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STUDY OF PHYSICO-CHEMICAL PARAMETERS OF IRRIGATED AND NONIRRIGATED SOIL

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STUDY OF PHYSICO-CHEMICAL PARAMETERS OF IRRIGATED AND NON-IRRIGATED SOIL

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ABSTRACT

Soil testing is important to increase crop yield from soil. The source of water is an important factor for transfer essential nutrient to crop. Here we selected some irrigated and non-irrigated soil sample for analysis. In this work we analysed pH, Electrical Conductivity, TDS, Salinity, Organic Carbon, Phosphorous (P), and Potassium (K). The Borwell and dam water is more useful for crop production.

Key-words :- Soil, Water, Physico-Chemical parameters.

INTRODUCTION

Soil and water are the most important natural resource and physical base for all life supporting system as water system as water system as water system life where soil acts as a medium.¹ Soil sampling was not difficult but it was new experience for me. The idea that one could or analyze a soil and obtain some information about properties especially its pH,² electrical conductivity,³ acidity,⁴ salinity⁵ and its nutrients status is long established and can be traced back the beginning of scientific inquiry about the nature of soil.⁶

A soil or a field may be assessed for its capability of providing a crop with essential or to check parameters in several ways

1. Field plot fertilizer trials
2. Deep black soil experiments
3. Plant analysis
4. To check the PH and Electrical conductivity

While all these approaches can be used in research the latter one is most amenable and one upon which recommendation for farmers can be used.⁷ In this paper tests primarily focus on the element in most demand crop which are supplied in most demand crop which are supplied by fertilizer, Nitrogen (N) and organic carbon, phosphorus (P) and potassium (K).⁸ As nutrient behaviour in soil is governed by soil properties and environmental condition measured of such properties is often required.⁹ Include pH, Salinity, organic matter (OM), calcium carbonate (CaCO₃), and texture soil testing involves for dynamic phase.¹¹

1. Sample collection –

This should be such that it reliably reflects the average status be such of a field for the parameters consider.

2. Fertilizer Recommendation –

This is based upon the soil calibration for field condition and consider other factor such as yield target, crop Nutrient requirement, soil type and method of fertilizer application etc. Deep black soil and water (Borwell, Rain, and Damwater) is used in this project.

METHODOLOGY

Soil and water are the most important natural resource that meet all human need and protect the environment and the civilization. Some of the nutrients (organic carbon, phosphorous, and potassium and parameters pH, electrical conductivity, salinity, TDS) of black soil and water are measured in this work. In this research work, black soil in lower part is used. Black soil is used in effect on growth of plant. Water holding capacity is high in black soil. In this project, precipitation in the principle water source during the cropping season, hence soil water storage is very important for agriculture production.

Physico-Chemical Parameters of Irrigated and Non Irrigated Soil

Village Name	Water	PH	Conductivity	Organic Carbon	Phosphorus	Potassium	Salinity	TDS
Sonai	Borwell+Dam	7.37	0.60	0.79	5.45	201.06	00.1	0.27
Katarad	Rain water	7.59	0.52	1.61	0.64	365.57	02.1	2.92
Shiregav	Dam	7.55	0.56	14.41	14.41	467.58	00.0	0.27
Vanjarwadi	Dam	8.01	0.57	9.93	9.93	314.63	00.2	0.48
Wamburi	Borwell	7.77	0.74	30.43	30.43	260.74	00.2	0.63
Rahuri	Dam	7.50	0.44	7.69	7.68	602.65		
Avarwadi	Borwell	7.45	0.71	14.73	14.73	197.30	00.2	0.44
viladghat	Borwell+Dam	7.01	4.23	133.57	133.57	899.67	00.0	0.14
Baramphure	Dam	7.71	0.81	0.96	0.96	281.03		
Maka	Borwell	7.49	0.34	8.33	8.33	194.07	00.0	0.19

RESULT AND DISCUSSION

a) pH

Soil is measure of the concentration of hydrogen ion in the soil solution Low PH values (< 5.5) indicate acidic soil and high PH value (>8.0) indicate alkaline soil. Soil PH between 5.5 and 8 is not usually a constraint to crop or pasture production. Soil PH is measure of the acidity or basicity of a soil. In soil, it is measured in a slurry of soil mixed with water (or a salt solution such as 0.01M CaCl₂) and normally fall between 3 and 10, with 7 being neutral. Acid soils have a PH below 7 and alkaline soils have a PH above 7. The optimum soil have a PH range for most plants is between 5.5 and 7.5

b) Electrical Conductivity

Soil electrical conductivity (EC) is a measurement that correlates with soil properties that affects crop productivity. Including soil texture, cation exchange capacity (CEC) drainage condition, organic matter level, salinity and sub soil characteristics soil electrical conductivity (EC) is measure of the amounts of nitrogen (N) available for plant growth.

c) Organic Carbon

Total organic carbon is the amount of carbon found in an organic compound and is carbon found in an organic compound and is often used as a non-specific indicator of water quality or non-specific indicator of water quality or cleanliness of pharmaceutical manufacturing equipment. Higher soil organic carbon promotes soil structure or tilth meaning there is greater physical stability. Soil organic carbon is a measurable components of soil organic matter. Organic matter makes up just 2-10% of most soil mass and has an important role in the physical, chemical and biological function of agricultural soils. Soil carbon management is an important strategy for improving soil quality, increasing crop yield and reduction soil loss

d) Phosphorous

Phosphorus is found in soil both in an organic form and an un-organic (mineral) form and its solubility in soil is low. In the optimum range between 30 and 50 ppm phosphorous is often recommended to offset crop removal and thus maintain the soil in the optimum range over time. A level of 40 to 60 ppm is desirable for good yield of most crop. The bicarbonate p (sodium bicarbonate) test measure the amount of readily available phosphorous is slightly basic (PH of 7.0-7.2) to highly basic soil (PH 7.3 and greater). In basic soil, the phosphorous exists mostly as alkaline earth phosphate.

e) Potassium

Both nitrogen and phosphorous are constituent of the soil organic matter, but potassium is not soil. Soil organisms have a much requirement for potassium than plants do. The level of potassium in soil 110 – 280 Kg/ha is medium and 110 is low level of potassium in soil. In photosynthesis, potassium regulates the opening and closing of stomata and therefore regulates the CO₂ uptake. Potassium trigger activation of enzymes and is essential for production of Adenosine Triphosphate (ATP).

f) Salinity

Soil salinity is the salt content in the soil, the process of increasing the salt content is known as salinization. Salts occurs naturally within soils and water Salinity not only decrease the agriculture production of most crops, but also effects soil physicochemical properties and ecological balance

of the area. The impact of salinity include – low agriculture productivity, low economic returns and soil erosions.

CONCLUSION:-

From the result obtained from survey, various comparisons and experiments, major conclusion were made as follows, Physico-chemical parameters determine the quality of black soil. The PH of the soil has increased in the Borwell and Dam Water. The Electrical Conductivity has increased in the Borwell and Dam Water. The Organic Carbon has increased in only Dam water. Macro Nutrients, P and K, of the increased in the Borwell and Dam water. Salinity has highly present in the only Rain Water. TDS has high in the rain water. Hence the Borwell and Dam Water are best in the crop yield.

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