Theme 1: Forage production and pasture management

BRACHIARIA GRASS MANAGEMENT

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

Brachiaria Grass Management (Level 2)

Learning Activities - You will learn about:

- How to establish and maintain Brachiaria grass field
- Harvesting, conservation and feeding of Brachiaria grass

Brachiaria Grass Management (Level 2)

Background

- Improved Brachiaria is a new grass variety that complements the widely used and known Napier grass as a fodder for dairy cows
- The grass is the most extensively cultivated forage in South America, Australia and Asia
- It is a native grass in East African. However the use of improved Brachiaria as cultivated forage in Africa is extremely limited.

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Varieties

i. Improved Brachiaria

- **CAYMAN -** Has an erect growth habit with well-defined tussocks, which is ideal for cut and carry
- **COBRA -** A leafy, vigorous, perennial grass of medium height, growing to between 80–110 cm
- **MULATO II -** A very leafy plant with 5–8 leaves (length 40–60cm, width 0.6–0.7 cm) per stem.

ii. Brachiaria cultivars

- BASILISK
- MG4
- PIETÀ
- XARAES (TOLEDO)

Photo: Felix Opinya

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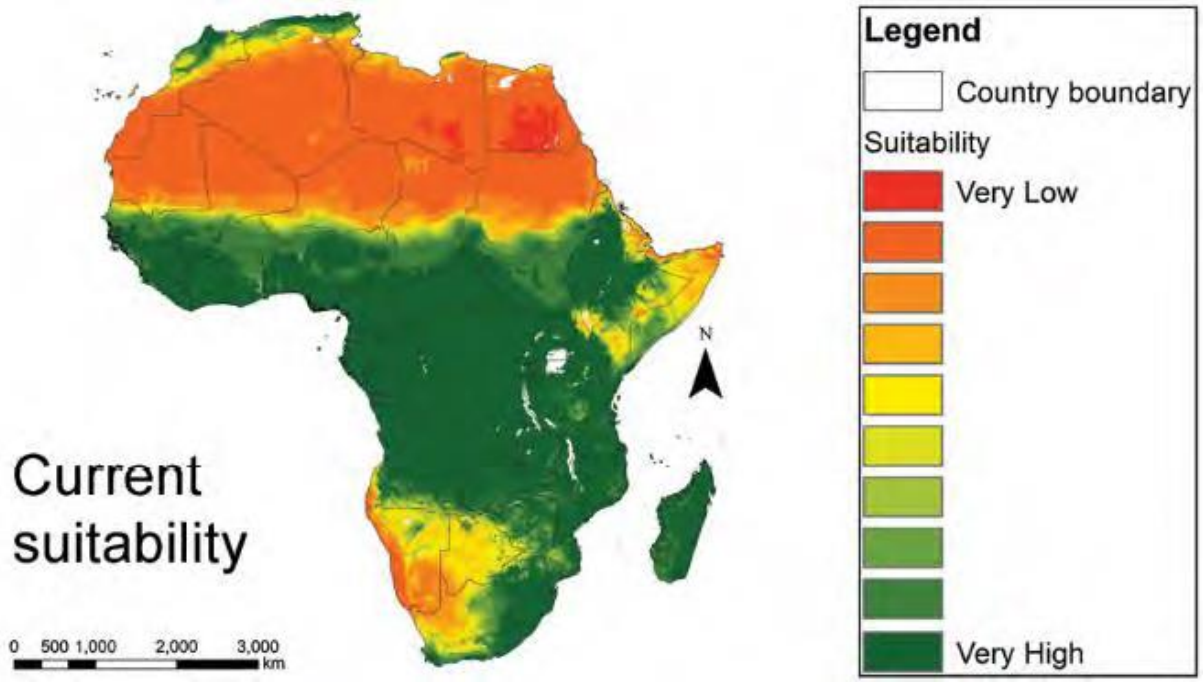
Ecological requirements

- Brachiaria grass performs well in sub humid and humid areas with annual rainfall of at least 700mm and temperatures of between 17°C - 30°C
- The optimum altitude is above 1800m above sea level
- Furthermore, the grass responds well under irrigation in arid and semi arid areas which receive longer dry seasons of over 5 months.



