



Study on Some Physiochemical Parameters on The Soil Samples of Hanoda Village in Durg District (Chhattishgarh)

A study was conducted on the physiochemical analysis of soil sample collected from Hanoda village, of Durg district Chhattisgarh, India for the agricultural management of the soil. The physical and chemical parameters were analyzed in samples such as colour, moisture, electric conductance, available nitrogen, phosphorus, potassium, calcium, magnesium and available carbon are analyzed by the chemical analysis method. The object of the present work is to observe the chemical composition of soil sample for the agricultural crops. On the basis of following analysis the soils of Hanoda village is suitable for the production of Rabi agricultural crops.

Key Words : Soil, Hanoda, Physiochemical Analysis, E.C., O.C.

MRS. PRATIBHA GUMASTA*, DR. Y R KATRE & DR. NARESH CHANDRA DESHMUKH***

Introduction :

Soil is the mixture of minerals, gases, organic matters liquid and other varieties of micro-organism, that together support life on earth. It is a natural body of pedosphere required for the growth of the plants, in other word it is a medium for the growth of plants by the storage and supply of water and macronutrient through the roots, it is also as the known skin of earth and dynamic natural body developed as a result of pedogenic process through weathering of rocks consisting of minerals and organic constituents, processing definite chemical physical, mineralogical and biological properties having a variable depth over the surface and providing a medium for plant growth. Indian agriculture occupies an important position on global cultivation of rice, wheat, sugarcane, pulses and vegetables. Soil analysis is determined to the main micro and macro nutrients, which are available in the chemical composition of soil required for the growth of plants. The properties of soil are sensitive to change in the management can be used as an indicator of characteristics of soils. Various types of micro and macro nutrients are available for the nutrition of the plants body, some are essential in the trace amount for human being, some are toxic for the human being. The physiochemical analysis is required for the behavioral explanation of each type of soil. Physiochemical characteristics of different soils vary in space and time due to variation in topology, climate, physical weathering process, vegetation cover microbial activities and several other biotic and abiotic variables. Plant and soil ecology play a key role in the agricultural field.

Material and Method :

Study Area :

For the present work, Hanoda is a village which is located in Durg district in state of Chhattisgarh, it belongs to Raipur division. It is the part of northern hilly region; district of Durg is situated in on the Hawada Mumbai main line of South Eastern railway national highway number 6. The quality of soil is black clay and sandy. It is suitable for the production of pulses.

Sample Collection :

The soil sample is collected from farming fields of Hanoda village. Samples were collected randomly at 0- 15 cm and 15-35 cm depth of the earth in well sterilized polyethylene bags and following physiochemical parameters will be observed by the chemical analysis method.

Physio-Chemical Analysis of Sample :

Reagents used for the following analysis were analytical research grade and laboratory research grade manufactured by S. D. fine, loba and merk. The soil samples were dried in the oven for 48 hours and grinded well, finally for the use of physiochemical analysis.

Results and Discussion :

Soil Colour : Physiochemical characteristics of soil are depended on the colour of soil, colour of soil is observed by the viewing method.

Soil Moisture : Moisture is known to be water holding capacity of soils, the moisture of soil is observed by the weighing method.

pH Value of Soil : The pH of soil is one of the most important physiochemical parameters, its affected minerals nutrient soil quality and presence of micro and macro

*Assistant Professor (Department of Chemistry), Sai College, Bhilai (Chhattisgarh)

**Head (Department of Chemistry), Kalyan P.G. College, Bhilai (Chhattisgarh)

nutrients. The pH was observed by the pH metric method and the result found in the ranges 5.6 to 6.0 that result shown the soil has slightly acidic in nature.

Electric Conductivity : The measurement of electric conductance is the measurement of the current that gives a clue for the soluble salt that is present in the soil sample; it depends upon the dilution for the soil sample, the value is found in the range between 0.6-0.7 μ by the conductometric method.

Nitrogen in Soil : The nitrogen content is present in the form of nitrate which directly affected pH value of the soil sample, some other reports states that high nitrogen did not lead to significant reduction of micro-organism. The result was found to the sample contain 229-300 kg per hectare.

Phosphorus in Soil : It is one of the most important nutrients for the soil and plays a key role in the plants growth, through supply of phosphoric fertilizers. It is measured by the titration method the range between 28- 35 kg per hectare in the soil sample.

Potassium in Soil : The potassium content is also essential nutrients for the growth of plants; it plays a vital role in crop production in agricultural fields, absorbed by the roots. It is measured by the flame photometry, its range between 455-658 kg per hectare.

Calcium in Soil : The calcium content are present in the cation form in the soil sample, calcium is determined in the soil by titration method. In the presence of high calcium content the soil become slightly acidic. In this analysis the calcium content was found in the range between 0.027-0.026%. This result shows that calcium was found in high percentage.

Available Carbon : The available carbon in the soil sample is the total quantity of the inorganic and organic carbon it is also responsible for the acidity of soil sample. It is determined by the titration method.

Magnesium in Soil : It is present in the form of cation in the soil sample; it is also responsible for the acidic nature of soil. It determined by the complexometric EDTA method.

The physiochemical properties of the soil of Hanoda village is shown in the Table 1.

Table 1

S.N.	Parameters	Soil sample
1	Colour	Black
2	Moisture %	2.2-2.5
3	pH	5.6-6.0
4	Electric conductance μ s	6.0-7.0
5	Nitrogen kg per hectare	229-300
6	Phosphorus kg per hectare	2.5-3.5
7	Potassium kg per hectare	455-658
8	Calcium %	0.027-0.026
9	Magnesium %	0.843-0.900
10	Available carbon %	2.28-2.68

Conclusion :

On the basis of above physiochemical analysis the

soils of Hanoda village are suitable for the Rabi crops. On the basis of the physiochemical parameters, micro and macronutrients are present in the sufficient quantity for the growth of plants. We can use these soils for the agriculture field in the best result for the Rabi crop production.

References :

(1) Borker et al : *Studies on Some Physiochemical Parameters of Soil Sample in Katal Taluka District Nagpur MS (India), Research Paper Journal and Forestry Sciences, vol. 3 1- 16-18 jan 2015.*
 (2) Adhikari k Guadagini A Toth G and Hermann T (2009) : *Geologist Analysis of Surface Soil Texture from Zala Country in Western Hungary International Symposium on Environment Energy and Water in Nepal recent Research and Direction of Futures.*
 (3) Andrews S.S., Karlan D.C. and Cambardella CA : *Soil Sciences Am J 68 2004 1945.*
 (4) Pandeal S., Sah JP (2003) : *Physiochemical Characteristics of Soil in Tropical Salshrearobustaganerth Forest in Eastern Nepal Himalayan J Sci, 1 2 107-110.*
 (5) Moawad, A.M. (1979) : *Ecophysiological of VAM in Tropics Harley JC and RS Rusell Eds The Soil Root Interface, pp 177-209.*
 (6) Hartwing P R Wittmann R Braun B Hartwiq Raz J , Jansa, A Muzafar, A Luscher , A leuchtmann E Frossard and J Nosberger (2001) : *Arbuscularmycorrhizal Infection Enhances The Growth Response of Lolium perenne Elevated Atmosphere pCo2, Institute of Plant Sciences.*

