Shri Sarda Education Society (Trust)'s

(A Linguistic Minority Education Institute)

SMT RADHABAI SARDA ARTS, COMMERCE AND SCIENCE COLLEGE

ANJANGAON SURJI, DIST- AMRAVATI (Maharashtra) 444705

(Affiliated to Sant Gadge Baba Amravati University, Amravati)

NAAC Accredited 'A' with CGPA 3.21

Dr Bashisth Choubey

Principal

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L No RSC-114/…… **Date- 22/02/2024**

"FIELD PROJECT"

(Academic session 2023-2024)

NOTICE

Date- 22/02/2024

All students hereby inform that "Field Project" is scheduled from 4/3/2024 to 2/4/2024 and submission of report is up to 30 April 2024. All students contact with Dr Prerana Bhatkar for detail information.

Dr Prerana Bhatkar

Incharge Teacher

Principal

SMT RADHABAI SARDA ARTS, COMMERCE & SCIENCE COLLEGE, ANJANGAON SURJI

DEPARTMENT OF CHEMISTRY

FIELD PROJECT REPORT

SESSION 2023-2024

B SC II (SEM IV)

Principal | Coordinator teacher

Dr Bashisth Choubey | Dr. Prerana P Bhatkar

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ANJANGAON SURJI- 444705, DIST- AMRAVATI (Maharashtra)

(Affiliated to Sant Gadge Baba Amravati University, Amravati)

FIELD PROJECT REPORT

Name of Activity : Soil analysis

Year : 2023-2024

In Collaboration / Participant : stduents of B Sc II

Session: 2023-2024

In Charge Teacher : Dr Prerana Pramod Bhatkar

Number of Students benefited : 67

Department : Chemistry

Objectives : 1) we save our wasundhara by various way

2)To aware to avoid chemical fertilizer and pesticide.

3)To creat Awareness among students.

Brief Description of the Project : The soil analysis activity was conducted by Dr. Prerana Bhatkar under the project activity.

The field base activity conducted in remaining half session, 65 students were participated in this activity. Students collected soil from various farms and observed and analyzed in laboratory, concluded the result.

Students of department chemistry participated in the field project and they visited to farms in various parts of town. Students collected the soil sample. Project was undertaken on to check the quality of soil and discussed the side effect of chemical pesticide and insecticide. By this project also aware about the side effect of toxic food on health and spread the knowledge among locality. Students discussed all information with daily routine life example under the guidance of teacher among them. 90% students know the side effect of chemical pesticide and insecticide, fertilizer but they do not know how to take care to avoid this. Teacher guided them**.**

Programme Outcome: Students became aware about the side effect of chemical fertilizer and chemical pesticides and health problem created by chemical fertilizers. Students learned analysis method of soil. They become abled to performed soil analysis in labortary. They understand the importance of soil analysis for farmer.

Coordinator

PRINCIPAL
Smt.Radhabai Sarda Arts,
Commerce & Science College
Anjangaon Surji

SMT RADHABAI SARDA ARTS, COMMERCE & SCIENCE COLLEGE, ANJANGAON SURJI

Academic Year 2023-2024

Class B.Sc.-II

Attendance Sheet Field Project

S No	Name of Students	Sign
1	AaliyaFirdous Kareem Shah	Aaliya
2	AayeshaSiddiquaIrshad Ahmad	Ayesha
3	AayeshaFirdaus Syed Karamat Ali	Ayesha
4	AbhayGawai	ABaiii
5	Ab. Huzef Ab. Rauf	
6	Abrar Ahmad Khan Hifazatulla Khan	
7	AchalKapilDamare	A.Damre
8	Adnan ZahidJamadar	
9	AkankashaArvindBorode	A.A.Borode.
10	AkanshaGovardhanBhagat	
11	Aliya Afreen Mohammad Nasir	
12	AnandBaburavAthawale	
13	BhargaviBharatbhushanYawale	Bawale
14	DishaHiwase	
15	ChetanPramodDamdhar	CPDamdhar.
16	Faizan Shah Saleem Shah	
17	GayatriArunraoMurkute	Gayatri A. Murkute
18	GayatriDilipKharode	G.D.Kharode
19	HarshadVinodraoTakore	HVTakore
20	HarshadaHaridasMakode	HHMakode
21	IshwariMahendraraoPatil	
22	IshwariShailesh Kale	ISKale.
23	Jay Rajkumar Tote	JTote
24	KahekashanAnjum Syed KaramatKaramat	
25	MadihaFatema	Madiha
26	MehreenKhanamWarees Khan	
27	MayuriGopalraoDatir	M.G.Datir
28	MohdAltamash Abdul Farooque	
29	MohdMuddassir Ab. Azeen	Mudassir
30	MohdSohel .AbKalim	Sohail
31	MohdSufiyanMohdTalib	
32	NageshArunraoPakhare	Pakhare
33	Nikita PremdasUke	NPke
34	PayalArunGaigole	PAGaigole
35	PrachiPradippantBhagat	PBhagat
36	PrachiSudhakarThorat	PSThorat
37	PranaliRavindraChopkar	P.R.chopkar

