Rayat Shikshan Sanstha's

Dr. Patangrao Kadam Mahavidyalaya, Ramanandnagar (Burli)

Department of Geography

Best Practice

SOIL ANALYSIS

2023-2024

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MESSAGE FROM THE PRINCIPAL

Rayat Shikshan Sanstha's Dr. Patangrao Kadam Mahavidyalaya, Ramanandnagar (Burli) promote quality education in response to the changing scenario of society. It imparts secular, liberal, progressive education to the rural students. The college executes the curriculum effectively. It has upgraded teaching learning and evaluation. It has enhanced the research potential of faculty and students. The student centric activities have supported the students and also resulted into their progression towards further education.

We take efforts for fulfilling our Sanstha's vision of educating the youth and inculcating Rayat culture in them. It works according to vision of Sanstha. This practice related the curricular. The aim of this practice is to soil analysis of the nearby village farm soil. Students get the practical knowledge of that practice with the survey of the various villages.

This is one of the best practices of our college demonstrating outcome of visionary of Karmaveer Anna. I appreciate the efforts taken by Soil and water Analysis team and wish them for the Soil analysis practice.

Principal

Rayat Shikshan Sanstha's

Dr. Patangrao Kadam Mahavidyalaya, Ramanandnagar (Burli)

Geography Department

Study Visit – Kundal Sugar Factory

Tal. Palus, Dist. Sangli

Soil Analysis

Introduction:

Successful farm production starts with healthy soil. The soil is primary resource for food production and the most important tool for every farmer. Successful farming depends on the quality of soil, which provides water and essential nutrients to crops. Rich and healthy soil, combined with the appropriate amount of water and sunlight can significantly contribute to a successful farming season and meeting yield quotas. Soil texture cannot be changed, but farmers can always improve soil quality by managing the nutrient levels and soil pH. One of the most important factors in managing soil quality is regular **soil analysis**.

To design a good sampling plan for soil and water testing, one needs to consider the basic facts related to soil formation and water cycling. For both soil and water, we are dealing with complex systems, where biological, chemical and physical factors all interact. Also, soil and water are interconnected, and farming practices affect both soil and water quality.

Statement of purpose:

Ever since the last few decades, with the Technology development, a majority use of chemical fertilizer the farmer are facing a soil problem especially to pH value. Hence Geography department planned to take a activity on soil and water analysis with the help of KrantiAgrni Dr. G. D Bapu Lad Sugar Factory Analytical Laboratory Kundal, Tal- Palus, Dist- Sangli. It is the part of curricula and the good social practice for students.

Aim:

The aim of the practice is Soil analysis is a valuable tool for farmer's farm as it determines the inputs required for efficient and economic production. A proper soil test will help ensure the application of enough fertilizer to meet the requirements of the crop while taking advantage of the nutrients already present in the soil.

Objectives:

1. To Study of Nearby Villege Farm Soil Analysis.
2. To study how to collect the soil sample.
3. To study how to calculate the pH value of soil.
4. To study of PKN calculate process of soil.
5. Report submits to the farmer for the further process.

Constitution:

Prin. Dr. L.D. Kadam	Chairman
Dr. A. S. Khade	Co-ordinator
Ms. A. B. Madavi	Member
Mr. S. A. Maske	Member
Mr. S. R. Patil	Member (Analytical Laboratory Kundal)
Mr. V. J. Patil	Member (Analytical Laboratory Kundal)

Execution:

The field survey part of the syllabus of the practical. In the practical most important factors is Soil Examine. So field Visit organized by the Department of Geography. The department arrange field Visit to going to KrantiAgrni Dr. G. D Bapu Lad Sugar Factory Analytical Laboratory Kundal, Tal- Palus, Dist- Sangli. In this activity 12 students participated. Soil Sample tool, soil analysis and Soil Report study, is the part of our visit. The successfully origination was done by Dr. Khade A.S Head of Geography Department.

