

## High density soil survey of CRC -1 by the use of laboratory methods

Comment [FO1]: The topic has no scientific coherence and therefore needs modification

### ABSTRACT

A field experiment was carried out during the year 2024 in the Department of soil science & Agricultural Chemistry, School of Agriculture, ITM, Gwalior. Surface (0-15 cm) and sub surface (15-30 cm) depth soil samples were collected by systematic survey using global position system from CRC-1 farm, ITM, Gwalior District, Madhya Pradesh. From CRC-1, we collected 120 soil samples. pH varied between 7.21 to 8.69 at 0–15 cm depth and 7.18 to 8.57 at 15–30 cm depth. The pH is slightly alkaline. The Electrical conductivity (EC) ranged from 0.23 to 0.52  $\text{dsm}^{-1}$  at 0–15 cm depth and 0.31 to 0.59  $\text{dsm}^{-1}$  at 15–30 cm depth, emphasizing that the soil is within the safe limit of EC. Organic carbon varied between 0.31 to 0.39 in 15–30 cm depth and 0.35 to 0.42 in 0–15 cm depth. The OC status is low to medium. N ranged between 134.5 to 139.9  $\text{kg ha}^{-1}$  at a depth of 0–15 cm and 132.4 to 135.5  $\text{kg ha}^{-1}$  at a depth of 15–30 cm. K ranged from 8.42 to 12.20  $\text{kg ha}^{-1}$  at 0–15 cm depth and 6.28 to 10.68  $\text{kg ha}^{-1}$  at 15–30 cm depth. S ranged between 15.36 to 20.54  $\text{kg ha}^{-1}$  at a depth of surface and 13.64 to 18.74  $\text{kg ha}^{-1}$  at a depth of sub surface.

Comment [FO2]: Please rewrite your abstract with a short background, aim/objective of study, conclusion and recommendations

**Keywords:** Soil survey, Soil pH, Electrical conductivity, Organic carbon, Nitrogen, Phosphorus, Potassium.

### 1. INTRODUCTION

Madhya Pradesh is the second-largest state area in the nation India. It lies between latitudes  $21^{\circ}6'$  and  $26^{\circ}54'$  N and longitudes  $74^{\circ}$  and  $82^{\circ}47'E$ . There are 50 districts and 10 divisions. Approximately 9.38% of India's total land area, or 308,245 square kilometers, are occupied by it. The distance between the ground and the water table is always 300 kilometers or more. It is located on the Central Indian tableland, which is bordered to the north by the Upper Gangetic plains, to the south by the Godavari valley, to the west by the Gujarat plains, and to the east by the plateaus of Bundelkhand and Chhattisgarh. The State extends east-west by the Vindhya, Satpura, and Maikal hill ranges. There are 87.2 million people living there, according to the 2023 census. The state has three distinct seasons with a typical tropical climate: winter, summer, and monsoon. Every year, 1200 millimeters of rain fall on Madhya Pradesh. These regions also don't have as much forest cover as the state's eastern and central regions. Due to its location in the state's western and northwestern districts, this state district is regarded as being susceptible to desertification. Its soils are rich, clayey, and gravelly, ranging widely. The state's soils can be divided into four primary categories: alluvial, medium and deep black, shallow and medium black, and mixed red and black. It has frequently experienced drought in the last ten years, which harms agriculture and causes a scarcity of drinking water.

Agriculture is unlikely to spread horizontally in Madhya Pradesh due to the soils' generally low micronutrient condition. Consequently, increasing agricultural yield in soil area combined with vertical growth will be necessary to meet the state's future needs for food, fruit, and fiber. The availability of micronutrients for crops may be impacted by the factors. The most important variables are drainage, plant nutrition interactions, soil pH and organic matter, and parent material type. The soil's micronutrient shortage is one of the

primary micronutrient barriers to crop productivity in Madhya Pradesh. However, Madhya Pradesh, India, has a lot of Zn, S, and Fe-poor soil. The fact that a large area of Madhya Pradesh is affected by the pH of the soil has exacerbated the problem. Naturally occurring to somewhat alkaline soil is common in Madhya Pradesh. The steady depletion of native reserves in Madhya Pradesh's rain-fed and irrigated systems is caused by crop removal, fertilizer application to the soil, and the use of organic manures.(Patidar *et al*, 2017). A dynamic natural feature that is susceptible to change as a result of both natural and man-made influences are the nutrients in the soil.

