Theme 1: Forage production and pasture management

USE OF NATURAL RESOURCES, COMPOST MAKING, FARM YARD MANURE, MANURE STORAGE AND USE (Level 2)

Topic	Training & information Content
1.1	Planning of fodder/feed requirements for the dry season
1.2.1	Integrated soil fertility management I
1.2.2	Integrated soil fertility management II
1.3	Use of natural resources, compost making, farmyard manure, manure storage and use
1.4	Growing maize and sorghum for fodder and estimating time of harvest and yield
1.5	Brachiaria, Panicum, & Napier (cut and carry) grass management
1.6	Growing fodder trees and use of feed
1.7	Estimating of dry matter content, feeding value and yield of various fodder crops
1.8	Guidelines for Tropical pasture management and grazing management
1.9	Scaled mechanization of forage production and pasture management (harvesting practices)
1.10	Operating farm equipment and self-propelled tractors
1.11	Mechanization of feeding management
1.12	Economics of forage and pasture production

1. You will learn about (learning objectives):

- ❑ Important of conserving natural resources.
- ❑ Ways of conserving natural resources.
- ❑ Recycling waste in a dairy farm.

2. Introduction

- Dairy farming depends on many natural resources from the environment.
- All these resources should be well managed to ensure productivity and longevity.
- Adoption of climate-smart farming systems helps conserve natural resources.

3. Why conserve natural resources?

- Sustainable livestock production without negatively impacting future production systems can be practised through:
  i. Improving productivity without affecting natural resources and environment at large.
  ii. Minimizing waste through recycling i.e. compost making.

