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Characterisation of Soil Properties of CRC-2 and CRC-3 at ITM University, under Gwalior Region, M.P, India

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The present "Characterisation of soil properties of CRC-2 and CRC-3 at ITM University, under Gwalior region, M.P" was carried out during the year 2024 in the department of soil science and agricultural chemistry, school of agriculture, ITM University, Gwalior. I collect the soil by traversing representative areas of CRC-2 and CRC-3, the soil survey under the high intensity. For the CRC-2 the total soil is 36 and for the CRC-3 is 66 and the soil is collected surface (0-15cm) and sub-surface (15-30cm). The collected soil is preparing for the various analysed of soil physical parameters like bulk density, mechanical analysis, porosity, particle density, moisture content, osmotic pressure and total dissolved soil. The bulk density of surface for the CRC-2 is range from 1.32 to 1.38 mg m^{-3} and the sub-surface is 1.36 to 1.41 mg m^{-3} while for the CRC-3 surface value

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of bulk density is ranged from 1.32 to 1.39 mg m^{-3} and the sub-surface is ranged from 1.35 to 1.44 mg m^{-3}. The mechanical analysis of surface for the CRC-2 is ranged from 59.7 to 61.0% and the sub-surface is ranged from 55.7 to 57.3%, for the CRC-3, it ranged from the 59.7 to 61.5% for surface and the sub-surface is ranged from 55.7 to 57.6%. The porosity of CRC-2, it ranged from 49.5 to 49.8% in surface and 50.0 to 50.7% in the sub-surface, where for the CRC-3 it ranged from 49.5 to 50.7% in the surface and 49.6 to 50.9% in the sub-surface. The silt% in the CRC2 is ranged from the 18.5 to 20.2% in surface and 16.7 to 18.5% in sub-surface while, CRC3 the silt% are ranged from18.53 to 20.30 % in surface and 16.6 to 19.4% in sub-surface The clay (%) of the CRC 2 are ranged from the 19.6 to 21.8% in surface and 21.4 to 23.4% in sub-surface while for the CRC 3 are ranged from the 19.6 to 21.8% in surface and sub-surface is 21.3 to 23.5%. Particle density for the CRC-2 ranged from 2.33 to 2.59 g cm^{-3} in the surface and 2.61 to 2.80 g cm^{-3} in sub-surface, for the CRC-3 it ranged from 2.30 to 2.58 g cm^{-3} in the surface and 2.59 to 2.90 g cm^{-3} in sub-surface. The moisture content of CRC-2 is ranged from 12.33 to 12.77% in the depth of 0-15cm and 12.85 to 13.23% in the depth 15-30cm. And the CRC-3 the value is ranged from 12.35 to 12.87% in the depth of 0-15cm and 12.86 to 13.35% in the depth of 15-30cm. The osmotic pressure for the CRC-2 is ranged from 0.175 to 0.183 N m^{-2} in the depth of 0-15cm and 0.182 to 0.187 N m^{-2} in the depth of 15-30cm where for the CRC-3 it ranged from 0.174 to 0.184 N m^{-2} in the depth of 0-15cm and 0.182 to 0.190 N m^{-2} in the depth of 15-30cm. Total dissolved soil for the CRC-2 ranged from 493.0 to 497.1% in the depth of 0-15cm and 497.7 to 503.9% in the depth of 15-30cm and for the CRC-3 it ranged from 494.1 to 498.8% in the depth of 0-15cm and 497.2 to 503.5% in the depth of 15-30cm.

Keywords: Determined the bulk density; soil texture; porosity; particle density; moisture content; osmotic pressure and total dissolved soil.

1. INTRODUCTION

Alluvial soil, laterite soil, black soil, red and yellow soil, and mixed soil are the five main types of soil found in Madhya Pradesh. The majority of the soil in the Gwalior district is sandy loam soil. In Madhya Pradesh, there are 3,14, 000 hectares of waste land and 17.31 lakh hectares of under cultivation combined. One of the key elements affecting agricultural productivity is soil fertility. In order to identify obstacles to crop production for sustained productivity and to support agrotechnology transfer programs, a comprehensive understanding of the condition of soil fertility is essential. Madhya Pradesh boasts diverse soil, water, climate, and biodiversity in agriculture. Gird zone is situated in the highlands of the centre. With the exception of the southernmost point of Rajasthan's Aravali ranges, the most of the area is level and lacks hills or mountains. Along the tributaries of the Yamuna, including as the Sindh, Chambal, Betwa, and Kunwari rivers, Madhya Pradesh is home to rivulets. Most of these are the north-flowering peninsular rivers in the state. Madhya Pradesh is home to about 6.83 lakh hectares (ha) of India's estimated 20.6 lakh ha of ravines.

The Gird zone of Madhya Pradesh (MP) is composed of alluvial, ravine, and medium black soils. In the regions of Bhind and Morena, widespread ravines pose a serious threat to human safety. These ravines are the result of alluvial soil erosion. A spatial and often temporal understanding of the physio-chemical properties of the soil is necessary for any soil-related landscape-scale environmental and agricultural research [1-8].

