

EGG SHELL AND BIO-WASTE MANURE

HarshaSharadchandraNikose. M.Sc. Botany Nagpur University India (working in kvs)

Abstract

EGG SHELL manure can be used for the growth of crops and plants in a most progressive way as compared to the conventional methods of growing of plants. Egg shell along with another Bio-waste like plant waste and animal waste was used in potted plants like money plant and wheat grass which was applied for night. On observing a result a remarkable growth in the plant was observed. As compare to the plant of the same type in the soil. This shows that the manure with egg shells and bio-waste has tremendous potential required for the plant. It fulfills the mineral requirement for the plants which supports the growth, disease free quality and showing the quality and quantity. Overall it is an excellent organic manure for garden plants vegetables, crops and fruit plants.

Key words Term- Manure, Bio-waste, biodegradable, soil erosion, mulch, and vermicomposting.



1) INTRODUCTION –Experiment shows the benefits of egg shell and bio-waste manure for the growth of crops, vegetables, garden, orchard etc. It has tremendous potential to fight against diseases. It fulfills mineral requirement, support growth and shows healthy produce. It enriches soil with multi-nutrients. This manure can show very striking results in case of growth and disease resistant power. This project can help to keep the environment clean (because only waste products we are using to prepare it). This manure is very cheap and supports organic food.

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CONTENTS/INGREDIENTS OF EGG SHELL

MANURE: Nutrients present in egg shell

1. Egg Shell
- 1) Calcium -- 1800 mg
2. Boiled Tea Powder.
- 2) Magnesium -- 48 mg
3. Green Vegetable Waste.
- 3) Phosphorus -- 16.8 mg
4. Dried Leaves.
- 4) Potassium -- 16 mg
5. Coconut Husk
- 5) Sodium -- 18 mg
- 6.

Principal ingredient-- calcium carbonate 94%

7. Straw/Hey.
- 7) Macronutrients .
8. Chicken waste.
- 8) Micronutrients .
9. Alpha - Alpha Hey.
10. Mulch.
11. Paper Waste.
12. Goat Waste.
13. Cow Waste

2)CONTRIBUTION

HOW TO PREPARE EGG SHELL FOR MANURE:

1. Wash Empty Egg Shells in Warm Water until
2. Lay broken pieces out on Paper Towel and allow all the Egg White is removed allow them to dry .Break the Egg Shells into small pieces and but do not remove membrane because it contains many important nutrients. grind them into a fine Powder in a Mixer or Grinder
3. Store Powdered Egg Shell in a covered Glass Jar
4. Egg Shell can be dried properly either by heating or Airtight Container. Keep it in a dry place. (dryer) or by keeping them in Sunlight.

SOURCES OF EGG SHELL:

- i. Poultry
- ii. Kitchen waste (Raw Egg Shell or Boiled Egg Shell)
- iii.Hotels and Restaurants.

HOW TO USE BOILED TEA WASTE FOR MANURE.

- i. Take Tea waste or Boiled Tea Powder. Spread it
- ii. It will dry well in 72 Hrs. on Cotton Cloth. Put Cotton Cloth in Sunlight.

2.1)Advantages of Boiled Tea Powder

- i. Boiled Tea Waste (which forms after making Tea)
- ii. It is also used for correcting the PH of Soil. is a good source of Tannic Acid which helps to neutralize the soil .
- iii. Addition of Composed Tea in Soil promotes their. It also provides Booster sort of paste fighting

growth of microscopic organisms (Bacterial and Fungal microbe to the Plant foliage.

microbes). It also supports the soil food web and it ensures the Plant to have a ready supply of nutrients available for easy absorption.

v. It also prevents the Growth of Harmful Microbes. Vi. It is good for Roses.



SOURCES:

It easily from Hotels,



can be available homes,

Restaurants and Tea Points in the form of Waste.

GREEN WASTE:

It is a biodegradable waste and easily available from Kitchen as Kitchen Waste and from the Vegetable Vegetablewaste ofMarket is really a big Garbageproblem, Marketon a large Scale. It can also be obtained from bydrying it andpowdering it we can use it as important Garden or Park in the form of Grass Waste orPlantcomponent of Manure for Plants. (By dumping in a pitis Cuttings, Flower cutting and Hedge trimming. also recommended)

IMPORTANCE OF GREEN MANURE:

Green Manure is especially important for farms where there is non - availability of enough Animal Manure.

