

PROF. DR. HAYTHM SALEM

ORGANIC FERTILIZATION

LECTURE NO. 4

FIRST LEVEL – FOOD SAFETY

BIO-ORGANO FERTILIZATION

(SELECTIVE COURSE)



Organic manure

Organic manure

Introduction

The use of chemical fertilizer is increasing day-by day for the sake of increasing production.

By excess use of it, the fertility of soil and health also deteriorate.

Therefore the use of organic manure is one of the alternative ways for enhancing production and improves the soil health.

It is not only cheaper; easily available ensures sustainable agriculture too.

Organic manure

Introduction

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Organic manure

Benefits of Organic Manures

- Organic manures increase the organic matter in the soil.
- Organic matter in turn releases the plant food in available form for the use of crops.
- Organic manures should not be seen only as carriers of plant food.
- These manures also enable a soil to hold more water and also help to improve the drainage in clay soils.
- They provide organic acids that help to dissolve soil nutrients and make them available for the plants.

Organic manure

Sources of Organic manures

1. By products of farming and allied industries.
2. FYM, droppings, crop waste, residues, sewage, sludge, industrial waste.



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Organic manure

Types of Organic Manures

1. Farm yard manure (FYM)
2. Green manures
3. Crop residues
4. Compost
5. Home compost
6. Concentrated organic manures

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1. Farm yard Manure

- Farm yard Manure is prepared basically using cow dung, cow urine, waste straw and other dairy wastes.
- It is highly useful and some of its properties are:
 - FYM is rich in nutrients
 - When cow dung and urine are mixed, a balanced nutrition is made available to the plants.
 - Availability of Potassium and Phosphorus from FYM is similar to that from inorganic sources.
 - Application of FYM improves soil fertility.

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Nutritional Status of FYM (%)



Nitrogen	0.5000
Phosphorus	0.2500
Potassium	0.4000
Calcium	0.0800
Sulfur	0.0200
Zinc	0.0040
Copper	0.0003
Manganese	0.0070
Iron	0.4500

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2. Green Manures

- Many countries have changed from a region of food scarcity to food sufficiency by increased fertilizer use with subsidized prices, but use of organic manures including green manure, declined substantially.
- Inorganic fertilizers are becoming more expensive, therefore sustainability of soil productivity has become a question.
- Hence, alternate sources to supplement inorganic fertilizers are thought.
- Green manuring are low cost and effective technology in minimizing cost of fertilizers and safeguarding productivity.

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Green Manure Crops

DHAINCHA

(Sesbania aculeata)



MANILA AGATHI

(Sesbania rostrata)



3. Crop Residues

- Crop residues are the non-economic plant parts that are left in the field after harvest.
- The harvest refuses include straws, stubble and Stover of different crops.
- Crop remains are also from thrashing sheds or that are discarded during crop processing.

