

**Vivekanand College, Kolhapur**  
(Empowered Autonomous)

**Department of Botany**

B.Sc. I: Open Elective

**TOPIC: MANURE VS FERTILIZERS**

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## Fertilizers vs Manures

### Fertilizers

- Nutrients from artificial sources.
- Mineral origin.
- High nutrient content.
- Simple salts.

### Manures

- Nutrients from natural sources.
- Natural or organic origin.
- Low nutrients compare to fertilizers
- Very complex

# Fertilizers vs Manures

## Fertilizers

- Soluble or give rapid response.
- Only specific nutrient.
- Cause side effects.
- Eg. urea,  $\text{NH}_3\text{SO}_4$  etc....

## Manures

- 30 days or more to decompose.
- Organic nutrients contain all nutrients.
- Don't cause side effect.
- Eg. excrete of animals, animal matter

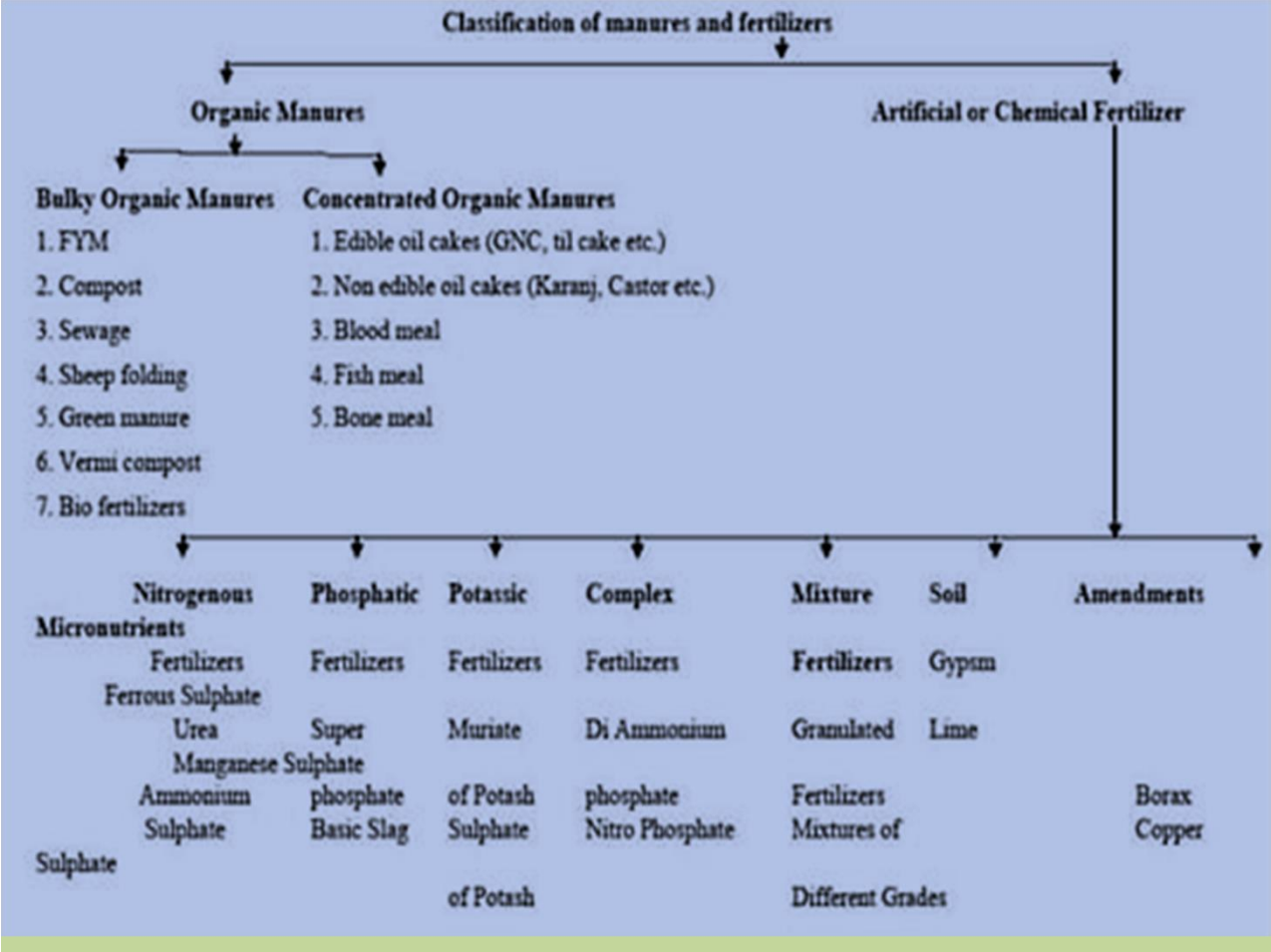
## Fertilizers



- What is a Fertilizer ?
- A **fertilizer** is any material of natural or synthetic origin that is applied to soils or to plant tissues to supply one or more plant nutrients essential to the growth of plants.

