

---

**ABSTRACT**

Soil is a complex mixture of mineral partials, organic matter and air. The present study has been undertaken to evaluate the physico-chemical parameters of soil samples collected from some villages of Yawal of Jalgaon District (M.S.). The parameters include PH, Electrical Conductivity, Percent organic carbon (% O.C.), percent potassium (% k), sodium (ppm), percent phosphorous (% P), total alkalinity etc. This information will help the farmers about the knowledge of soil components, Nutrients and their deficiency in a particular part of soil.

**KEYWORDS:** Physico-Chemical Character of soil.

---

**INTRODUCTION**

Soil is a three dimensional, dynamic and natural body on the surface of the earth which performs the following main functions:

1. It is a natural medium for plant growth and their development.
  2. It provides mechanical support to plants and trees.
  3. It supplies essential nutrients and water to plants for their growth<sup>2,3</sup>.
- Soil plays an important role in determining the fertility of fishes in ponds and rivers.

The fertility of soil depends on the concentration of N, P, K, Organic and Inorganic materials, Conductivity.

The physicochemical properties such as moisture content, specific gravity, Nitrogen as a fertilizer required for the growth of plants. Potassium is used for flowering purpose, it is also required for building of proteins, photosynthesis, fruit quality and reduction of diseases and phosphate is used for growth of roots in plants<sup>[4-9]</sup>.

**MATERIALS AND METHODS**

A collection of soil sample from Nine villages of Yawal Taluka, of Jalgaon District (S<sub>1</sub>- Hingona, S<sub>2</sub>-Hambardi, S<sub>3</sub>- Yawal, S<sub>4</sub>-Chitoda, S<sub>5</sub>-Kolwad, S<sub>6</sub>- Bhalod, S<sub>7</sub>- Chikhali, S<sub>8</sub>-Anjala, S<sub>9</sub>-Nimgaon), which represents soil of that villages.

Surface soil samples may be collected using tools like spade or shovel. Soil sample from just near the root of large trees should be avoided. Soil from near the foundations civil constructions may not represent their make-up, therefore, should be avoided. For collections of soil from deeper profiles special borer samples are used<sup>1, 2, and 4</sup>. Soil sample so collected should be put in thick quality clean polythene bags. The soil samples were dried in oven to 105°C about 24 hrs and grinded more finely; this powder was passed through 2mm sieve and stored in polythene bags<sup>1,4</sup>. The physico-chemical analysis of soil samples were carried out by the standard procedure<sup>1,4</sup>.

For many other edaphic factors the sample may be stored after drying it at about 40°C. The dried soil may be grind using mortar and pestle and sieved through a 2mm mesh-sized sieve<sup>10,11</sup>.

Chemicals and reagent of standard quality were used. Most of these were A.R. grade and E.Merck Glass wares of Borosil and Pyrex were utilized throughout the experimental work. The  $P^H$  was determined by  $P^H$  meter. For standardization of  $P^H$  meter KH-phthalate buffer was used. Electrical Conductivity was determined by Conductivity Meter, Sodium (ppm) and Percent available Potassium (% K) in soil was determined by using Digital Flame

| Parameters                          | S <sub>1</sub> | S <sub>2</sub> | S <sub>3</sub> | S <sub>4</sub> | S <sub>5</sub> | S <sub>6</sub> | S <sub>7</sub> | S <sub>8</sub> | S <sub>9</sub> |
|-------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| $P^H$                               | 7.2            | 6.9            | 7.8            | 7.3            | 6.8            | 7.2            | 8.0            | 6.6            | 6.5            |
| Conductivity ( $\mu\text{mho/cm}$ ) | 0.18           | 0.96           | 0.27           | 0.18           | 0.33           | 1.23           | 0.45           | 0.99           | 0.24           |
| % O.C.                              | 0.725          | 0.815          | 0.88           | 0.55           | 0.41           | 0.551          | 0.450          | 0.679          | 0.74           |
| % P                                 | 0.0042         | 0.005          | 0.0083         | 0.0097         | 0.0077         | 0.0088         | 0.0075         | 0.0071         | 0.0083         |
| % K                                 | 1.25           | 1.728          | 3.45           | 5.18           | 3.86           | 3.81           | 4.31           | 2.36           | 3.51           |
| Na(ppm)                             | 6.00           | 9.00           | 10.2           | 8.00           | 9.10           | 8.66           | 12.90          | 10.26          | 9.45           |
| Alkalinity (mg/lit)                 | 259            | 238            | 274            | 211            | 284            | 275            | 213            | 298            | 290            |

Photometer. Percent available Phosphorous (% P) was determined by Oleson's method Spectrophotometrically by using p- Nitro phenol indicator, Percent Organic Carbon (%O.C.) was determined By Walkely and Black's method by using Diphenyl amine as an indicator, Total Alkalinity (mg/lit) was determined by Titrimetric method by using methyl orange indicator.