1. It improves soil structure and helps to prevent Soil Erosion.
2. It helps in Nitrogen Fixation.



3. It can help to improve the fertility of Soil.
4. It enrich the soil with micro and macro nutrients.
5. It promotes the growth of useful microbes in the Soil.
6. Green Manure helps in increasing Fertility through the incorporation of Nutrients and Organic Matter in to the Soil.
7. Leguminous Plants such as Clover are often used for this as they fix Nitrogen using Rhizobium Bacteria in Specialized Nodes/Nodules of Roots

3)VERMICOMPOSTING:

- i. The worm Manure is called Vermicomposting. The
- ii. It provides a alance source of Nitrogen, Manure product left behind by Worms is called Worm casting.Phosphorous, Potassium as well as Micronutrients It is an excellent Farm fertilizer or Garden Fertilizer when mixed in Egg Shell Manure or Garden



efficiently and allows more Oxygen to reach the Plants Roots.of Nitrogen and other nutrients.

PRECAUTIONS

It should be decomposed well and dried well before mixing into the Egg Shell Manure.

POULTRY WASTE

It will be also one of the important constituent of also helps to enhance the quality of Manure. Egg Shell Manure. It is easily available from Poultry's and

COW DUNG AS A SOURCE OF MANURE

It is easily available and it enhance the quality of Manure.



GOAT WASTE AS A PART OF MANURE:

Goat Waste can be easily available in Rural Area and it is a rich source of Nitrogen and other nutrients



ADVANTAGES

- a) It helps to improve the Structure and Fertility of Soil.
- b) Composting Cow Manure prevents any Seed in the Manure from Germinating in your Field.
- c) It contains important micro and macro nutrients responsible for Plant Growth.

PRECAUTIONS

1. Untreated Cow Manure contains harmful micro – organisms that can contaminate Vegetables and other crops.
2. Before using Cow Dung it should be dried well. crops if it is applied directly.

STRAW

- 1)It is a natural mulch which improves soil structure
- 2) It suppresses weeds
- 3) It helps to add nitrogen to the soil.

ADVANTAGES

1. It improves the Soil Texture. It uses water more
2. It is low cost and easily available. It is a Rich source

CHIKEN WASTE

1 It is easily available in homes , farm houses etc. it contain high level of Nitrogen and Potassium . which are good for leaf component which required for the growth of the and flower development plant is also present in it.

USE OF ALFA-ALFA HEY IN EGG SHELL MANURE:

It is natural fertilizer, very high in Nitrogen and



contains Phosphorous and Potassium. It is a natural source of Growth Hormone and contains high availability of trace minerals . It is used to increase organic matter in the soil making an excellent fast and effective soil conditioners by its Protein an Carbohydrates. It encouraging microbial activity in the Soil.

ADVANTAGES:

- 1) It rapidly decomposed and will generate a good amount of heat in a Short Time
- 2) The Powdered Hey is very useful for growing Potato with Egg Shell Manure.
- 3) Decomposition of hey (when it put in to water it starts to decomposing) and during this process Chemicals released which inhibit the growth of Algae which can be used as Manure (Algae should be dried and powdered it and mixed with Egg Shell Manure).

VARIETIES OF MATERIALS USED AS MULCH:

- i. Organic Residue: Grass clipping, leaves, hey, Straw,
- ii. Powdered Rock and Gravel: It can be used in Kitchen Scrap, Egg Shell, Wood chips, animal manure. Mulch to provide minerals to the Soil.
- iii. Dried Leaves: To provide the humus to the Soil.
- iv. Covering Material; they are biodegradable and neutral in PH They are good in moisture retention and weed controlling properties.

Uses of mulch

- 1) It help to enhance the visual appearance of the Area.
- 2) It may be applied to the bare soil or around existing vi. It is used both in commercial crop production. plant ,mulches of manure will be incorporated naturally in to the and in Gardening and help to improve the Soil

USE OF COCONUT HUSK IN MANURE:

The Powdered Coconut Husk can be used to enrich the soil with nutrients and helps to allow sufficient Oxygen to the Soil.

USE OF COAL DUST:

- i. Coal dust can be used to check the weeds in the field.
- ii. It contains Sulphur and Iron which are also helpful for the growth of Plant.

