

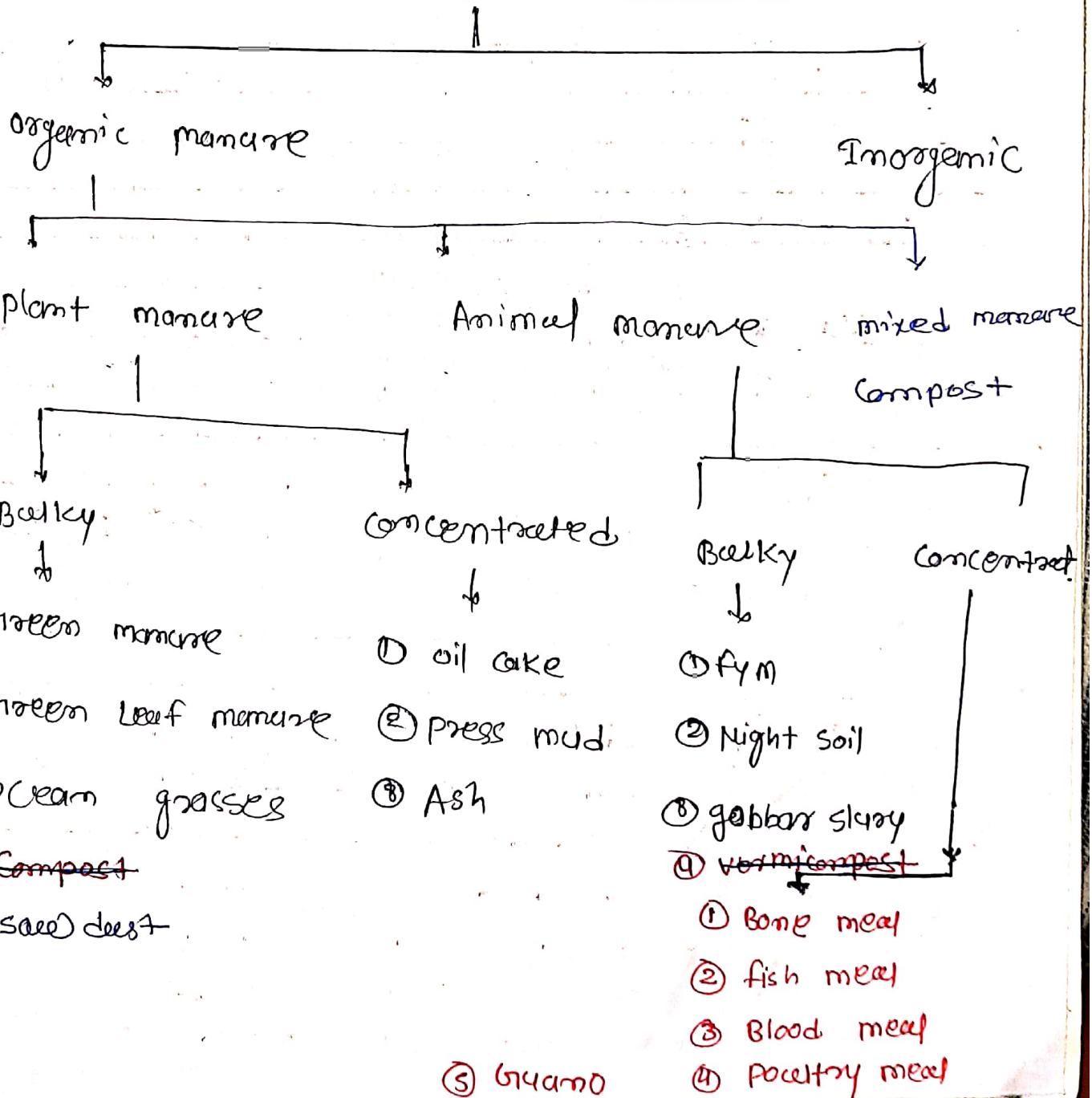
# CHAPTER - 5

## MANURE AND FERTILIZER

# Manure (खाद): Decomposed form of organic waste mainly plant & animal residues are known as manure.

→ Manure nutrient contained is low but No. of nutrients are high

### Classification of Manure



### Nutrient contained in manure

| No.  | Manure                  | N       | P     | K    |
|------|-------------------------|---------|-------|------|
| * 1. | Cobbar manure (FYM)     | 0.5%    | 0.25% | 0.5% |
| 2.   | Urban / city compost    | 1.5%    | 0.5%  | 1.0% |
| 3.   | Rural / village compost | 0.6%    | 0.5%  | 0.8% |
| * 4. | Vermi - compost         | 2.5-3.0 | 1.0%  | 1.5% |
| 5.   | Green manure            | 0.6%    | 0.2%  | 0.6% |
| * 6. | Guano                   | 13%     | -     | -    |
| 7.   | Blood meal              | 10%     | 1.5%  | 0.8% |
| 8.   | Ground nut cake         | 7.3%    | 1.5%  | 1.3% |
| 9.   | Safflower cake          | 7.9%    | 2.2%  | 1.9% |

### Method of Composting

### Scientist name

|    |                          |                     |
|----|--------------------------|---------------------|
| 1. | Indore method            | Haward & Wadaya     |
| 2. | Bangalore method         | Dr. C.N. Acharya    |
| 3. | ADCo method              | Harchinsan & richa  |
| 4. | Activated compost method | Fowler              |
| 5. | Nadep method             | Narayan row pande   |
| 6. | Vermi compost method     | Dr. Sultan Ahmad sm |

\* Green manure: It is practice of ploughing or turning into the soil, undecomposed green plant tissue for the purpose of improving soil fertility.