38	PranjaliPramodRisodkar	P. P. Risodkar
39	PratikshaBajrangDalu	
40	PratikshaNajukraoRangole	P.N.Rangole
41	Pratiksha Suresh Tathe	P Tathe
42	Rafiya Sultana MohdShafique Khan	
43	RasikaVinod Kale	R.V.Kale
44	Riya NitinRahate	रिया नि. राहाटे
45	RoshanDilipThorat	
46	RumaisaSadafShabbir Ahmad	
47	Rutuja Sanjay Bawane	
48	Saba Saher Mohammad Sabir	Saher.
49	SadiyaKhanamZabiullah Khan	Sadiya
50	SakshiRajendraKhade	Skhade
51	SakshiTulashiramAswar	
52	Saniya AnjumShakeel Khan Pathan	
53	SanskrutiSatishBawankar	Sanskruti S. Bawankar
54	ShraddhaRameshraoIkhar	S. R. Ikhar
55	Shravani Narayan Bhele	Bhele
56	Shreya Mohan Nipane	
57	ShrihariMilindMaldhure	Mmaldhure.
58	Sk Hassan SkNisar	
59	SnehalRameshraoUmbarkar	Rumbarkar
60	SnehalSudhakarMasurkar	Smasurkar
61	SwitiPravinBochare	SBochare
62	TanzeelaKhanamMahboob Khan	
63	TanzilaFirdousRiyazoddin	
64	Taufeeque Ali Aashique Ali	Tauki
65	Tauqueer Khan Jawed Khan Jawed Khan	
66	Tejasvini Bharat Rangire	TRangire.
67	Vaishnavi Ashok Adhau	
68	Vaishnavi Rajesh Gour	V.R.Gour.
69	Vaishnavi Suresh Bundile	
70	Vinit Narayan Bhele	Bhele
71	VaishnaviWankhade	Wankhade.

PBhatkar

Teacher Incharge

PRINCIPAL
SMT. RADHABAI SARDA COLLEGE
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DEPARTMENT OF CHEMISTRY

Academic session 2023-2024

A Project report on

Soil Analysis Study for Environment Saving.

Submitted by

1) Mahreen Wahees Khan
2) Ayesha Irshad Ahmad
3) Ab. Hureg Ab. Rauf
4) Bhargavi B. Yawale
5] Ishwari S. Kale.
6) Mohd. Sufiyan Mohd. Talib.

Guided by

Dr P P Bhatkar

What is soil pollution?

It is a serious environmental concern since it harbours many health hazards. For example, expousure to soil containing high concentrations of benzene increase the risk of contracting leukamia. An image detalling the discolouration of soil due to soil pollution is provided below.

It is important to understand that all soils contain compounds that are harmful to human beings and other living organism. However, the concentration of such substance in unpolluted soil is low enough that they do not pose any thread to the surrounding ecosystem. When the concentration of one or more such toxic substances is high enough to cause damage to living organisms, the soil is said to be contaminated.

The root cause of soil pollution is often one of the following.

- Agriculture
- Excessive industrial activity
- poor management or inéfficient disposal of waste.

The challenges faced in soil rememediation are closely related to the extent of soil pollution. The greater the contamination, the greater the requirement for resources for remediation.

What are the pollutants that contaminate soil?

Some of the most hazardous soil pollutants are xenobiotics - substances that are not naturally found in nature and are synthesized by human beings. The term xenobiotic, has Greek roots - 'xenos' (foreigner), and 'Bios' life. Several xenobiotics are known to be carcinogens. An illustration detailing major soil pollutants is provided below.