Suitable areas for growing Brachiaria grass

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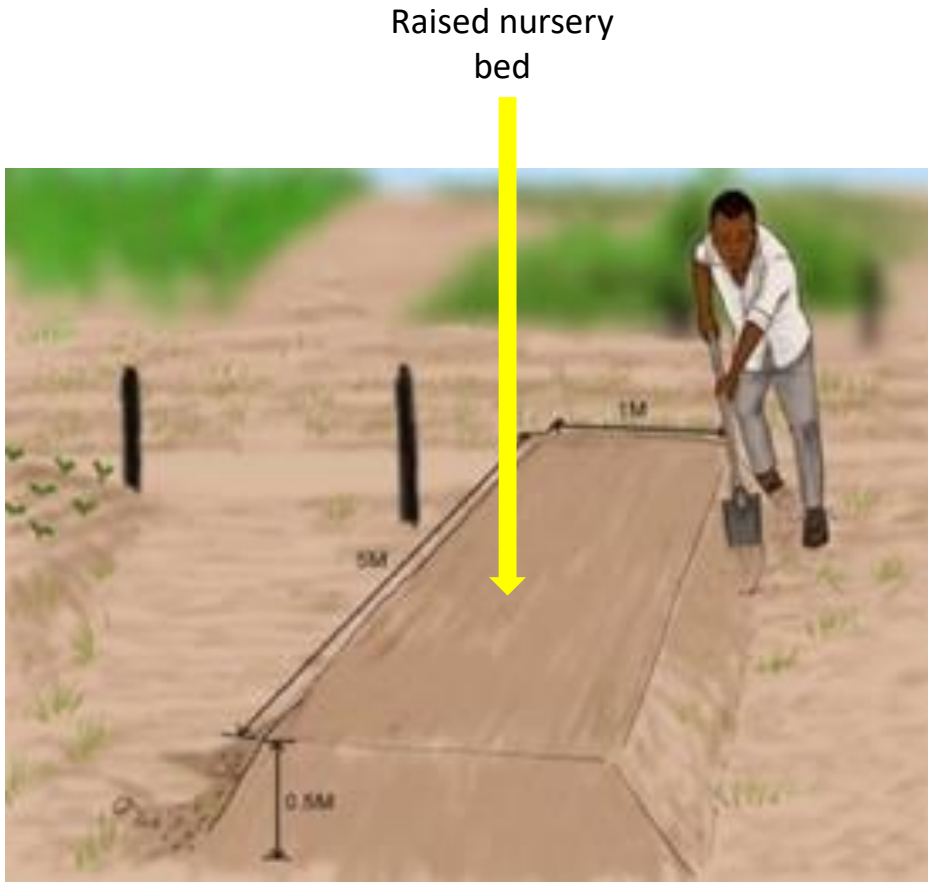
How to establish Brachiaria Grass: Nursery establishment

How to prepare a raised nursery bed

- Measure the nursery area, and make sure it is 1 x 5m
- Double dig the nursery to a fine bed
- Raise the nursery bed by 0.5m. This is to prevent water logging in the seedbed and allow strong roots to develop easily
- **Note:** Brachiaria Basilik and Cobra varieties can do well even without need of a nursery bed, especially in South west Uganda



Important: *The nursery bed should be protected from domestic animals like dogs and poultry*

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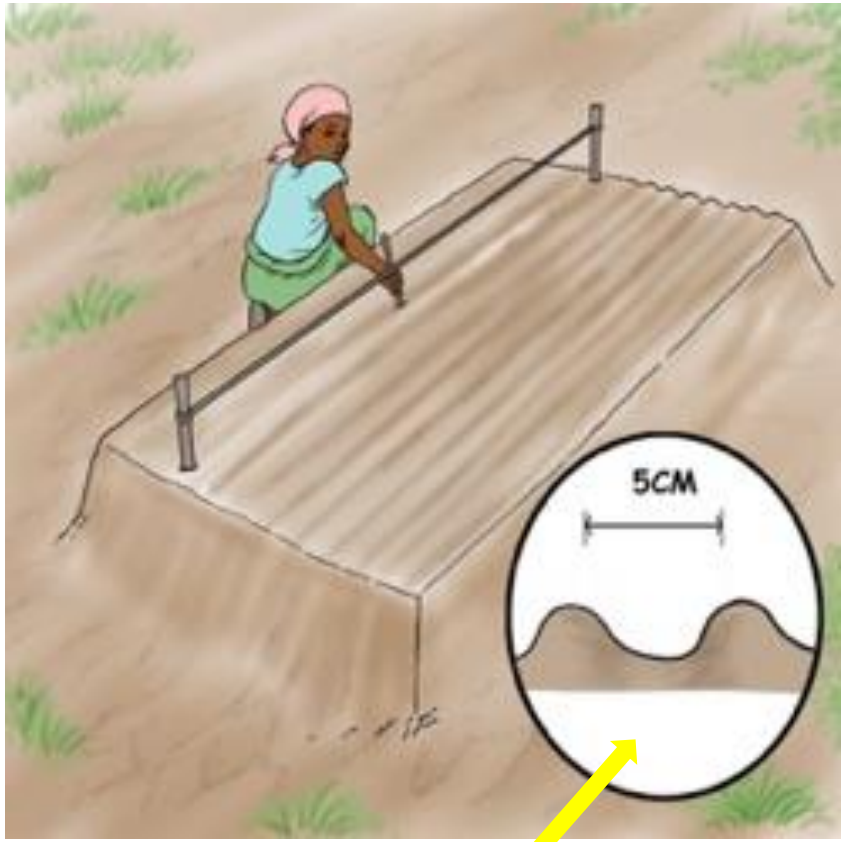
Propagating Brachairia grass