4)HOW TO FERTILIZE SOIL WITH EGG SHELL:

- i. Gather egg shells from boiled eggs and broken eggs.
- ii. Crush it in the Grinder. Turn them into Powdered Form.
- iii. Mix the Powdered Egg Shell into above mentioned iv. Crushing the Egg Shell or Powdered Egg Shell will help to ingredients and Sprinkle on to the Soil. (Precaution: Before making provide calcium readily to the Plant. If the Calcium deficient the Egg Shell Powder it should be washed and dried carefully).cell wall is there, the Plant becomes weak and unstable. So stronger the Cell wall, stronger will be the Plant. Its Roots will also be stronger.
- v. Calcium plays important Role in the construction of use of Sunlight, Carbon Dioxide, Water, Nitrogen and Minerals.many hormones and enzymes system that can protect the Plant from insect and disease attack.

5)Useful components of egg shell manure
Calcium carbonate is a principle ingredient of The egg shell it also contain micro and macro nutrients

Nitrogen:

1. Nitrogen is a part of living cells and is necessary part of all
- 2 Nitrogen helps plants with rapid growth, increasing proteins, enzymes and metabolic processes involved in the synthesis seeds, food production and improving the quality of leaf and transfer of Energy.
3. Nitrogen often comes from the legumes. The Legumes in turn gets Nitrogen from the Atmosphere. Other sources of Nitrogen are Water, Alfa-Alfa hey, Green Waste, Coconut husk and Rainfall.

Potassium:

1. Potassium is absorbed by the Plant in larger amount than Other minerals
2. It helps in the building of Protein, Photosynthesis, the other minerals except Nitrogen and in some cases Calcium. Fruit quality and reduction of diseases.
3. Potassium is supplied to Plants by Soil Minerals, Alfa-Alfa hey and Green Waste Material

ZINC:--It is essential for the transformation of Carbohydrates.

1. It regulates consumption of Sugar It is a part of the
- 2 Sources of Zinc are Soil, Green Waste, Animal enzymes System which regulates Plant growth.
- 3 sources of zinc are green waste animal Fodder and Egg Shell.

MAGNESIUM:

1. It is a part of Chlorophyll in all green Plants essential
2. It activates many Plant enzymes needed for growth. for Photosynthesis.
3. Soil minerals, Organic Material, Green Waste and Manures are the sources of Magnesium

MOLYBDENUM:

1. It helps in the use of Nitrogen.
- 2 Soil, Animal Fodder and Egg Shell is the source of Molybdenum.

PHOSPHOROUS:

1. Like Nitrogen ,Phosphorous is an essential part for the
2. It involves in the formation of all Oils, Sugar and process of Photosynthesis.Starches.
3. It helps in the transformation of Solar Energy into chemical energy proper Plant maturation and withstanding stress.
- 4 It affects rapid growth.
5. It promotes blooming and Root growth.

6. Phosphorous often comes from Fertilizers/Manure, Alfa-Alfa hey and Bone Meal etc.

CALCIUM:---

1. It is an essential part of Plant cell wall structure, provides 2. It also counteract the effect of Alkali, Salts and normal transport and retention of other elements as well as Organic Acids within a Plant. strengthen the Plant.

3. Sources of Calcium are Egg Shell and Manure.

SULPHUR:

1. It is essential plant food for production of Proteins. Promotes activity and development of enzymes and Vitamins.
2 It helps in Chlorophyll formation. It improves Root growth and Seed production.
4 It helps in vigorous Plant growth and resistance to Cold. Sulphur may be supplied to the Soil from the Rain Water, Egg Shell and Coal Ash (small amount)

MICRONUTRIENTS

BORON:

1. It helps in the use of nutrients and regulation of the nutrients.
2. It aids production of sugar and carbohydrates.
3. it is essential for Seed and Fruit development.
4 Sources of Boron are Organic matter, Egg Shell, Animal Fodder and Green waste.

COPPER:

1. Important for reproductive growth of Plant.
2. Aids in Root metabolism and helps in the utilization of Proteins.
3. Sources of Copper are green waste, Egg Shell Powder and Animal Fodder.

CHLORINE:

1. It aids Plants in Metabolism.
2. Sources: Animal Fodder and Chloride found in the Soil.

IRON:

1. It is essential for the formation of Chlorophyll.
2. Sources of Iron are Soil, Egg Shell, Coal Ash, Animal Fodder and Green Waste

MANGANESE:

1. It functions with enzyme system and involved in
2. Soil and Animal Fodder is a source of Manganese. breakdown of Carbohydrates and Nitrogen metabolism.