Heavy Metals

The presence of heavy metals (such as lead and mercury, in abnormally high concentrations) in soils can cause it to be become highly toxic to human beings. Some metals that can be classified as soil pollutants are tabulated below.

Toxic Metals that cause soil pollution.		
Arsenic	Mercury	Lead
Antimony	Zinc	Nickel
cadmimum	selenium	Beryllium
Thallium	chromium	copper

These metals can originated from several sources such as mining activities, agricultural activites, and electronic waste and waste.

What is Soil Fertility?

"Soil fertility refers to the ability of the soil to sustain plant growth."

Fertile soil results in high yield and better quality of plants. Fertile soil is rich in fundamental elements and minerals has good aeration, water holding capacity, and good texture.

Let us have a look at what is soil fertility and how can it be replenished.

Factors Affecting Soil Fertility

The following Factors affect the soil fertility.

Mineral Composition

The mineral composition of the soil helps to predict the ability of the soil to retain plant nutrients. Application of proper fertilizers and manures helps in enhancing the quality of the soil.

Soil pH

Soil pH helps in maintaining the nutrient availability of the soil. A pH range between 5.5-7 optimum for soil fertility.

Soil Texture

The minerals of different sizes are responsible for maintaining the structure of the soil. clayey soil can retain more nutrients and hence acts as a reservoir.

Organic Matter

Organic mater is a source of nitrogen and phosphorus. These can be mineralized and made avaiable to the plants.

Nutrient Replenishment

Nutrients can be replenished in the following ways.

Adding Manures and Fertilizers

Fertillizers such as nitrogen, potassium and phosphorus are added to the soil to make it fertile. These are also added to the potted plants in gardenes to Enhance plant gardens to growth. NPK and urea are the most common fertilizers required by the soil. Urea adds nitrogen to the soil. Whereas, NPK adds nitrogen, pottassium and phosphorus to the soil.

Leguminous Crops

Leguminous plants contain nitrogen-fixing bacteria such as Rhizobium in the root nodules. These bacteria trap atmospheric nitrogen and make it available to the plants in the form of nitrogen compounds. The remaining nitrogen compounds are mixed with the soil to increase its fertility.

* Fertile Soil - A fertile soil will contain all the major nutrients for basic plant nutrition, as well as other nutrients needed in small quantities. It is ability to supply essential plant nutrients and water in the adquate amounts and proportions for the plant growth and reproduction.

* Non- fertile Soil - The soil which is not capable of supporting or is unfavourable to the growth of plants. In other words, this soil is not good enough for plant or crop to grow well.

The fertilised soil & non - fertilised soil nature depends on the physical, biological and the chemical factors of the soil.

fertilized soil contains added nutrients such as nitrogen, phosphorus and the pottassium which are essential for the plant growth. This nutrients comes from natural source like manure or from synthetic fertilizers. unfertilized soil does not have these added nutrients & relies solely on nutrients present in soil & organic matter.

① plant growth & productivity - fertilized soil provides adquate nutrients to plant for healthy growth, development & productivity. Nutrient defeciencies in unfertilized soil may limit plant growth & yeild, poor crop quality.

② soil fertility - fertilized soil tends to have higher fertility level compared to unfertilized soil as it contains sufficient nunteients to support plant growth & maintain the soil productivity.

③ Environmental Impacts - Application of the fertilizers to soil can have environmental consequences includes nutrients runoff, water pollution and soil degradation excessive use of fertilizers leads to nutrients imbalance, euttophication of water bodies. unfertilized soil may have lower environmental impacts but requires additional management practices.

Management practices - fertilized soil often requires careful nutrients to optimize nutritient use efficiency minimize envisomental impacts, prevent leaching or runoff nutrients. unfertilized soil requires alternative managment steategies like crop rotation, cover cropping, organic amendments etc.

Over all, difference between fertilized and non-fertilized soil lies in nutrients content, plant growth & productivity, soil fertility, environmental impacts and the managment practices associated with each type of soil. proper soil fertility management is essential for the sustainable agriculture ensuring optimal crop production while minimizing the enviromental degradation and the resource depletion.

Result of process by fertilization.

Sr. No	observe	Without process Soil	With process Soil
i)	Weight	5gm	5gm
ii)	Adding of water	10 ml	10 ml
iii)	Water holding capicity	30% (4ml)	0% (0 ml)
iv)	pH of soil	3.2	7.2
v)	colour	Brown	Black.

