Soil & Water Analysis (UG)
Syllabus (2017-18)

Introduction:

Soil so essential to life on earth is one of the most complicated of materials.[1-2] A complex mixture of inorganic and organic solids, liquids, and gases, soil presents a challenging material for analysis,[3-5] especially for researchers who are not specialists in soil chemistry. This clear, broadly applicable reference provides chemists and environmental scientists with the background they need to analyze soil, interpret their findings, and develop new analytical methods for soil. Introduction to soil chemistry will also be valuable to the soil scientist confronting soil analyses. Analysis and instrumentation investigates the most important soil characteristics that impact analysis and the procedures, chemicals, and equipment used to determine the composition and quantity of soil constituents.[6-12] It also discusses factors that interfere with accurate soil analysis.

Soil Sample Preparation:

Ideally, a soil should be tested without disturbing or altering it chemically or mechanically in the process of sample preparation. This would require testing in situ, which is not technically feasible today. For the convenience of handling and to provide a homogenous mix for subsampling, soil samples are usually dried and pulverized. Subsamples of the dry, pulverized soils are either weighed or measured by volume. Galvanized containers, cast iron mortars, rubber stoppers, brass screens and a variety of other tools can contribute to contamination with iron, zinc and other micronutrients, and should not be used.

Sample handling before analysis can affect soil test results. It has been shown[13, 23, 26] that drying can result in increased release of exchangeable potassium (K) in many soils and in fixation in others. The fixation tends to occur in recently fertilized soils at higher test levels. The extent of reversion on rewetting varies among soils and is seldom, if ever, complete. Increased temperature can also increase the exchangeable K levels.[16] Dowdy and Hutcheson[17]found that elite was the source of K release on drying and that fixation could be attributed to vermiculite ormontmorillonite. Early studies in Iowa[23] showed that the results

from field-moist samples were better correlated with the potassium uptake by plants than the results from air-dried soils. Higher correlations with field-moist samples were also found in there gional K studies in the late 1950s and early 1960s.[14,20,21]The K release on drying and the reversion on rewetting can be controlled with organic additives[24], but this procedure has not been evaluated in practical soil testing.

Drying and method of drying may also affect the results of the tests for mineralizable nitrogen [22],phosphorus [25], sulfur [15, 25,28], zinc [19] and perhaps other micronutrients, but the correlations between the test results and the uptake of nutrients by plants have not been shown to be significantly affected by drying.

Primarily because of the effect of drying on potassium results, a method of testing undried soil samples was developed and put into use in the Iowa State University Soil Testing Laboratory until 1990. Because of the difficulties of analyzing moist sample sand because most correlation and calibration studies have been done on air-dried soils, the undried soil analysis method has not been adopted widely.The traditional method of preparing dry samples is presented here.

Recommended Procedure for:

Handling Dry Soil Samples:

Traditionally, most soil analysts have considered dry soil as the convenient state from which to start chemical tests. Because soil samples are received in a wide range of physical conditions, a common denominator in preparation is required to all evicted these problems and expedite processing.

Drying:

Moist, well-mixed samples may be transferred to paper bags, cardboard boxes or aluminum trays of convenient size. The open sample container is then placed in a drying rack or cabinet equipped with exhaust fans to expedite air movement and moisture loss. If heat is necessary, the temperature of the cabinet should not exceed 40°C (104°F). This is especially critical for potassium analysis, which can be significantly influenced by drying temperatures. If nitrate analyses are involved, the soil should be dried or frozen within 12 hours of sampling. Such sample scan is dried by spreading them out on a clean paper or cloth and blow drying them with a fan.

Where sample volume is not adequate to justify artificial drying, samples may be spread on clean surfaces, such as paper plates. Initial crushing of soil clods will decrease the time required for drying at room temperatures.

Microwave drying is a relatively rapid method to dry a few soil samples. For moisture determination, the method worked well.[29] However; microwave drying appears to change many nutrient analyses as compared to air-drying[30]and is not recommended.

Crushing and Sieving:

The natures of analyses to be conducted, plus presence of rocks or limestone concretions, dictate initial steps to crushing. Crush samples designated for mechanical analyses with a wooden rolling pin after removing all stony material from the soil.

Crush other samples with a flail-type grinder, a power-driven mortar and pestle, or some other crusher which is designed to minimize contamination through carry over from one sample to another.

