

Physico chemical analysis of soil samples from Sahur village, of Ashti Tahasil, dist Wardha

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Manuscript details:

Available online on <http://www.ijlsci.in>
ISSN: 2320-964X (Online)
ISSN: 2320-7817 (Print)

Cite this article as:

Bhokare PR and Awate PJ (2021) Physico chemical analysis of soil samples from Sahur village, of Ashti Tahasil, dist Wardha, *Int. J. of Life Sciences*, Special Issue, A16: 39-42.

Article published in Special issue of National Conference on "Recent Trends in Science and Technology-2021 (RTST-2021)" organized by Department of Environmental Science, Shri. Dnyaneshwar Maskuji Burungale Science & Arts College, Shegaon, Bhuldhana, and Department of Botany Indraraj Commerce and Science College Shillod, Dist. Aurangabad, Maharashtra, India date, February 22, 2021.



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ABSTRACT

The present study objectively conducted to analyze physico-chemical properties of soil sample of Sahur village. The study area was divided into four sampling stations to cover the whole farms of Sahur village Ashti tahsil comprehensively in the April 2020. During the study Moisture, pH, EC, Carbon, Calcium carbonate, TDS, Magnesium, Calcium, Nitrogen, Copper, Potassium and Phosphorous content, were analyzed. The study revealed that the pH of the soil samples ranged from 7.70 to 8.4 and was on slightly alkaline side but within the limit of 6.5-8.5 which is optimum for crops. EC values ranged from 0.4ms to 0.8ms. and indicating low salinity status of the soils. OC content ranged from 1.30% to 1.65% and all the samples were of medium rating. Available nitrogen ranged from 245 kg/ha to 271kg/ha; available phosphorous ranged from 19.50kg/ha to 24.0 kg/ha and samples were nitrogen and phosphorous deficient. Potassium ranged from 445 kg/ha to 645 kg/ha and samples were of medium rating except one sample of high rating with respect to potassium.

Keywords: Physico-chemical parameters, Sahur village, Soil quality Nutrients.

INTRODUCTION

Soil analysis is well recognized as a sound scientific tool to assess the status of available micronutrients in soils and their relationship with various physico-chemical properties Considerable research work has been done regarding the study of Nutrients and Physico-Chemical assessment of various types of soil in Maharashtra as well as in India have been attempted by several investigators Kumar (2011) Nazif *et al.*(2016), Methur *et al.*(2011) reported soil analysis and its environmental impact on Nanded city of Maharashtra State. Khadke *et al.*(2013), The status of micronutrients in soils district Bhimber and their relationship with various physico-chemical properties were investigated by Wajahat *et al.* (2006).

Soil fertility and productivity are the key pillars for food production and soil quality is of equal significance in the background of soil degradation caused by many factors. Crop growth is influenced by aerial and soil environment. Suitable environment is necessary for better germination, growth and yield of crops. The higher nutrient availability is favourable when soil has higher water holding capacity, proper aeration and less soil strength or mechanical resistance. The six elements nitrogen, phosphorous, potassium, magnesium, calcium and sulphur which are required in large quantities are labeled as macronutrients. Most of the soils supply enough calcium, magnesium and sulphur and soil scientists called these elements as secondary nutrient elements. The other three elements nitrogen, phosphorous and potassium are called as primary nutrients and are not usually available in large amounts which is enough for best growth and therefore are added through fertilization. Considerable research work has been done regarding the study of Nutrients and Physico-Chemical assessment of various types of soil in Maharashtra as well as in India A.A.Patil et.al. (2013), R.P.Ganorkar et.al. (2013), R.P.Ganorkar et.al. (2014), Keeping these points in view, investigation was carried

out to analysis of status of soil samples of Sahur village in Ashti Tahsil of Wardha district in Maharashtra, India.

MATERIAL AND METHODS

Study Area

Sahur is a village in Ashti Tahsil in Wardha District of Maharashtra State, India; which is shown in Fig-1. It belongs to Vidarbha region Wardha Division, This area is well known for Cotton, Jawar and Soyabean. The sources of water for this area is back water Upper Wardha Project.

Sample Collection

Four samples were collected from the study area (farmers field) in the month of April 2020. Soil samples were collected randomly at 0 to 15 cm and 15 to 30 cm depths with four plots, a sample from each plot respectively, in well sterilized polythene pouches. Soil sample were collected from following Farmers fields-

1. Sample-1 was collected from Mr. Ishwar Warkad field.
2. Sample-2 was collected from Mr. Narendra Thor field.
3. Sample-3 was collected from Mr. Chhatrapati Ghatole field.
4. Sample-4 was collected from Mr. Sanjay Gedam field.