The above mentioned ingredients are present in Manure and helps to make the Manure efficient for the growth

6)RESULT-

6.1)Experiment with money plant---

Two plants I have grown in different conditions. One used because wood ash is alcoholic and they are specially was grown with eggshell and bio waste manure and other plant high in Potassium. Coal ashes usually contains large was grown without this manure.

amount of Sulphur Decomposed/Spoiled Hay or Straw Eggshells contain Calcium carbonate which helps can also be used which make an excellent Carbonbase Plants to form strong cell walls and transport molecules between for this manure. It may contain more Nitrogen that is Cells. The manure sprinkled around the plant, Beside this egg present in straw. If the soil deficient in Sulphur then with shell contents can also defer Pests. There are many components our manure we can add Coal Ash. Egg Shell Manure/ present in the egg shell that affect the overall quality of the Compost can be made with material such as leaves, manure. The egg shell consists of about 94 to 97% Calcium Carbonate Kitchen Scrap, Boiled tea Powder, paper waste wood and 3% is Organic matter. Now forget spending money on bags of dust, rock dust, Rotten hay and straw can be mixed with Fertilizers for your Garden. Ordinary Kitchen waste which you discard Soil either in dry powered form or dump it into pit for everyday have the same Potential to nourish your Plants and 30 to 35 days it will decompose their and can be turned prevents bugs and weeds. into Compost and can be used for Garden Plants like After mixing all above mentioned constituents we can Lemon, Oranges, Guava, Mango, Custard apple and even make home made Fertilizer which can protect our Plants, helps in in the field after Ploughing we can add it as a Manure. So growth nd can make them healthy. This can also be used to grow the Crop will get organic feed for their growth and they other Plants and Crops. will nourish very well without adding urea and othe

6.2) MANURE:- Vegetables wastes, Kitchen Scrap, boiled tea powder Fertilizer. In such Soil Microbes will grow very well. We can also used to make compost from it. This manure will help to have already done this experiment with Lemon, Oranges improve the water holding capacity of soil. Paper waste can also and Mango Trees and also see the result adding this be used in thipreparation. Kitchen waste is mostly rich in Nitrogen manure in Field on a Large Scale. Cowdung isan and plays important role for this manure. Wood ash can also be excellent addition to the soil, will help to improve soil quality and structure.



6.3) TEST ON WHEAT GRASS. - Select area (A) and prepare soil before eggshell manure we can see tremendous difference sowing seed with egg shell manure ,pour water and make soil ready between two plants. for sowing . Take another area (B) and sow seed without using



Plant (A) grow very fast with healthy look, disease free with healthy grains.

TEST ON FRUIT PLANTS—

Select some fruit plants like Mango, disease resistant power every factor is different from Oranges ,Banana, Papaya, Citrus, etc and use this manure for the plant in which eggshell and biowaste manure is these plants we can observe how nicely it can bear healthy fruits, added. This manure is highly enriched with we can see the quality and quantity of fruits. we can see macronutrients and micronutrients that can help to plants are more resistant to diseases, early maturity of plant as improve the texture, structure, aggregation, density, compare to other plants ,good quality of fruit pulp and healthy drainage and water holding capacity of the soil, health Seeds On the other hand side for the same plants instead of of the soil will help to grow soya bean ,wheat, Paddy eggshell manure we had added fertilizer (urea) but the result was and fruit plants etc. not very good. quality and quantity of fruits, period of maturity,

TEST ON VEGETABLE CROP

Vegetable crop like potato , tomato, sweet potato, carrot, altering the balance of microorganism in soil. reddish, onion etc respond well to the eggshell manure. It control plant parasitic nematodes and fungi to some extent by

7) CONCLUSION

THE EFFECT OF MANURE ON SOIL AND PLANT

1) It improve nutrient uptake , It allow to hold cations in 5) It improved water retention, it improved plant away that makes them more easily available to plant roots and thus health, it improved nutrient holding capacity and improve micronutrient transfer to plant's circulation system. increased nutrient value.
2) Seed germination- it helps to germinate seeds .
6) Soil properties -It reduces soil erosion by
3) Microorganism stimulation - It is a source of phosphate increasing the cohesive forces of the very fine soil and carbon by stimulating micro flora population. A healthy soil with particles. a balanced micro flora support healthy plants. 7) It control plant parasitic nematodes and fungi are
4) Plant Growth - It accelerated cell division , plant grow controlled to some extent by altering the balance of stronger and healthier . It resist plant disease better and help to microorganism in the soil. (Due to the addition of identify enzyme system of plant. Margosa oil cake and dried margosa leaves)

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Author Name—

Harsha Sharadchandra Nikose, Master Degree –
M.Sc. Botany, Nagpur University, India (working in KVS)