

Integrated Farmyard Manure (FYM) Production

LPM-610 (Integrated Livestock Farming Systems)

(Unit-II)

Lecture-1



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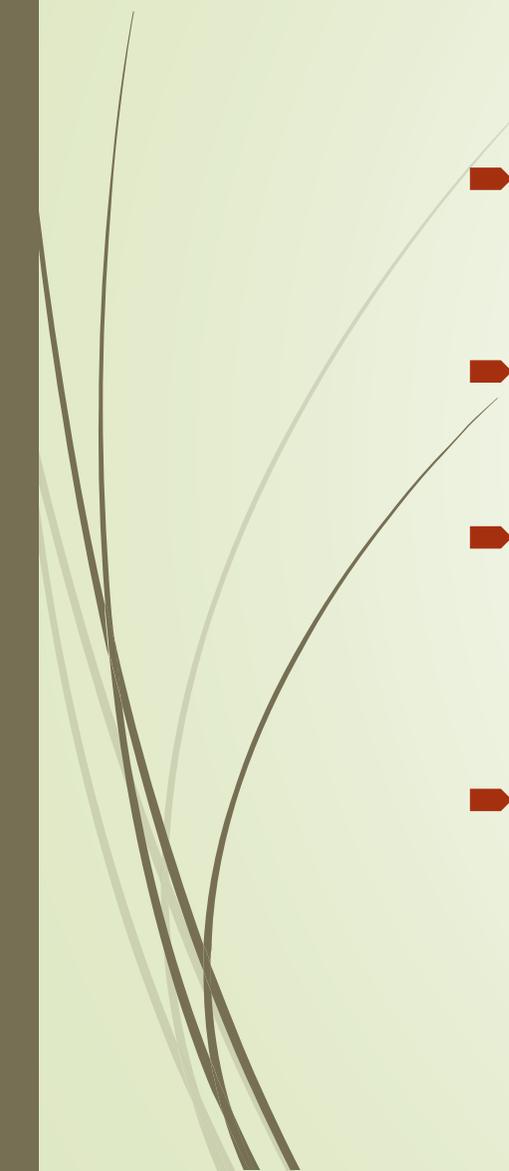
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Farmyard Manure (FYM)

- Farmyard manure refers to the decomposed mixture of dung and urine of farm animals along with litter/bedding materials and left over material from roughages or fodder fed to the cattle.
- On an average well decomposed farmyard manure contains 0.5 percent N, 0.2 percent P_2O_5 and 0.5 percent K_2O .
- Farmyard manure has a high proportion of organic material which nurtures soil organisms and is essential in maintaining an active soil life.
- The high organic matter content and the active soil life improve or maintain friable soil structures, increase the cation exchange capacity, water holding capacity, and infiltration rate, and reducing the risk of soil pests building up.

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- Only about half of the nutrient content of farmyard manure becomes available for crop growth during the first year after it has been applied to the soil.
 - The rest is channeled through soil biotic processes and the nutrients are released in the following years.
 - The entire amount of nutrients present in farmyard manure is not available immediately.
 - About 30 per cent of nitrogen, 60 to 70 per cent of phosphorus and 70 per cent of potassium are available to the first crop.

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- The present method of preparing farmyard manure by the farmers is defective.
 - Urine, which is wasted, contains 1% nitrogen and 1.35% potassium.
 - Nitrogen present in urine is mostly in the form of urea which is subjected to volatilization losses.
 - Even during storage, nutrients are lost due to leaching and volatilization.
 - However, it is practically impossible to avoid losses altogether, but can be reduced by following the improved method of preparation of farmyard manure.