The soil-forming elements that influence the characteristics and formation of soil are climate, relief, parent material (bedrock), organisms, and time (Jenny, 1941; Birkeland, 1999). Since soil scientists are continuously creating local, regional, and global databases, they are essential to the creation of spatial data. Since soils and the landscape are closely related, land form, geomorphology, and physiography are crucial to understanding soil pedological processes. Understanding these correlations helps to investigate the pedologic basic level, which in turn helps to understand the geographical distribution of modern soils. Although human activity can degrade productive soils in a matter of decades, it takes nature thousands of years to generate a unit soil out of sterile bedrock (Hill,2003). A farmer's interest in soil conditions and how they affect crop productivity and growth often ends at the depth at which a plough disturbs the soil, but the carrying capacity of the ecosystem has been severely reduced by current global population growth, especially in the soil system. Consequently, farmers are preventing land degradation in the field of agricultural management (White, 2006).

## 2. MATERIALS AND METHOD

The CRC -1, ITM University, Gwalior, Madhya Pradesh, where the research work is conducted in 2024 under the Department of soil science & Agricultural Chemistry, School of Agriculture. We take surface (0-15 cm) and sub surface (15-30 cm) depth are soil sample are collected by systematic survey were collected using global position system from CRC-1 farm, ITM, Gwalior District, Madhya Pradesh. The region is exposed to both summer and winter conditions. The rainfall is moderate amount to 780 millimeters (30.7 inches) per year. A humid subtropical climate characterises Gwalior with dry hot summer (late march to June) and winter (Mid November to February).

### Chemical Parameter

1. Soil pH
2. Electrical conductivity (EC).
3. Organic carbon (OC)
4. Available Nitrogen
5. Available Phosphorus
6. Available Potassium
7. Available sulphur

#### 1. Soil pH

Soil pH was concepted by Soren Sorensen (1909) as convenient way of expressing acidity. Weigh out about 10 gram of soil and 50ml of distilled water. Ensuring a 1:5 diluted will suffice respectively. Shake the container and settle the soil for 10 minutes. Measure the

**Comment [FO3]:** This introduction is poorly constructed and requires thorough review. Please start your introduction from a broader perspective and end with a narrower perspective. Your introduction should include a brief background of the study, statement of problem, justification, significance of study, and overall aim of study. Your introduction completely lacks all these important information.

**Comment [FO4]:** This is not properly structured to attract scientific audience. It has a lot of grammatical errors and sentence discontinuities.

**Comment [FO5]:** This is an ambiguous word

pH value on the water above the soil. Ensure you get a steady reading on the digital readout. Always wash your containers out before testing your next sample.

## **2. Electrical conductivity (E.C)**

Using an electrical conductivity meter as described by Jackson (1973), the electrical conductivity of the soils was ascertained in soil water extract. Wait ten minutes after activating conductivity bridge. Using 0.01N KCl and saturated Ca SO<sub>4</sub> solution give the device a test. Use the same soil water solution that was used to measure pH to calculate EC. Give the mixture a brief swirl and then let the dirt to sit for five minutes. The electrodes should be well cleaned before being immersed in a dirt solution. Make the required temperature adjustment. This point's readings on the scale display the electrical conductivity. Multiply this by the cell constant (given on the cell itself) to get a specific conductivity.

