



Study the Physio-Chemical Properties of Black Soil of Bahora Village of Jashpur District, Surguja Division of Chhattisgarh, India.

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ABSTRACT:-

Soil is one of the major foundations of life on Earth, serving as a reservoir of water and nutrients, as a medium for filtering and breaking down harmful wastes, and as a means of transporting carbon and other elements through the global ecosystem. acts as a participant in the circulation of Therefore, it is necessary for us to know the properties of soil. We will study the Physio-chemical properties of black soil in our research, the black soil on which we are doing research is found in Bahora village of Jashpur district of Chhattisgarh. We will study the Physio-chemical properties of this soil in our research, which element is found in it, what is its physical properties. During this we will study the physical properties like that Conductivity, pH-value, percentage of Carbon etc. We will study the chemical properties like presence and quantity of Fe, Cu, Zn, Ca, Mg, S, N etc. And try to reach some conclusion.

Keywords: *Black* soil, Conductivity, Resistive, pH-value, Physical properties, Chemical properties etc.

Introduction: -

The black soil on which we are doing research is found in Bahora village of Jashpur district of Chhattisgarh,INDIA.The villagers use this soil to paint their houses. This soil is situated in a marshy area, and by digging it a source of water emerges. This soil is found in very small quantity in this area. Bahora village is 85 Km away from Ambikapur, the headquarter of Surguja division and the distance of this place is 433 Km from Raipur, the capital of Chhattisgarh. and geographical location position of the this research area is at 23.095348° latitude and 83.723400° longitude and no research has been done here.



Electrical Conductivity:-

Soil electrical conductivity, referred to as EC, is the ability of soil to conduct (transmit) or attenuate electrical current. EC is expressed in milliSiemens per meter (mS/m) or at times is reported in deci-Siemens per meter (dS/m). Over the years, soil scientists have used EC to measure soil salinity. However, soil EC measurements also have the potential for estimating variations in soil physical properties where soil salinity is not a problem, including texture, moisture, depth of top soil plus others. The important aspect to remember is that anything that affects conductivity in the soil will influence measurements, so it is important to ground reference to understand the driving variable(s) for soil EC measurements[1],[2].

pH-value :-

Soil pH is a measure of the acidity or alkalinity of the soil. A pH value is a measure of hydrogen ion concentration. Because hydrogen ion concentration varies over a wide range, a logarithmic scale (pH) is used: for a pH decrease of 1, the acidity increases by a factor of 10. It is a 'reverse' scale in that very acid soil has a low pH and a high hydrogen ion concentration. Therefore, at high (alkaline) pH values, the hydrogen ion concentration is low. Most soils have pH values between 3.5 and 10. In higher rainfall areas the natural pH of soils typically ranges from 5 to 7, while in drier areas the range is 6.5 to 9. Soils can be classified according to their pH value. 6.5 to 7.5—neutral, over 7.5—alkaline, less than 6.5—acidic, and soils with pH less than 5.5 are considered strongly acidic[3]

LITERATURE REVIEW

Black Soil in India: Black soils, locally called regard or black cotton soils, and internationally known as 'tropical black earths' or 'tropical chernozems' have been developed by the weathering of the Deccan lava in major parts of Maharashtra, western Madhya Pradesh (Hoshangabad, Narsinghpur, Damoh, Jabalpur, Raisen and Shahdol districts), Gujarat (Surat, Bharuch, Vadodara, Kheda, Sabarkantha and Dang districts), Andhra Pradesh (Adilabad, Warangal, Khammam, Mahbubnagar, Kurnool, Guntur and Karimnagar districts), Karnataka (Bijapur, Dharwar, Gulbarga, Bidar, Belgaum, Raichur, Bellari and Chitradurga districts), Rajasthan (Kota, Bundi, Sawai Madhopur, Bharatpur and Banswara districts), Tamil Nadu (Ramnathpuram, Tirunelveli, Coimbatore, Madurai and South Arcot districts) and Uttar Pradesh (Jalaun, Hamirpur, Banda and Jhansi districts)[4].

