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PHYSICO CHEMICAL ANALYSIS OF SOIL IN THE DEFFERENT REGION OF GONDIA

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ABSTRACT:

Composite sampling can be performed by combining soil from several locations prior to analysis. This was a common procedure, but should be used judiciously to avoid skewing results. This procedure must be done so that government sampling requirements are met. A reference map should be created to record the location and quantity of field samples in order to properly interpret test results. Oil testing was often performed by commercial labs that offer a variety of tests, targeting groups of compounds and minerals. The advantage associated with local lab was that they are familiar with the chemistry of the soil in the area where the sample was taken. This enables technicians to recommend the test that are most likely to reveal useful information.

Key words :-

INTRODUCTION:

Soil test commonly refers to the analysis of a soil sample to determine nutrients content, composition & other characteristics such as the acidity or pH level. A soil test can determine fertility or the expected growth potential Of the soil which indicates nutrients deficiencies, potential toxicities for excessive fertility and inhabitations from the presence of non essential trace minerals. The test was used to the function of roots to assimilate minerals. The expected rate of growth was modeled by the law of maximum.[5]

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Soil testing was often performed by commercial labs that offer a variety of tests, targeting groups of compounds and minerals. The advantage associated with local lab was that they are familiar with the chemistry of the soil in the area where the sample was taken. This enables technicians to recommend the test that are most likely to reveal useful information.[7]

STANDARD SOIL TESTS:- Laboratory tests often check for plant nutrients in three categories :-

- Major nutrients: nitrogen (N), phosphorus (P), and potassium (K).
- D Secondary nutrients: sulphur, calcium, magnesium.
- Minor nutrients: iron, manganese, copper, zinc, boron, chlorine.

The relative amount of these particles are used to categorize soil into textural classes. Listed generally from most clayey to most sandy these are clay, silty clay, sandy clay, silt clat loam, clay loam, sandy clay, loam, sandy clay loam, silt, silt loam, sandy loam, loamy sand and sand. Clayey soils hold more water and nutrients, but are more difficult to till and may absorb water very slowly. Sandier soils accept water quickly, are easy to till, but hold little water and may require frequent irrigation and fertilizer application.[9]

Calcium (Ca):- calcium was an important constituent of plant cell walls, thereby giving overall strength to the plant. Calcium was also essential for good root development and may serve to neutralize some toxic compounds present in the plant .

pH Soil :- pH was a measure of the acidity or alkalinity of a soil. Arizona soils are generally alkaline (high pH; pH 8.0 to 8.5) and although pH adjustment was not a; common practice, amendments containing sulphur can be used to lower pH levels.

Nitrogen (N):- Nitrogen analyses are not difficult to conduct, but interpreting results can be problematic. This was because plant availability of soil N depends on 0-M breakdown, which cannot be predicted from a soil test. Nitrogen in the nitrate form (NO-3-N) was directly available to plants however $N0_3N$ can be quickly lost from soil. Be aware that nitrate analyses provides a

'Snapshot' of available N, but may not indicate N availability later in the growing season.

Phosphorus (P):- Most soil P was tightly bound to the soil particles. The P- containing complexes in alkaline soils are very different that those in neutral or acidic soils. The amount of P removed during soil extraction was dependent on the nature of P complexes and on the specific extract ant used, so it was critical that P extract ants be matched to soil properties. The Olsen or bicarbonate extract ant was appropriate for Arizona soils and was a reliable and useful soil test in our state. On a soil test report, the analysis may be reported as P04-P.

MATERIAL & METHODS:

- First divide the field according to the slope, color, depth, texture, management &cropping patter, after demarcation of field into uniform portion each of this must be sampled separately.
- Then divide each unit in two parts. Draw the zigzag line having about 8 to 10 corner on both the sides of middle line so that it will cover the whole area.
- Where the crops have been planted, collect the soil sample between the lines.
- Do not sample unusual area. Avoid area recently fertilized, old bund, marshy spots, near trees, compost heaps or the non-representative location.
- Use proper sampling tools like auger, soil tube, phaida (spade) or khurpi (trowel).
- Before taking the sample, scrape away surface; litter or any stone etc. collect the soil samples from 10 to 20 spots in the field depending upon the area. At each of the zigzag line take the sample by augar at the depth of 15-20cms or with the help of trowel & spend by digging "1/' shaped hole up to plow/plough depth, Then cut out uniform thick 2cms slice of soil from bottom to top of exposed soil surface, collect the sample on the blade or in your hand & place it in clean bucket.
- Collect the sample from the uniform area into the same bucket,
- Pour the soil from the bucket on a piece of clean paper or cloth & mix thoroughly.
- Discard by quartering, excess of soil and collect approximately h kg. Of soil.
- TO quarter the sample, mix well divide into four equal parts &Reject opposite quarter.
- Mix the remaining two portions & repeat the procedure as many time a necessary to arrive at the desired size sample.
- If the sample was wet or moist, dry it in the shade before putting into plastic bags.