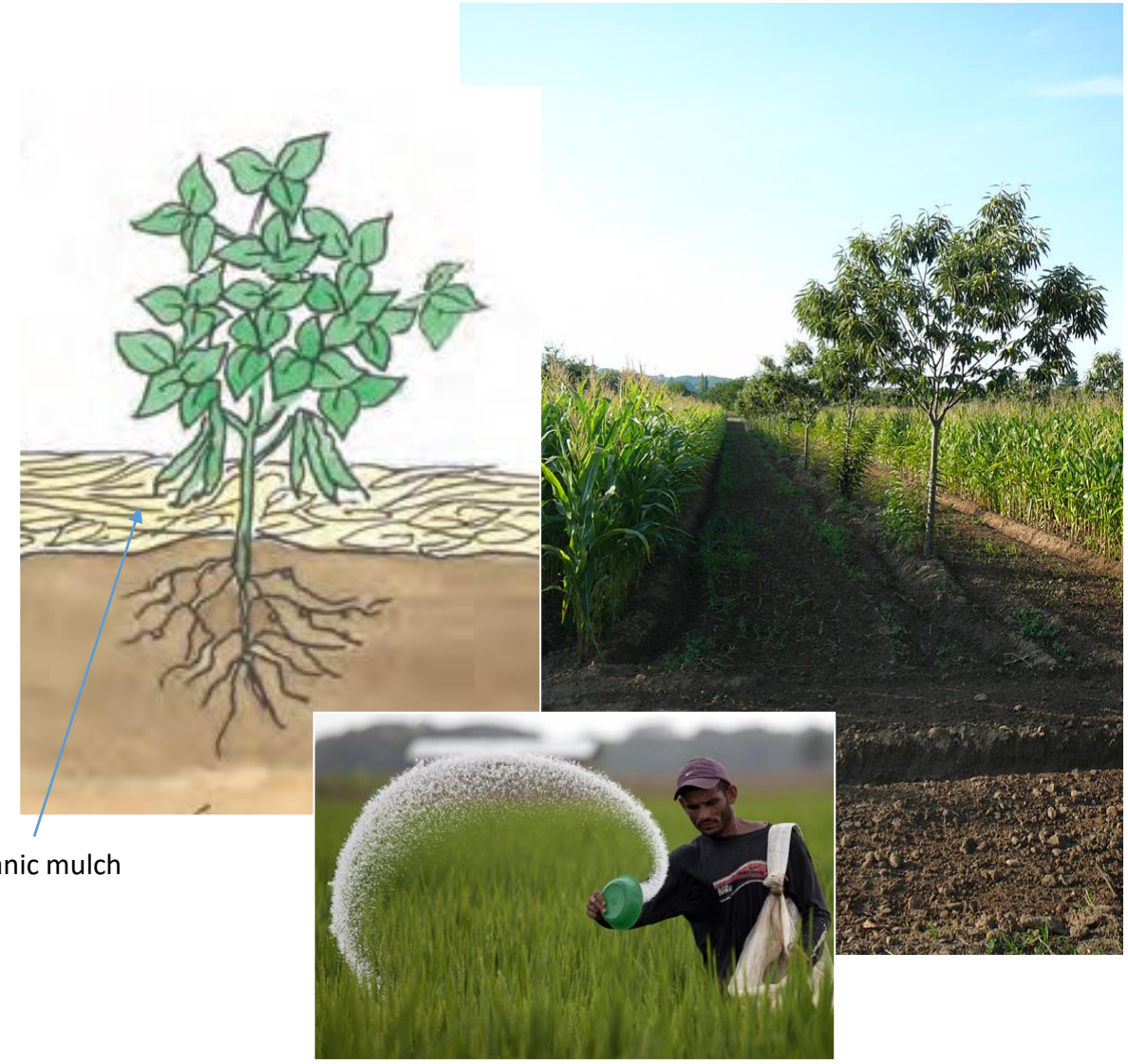
4. How to conserve natural resources

- Is achieved by;

    i. Reducing soil erosion.
    ii. Avoiding pollution of water and soil.
    iii. Reducing deforestation.
    iv. Encouraging biodiversity.
    v. Reducing global warming.
    vi. Managing energy sources.

5. Sustainable farming practices

- Adopting pasture management & sustainable grazing practices.
- Using organic manure and mulch.
- Where inorganic fertilizers are used, they should be applied at recommended rates (soil test).
- Improving water management during farming operations and encourage recycling.
- Minimum tillage.
- Intercropping and crop rotation, preferably with leguminous crops/trees.