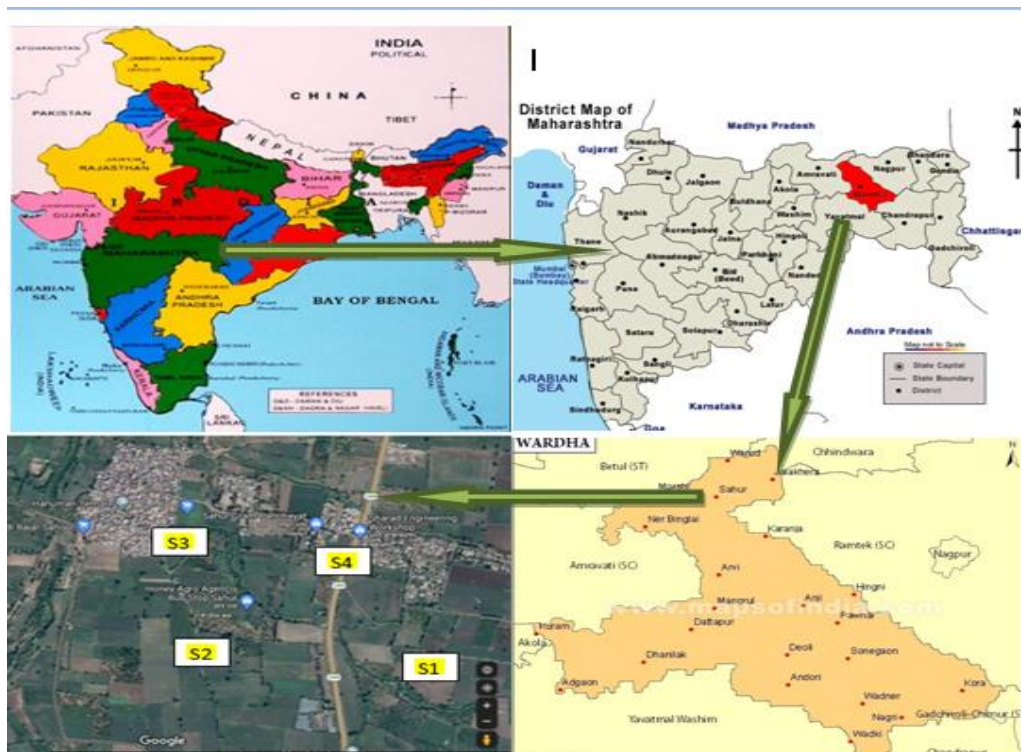


Figure 1: Map of Study area Sahur, Tahsil Ashti.

Table 1: Physico chemicals parameters of soil samples.

Sr. No	Parameters	S1	S2	S3	S4
1	Colour	Brown	Faint Black	Reddish Brown	Faint Black
2	TDS (mg/lit)	170	225	125	162
3	Moisture (%)	1.8	7	9.9	2.6
4	pH	7.70	7.80	8.20	8.40
5	Organic Carbon (%)	1.60	1.44	1.30	1.65
6	Nitrogen (Kg/hect)	271	245	250	256
7	Phosphorus (Kg/hect)	21.5	19.50	24	20.0
8	Potassium (Kg/hect)	496	645	442	510
9	Magnesium (%)	0.845	0.855	0.873	0.890
10	Electro Conductance (ms)	0.4	0.8	0.4	0.6
11	Calcium (%)	0.09	0.09	0.10	0.18
12	Alkalinity (mg/lit)	730	824.5	533.5	118.5
13	CaCO ₃ (%)	5.20	7.35	5.50	5.25

Physicochemical Analysis of Soil Samples

Estimation of various parameters done as follows, Determination of Moisture was by Weighting Method, pH by Digital pH Meter, EC by Conductometer, OC, Ca, N,P,CaCO₃ by Titration Method, Determination of Mg was done by EDTA Titration Method. Determination of TDS estimated by TDS meter, Determination of Potassium (K) by FlamePhotometry. Determination of Colour of Soil, by Viewing soil.

RESULTS AND DISCUSSION

Colour of Soil

The soil sample S1 are Brown, sample S3 are Reddish Brown and S2,S4 was Faint Black in colour.

TDS

The percentage of TDS in soil samples ranges from 125-225. It was observed in sequence S3<S4<S1<S2.

Moisture

Value of moisture contain ranges from 1.8% - 9.9 %. The result shows that the moisture of sample S1 is less as compared to other samples.

pH

The range of pH is found in between 7.70 - 8.40. The sample S4 is slightly alkaline sample as compare to S1,S2,S3 soil sample which is medium alkaline.

Organic Carbon

Organic carbon were recorded in the range of 1.30 - 1.65 %. The soil sample S1,S4 has high percentage of organic carbon sample S2 have moderate and sample S3 has less organic carbon.

Nitrogen

Nitrogen content in the soil ranged from 245- 271 kg/hect. The sample S1 have high nitrogen content as compared to other sample.

Phosphorous

Phosphorous content in the soil sample ranged between 19.5- 24.0 kg/hector. The soil sample S3 has more phosphorous content as compared to sample S1,S2 and S4.

Potassium

Potassium content in the soil sample ranged between 445 - 645 kg/hector. The soil sample S2 have more potassium content as compared to sample S3,S1 & S4 .

Magnesium

The Magnesium content in the soil sample ranged from 0.845 - 0.890 %. It is seen in sequence S1<S2<S3<S4.

Electric Conductance

The Electric Conductance values varies from 0.4 - 0.8 ms . It is seen that soil sample S1 & S3 have less amount of Electric Conductance as compared to sample S2 & S4.

Calcium

The Calcium content in soil sample ranges from 0.09 - 0.17 %. The soil sample S4 has high percentage of calcium, sample S3 have moderate and samples S1,S2 has less calcium content.

Alkalinity

The Alkalinity was observed in the range between 543.5-118.5 mg/lit. and it is in the range S4>S2>S1>S3.

Calcium Carbonate

The Calcium Carbonate content in soil samples ranges from 5.20-7.35 %.It is seen that soil sample have S2 more amount of Calcium Carbonate as compared to soil samples S1,S3,S4

CONCLUSION

The physico chemical analysis of soil provides necessary information to set the target of nutrient application. The soil samples are slightly alkaline and the pH is in S4<S3<S2<S1 order hence the Suggestion the use of compost manure in the soil sample S1 and S2 the magnesium is less. In the soil sample S2andS4 phosphorous is less as compare to other sample. In the soil sample S1 and S4 the organic carbon is approximate high and nitrogen is approximate high.

Conflicts of interest: The authors stated that no conflicts of interest.

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