Apart from the heat-related stress caused by global warming, new studies on projected climate changes examined through global climate models (GCMs) suggest that future stress on the supply of water in tropical Asia is expected to increase (IPCC, 1996a). Furthermore, studies indicate that crop yields in tropical regions that are both subhumid and arid have significantly decreased (IPCC, 1996b). In developing countries like India, which occupy just 2% of the planet's land area but are home to over 15% of all livestock and approximately 18% of all people, the effects of climate change may be more severe at regional and local scales, even though these are long-term evaluations that focus on average effects over time and space. Since June to September accounts for about 65% of India's gross cultivated land, the country is highly dependent on the monsoon rainfall [9-12]. During this period, 70% of the nation's yearly rainfall falls. A comprehensive analysis and evaluation of the likely effects of climate variability and change on agricultural output is required in order to sustain a balanced growth and development in

agriculture (growth rate of 2.37% year from 1990 to 1996).

Soil test-based fertility management can increase the productivity of agricultural soils with a high degree of geographical variability caused by the combined effects of physical, chemical, or biological processes (Goovaerts, 1998). This included the fact that small-holding farming methods are predominant in India and that there is a lack of infrastructure that allows for the full assessment of soil [13-15]. GIS-based mapping of soil fertility has become a good alternative in this area. The use of such maps as a decision support tool for nutrient management will also reduce the need for intricate plot-by-plot soil testing processes by taking a more reasonable approach than farmer practices or the widespread application of state-recommended fertilizer. However, there is a dearth of information regarding the use of GIS-based fertility maps in India.

2. MATERIALS AND METHODS

An evaluation based on the experiment with the title "Characterisation of Soil properties of CRC-2 and CRC-3 at ITM University, M.P under Gwalior region" will be conducted at CRC-2 and CRC-3 department of soil science and agricultural chemistry at ITM materials and methods used in the field and laboratory.

2.1 Experimental Site

The experimental field is located at $26^0$8'23.39'' N and $78^0$11'42'' E. The region is leis in 211.52 meter from above the sea level. In the field of the CRC 2 and CRC 3 of the department of soil science and agriculture chemistry, ITM University (School of Agriculture), Gwalior, MP is the site of the examination related to the topic.

2.2 Climate and Weather Condition

Research is being done on ITM University's CRC 2 and CRC 3 fields in Gwalior, MP. The area is susceptible to both summer and winter weather. Gwalior is known for its humid subtropical climate, which features dry, scorching summers (late March to June) and frigid winters (mid-November to February). The annual amount of moderate rainfall is up to 780 millimetres (30.7 inches).

2.3 Collection and Processing of the Soil Sample

A soil sample is taken in a zigzag pattern from the fields of ITM University's CRCs 2 and 3 in the Gwalior area of MP. We used GPS to gather the soil sample, which is between 10 and 30 centimetres deep. Gather the dirt with a screw auger and put it in a plastic bag. The collected soil sample will be allowed to air dry in the shadow; sunlight should not be used to dry the soil. To create a homogenous sample for the examination, the dry soil is softly crushed with the aid of a wooden roller and passed through a 2 mm sieve. For the purpose of the study, the sieving soil will be meticulously maintained in polythene bags after being levelled with an aluminium tag.

2.4 Experimental Parameter

- Bulk Density
- Soil texture
- Porosity
- Particle Density
- Moisture Content
- Osmatic Pressure
- Total Dissolved Soils

1. Bulk Density

The core method was used to calculate the bulk density of soil. By weighing the wet core and drying it to constant weight in an oven at 105˚C, as described in Singh et al. (1989), the mass of solids and water content of the soil were ascertained.

2. Soil texture

According to Baruah and Barthakur (1999), the soil texture of the soil sample was ascertained using the hydrometer method (Bouyoucos, 1962), and the textural class was identified using the USDA textural triangle.

3. Porosity

Porosity is defined as the amount of space occupied by air and water inside the soil particles. The porosity of the soil samples are calculated using the formula-

Porosity = 1 - (Bulk Density \ Particle density)

4. Particle density

Particle density of a soil sample is calculated from two measured quantities namely mass of the soil solid and its volume. As pycnometer was used to determine the

particle density and the method is known as "Pycnometer method".

5. Moisture Content

Moisture content is the ratio of the mass of water contained in the pore spaces of solid mass of particles in the material, expressed as a percentage. It was described by the Coleman and Fellows (1925).

Moisture% = (Wet soil weight – Dry soil weight) / Dry soil weight

6. Osmotic pressure

Osmotic pressure = EC x 0.36 N m^{-2}

7. Total Dissolved Soil

TDs = EC x 1064 %

3. RESULTS AND DISCUSSION

3.1 Bulk Density

The bulk density of soil in different blocks of CRC2 and CRC3 at the surface and underneath the ITM University study field. The bulk density range of CRC2 soil is 1.32 to 1.38 at a depth of 0 to 15 cm and 1.36 to 1.40 at a depth of 15 to 30 cm. Additionally, block number five has a higher bulk density than the other blocks because to its more prone sandy soil. However, for the CRC3, the soil's bulk density ranges from 1.32 to 1.39 at a depth of 0 to 15 cm and 1.35 to 1.44 at a depth of 15 to 30 cm. Block No. 3 in the CRC3 has a higher value than the other blocks and Block No. 6 is the lowest. E. Saki n et. al. [16] and T. Aşkın, N. Özdemir [17].

