Theme 1: Forage production and pasture management

PLANNING OF FODDER/FEED REQUIREMENTS FOR THE DRY SEASON

Level 3

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

Planning of fodder/feed requirements for the dry season (Level 3)

1. You will learn about (learning objectives):

- ❑ How to plan and prepare for dry season feeding: Planning and preparing in wet season to grow, harvest and conserve abundant grass and crop residues for feeding in the dry season

  - Dry season the need for feed planning
  - Reasons for Dry season feeding
  - Causes of feed shortage in dry season
  - Relative qualities of forages in Uganda
  - Dry season feeding principles
  - The solution to dry season: Plan ahead
  - Strategies for dry season

Planning of fodder/feed requirements for the dry season (Level 3)

2. Dry season: The need for feed planning

- Drought (prolonged dry season) leads to pasture and water stress
- Overstocking on the other hand, leads to decline in quantity and quality of pastures and the stock
- Additionally, overstocking results in overgrazing. Factors that have led to overgrazing are communal grazing, increasing human population, poverty, bush burning, immigration
- Others include soil erosion and lack of soil conservation practices by smallholder farmers, who are the majority.

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2.1 Reasons for Dry season feeding

Remember: *Milk production depends on fodder quality*

- Dairy cows will only produce milk if they are given enough, good quality feed
- Also calves and young stock can only gain weight if they are given balanced feed rations
- When fed more on better quality forage, cows will give more milk if all other management practices are observed.

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2.2 Causes of feed shortage in the dry season

- Due to lack of rainfall, pasture grasses and forage crops fail to grow or grow too slowly
- The feeding value of the grasses and forage crops also becomes too low
- Fodder too, becomes insufficient to satisfy cows and calves. The feeding value also cannot meet the requirements of the cow.

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3. Relative quality of forages in Uganda

Relative quality of bulk and supplementary forages used in Uganda			
Supplementary forages*	**Good quality bulk forages**	**Medium quality bulk forages**	**Poor quality bulk forages**
Silverleaf & greenleaf desmodium (Desmodium uncinatum & D. introtum)	Young Napier grass (less than I metre tall:dark green stems and leaves	Old Napier grass (1 to 2 meters tall)	Overgrown Napier grass (more than 2 metres tall)
Lucerne (Medicago sativa)	Young Rhodes/Kikuyu/Setaria grass (fresh, green leaves and stems ;up to flowering stage	Old Rhodes/Kikuyu/Setaria grass (yellowing leaves and stems: seed set)	Dry maize or sorghum stovers (after harvesting the cob)
Caliandra (Calliandra calothyrus)	Young fodder sorghum (fresh, green leaves and stems; before flowering stage)	Old fodder sorghum(yellowing leaves and stems; seeds set and dropped	Rice straw
Laucaena(various Leucaena species)	Young fodder oats (fresh, green leaves and stems; before flowering stage)	Old pasture/grass (yellowing leaves and stems; seed set)	Wheat straw
Sesbania (Sesbania seban)	Young weeds (fresh, green foliage; before flowering stage)	Green maize stover (fresh, green leaves and stalks with cob removed; food/feed maize)	Barley straw
Gliricidia (Gliricidia sepium)	Young roadside grass (fresh, green stem and leaves; before flowering stage)	Old weeds (yellowing leaves and stems; seeds set and droped)	Old, dry pasture/grass (dry leaves and dry, hard stems; seed dropped)
Tree lucerne (Chamaecystisus palmensis)	Hay (made at early to mid-flowering stage of grasses)	Hay (made after seed set)	Bean hauulums/husks (after harvesting the beans)
Mulberry (Morus alba)	Maize thinningHorticultural waste (outer leaves of cabbages and fresh beans and peas rejected by export companies)	Old fodder oats (yellowing leaves and stems; seeds set and dropped)	Banana pseudostems and leaves (fresh green leaves and stems)
Sweet potatoe vines (before and after harvesting potatoes)		Mature roadside grass (seed set, leaves and stems dryig and turning yellow)	
Lab lab (Lablab purpureus also known as Dolchos lablab		Sugar cane tops	