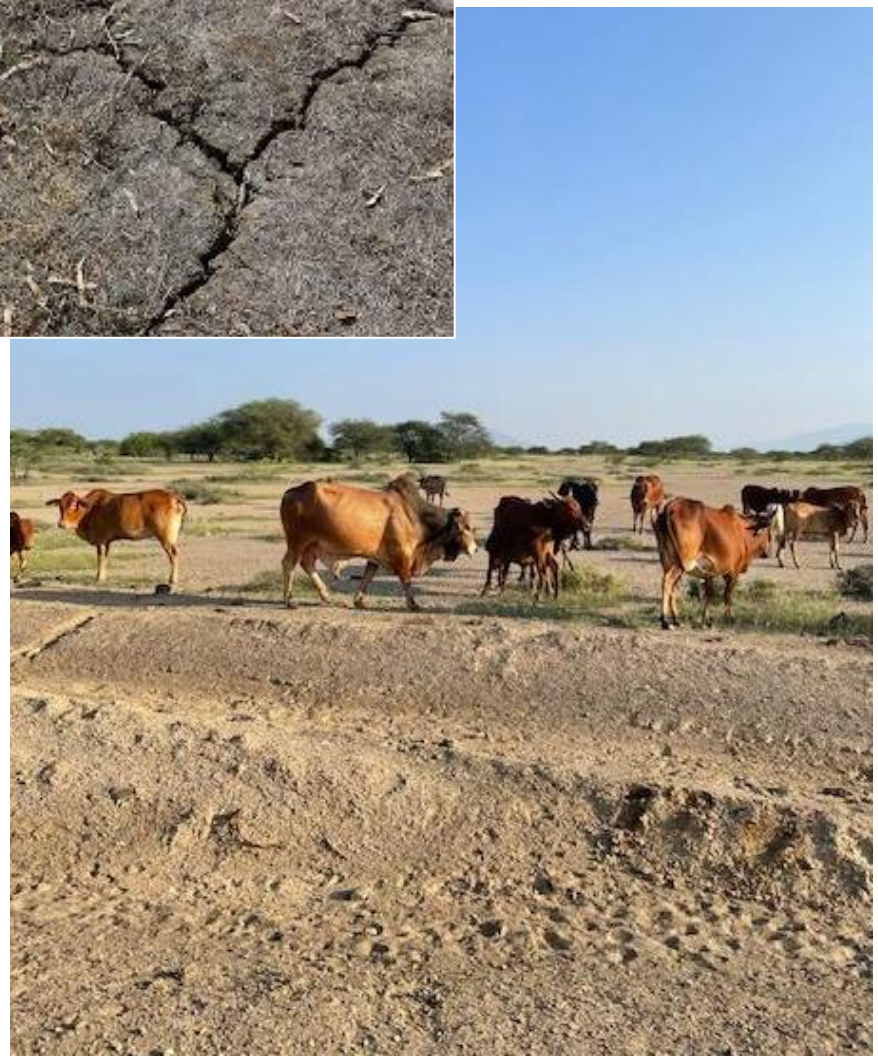


Organic mulch

Apply inorganic fertilizers at recommended rates

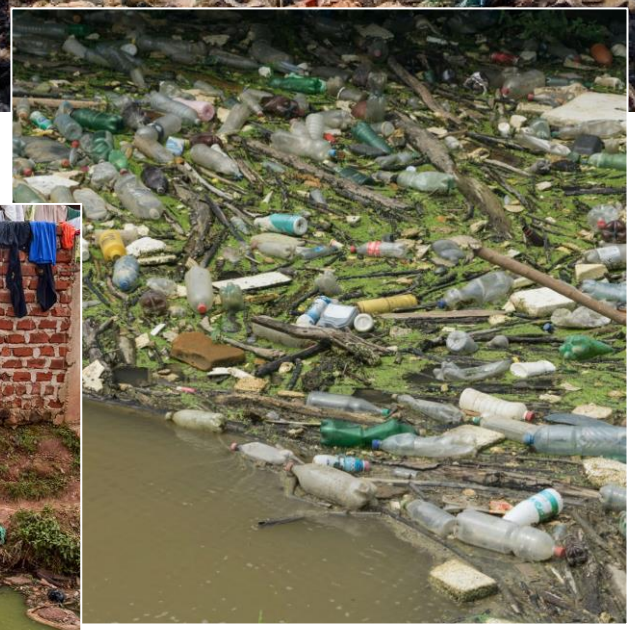
6. Soil erosion

- Unsustainable farming practices results to soil erosion.
- Overstocking leads to slow re-growth of pastures due to increased soil compaction.
- Reduction in soil cover also exposes the soil to massive erosion.
- Soil degradation can be slowed by better management of natural resources.



7. Water and Soil pollution

- Decrease in land and water potential over time (water-shed degradation) is influenced by overexploitation of natural resources and increased human activities.
- Other common causes of water & soil pollution include:
  - Careless waste disposal
  - Poor & unregulated fertilizer application.
  - Poor farming activities.
- All these factors exposes water & soil to pollution.



8. Deforestation

- Deforestation of most forests in Uganda is caused by;
  - Unregulated harvesting of forest products i.e. tree logging.
  - Charcoal burning for fuel.
  - Agricultural production.
- Activities such as extensive cattle production activities (ranching), pushes livestock production to forest areas.
- Deforestation releases carbon-dioxide into the atmosphere contributing to global warming.
- Deforestation can lead to desertification in the long run.
- Forests and trees in general should be greatly conserved by the farming community.