Date :- 24-04-2024

Smt. Radhabai sarda Arts commerce and science college

District – Amravati (Maharashtra)

Department of chemistry

Bsc 2 nd year (sem -4)

Academic session 2023-24

Project on - Soil Analysis is Need of Today's life

Submitted by :

1.Achal Kapil Damre

2. Harshada Haridas Makode

3. Nikita Premdas Uke

4. Pratiksha Bajarang Dalu

5. Snehal Sudhakar Masurkar

Under The Guidance of:

Dr. Prerna P Bhatkar

Soil :

Soil is the loose surface material that covers most land. It consist of inorganic particles and organic matter. soil provides the structural support for plants used in agriculture and is also their source of water and nutrients. soils vary greatly in their chemical and physical properties.

used :

Soil provides many services and many products. The plants that are grown in soil can be used for food, clothing, recreation, aesthetics, building materials, medicines and more. The minerals that make up soil particles can be used for dyes, make-ups and medicines or shaped into bricks, plates and vases.

PH range (soil) :

Soil generally range from an extremly acidic pH of 3 to a very alkaline pH of 10. This range is a result of many factors, including a soil's parent material and the amount of yearly rainfall an area receives. Most cultivated plants enjoy slightly acidic conditions with a pH of about 6.5.

Polluted soil :

Polluted soil include pesticides, petroleum products radon, asbestos, lead, chromated copper arsenate and creosote. These soil is normally found in cities, old factory sites, around roadways, illegal dumps and sewa treatment station. In these soil toxic substances that are deposited on the earth's surface harm our health and well-being and affect food, water and ai quality. The most important effects of soil pollution according to IPBES and the FAO are damage to heal poorer harvests, climate change, population displacemer species extintion, desertification, Economic impact etc. so, increase in soil fertility is very necessary.

Remediation of Polluted soil :

- Phytoremediation : During recent years the concept of using plants to remediate contaminated sites has received greater attention.
- It consists of the Greek prefix phyton (plant), attached to the Latin root remedium (to correct or to remedy)
- phytoextraction,
- phytostabilization

- Rhizofiltration
- phytovolatalization
- phytodegradation
- Hyperaccumulation : Brossica Juncea (Mustard), Thlaspi spp. (Brassicaceae) - T. caerulescens, T. montanum, T. ochlecum. Alyssum spp. (Brassicaceae) - A. argentum, A. corsicum, A. euboeum, A. heldrechii, A. murale, A. cnium, A. Tiodii
- Soil scraping : Replacement of uppermost contaminated soil (0-15 cm depth) from cultivated field has been possible.
- The maximum amount of lead was absorbed / adsorbed by soil in clay - human complexes.
- By scraping of contaminated soil highest quality of heavy metals can be removed from the soil and become suitable from growing the crops.

Therefore, human activities are responsible for the majority of the soil pollution. We, as humans buy things that are harmful and not necessary, use agricultural chemicals (fertilizers, pesticides, herbicides, etc.), drop waste here and there, it is very important to educate people around you and me the importance of environment if they are not aware.

How to make the soil fertile ?

There are two ways - organic and inorganic for the experiment on water holding capacity of water we proceed organic ways.

organic method

organic ways such as crop rotation, bush following, no-till farming, growing cover crops, us of manures, weed control etc. These are some of the organic measures that are used to preserve the fertility of the soil.

1. Coverge

Also called mulching, It consist of covering the ground using leaves or other organic materi (cowdunk, , Jaggery etc) Thus, moisture is retained for longer and erosion is reduced. A there are move living beings aerating and facilitat the generation of nutriets and the fertility of th soil increases.

2. Use of cover crops

cover crops help to aerate the soil and by decomposing their leaves, they provide nutrients. For example, legumes generate nitrogen, while grass improves structure.

3. Use of organic matter

Decomposed manure provides nutrients immediately, which favors greater soil fertility, but it is vitally important to avoid spreading some disease-causing agents when using homemade manure.

4. Tillage minimization

Continuous tillage exposes the lower layers, usually those with moisture, causing the water to evaporate and lowering the moisture level in the soil; In addition, it also favors greater soil erosion and therfore, lower fertility. By tilling as little as possible, existing organic matter can break down and provide nutrients.