# Types of Fertilizers

- Straight.
- Mix.
- Complete
- Incomplete
- Organic
- Inorganic
- Soluble
- Insoluble



## Straight Vs. Mix-

- Straight fertilizers contains single nutrient in it as that of Urea contains only Nitrogen (N) @ 46 % OR Single Super Phosphate (SSP) contains only Phosphorus (P) @ 16 %.
- Mix fertilizers contains 2 or more nutrients as that of Di-amonium Phosphate (DAP) contains 18 % Nitrogen (N) and 46 % Phosphorus (P).

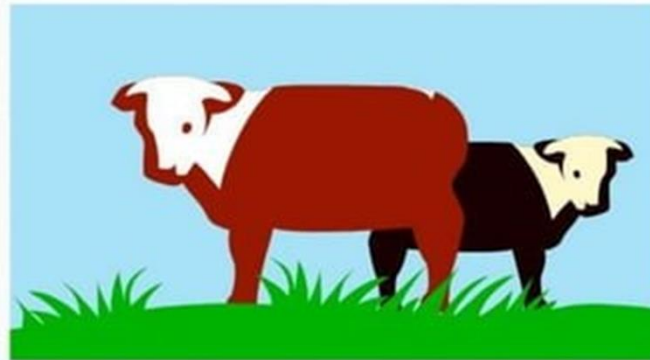
## Complete vs. Incomplete

- Complete has all three primary nutrients-nitrogen phosphorous & potassium
  - Examples: 10-10-10, 15-30-15, 20-5-20
- Incomplete DOES NOT have all three primary nutrients
  - Examples: 20-0-0, 0-20-0, 12-0-44



# Organic Fertilizers

- Comes from plant or animal matter and contains carbon compounds
- Examples: urea, sludge and animal tankage



## Advantages of Organic

- Slow release of nutrients
- Not easily leached from the soil
- Add organic components to growing media