Fill the sample into plastic bag & put the plastic bag into cloth bag.

Fill out the information sheet completely & pack inside the sample

Determination of calcium by EDTA titration method from soil sample:-

1) Standard calcium chloride solution (0.1N): Dissolved exactly 0.5005 gm of A.R. grade CaC03 (dried at 1500C)in minimum (about 10 mi) of 0.2N Hcl (AR). Boil gently to expel the C02. Then make the volume accurately to 1 litre.

2) Erichrome Black T Indicator: Homogenize 0.2 gm of EBT in 50 gm of Kcl or Nacl. Erichrome blue black -B, 0.5% in ethanol. Dissolve 0.5 gm Erichrome blue-black -B in 100 ml of 95 % of ehanot.

3) Sodium Hydroxide (10%): Dissolve 10 gm of NaOH in 100 ml of distilled water.

4) Murexide Indicator: Take 0.2 gm of murexide (also known as ammonium Sulphate) and mix it with 40gm of powdered potassium sulphate. The indicator was kept in powdered form as it goes oxidation in the solution form.

Procedure:-

1. Take 10 ml water sample in 100 ml of conical flask and dilute the content by adding about 25m) of distilled water.
2. Add approximately 5ml of 10% NaOH solution to raise the pH to 12.0 warm to about 600C.
3. Add a pinch of HHSNN indicator mixture or Murexide indicator and titrate with 0.01N EDTA to a pure turquoise blue without any traces of red. This titre value may be considered as B .
4. Before carrying out a batch of determination titration 20ml 0.01N calcium chloride little 0.01N magnesium chloride may be added 0.01N EDTA.

Determination of electrical conductivity of soil sample principle: the method based on the **Procedure:-** 10g of soil was shaken intermittently with 25ml of distilled water n 150 ml conical flask for I hr & allow to stand. Alternatively the clear extract after pH can be used for electrical conductivity measurement. The conductivity of supernatant liquid was determined with the help of salt bridge. The measurement of EC was to be adjust for now temperature of the solution by setting the knob provided for the purpose.

Determination of microbial activity present in soil sample: Nitrogen Fixing Organisms

Media:- Yeast Extracted Mannitol Agar.

Composition:- Suspention 31.8 g in 100 ml distilled water heat to dissolved the medium completely. Sterilize by autoclaving at 151bs pressure (121 ^{0}C) for 15 minutes. Mix well and pour into sterile petriplates.

Procedure:-

1. Prepare the media by dissolved.
2. Sterilize the media by autoclaving at 121 ^{o}C for 15 min.
3. After autoclaving cool the media to 45-500C and pour into sterile petriplates.
4. Allow it to solidify inoculate with soil sample by four way streaking at room temperature and incubate 28^{0}C for 2-3 days.

CONCLUSION:

In a broad sense, soil testing was any chemical or physical measurement made on a soil. Soil testing may, therefore, be defined as a tool for rapid soil chemical analysis to access the available nutrients status & tilth of soil. Interpretation of soil test result & making fertilizer recommendations are based on crop responses & economic consideration

Phase of soil testing:-

- Collection of soil sample from field e Extraction & determination available nutrients
- Interpretation of analytical result & Making fertilizer recommendation

Fertilizer recommendation from soil test crop response studies:-

The research support to soil advisory service comes from soil test crop response correlation studies conductivity in different soil-agro-climate regions. System studies on these lines were initiated under the all India co- ordinate soil test crop response correlation project of Indian council of agriculture research, New Delhi from 1968 at mahatma phule krishi vidyapeeth, rahuri.

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Calcium of soil:-

Sr. No.	Sample Name	Calcium of Soil
1	Khambi	723
2	Nimgoan	740
3	Bondgoan	859
4	Chapti	781

PH of Soil:-

Sr. No.	Sample Name	PH of Soil
1	Khambi	7.046
2	Nimgoan	7.873
3	Bondgoan	7.075
4	Chapti	7.886

Nitrogen of Soil:-

Sr. No.	Sample Name	Nitrogen of Soil N kg ha-1
1	Khambi	83.5
2	Nimgoan	527.4
3	Bondgoan	93.35
4	Chapti	228.17

Electrical Conductivity of Soil:-

Sr. No.	Sample Name	Electrical Conductivity (dsm-1)
1	Khambi	4.232
2	Nimgoan	4.125
3	Bondgoan	4.083
4	Chapti	4.234

Microbial Activity of Soil:-

Sr. No.	Sample of Soil	Nitrogen Fixing Organism	PSB Bacteria
1	Khambi	Present	Present
2	Nimgoan	Present	Present
3	Bondgoan	Present	Present
4	Chapti	Present	Present