If micronutrient analyses are to be performed, it is essential that all surfaces coming into contact with the soil be stainless steel, plastic or wooden, preferably in the order listed. Samples should be crushed until a major portion of the sample will pass a U.S.No. 10 (2 mm opening) sieve. Crushing to pass a finermesh sieve may be desirable for analysis utilizing less than one gram of soil.

METHODS OF SOIL ANALYSIS

Introduction:

There are many methods currently in use for the testing of soils. Eachsection of the country appears to favor a particular method or group of method sand many times individual soil testing laboratories develop modifications of these methods. Then, too, procedures have changed greatly in the last 10 to 15 years. The development of new instruments, such as the flame photometer, and new titration procedures such as EDTA or Versene, has practically revolutionized soil testing. They not only have made the methods more accurate but have made them many times more rapid.

The methods for the analysis of soils as given here are those which are currently being used in the Oregon State College Soil Testing Laboratory. They have been selected on the basis of their reliability for predicting fertilizer and liming needs of Oregon

soils and for their adaption to use for a large volume of soils. Changes will be made in these procedures from time to time as new method sand techniques are developed.

It is not the purpose of this bulletin neither to describe the various methods listed nor to compare them with any other methods in use. There are several books[31-35] and periodicals which devote many pages to the descriptionof procedures involved in testing soils. Where applicable a reference is given to the originator of a particular method.

1. **pH:**

pH indicates the acidity or alkalinity of soil. A pHof 7 is neutral. Values less than 7 are acidic and values greater than 7 are alkaline. Utah soils tend tobe moderately alkaline (pH range 7.5 to 8.5). Most plants grow well in soils with pH values between 6.0 and 8.0. Trace element (e.g., iron) deficiencies can occur in soils with pH values greater than 8.0,and with some sensitive plants (e.g., berries, grapes,silver maple, pin oak) in soils with pH values greater than 7.5.

Procedure:

1. Weigh 10 grams of soil into a 50 ml beaker or No. 250 C.R. soufflé cup.
   Add 10 ml of distilled water, Stir thoroughly.
2. Let stand for at least 30 minutes, stirring two or three times.
3. Read with a pH meter using a glass electrode.

2. Phosphorus (P)- Sodium bicarbonate method:

The phosphorus soil test result is in units of parts per million (or ppm), which is equivalent to pounds of available phosphorus per million pounds of soil.The soil test value is a measure of the amount of phosphorus available to plants during the growing season. A very low or low phosphorus test value indicates that additional phosphorus must be applied to prevent a deficiency. An adequate to high soiltest value indicates that sufficient phosphorus is available to grow the plants you identified. Very high amounts of phosphorus indicate excessive fertilizer or manure application, and may lead to nutrient imbalances in plants, or negative environmental impacts to nearby water sources.

Procedure:

1. Weigh out 2.5 grams of soil into a 50 ml shaking bottle and add 25 ml extractant. Shake for 30 minutes.

2. If resulting soil solution is colored, decolorize with Darco G-60.Use about 4 teaspoon for each 25 ml extract, or more if necessary.
3. Filter through Whatman No. 5 filter paper. The Darco G-60 may be added to the soil prior to shaking. (The Darco G-60 should be testedfor phosphorus and if it contains enough to color the solution, it should be washed with sodium bicarbonate before using.)Place 5 ml of the filtrate in a 25 ml volumetric flask. This can bedone with an automatic pipette.
4. With an automatice pipette add 5 ml of ammonium molybdate solution to each flask and shake well. Remove all traces of the molybdate solution from the neck of the flask by washing down with distilled water until approximately 10 ml has been added.
5. Add 1.0 ml of the dilute stannous chloride solution, mix well immediately, and make up to volume with distilled water and again shake thoroughly.
6. Read color intensity in the colorimeter using a 560 mu filter, ten minutes after addition of the stannous chloride solution. Determine amount of phosphorus from curve prepared by running a series of standards.

3. Potassium (K), Calcium (Ca) , Magnesium(Mg) - Flame Photometer method:

The potassium soil test value is a measure of the amount of potassium available to plants during the growing season. A very low or low potassium test value indicates that additional potassium must be applied to prevent a deficiency. An adequate or higher soil test value indicates that sufficient potassium will be available for growing the plants you identified. There are no known negative impacts to plants for potassium levels testing high or very high.