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4. Dry season feeding principles

- Maintain continuity in feeding
- Avoid sudden changes in the ration, if necessary change as gradual as possible
- Feed at least twice daily at 12 hours interval
- Provide green fodder and/or silage throughout the year but definitely in the dry season
- A tasty (good palatable) ration increases the intake and digestibility of the feed. This is achieved by adding some molasses, maize bran or salt. Also by chaffing, soaking or grinding the feed.
- Clean, fresh water should be provided throughout or at least three times a day

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5. The solution to dry season: Plan ahead

- Make use of abundant grass growth and fodder crops during the wet season
- Harvest excess grasses and legumes during the wet season
- Grow grasses and deep rooted legumes that provide high quality fodder for a longer period
- Plant sweet potatoes; the vines are protein boosters and can survive even during the dry season
- Preserve nutrients in the grass available at that time by:
  - Wilting, chopping and making silage
  - Or drying and storing as hay
  - Leaves of fodder trees can be dried as leaf meal

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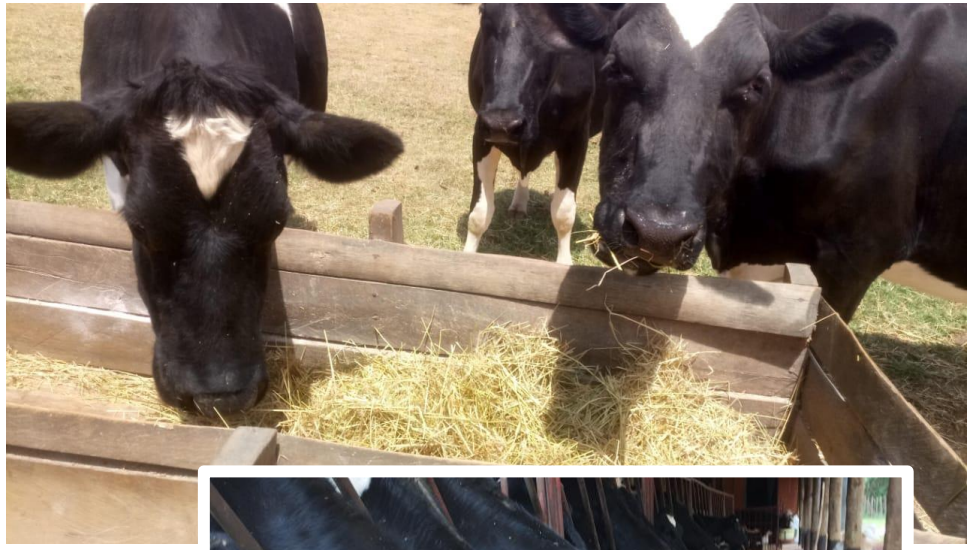
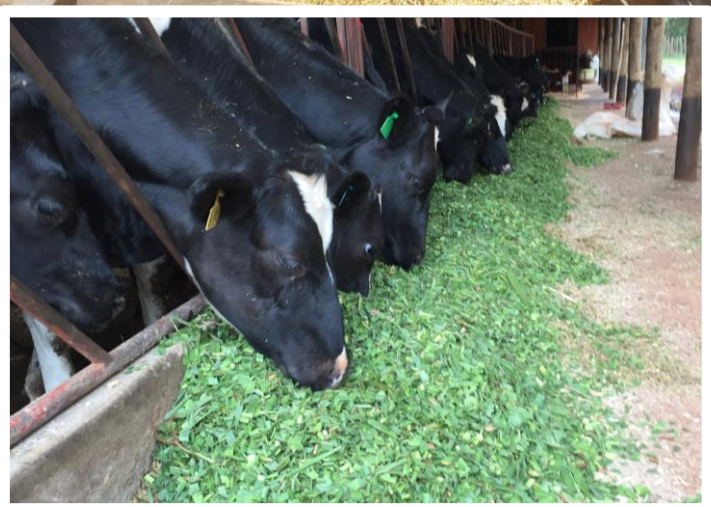
6. Strategies for the Dry season