Analytical Laboratory:-

Soil Sample Analysis Report

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1. **Soil Profile :-**
2. **Soil Sample Tools :-**
3. **Soil Analysis :-**

Methodology:-

1. Field survey
2. Observation
3. Analysis
4. Photo

Observation:-

1. Lab Work
2. Practical Work
3. pH Value Calculation
4. Soil Sample
5. Soil sampling Tools
6. Works of Machinery
7. Computerized Report

Analysis Report:-

KrantiAgrni Dr. G. D Bapu Lad Sugar Factory Analytical Laboratory soil examine center situated at Kundal, Tal- Palus, Dist- Sangli It's near of Ramanandnagar so we selected it for the field survey.

- **Soil Sample Tools :-**

Soil Sample

Conductivity Meter

Soil pH Counting Process

Soil pH Solution in 3 Range

Flame Photo Meter

Practical Session by Mr. S. R Patil:-

In a practical session we study how to take a soil sample and what is a process of soil testing.

Process or soil Test:-

❖ Quantities required of Soil for Test

Sr.No.	Test	Quantities
1	pH & E.C.	20 gm
2	Organic Carbon	1 gm
3	Potassium (K) & Sodium (Na)	5gm
4	Phosphorus (P)	2.5gm
5	Free Caco3	5 gm
6	Calcium and Magnesium (Ca & Mg)	5 gm
7	Micro Nutrients (Cu, Zn, Mn, Fe)	10 gm

To study how to collect the soil sample: -

Soil sample collect the farm for testing is best time of the before summer. The month of May or June because that time we are not adding any material in the soil so that time is the best for soil collection for the testing.

- ❖ In the farm there were 5 point of the place decide first.
- ❖ Four corner of the farm and the one of the center part of the farm.
- ❖ Then digging 1 feet area.
- ❖ Take the 1 kg soil from the each corner or center.
- ❖ Then mix very well to all 5 kg soil of the farm.
- ❖ Take the soil sample to soil center.
- ❖ In the soil center they take soil and filter the soil.
- ❖ After filtering the soil they take Quantities required of Soil for Test
- ❖ Last they examine all 12 parameter of soil testing and made a soil report in a three and a week.

To study how to calculate the pH value of soil & to study of pH value process:-

Soil sample collect the farm for testing. After collecting soil send to the lab for testing to calculate the pH value of soil. There were a some process doing that,

1. Take a 20 gm soil first in Flask.
2. Then take 50 ml distilled water.
3. Shake the properly.
4. Placed for 1 hour.
5. And check in the pH meter.
6. Then check in the conductivity meter.
7. Soil pH Solution in 3 Range.
8. One is 9.2, second is 4 and third is neutral.

❖ **To study of P.K.N calculate process of soil.**

Soil sample collect the farm for testing. After collecting soil send to the lab for testing to calculate the pH value of soil. In this center 12 parameters taking for test. Only four parameters are in the syllabus to the study. So we study only 4 parameters due to the time limit. That is pH value, Potash (K), Phosphorus and Nitrogen.

To study of Potash (K), calculate process of soil.

1. Take a 5 gm soil sample.
2. Soil Sample in a 100 ml conical flask.
3. Add 25ml ammonium acetate solution.
4. Shake it 5 minute.
5. It filtrates with the help of filter paper.
6. Take 5 ml filtrate solution in 25 ml volumetric flask.
7. Then add 20 ml distilled water up to the mark of flask.
8. Take the reading in the flame photo meter and take 5 dilutions Factor.

To study of Phosphorous calculate process of soil.

1. Take a 2.5 gm soil sample.
2. Add 1 gm Charcoal powder.
3. Add 50 gm sodium bicarbonate.
4. Shake well the properly.
5. Placed for 1 hour.
6. Then filter the solution.
7. Take 5 ml filtrate solution in 25 ml volumetric flask.