Procedure:

1. Weigh or measure 2 grams of soil into a 50 ml shaking bottle, add 20 ml of the ammonium acetate extractant, and shake for 30 minutes.
2. Filter through Whatman No. 5 filter paper.
3. Determine with the flame photometer using the following wave lengths:

    a. Magnesium - 383 mu (285.2 mu if possible)
    b. Calcium - 554 mu
    c. Sodium - 580 mu
    d. Potassium - 768 mu

4. Prepare a curve for each element by running a series of standards.

4. **Organic matter- - Walkley-Black method:**

Organic matter provides nutrients such as nitrogen and sulfur for plant growth while improving soiltilth (physical condition). Generally, higher levelsof organic matter are desirable. Soil organic matter content also influences the effectiveness and application rate of certain herbicides. Follow the instructions on your herbicide label or contact yourlocal county Extension agent for assistance.

Procedure:

1. Pass soil through a a ½ mm sieve and weigh out 0.5 grams soil into *a* 500 ml Erlenmeyer flask.
2. Add 10 ml potassium dichromate and 20 ml concentrated H_2SO_4 . Mix rapidly and thoroughly for 1 minute. Let stand for at leat 20 minutes or until cool.
3. Dilute to 150 ml with water and add 10 ml concentrated H_3PO_4.
4. Titrate with 0.4 N ferrous-ammonium-sulfates. Use 6 drops 0-phenanthroline indicator.
5. Run a blank simultaneously using same procedure.

Calculation:

O.M. % = ml Fe (NH4)2(SO4) used (Blank - Sample titration) x N/0.4

x 0.545

Total Nitrogen- = Kjeldahl method:

Procedure:

1. Weigh out 10 grams of soil and place in an 800 ml Kjeldahl flask.
2. Add 1 teaspoonful (10 grams) of catalyst and 30 ml concentrated H_2SO_4.
4. Digest until clear (20 to 30 minutes) + one-half clearing time (10 to15 minutes.) Cool.
5. Meanwhile place a 500 ml Erlenmeyer flask containing 50 ml boric acid solution and 4 drops of indicator under the condenser. Be sure the condenser tube is below the liquid surface.
6. Add 400 ml distilled water, one boiling stone and a small piece of mossy zinc to the Kjeldahl flask.
7. Pour in slowly and carefully down the side of the flask 60 ml of concentrated NaOH. Do not mix at this point.

8. Connect to condenser; then gently rotate solution until the material is thoroughly mixed.
9. Turn on distillation unit burners and distill over approximately 100 ml. Turn off burners and immediately lower the Erlenmeyer flasks.
10. Titrate NH with 0.1000 N H_2SO_4 using the mixed indicator.
11. Run a blank whenever there is a change in reagents or at least once a day.

Calculation:

$$\frac{\text{ml H2SO4 used (Sample titration - Blank Titration)} \times \text{N} \times 0.014 \times 100}{\text{weight of material (grams)}}$$

5. Nitrate – Nitrogen (N):

The most limiting plant nutrient in the soil system. Itis required for optimal growth and function for all living things, and hence is in very high demand in terrestrial systems. Annual additions of nitrogen are generally required for optimum growth and performance of any plant and so recommendations are based on annual plant needs rather than soil test levels. For this reason, nitrogen analysis is not included in the routine soil analysis package available through the lab. However, in many instances, especially where large, repeated applications of compost or manure are added to soils, nitrogen dynamics and management can becomplex and knowledge of the soil test level is imperative to prevent over application, or loss of nitrogen from the system.If requested, the amount of plant-available nitrogenis indicated by the nitrate-nitrogen value in the upper 2 or more feet of soil, normally the sum of 0to 12 inch and 12 to 24 inch sample depths. The upper 2 feet of soil are used because nitrate-N is mobile and will move through soil with irrigation water or rainfall. Nitrogen recommendations depend on the nitrate-nitrogen soil test value, the crop to begrown or landscape setting (e.g., lawn or garden),yield, and site history (last crop grown, residue removal, and previous applications of nitrogen and/or manure). If a nitrate-nitrogen test was not requested, nitrogen recommendations will be based on the annual need of the crop to be grown, yield,and site history.

Procedure:

1. Shake 10 grams of soil with 50 ml of distilled water for 10 minutes. Add 0.2 gram Ca(OH) 2 powder and shake for an additional 5 minutes.

2. Filter and wash with an additional amount of water.
3. Transfer 5 ml of the filtrate to a 5-ml beaker. Add 1 ml $Ca(OH)_2$ solution and evaporate to dryness on a warm hot plate. Cool.$Ca(OH)_2$
4. Add 1 ml of phenol disulfonic acid and rotate the beaker so that the acid comes in contact with the entire residue.
5. Add 14 ml of distilled water and 5 ml of 1:1 ammonium hydroxide solution.
6. Transfer the solution to a colorimeter tube and read in a colorimeter at 420 mu. Determine the amount of nitrate from curve prepared by running a series of standard solutions.

