

**PHYSICOCHEMICAL STUDIES OF SOIL FROM SOME FARMS OF DARWHA 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. 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 Darwha Taluka 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 values observed in the different parameters due to the soil quality in different places.

Keywords: Parameters, Conductivity, TDS, Organic carbon.

INTRODUCTION: The physicochemical studies of soil plays important role in understanding its composition and fertility, The review starts by gathering soil tests from different ranches across the locale, taking into account factors, for example, geology, land use, and yield types. Micronutrients, including iron (Fe), zinc (Zn), and manganese (Mn), are fundamental in more modest amounts yet are similarly basic for compound capabilities, chlorophyll amalgamation, and in general plant¹. Evaluating microbial action is fundamental for understanding supplement cycling, decay cycles, and in general soil organic wellbeing². The difficulties and potential open doors that the local area faces, adding to a nuanced viewpoint on the district's general improvement³. Commonsense applications across different spaces, including geological examinations, verifiable exploration, metropolitan preparation, rural turn of events, and local area⁴. The utilizations of such examinations stretch out to suggestions for crop expansion and the reception of imaginative cultivating methods⁵. Physicochemical soil investigation includes a scope of techniques pointed toward evaluating the physical and compound properties of soil⁶. In this reseach paper the used soil is in darwha 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 Darwha Taluka at Yavatmal District in state Maharashtra at the time of month March-April 2022 from different sampling stations. Soil samples V₁, V₂, V₃, V₄, and V₅ were collected in the depth of 0-30 cm from the surface of soil from Taroda, Mahagaon, Sajegaon, Bhulai, Manaki villages were collected for analysis⁷ as shown in the Table 1.

Table 1: Soil samples from different sampling stations

Name of Village	Taroda	Mahagaon	Sajegaon	Bhulai	Manaki
Sample Site	V ₁	V ₂	V ₃	V ₄	V ₅

The soil samples were preserved in polythene bags for further analysis⁸. The chemicals and reagents used for analysis were of A. R. grade. Method used 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, Alkalinity, Total Dissolved Solid, Organic Carbon, Calcium and Magnesium of soil samples^{9,10} are presented in Table 3.

Colour: In the earth soil there is lot of colour soil sample but some presented Soil samples are V₁, V₂, and V₃ are Brown and V₄ and V₅ are black in colour.

Moisture: The moisture content value ranges from 17.73% to 20.10% It is clear from result sample V₃ have highest moisture content than samples V₁, V₂, V₃, V₄ and V₅.

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	Brown	Broun	Broun	Black	Black	Visual Assessment
2	Moisture (%)	18.65	18.01	20.10	19.94	17.73	17-30% Per Crop
3	pH	7.70	7.93	7.50	8.23	6.90	6.0 -8
4	Conductivity	0.46	0.35	0.18	0.32	0.19	< 0.8 Ds/M
5	ANN (kg/ha)	396	401	290	410	384	Variable
6	Alkalinity (%)	210	198	361	561	212	Variable
7	TDS	209	376	349	288	262	< 1000 PPM
8	Organic Carbon (%)	0.16	0.15	0.10	0.28	0.22	0.1-3%
9	Calcium (ml/100gm)	411	419	400	420	400	Variable
10	Magnesium (mg/100gm)	08	10	18	33	42	Variable

[IAS- 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 6.9 to 8.2 The samples V₁, V₃ and V₅ are very slightly alkaline and samples V₂ and V₄ 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 μ S to 0.46 μ S. Conductivity of sample V₃ is less as compared to samples V₁, V₂, V₄ and V₅.

Available Nitrate Nitrogen: Available nitrate nitrogen in the soil from 290 to 410 kg/hectare. The soil sample V₄ has high nitrate nitrogen as compared to samples V₁, V₂, V₃ and V₅.

Alkalinity: Alkalinity was observed in the ranges from 198% to 561% Alkalinity of sample V₂ is less as compare to samples V₁, V₃, V₄, and V₅.

Total Dissolved Solid (TDS): TDS values for soll sample ranges from 209 to 376 Soil sample V₁ has lowest TDS as compared to V₂, V₃, V₄, and V₅.

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 0.16% to 0.28% Organic carbon of sample V₄, is high as compared to samples V₁, V₂, V₃ and V₅.

Calcium: Calcium ranges from 400ml/100gm to 420ml/100gm Soil sample V₄ have high calcium content as compared to samples V₁, V₂, V₃ and V₅.

Magnesium: Magnesium available to plants as the ions Mg²⁺ its content in the soil samples ranges from 8ml/100gm to 42ml/100gm. Sample V₁, contains less amount of magnesium

CONCLUSION: Physicochemical analysis of soil different values for various sites. It 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 get various idea about the fertilizers and nutrients needed to soil for increase the percentage yield of crops.

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