5. Soil Analysis

carrying out a soil analysis help to understand what nutriets are necessary for it. since soil types are different, the amounts to maintain fertility may vary.

Depending on the type, some crops may be planted and depending on what types of chemical products may be use to eliminate pests and diseases.

A healthy and balanced soil in nutrients favors the growth of crops and the existance of micro-organisms.

After processing of this method fertile soil is getting.

For cheking the water holding capacity of simple soil (polluted) and fertile soil we proceed experiment.

Procedure -

We take simple soil (polluted) as well as fertile soil. when the fertile soil is make these soil will be soft. After taking soil, we strain both soil with the help of straine

Then, measure the soil 5 gram both fertile and polluted soil. soil transfer in beaker and add 10 ml water. put it for 5-10 minutes to absorbed water.

After 5-10 minutes, we take tripod stand, funnel and beaker as well as filter paper. Then with the help of filter paper strain the both soil and measure the remaining water.

Then, filter soil transferred in clean beaker. Add 50 ml of water in both soil beaker. set the pH meter at room temperature. check the pH of soil sample.

Deep electrode in the beaker (soil). Note the pH of soil.

observation -

We observed in this experiment the fertile soil having more capacity for water holding as compare to simple soil (polluted).

So, that when soil having more water holding capacity the crop is organic and very useful for the human as well as human being.

Result :

Room temperature at 34°c. 4.5 ml water holding capacity of simple soil is 5.5 ml (remain) and fertilize soil is 2.2 remain and 8.8 %.

pH of simple soil is 5 and fertilize soil is 2.

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DEPARTMENT OF CHEMISTRY

Academic session 2023-2024

A Project report on

Purification of soil or healthy existance

Submitted by

1. Roshan D. Thorat
2. Chetan P. Damdhar
3. Shrihari M. Maldhure
4. Pranjali P. Risodkar
5. Prachi S. Thorat.
6. Rutuja S. Bawane

Guided by

Dr P P Bhatkar

Date of Submission: 24-04-2024

Polluted soil

Polluted soil as part of land degredation is caused by the presence of xenobiotics chemicals or other alteration in the natural soil environment. It is typically caused by industrial activity, agricultural chemicals or improper disposal of waste. Polluted soil has gradually become a major challenge that we need to overcome for establishing a healthy environment. Wheathering of the earth's crust by different processes leads to the formation of soil that accumulates over the centuries. The soil is the home for a large part of bacterial biodiversity and other microscopic & microscopic living organisms.

Polluted soil refer to anything that cause contamination of soil and degrades the soil quality. It occurs when the pollutants causing the pollution reduce the quality of the soil and convert the soil inhabitable for microorganism and macroorganisms living in the soil. Soil contamination or polluted soil can occur either because of human activities or because of natural process. mostly is due to human activities. The soil contamination can occur due to the pressence of chemicals such as pesticides, herbicides, ammonia, petroleum hydrocarbons, lead, nitrate, mercury, nephthalene, etc in an excess ammount. The primary cause of polluted soil is a lack of awareness in general people.

Fertile soil

Fertile soil results in high yeild and better quality of plant. Fertile soil is rich in fundamental element and minerals, has good aeration, water holding capacity, and good texture. soil Firtility refers to the ability of the soil to sustain plant growth. to provide plant habitat and result sustained and consistent yeilds of high quality. It also refer's to the soil's ability to supply plant / crop nutrients in the right quantities and qualities over a sustained period of time. A fertile soil has the following properties.

- The ability to supply essential plant nutrients and water in adequate ammount and proportion for plant growth and reproduction.
- Sufficient soil depth for adequate root growth and water retention.
- soil pH in the range 5.5 to 7.0 suitable for most plant but some prefer or tolerate more acid or alkaline conditions.
- Topsoil or horizon O is with sufficient soil organic matter for healthy soil structure and soil moisture retention.

In lands used for agriculture and other human activities maitenance of soil fertility typically requires the use of soil conservation practices. This is because soil erosion and other froms of soil degredation generally result in a decline in quality with respect to one or more of the aspects indicated above.

Infertile soil

Infertile soils lacking in decomposing organic matter such as manure, will lack nutrients & binding qualities as well. For healthy growth, all plants require certain nutrients from the soil. Sandy soils with low organic matter content are generally considered infertile soil. Unfertile soil is of poor quality so that plants cannot grow in it. Unfertile soile is not good enough for plant or crops to grow well there. Soil infertility implies lack of the qualities which enable to provide nutrient element and compounds in adequate amounts and in proper balance for the growth of specified plants. Nutrient - weak soil may be aggravated by poor soil mechanics, perticularly poor binding properties which do not hold soil particles together in a porous, water stable structure.