In 2015, the research paper of Kazutake KYUMA and Yoshikazu TAKAYA "Black soils In eastern India" concluded that Black soils of the Grumusol group studied in the eastern part of India are grouped into the following four categories according to their mode of occurrence: (1) Black soils on calcareous basements, (2) Black soils on non-calcareous basements, (3) Black soils associated with recent river terraces, (4) Black soils on deltaic and coastal alluvia[5].

In 2015, the research paper of SS Kekane, RP Chavan, DN Shinde, CL Patil, SS Sagar "A review on physico-chemical properties of soil" concluded that study of soil quality can be carried out by different parameters. Most of the parameters are quite higher or lower than acceptable limits. Therefore, it is very important to put a total ban on the human activities which are responsible for soil quality deterioration[6].

In 2015, the research paper of V.K. PHOGAT, V.S. TOMAR AND RITA DAHIYA "Soil Physical Properties" concluded that Physical properties have significant influence on the behaviour of soil for agricultural and engineering uses. Soil texture and structure determine the total porosity and the size distribution of pores which influence water, heat and air relationships in the soil. Soil texture is a static property but structure may be manipulated through management practices. It is essential to carry out the tillage operations at optimum soil moisture to avoid deterioration in soil structure. Management of physical, chemical and biological factors can help in maintaining proper soil physical conditions for plant growth. Soil aeration and soil temperature affect the quality of soils for plants and other organisms. Soil water has a major influence on both soil aeration and temperature. It competes with soil air and moderates soil temperature. Soil consistency, plasticity, compaction, strength etc., help in determining the stability of soil against loading forces from traffic, tillage or building foundations. Looking at the current stress on soil as a natural resource for food security and safety, due emphasis is needed for maintaining soil physical fertility by adding organic materials, introduction of legumes in rotation, adoption of conservation tillage, etc.[7]

In 2017, the research paper of Prof. A. Balasubramanian Centre for Advanced Studies in Earth Science, University of Mysore, Physical Properties of Soils concluded that Soils contain a lot of mineral and organic constituents. Soil types are described according to these main constituents. A soil with a lot of sand is called as a sandy soil; soil with a lot of clay is called as a clay soil; and soil with a lot of organic material is called as an organic soil. Along with soil structure, the texture of soil is also important to determine the water-holding capacity, water movement, and the amount and movement of soil air in a given soil. All of these physical properties are very important to the health and type of plants and other organisms that can exist in a particular soil. The physical properties of soils is a major aspect of study in soil science, civil engineering and agricultural engineering.[8]