## Disadvantages of Organic

- Hard to get
- Not sterile
- Low nutrient content
- Expensive



# Inorganic Fertilizers

- Comes from sources other than animals or plants
- Chemical products



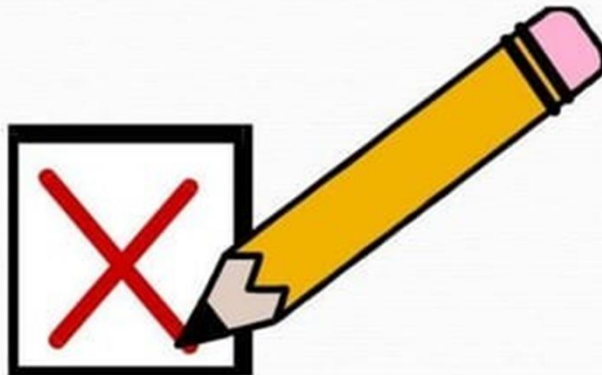
## Advantages of Inorganic

- Can make the desired ratio of nutrients
- easy to get
- lower cost



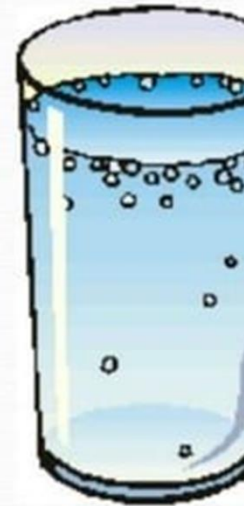
## Disadvantages of Inorganic

- No organic material
- possible chemical building up in growing media



# Soluble Fertilizer

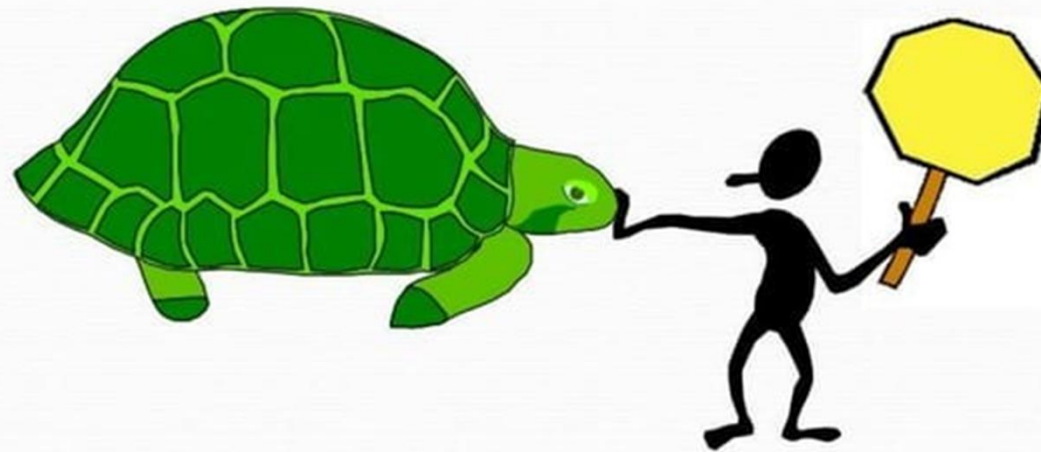
- Dissolve in water and are applied as a liquid solution
- Fertigation
  - fertilizing through irrigation water
  - big advantage





# Insoluble Fertilizer

- Includes granular and slow release applied to the growing media





## Granular vs. Slow Release

- Granular
  - relatively inexpensive
  - easy to find
- Slow Release
  - more expensive because it is coated
  - more uniform release of nutrients over time period

## Fertilizer Analysis

- Fertilizer analysis expresses weight as a percent of nitrogen, phosphorus and potassium

20-10-20  
N P K

# Fertilizer Analysis

- For Example
  - A 100 kg bag of fertilizer has an analysis of 15-5-15. How many pounds of nitrogen, phosphorus and potassium are in the bag?
    - Nitrogen:  $100 \times 15\% = 15 \text{ Kg}$
    - Phosphorus:  $100 \times 5\% = 5 \text{ Kg}$
    - Potassium:  $100 \times 15\% = 15 \text{ Kg}$

## Fertilizer Ratios

- A fertilizer with a 10-10-10 analysis would have a 1:1:1 ratio
- A fertilizer with a 24-8-16 analysis would have a 3:1:2 ratio
- What would be the ratio for a fertilizer with an analysis of 36-18-27?

4:2:3

## *Advantages of fertilizers*

- *We need more food to feed increased population.*
- *This is only possible through yielding variety of food grains and other food materials like oilseeds sugar fruits etc.*
- *All these things need nutrition from roots from soil.*
- *These nutritions in large quantity can only be fortified to the soil through the use of chemical fertilizers.*

## Disadvantages of fertilizers

- Excess or uncontrolled use can spoil the soil properties, osmotic pressure, conductivity and water holding capacity.
- It also may affect adversely on population of microorganisms and other parameters.
- It can also damage water resources.

