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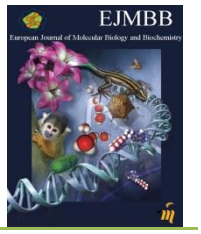

STUDIES ON SOIL PROFILE AND CHEMICAL ANALYSIS OF SOIL WITH SPECIAL REFERENCE TO P, K.

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ABSTRACT

The principles objectives of Soil Analysis was to study the soil at the kota block .The effect of soil analysis of kota block can give significant improvement in its soil quality. The study therefore provides an opportunity to investigate some aspects such as-acidity & basisity nature of soil, toxic effect of soil, importance of the soil etc. To collect information of soil type, slope, acidity viz. of the soil causes trace element deficiencies, N, P, and K deficiencies. To study the physical, and chemical properties. To know what soil pH & conductivity is and how it is calculated. Crop fertility. Understand and analyze the soil quality and given fertilizer recommendation for crop. Provide awareness for which type of nutrients required in how much quantity of kota block. In result pH value found is between 6.5 to 8.5. The EC values were in the range of 0.13 to 0.29. The organic carbon values were in the range of 0.20 to 0.30. The Phosphorus values were in the range of 2.09 to 4.50. The Potassium values were in the range of 85 to 211.

INTRODUCTION

Soil may be defined as a thin layer of earth's crust which serves as a natural medium for the growth of plants. It is the unconsolidated mineral matter that has been subjected to, and influenced by genetic and environmental factors – parent material, climate, organisms and topography all acting over a period of time [1]. Soil differs from the parent material in the morphological, physical, chemical and biological properties. Also, soils differ among themselves in some or all the properties, depending on the differences in the genetic and environmental factors. Thus some soils are red, some are black; some are deep and some are shallow; some are coarse-textured and some are fine-textured [2]. They serve in varying degree as a reservoir of nutrients and water for crops, provide mechanical anchorage and favourable tilth. The components of soils are mineral material, organic matter, water and air, the proportions of which vary and which together form a system for plant growth; hence the need to study the soils in perspective [3]. A study of the soil profile is important from crop husbandry point of view, since it reveals the surface and the sub-surface characteristic and qualities namely, depth, texture, structure, drain age conditions and soil moisture relationship which directly affects the plant growth [4]. A study of soil profile supplemented by physical, chemical and biological properties of the soil will give full picture of soil fertility and productivity. Physical properties of the soil include water holding capacity, aeration, plasticity, texture, structure, density and colour etc. Chemical properties refer to the mineralogical composition and the content of the type of mineral such as Kaolinite, illite and montmorillonite, [5] base saturation, humus and organic matter content. The biological property refers to a content of extent and types of microbes in the soil which include bacteria, fungi, worms and insects.

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Major Soil Types of India

Some dominant groups of Indian soil, classified according to soil taxonomy and chemical property are mentioned below:

1) Red Soil: They are quite wide in their spread.[6]The red colour is due to diffusion of iron in the profile.

2) Lateritic soil: are composed of a mixture of hydrated oxides of aluminium and iron with small amounts of manganese oxide.

3) Black soil: contains a high proportion of Calcium and Magnesium Carbonates and have a high degree of fertility. [4].

4) Alluvial soils: This is the largest and agriculturally most important group of soils.

5) Desert soils: occur mostly in dry areas and important content is quartz.

SITES OF STATION

The sampling sites were abbreviated as below:

We are dividing this area according to their crop conditions [7].

Disturb area Villages- where the all condition is not favorable for crop.

Non Disturb area Villages- where the all condition are favaourable. (Soil fertility good, irrigation condition better, etc.)

Disturb area Villages – Nawadih, Semaria, Majhgaon,

Non disturb area village - Amne, Gobripat, Jogipur

S_1 = Amne

S_2 = Semaria

S_3 = Majhgaon

S_4 = Amne

S_5 = Gobripat

S_6 = Jogipur

Details of the same physico-chemical parameters determined in the soil from various sources of the different 6 soil samples are described below.

pH:-

The pH values were in the range of low 5.3 to high 6.10. Minimum pH was observed from SN_1 village soil at and a maximum of high was observed from SN_6 sample station [8]. The acceptable limit of pH value is between 6.5 to 8.5.