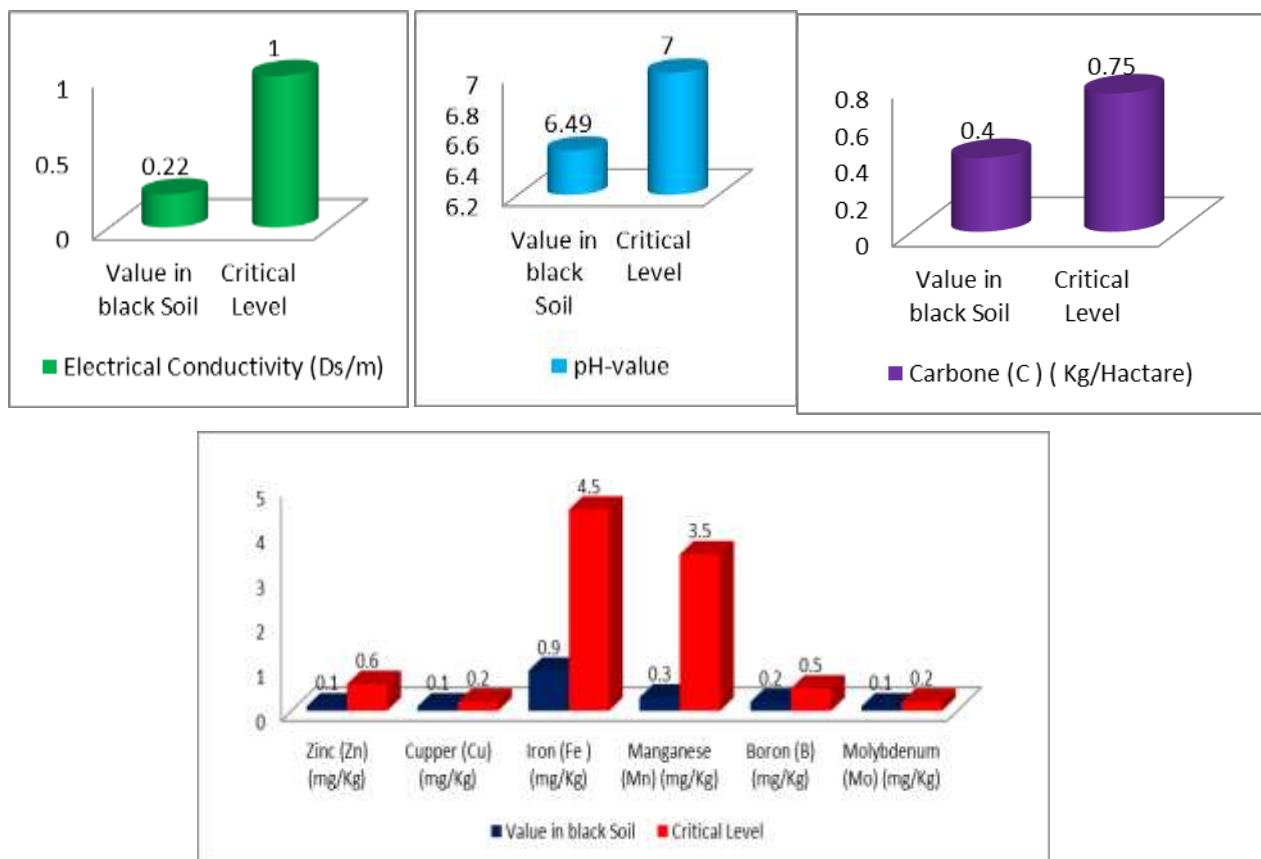
Material & Methods:-

We have used experimental Method in our Research as Methodology. During this time we took a Black soil sample 3 cm deep in the research found in the Bahora village, Block Bagicha, district Jashpur. Determined the presence and quantity of Physio-Chemical properties such as Fe, Cu, Zn, Ca, Mg, S, N conductivity, pH-value, etc. of the sample taken which are as follows-

Sl.No.	Physio-chemical properties	Unit	Value in salt Soil	Level Description/Critical Level
01	Electrical Conductivity	Ds/m	0.22	Less than 1.0-Normal
02	pH-value	pH-Scale	6.49	Between 5.5-6.5 Medium Acidic
03	Carbone (C)	Kg/Hactare	0.40	Less than 0.50- Lower
04	Zinc (Zn)	mg/Kg	0.1	0.6
05	Copper (Cu)	mg/Kg	0.1	0.2
06	Iron (Fe)	mg/Kg	0.9	4.5
07	Manganese (Mn)	mg/Kg	0.3	3.5
08	Boron (B)	mg/Kg	0.2	0.5
09	Molybdenum (Mo)	mg/Kg	0.1	0.2

Result & Discussion :-

The conductivity of the Black soil found in the Bahora village is much lower than normal only 22% of critical level of conductivity, so this soil will not be a saline soil. Obtained a pH-value of 6.49 which means that the Black soil found in it is neutral. The amount of organic carbon was obtained in range of the lower value 0.50.



The chemical properties of Black soil found in the Bahora village were tested when Zn content was found to be 83% less than the critical level, Cu was obtained only by 50% compared to the critical level, Iron was obtained only 20% compared to the critical level Happened, Similarly Mn , B , and Mo obtained only 8.5% , 40% and 50% as compared to critical level. The amount of all these chemical elements is very less.

Conclusion:-

The nature of the Black Soil found in the Bahora village, district Jashpur is not saline as well as neutral. The amount of iron and magnesium in the Hair wash soil here is very less. Copper and molybdenum are likely to be found in Black soil.

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