Soil binding is the result of microorganisms exuding gummy substances during organic decomposition. Infertile soils lacking in decomposing organic matter such as manure, will lack nutrients and binding qualities as well.

Process by fertilization :

(I) First we brought soil from outside
(II) and then put a layer of tree leaves on it and then put cow dung and cow urine on it and this process was going on for 4 - 5 months.
(III) Then we took 5 gm of polluted soil and 5 gm of pure soil.
(IV) Then we added 5 ml of water and waited for 5 minutes.
(V) Then we filtered the water
(VI) After fitering the water, the water holding capacity of pure soil was 6 ml. & the polluted water holding capacity is 8 ml.
(VII) The we added 50 ml of distilled water in polluted soil ~~solution~~ and pure soil filtered water.
(VIII) and then we check its pH range.

Result :

* weight of soil :- Pure soil - 5 gm
polluted soil - 5 gm.

* colour of soil :- Pure soil - Black
(Before adding water) - polluted soil - light Brown

(After adding water) - Pure soil - Dark black
polluted soil - black.

* Adding of water :

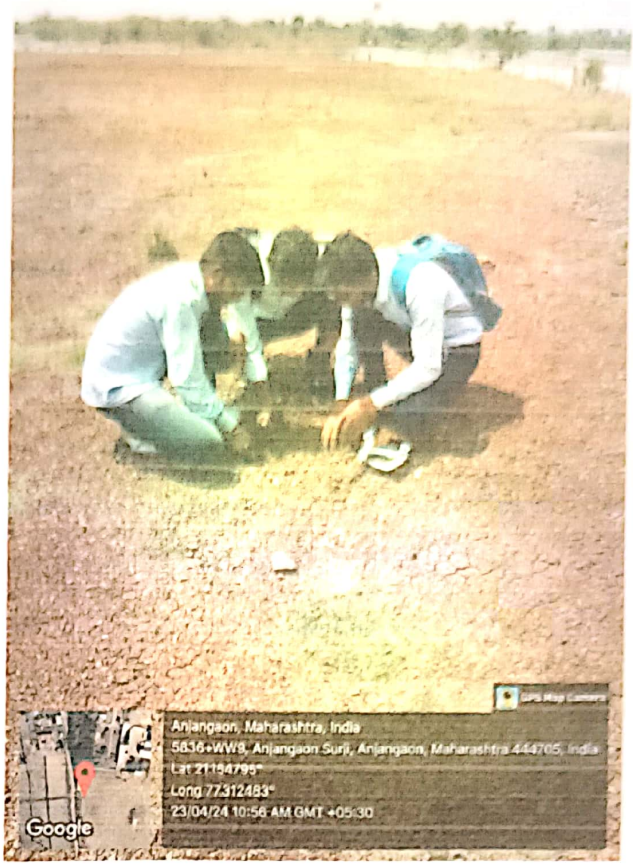
① Add 5 ml of water to the polluted soil
② and 5 ml of water added in pure soil
③ And then added 50 ml of of distilled water to the filtered water of Polluted soil and pure soil.

* Water Holding capacity :

① Pure soil - 8 ml
② Polluted soil - 6 ml.

* PH of soil :

PH of unfertilized soil - 7.60
PH of polluted soil - 6.5
PH of Pure soil - 3.5



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ANJANGAON SURJI- 444705, DIST- AMRAVATI (Maharashtra)

DEPARTMENT OF CHEMISTRY

Academic session 2023-2024

Class : B.Sc II (Sem IV)

Project on

Topic Name : Purification And Fartility of Soil

Submitted by

1) Akanksha A. Borode
2) Shravani N.Bhele
3) Pratiksha N.Rangole
4) Vaishanvi S.Bundile
5) Rasika V.Kale
6) Pratiksha S.Tathe

Guided by

Dr.P.P.Bhatkar

Purification of soil

Soil recomediation is a process where the contamiinated soil is either removed or purified using different means and most intresting approches for soil purifiation is bioremediation.