3.2 Soil Texture

3.2.1 Sand (%)

The sand% in the different location of the CRC2 is ranged from the 59.7 to 61.0% in the depth of 0-15cm and 55.7 to 57.3% in the depth of 15-30cm. The block no.6 has the higher sand content as compared to other blocks because the water flows straight through it and the block no.3 is the lowest sand content. While for the CRC3 the sand% are ranged from 59.7 to 61.5% in the depth of 0-15cm and 55.7 to 57.6 in the depth of 15-30cm. In the CRC3 block no.8 has the higher as compared to the other blocks and block no.2 is the lowest. These results are also found with the observation of Wani, 2001 and Wani *et al.* 2016.

3.2.2 Silt (%)

The silt% in the different location of the CRC2 is ranged from the 18.5 to 20.2% in the depth of 0-15cm and 16.7 to 18.5% in the depth of 15-30cm. The block no.6 has the higher silt content as compared to other blocks because block no.6 had the lowlands as compared to other that's why heavy rain pound the soil some of these fine granular particles are carried by the runoff water and deposited. While for the CRC3 the silt% are ranged from18.53 to 20.30 % in the depth of 0-15cm and 16.6 to 19.4% in the depth of 15-30cm. In the CRC3 block no.11 has the higher as compared to the other blocks and block no.2 is the lowest. Shama *et al.* (2005), Dar (2009), Najar (2009). Naik (2014) reported similar observations which working with the soils Punjab and Kashmir respectively.

3.2.3 Clay (%)

The clay (%) of the soil of studied area of CRC 2 are ranged from the 19.6 to 21.8% in the depth of 0-15cm and 21.4 to 23.4% in the depth of 15-30cm while for the CRC 3 are ranged from the 19.6 to 21.8% in the depth of 0-15cm and in the depth 15-30cm is 21.3 to 23.5%.

3.2.4 Porosity

The porosity% of the CRC2 of ITM University of the soil is ranged from the 49.5 to 49.8% in the depth of 0-15cm and 50.0 to 50.7% in the depth of 15-30cm. In CRC2 the block no.5 has the highest as compared to other blocked and block no.2 is the lowest as compared to other. Porosity is high because the content of organic matter is higher as compared to other blocks. The porosity% of the CRC3 are ranged from 49.5 to 50.7% in the depth of 0-15cm and 49.6 to 50.9% in the depth 15-30cm. For 0-15cm block no.7 is the lowest and block no.3 has the highest as compared to others. Singh et. al. (2017) and Mathan and Mahendra (1994) all noted the same tendency.

3.2.5 Particle Density

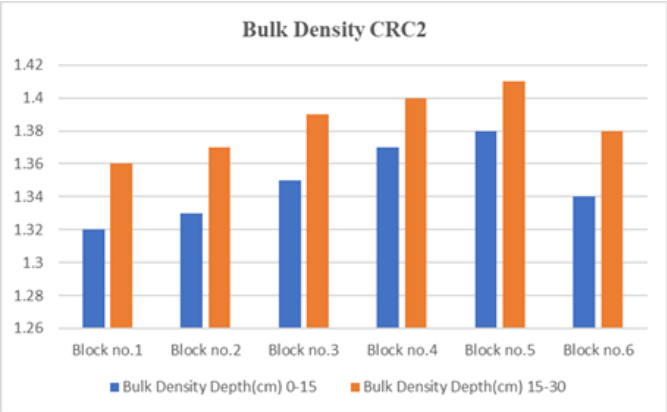
The particle density of the CRC2 of ITM University is ranged from 2.33 to 2.59g m^{-3} in the depth of 0-15cm and 2.61 to 2.80g m^{-3} and the CRC3 of the ITM University, particle density is ranged from 2.30 to 2.58g m^{-3} in the depth of 0-

15cm and 2.59 to 2.90g m^{-3} in the depth of 15-30cm. For CRC2, In the depth of 0-15cm block no.3 has the lowest and block no.5 had the higher as compared to the other blocks. Particle density is high because of the void content of the particles and the chemical composition and structure of the minerals in the soil. For CRC3 block no.7 is the lowest and block no.9 is the higher in the depth of 0-15cm and 15-30cm. It showed that the increase in the depth increase the particle density in the soils. Chaudhari, P.R. Mire. D.V. and Ahire. V D. [18] and Chohan, M. et. al. [19].