## **3. Organic carbon**

Walkley-Black (1934) method was used to estimate organic carbon. By using concentrated H<sub>2</sub>SO<sub>4</sub> and potassium dichromate (K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>) in combination with the heat of dilution of H<sub>2</sub>SO<sub>4</sub>, organic matter in the soil is oxidised in this process back-titrating K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> with ferrous ammonium sulphate.

## **4. Available nitrogen (N)**

Alkaline permanganate method was used to determine the amount of available nitrogen. Using this method, fill a digestive tube with 5 g of dirt and a tiny amount of water. After mixing the sample with 20 milliliters of a 0.32% KMnO<sub>4</sub> solution, place the tube into the distillation machine. Apply 20 ml of 2.5% NaOH solution with the distal-dosing pump. About 20 ml of 2.5% boric acid into the conical flask, then clip the distal-receiving end. Take the ammonia gas out of the tube and combine it with the acid that was given. After that, titrate with 0.02N H<sub>2</sub>SO<sub>4</sub> and add 5 drops of mixed indicator. A blank correction (without soil) must be included in the final calculations.

## **5. Available phosphorus(P)**

Olsen's method was used to calculate the availability of phosphorus in the soil. (Olsen et al. 1954). About 2.5 g of the soil sample was shaken for 30 minutes in a 100 ml, conical flask on a mechanical shaker with 50 ml of 0.5N NaI-IC<sub>3</sub>(adjusted to pH 8.5) as an extractant and 1 g of Darco G-60 (Free from soluble phosphorus)

## **6. Available potassium(K)**

A flame photometer is used to measure the potassium concentration in the filtrate obtained from filtering the TC suspension through Whatman No. 42 filter paper. M.L. Jackson (1973) uses the Neutral Ammonium Acetate Method to determine the accessible potassium concentration in the soil. The material was transferred into a 100 ml conical flask, and five minutes were spent shaking it. Twenty-five milliliters of 1 N ammonium were added to the solution.

## **7. Available Sulphur**

Available sulphur was determined by the method given by Chesnin, L and Yien, C.H. (1951)

### **i) Preparation of standard curve**

Dissolved 0.5434 grams of oven-dried K<sub>2</sub>SO<sub>4</sub> (A.R.) in one liter of purified water. 100 parts per million of sulfur were present in this solution. A range of concentrations ranging from 5,

10, 15, 20, 25, 30, 35, 40, 45, and 50 parts per million was created using S solution. 25 milliliter volumetric flasks were filled with 10 milliliters of standard solution at different concentrations. Each flask was then shaken after adding one milliliter of the 0.25 per gum acacia solution and one milliliter of 6N HCl (seed solution). With distilled water, the final volume was adjusted. After transferring the contents of the flasks to a beaker, 0.5 g of crystals of barium chloride (30 mesh) were added, and the mixture was gently stirred for half a minute. The transmittance per cent was used to measure the resultant turbidity using a spectrophotometer set at 420 mμ. Plotting the transmittance percent against the sulfur concentration (ppm) in solution led to the construction of a standard curve.

#### ii) Extraction

A 10g sample of soil was collected, and after being thoroughly agitated for approximately half an hour and filtered using Whatman number 40 filter paper, 50 ml of extractant ( $\text{CH}_3\text{CooNH}^4 + \text{CH}_3\text{CooH}$ ) and 0.5 g of sulfur-free activated charcoal were added.

#### ii) Development of turbidity

In a 25 ml volumetric flask, 10 ml of the aforementioned extract was shaken. It was shook after adding 1 ml of 0.25 per pent gum acacia solution and 1 ml of 6 N HCl (seed solution). Distilled water was used to get the final volume up to par. The flask's contents were moved into a beaker. After adding 0.25 g of barium chloride crystals (30 mesh), gently stir for a duration of two minutes. The transmittance per cent was used to measure the resultant turbidity using a spectrophotometer set at 420 mμ. Once the device has been calibrated to read 100% transmittance, prepare a blank. The sulfur content was computed as S kg/ha.

