

Physicochemical Analysis of Soil from Some Farms of Ghatanji Region of Yavatmal District in Maharashtra

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ABSTRACT

The yield of the crop is dependent of the type of the soil and proper cultivation. Hence it is necessary to study some parameters of the soil. So in the present study is undertaken to determine the physico-chemical characteristics of some samples of soil from some farms of nearby village of Ghatanji region, Dist Yavatmal. The soil characterization was carried out for the parameters like pH, conductivity, chloride, sulphate, sodium, potassium. The variation of values were observed in the different Parameters due to the soil quality in different places.

Keywords : Conductivity, Chloride, Sulphate, Sodium, Potassium, Carbon.

I. INTRODUCTION

The soil word is derived from latin word, 'Solum' meaning the earthy material in which plant growth occurs¹. Soil is mixture of minerals , organic matter gases, liquids and myriad of micro and macro organisms, that can support plant life. Soil is the natural material spread in different layer². It differ in physical, chemical and mineralogical characteristics. Soil as a general term usually denote the unconsolidated thin, variable layer of mineral and organic material usually biologically active that covers rest of the earth land surface. Soil property that are sensitive to change in the management can be used as indicators. In India, now a day's large numbers of fertilizers are used instead of manures. Due to this 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 fertilizers to the soil, it is difficult to control the adverse effects of the chemical fertilizer to the soil, plants, animals and human being. The status of available micronutrients in the soil and their relationship with various physicochemical properties have been attempted by Several investigators In, Yavatmal district and hence in Ghatanji Taluka region, ths 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 is carried out for the studies of various parameters like pH, conductivity, chloride, sulphate, sodium, potassium.

II. MATERIAL & METHODOLOGY

The soil samples were collected from Ghatanji taluka in the month of March-April 2020 from different sampling stations. Soil samples G1, G2, G3, G4 and G5 were collected in the depth of 0-30 cm from the surface of soil from Khapri, Kumbhari, Dangargaon, Belora, Sakhara Villages were collected for analysis as shown in the table 1.

Table-1: Soil samples from different sampling stations

Sample Site	Name of village
G1	Khapri
G2	Kumbhari
G3	Dangargaon
G4	Belora
G5	Sakhara

The soil samples were preserved in polythene bags for further analysis. The chemicals and reagents used for analysis were of A. R. grade 3,4. 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 parameters.

Parameter	Method
Colour	By viewing soil
Alkalinity	Volumetric method
Chloride	Volumetric method
Sulphate	Gravimetric method
pH	pH metry
Conductivity	Conductometry
Sodium	Flamephotometry
Potassium	Flamephotometry

III. RESULTS AND DISCUSSION

The values of physicochemical parameters are presented in table-3. The colour soil sample was observed visually. Soil sample G1, G2 and G3 are faint black and G4 and G5 are dark black in colour. Alkalinity is a measure of saline or salt effected soil, the pH of these soil is greater than 7. These soils occur most extensively in aired climates and as the villages is aired the alkalinity value is ranging from 25 to 84 meq/100gm. Chloride in the soil samples was found by titration method. The chloride content was very variable at all the places, it ranged from 1.10 to 1.96 g/100gm. The values of pH showed that they lie in the alkaline side of the pH scale. Many workers have reported the values of pH in their investigations. The value of conductivity is lying within the range of 1.3 to 1.9 m mohs. The value of conductivity is the measure of ions present in the sample. The conductivity values can vary with the chemical properties of soil, if the soil is contaminated by chemicals or if it is saline,

Table-3: Values of physicochemical parameters

Sample No.	Color	Alkalinity	Chloride	Sulphate	pH	Conductivity x 10 ⁻³ Scm ⁻¹	Sodium (ppm)	Potassium (ppm)
G1	Faint black	25	1.23	0.158	7.28	1.4	40.4	120.6
G2	Faint black	30	1.42	0.186	7.35	1.5	100.7	123.2
G3	Faint black	20	1.10	0.134	6.85	1.3	114.8	100.7
G4	Dark black	54.0	1.96	0.432	7.41	1.9	112.5	128.5
G5	Dark black	50.0	1.84	0.228	7.28	1.7	127.3	122.3

1. pH: The most significant property of soil is its pH level, Its effects on all other parameters of soil. Therefore, pH is considered while analyzing and kind of soil. If the pH is less than 6 then it is said to be an acidic soil, the pH range from 6-8.5 it's a normal soil and greater than 8.5 then it is said to be alkaline soil⁵.
2. Electrical conductivity : Electrical conductivity is a very important property of the soil, it is used to check the quality of the soil.It is a measure of ions present in solution The electrical conductivityof a soil solution increases with the increased concentration of ions. Electrical conductivity is a very quick, simple and inexpensive method to check health of soils. It is a measure of ions present in solution. The electrical conductivity of a soil solution increases with the increased concentration of ions^{5,6}.
3. Phosphorus: Phosphorus is a most important element present in every living cell. It is one of the most important micronutrient essential for plant growth. Phosphours most often limit nutrients remains present in plant nuclei and act as anenergy storage^{5,6}.
4. Potassium : Potassium plays an important role in different physiological processes of plants ; it is one of the important elements for the development of the plant. It is involved in many plant metabolism reactions, ranging from lignin and cellulose used for the formation of cellular structural components, for regulation of photosynthesis and production of plant sugars that are used for various plant metabolic needs^{5,6}.
5. Sulfur : Sulfur is as necessary as phosphorus and is considered an esential mineral. Sulphur in plants helps from important enzymes and assists in the formation of plant proteins. It is needed in very low amount, but deficiency can cause serious plant health problems and loss of vitality⁶.
6. Organic Carbon : Soil organic carbon is the basis of soil fertility. It release nutrient for plant growth, promotes the structure, biological and physical health of soil, and is buffer against harmful substances. Increasing soil organic carbon has two benefits as well as helping to mitigate climate change, it improves soil health and fertility^{6,7}.

IV. CONCLUSION

The conclusion can be drawn that this study of physicochemical parameters of soil samples showed dissimilar values at different places. This can be due to the irregular distribution of different parameters present in soil. Physicochemical parameters values suggest no any pollution effect. The fertilizer used by farmer of this reason use well combination of chemical and manure fertilizers.

V. REFERENCES

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