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INDUSTRIAL PARAMETER AND PHYSICOCHEMICAL STUDIES OF SOIL FROM SOME FARMS OF DIGRAS REGION

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ABSTRACT:
Soil is an important component of our farming. 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 DigrasTaluka region District Yavatmal, Maharashtra. The soil characterization was carried out for the parameters like pH, Conductivity, TDS, organic carbon, available nitrate nitrogen, calcium and magnesium. The variation of valuesobserved in the different parameters due to the soil quality in different places.
Keywords: Parameters, Conductivity, TDS, Organic carbon.

INTRODUCTION:

Insoilchemistry physicochemical studies plays important role in composition and fertility,Commonsense applications across different spaces, including geological examinations, verifiable exploration, metropolitan preparation, rural turn of events, and local area[1]. The utilizations of such examinations stretch out to suggestions for crop expansion and the reception of imaginative cultivating methods[2]. Physicochemical soil investigation includes a scope of techniques pointed toward evaluating the physical and compound properties of soil[3]. The status of available micronutrients in the soil and their relationship with various physicochemical properties have been attempted by several investigators.[4] 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.[5] The most significant property of soil is its pH level, Its effects on all other parameters of soil[6].In this research paper the used soil is in Digras Taluka region, this soil is not getting polluted due to no industrial waste problem in this 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 AND METHODOLOGY:

The soil samples were collected from different village of DigrasTaluka at Yavatmal District in state Maharashtraat the time of month March-April 2023 from different sampling stations. Soil samples V_1, V_2, V_3, V_4, and V_5were collected in the depth of 0-30 cm from the surface of soil from Harsul, Isapur, Tiwari, kalgaon, Mahagaon villages were collected for analysis[7] as shown in the Table 1.

Table 1: Soil samples from different sampling stations

Name of Village	Harsul	Isapur	Tiwari	Kalgaon	Mahagaon
Sample Site	V_1	V_2	V_3	V_4	V_5

The soil samples were preserved in polythene bags for further analysis[8]. The chemicals and reagents used for analysis were of A. R. grade. Methodused 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 used 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,Total Dissolved Solid,Organic Carbon,Calciumand Magnesium of soil samples[9,10] are presented in Table3.

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 Blackand V_4 and V_5 are Brown in colour.

Moisture: The moisture content value ranges from 19.41% to 25.20% It is clear from result sample V_1 have highest moisture content than samples V_2, V_3, V_4 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 Soil Analysis
1	Colour	Black	Black	Black	Brown	Brown	
2	Moisture (%)	25.20	19.41	21.91	23.89	21.49	17-30% Per Crop
3	pH	8.00	7.77	6.99	7.09	7.98	6.0 -8
4	Conductivity	0.58	0.70	0.50	0.48	0.41	< 0.8 Ds/M
5	ANN (kg/ha)	400	581	408	320	400	Variable
6	Alkalinity (%)	301	360	415	408	400	Variable
7	TDS	376	391	300	312	367	<1000 PPM
8	Organic Carbon (%)	0.40	0.76	0.76	0.41	0.49	0.1-3%
9	Calcium (ml/100gm)	509	538	500	412	451	Variable
10	Magnesium (mg/100gm)	23	43	40	36	40	Variable

[IAS- Agriculture Standard, ANN-Available NitrateNitrofen,TDS-Total Dissolve Solid.]

pH: The pH of soil is one of the most important physicochemicalParameter. It affects minerals nutrient soil quality and much microorganism activity. The pH was observed in the ranges from 6.9 to 8.0 The samples V_2, V_3 and V_4 are very slightly alkaline and samples V_1 and V_5 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 0.41μS to 0.70μS. Conductivity of sample V_5 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 320kg/hectare to 581 kg/hectare. The soil sample V_1& V_5has high nitrate nitrogen as compared to samples V_2, V_3 and V_4.

Alkalinity: Alkalinity was observed in the ranges from 301% to 415% Alkalinity of sample V_1 is less as compare to samples V_2, V_3, V_4, and V_5.

Total Dissolved Solid (TDS):TDS values for soil sample ranges from 300 to 391 Soil sample V_3 has lowest TDS as compared to V_1,V_2,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 range from 0.40% to 0.76% Organic carbon of sample V_2,& V_3 is high as compared to samples V_1, V_4 and V_5.

Calcium: Calcium ranges from 412ml/100gm to 538ml/100gm Soil sample V_2have high calcium content as compared to samples V_1, V_3, V_4 and V_5.

Magnesium: Magnesium available to plants as the ions Mg^{2+}it content in the soil samples ranges from 23ml/100gm to 43ml/100gm. Sample V_1, contains less amountof magnesium

CONCLUSION:

Industrial parameter and physicochemical analysis of soilforvarious sites.It is important to agricultural chemists for plant growth and soil management. Magnesium and calcium content in the soil sample are less than required 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 various idea about the fertilizers and nutrients needed to soil for increase the percentage yield of crop and plants.

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