**Comment [FO6]:** I am suggesting that you merge the analytical methods into one paragraph. In addition, you only need to state the name of the test and reference citation rather than explaining the whole methodology, which is worthless.

### 3)Result and discussion

#### 3.1pH

The pH ~~range of the CRC 1 soil of the under study area was ranges from~~ 7.18 to 8.57 at 15–30 cm depth and 7.21 to 8.69 at 0–15 cm depth, ~~which indicates that the soils are slightly acidic to slightly alkaline.~~ In general, the pH ~~trended downward~~ decreased with depth. ~~In response, the soils ranged from slightly acidic to slightly alkaline.~~ In addition to the calcium carbonate concentration, bases may leach from the surface and ~~become deposited~~ at lower layers, ~~thus~~

causing the pH to fall decrease with depth. Previous reports of the pH decreasing with depth came from have been reported by Rajeshwar and Khan (2008), Bhat (2010), and Wani et al. (2017).

Table 1 :Variation in pH concentration in different blocks

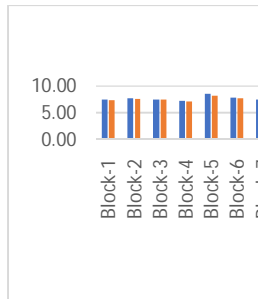


Fig 1 Depth wise distribution of Soil pH in the soil.

Location	pH	
	Depth(cm)	
	0-15	15-30
Block-1	7.44	7.37
Block-2	7.79	7.65
Block-3	7.52	7.45
Block-4	7.21	7.18
Block-5	8.56	8.26
Block-6	7.81	7.76
Block-7	7.56	7.49
Block-8	8.70	8.57
Block-9	7.58	7.45
Block-10	8.34	8.25
Block-11	7.42	7.38
Block-12	8.67	8.52
Block-13	8.27	8.12
Block-14	8.34	8.29
Block-15	7.49	7.38
Block-16	8.44	8.35
Block-17	7.97	7.82
Block-18	8.35	8.28
Block-19	7.45	7.32
Block-20	7.67	7.45
C.D.	0.04	0.03
SE(m)	0.01	0.01
SE(d)	0.02	0.01
C.V.	0.28	0.21

distribution of Soil pH

### 3.2 Electrical

The electrical the CRC of the study conductivity increases from ranging from 0.23 15 cm depth and 0.31 30 cm depth. As soil displayed an increasing that every soil sample electrical conductivity (EC < 1.0 dSm<sup>-1</sup>). One the depth-dependent conductivity is the surface to subsurface findings conform to outcomes concur with those of Tuba and Kaleem (2016) and Najar (2009).

### conductivity (dsm<sup>-1</sup>)

conductivity of soils in area had electrical with depth ranging to 0.52 dsm<sup>-1</sup> at 0 to to 0.59 dsm<sup>-1</sup> at 15 to depth increased, it trend. It was discovered was However, the seems to be normal possible explanation for increase in electrical leaching of bases from horizons. These those reported by

**Comment [FO7]:** Please use either the tables or the figures to present your results. Don't use both at the same time, otherwise you would be presenting the same information, which does not actually make any sense.

Alternatively, you can use the tables to present your results and then use the figures to discuss your results.

This holds for all areas where you have used tables and figures to present your findings.

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Table 2 :Variation in EC concentration in different blocks

Location	EC	
	Depth(cm)	
	0-15	15-30
Block-1	0.34	0.423
Block-2	0.45	0.53
Block-3	0.37	0.44
Block-4	0.23	0.31
Block-5	0.43	0.49
Block-6	0.35	0.43
Block-7	0.46	0.48
Block-8	0.52	0.59
Block-9	0.45	0.52
Block-10	0.24	0.32

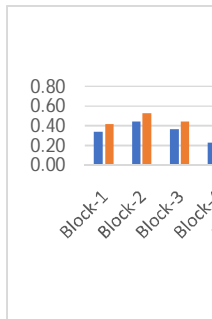


Fig 2 Depth wise distribution EC in the soil.