→ Green manure crop turning in the field during flowering, or before pod formation (45-50 Day)

\* Suitable crop for green manure

- (1) Sun-hemp (सर्ह) *Crotalaria juncifera*
  - (2) Dhaicha (best) Nitrogen *Sesbania aculeata*
- Dhaicha are fixation of both stem & root.

\* Rajma / French Bean is one pulse crop which doesn't fixation of atmospheric Nitrogen.

\* Suitable green manure in Rice field → Dhaicha

| Crop Types        | Crops                                       |
|-------------------|---|
| 1) Pulses (दालहन) | Sun-hemp, moong, urd, Dhaicha, lobia, Rajma |
| 2) Cereals अदालहन | Maize, sorghum (Jowar), Sunflower           |

## # Character of Green manure :

- It should be pulses crop.
- It should be Nitrogen fixation crop.
- Less manure / Fertilizer consuming crop.
- Less water require crop.
- Less insectpest crop.
- Short duration crop.

## ~~#~~ Gobar manure (FYM) Farm Yard manure

- Dr. C.N. Acharya
- FYM is refered to a decompose mixture of dung & urine of farm animal along with their litter (chara)
- In fym → 70-80% water, 20-30% solid matter
- \* → In cereal crop required 10-15 tonne / hectare FYM.
- In fruit crop required 10-20 kg / plant of FYM
- \* → Application of FYM in field before ~~soil~~ sowing of 15-30 days.

## Factor affecting ~~of~~ ~~for~~ FYM

1. Source of manure
2. Food of animals
3. Age of animals
4. Function / work of animals

5) storage of manure

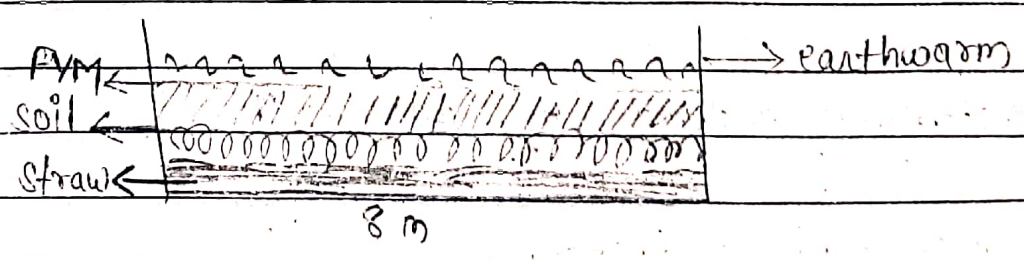
### \* Vermicompost

Manure that is prepared with the help of earthworm is called Vermicompost.