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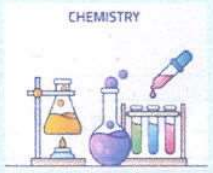
D. P. Bhosale College, Koregaon

Department of Chemistry



Certificate Course (Soil & Water Analysis)

TIME TABLE (Dec.- 17- Feb. 2018)
(2017-18)(UG)

Class	**Time**	**Friday**(02/12/2017)	**Saturday**(03/12/2017)
Theory	10.20AM-11.20AM	(RBN)	(RBN)
Practical	17.50AM-10.20AM	(NDN)	(NDN)
Class	**Time**	**Friday**(09/12/2017)	**Saturday**(10/12/2017)
Theory	10.20AM-11.20AM	(RBN)	(RBN)
Practical	17.50AM-10.20AM	(NDN)	(NDN)

Class	**Time**	**Friday**(16/12/2017)	**Saturday**(17/12/2017)
Theory	10.20AM-11.20AM	(ARK)	(ARK)
Practical	17.50AM-10.20AM	(SPK)	(SPK)

Class	**Time**	**Friday**(23/12/2017)	**Saturday**(24/12/2017)
Theory	10.20AM-11.20AM	(SPP)	(PSP)
Practical	17.50AM-10.20AM	(NMG)	(SPP)
Class	**Time**	**Friday**(30/12/2017)	**Saturday**(31/12/2017)

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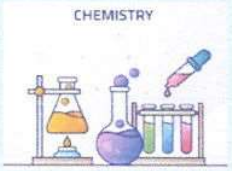


(2017-18)

Notice

Date: 28/11/2017

All the Students of B.Sc. III (Chemistry) are here by informed that Department of Chemistry going to organize your Certificate Course **(Soil & Water Analysis)** has been Scheduled from 02/12/2017 to 25/02/2018 Kindly, remain present at prescribed time in lecture hall.

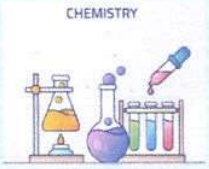
Course Coordinator

Head
Department of Chemistry
D. P. Bhosale College, Koregaon

Rayat Shikshan Sanstha's,

D. P. Bhosale College, Koregaon

Department of Chemistry



Certificate Course (2017-18)

Soil & Water Analysis (UG)

REGISTRATION

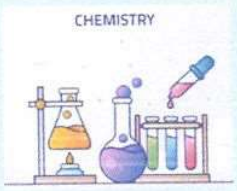
Sr.No	Roll No.	Students Name
1	1401	Barge Rohit Sanjay
2	1402	Bhatuse Dhananjay Sarjerao
3	1403	Bhilare Dipalee Sayaji
4	1404	Bhosale Aishwarya Jalindra
5	1405	Bhosale Dattatray Chandrakant
6	1406	Bhosale Kajal Dilip
7	1407	Bhosale Komal Ramchandra
8	1408	Bhosale Ranjit Popat
9	1409	Bhosale Sanit Dnyandev
10	1410	Bhosale Supriya Sunil
11	1411	Bikkad Ashwini Ashruba
12	1412	Chandekar Avadhut Rajendra
13	1413	Chavan Jotsna Anil
14	1414	Chavan Prabhuraje Mahadev
15	1415	Chavan Rohini Shrikant
16	1416	Chavan Sangram Bhanudas
17	1417	Chavan Shivadatta Subhash

18	1418	Deshmane Vaishali Prakash
19	1419	Devkar Akash Vasant
20	1420	Garule Pravin Narayan
21	1421	Ghadge Shivani Rajendra
22	1422	Gharge Abhijeet Vilasrao
23	1423	Ghorpade Dinesh Shrimant
24	1424	Ghorpade Nikhil Shivaji
25	1425	Ghorpade Priyanka Anandrao
26	1426	Ghorpade Vaibhav Narayan
27	1427	Jadhav Akshay Sudam
28	1428	Jadhav Aparna Rajendra
29	1429	Jadhav Bhagyashri Ravindra
30	1430	Jadhav Dattatary Blakrishna
31	1431	Jadhav Jyoti Ravindra
32	1432	Jadhav Mayuri Dattaji
33	1433	Jadhav Pratiksha Sanjay
34	1434	Jadhav Samadhan Anil
35	1435	Jadhav Shamal Hanamant
36	1436	Jadhav Sonam Shankar
37	1437	Jadhav Vidyavati Sanjay
38	1438	Jagadale Akshay Govind
39	1439	Jagtap Aishwarya Vitthal
40	1440	Jagtap Komal Anil
41	1441	Jagtap Shubham Jalindar
42	1442	Jagtap Tanuja Abaji