<b>Block-11</b>	0.27	0.34
<b>Block-12</b>	0.43	0.51
<b>Block-13</b>	0.25	0.32
<b>Block-14</b>	0.38	0.41
<b>Block-15</b>	0.29	0.34
<b>Block-16</b>	0.28	0.32
<b>Block-17</b>	0.29	0.33
<b>Block-18</b>	0.25	0.32
<b>Block-19</b>	0.33	0.37
<b>Block-20</b>	0.51	0.58
<b>C.D.</b>	0.03	0.032
<b>SE(m)</b>	0.01	0.011
<b>SE(d)</b>	0.015	0.016
<b>C.V.</b>	5.018	4.593

distribution EC in

### 3.3 Organic carbon

The ~~range of~~ organic carbon ~~in the~~ soils of the ~~CRC 1~~ study area ~~decreases with depth, ranging from~~ 0.31 to 0.39 ~~in at~~ 15–30 cm depth and 0.35 to 0.42 ~~in~~ 0–15 cm depth. ~~With depth, the organic carbon content showed a declining tendency. The reduced reduction inorganic carbon was is probably caused by erosion, which has the tendency to removing removes~~ surface soils with high levels of organic carbon (Rajeswar *et al.* 2009). These soils have ~~a~~ medium levels of organic carbon ~~because of due to~~ the rapid burning of organic matter ~~brought on by the resulting from~~ high temperatures in the area. Similar findings were observed by Lathwal (2006) ~~in the soil~~ and Sharma *et al.* (2008) in the soils of the Amritsar district.

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Table 3 :Variation in organic carbon concentration in different blocks

OC		
Location	Depth(cm)	
	0-15	15-30
<b>Block-1</b>	0.38	0.33
<b>Block-2</b>	0.36	0.31
<b>Block-3</b>	0.39	0.35
<b>Block-4</b>	0.35	0.34
<b>Block-5</b>	0.39	0.36
<b>Block-6</b>	0.36	0.33
<b>Block-7</b>	0.41	0.37
<b>Block-8</b>	0.42	0.39
<b>Block-9</b>	0.37	0.34
<b>Block-10</b>	0.39	0.35
<b>Block-11</b>	0.36	0.32
<b>Block-12</b>	0.38	0.35
<b>Block-13</b>	0.39	0.34
<b>Block-14</b>	0.37	0.32

<b>Block-15</b>	0.36	0.33
<b>Block-16</b>	0.38	0.34
<b>Block-17</b>	0.37	0.34
<b>Block-18</b>	0.36	0.33
<b>Block-19</b>	0.40	0.36
<b>Block-20</b>	0.42	0.37
C.D.	0.033	0.031
SE(m)	0.011	0.011
SE(d)	0.016	0.015
C.V.	5.218	5.353

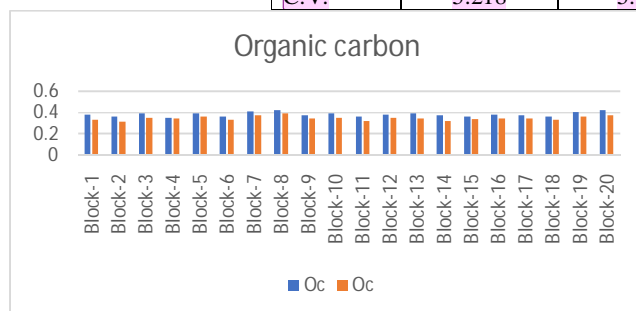


Fig 3 Depth wise distribution of organic carbon in the soil.

