Moisture	By weighing
3	pH	pH metry
4	Conductivity	Conductometry
5	Available Nitrate Nitrogen	Titration
6	Alkalinity	Titration
7	Total Dissolved Solid	TDS Metry
8	Organic Carbon	Titration
9	Calcium	Titration
10	Magnesium	Titration

RESULT AND DISCUSSION :

Physicochemical parameters just like a colour, Moisture, pH, conductivity alkality and etc of soil samples are presented in table-3

Colour : In the earth soil there is lot of colour soil sample but some presented Soil samples are V_1, V_2, and V_3 are faint black and V_4 and V_5 are dark black in colour.

Moisture : The moisture content value ranges from 4.85% to 11.30% It is clear from result sample V_4 have highest moisture content than samples V_1,V_2,V_3 and V_5.

Table - 3 Physicochemical parameters of soil sample

S.N.	Soil Parameters	V_1	V_2	V_3	V_4	V_5	IAS for soil analysis[6]
1	Colour	Faint Black	Faint Black	Faint Black	Dark Black	Dark Black	.....
2	Moisture (%)	9.57	8.48	6.59	11.30	4.85	…….
3	pH	7.74	7.86	7.93	7.60	7.79	5.8 - 8.3
4	Conductivity	0.19	0.28	0.24	0.17	0.18	……..

5	ANN (kg/ha)	248.6	258.3	215.04	222.12	237.24	217.6-272
6	Alkalinity (%)	25	30	20	15	40	……...
7	TDS	0.38	0.54	0.58	0.52	0.49	< I
8	Organic Carbon (%)	0.78	0.64	0.34	1.25	1.50	……..
9	Calcium (ml/100gm)	9.0	7.0	9.0	8.0	10.0	10-30
10	Magnesium (mg/100gm)	7.0	6.0	5.0	4.0	5.0	5-10

IAS - International Agriculture Standard, ANN - Available Nitrate Nitrofen,TDS - Total Dissolve Solid.

pH : The pH of soil is one of the most important physicochemical parameter. It affects minerals nutrient soil quality and much microorganism activity. The pH was observed in the ranges from 7.6, to 7.9 The samples V_1, V_4 and V_5 are very slightly alkaline and samples V_2 and V_3 are medium alkaline.

Conductivity : The measurement of conductivity is for measure the current that given a clear idea of soluble salt present in the soil. conductivity depends upon the dilution of soil suspension. The conductivity vales range from 0.18 μS to 0.28 μS. Conductivity of sample V5 is less as compared to samples V_1, V_2, V_3 and V_4.

Available Nitrate Nitrogen : Available nitrate nitrogen in the soil from 215.04 kg/hectare to 258.3 kg/hectare. The soil sample V_2 has high nitrate nitrogen as compared to samples V_1, V3, V_4 and V_5.

Alkalinity: Alkalinity was observed in the ranges from 15% to 40% Alkalinity of sample V_4 is less as compare to samples V_1, V_2, V_3, and V_5.

Total Dissolved Solid (TDS) : TDS values for soll sample ranges from 0.38 to 0.58 Soil sample V_1 has lowest TDS is compared to V_2,V_3,V_4, and V_5.

Organic Carbon : Organic carbon is the index for nitrogen content in the soil. The source of organic carbon in the cultivated soil included crop residue, animal manure, cover crops, green manure and organic fertilizer etc. Organic carbon values ranges from 0.3% to 1.5% Organic carbon of sample V_5, is high as compared to samples V_1, V_2, V_3 and V_4.

Calcium : Calcium ranges from 7ml/100gm to 10ml/100gm Soil sample V_5 have high calcium content as compared to samples V_1, V_2, V_3 and V_4.

Magnesium : Magnesium available to plants as the ions Mg^{2+} Magnesium content in the soil samples ranges from 4ml/100gm to 7ml/100gm. Sample V_4, contains less amountof magnesium

CONCLUSION:

Physico-chemical analysis of soil under study show different values forvarious sites, physicochemical study of soil is important to agricultural chemists for plant growth and soil management. Magnesium and calcium content in the soil sample are in lower amount so fertilizers containing magnesium and calcium are added for the proper growth and development of the crop. On the basis of this study farmers can be get a approx idea about the amount of which fertilizers and nutrients needed to soil for increase the percentage yield of crops.

REFERENCES:

1. Wankhade, R. R., *Int. Journal of Mult. & Allied Studies.*2(10), 2015, 1-4.
2. Raut P. P. & Ekbote P. D., *Int J. of Basic and Appl. Res. Special Issue*, 2012 112-116

3. Borkar A. D. *Res. Journal of Agriculture anf Forestry Science*, 3(1),2015, 16-18.
4. Soni M., *Pharma Innovation Journal*5(11), 2016, 37-39