Table 1. Bulk Density of the CRC-2 and CRC-3

	Bulk Density (Mg m^{-2})	
Location	**Depth(cm)**	
CRC2	0-15	15-30
Block no.1	1.32	1.36
Block no.2	1.33	1.37
Block no.3	1.35	1.39
Block no.4	1.37	1.40
Block no.5	1.38	1.41
Block no.6	1.34	1.38
C.D.	0.03	0.03
SE(m)	0.01	0.01
SE(d)	0.01	0.01
C.V.	1.20	1.00

	Bulk Density (Mg m^{-2})	
Location	**Depth(cm)**	
CRC3	0-15	15-30
Block no.1	1.35	1.36
Block no.2	1.37	1.39
Block no.3	1.39	1.44
Block no.4	1.34	1.38
Block no.5	1.36	1.40
Block no.6	1.32	1.35
Block no.7	1.35	1.36
Block no.8	1.37	1.39
Block no.9	1.36	1.41
Block no.10	1.34	1.38
Block no.11	1.34	1.39
C.D.	0.03	0.02
SE(m)	0.01	0.01
SE(d)	0.01	0.01
C.V.	1.20	0.98



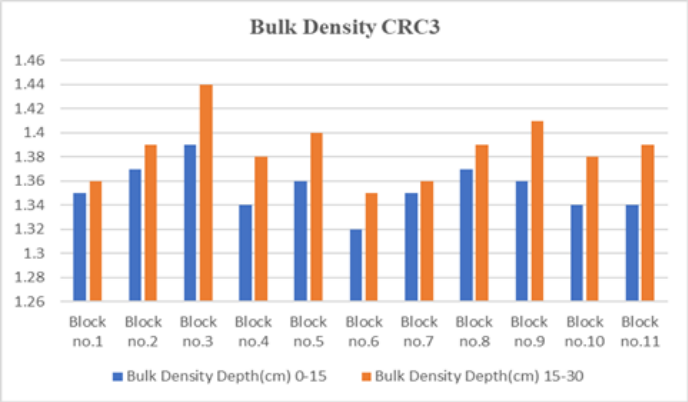


Fig. 1. Bulk Density of the CRC-2 and CRC-3

Table 2. Soil Texture of the CRC-2 and CRC-3

Depth wise distribution of sand, silt and clay % of soil						
	Sand		Silt		Clay	
Location	Depth(cm)		Depth(cm)		Depth(cm)	
CRC2	0-15	15-30	0-15	15-30	0-15	15-30
Block no.1	60.0	56.4	19.5	17.6	21.5	22.3
Block no.2	60.2	56.0	19.3	17.5	20.6	22.3
Block no.3	59.7	55.7	18.5	16.7	19.6	21.4
Block no.4	60.1	56.9	19.8	18.3	21.8	23.4
Block no.5	60.3	56.5	19.7	18.4	20.4	21.5
Block no.6	61.5	57.3	20.2	18.5	20.7	23.3
C.D.	N/A	0.4	0.4	0.4	0.4	0.4
SE(m)	0.3	0.1	0.1	0.1	0.1	0.1
SE(d)	0.4	0.2	0.2	0.2	0.2	0.2
C.V.	0.7	0.4	1.2	1.3	0.9	1.0

Depth wise distribution of sand, silt and clay % of soil						
	Sand		Silt		Clay	
Location	Depth (cm)					
CRC3	0-15	15-30	0-15	15-30	0-15	15-30
Block no.1	60.2	55.9	18.87	17.73	20.4	23.4
Block no.2	59.7	55.7	18.53	16.63	21.5	22.8
Block no.3	60.1	56.5	19.50	18.36	21.8	23.5
Block no.4	60.5	56.4	19.33	16.70	20.6	22.3
Block no.5	60.3	56.0	19.77	17.47	21.5	21.4
Block no.6	61.0	56.9	18.53	18.33	21.4	22.4
Block no.7	60.2	57.3	19.33	17.63	20.6	22.3
Block no.8	61.5	57.6	20.23	19.40	19.6	21.3
Block no.9	60.5	56.4	19.77	18.43	21.5	22.3
Block no.10	60.5	55.7	19.67	18.30	20.4	21.5
Block no.11	60.3	56.0	20.30	17.63	20.7	23.3
C.D.	0.7	0.4	0.35	0.394	0.3	0.4
SE(m)	0.2	0.1	0.12	0.133	0.1	0.1
SE(d)	0.3	0.2	0.16	0.188	0.2	0.2
C.V.	0.7	0.4	1.04	1.292	1.0	1.0

3.2.6 Moisture content

The moisture content of the CRC2 of ITM University is ranged from the 12.33 to 12.77% in the depth of 0-15cm and 12.85 to 13.23% in the depth of 15-30cm. For CRC3 of the ITM University, moisture content is ranged from 12.35 to 12.87% in the depth of 0-15cm and 12.86 to

13.35% in the depth of 15-30cm. Deekor et. al. [20] and Desavathu et. al. [21].

3.2.7 Osmotic pressure

The osmotic pressure of the CRC2 of ITM University is ranged from the 0.175 to 0.183 N m^{-2} in the depth of 0-15cm and 0.182 to 0.187 N m^{-2} in the depth of 15-30cm. For CRC3 of the ITM University, osmotic pressure is ranged from the 0.174 to 0.184 N m^{-2} in the depth of 0-15cm and 0.182 to 0.190 N m^{-2} in the depth of 15-30cm.