1. “Tumbukiza”
2. Irrigation/watering crops
3. Planting drought resistant grasses and fodder crops
4. Planting fodder trees
5. Making silage
6. Making hay
7. Utilizing and storing crops residues
8. Making Urea Molasses Blocks (UMB)





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6.1 Tumbukiza

- This techniques is borrowed from smallholders to use their small parcels of land intensively
- They plant high value food crops such as bananas and coffee in pits. At the bottom there is a heavy dose of farm yard manure
- Used to plant and produce Napier grass.

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6.2 Irrigation/Watering crops

- Water the fodder crops planted with the Tumbukiza method or irrigate the crops if water is available to maintain grass growth during the dry season.

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6.3 Planting Drought resistant grasses and fodder crops

- Used for feeding the cattle during the dry season. They include among others;
    - Napier
    - Brachiaria
    - Desmodium
    - Lab lab
    - Fodder trees

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6.4 Conserving crop residues

- Feeding the cattle during the dry season needs good planning. A lot of fodder can be conserved and used to feed the animals during the dry periods when there is severe fodder shortage
- Crop residue can be collected and conserved well for use as fodder in the dry season
- Do not leave crop residue in the field where it is exposed to wet conditions
- Put up a good store, trough and feeding rack. A good part of the fodder can be conserved and used to feed the animals during the dry season

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6.5 Silage making

- Green forage can be preserved by turning it into silage
- The process of silage making is based on fermentation Leguminous fodder which are rich in proteins and low in sugars, are therefore difficult to ensile
- To allow the bacteria to grow, air (oxygen) should be expelled. That is why the fodder is heaped and pressed.

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6.5 Silage making cont'd…

- To facilitate pressing and thus the process of ensiling, it is advisable to chop the green fodder
- To prevent air entering the silage at a later stage, cover the heap with plastic sheets and a layer of soil
- It takes about 6 weeks for the silage to mature and be ready for feeding.

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6.5.1 Advantages of Silage making

- Proper ensiling ensures a juicy (succulent) fodder during periods of scarcity of green fodder, with a reasonable loss of nutrients only
- Silage is very palatable, laxative, digestible and more nutritious than hay. It requires less floor area for storage than hay
- It is recommended that small holder dairy farmers too, make silage. This will enable farmers to maintain a good level of milk production in the dry season

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7. Hay making

- Hay making is a method to dry freshly cut free forage while the weather is sunny with some wind. This prevents the grass to reach full maturity, dry and eventually even rot and decompose

- Once the moisture (water) content is reduced from 80% in the fresh material to less than 20%, we speak of hay

- It is much better to cut the fodder fresh and preserve it, than to leave it to dry on the stem, become very old, fibrous and loose almost all its feeding value

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7.1 Hay making cont'd..

- Well prepared hay remains leafy, clean, soft, palatable and nutritious
- Feed sources/materials such as Lucern must be dried to a water content of only 10% to become hay. Ordinary common bush grass, when harvested before naturally over-maturing is also a source of good hay
- Care should be taken that the hay is stored in a dry place. If exposed to rain it will loose its quality.

Baled grass hay

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7.2 Types of Hay

Legume hay

Non-legume hay

Mixed hay

Stover and straws

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7.2.1 Legume hay

- Hay made from legumes have a high feeding value and is especially rich in digestible crude protein, vitamins and minerals
- The hay is highly palatable and liked by the animals
- Examples are: lucerne, cow pea, soya bean, velvet bean, sun-hemp, etc.