Suitable species for preparation of Vermicompost:

- \* 1. Pheritima posthuma (Scientific name of earthworm)
- 2. Ishuria fetida - " -
- 3. Eudrilus eugeniae - " -

- In cereal crop required 5-6 tonne / hectare Vermicompost.
- In vegetable crop required 5-7 tonne/hectare Vermicompost.
- In fruit crop required 5 kg / plant Vermicompost.
- In flower crop required 1-2 kg/m<sup>2</sup> Vermicompost.



# FERTILIZER (उर्वरक)

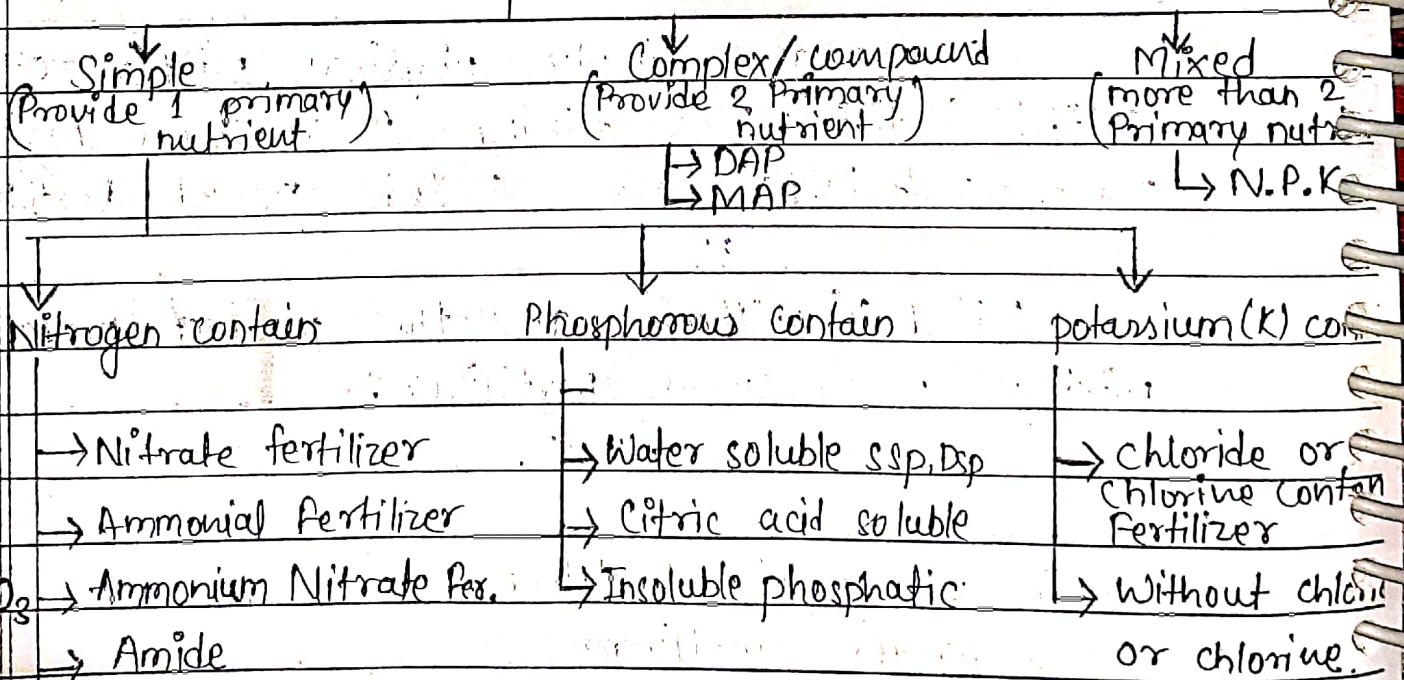
Topic to be covered

- (1) Definition
- (2) Classification
- (3) Nutrient content

Defination: Naturally or Artificially synthesis<sup>ed</sup> chemically compound, whose nutrient composition & structure are fixed & are used for supplying essential plant nutrients to plant are called fertilizers.

- Fertilizer are inorganic nature.
- Fertilizer are manufacture in industry.

## Classification Fertilizer



(A) Simple / Straight Fertilizer

Fertilizer which supply 1 ~~or~~ major primary plant nutrients called simple fertilizer.

ex - Urea

(B) Complex / Compound Fertilizer

Fertilizer which supply 2 ~~or~~ major primary plant nutrients.