ELECTRICAL CONDUCTIVITY

Electrical conductivity is a measure of the ability of solution to conduct electricity. It is related to the amount of conduct electricity. [9]It is related to the amount of dissolved substance (or ions) in soil solution. It gives an indication of which minerals are present. Changes in conductivity over time may indicate changing soil quality. Soils have at least small amounts of various soluble salts in them.

These salts may be acidic, neutral or basic. They may arise from different sources such as -

1. Primary minerals found in soil and in the exposed rocks of the earth crust and
2. Surface and ground waters.

The EC values were in the range of 0.13 to 0.29 Minimum EC was 0.13 observed from SN_2 sampling station village, and a maximum of 0.29 was observed from SN_4 sampling station.[10] Beyond this range it will not affect the crop production.

Organic Carbon

Organic carbon are used to assess the amount of organic matter in soils Increasing soil organic carbon (SOC) can improve soil health and can help to mitigate climate change. Carbon consists of inorganic and organic carbon [11]. The inorganic carbon, present as carbonate or bicarbonate ions, must be removed or quantified prior to the analysis of organic carbon. Once the inorganic carbon is removed, subsequent analysis of the sample aliquot assumes that all carbon remaining is organic. On the basis of different percentage of organic carbon it can be divided in to low, medium and high**.** The organic carbon values were in the range of 0.20 to 0.30 Minimum was observed from SN_4 sampling village and maximum was observed from SN_6 [12]. The organic carbon was lower in Amne & high in Jogipur so the organic carbon value is medium effect; beyond this range the soil will affect crop productivity.

Phosphorus

Phosphorus (P) is an essential element classified as a macronutrient because of the relatively large amounts of P required by plants. Phosphorus is one of the three nutrients generally added to soils in fertilizers. One of the main roles of P in living organisms is in the transfer of energy. The Phosphorus values were in the range of 2.09 to 4.50 Minimum P was observed from SN_2 and maximum was observed from SN_4 [13]. So the Phosphorus value is low. Beyond this range the soil will affect crop fertility. On the basis of different percentage of phosphorus it can be divided in to low, medium and high.

Potassium

Potassium (K) is an essential nutrient for plant growth. Because large amounts are absorbed from the root zone in the production of most agronomic crops, it is classified as a macronutrient [14]. Potassium is associated with movement of water, nutrients, and carbohydrates in plant tissue. If K is deficient or not supplied in adequate amounts, growth is stunted and yields are reduced. Some crops exhibit characteristic deficiency symptoms when adequate amounts of K are not available for growth and development [15]. Potassium is mobile in plants and will move from lower to upper leaves. For corn, the margins of

the lower leave turn brown. On the basis of different percentage of potassium it can be divided in to low, medium and high. The Potassium values were in the range of 85 to 211. Minimum k was observed from SN_2 and maximum k was observed from SN_6.

RESULT AND DISCUSSION

With the help of this study we find out that the pH value & conductivity of the soil. Moreover we also get to know about the nature of the soil (acidic or basic) and the type of ions found in it .The measurement of pH value is important because it is helpful in growing crops as they show proper and maximum growth at optimum pH . If the pH of the soil is found to be acidic then in order to neutralize its acidity farmers are advised to use $CaCO_3$ in their land and if the pH is found to be basic then they are advised for the use of Gypsum for neutralizing the alkalinity of the soil. With the help of conductivity measurement we can find out the amount of soluble salts present in the soil. If it is above 3 then it hampers the process of seed germination as the soil becomes smooth and fine .In order to decrease the amount of salts in soil farmers are advised to have more and more amount of water so that its conductivity would decrease significantly. The pH value also helps to determine the presence of toxic elements present in the soil. Furthermore it tells about the effect of such element in the fertility of the soil.

With the help of conductivity and alkalinity of the soil, presence of some elements and their effect on plant growth .Its increased content in soil produces toxic effect in plants. So we concluded that the pH of this area is mainly below 6.5 to 8.5. This causes soil acidity and low productivity, whereas electrical conductivity of this area is mainly below to 1, which are well within the limit for the normal crop growth and it suggests that soil is not salty.

CONCLUSION

It is clear from the analytical result that pH and Conductance, nitrogen and pottsium of the soil is impotant for the crop. P^H value shows that soil is acidic, normal or alkaline range. It is suggested that the production of crop may be increased by the addition of micronutrients fertilizer in sufficient quantity for healthy crop.Results and suggestion provide useful information to the formers and residing in the study area.

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CONFLICT OF INTEREST:
The authors declare that they have no conflict of interest.

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