In bioremediation microorganisms are used to break down the contanminats within the soil Bioremediation is most typically used to treat organic contamina-nats such as oils and petroleum based fuels.

Soil remediation is defined as the removal of hazardous substance from soil, sediment or surface water. This process can involve a variety of techniques that range from physicals methods like excavation to chemical treatments such as bioremidiation.

Microorganisms such as Bacteria and fungi present in the soil feed on dead plant & animal matter to form humus, which is rich in nutrients and makes the soil fertile. This is how microorganisms make clean and fertilized soil. Thus we can say that soil becomes barren when nutrients in the soil exceed or decrease in optimal levels.

Soil fertility :-

Soil fertility is the ability of a soil to sustain plant growth by providing essential plant nutrients and favorable chemical, physical and biological characteristics as a habitat for plant growth.

Characteristics of Fertile soil

1) Contains all basic nutrients i.e., nitrogen, potassium and other minerals such as boron, iron, copper, zinc necessary for plant survival.
2) Has a pH in the range of 6.0 to 6.8.
3) Has a large amount of topsoil
4) Has a diversity of microbes which helps in plant growth.
5) Has organic matter which maintains the soil structure
6) Has capacity to retain more moisture.
7) Has a depth that permits plants to grow their roots deep for nutrition.
8) High cation exchange capacity.

Factors Affecting Soil Fertility.

1. Soil structure
2. Climate
3. Water retention capacity.
4. Soil pH.

Soil structure

Soil structure depends on the stagble aggregates of soil particles. Soil aggregates are natural clusters of soil particles with strong binding force. These aggregates may be bound together with other aggregates in larger masses called peds. Cementing material is humus and polysaccharides produced by microbes. Fungi has greatest aggregating influence then streptomyces then gum producing bacteria and then yeast. Among fungi rapidly growing Rhizopus, Mucor, Fusarium, Cladosporium, Aspergillus, Rhizoctonia secrete gums. Gum producing bacteria are Azotobacter, Rhizobium Xanthomonas, Bacillus. Soil structure is on of those properties which have a great impact on soil fertility.

Organic matter and farming patterns influence soil structure. Soil ~~resin~~ receiving well decomposed organic manures will have

better soil aggregates. Activity of microbes helps in improving soil structure. soil structure influences the movement of water and air in soil and organizational steadiness of soil. So a soil with good structure will be stable and will be repellent of scraping away of soil. A good soil structure is grain-like with a diameter less than 0.5 cm.

Climate

Weather conditions that exist in an area for long span is climate. Among features of climate, temperature and rainfall are the ones that affect the soil fertility. Crops yield obtained from fields depends on rainfall and temperature. Greenhouse gasses have a great impact on ~~soil and~~ climate which in turn has an effect on temp. and rainfall. Increased temp. and low rainfall have a bad impact on soil and they are involved in causing dry spell. Surface runoff and flooding is there is more rain in an area. So, both these factors have a bad impact on crop production and there will be less soil fertility.

Th Temperature, impacts the presence of organic matter and also the working of microorganisms. in soil. They do so by

affecting the presence of plants or other herbs, shrubs. Places where temp. is high will have low presence of these and hence less organic matter.

Water retention capacity.

Water holding or water retention capacity is the potential of soil to hold water against gravitational force. It is also known as the amount of water held by capillary spaces of soil after the percolation of gravitational water into deeper layers. Cohesion is involved in holding water molecules together. The soil sample in which sand dominates will have less water holding capacity. Gravitational, capillary and hygroscopic are three divisions of soil water.

This is an important factor to be considerd in choosing which plants should be grown and to determine how much water to apply by irrigation. Avability of water in soil is a good indicator of soil fertility and it helps plant root to reach great depths. Organic matter content and soil texture, soil structure and bulk density influence water holding capacity.

Soil pH.

Soil pH is very important factor for soil fertility to determine the soil reations and processes and it is indicated as the acidity and the alkalinity of the soil through measuring on pH scale from 0 to 14; pH 7 is considered neutral, pH lower than 7 is counted acidic and above 7 is considered alkaline. Majority of the plants are tolerant and they maintain pH range between 5.5 - 6.5. The solubility of most minerals and nutrients are higher in acidic soils than in slightly alkaline or neutral soil. The availability of macronutrients such as Ca, Mg, K, P, N, S, MO, and B in strongly acidic soil is reduced. Unlikely, the availability of micronutrient such as Fe, Mn, Zn, Cu and Co is more in soil with low pH.