OR

The fertilizer containing 2 or major primary plant nutrients, which are in chemical combination called complex fertilization.

ex - DAP  $(\text{NH}_4)_2 \text{H}_2 \text{PO}_4$

(C) Mixed Fertilizer

These are simply physical mixture of solid fertilizer. Containing 2 or more major plant nutrients are called mixed fertilizer.

OR

Mixed fertilizer are the product made by mixing 2 or more fertilizer.

ex - N.P.K.

(A) Simple / Straight Fertilizer

1. Nitrogenous fertilizer

(i) Nitrate ( $\text{NO}_3$ )

→ Highly mobile in soil

→ Suitable for top dressing. †

→ Nitrate fertilizer are basic residual in nature.

→ Leaching & denitrification loss high.

ex - (1) Sodium nitrate ( $\text{NaNO}_3$ )

→ 16% N

(2) Calcium nitrate ( $\text{Ca}_2\text{NO}_3$ )

→ 15% N

(3) Potassium nitrate ( $\text{KNO}_3$ )

→ 13% N

(ii) Ammonical Fertilizer ( $\text{NH}_4$ )

→ Less Leaching loss

→ Suitable for water logged area

→ Acidic in nature

→ More volatilization loss

Loss of Nitrogen in less water level field

ex : (1) Ammonium sulphate ( $\text{NH}_4\text{SO}_2$ )

→ 20% N & 24% S

\* Suitable crop ⇒ Rice, sugarcane, Tea, groundnut

~~Suitable crop~~ ~~1/1/1~~

→ mostly use in Rice.

(2) Ammonium chloride ( $\text{NH}_4\text{Cl}_2$ ) (Acidic nature)

→ 25% N

(iii) Ammonical nitrate fertilizer ( $\text{NH}_4^+ \text{NO}_3^-$ )

# Ammonic nitrate

→ It contain 33% of nitrogen.



→ Highly ~~hygroscopic~~ hygroscopic nature.

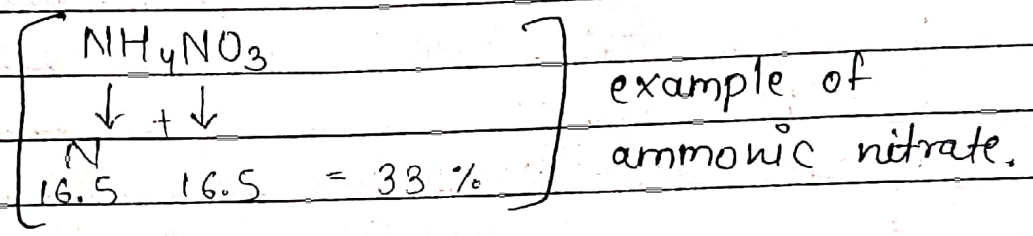
→ It is a Explosive fertilizer.

# Calcium Ammonium nitrate:

\* Common known as "Kishan" fertilizer.