9. Global warming

- Global warming is caused by human activities that lead to burning up of fossil fuel.
- This leads to rise of global temperatures due to increase in the concentration of greenhouse gases (CO_2 and other air pollutants) in the atmosphere.
- Methane expulsion by livestock contribute to the total greenhouse gases.

10. Recycling resources in dairy

- **T**he ultimate way to effectively manage resources sustainably is by adopting recycling.
- Farmers can practice recycling by:
  - Recycling dung to farmyard manure.
  - Using methane digesters to convert waste to energy.
  - Recycling or treating water from cow sheds for irrigation.
  - Compost making.

Compost making

11. Recycling water

- A lot of water is used in dairy farms for various production purposes and as drinking water.
- Water harvesting and recycling are key water handling and management practices.
- Water recycling involves re-distributing already used water to aid in other purposes.

12. Biodigester (Biogas)

- Biodigesters store farm waste (manure). This is mixed with water and after the solution ferments, it gives end products.
- Gas produced is directed to produce fuel for cooking and heating water. Organic fertilizer produced is used in place of chemical fertilizers.

13. Farm yard manure (FYM)

- Farmyard manure (FYM) is quite an important and great source of organic fertilizer.
- It basically involves storing together the bedding material, dung and urine collected from animal housing.
- It is the cheapest source of fertilizer.