Average nutrient content of manures

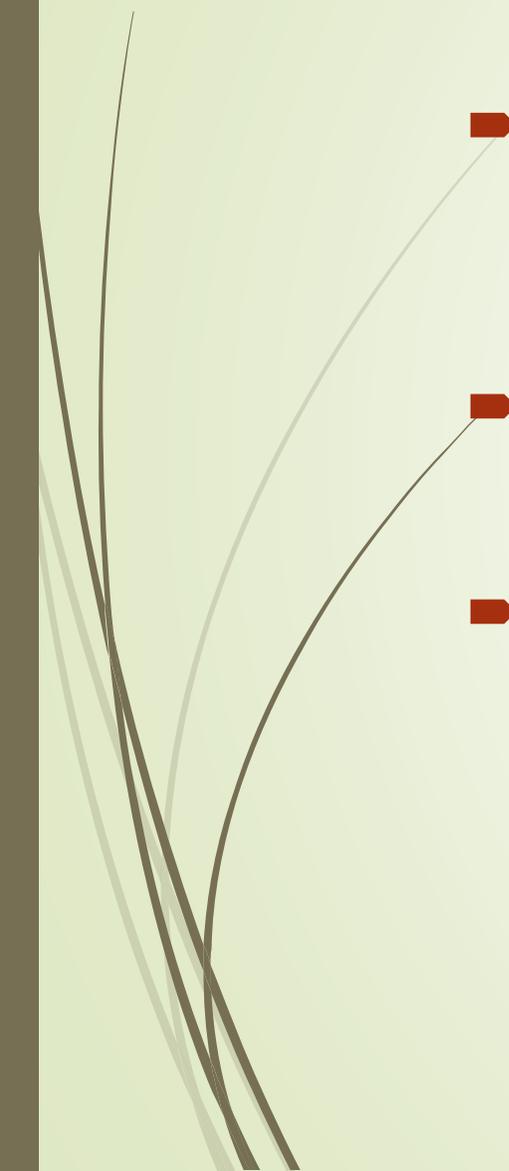
Manure	Nitrogen (%)	P ₂ O ₅ (%)	K ₂ O (%)
Cattle dung fresh	0.4-0.5	0.3-0.4	0.3-0.4
Horse dung fresh	0.5-0.6	0.4-0.6	0.3-1.0
Poultry manure fresh	1.0-1.8	1.4-1.8	0.8-0.9
Sheep manure fresh	2.8-3.2	0.9-1.2	1.8-2.4
Animal refuse	0.3-0.4	0.1-0.2	0.1-0.3
Cattle urine	0.9-1.2	Trace	0.5-1.0
Horse urine	1.2-1.5	Trace	1.3-1.5
Sheep urine	1.5-1.7	Trace	1.8-2.0

Advantages of Farmyard Manure

- Provides all the nutrients that are required by plants but in limited quantities.
- Helps in maintaining C:N ratio in the soil and also increases the fertility and productivity of the soil.
- Improves the physical, chemical and biological properties of the soil.
- Improves both the structure and texture of the soils.
- Increases the water holding capacity of the soil.
- Due to increase in the biological activity, the nutrients that are in the lower depths are made available to the plants.
- Minimizing the evaporation losses of moisture from the soil. .