3.2.8 Total dissolved soil

The total dissolved soil of the CRC2 of ITM University is ranged from the 493.0 to 497.1% in the depth of 0-15cm and 497.7 to 503.9% in the depth of 15-30cm. For CRC3 of the ITM University, total dissolved soil is ranged from the 494.1 to 498.8% in the depth of 0-15cm and 497.2 to 503.5% in the depth of 15-30cm.

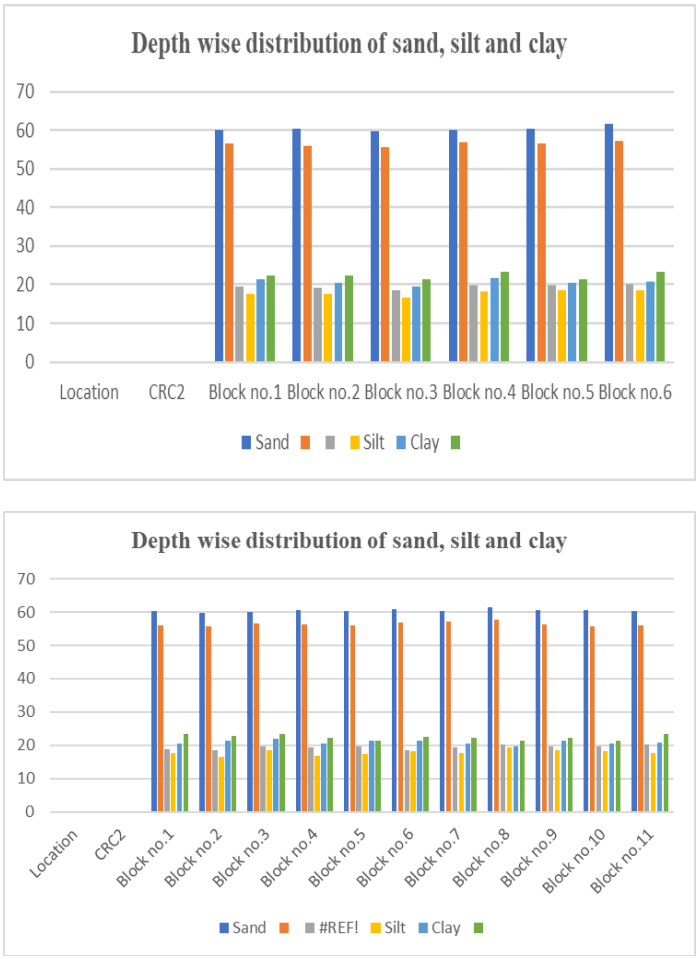


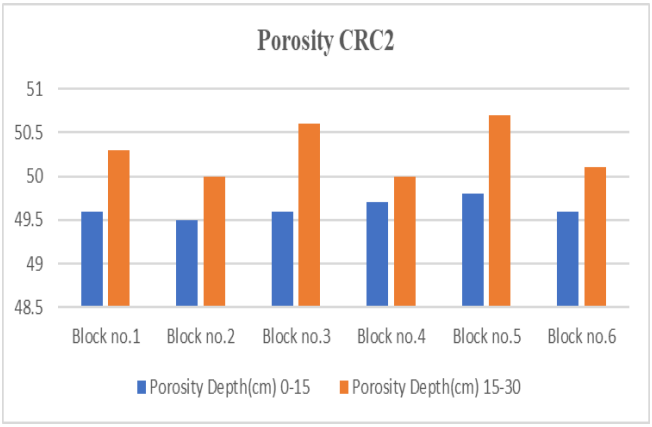
Fig. 2. Soil Texture of the CRC-2 and CRC-3

Table 3. Porosity of the CRC-2 and CRC-3

	Porosity (%)	
Location	**Depth(cm)**	
CRC2	0-15	15-30
Block no.1	49.6	50.3
Block no.2	49.5	50.0
Block no.3	49.6	50.6
Block no.4	49.7	50.0
Block no.5	49.8	50.7
Block no.6	49.6	50.1

Porosity (%)		
Location	**Depth(cm)**	
C.D.	N/A	N/A
SE(m)	0.1	0.2
SE(d)	0.2	0.3
C.V.	0.5	0.6

Porosity (%)		
Location	**Depth(cm)**	
CRC3	0-15	15-30
Block no.1	50.3	50.6
Block no.2	50.0	50.0
Block no.3	50.7	50.9
Block no.4	50.1	50.1
Block no.5	49.7	50.0
Block no.6	49.6	50.6
Block no.7	49.5	49.6
Block no.8	49.6	50.7
Block no.9	49.7	50.1
Block no.10	49.6	50.0
Block no.11	49.7	49.7
C.D.	0.5	0.3
SE(m)	0.2	0.1
SE(d)	0.2	0.1
C.V.	0.5	0.4



