

Manures and Fertilizers

Soil Fertility and Nutrient Management (NRH-121)

Instructor
Dr. R.K. Pathak
Assistant Professor



Presented By
Ravindra Sachan
Teaching Associate

Department of Soil Science and Agricultural Chemistry C.S.A
UNIVERSITY OF AGRICULTURE AND TECHNOLOGY KANPUR(U.P.)
208002

CONTENT

- ▶ Introduction
- ▶ Organic Manure
- ▶ Inorganic Fertilisers
- ▶ Role Of Organic Manure & Inorganic Fertiliser in Sustainable Agriculture

INTRODUCTION

- ▶ **Sustainable Agriculture-** means the adoption of such agriculture practices which do not pollute or over exploit the components of environment and agricultural production remains on suitable level for a very long time.
- ▶ Sustainable agriculture practice in India has been adopted by around 800000 farmers.
- ▶ Around 2.8 mha comes under the organic farming.
- ▶ Major state of India- Andhra Pradesh Maharashtra Madhya Pradesh
Tamil nadu

ORGANIC MANURE

➤ Manures are plant and animal wastes that are used as sources of plant nutrients they release nutrients after their decomposition. Manures are two types

1. Bulky organic manure
2. Concentrate organic manure



BULKY ORGANIC MANURE

- **DEFINITION-** Bulky organic manure contain small Percentage of nutrients and they are applied in large quantities.

Example :

FARM YARD MANURE

COMPOST

VERMICOMPOST

NIGHT SOIL

GREEN MANURE

HOME COMPOST

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.
 - Application of FYM improves soil fertility.

Nutritional status of FYM

ELEMENTS	PERCENTAGE(%)
Nitrogen	0.50
Phosphorus	0.25
Potassium	0.50
Calcium	0.08
Sulphur	0.02
Zinc	0.04
Copper	0.0003
Manganese	0.0070
Iron	0.4500

GREEN MANURE

- Green undecomposed plant material used as manure is called green manure.
- The plants that are grown for green manure crops.
- The most important green manure crops are Sunhemp, Dhaincha, Cowpea, Clusterbean etc.
- Green manure helps in reclamation of alkaline soil.

Dhaincha

1) *Sesbania aculeata*

2) *Sesbania rostrata*



COMPOST

- ▶ A mass of rotted organic matter made from waste is called compost.
- ▶ The compost made from waste like sugarcane trash paddy straw weed and other plant waste is called farm compost.
- ▶ The average nutrient contents of farm compost is 0.5% Nitrogen, 0.25% Phosphorus and 0.5% Potash.
- ▶ Compost is rich source of organic matter.
- ▶ Soil organic matter plays an important role in sustaining soil fertility and enhance in sustainable agriculture.
- ▶ It improves the physical, Chemical, and Biological properties of soil.

Vermicompost

- ▶ Compost that is prepared with the help of earthworms is called vermicompost.
- ▶ In India *Eisenia fetida* and *Eudrilus eugeniae* are most widely used in vermicompost.
- ▶ This compost is an odorless, clean, organic material containing adequate quantities of N, P, K and several micronutrients essential for plant growth.
- ▶ Vermicompost contains 3% Nitrogen 1% Phosphorus and 1.5% Potash.

VERMICOMPOST



CONCENTRATE ORGANIC MANURE

- **DEFINITION-** Concentrate organic manure have higher nutrient content than bulky organic manure they are applied in small quantities.
- Concentrated organic manure are also called the organic nitrogen fertilizer.
- These are Oilcakes ,fish manure ,horn and hoof meal, oil cakes, etc.
- Oilcakes are two type -Edible (Groundnut cake Mustard cake Coconut cake) and non edible oilcakes are(Castor cake Mahua cake)etc

Edible oilcakes

▶ Nutrients contents%

▶ Oil-cakes

▶ N P K

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

NON EDIBLE OILCAKES

▶ Oil-cakes

▶ Non edible oil-cakes

▶ Castor cake

▶ Cotton seed cake (undecorticated)

▶ Mahua cake

▶ Safflower cake (undecorticated)

Nutrients contents%

N P K

4.3 1.8 1.3

3.9 1.8 1.6

2.5 0.8 1.2

4.9 1.4 1.2

INORGANIC FERTILIZER

- ▶ **Definition :** Inorganic fertilizer, also referred to as synthetic fertilizer , is manufactured artificially and contains minerals or synthetic chemical.
- ▶ **example:** Nitrogenous fertilizers
Phosphatic fertilizers
Potassic fertilizers etc.

Classification Of Nitrogenous Fertilizers

Ammoniacal	Nitrate	Ammoniacal & Nitrate	Amide
Ammonium sulphate (N ₂ -20.5%)	Sodium nitrate (N ₂ - 16%)	Ammonium nitrate (N ₂ - 33%)	Urea (N ₂ -46%)
Ammonium chloride (N ₂ -24-26%)	Calcium nitrate (N ₂ -15.5%)	Calcium ammonium nitrate (25%)	Calcium cyanide (N ₂ - 21%)
Anhydrous ammonia (N ₂ -82%)			

Classification of Phosphatic Fertilizers

Water soluble phosphoric acid	Citric acid soluble phosphoric acid	Phosphoric acid not soluble in water or citric acid
SSP- 16% P ₂ O ₅	Basic slag- 14-18% P ₂ O ₅	Rock phosphate- 20-40% P ₂ O ₅
DSP- 32% P ₂ O ₅	Dicalcium phosphate- 34-39% P ₂ O ₅	Raw bone meal- 2-2.5% P ₂ O ₅
TSP- 48% P ₂ O ₅		Steamed bone meal - 25% P ₂ O ₅

Classification Of Potassic Fertilizers

Potassium chloride	60% K ₂ O
Potassium nitrate	44% K ₂ O
Potassium sulphate	48- 52% K ₂ O

Role of Organic Manure & Inorganic Fertilizer In Sustainable Agriculture

- ▶ Organic manure provide long term benefit to people and the environment.
- ▶ Organic manure to increase long term soil fertility.
- ▶ Organic manure insure that water stay clean and safe.
- ▶ Organic manure produce nutritious food, fiber, timber etc. without exploitation.
- ▶ In sustainable agriculture food production requires application of inorganic fertilizer including macro & micro nutrients in arable land.
- ▶ Inorganic fertilizers application in agricultural practices has significantly increased the production of food , fiber and other plant products.

**THANK
YOU**

