QUALITY ASSESSMENT OF SOIL USING FIELD KIT: PH AND NPK

PROCEDURE FOR COLLECTION OF SOIL SAMPLE

STEP-1⇒ A clean bucket or polythene bag is to be taken for collecting and mixing soil sample.

STEP-2⇒ An auger or spade is to be used for collecting from the soil of the field.

STEP-3⇒ The litter from the surface is to be scarped and the soil is to be exposed.

STEP-4⇒ A boring about six inches deep is to be made with an auger and the soil is to be pulled up. If a spade is used a 'V' shape hole is made about six inch deep and a thin slice is cut from the side of the hole.

STEP-5⇒ 10 or more sample of soil are to be taken or collected from each area after through mixing of all the sample of each area, a pound of soil is placed in a small container, polythene bag e.t.c and the mouth is closed.

STEP-6⇒ The soil sample collected from the field is spread over a paper or polythene sheet for drying

STEP-7⇒ When the soil is sufficiently dry to pass through between the fingers, foreign matters like loose roots, small stones e.t.c are to be removed.

STEP-8⇒ A wooden or glass motar and pestle is to be used for grading the soil.

STEP-5 ⟹ When the soil is grinding, after that the soil sample is ready for chemical test and is preserved in a clean plastic container proper labels.

SOIL PH :- Soil P^H is measurement of acidity or alkalinity of a soil solution. It is expressed as the negative logarithm or hydrogenion concentration in the solution.

$$P^H = -\log[H^+]$$

$$= \frac{1}{\log[H^+]}$$

P^H scale ranges from 0 to 14 P^H refers to neutral soil. P^H value less than 7 indicate acidic soil and P^H values more than 7 indicate alcaline soil.

P^H	4	5	6	7	8	9	10
Nature of Soil	Intensely acidic	Moderately acidic	Slightly acidic	Neutral	Slightly alcaline	Moderately alcaline	Intensely alcaline

For the present purpose a soil is to be concidered as normal if its P^H is between 6 and 8.5

Most of the plants prefer to grow in normal soil.

SL. NO.	Name of the Plant	P^H Range of Soil Prefered by the Plant
1	Abble	5.5 - 6.5
2	Banana	6.5 - 7.5
3	Cabbage	6.0 - 7.0
4	Cauliflower	6.0 - 7.0
5	Coconut	6.0 - 7.5
6	Coffee	6.0 - 7.0
7	Cotton	5.5 - 6.5
8	Cucumber	6.0 - 8.0
9	Dahlia	6.0 - 8.0
10	Grabe	5.0 - 7.0
11	Ground nut	5.5 - 6.0
12	Lettus	5.0 - 7.0
13	Onion	6.0 - 8.0
14	Pea	6.0 - 8.0
15	Pineabble	5.0 - 6.0
16	Potato	5.0 - 6.5
17	Radish	6.0 - 8.0
18	Rice	6.0 - 7.0
19	Rose	6.0 - 8.0
20	Rubber	4.5 - 7.5
21	Soyabeen	6.0 - 7.0
22	Sugarcane	6.0 - 8.0
23	Tea	5.5 - 6.5
24	Tomato	5.0 - 6.0
25	Wheat	6.0 - 7.0

DETERMINATION OF SOIL PH

PROCEDURE :-

1. A clean test tube is taken.
2. Distill water is poured upto 5ml mark.
3. 2gm of Sail is added to the test tube with the scoop provided.
4. 0.5 to 1gm of Barium sulphate ($BaSO_4$) from Container No. 3 is added to the test tube.
5. The test tube is allowed to stand for 20 minutes with occassional shaking.
6. 5 drops of the Indicator No. 1 from Container No. 1 is added to the above and the mouth of the test tube is closed with cleaned rubber stopper and the contents are shaken thoroughly. The Sail is allowed to Settle down completely.
7. The Colour of the upper liquid in the test tube is Compared with the Colour chart No. 1 and the nearest match is found. The match Coloured indicates the PH of the Sail.
8. If the Colour of the upper liquid in the test tube indicates PH near 6, then the whole experiment is repeated using Indicator No. 2 matching the Colour of the upper liquid with chart No. 2.

DETERMINATION OF SOIL PH USING SOIL TESTING KIT

DATE – 15/03/2019

SOIL KIT NO. – 1

PLACE – Soil laboratary, Kabi Sukanta Mahavidyalaya, Geography department.

OBSERVER – 170140700096

TIME – 11.30 am – 12.10 P.m

SAMPLE NO. – OM/1

Distilled water	Soil added	Barium sulphate from Container no. 3	Standing time	Container no. - 1	Setting time	Colour chart no.	Soil pH	Remarks
5 ml	2g	1g	20 min	5 drops	5 min	1	6.5	Slightly acidic

1/8/19

ESTIMATION OF NITROGEN

Majority of India Soil are poor in nitrogen and respond favorable to addition of fertilizer.

PROCEDURE FOR ESTIMATION OF AMMONIACAL NITROGEN

1. A clean test tube is taken and distilled water is filled up to 10ml mark.
2. 2gm of Soil Sample is added to it and the test tube is closed with clean stopper.
3. The mixture is shaken throughly to 5 minutes and filtered.
4. 3 drops of filtrate is transfered to a clean 2 inch test tube and 1 drop of solution from container no. 14 is added to it.
5. The colour is compared with colour chat no. 6.

