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PHYSICO- CHEMICAL PROPERTIES OF SOIL (SECL) KUSMUNDA AREA DIST KORBA (CG)

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ABSTRACT

An investigation was carried out to study the soil properties at the Kusmunda of korba Dist. The main objectives of this study is 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 of Kusmunda. Maximum Matasi Soil Samples of Kusmunda block have low water retention capacity & low fertility status. Then on saline nature of soil is due to the presence of carbonates & bicarbonates of Na+Ca2+,Mg2+,K+ and acidic nature is determined by the presence of chloride or sulphate salts of Na+ Mg2+ etc. High correlation between pH & Conductivity in soil is that pH values affect the conductivity. Conductivity based on salt ion mobility of soil. A decrease in the pH value decreases E.C. or any change in pH value induces a change or variability in the E.C. With the help of this study we found the pH & 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. 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.

Keywords: Deficiencies Toxicity, Loamy Soil, Parameters, Conductivity.

INTRODUCTION

Life on earth depends directly on the living soil and the aquatic ecosystem of rivers. Without fertile soil and the microbial fauna that inhabit it food would not grow, dead things would not decay and nutrients would not be recycled. Yet the earth's soils are beings stripped away, rendered sterile and contaminated with toxic chemicals at a rate that cannot be sustained.

Soils are most valuable natural resources on which the agriculture production is based. The production of food, fodder, and fuel to fulfill the ever growing needs of human being and animal are depends on Agriculture and allied per suits, based on exploration of the soil resources. Further, the varieties of industrial products are also dependent on farm and forest produces directly derived from the soil. Familiarity with the potentiality of soil, knowledge of their limitation and their use and method of management of soil without deterioration are important for sustained production. It is further important to bring the deteriorated land in the use after due reclamation. Knowledge of such kinds of soil and their extent is important for proper planning and optimum use for maximization for agriculture production. Soil survey is the only tool for making the inventory of soils.

THE STUDY AREA

The study area of the present investigation is located at kusmunda, Korba, CG. India.

A careful literature survey reveals that soils of C G state are acidic of acid prone. We know that the Kusmunda, Korba district is more irrigated area in C G

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None of the agency has carried out any type of soils survey work in the command area of Kusmunda irrigation area, It is so experience that a lots of problem like salinity, soil acidity, water logging, fertility may develop in the irrigation project area if water, NPK not properly available in the soil. In order to know the details of soil and to overcome the bad after effect of irrigation, the soil survey was felt necessary, as the area was more and time was less

Hence a reconnaissance soil survey was carried out from December to March 2014.

Kusmunda, Korba District is more irrigated area in CG. It reveals that the soil of newly formed C G is acidic or acid prone. So the sampling sites soil is also acidic. There is all types (Kanhar, Matasi, Dorsa) of soil are found in Kusmunda Korba.

Different ratio of available soil in Kusmunda, Korba are as follow:-

Dorsa	:	33.92%
Kanhar	:	28.10%
Matasi	:	26.65%

OBJECTIVE OF THE PRESENT WORK

The main aim and objectives of this study is:

1.General Physic – Chemical characteristic of the soil.

2.Importance of the macronutrient (NPK).

3.Analysis of the macronutrient (NPK) of different soil samples.

Soil Sample Process

The testing in the laboratory requires only a few grams of the soil sample, yet the sample sent to the laboratory must be a true representative of the field in question. In a homogenous field, soil samples fror C Glough layer (0-15cm) should be selected randomly in a zig-zag manner. The samples should not be collected from near the bunds, water channels, field paths and heaps of crop straw, stubbles, manure, etc.

1. The sample collected from the selected sites should be composite and mixed thoroughly in a container.
2. From this lot a representative sample, about 500 gm should be taken out and air-dried under shade.
3. The air-dried sample should be transferred into a clean cloth bag bearing a slip with a mention of complete address, field number, cropping sequence being followed, source of irrigation (tubewell/canal), soil type (coarse textured fine textured, alkali or waterlogged), fertilizer/manure schedule followed in the preceding crops and any other specific observation about the soil and/or the crops grown therein.
4. Then the sample should be taken to the laboratory where facilities for testing soils for micronutrients are available.
5. **Prescribed Area for taking Soil Samples**

Land Use	Area(in Hect.)
Pastures, permanent grass	5-10
Cultivated Crops: -level terrain -eroded terrain -irrigated terrain	 2 - 5 1 - 2 0.5 – 1
Orchards, vineyards, forests	0.5 – 2
Vegetable gardens, irrigated	0.5 – 1
Greenhouse, nursery, lawns	0.1 - .2

6. When to Take Samples
7. At least one month before planting time.As a rule 'if soil is too wet to plow, it is too wet to sample'.Try collecting samples at the same time every year
8. Frequency of Soil Sampling
9. Soils from coastal plains, sandy, light textured soils - sample once after every 2-3 crops Silty, clay loams and mountain soils- sample once every four cropping years.

Soil Sampling Tools

1. Easy to clean, rust resistant, strong and easy to use
2. Take small, equal volume of soil from each sub-sampling site to obtain composite size.
3. Adaptable to dry sandy soils as well as moist sticky soil
4. Provide uniform cores or slices of equal volume at all spots within the composite area

Soil tube, screw auger, spade, shovel are some of the sampling tools most commonly-used.