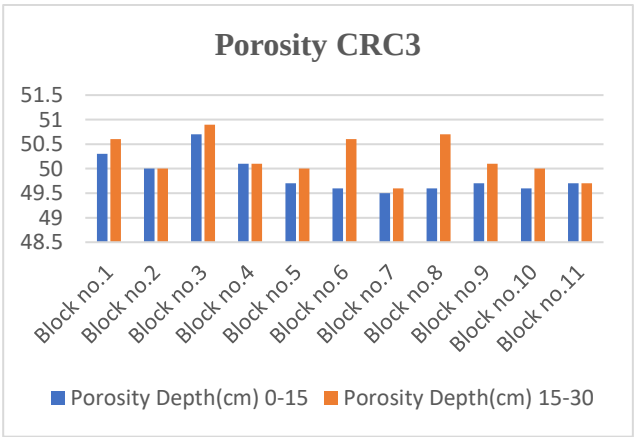


Fig. 3. Porosity of the CRC-2 and CRC-3

Table 4. Particle Density of CRC-2 and CRC-3

Particle Density (g cm^{-3})		
Location	**Depth(cm)**	
CRC2	0-15	15-30
Block no.1	2.53	2.77
Block no.2	2.50	2.65
Block no.3	2.33	2.61
Block no.4	2.57	2.77
Block no.5	2.59	2.80
Block no.6	2.50	2.63
C.D.	N/A	N/A
SE(m)	0.09	0.08
SE(d)	0.13	0.12
C.V.	6.41	5.32

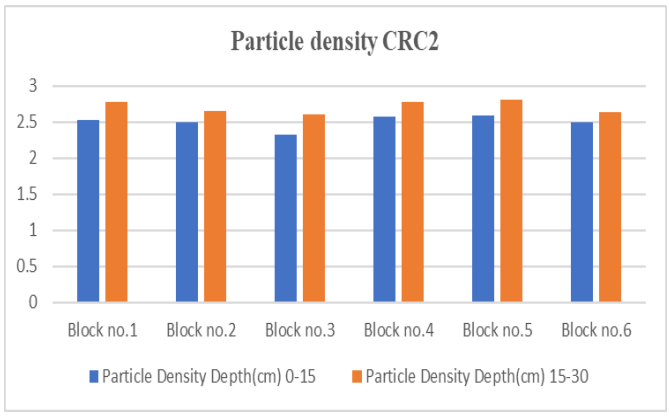
Particle Density (g cm^{-3})		
Location	**Depth(cm)**	
CRC3		
Block no.1	2.52	2.73
Block no.2	2.51	2.73
Block no.3	2.50	2.77
Block no.4	2.37	2.60
Block no.5	2.53	2.77
Block no.6	2.50	2.60
Block no.7	2.33	2.59
Block no.8	2.57	2.60
Block no.9	2.58	2.90
Block no.10	2.43	2.80
Block no.11	2.30	2.63
C.D.	N/A	N/A
SE(m)	0.09	0.09
SE(d)	0.13	0.13
C.V.	6.54	5.92

Table 5. Moisture Content of the CRC-2 and CRC-3

Moisture Content%		
Location	**Depth(cm)**	
CRC2	0-15	15-30
Block no.1	12.50	13.04
Block no.2	12.33	12.85
Block no.3	12.43	12.98
Block no.4	12.67	13.21
Block no.5	12.77	13.23
Block no.6	12.73	12.87
C.D.	N/A	0.27
SE(m)	0.11	0.09
SE(d)	0.15	0.12
C.V.	1.49	1.13

Moisture Content%		
Location	**Depth (cm)**	
CRC3	0-15	15-30
Block no.1	12.77	13.21
Block no.2	12.87	13.35
Block no.3	12.57	13.23

Moisture Content%		
Location	**Depth (cm)**	
Block no.4	12.43	13.03
Block no.5	12.67	13.10
Block no.6	12.77	13.18
Block no.7	12.73	13.13
Block no.8	12.50	13.04
Block no.9	12.35	12.86
Block no.10	12.57	12.98
Block no.11	12.67	13.21
C.D.	N/A	0.26
SE(m)	0.11	0.09
SE(d)	0.16	0.13
C.V.	1.52	1.17



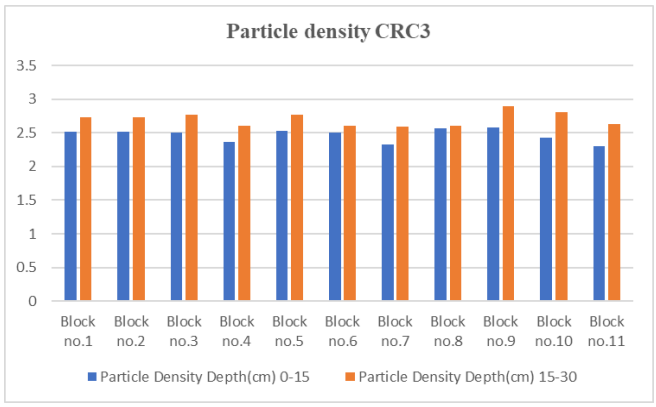
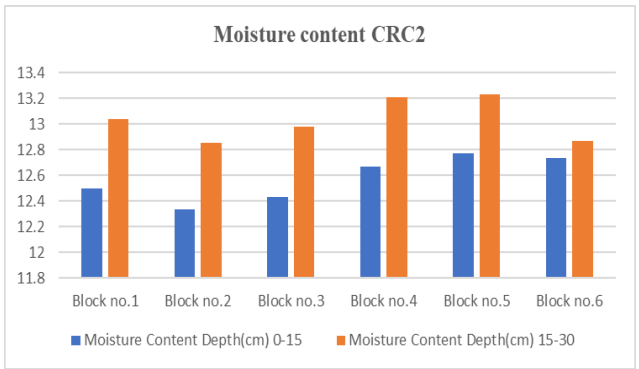