67	1467	Shinde Vijaya Jaydas
68	1468	Shirke Nikita Dasharath
69	1469	Sonavane Ganesh Dilip
70	1470	Sutar Bhagyashri Bhanudas
71	1471	Sutar Komal Tukaram
72	1472	Valekar Pradip Tarachand
73	1473	Wagh Arti Shivaji
74	1474	Zanjurne Mayuri Mohan
75	1475	Jadhav Rushikesh Rajendra

Course
Coordinator

Head
Department of Chemistry
D. P. Bhosale College, Koregaon



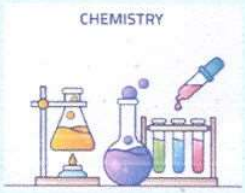
(2017-18)

Question Paper (Soil and Water Analysis)

1) Which one is the major technique of soil conservation?
   a) Control on cattle grazing
   b) Crop rotaion
   c) Use of chemical fertilizers
   d) Strip cropping
2) Soil washed away by running water is called
   a) Regolith
   b) Soil profile
   c) Eliviation
   d) Illuviation
3) -----is the most common used amendment for sodic soil reclamation primarily because of low cost and easy availablility.
   a) Concrete
   b) Sand
   c) Bitumen
   d) Gypsum
4) Which of the following is the first stage of water erosion?
   a) Rill erosion
   b) Sheet erosion
   c) Splash erosion
   d) Gully erosion
5) Red soil results from the weathered material material of----
   a) Igneous rock
   b)Sedimentary rock
   c)Metamorphic rock
   d)All of these
6) Which among the following is not a nitrogenous fertilizer?
   a) Ammonium Sulphate
   b) Calcium Cyanamide
   c) Superphosphate of Lime

d) Urea

7) Which of the following is not a measure for soil conservation?
   a) Strip cropping
   b) Terace cultivation
   c) Shelter belts
   d) Overdrawing of ground water
8) Soil erosion is caused due to
   a) Rapid urbanization
   b) Cutting of trees
   c) Over grazing by animals
   d) All of above factors
9) What is a common feature between Rhizobium and Azospirllum?
   a) Both are nitrogen fixing fungi
   b) Both are nitrogen fixing bacteria
   c) Both are harmful for plants
   d) Both are parasites
10) Which of the following soil conversation methods is generally implanted in the coastal and dry regions?
   a) Contour sloughing
   b) Terrace farming
   c) Mulching
   d) Shelter belts



(2017-18)

Model Answer Paper (Soil and Water Analysis)

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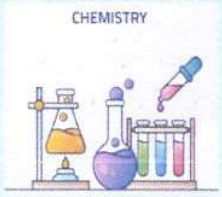


(2017-18)

Result Analysis

Sr.No	Roll No.	Students Name	Marks	Grade
1	1401	Barge Rohit Sanjay	14	B
2	1402	Bhatuse Dhananjay Sarjerao	16	B+
3	1403	Bhilare Dipalee Sayaji	18	A
4	1404	Bhosale Aishwarya Jalindra	20	A+
5	1405	Bhosale Dattatray Chandrakant	14	B
6	1406	Bhosale Kajal Dilip	14	B
7	1407	Bhosale Komal Ramchandra	16	B+
8	1408	Bhosale Ranjit Popat	18	A
9	1409	Bhosale Sanit Dnyandev	20	A+
10	1410	Bhosale Supriya Sunil	14	B
11	1411	Bikkad Ashwini Ashruba	14	B
12	1412	Chandekar Avadhut Rajendra	16	B+
13	1413	Chavan Jotsna Anil	16	B+
14	1414	Chavan Prabhuraje Mahadev	18	A
15	1415	Chavan Rohini Shrikant	18	A