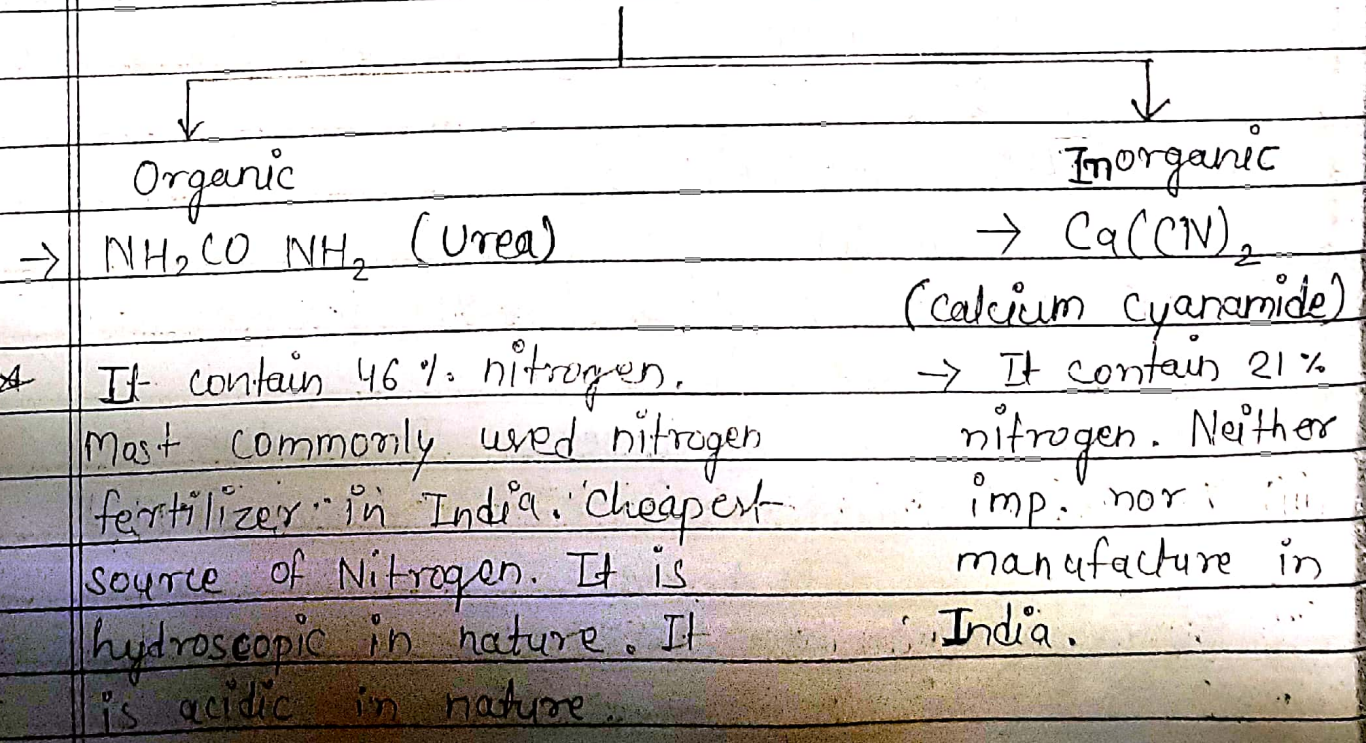
→ It contain 26 % nitrogen is present.

→ It is an neutral in nature.



(iv) Ammide fertilizer : (NH<sub>2</sub>)

Ammide fertilizer



## 2) Phosphorus contain fertilizer

(i) Water soluble

→ SSP (single Super phosphate)  $\text{Ca}(\text{H}_2\text{PO}_4)_2$   
It contain 16%  $\text{P}_2\text{O}_5$

→ 21% Calcium or 12% Sulphur

→ DSP (Double super phosphate)  
It contain 32% phosphorus.

→ TSP (Triple super phosphate)  
It contain 46% - 48% phosphorus.

→ DAP (Di ammonium phosphate)  
complex  $(\text{NH}_4)_2 \text{H}_2\text{PO}_4^-$   
It contain 46% phosphorus & 18% nitrogen

→ MAP (Mono ammonium phosphate)  
It contain 17% nitrogen and 48% phosphorus

(ii) Citric soluble

→ Dicalcium phosphate (DCP)  $(\text{Ca}_2)_2 \text{H}_2 \text{PO}_4^-$   
It contain 33 - 48% phosphorus.

→ Basic slay fertilizer, It contain 14 - 18% phosphorus.

(iii) Insoluble phosphoric fertilizers

- Rock phosphate. It contain 20-40% phosphorous.
- Bone meal. It contain 25% of phosphours.

3) Potassium (K) contain fertilizer : (Potash)

(i) Chlorine contain 920

→ KCL (potassium chloride)

- \*→ It is most common & cheap potassic fertilizers
- It contain 60% potash, (K<sub>2</sub>O)

→ Suitable for acid soil.

→ Crop should not be used :-

Sugarcane, beetroot, Tobacco, Tomato, potato

(ii) Without Chlorine contain

(a) Potassium sulphate (K2SO4)

↓             ↓  
48%      17%

(b) Potassium Nitrate (K2NO3)

↓             ↓  
46%      13%

\* Suitable for - fruit crop

Vegetable

tobacco

## \* Acidic Residuality

- Anhydrous Ammonia — 148 meq / 100 gr.
- Ammonium Chloride — 128
- Ammonium sulphate — 110
- Urea — 80 - 85
- DAP — 77
- Ammonium Nitrate — 60

## # Basic

- Calcium Cyanamide — 63
- Calcium Nitrate — 29
- Sodium Nitrate — 21