Fig. 4. Particle Density of CRC-2 and CRC-3



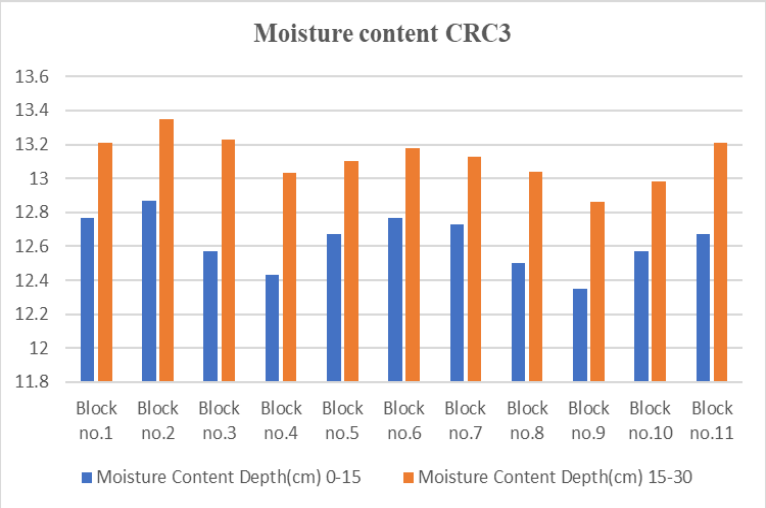


Fig. 5. Moisture Content of the CRC-2 and CRC-3

Table 6. Osmotic Pressure of the CRC-2 and CRC-3

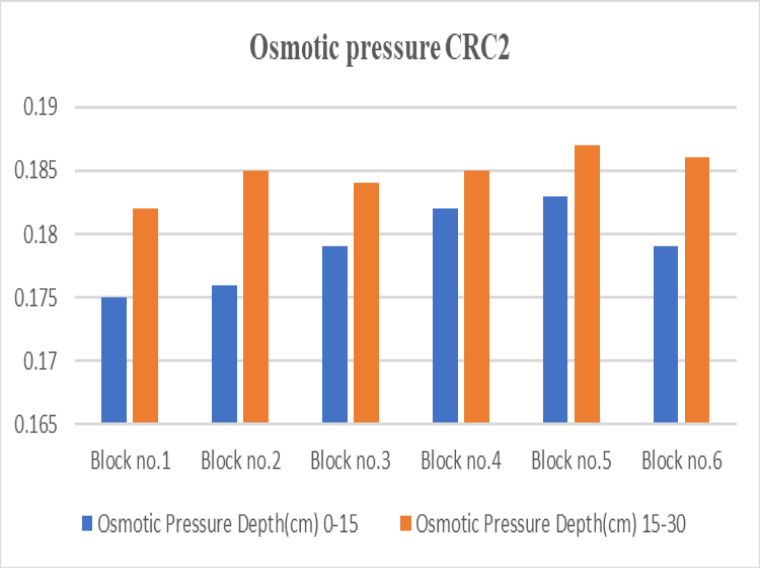
Osmotic Pressure (N m^{-2})		
Location	**Depth(cm)**	
CRC2	0-15	15-30
Block no.1	0.175	0.182
Block no.2	0.176	0.185
Block no.3	0.179	0.184
Block no.4	0.182	0.185
Block no.5	0.183	0.187
Block no.6	0.179	0.186
C.D.	0.003	N/A
SE(m)	0.001	0.001
SE(d)	0.001	0.001
C.V.	0.933	0.96

Osmotic Pressure (N m^{-2})		
Location	**Depth (cm)**	
CRC3	0-15	15-30
Block no.1	0.174	0.182
Block no.2	0.181	0.186
Block no.3	0.177	0.185
Block no.4	0.176	0.184
Block no.5	0.179	0.187
Block no.6	0.182	0.185
Block no.7	0.184	0.190
Block no.8	0.179	0.185
Block no.9	0.176	0.186
Block no.10	0.18	0.187
Block no.11	0.177	0.185
C.D.	0.003	0.002
SE(m)	0.001	0.001
SE(d)	0.001	0.001
C.V.	0.987	0.754