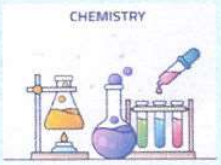
16	1416	Chavan Sangram Bhanudas	18	A
17	1417	Chavan Shivadatta Subhash	20	A+
18	1418	Deshmane Vaishali Prakash	14	B
19	1419	Devkar Akash Vasant	18	A
20	1420	Garule Pravin Narayan	16	B+
21	1421	Ghadge Shivani Rajendra	16	B+
22	1422	Gharge Abhijeet Vilasrao	18	A
23	1423	Ghorpade Dinesh Shrimant	18	A
24	1424	Ghorpade Nikhil Shivaji	18	A
25	1425	Ghorpade Priyanka Anandrao	20	A+
26	1426	Ghorpade Vaibhav Narayan	14	B
27	1427	Jadhav Akshay Sudam	14	B
28	1428	Jadhav Aparna Rajendra	14	B
29	1429	Jadhav Bhagyashri Ravindra	16	B+
30	1430	Jadhav Dattatary Blakrishna	18	A
31	1431	Jadhav Jyoti Ravindra	16	B+
32	1432	Jadhav Mayuri Dattaji	18	A
33	1433	Jadhav Pratiksha Sanjay	18	A
34	1434	Jadhav Samadhan Anil	18	A
35	1435	Jadhav Shamal Hanamant	20	A+
36	1436	Jadhav Sonam Shankar	14	B
37	1437	Jadhav Vidyavati Sanjay	14	B
38	1438	Jagadale Akshay Govind	18	A

39	1439	Jagtap Aishwarya Vitthal	18	A
40	1440	Jagtap Komal Anil	18	A
41	1441	Jagtap Shubham Jalindar	20	A+
42	1442	Jagtap Tanuja Abaji	18	A
43	1443	Kadam Aditya Balu	20	A+
44	1444	Kadam Nikita Rajaram	20	A+
45	1445	Kadam Pradnya Vishnu	18	A
46	1446	Kadam Yogesh Kumar	20	A+
47	1447	Kumbhar Amita Dinkar	16	B+
48	1448	Kumbhar Shubhangi Tanaji	18	A
49	1449	Mane Omkar Pramod	18	A
50	1450	Mane Supriya Yuvaraj	20	A+
51	1451	Momin Asamana Aslam	20	A+
52	1452	Nalawade Sonali Gopinath	20	A+
53	1453	Nikam Akshay Sanjay	20	A+
54	1454	Pawar Prajwal Dilip	14	B
55	1455	Pawar Shrhddha Jaysing	14	B
56	1456	Phadtare Pankaj Dilip	16	B+
57	1457	Phadtare Prafful Dilip	18	A
58	1458	Raje Akash Chandrakant	18	A
59	1459	Rakshe Rasika Anandrao	18	A
60	1460	Rathod Seema Dahnsing	18	A
61	1461	Raut Suraj Shankar	18	A

62	1462	Salunkhe Komal Ashok	20	A+
63	1463	Sankpal Aniket Nandkumar	14	B
64	1464	Sawant Dipali Rajendra	14	B
65	1465	Sayyad Suhana Sharif	18	A
66	1466	Shinde Ashish Shankar	16	B+
67	1467	Shinde Vijaya Jaydas	16	B+
68	1468	Shirke Nikita Dasharath	16	B+
69	1469	Sonavane Ganesh Dilip	18	A
70	1470	Sutar Bhagyashri Bhanudas	18	A
71	1471	Sutar Komal Tukaram	18	A
72	1472	Valekar Pradip Tarachand	18	A
73	1473	Wagh Arti Shivaji	16	B+
74	1474	Zanjurne Mayuri Mohan	18	A
75	1475	Jadhav Rushikesh Rajendra	18	A

Course Coordinator

Head
Department of Chemistry
D. P. Bhosale College, Koregaon



Soil & Water Analysis (UG)
Report (2017-18)

It has been noted that, the Soil recommendations contain important factors including fertilizer form, source, application timing, and placement and irrigation management. The optimum fertilizer amount is determined from laboratory experiments conducted on various parameters like primary element and secondary elements, and micronutrient analysis. The goal of Soil & Water analysis research on Soil is to determine the amount of fertilizer needed to achieve commercial crop yield. Generally, available nitrogen, Phosphorous and potassium can be estimated in chemical laboratory with Conductometer and P^H meter. Some software's are developed in order to feed the calculated readings. The common simple parameters like P^H and E.C. are very much applicable in deciding micronutrient availability to the crops. Thus, if P H is below than 7, soil can be made alkaline by adding lime till P H becomes neutral. On the other side if P H is more than 7 soil can be made acidic by adding Gypsum till P H becomes neutral. The determination of E.C. ensures total amount of Salts present in the soil and proper recommendation is made accordingly. The E.C. should be less than 1for better crop yield. Overall, more than 65 students of B.Sc. III Students worked for the samples from nearby Koregoan Tehsil. Students have been participated in the said course with actual demonstration and hands on training with proper guidance. After completion of the Course, certificates are conferred individually at the end of Course.