### 3.4 Available nitrogen

The range of available nitrogen in the soil of the CRC the study area was decreases with depth, ranging from 134.5 to 139.9 cm at a depth of 0–15 cm and 132.4 to 135.5 cm at a depth of 15–30 cm. Higher levels of nitrogen were found in surface soils, however the amount of nitrogen that was available decreased with depth. These data points are also noted by Dar *et al.* (2012), Najar *et al.* (2009), and Mushki, (1994). Surface soils had larger levels of accessible nitrogen, which decreased linearly as soil depth increased.

Table 4 :Variation in nitrogen concentration in different blocks

Location	Nitrogen(kg ha <sup>-1</sup> )	
	Depth(cm)	
	0-15	15-30
<b>Block-1</b>	135.4	131.4
<b>Block-2</b>	136.3	133.0
<b>Block-3</b>	135.6	131.3
<b>Block-4</b>	135.5	131.4
<b>Block-5</b>	136.9	133.4
<b>Block-6</b>	135.2	130.6
<b>Block-7</b>	138.6	133.8
<b>Block-8</b>	139.6	135.5
<b>Block-9</b>	138.5	134.6
<b>Block-10</b>	135.1	132.9
<b>Block-11</b>	136.9	134.5
<b>Block-12</b>	135.1	132.9

**Comment [FO10]:** What is the relevance of these statistical analysis if you do not discuss them?

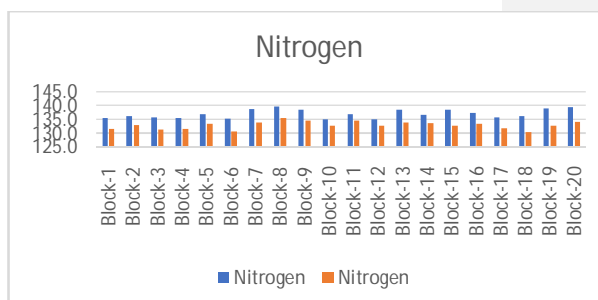
**Comment [FO11]:** Please state the correct unit.

**Comment [FO12]:** Please state the correct unit.

**Comment [FO13]:** This does not seem to be true except if there is a publication to support your statements. Generally, available N is low (<250 kg/ha), medium (250-540 kg/ha), and high (>540 kg/ha). If this holds for soils of your study area, then all your soils are low in available N.

**Comment [FO14]:** Please support your statements with corroborated results or findings. These are at par.

<b>Block-13</b>	138.5	133.9
<b>Block-14</b>	136.7	133.6
<b>Block-15</b>	138.5	132.6
<b>Block-16</b>	137.3	133.3
<b>Block-17</b>	135.7	131.9
<b>Block-18</b>	136.3	130.3
<b>Block-19</b>	138.9	132.6
<b>Block-20</b>	139.5	134.2
C.D.	2.423	1.556
SE(m)	0.843	0.542
SE(d)	1.192	0.766
C.V.	1.066	0.706



**Fig 4** Depth wise distribution of Nitrogen in the soil.

### 3.5 Available Phosphorus

The available phosphorus of soils in the CRC 4 study region area decreases with depth, had available phosphorus ranging from 8.42 to 12.20 cm at 0–15 cm depth and 6.28 to 10.68 cm at 15–30 cm depth, which are low to medium. With depth, the amount of phosphorus that was available trended downward; the highest level was found in surface soils. The present results are consistent with those of Mostara (2002), who reported that a medium amount of phosphorus was present in most Karnataka soils are medium in available phosphorus, particularly in the Mal Prabha command. The Similar findings confirming medium levels of available phosphorus from Jharkhand's Dumka were reported by Niraaret *et al.* (2009) and Kumar *et al.* (2009) samples from Jharkhand's Dumka had moderate levels of phosphorus.

Comment [FO15]: Please state the correct unit.