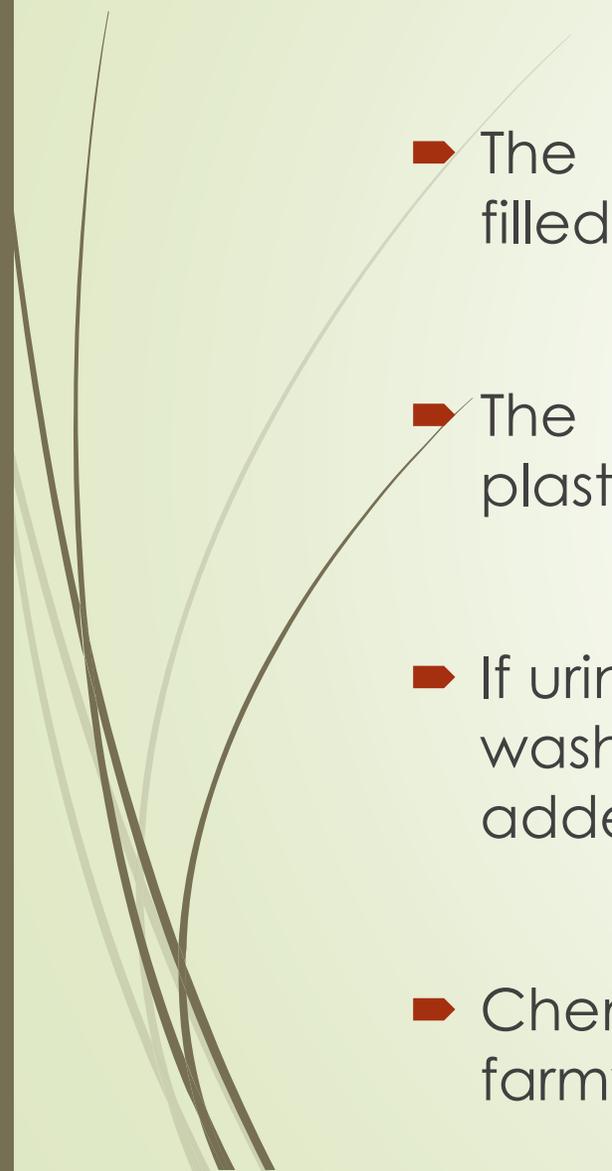


Disadvantages of Farmyard Manure

- Its decomposition releases harmful gases that polluted the atmosphere.
 - Reduces the availability of certain micronutrients.
 - FYM needs more cost/unit weight of nutrients during handling, storage and application as compared to fertilizer.
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Process of FYM Production

- Trenches of size 6.0-7.5 m length, 1.5-2.0 m width and 1.0 m deep are dug.
- All available litter and refuse is mixed with soil and spread in the shed so as to absorb urine.
- The next morning, urine soaked refuse along with dung is collected and placed in the trench.
- A section of the trench from one end should be taken up for filling with daily collection.

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- When this section is filled up to a height of 45-60 cm above the ground level, the top of the heap is made into a dome and plastered with cow dung earth slurry.
 - The process is continued and when the first trench is completely filled, second trench is prepared.
 - The manure becomes ready for use in about 4-5 months after plastering.
 - If urine is not collected in the bedding, it can be collected along with washings of the cattle shed in a cemented pit from which it is later added to the farmyard manure pit.
 - Chemical preservatives can also be used to reduce losses and enrich farmyard manure.

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- The commonly used chemicals are gypsum and superphosphate.
 - Gypsum is spread in the cattle shed which absorbs urine and prevents volatilization loss of urea present in the urine and also adds Calcium and Sulphur.
 - Superphosphate also acts similarly in reducing losses and also increases phosphorus content.
 - Partially rotten farmyard manure has to be applied 3-4 weeks before sowing while well rotten manure can be applied immediately before sowing.
 - Generally 10-20 tones/ha is applied, but more than 20 tones/ha is applied to fodder grasses, vegetables and cash crops.

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- Farmyard manure should be applied at least 15 days in advance to avoid immobilization of nitrogen.
 - The existing practice of leaving manure in small heaps scattered in the field for a very long period leads to loss of nutrients.
 - Whether it is best to heap up the manure or put it in a pit depends on the local climate.
 - Heaping has the advantage of being less costly, while the pit method reduces runoff and the loss of nutrient rich fluids.
 - A prerequisite for the manure having a positive impact on soil fertility is that it is properly decomposed.

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- The application of partially decomposed manure can increase the number of white grubs, red ants and other soil pests.
 - Decomposition is enhanced and the time it takes to happen is reduced if the manure is kept warm and moist (but not wet) at all times.
 - Adding nitrogen in the form of urine improves the carbon to nitrogen ratio.
 - It is possible to prepare by this process 7.0-8.5 cubic m. of FYM.
 - 5-6 tones per year per head of cattle containing 0.5% nitrogen.
 - Slurry from biogas plant is also used in similar manner.



THANKS