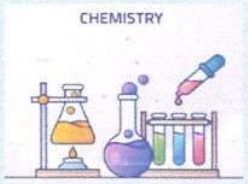
Course Coordinator

Head
Department of Chemistry
D. P. Bhosale College, Koregaon

Rayat Shikshan Sanstha's,

D. P. Bhosale College, Koregaon

Department of Chemistry



Soil and Water Analysis (2017-2018)

Feedback

Name of Student	Bhilare dipalee Sayaji
Roll. No	1503
Mobile. No	–
Email. Id	bhilaredipalee@gmail.com

Give your Valuable feedback marking the appropriate option with

Sr. No	Course Particulars	Excellent	Good	Satisfactory	Pour
1	Transparency in conduct of the course	✓			
2	Syllabus		✓		
3	Topics Taught		✓		
4	and Overall Management	✓			
5	Overall impression	✓			

Suggestion for improving, if any

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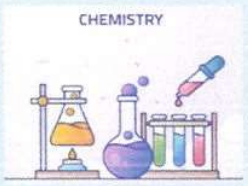
Rayat Shikshan Sanstha's,

D. P. Bhosale College, Koregaon

Department of Chemistry



Soil and Water Analysis (2017-2018)

Feedback

Name of Student	Kambhar Shubhangi Tanaji
Roll. No	1448
Mobile. No	-
Email. Id	kshubhangi@gmail.com.

Give your Valuable feedback marking the appropriate option with

Sr. No	Course Particulars	Excellent	Good	Satisfactory	Pour
1	Transparency in conduct of the course	✓			
2	Syllabus	✓			
3	Topics Taught		✓		
4	and Overall Management	✓			
5	Overall impression	✓			

Suggestion for improving, if any

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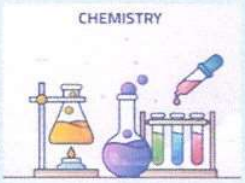
Rayat Shikshan Sanstha's,

D. P. Bhosale College, Koregaon

Department of Chemistry



Soil and Water Analysis (2017-2018)

Feedback

Name of Student	Jadhav Dattatray Balkrishna
Roll. No	1430
Mobile. No	—
Email. Id	dattatrayjadhv11@gmail.com

Give your Valuable feedback marking the appropriate option with

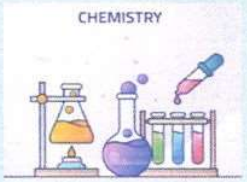
Sr. No	Course Particulars	Excellent	Good	Satisfactory	Pour
1	Transparency in conduct of the course	✓			
2	Syllabus		✓		
3	Topics Taught	✓			
4	and Overall Management	✓			
5	Overall impression	✓			

Suggestion for improving, if any

Rayat Shikshan Sanstha's,

D. P. Bhosale College, Koregaon

Department of Chemistry



Soil and Water Analysis (2017-2018)

Feedback

Name of Student	Jadhav Jyoti Ravindra
Roll. No	1431
Mobile. No	-
Email. Id	jadhav.jyoti@rediffmail.com

Give your Valuable feedback marking the appropriate option with

Sr. No	Course Particulars	Excellent	Good	Satisfactory	Pour
1	Transparency in conduct of the course	✓			
2	Syllabus	✓			
3	Topics Taught	✓			
4	and Overall Management		✓		
5	Overall impression	✓			

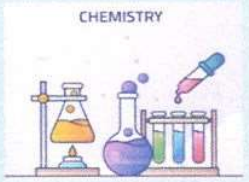
Suggestion for improving, if any

-

Rayat Shikshan Sanstha's,

D. P. Bhosale College, Koregaon

Department of Chemistry



Soil and Water Analysis (2017-2018)

Feedback

Name of Student	Kumbhar Amita Dinkar
Roll. No	1447
Mobile. No	-
Email. Id	kumbharamita@gmail.com

Give your Valuable feedback marking the appropriate option with

Sr. No	Course Particulars	Excellent	Good	Satisfactory	Pour
1	Transparency in conduct of the course	✓			
2	Syllabus	✓			
3	Topics Taught	✓			
4	and Overall Management		✓		
5	Overall impression	✓			

Suggestion for improving, if any

-

RAYAT SHIKSHAN SANSTHA'S

D. P. BHOSALE COLLEGE, KOREGAON

DIST-SATARA, MAHARASHTRA, INDIA-415501

DEPARTMENT OF CHEMISTRY

CERTIFICATE COURSE

Certificate

This is to certify that, Mr. Barge Rohit Sanjay Class: B.Sc. III Subject: Chemistry Successfully completed One month Certificate Course on "Soil and Water Analysis" with B grade Organized by Department of Chemistry, in February 2018.