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Table 5 :Variation in phosphorus concentration in different blocks

Location	Phosphorus (kg ha <sup>-1</sup> )	
	Depth	
	0-15	15-30
<b>Block-1</b>	9.34	7.52
<b>Block-2</b>	11.45	9.63
<b>Block-3</b>	10.32	8.54
<b>Block-4</b>	8.42	6.28
<b>Block-5</b>	11.32	9.52
<b>Block-6</b>	9.68	7.84
<b>Block-7</b>	11.12	9.72
<b>Block-8</b>	12.21	10.68
<b>Block-9</b>	10.52	8.74
<b>Block-10</b>	10.36	8.58
<b>Block-11</b>	8.48	6.64
<b>Block-12</b>	11.52	9.72
<b>Block-13</b>	10.62	8.48
<b>Block-14</b>	9.82	7.18
<b>Block-15</b>	8.54	6.74

<b>Block-16</b>	10.74	8.52
<b>Block-17</b>	9.32	7.48
<b>Block-18</b>	10.34	8.52
<b>Block-19</b>	11.12	9.38
<b>Block-20</b>	12.13	10.42
C.D.	0.016	0.017
SE(m)	0.006	0.006
SE(d)	0.008	0.008
C.V.	0.095	0.117

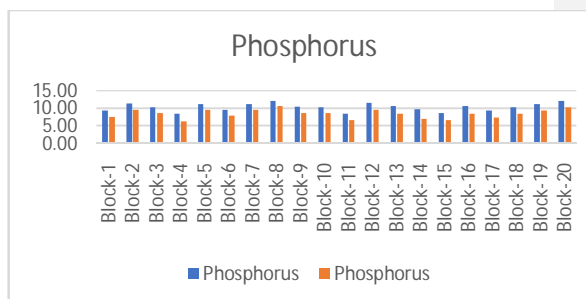


Fig 5 Depth wise distribution of Phosphorus in the soil.

### 3.6 Available potassium

The range of available potassium in soils of the study area in the soil of the CRC-1 study area varies from 296.2 to 302.7 cm at a depth of 0–15 cm and 291.2 to 297.8 cm at a depth of 15–30 cm, which are relatively high. These data points are also noted by The findings conform to those of Verma *et al.* (2005), Nirawar *et al.* (2009) and Sharma (2017). The comparable high levels of available K in soils of Sardulgarh, Bhikhi and Budhlada block, is attributed to the predominance of K-rich micaceous and feldspar minerals may be responsible for this higher value outcomes in the soils of Sardulgarh, Bhikhi, and Budhlada block sand.

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Comment [FO18]: Please state the correct unit.

Table 6 :Variation in potassium concentration in different blocks

Location	Potassium(kg ha <sup>-1</sup> )	
	Depth(cm)	
	0-15	15-30
<b>Block-1</b>	295.4	290.1
<b>Block-2</b>	297.9	292.5
<b>Block-3</b>	300.4	295.8
<b>Block-4</b>	296.2	291.2
<b>Block-5</b>	298.3	293.5
<b>Block-6</b>	297.3	292.7
<b>Block-7</b>	301.3	289.4
<b>Block-8</b>	302.7	297.8
<b>Block-9</b>	298.7	292.3
<b>Block-10</b>	296.6	291.5
<b>Block-11</b>	301.4	296.8
<b>Block-12</b>	297.3	292.3
<b>Block-13</b>	299.3	294.8
<b>Block-14</b>	296.7	291.3
<b>Block-15</b>	301.3	296.4

<b>Block-16</b>	297.2	292.8
<b>Block-17</b>	299.3	294.4
<b>Block-18</b>	296.8	291.7
<b>Block-19</b>	298.8	293.3
<b>Block-20</b>	302.4	297.3
C.D.	1.701	4.317
SE(m)	0.592	1.502
SE(d)	0.837	2.124
C.V.	0.343	0.887

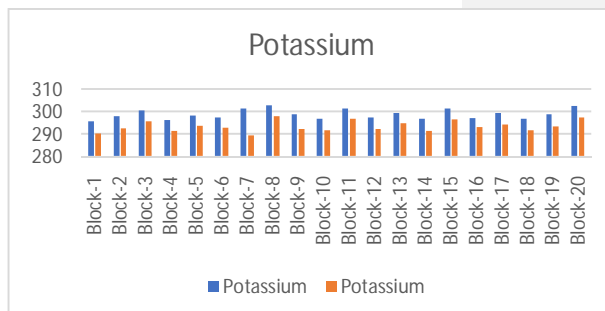


Fig 6 Depth wise distribution of Potassium in the soil.