DETERMINATION OF AMMONIACAL NITROGEN USING SOIL TESTING KIT

DATE— 8/5/2019

PLACE— Soil laboratary, Kabi sukanta Mahavidyalaya, Geography department.

TIME— 1.15 P.m - 2.15 P.m

SOIL KIT NO.— 1

OBSERVER— 170140700096

SAMPLE NO.— OA/1

Distilled water	Sail added	Shaking time	Solution is filtered	Filtrate	Container NO. 14	Colour Chart NO.	Remarks
10 ml	2g	5 min		4 drops	1 drops	6	Low

1/7/19

PROCEDURE FOR ESTIMATION OF NITRATE NITROGEN

1. A clean test tube is taken and distilled water is filled up to 10ml mark.
2. 2gm of soil sample is added to it and the test tube is closed with a clean stopper.
3. The mixture is shaken thoroughly for 5 minutes and filtered
4. 1 drop of the filtrate is transfered to a clean 2 inch test tube and 8 drops of sollution from container no. 13 is carefully added to it.
5. The colour is compared with colour chart no. 5

DETERMINATION OF NITRATE NITROGEN USING SOIL TESTING KIT

DATE — 08/05/2019

PLACE — Soil laboratary, Kabi sukanta Mahavidyalaya, Geography debartment.

TIME — 1.15 P.m - 2.15 P.m

SOIL KIT NO. — 1

OBSERVER — 170140700096

SAMPLE NO. — OA/1

Distilled water	Soil taken	Shaking time	Sollution is filtered	Filtrate	Container NO. 13	Clour chart NO.	Remarks
10 ml	2g	5 min		1 drop	8 drops	5	very low

1/05/19

ESTIMATION OF AVAILABLE POTASSIUM

PROCEDURE :-

1. A clean test tube is taken
2. 10ml of Solution from container No. 10 is Powred in it.
3. 5g of Soil is added to it
4. The test tube is closed with a rubber stopper and the Solution is shaken for 1 minute and then filtered. The filterate is kept aside.
5. An another clean test tube is taken.
6. 2ml of Solution from container No. 11 is Powred into it.
7. 6 drops of Solution from container No. 12 is added to the above without touching the sight of the test tube
8. 2ml of the filtrate solution is taken in a syringe.
9. The Solution from the syringe is injected with force in to the other solution is step No. 7 turbidity develops in the solution after 5 minutes.
10. The turbidity evaluated using chart No. 4.

DETERMINATION OF AVAILABLE POTASSIUM USING SOIL TESTING KIT

DATE– 08/05/2019

SOIL KIT NO.– 1

PLACE– Soil laboratary, Kabi Sukanta Mahavidyalaya, Geography department.

OBSERVER– 17014070096

TIME– 12.00 Pm

SAMPLE NO.– OA/1

Container no. 10	Soil added	Shaking time	Filter and keep the filtrate	Container no. 11	Container no. 12	Filtrate (using syringe)	Add filtrate in to the solution made from Container 11 and 12	Turbidity Develops	Lines visible	Remarks
10 ml	5g	1 min		2ml	6 drops	2 ml			All the 3 lines	low

1/5/19

ESTIMATION OF AVAILABLE PHOSPHATE (OLSEN'S METHOD)

PROCEDURE ⇒

1. A clean test tube is taken.
2. Solution from container NO. 4 is poured into a test tube upto 10ml mark.
3. A Pinch of darco from container NO. 5 is added to the above test tube.
4. 5 gram of soil is added to the above solution.
5. The test tube is closed in rubber stopper and the contains are shaken thoroughly for 3 minutes and the solution is filtered.
6. The filter solution upto 2ml mark is taken in a another test tube.
7. 2ml of solution from container NO. 6 is added to the test tube containing filtered solution.
8. The side of the test tube is washed with a little distill water and kept aside.
9. 66ml of distilled water is taken in a 100ml beaker.
10. 0.5ml of solution from Container NO. 7 is added to beaker containing water.
11. 1ml of the solution from this beaker is added to the solution had step NO. 8

12. The contains are thoroughly shaken after closing a test tube with a stopper.
13. Distill water upto 10ml mark is added to the above test tube.
14. The colour of the solution is compared with colour chart no. 3.
15. Solution in container no. 7 (stannous chloride) oxidises or deteriorates if kept for more than 3 month, so its to be reduced before use at step no. 10 0.5ml stannous chloride solution is taken to the test tube a pinch of zin dust from container no. 5 is added to it. 2 to 3 drops hydrochloric acid from container no. 8 is added to it. This solution is used in step no. 10.

DETERMINATION OF AVAILABLE PHOSPHATE USING SOIL TESTING KIT (OLSEN'S METHOD)

DATE — 1/10/2019

SOIL KIT NO. — 1

PLACE — Soil laboratory, Kabi Sukanta Mahavidyalaya, Geography department.

OBSERVER — 170140700096

TIME — 3:00 P.m.

SAMPLE NO. — A

Container No. 4	Container No. 5	Soil	Shaking Time	Solution Filtered	Filtrate	Container No. 6	Distilled Water
10 ml	Pinch of Darco	5g	3 min		2 ml	2 ml	2 ml

Beaker (100ml)	Container No. 7	1 ml of Solution taken from beaker	The Solution is added to the filtrate mixture	Contents Shaken thoroughly	Distilled water	Colour Chart No.	Remarks
66 ml distilled water added	0.5 ml into the beaker				upto 10ml mark	3	20 to 50 lbs Per acre (Medium)

11/11/19