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7.2.2 Non-legume hay

- Hay from other fodders is in general less palatable and of lower feeding value than legume hay
- Protein content, minerals and vitamins are usually lower than in legumes
- Palatability, feeding value and protein content depend highly on the stage in which the fodder is harvested
- Examples are: Rhodes grass, Brachiaria grass, buffel grass, natural grass, etc.

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7.2.3 Mixed hay

- The feeding quality depends on the type of mixture and the ratio of legumes and non legumes
- Examples are: Rhodes grass and desmodium, Kikuyu grass and clover, Brachiaria grass and centrosema

Sun dried mixed grass hay

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7.2.4 Stover and straws

- Plant residues like stover and straw are also dry like hay. However, these contain more fibre and indigestible material and therefore have a lower feeding value

- Examples are the maize plants after removing the cobs and pea-plants after harvesting the green pods for vegetables

- Stover and straw also need to be stored in a dry place. When exposed to rain they loose quality.

Dry maize stover

Baled wheat straws

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8. Fodder trees

- Suitable fodder trees include;

  - Leuceana
  - Sesbania
  - Moringa
  - Gliricidia
  - Pigeon pea
  - Calliandra
  - Mulberry tree

Planning of fodder/feed requirements for the dry season (Level 3)

8.1 Why fodder trees?

- Fodder trees can be an ideal solution to supplement the animals with high quality feed, particularly during the dry season

- Several fodder trees like Calliandra, Sesbania and Leucaena are legumes. Their dry seed pods can be included as feed. Leaves and twigs originating from pigeon pea and mulberry can be used as well

- The advantage of fodder trees is that they can easily be included and grown on small scale farms, they from a nice fence or hedge and do not take much space.

Planning of fodder/feed requirements for the dry season (Level 3)

9. Supplementation with Urea Molasses Blocks (UMB)

- Molasses Urea Mixtures are an ideal supplement to provide energy, protein and minerals to ruminants, when these nutrients are in short supply during the dry season
- Only ruminants can utilize urea, which is converted into proteins by the bacteria in their rumen
- Urea is highly poisonous to other animals. It is also poisonous to ruminants if given in excessive amounts. For the same reason it should never be fed to young calves before they are weaned and start ruminating.

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9.1 Preparation of Urea Molasses Blocks

- Prepare wooden frames with the dimensions: 10 cm x 20 cm x 5 cm

- Buy the necessary ingredients and weigh them carefully. In case you want to make a quantity of 100 kg (sufficient for 25 – 30 blocks of 3.5 - 4 kg each) use the following quantities:
  - Molasses 38 kg
  - Urea 12 kg
  - Mineral Mixture / DCP / bone meal 2 kg
  - Salt 3 kg
  - Cement 13 kg
  - Wheat Bran / Maize bran 32 kg

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9.2 Mixing ingredients for 25, 4 kg Urea Molasses Block

- Start with molasses. Add 1 – 3 % water if it is too dry to mix easily
- Add the urea and mix until it is completely dissolved
- Add bone-meal or mineral mixture and the salt
- Add cement and mix it till the liquid reaches uniformity
- Finally add fine wheat bran, maize bran or rice polish and mix it well
- Pour the mixture into a wooden frame to give it a rectangular shape
- Allow the blocks to dry for 3-4 days in the shade before they can be used to feed the animals.

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9.3 Feeding Urea Molasses Blocks (UMB)

- Recommended quantities of urea molasses mixture to feed per cow per day:
  - Large cows (over 400 Kg) 2 kg
  - Small cows (under 400Kg) 1 kg

- If provided as a block, a mature dairy animal will consume (lick) up to 0.5 kg per day.

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9.4 Commercial Urea Molasses Blocks (UMB)

- Some feed companies do make urea molasses mineral block. Blocks containing molasses and minerals only with no urea are available in the market

- Provide these salt licks throughout as their minerals are essential to maintain good fertility status among cows.

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