### 3.7 Available Sulphur

The range of available sulphur in soils of the study area in the soil of the CRC-1 study area was ranges from 15.36 to 20.54 cm at a depth of 0 -15 cm and 13.64 to 18.74 cm at a depth of 15 - 30 cm. For the Rewa district as a whole 45.19 Forty-nine per cent of the samples of Rewa District were tested low in available sulphur. Similar findings were reported by Rathore et al. (1995), Singh and Sarkar (1999), Bhatnagar et al. (2003) and Singh and Bansal (2007). The correlation coefficients was found to be significant at 5 percent level of significance ( $r=0.1502$ ). Similar relationships have also been reported by Dhane and Shukla (1995) and Sahoo et al. (1998).

Comment [FO19]: Please state the correct unit.

Comment [FO20]: Please state the correct unit.

Comment [FO21]:  $r$  is less than 0.25. How really is this correlation coefficient significant as you are emphasizing here?

Table 7 :Variation in sulphur concentration in different blocks

Location	Sulphur ( $\text{kg ha}^{-1}$ )	
	Depth(cm)	
	0-15	15-30
<b>Block-1</b>	18.63	16.463
<b>Block-2</b>	18.72	16.32
<b>Block-3</b>	16.24	14.58
<b>Block-4</b>	15.36	13.64
<b>Block-5</b>	17.82	15.35
<b>Block-6</b>	19.29	17.42
<b>Block-7</b>	20.23	18.64
<b>Block-8</b>	20.54	18.74
<b>Block-9</b>	18.28	16.84
<b>Block-10</b>	17.52	15.36
<b>Block-11</b>	19.82	17.62
<b>Block-12</b>	18.64	16.82

<b>Block-13</b>	16.25	14.63
<b>Block-14</b>	17.32	15.71
<b>Block-15</b>	18.63	16.43
<b>Block-16</b>	16.25	14.63
<b>Block-17</b>	17.84	15.43
<b>Block-18</b>	15.46	13.74
<b>Block-19</b>	20.18	18.35
<b>Block-20</b>	20.21	18.32
<b>C.D.</b>	0.029	0.027
<b>SE(m)</b>	0.01	0.009
<b>SE(d)</b>	0.014	0.013
<b>Block</b>	0.097	0.101

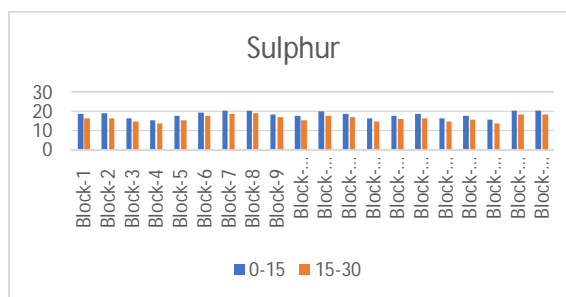


Fig 7 Depth wise distribution of sulphur in the soil.

## CONCLUSIONS

The research examined the simultaneous prediction of chemical characteristics. As soil depth increased, pH moved upward and EC moved downward. The research farms at ITM University have a pH that is between neutral and slightly alkaline, and the outcomes are typical. The soils of the ITM research farm had low levels of phosphate, nitrogen, and organic carbon. It is suggested that integrated nutrient management and fertilizer be employed in order to grow crops.

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**Comment [FO22]:** The conclusion should be strengthened by the findings of the study. In order words, the author(s) should state in the conclusion what outcomes are possible based on the current findings.

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**Comment [FO23]:** Please redo the referencing according to the journal format