Table 7. Total Dissolved Soil of the CRC-2 and CRC-3

Total Dissolved Soil (%)		
Location	**Depth(cm)**	
CRC2	0-15	15-30
Block no.1	493.0	497.7
Block no.2	493.2	500.4
Block no.3	495.4	502.7
Block no.4	494.4	500.5
Block no.5	495.5	501.9
Block no.6	497.1	503.9
C.D.	N/A	1.4
SE(m)	1.1	0.5
SE(d)	1.5	0.6
C.V.	0.4	0.2

Total Dissolved Soil (%)		
Location	**Depth(cm)**	
CRC3	0-15	15-30
Block no.1	494.4	497.7
Block no.2	495.5	500.4
Block no.3	497.1	502.7
Block no.4	498.8	503.5
Block no.5	497.3	500.7
Block no.6	493.2	500.4
Block no.7	495.4	502.7
Block no.8	494.1	497.2
Block no.9	495.5	501.9
Block no.10	497.1	500.9
Block no.11	496.9	502.2
C.D.	2.5	1.2
SE(m)	0.9	0.4
SE(d)	1.2	0.6
C.V.	0.3	0.1



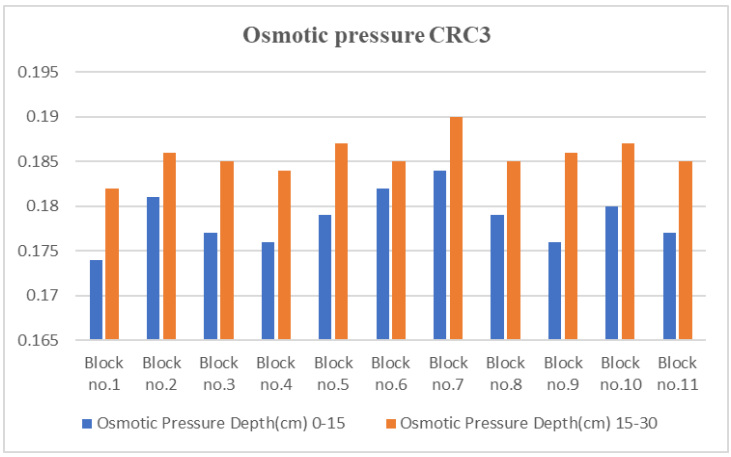
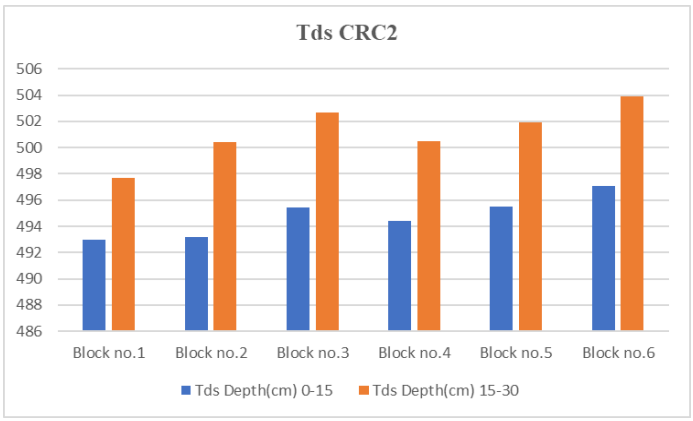


Fig. 6. Osmotic Pressure of the CRC-2 and CRC-3



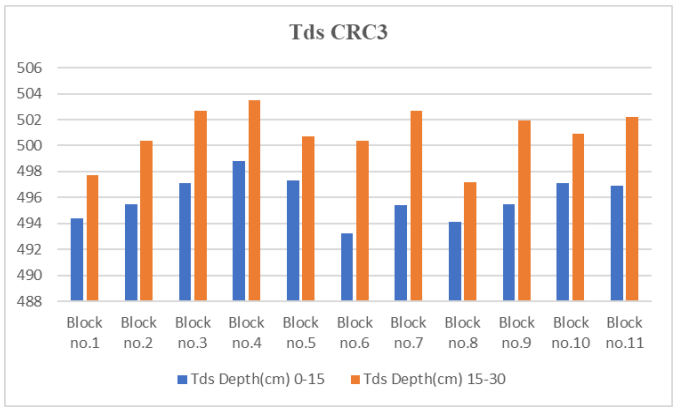


Fig. 7. Total Dissolved Soil of the CRC-2 and CRC-3

4. CONCLUSION

The recent distributions of physical properties of soil in different depths of soil has been analysed and collect at the different blocks of CRC2 and CRC3 of ITM University Gwalior. The bulk density of soil is increased while the depth of the soil is increased at all the blocks of the CRC2 and CRC3 fields. The mechanical analysis of the soil the sand and silt particles decrease significantly while the depth is increase and for the clay particles increase the depth increased the particles. The porosity of the soil for the both fields increase the depth of the soils decrease the porosity of the soils. If the depth of the soil is increase then the moisture content will be increased. For the osmotic pressure the depth of the soil is increase then the osmotic pressure will

be increased. If the depth of the soil is increase then the total dissolved soil will be increased.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

I use the AI for the correction of the languages and some grammar of the sentence and paragraph.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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