VIDYABHARATI Vidyabharati International Interdisciplinary Research Journal ISSN 2319-4979

Physicochemical And Plant Growth Development Studies Of Soil From Some Farms Of Zari Region

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Abstract
Physical and chemical properties which bear upon the soil productivity. Study of soil parameter is very important for development of soil and plant growth. The quality of soil and availability of water are essential factor for the good yield of the crop. Due to this reason and increase the productivity of soil 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 Zari 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 farms for used of plant growth of Ardhawan, Bopapur, Dabha, and Dorli village
***Keywords**: Physicochemical studies, pH, Conductivity, TDS.*

Introduction

Economic and technical studies of feasibility in semi-arid agricultural soils[1] Spatial heterogeneity of soil micronutrients in shivalik foothill zone of himachal pradesh: a cross-site investigation of soil fertility[2]. Traditional methods of soil analysis often involve laboratory intensive processes and can be time-consuming, limiting their practicality for large-scale agricultural operations. In this paper some method which are applicable for farmer to increases the quality of soil. The effects of various land use types on particular physicochemical characteristics of the soil in mante watershed, south regional government of ethiopia[3]. Application of soil moisture probe in optimizing the parameters of a land surface model[4]. Some selected soil sample from Viroda is a town in Burhanpur district of India state of Madhya pradesh. Mostly agricultural crops is found in Viroda village is as follows Banana, Cotton, Maize, Wheat, Jawar, and Haldi. Banana is one of the most important crops in Viroda village[5]. Evaluating microbial action is fundamental for understanding supplement cycling, decay cycles, and in general soil organic wellbeing[6]. In this reseach paper the used soil is in different farms of Ardhawan, Bopapur, Dabha, and Dorli village of Zari taluka region and District Yavatmal. This soil is not getting polluted due to no industrial waste problem in this region. All samples were collected in Winter 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

We collect soil sample as per the requirement of farmer. The soil samples were collected from different village of Zari taluka region, District Yavatmal Maharashtra at the time of month April -May 2026 from different sampling stations. Soil samples V_1, V_2, V_3 and V_4 were collected in the depth of 0-30 cm from the surface of soil from Ardhawan, Bopapur, Dabha, and Dorli villages were collected for analysis[7] as shown in the Table 1.

Table 1: Soil samples from different sampling stations

Name of Village	Ardhawan	Bopapur	Dabha	Dorli
Sample Site	V_1	V_2	V_3	V_4

The soil samples were preserved in polythene bags for further analysis[8]. 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

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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, 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 V_1, V_2, V_3 and V_4 are Brown in colour.

Moisture: The moisture content value ranges from 17.73% to 20.10% It is clear from result sample V_3 have highest moisture content than samples V_1, V_2, V_3, V_4 and V_5.

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 V_1 and V_3 are very slightly alkaline and samples V_2 and V_4 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 0.46 μS. Conductivity of sample V_3 is less as compared to samples V_1, V_2 and V_4.

Available Nitrate Nitrogen: Available nitrate nitrogen in the soil from 290 to 410 kg/hectare. The soil sample V_4 has high nitrate nitrogen as compared to samples V_1, V_2, V_3.

Alkalinity: Alkalinity was observed in the ranges from 198% to 561% Alkalinity of sample V_2 is less as compare to samples V_1, V_3 and V_4.

Total Dissolved Solid (TDS): TDS values for soll sample ranges from 209 to 376 Soil sample V_1 has lowest TDS as compared to V_2, V_3, and V_4.

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 V_4, is high as compared to samples V_1, V_2, and V_3.

Calcium: Calcium ranges from 400ml/100gm to 420ml/100gm Soil sample V_4 have high calcium content as compared to samples V_1, V_2, and V_3.

Magnesium: Magnesium available to plants as the ions Mg^{2+} it content in the soil samples ranges from 8ml/100gm to 42ml/100gm. Sample V_1, contains less amount of magnesium

Table 3: Physicochemical parameters of Soil sample

S.N.	Soil Parameters	V_1	V_2	V_3	V_4	IAS Soil Analysis
1	Colour	Blackish	Blackish	Brown -Blackish	Blackish	Visual Assessment
2	Moisture (%)	17.7	18.6	18.2	19.4	17-30% Per Crop
3	pH	7.1	7.05	6.9	7.2	6.0 -8
4	Conductivity	0.52	0.46	0.38	0.39	< 0.8 Ds/M
5	ANN (kg/ha)	395	405	445	455	Variable
6	Alkalinity (%)	211	198	265	262	Variable
7	TDS	401	376	346	388	< 1000 PPM
8	Organic Carbon (%)	0.19	0.18	0.16	0.22	0.1-3%
9	Calcium (ml/100gm)	403	414	405	415	Variable
10	Magnesium (mg/100gm)	09	08	07	08	Variable

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

Conclusion

On the basis of this study farmers can used plant growth study of various idea about the fertilizers and nutrients needed to soil for increase the percentage yield of crops. From all conclusion physicochemical analysis of soil different values for various farms.

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