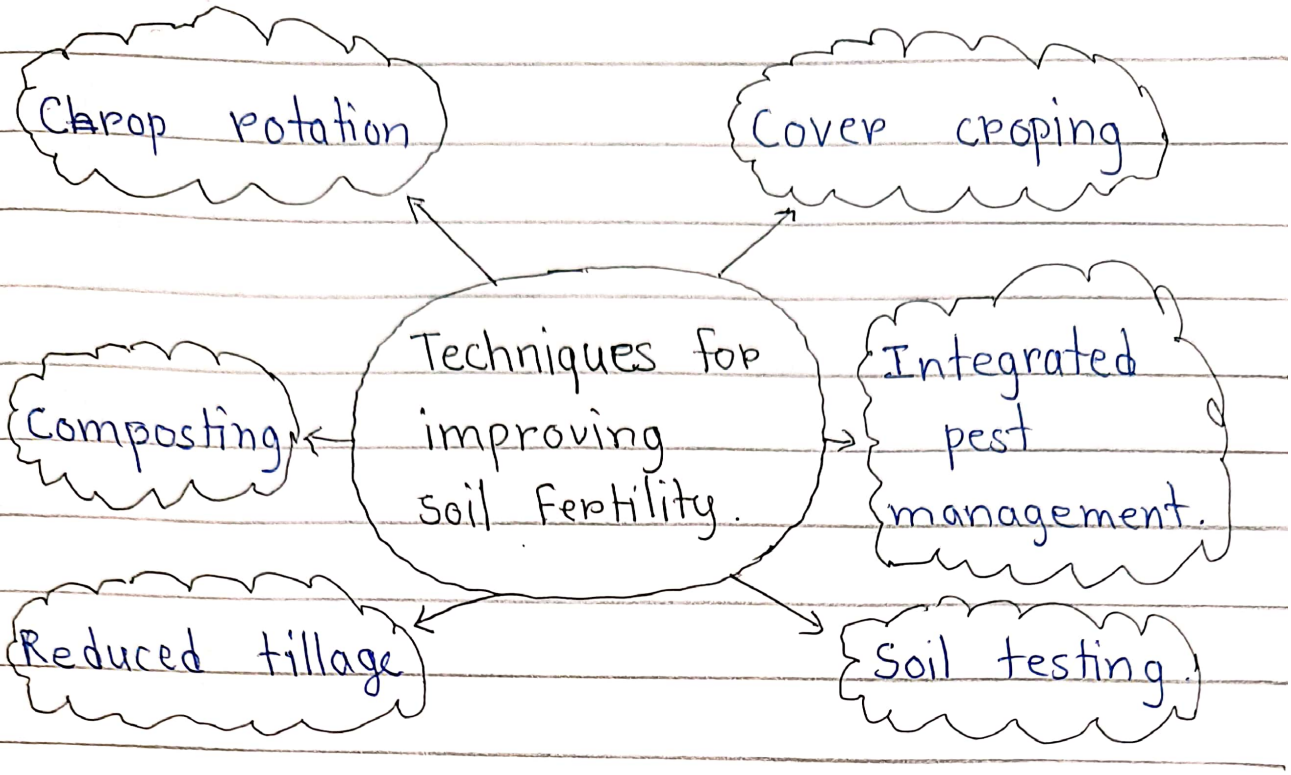
Organic matter.

Organic matter is formed by the dead bodies of amnimals and plants, fungi, insects, etc. Humus, leaf litter and animal manures constitute organic matter. The soil contains approximatly 5% of organic matter, so a major

portion of soil fertility owes to it. The organic matter ~~represent~~ responssible for the smoothness of the surface of soil.

Important of soil fertility.

- Soil productivity is the crop yielding ability of a soil from a unit area.
- Soil fertility is vital to a productive soil but, a fertile soil is not always a productionve one. Poor drainage, weeds, insects, disease, drought and other factors can limit productivity even when fertility is adequate.
- Fertile soils are not always ~~hight~~ highly productive, but the productive soils are always fertile.
- Very fertile and productive soils are rarely found in nature.



Practicaly perform

Soil sample	pH	Water holding capacity in (10ml)	
		water loss	water hold.
Fertilized soil	6.5	7.2	2.8
Non-fertilized soil	7.6	8.3	1.7