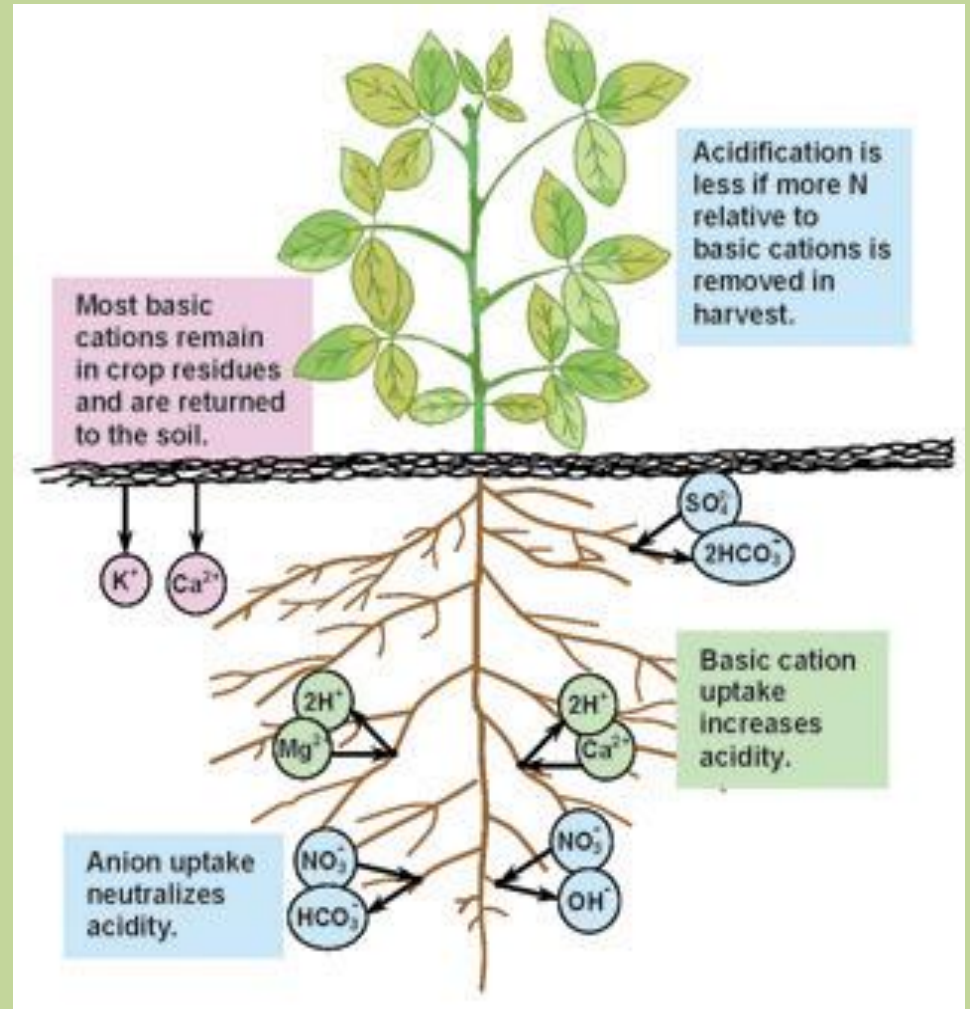
Organic manure



Biocompost preparation with farm waste



Separation of composted materials through sieving



Organic manure

- The greatest potential as a biomass resource appears to be from the field residues of sorghum, maize, soybean, cotton, sugarcane etc.
- These residues will contribute 100000 ton of nitrogen, 50000 ton of phosphorus and 200000 tons of potassium.
- How ever crop residues need composting before being used as manure.

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4. Compost

- Compost is a rich source of organic matter.
- Soil organic matter plays an important role in sustaining soil fertility, and hence in sustainable agricultural production.
- In addition to being a source of plant nutrient, it improves the physico-chemical and biological properties of the soil.

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Importance of Composting

- Final weight of compost is very less.
- Composting temperature kill pathogen, weed seeds and seeds.
- Saleable product
- Improves manure handling
- Reduces the risk of pollution
- Volume reduction of waste. During composting number of wastes from several sources are blended together.
- Composting temperature kills pathogen, weed seeds and seeds.
- Matured compost comes into equilibrium with the soil.
- Excellent soil conditioner.

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VermiCompost

- Vermicompost is an organic manure (bio-fertilizer) produced as the vermicast by earth worm feeding on biological waste material; plant residues.
- This compost is an odorless, clean, organic material containing adequate quantities of N, P, K and several micronutrients essential for plant growth.



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Vermicompost shed

- Vermicompost is a preferred nutrient source for organic farming.
- It is eco-friendly, non-toxic, consumes low energy input for composting and is a recycled biological product.
- The process allows for the safe conversion of waste into a valuable nutrient rich humus fertilizer-Vermicompost.



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5. Home Compost



Organic waste + Dried Leaves become compost is 90 days

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6. Concentrated Organic Manures

- Edible oil cakes which can be safely fed to livestock; e.g.: Groundnut cake, Coconut cake etc.,
- Non edible oil cakes which are not fit for feeding livestock; e.g.: Castor cake, Neem cake, Mahua cake etc.,
- Both edible and non-edible oil cakes can be used as manures.
- However, edible oil cakes are fed to cattle and non-edible oil cakes are used as manures especially for horticultural crops.
- Nutrients present in oil cakes, after mineralization, are made available to crops 7 to 10 days after application.

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Oilcakes need to be well powdered before application for even distribution and quicker decomposition.

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Average Nutrient Content of Oil Cakes

Oil-cakes	Nutrient content (%)		
	N	P ₂ O ₅	K ₂ O
Non edible oil-cakes			
Castor cake	4.3	1.8	1.3
Cotton seed cake (undecorticated)	3.9	1.8	1.6
cake	3.9	0.9	1.2
Mahua cake	2.5	0.8	1.2
Safflower cake (undecorticated)	4.9	1.4	1.2

Cont.

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Oil-cakes	Nutrient content (%)		
	N	P ₂ O ₅	K ₂ O
Edible oil-cakes			
Coconut cake	3.0	1.9	1.8
Cotton seed cake (decorticated)	6.4	2.9	2.2
Groundnut cake	7.3	1.5	1.3
Linseed cake	4.9	1.4	1.3
cake	4.7	1.8	1.3
Rape seed cake	5.2	1.8	1.2
Safflower cake (decorticated)	7.9	2.2	1.9
Seamus cake	6.2	2.0	1.2

Source: agriTechportal.ac.in

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Let Us Sum Up

- Organic manures are cheapest sources of nutrient compare to synthetic fertilizers.
- Various sources of organic manures are descried and individual nutrient statuses are summarized.
- All the sources are available in on farm.
- Farmers can adopt these practices for improved banana production.

Resources

- Krishan Chandra (2005), ORGANIC MANURES , Regional Centre of Organic Farming.
- Robert Parnes (2013), Soil Fertility, A Guide to Organic and Inorganic Soil Amendments.
<http://creativecommons.org/licenses/by-nd/3.0>