## **MANURE:**

**A manure is a mixture of various decomposed organic substances like dead leaves, city garbage, agricultural wastes, animal dung, crop residue etc. through the action of microbes.**

- **Manure increases the fertility and productivity of crops.**
- **As they contain plenty of organic compounds and almost all the essential elements required by the plants.**

- 1) Manures are organic substances obtained through the decomposition of plant wastes (like straw) and animal wastes (like cow dung).
- 2) The decomposition is brought about by the action of microbes.
- 3) Manures contain large quantities of organic matter.
- 4) Manures contain nutrients in small quantities and therefore are needed to be supplied to crops in large quantities.
- 5) Manures are not nutrient specific. For this reason, manures are not of much help when a specific nutrient is required for a particular crop.



**6) Manures are bulky. So it is not convenient to store and transport manures.**

**7) Manures are recycled and do not cause pollution.**

**8) They enrich the soil with nutrients.**

**9) Being rich in organic matter, manures improve soil texture and soil aeration.**

**10) Water holding capacity in case of sandy soils and drainage in clay soil is increased.**

## Types of Manure:

The manures are of three types :

- 1) Farmyard manure
- 2) Compost
- 3) Green manure

## **Farmyard Manure**

- **It is the oldest manure known to mankind.**
- **It is made-up of dung of farm animals, urine, farm refuse, and crop residues (plant remains) which are allowed to partial decay with the help of soil microorganisms.**
- **These soil microorganisms degrades the complex organic substances into a dark amorphous substance caled humus.**

- The humus is easily assimilated by plants.
- These manure loosens the soil, increases its aeration and makes the soil more fertile.
- It provides various organic substances to plant for normal growth and development. The residue of gobar gas plant is a type of farmyard manure.

## **Compost**

**It is prepared by degrading the dung of farm animals, crop residues, farm wastes and other organic debris in specially designed pits**

**or**

**degrading material is covered by a mud pack to prevent water logging during the rainy season. It takes about 6-8 months to prepare the compost.**

## Green manure

- ❑ To prepare it, many leguminous and non-leguminous crops are grown in the field and ploughed back into the soil while they are still green and young.
- ❑ This practice is done for nitrogen, phosphorous, calcium, sulphur and other minerals enrichment of the soil.
- ❑ The complex organic matter present in the plants is decomposed by the action of micro-organisms.

- **Apart from supplying nutritional requirements, it reduces alkalinity, prevents soil erosion also.**
- **Green manures enhance crop yield by 30 to 50 percent plants like *Crotalaria juncea* (sunn hemp), *Sesbania aculeata* (dhaincha), *Vigna sinensis* (lobia) and various other plants are used as green manures in India.**

## manures

What is a manure ?

Manure is organic matter, mostly derived from animal feces except in the case of green manure, which can be used as organic fertilizer in agriculture. Manures contribute to the fertility of the soil by adding organic matter and nutrients, such as nitrogen, that are trapped by bacteria in the soil.





## Types of manures

There are three types of manure they are:-

- Green manure
- Farmyard manure
- compost manure

## Advantages of manures

- (1) Using manure improves the soil structure (aggregation), so that it holds more nutrients and water, and makes the soil more fertile.
- (2) Manure encourages soil microbial activity that promotes the soil's trace mineral supply, improving plant nutrition. It also contains some nitrogen and other nutrients itself which assist the growth of plants.
- (3) As it is an organic product, it will not cause any harm to the environment

## Disadvantages of manures

- The manure of cattle and horses may include weed seeds . weeds easily sprout, spread and seed . Manure also may be also high in nitrogen . High nitrogen levels may cause grossly imbalanced nutrient in soil. For eg. a nitrogen excess brings about dense lush plant growth at the expense of fruiting and flowering. And manure endanger health, through the spread of E.