8. Add the 1 ml 5N sulfuric acid and 2-4 drops of Para nitro phenol.
9. Solution appeared yellow Color.
10. Then add the 5N sulfuric acid for disappear the color.
11. Add the 4-5 ml solution B and filled the distilled water up to the mark of flask.
12. Check the reading in the spectrometer at the wavelength 882nm.

To study of Nitrogen calculate process of soil.

1. Take a 20 gm soil sample.
2. Take Soil Sample in a 100 ml round flask.
3. Then take 20 ml distilled water.
4. Shake well the properly.
5. Add the 2-3 glass beads and add normally 1ml liquid paraffin.
6. Add 100 ml potassium permanent and 100 ml sodium hydroxide solution and join the flask Kelda's assemble.
7. Stopper the flask immediately and start distillation.
8. The tip of the condenser should dip in the 20 ml of boric acid solution in the beaker on heating ammonia will be liberated which will be absorbed in the boric acid.
9. The original wine red color turns to green with absorption of ammonia.
10. Collect nearly 100 ml of the distillate in about 30 min.
11. Then titrate with 0.02 N sulphuric acids.
12. Run a blank without soil and use the reading.

Soil Analysis:-

Soil sample collect the farm for testing. After collecting soil send to the lab for testing in 12 parameters taking for test. Only four parameters are in the syllabus to the study. So we study only 4 parameters due to the time limit. That is pH value, Potash (K), Phosphorus and Nitrogen. After the soil testing soil report made by computer. In the center we going another lab there were a flame Photo meter are available. There are computer unit in this computer calculate the 4

parameters (**Cu, Zn, Fe, Mn**) of soil, and generate the soil report. There processes are given below:

1. Switch on of machine.
2. To do tight the Nob and loose the gas nob.
3. To start the computer and open the AAS application for further process.
4. Then go to the setting and communication part 1 to start.
5. Then select the lamp 1.
6. Then go to the modes format and select **Standard Calibration** (**Cu, Zn, Fe, Mn**)
7. Then scanning processes start while there were shown a value 2.5.
8. Then go to the view and select Standard Calibration.
9. Then put the Total number of standard.
10. Then put the formation of (**Cu, Zn, Fe, Mn**)
11. Then go to the view and select the sample.
12. Take the print of final report.
13.

Standard Calibration (Cu, Zn, Fe, Mn)

Cu		
Std. No	Conc. (in. ppm)	Absorbance
1	2	0.1580
2	3	0.3544
3	4	0.4699
4	5	0.6060

Zn		
Std. No	Conc. (in. ppm)	Absorbance
1	0.4	0.2239
2	0.6	0.3331
3	1	0.5367
4	1.6	0.8142

Fe

Std. No	Conc. (in .ppm)	Absorbance
1	0	0.0054
2	2.5	0.1268
3	4	0.7729

Mn

Std. No	Conc. (in. ppm)	Absorbance
1	1	0.0722
2	3	0.2338
3	4	0.2902
4	20	0.9408

Six Soil Ratio-

1. Ca: Mg

2. Mg: K

3. K: Na

4. P: S

5. P: Zn

6. Fe: Mn

Conclusion:-

In this study we concluded the summery of the soil examine. It is necessary process for every farmer of land lord, because after the particular time soil has lost the some factor. So soil examine for the pH value and other parameters. When we got the report of soil we conservation of soil degradation. We provided the important and needed factor which one is compulsory to crops fertility. We have known how much pH value of the soil. If less 7 pH which factor is causes and pH more of 7 is which factor are causes. After knowing we maintain the factored and provide composed fertilizer in a land.

Our Student gets the Knowledge of Soil Examine and to aware the farmer for the farther Soil examine. They take the sample form Mr. Sarjerao Shamrao Pawar A/P – Kundal Tal – Palus Dist – Sangli for the Soil Examine after that the received report dated on 9/6/2022.

This Practices to Beneficiated to not only farmer also our students.