If spade or shovel is used, it is advisable to make a 'V' shaped cut into soil at required depth and few cm thick vertical slice is removed to the same depth from both sides. Before sample collection, organic debris, rocks and trash must be removed from the surface of sampling area.

Depth of Sampling

Prescribed Depths of soil Sampling

Crop/Soil	Sampling Depth (Cm)
Arable crops	15
Orchards	20-30
Lawns and Turf	10
Gardens	15
Deep rooted crops / Problem soils	30/60
Regular tillage	20
Minimum tillage	15
Zero tillage	15-20
Continuous ridge	10/15
Pastures and Forages	8-10

Directions while Soil Sampling and Preparation

1. Soil samples should not be collected from recently fertilised areas, bunds, low lying corners, spots near trees, fences, channels, compost pits, etc.
2. Samples should be drawn between rows in line sown cropping areas.
3. Sampling should be done separately for areas represented by different crops, problem spots, etc.

4. Once the soil is collected, the bulk soil is mixed thoroughly and desired quantity of soil sample is obtained by 'quartering method'.
5. Soil samples should not be placed in fertiliser bags, and in porous cloth.
6. Wet samples should be dried in shade before sending them to the laboratory.

Soil Test Interpretation for Fertilizer Recommendations

After collection and analysis of soil samples, it is the responsibility of the analyst/scientist to interpret the results and properly give the fertiliser recommendations to farmers. Many people have an impression that soil testing is a simple procedure to determine the plant nutrients that are deficient and recommend those nutrients in fertiliser form so that harvests are assured. Nevertheless, soil testing is much more than determining nutrient availability.

Various approaches used for fertiliser recommendations

1. Generalisedfertiliser recommendations (or) Agronomic fertiliser recommendations.
2. Fertiliser recommendations based on soil critical levels
3. Fertiliser recommendations adjusted based on soil fertility categories
4. Fertiliser recommendations for maximum yield
5. Fertiliser recommendations for certain percentage of maximum yield
6. Fertiliser recommendations for specific yield targets

Soil Test Calliberation

Incorporation of generated data through intensive research and establishing a significant relationship between.

1. Soil test values and the uptake of applied plant nutrients by a particular crop
2. Calibration between soil tests values and crop yield responses to rates of plant nutrients applied through fertilisers in the field
3. Changes in soil test values that occur when known quantities of fertilisers are applied to the soil

Table 1. Ratings of soil test parameters

Nutrients	High	Medium	Low
Organic carbon (%) as a measure of available N	<0.5	0.5 - 0.75	>0.75
Available N by alkaline permanganate method (kg/ha)	< 280	280-560	>560
Available P by Olsen's method (kg/ha)	<10	10-24.6	>24.6
Available K by ammonium acetate method (kg/ha)	<108	108-280	>280

Table 2. Obtained pH value of different soil samples are as follows

S.N.	Soil Samples	pH
	1	2
1	B1	7.14
2	B2	6.87
3	B3	7.04
4	A1	7.08
5	A2	6.48
6	A3	7.35
7	E1	7.42
8	E2	6.72
9	E3	7.14

Table 3. Percentage of Organic Carbon in taken soil samples

s.n.	Soil Samples	Org. Carbon (in %)
	1	2
1	B1	0.210
2	B2	0.330
3	B3	0.465
4	A1	0.300
5	A2	0.585
6	A3	0.510
7	E1	0.390
8	E2	0.570
9	E3	0.345

Table 4. Available Nitrogen in taken soil samples are as follows

s.n.	Soil Samples	Available N (kg/acre)
	1	2
1	B1	95
2	B2	143
3	B3	180
4	A1	143
5	A2	235
6	A3	200
7	E1	180
8	E2	200
9	E3	143

Table 5. Available Phosphorus in taken soil samples

S. No.	Soil Samples	Available P (kg/acre)
	1	2
1	B1	12.54
2	B2	14.33
3	B3	12.02
4	A1	8.96
5	A2	11.64
6	A2	15.23
7	E1	16.12
8	E2	9.85
9	E3	18.81

RESULT

Table 6. The values obtained in the experimental sections

s.n.	Soil Samples	Characters					
		pH	E.C.	O. C. (in %)	Available N (kg/acre)	Available P (kg/acre)	Available K (kg/acre)
	1	2	3	4	5	6	7
	B1	7.14	0.21	0.210	95	12.54	402.52
	B2	6.87	0.37	0.330	143	14.33	303.07
	B3	7.04	0.18	0.165	180	17.02	357.52
	A1	7.08	0.32	0.300	143	8.96	322.20
	A2	6.98	0.23	0.585	235	11.64	417.93
	A3	7.35	0.09	0.510	200	15.23	367.65
	E1	7.42	0.28	0.390	180	16.12	350.55
	E2	6.72	0.35	0.570	200	9.85	291.03
	E3	7.14	0.46	0.345	143	18.81	384.97

B1, B2, B3 = Soil Samples of Hoshangabad area.
A1, A2, A3 = Soil Samples of Tikhad area.
E1, E2, E3 = Soil Samples of Babai area.

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