Mr. N. M. Gosavi	Prof. Dr. S. D. Jadhav	Hon. Dr. V. S. Sawant
Course Coordinator	HoD Chemistry	Principal

RAYAT SHIKSHAN SANSTHA'S

D. P. BHOSALE COLLEGE, KOREGAON

DIST-SATARA, MAHARASHTRA, INDIA-415501

DEPARTMENT OF CHEMISTRY

CERTIFICATE COURSE

Certificate

This is to certify that, Mr. Bhatuse Dhanajay Sargerao Class: B.Sc. III Subject: Chemistry Successfully completed One month Certificate Course on "Soil and Water Analysis" with B+ grade Organized by Department of Chemistry, in February 2018.

Mr. N. M. Gosavi	Prof. Dr. S. D. Jadhav	Hon. Dr. V. S. Sawant
Course Coordinator	HoD Chemistry	Principal

RAYAT SHIKSHAN SANSTHA'S

D. P. BHOSALE COLLEGE, KOREGAON

DIST-SATARA, MAHARASHTRA, INDIA-415501

DEPARTMENT OF CHEMISTRY

CERTIFICATE COURSE

Certificate

This is to certify that, Miss. ***Bhillare Dipali Sanjay*** *Class:* ***B.Sc. III*** *Subject:* ***Chemistry*** *Successfully completed One month* ***Certificate Course*** *on* ***"Soil and Water Analysis"*** ***with A grade*** *Organized by Department of Chemistry, in February 2018.*

Mr. N. M. Gosavi	**Prof. Dr. S. D. Jadhav**	**Hon. Dr. V. S. Sawant**
Course Coordinator	**HoD Chemistry**	**Principal**

RAYAT SHIKSHAN SANSTHA'S

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DIST-SATARA, MAHARASHTRA, INDIA-415501

DEPARTMENT OF CHEMISTRY

CERTIFICATE COURSE

Certificate

This is to certify that, Miss. Bhosale Aishwarya Jalendra Class: B.Sc. III Subject: Chemistry Successfully completed One month Certificate Course on "Soil and Water Analysis" with A+ grade Organized by Department of Chemistry, in February 2018.

Mr. N. M. Gosavi	Prof. Dr. S. D. Jadhav	Hon. Dr. V. S. Sawant
Course Coordinator	HoD Chemistry	Principal

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D. P. BHOSALE COLLEGE, KOREGAON

DIST-SATARA, MAHARASHTRA, INDIA-415501

DEPARTMENT OF CHEMISTRY

CERTIFICATE COURSE

Certificate

This is to certify that, Mr. Bhosale Dattatraya Chandrakant Class: B.Sc. III Subject: Chemistry Successfully completed One month Certificate Course on "Soil and Water Analysis" with B grade Organized by Department of Chemistry, in February 2018.

Mr. N. M. Gosavi	**Prof. Dr. S. D. Jadhav**	**Hon. Dr. V. S. Sawant**
Course Coordinator	**HoD Chemistry**	**Principal**

RAYAT SHIKSHAN SANSTHA'S

D. P. BHOSALE COLLEGE, KOREGAON

DIST-SATARA, MAHARASHTRA, INDIA-415501

DEPARTMENT OF CHEMISTRY

CERTIFICATE COURSE

"Soil and Water Analysis"

Introduction

The leaf analysis laboratory of the Division of Soil Science and Agricultural Chemistry, ICAR-IIHR, Bengaluru is extending the soil, plant/leaf, irrigation water, manure/compost analysis facility to the farming community and company/firm. The main objective of the activity is to receive samples from individual farmers and company/firm and to analyze the samples for their nutritional status. Based on which the nutrient application through fertilizers and manures to meet the crop specific needs are recommended for better soil health management and enhancing economic return to farmers / clients.

Benefits

- Test
- Practical training
- Certificate
- One Month
- Conceptual discussion

For B.Sc. III Chemistry Students

Mr. N. M. Gosavi	Prof. Dr. S. D. Jadhav	Hon. Dr. V. S. Sawant
Course Coordinator	HoD Chemistry	Principal