Example of Soil Report

क्रांतिअग्रणी डॉ. जी. डी. बापू लाड सहकारी साखर कारखाना लि., कुंडल

ता. पलूस, जि. सांगली (महाराष्ट्र) पिन ४१६ ३०९ फोन : (०२३४६) २७१६०१, २७२०७५

KRANTI SUGAR

■ माती, पाणी व देठ परिक्षण प्रयोगशाळा ■

महाराष्ट्र शासन (कृषि विभाग) नोंदणी क्र. SNG/STLR No. : 011/13

sugarcane 86032

जमिन आरोग्य पत्रिका

शेतक-याचे नांव -	सर्जेराव शामराव पवार						
पत्ता रा.	कुंडल	तालुका	पलुस				
सर्व्हे नं/गट नं-	७२	क्षेत्र -	६०	नमुना क्रमांक -		२२६५७	
पिक प्रकार -	ऊस			दिनांक -	९/६/२०२२		

तपशिल	परिमाण	निरिक्षण	स्पष्टिकरण			
सामू (pH)		८.००	FALSE			
विद्युत वाहकता (E.C.)	mmhos/cm	०.५२०	Normal			
उपलब्ध नत्र (Nitrogen)	Kg/ha	१५५	कमी			
उपलब्ध स्फुरद (Phosphrus)	Kg/ha	३४	मध्यम			
उपलब्ध पालाश (Potash)	Kg/ha	३५९	भरपुर			
सेंद्रीय कर्ब (O.C)	%	१.१०	अत्यंत भरपुर			
कॅल्शियम कार्बोनेट (CaCo३)	%	३.३	साधारण			
युक्त सोडीयम (Na)	MGM%	२३.०				
लोह (Fe)	ppm	४.७०	Modrate PPM	४.५०		
मंगल (mn)	ppm	१२.७०	Modrate PPM	४.५०		
जस्त (Zn)	ppm	०.८५	Modrate PPM	२.००		
तांबे (Cu)	ppm	६.९५	Modrate PPM	०.२०		

पिकाचे नांव--		आडसाली		क्षेत्र	६०
लागणाऱ्या अन्नद्रव्याचे एकूण प्रमाण कि ./हे.	नत्र	स्फुरद	पालाश		
	४००	१८०	१६५		

पध्दती १ किंवा २	खताचे नांव / प्रमाण कि	लागण करताना	४५ दिवसानंतर	९०दिवसानंतर	भरणीचे वेळी		
१)चुनाडीविरहीत जमिनीसाठी	युरिया	५२	२०८	५२	२०८		
	सिंगल सुपर फॉस्पेट	३३८	--	---	३३८		
	पोटॅश	८३	--	---	८३		
२)चुनाडीयुक्त जमिनीसाठी	युरिया	---	२०८	---	२०८		
	अमोनिअम सल्फेट	९९	--	९९	---		
	डी. ए. पी.	११७	--	---	११७		
	पोटॅश	८३	--	---	८३		
सुक्ष्म मुलद्रव्ये	मॅग्नेशियम सल्फेट	फेरस सल्फेट	मॅगेनिज सल्फेट	झिंक सल्फेट	कॉपर सल्फेट	गंधक	बोरॉन
लागण करताना कि ग्रॅम	१८	९	३	९	०	१८	२
भरणीचे वेळी कि ग्रॅम	१८	६	३	६	०	१८	१.२

टिप :- सर्व पिकासाठी हेक्टरी २५ मे. टन शेणखत/ कंपोस्ट किंवा क्रांती गांडुळ खत मे. टन वापरावे , सदरचा रिपोर्ट कोर्टाच्या कामासाठी वापरता येणार नाही.

टिप :- ऊस बेणे प्रक्रियेसाठी पी.एस.बी. व ॲसीटोबॅक्टर वापरावे.

प्रयोगशाळा प्रमुख

Photo gallery :- Soil Analysis Computer Lab: -

Photo gallery: -