ijCEPr

International Journal of Chemical, Environmental and Pharmaceutical Research

Vol. 4, No.2&3, 46-49
May-December, 2013

Physicochemical Assessment of Soil in Rajura Bazar in Amravati District of Maharastra(India)

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Article History:
Received: 13 August 2013
Accepted: 12 December 2013

ABSTRACT

In the present research work, studies on soils with physical properties , chemical properties and micronutrients of soils have been done . Soil samples were collected from six different locations covering Rajura Bazar, in Warud Tahsil in Amravati District (Maharashtra) India. The soil parameters like soil moisture, pH, EC, Carbon, Calcium carbonate, TDS, Magnesium, Calcium , Nitrogen, Copper, Potassium and Phosphorous content, were analyzed in the month of February 2013. The values of pH indicated that all samples of the soils are alkaline, all samples were containing moderate amount of available micronutrients**.**

Keywords: Physico-Chemical analysis, Parameters,Rajura Bazar ,Warud Tahsil, Soil quality.

INTRODUCTION

Indian agriculture occupies an eminent position in global cultivation of rice, wheat, sugarcane, pulses and vegetables. Soil testing is the only way to determine the available nutrient status in soil and the only way we can develop specific fertilizer recommendations. Soil is the unconsolidated or loose covering of fine rock particles that covers the surface of the earth. Soil properties that are sensitive to changes in the management can be used as indicators Andrews and Cambardella[1]. Bell and Dell[2] have showed that the deficiency of nutrients has become major constraint to productivity, stability and sustainability of soils.

The status of micronutrients in soils district Bhimber and their relationship with various physico-chemical properties were investigated by Wajahat Nazif, Sajida Perveen and Iftikhar Saleem[3]. The impacts of industrial pollution on the ground water soil and plant have also been reported in our country and abroad[4].

Perveen S. et al.[5] have studied micronutrient status of soils and their relationship with various physico-chemical properties. Chhabra G. et al.[6] have shown that available manganese decreased with soil pH and available copper increased with clay and organic carbon content. Results of physical and chemical tests provide information about the capacity of soil to supply mineral nutrients. The status of available micronutrients in soils and their relationship with various physico-chemical properties have been attempted by several investigators [7-9]. Khadke P.A.et.al. reported soil analysis and its environmental impact on Nanded city of Maharashtra State[10]. Investigation of some parameter and Nutrients from Soil samples of Rice field by Jadhav S.D . *et.al* .but the investigation of nutrients and parameters of Soil of Rajura Bazar village in Warud Tahsil of Amravati district in Maharashtra, India was still lacking.

MATERIALS AND METHODS

Study Area

Rajura Bazar is a village in Warud Tahsil in Amravati District of Maharashtra State, India; which is shown in Fig.-1. It belongs to Vidarbha region. It belongs to Amravati Division, This area is well known for oranges, Turmeric and Chillies. The sources of water for this area is of well and tube well . It is located at bottom of Satpuda ranges. Relative to its geographical location, the study area enjoys a tropical type of climate.

Sample Collection

Six samples were collected from the study area (farmers field) in the month of February 2013. Soil samples were collected randomly at 0 to 15 cm and 15 to 30 cm depths with five plots, five samples from each plot respectively, in well sterilised polythene pouches. Soil sample were collected from following Farmers fields-

1. Sample-1 **(PGC-1)** was collected from **Mr. Devidasrao Bahurupi's** field.
2. Sample-2 **(PGC-2)** was collected from **Mrs. Sulbhatai Bahurupi's** field.
3. Sample-3 **(PGC-3)** was collected from **Mr. Ravindraji Choudhary's** field.

4. Sample-4 **(PGC-4)** was collected from **Mr. Rajabhau Sable's** field .
5. Sample-5 **(PGC-5)** was collected from **Mr. Sheshraoji Nagdive's** field.
6. Sample-6 **(PGC-6)** was collected from **Mr. Gajananrao Kale's** field.

Fig.-1: Study Area

Physicochemical Analysis of Soil Samples

Reagents uses for this research work were AR grade and chemicals other than reagent are LR grade manufactured by S.D. fine, LOBA and Merck. The soil sample were dried for about 24 hr. and grinded more finely.Methods use for estimation of various parameters are-

1. Determination of Moisture: by Weighting Method.
2. Determination of pH: by Digital pH Meter
3. Determinationof of Electric Conductance: by Conductometer
4. Determination of Organic Carbon: by Titration Method

5. Determination of Magnesium (Mg): by EDTA Titration Method
6. Determination of Calcium (Ca): by Titration Method.
7. Determination of (Total Dissolved Solid) TDS: by TDS METER.
8. Determination of Copper (Cu): by Atomic Adsorption Spectroscopy.
9. Determination of Nitrogen (N): by Titration Method
10. Determination of Phosphorous (P): by Titration Method
11. Determination of Pottasium (K): by Flame Photometry
12. Determination of Calcium Carbonate ($CaCo_3$): by Titration Method
13. Determination of Colour Of Soil: by Viewing soil

RESULTS AND DISCUSSION

Colour of Soil
The soil sample PGC-1,PGC-2,PGC-4 & PGC-6 was Faint Black in colour , samples PGC-3 are Brown and PGC-5 are Reddish Brown in colour.

