STUDIES OF THE PHYSICOCHEMICAL PARAMETERS OF SOIL SAMPLES

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***Abstract:** In the present work studies on soils with physical properties and micronutrients of soils have been done. Soil samples were collected from five different locations covering Nagapattinam district (south) in tamilnadu, India. The soil parameters like soil pH, EC, Colour, Zinc, Copper, Nitrogen, Potassium content were analysed in the month of March 2018. The parameters value is agreed with International Agriculture Standard value.*

***Key words:** IAS, pH, Nagapattinam, Soil, march 2018.*

I. Introduction

Soil is mixture of minerals, organic matter gases liquid and myriad of micro and macro organisms that can support plant life. The soil as a general term usually denotes. The unconsolidated thin, variable layer of mineral and organic material usually biologically active the covers rest of the earth land surface. Soil properties that are sensitive to changes in the management can be used as indicators [1, 2]. The physicochemical properties such as moisture content, specific gravity nitrogen as a fertilizers required for growth of plant potassium is used for flowering purpose it is also required for building of protein, photosynthesis fruit quality and reduction of disease and phosphate is used for growth of roots in plant[3-5].

II. Material and methods

2.1 Collection of soil samples

Different location was selected for sampling and five samples were collected from different depth. The depth was used because it is believed that pollution decrease with increase in depth. The soil samples were collected into labelled sterile polyethylene bags and taken in ice-packed cooler to the laboratory for physicochemical analysis.

2.2 Preparation of soil sample for analysis

Each sample meant for physic-chemical analysis was air dried for six days and then sieved to ensure homogeneity using a 2mm size sieve.

2.3 Material analyses

Analytical grade reagents are for the preparation of reagents. Glassware washed thoroughly with detergent and then with deionized water.

Table 1: Details of soil samples at different location point.

s.no	area	Sample code	Depth (cm)
1	Nalluvathaphy	S1	15-30
2	Pushpavanam	S2	15-30
3	Kovilpathu	S3	15-30
4	Vellappallam	S4	15-30
5	Poigainallur	S5	15-30

2.4 Physicochemical analysis of soil samples

The soil samples were dried for about 28 hours and grinded more finely. Methods uses for estimation of various parameters are

1. Determination of pH by Digital pH Meter.
2. Determination of Electric Conductance by Conductometer.
3. Determination of Organic Carbon by Titration Method.
4. Determination of Magnesium by EDTA Titration Method.
5. Determination of Copper by Atomic Adsorption Spectroscopy
6. Determination of Phosphorus by Titration Method
7. Determination of Potassium by Flame Photometry
8. Determination of Colour Of Soil by Viewing Soil

III. Result and discussion

Physicochemical parameters of soil samples are presented in table-2.

3.1 pH

The pH of soil is one of the most important physicochemical parameter. It affects mineral nutrient soil quality and much microorganism activity. The pH was observed in the ranges from 6.95 to 7.30. All the samples are matched with IAS value.

3.2 Colour of soil

The soil samples observed in black and Gray colour.

3.3 Electric conductivity

The measurement of conductivity is for measure the current that gives a clear idea of soluble salt present in the soil. The Conductivity values upon the dilution of soil suspension. The EC value ranges from 0.14µs to 0.17 µs.

3.4 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 and cover crops etc. Organic carbon values from 0.28 to 0.35 %

3.5 Nitrogen

Nitrogen is essential to nearly aspect of plant growth. Nitrogen is absorbed from the soil as nitrate and ammonium, this soil parameters estimate there current levels. It range agree with IAS value.

3.6 Phosphorous

Phosphorous provides plant with means of using the energy harnessed by photosynthesis to drive its metabolism [6]. The normal range for phosphorus is 22.5kg/ha to 56 kg/ha. Phosphorous content in the soil samples ranges from 18.5to 20.3 kg/ha.

3.7 Potassium

Potassium regulates many metabolic process required for growth food development. Many vegetables and fruits crop are high potassium which is vital for animal and human nutrition. Potassium content in the soil sample ranges between 284 to 292 kg/ha.

3.8 Zinc

The zinc content in the soil sample ranged from 0.09 to 2.68ppm.

3.9 Copper

The copper content in the soil sample ranged from 0.36 to 0.44ppm.

3.10 Magnesium

The predominant role of mg is as major constituent of the chlorophyll molecules and it is therefore actively involved in photosynthesis and it also assists the movement of sugars with in a plant. The magnesium content in the soil sample ranged from 0.26 to 6.74.

Table- 2: Physicochemical parameters of soil samples

S.No	Soil parameter	S1	S2	S3	S4	S5	IAS Value
1	colour	Gray	Gray	Gray	black	black	-------
2	Organic carbon (%)	0.35	0.30	0.30	0.28	0.30	-------
3	pH	7.10	6.95	7.30	6.98	7.30	5.8-8.3
4	Electrical conductivity	0.17	0.17	0.15	0.14	0.14	<1
5	Nitrogen	271	269	272	274	271	217-272
6	Phosphorous	19.5	19.1	18.5	20.3	20	22.5-56
7	Potassium	290	291	284	284	292	150-340
8	zinc	2.68	0.44	0.19	0.14	0.09	------
9	copper	0.44	0.42	0.46	0.36	0.42	------
10	Magnesium	3.24	3.54	6.74	0.26	1.79	5-10ml/100g

IV. Conclusion

Study of physicochemical parameters is important to agricultural chemists for plant growth and soil management. It is concluded from the data, Electrical conductivity of soil samples is found be less compare than IAS value. Potassium, Nitrogen and pH values are permissible limit and matched IAS value. Samples S1, S2, S3, S4, S5 having low quality of phosphorous nutrients. Magnesium content in soil samples S1, S2, S4, S5 are lower amount so fertilizer containing magnesium is added for proper growth and development of the crops.

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