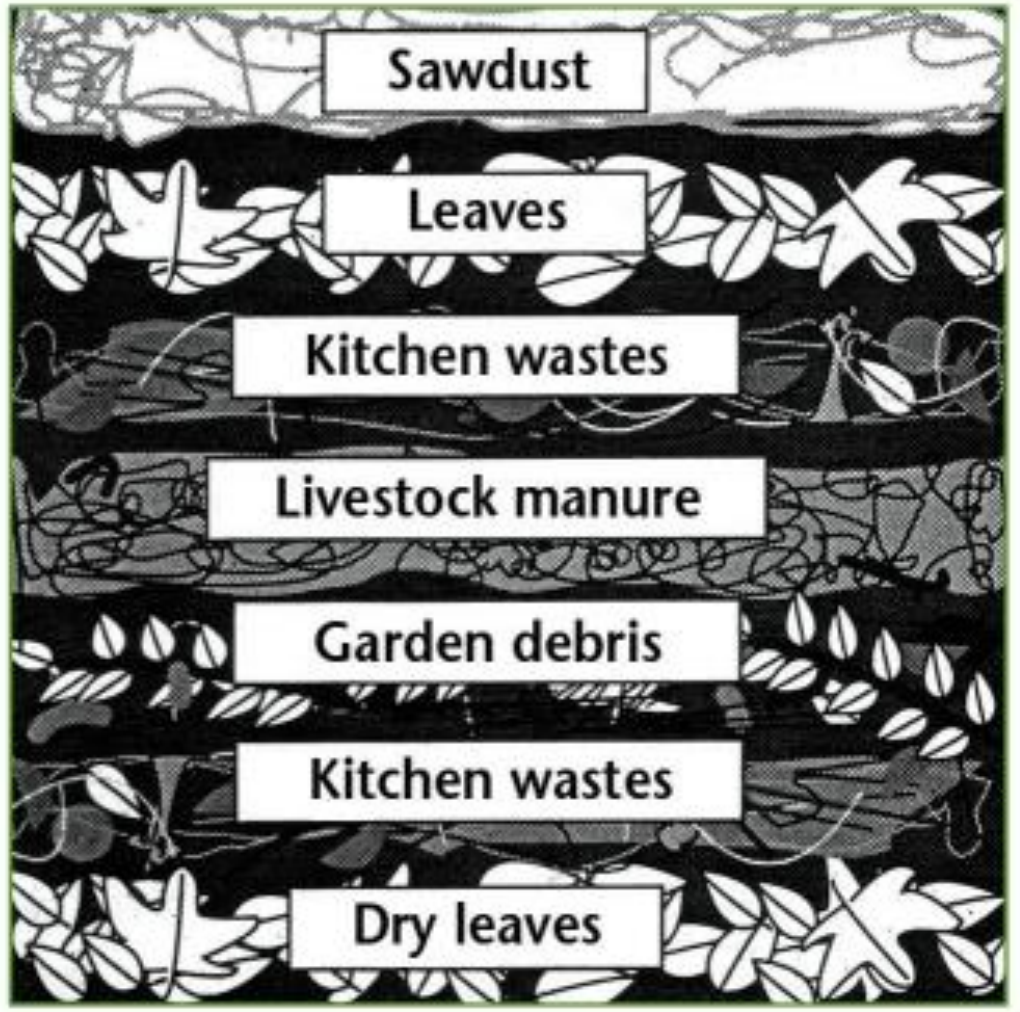
14. Compost making

Ingredients for a good compost

- **Plant materials** - any plant materials including weeds and grasses.
  - Dry (brown) plant material i.e. plant straws (wheat)
  - Wet (green) plant material i.e. vegetable leftovers
- **Animal waste** i.e. cow dung, chicken droppings (rich in Nitrogen).
- **Water** - to maintain decomposition without causing anaerobic conditions. Can also be urine.
- **Air** (oxygen) - to oxidize the carbon.
- **Carbon** - source of energy for living organisms in the pit.
- **Nitrogen** - grows and reproduces more organisms to oxidize the carbon.

15. Making compost manure

- Select site for the pit and clear the ground around, best if near the farm.
  - Site should be well drained.
  - Site should be accessible for easy loading and offloading.
  - Consider direct of wind.
- Dig a pit about 1 meter deep, height should not be too high to avoid materials being compressed by its weight.
- Place organic material in layers with most fibrous plants at the bottom to facilitate drainage.



16. Balancing factors inside the compost pit

- Excess water - Causes bad smell as a result of materials rotting in the pit.
- Excess air and limited water - Materials in the pit dry up and do not decompose to be compost.
  How to correct: Add water to the pit.
- Excess water and inadequate air - Nitrogen is converted into ammonia making the pit to smell.
  How to correct: Add dry plant material and turn materials in the pit.
- Balanced moisture - Rate of decomposition in the pit is best facilitated.
- Turn materials in the pit for aeration purposes using a long stick.

17. Importance of compost manure

- Source of nutrients to plants.
- Improves soil productivity.
- Controls spread of pest and diseases as well as weeds, due to high temperatures in the pit.
- Improves the soil structure when used.
- Humus improves moisture holding capacity of soil.
- Reduces effects of soil erosion.

18. Commonly used compost making methods

i. Ring-hole method

- Commonly used by farmers growing perennial crops .
- In Uganda, banana plantations use this method.
- Involves creating holes that are ring-like around banana plants.
- Nutrient rich waste and livestock manure are damped in the hole.
- Soil is added on top of the waste products and left there as compost.
- Restores nutrients and moisture of soil at site damped.

ii. In-Situ composting method

- Involves placing nutrient rich waste on top of the soil surface.
- This generally composts on soil surface.
- Wastes (food waste, livestock manure) are left on the surface to decompose in open air.
- Restores soil nutrients and soil moisture.

18.1 Commonly used compost making methods Cont'd…

iii. Pit composting

- This is a common method known by farmers.
- Involves collecting waste in pits.
- This pits contain nutrient-rich materials used by microbes and worms.
- Improves soil nutrients at site/area placed after maturity.

19. Signs of ready manure

- Volume of the manure is low/goes down.
- Manure is light in weight and crumbly when felt between fingers.
- Moisture content of manure is low/not dump/wet.
- Change in smell from rotting to earthy-like smell.
- Becomes dark in colour.

20. Vermicomposting

- Vermicomposting is a method of producing compost using earthworms.
- Is not a common method practised by many farmers despite its use as an organic fertilizer.
- The manure produced improves soil health by introducing living soil organisms to the soil.

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