TDS
The TDS in soil samples ranges from 108-222 %.It is seen that soil sample PGC-5 and PGC-6 have less amount of TDS content as compared to sample PGC-1 ,PGC-2, PGC-3 and PGC-4.

Moisture
The moisture content value ranges from 1.5 % - 10 %. It is clear from the result that soil sample PGC-3 only 1.5 % moisture which is less as compared to sample PGC-1,PGC-2,PGC-4,PGC-5 and PGC-6.

pH
pH was observe in the range 7.80 – 8.46. The Soil sample PGC-3, PGC-4,PGC-6 is very slightly alkaline sample and PGC-1,PGC-2,PGC-5 soil sample is medium alkaline.

Organic Carbon
Organic carbon values were recorded in the range of 1.25 – 1.69 %.The soil sample PGC-5 has less organic carbon , sample PGC-4 have moderate and sample PGC-1,PGC-2,PGC-3,PGC-6 has high percentage of organic carbon.

Available Nitrogen
Available nitrogen content in the soil sample ranged from 219- 298 kg/hect. The soil sample PGC-2 have high nitrogen content as compared to sample PGC-1,PGC-3,PGC-4,PGC-5,PGC-6.

Phosphorous
Phosphorous content in the soil sample ranged between 18.5- 25 kg/hect. The soil sample PGC-4 and PGC-6 has less phosphorous content as compared to sample PGC-2,PGC-3 and PGC-5 .

Potassium
Potassium content in the soil sample ranged between 445 – 648 kg/hect. The soil sample PGC-3,PGC-5 and PGC-6 have less potassium content as compared to sample PGC-1,PGC-2 & PGC-4 .

Copper
The Copper content in soil samples ranges from 3.84 - 6.14. It is seen that soil sample PGC-2 have less amount of Copper content as compared to sample PGC-1,PGC-3,PGC-4,PGC-5 & PGC-6.

Magnesium
The Magnesium content in the soil sample ranged from 0.842 – 0.895 %. It is seen that soil sample PGC-2,PGC-3,PGC-4 and PGC-5 have less amount of magnesium as compared to sample PGC-1 and PGC-6.

Electric Conductance
The Electric Conductance values ranged from 0.3 – 0.7 μS . It is seen that soil sample PGC-5 have less amount of Electric Conductance as compared to sample PGC-1,PGC-2,PGC-3,PGC-4 & PGC-6.

Calcium
The Calcium content in soil sample ranges from 0.07 - 0.16 %.It is seen that soil sample PGC-3 and PGC-4 have less amount of Calcium content as compared to sample PGC-1,PGC-2,PGC-5 and PGC-6 .

Alkalinity
The Alkalinity was observed in the range between 533.5–1164 % . It is seen that soil sample PGC-3,PGC-4,PGC-5 & PGC-6 has less alkalinity as compared to PGC-1 , PGC-2.

Calcium Carbonate
The Calcium Carbonate content in soil samples ranges from 5.25-7.25 %.It is seen that soil sample PGC-1,PGC-3 and PGC-6 have less amount of Calcium Carbonate as compared to soil samples PGC-2,PGC-4 and PGC-5 .

Table-1: Physicochemical Parameters of Soil Samples

S. No.	Parameters	PGC-1	PGC-2	PGC-3	PGC-4	PGC-5	PGC-6
1	Colour	Faint Black	Faint Black	Brown	Faint Black	Reddish Brown	Faint Black
2	TDS (mg/L)	160	195	166	222	113	108
3	Moisture (%)	2.5	2.5	1.5	7	10	3
4	pH.	8.46	8.34	7.93	7.80	8.22	7.93
5	Organic Carbon (%)	1.62	1.53	1.61	1.42	1.25	1.69
6	Nitrogen (kg/hect)	255	298	268	248	249	219
7	Phosphorous(kg/hect)	19.5	22.5	22.00	18.5	25	18.5
8	Potassium (kg/hect)	515	545	498	648	445	495
9	Copper (ppm)	4.61	3.84	4.99	6.14	5.38	4.99
10	Magnesium (%)	0.895	0.861	0.842	0.857	0.871	0.890
11	Electro Conductance(ms)	0.5	0.6	0.4	0.7	0.3	0.4
12	Calcium (%)	0.16	0.10	0.07	0.09	0.12	0.15
13	Alkalinity(mg/L)	1018.5	1164	727.5	824.5	533.5	630.5
14	$CaCo_3$ (%)	5.25	7.25	5.25	7.25	5.60	5.25

ACKNOWLEDGEMENTS
The authors are thankful to Dr.D.V.Atkare, Principal Mahatma Fule Arts ,Commerce & Sitaramji Chaudhary Science Mahavidyalaya ,Warud and Non teaching staff for providing necessary laboratory facility. Dr.A.P.Deshmukh, Dead Deptt.of Soil testing Lab, Shri Shivaji Agricultural College, Amravati for his valuable guidance.

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[ijCEPr-271/2013]