## RESULT AND DISCUSSION

### Physico-Chemical parameters of soil collected from some Villages of Yawal of Jalgaon District (M.S.)

In the present study  $P^H$  of soil of Yawal region were ranges in between 6.5 to 8.0,  $P^H$  of some soil samples includes basic nature of soil. In the present study electrical conductivity of soil of Yawal region was in between 0.18 $\mu\text{mho/cm}$  to 1.23 $\mu\text{mho/cm}$  indicates normal ranges. In the present study percent organic carbon (% O.C.) of soil of Yawal region was in between 0.41% to 0.88%. For some soil samples % O.C. was lower than normal range indicates fertility of soil is less. In present study percent available phosphorous (% P) of soil of Yawal region were in between 0.0042% to 0.0097%. For some soil samples % P was higher than the normal range the excessive phosphorous has been some harmful effects, such as profuse root growth in case of lateral and fibrous root lets. It may cause iron and zinc deficiency in some cases. In present study percent potassium (%K) of soil of Yawal region was in between 1.25% to 5.18%. For some soil samples values of %K was larger than normal ranges. A higher value of 'K' shows that there is much large use of chemical fertilizers in soil. To avoid this, there is a need for use of natural fertilizers to improve the quality of soil. In present study the values of Na (ppm) were ranges in between 6.00 ppm to 12.90 ppm. For some soil samples the values of Na (ppm) were lower than normal ranges, it may cause shedding of flowers, poor seed setting and attack of diseases. In present study the values of alkalinity were normal and ranged in between 211 mg/lit to 298 mg/lit.

## CONCLUSION

The physico-chemical parameters are important to agricultural chemist for plant growth and soil management. A physico-chemical studies of soil samples from nine places of Yawal region shows that the physico-chemical parameters,  $P^H$ , conductivity, alkalinity are within the normal range but the % P, % K, Na (ppm), % organic carbon within the limits, this is due to improper use of fertilizer.

These studies give information about the nature of soil, present nutrient in soil. According to this information former arrange the amount of which fertilizer and nutrients needed to soil for increases the % yield of crop as soil sample quality is improved, the production of plants is also increases and the amount of chemical decreases in the soil. So the crop will be much healthy for animal and human being.

### ACKNOWLEDGEMENT

Authors are thankful to the Chairman Mr. Maheshbhai Phalak of Tapti Education Society Bhusawal and Principal of Bhusawal Arts, Science and P. O. Nahata Commerce College, Bhusawal, Dist. Jalgaon 425201 for providing necessary laboratory facilities also thankful to Principal Dr. R.P. Phalak of D.D.N.B. College Bhusawal.

### REFERENCES

- [1] Analytical chemistry by Alka.L.Gupta.
- [2] Analytical chemistry by H.Kaur Edition 2013.
- [3] Association of official Analytical chemistry (AOAC) - 13<sup>th</sup> Edition 1980.
- [4] Handbook of water and soil analysis by M.M. Saxena. 2001.
- [5] Bartlett, R.J. and B.R. James 1979. Behaviour of Chromium in Soils: III. Oxidation. J.Environ. Qual. 8:31-35.
- [6] Dr. Yin chan, Principal Research Scientist (Soil), Richmond, [www.dpi.nsw.gov.au](http://www.dpi.nsw.gov.au).
- [7] Garrido, J.M.P.J., R.A.S. Lapa, J.L.F.C. Lima, Delerue- Matos and J.L.M Santos. 1996. FIA automatic dilution system for the determination of metallic cations in water by atomic absorption and Flame emission spectrometry. J.Autom. Chem. 18:17-21
- [8] Jeffry Jacobsen and Scott larbeer. Soil ; plants and water Analytical laboratories for Montana Agriculture.
- [9] K. Kanimozhi; A Panneer Selvam; Archives of Applied Science Research, 2011, 3(2): 525-536.
- [10] Kiran G. chaudhari, Advances in Applied Science Research, 2013, 4(6): 246-248.
- [11] Kiran G. chaudhari, Advances in Applied Science Research, 2013, 5(6): 72-73.
- [12] Oleson. S.R. cole, C.V.Watanobe, F.S. and Dean L.A. 1954. Estimation of available phosphorous in Soils by extraction with sodium bicarbonate. US. Dop. Of Agric. Circ. 939.
- [13] Ranjan, Rakesh. Analysis of Abiotic parameters of River sir krahana, Near Motihari Bihar, India. Aslam J. Exp. Che; 2011, 6(2): 93-95.
- [14] Walkely .A and Black's, I.A., 1934. Soil sci. 37:29-38.
- [15] [www.nssc.nrcs.usda.gov](http://www.nssc.nrcs.usda.gov).USDA Natural Resources Conservation Services, January 1998.