Brachiaria grass can be propagated by **seeds** or **vegetative methods (root splits).**

Seeds: Sowing the seeds

- Use a string to make straight furrows 5cm between the rows
- Dig the furrows along the row no more than 2 cm deep
- This should give you 18–20 furrows.



Distance of furrows between the rows

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Drill the seeds into the furrows

- Drill 0.5 kg of seeds, evenly placed in the furrows
- Cover them lightly with soil. Ensure all the seeds are covered by the soil.
- Water the nursery bed immediately after drilling.

Important: *2.5kgs – 3kgs of seeds are enough for One (1) acre piece of land*

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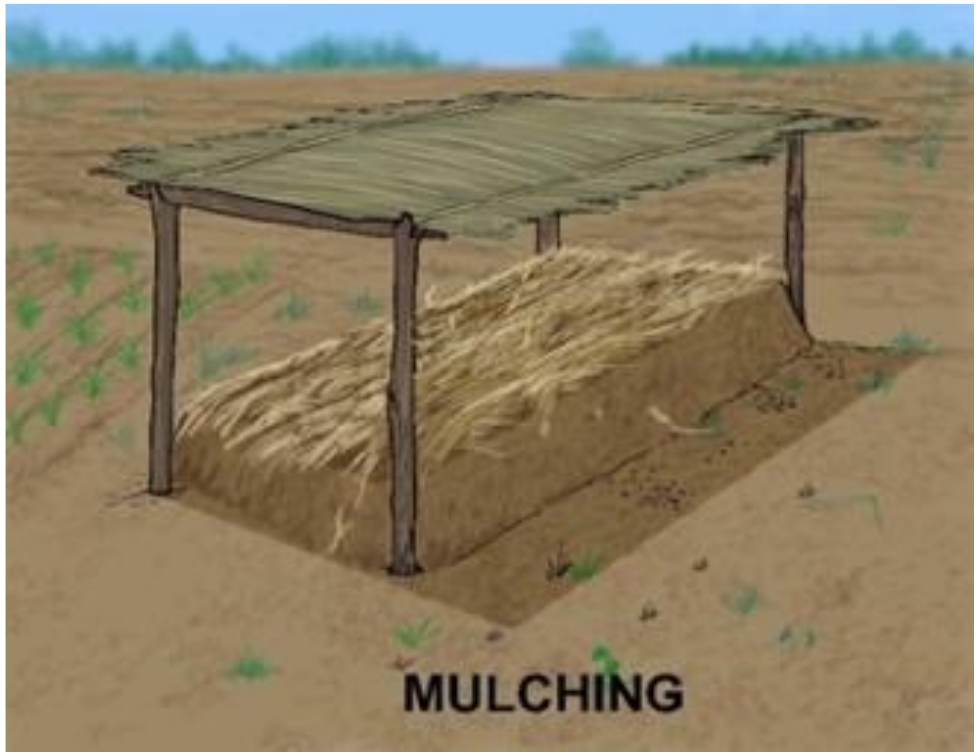
Mulching

- When the drilling is complete, cover the nursery bed with dry grass, straw, dry banana leaves or any such kind of material. This is known as **mulching.**
- Mulching helps preserve the moisture in the nursery
- Using local materials, construct a simple shade over the nursery. This will protect germinating seedlings as young seedlings can be delicate and die if exposed to direct sunshine. It also prevent birds from eating the seeds.



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Watering

- On dry days, water the nursery bed twice daily (morning and evening) using a watering can with a nozzle
- Be careful not to water the nursery bed excessively; as it can cause water logging that could stress the seedlings
- Monitor the nursery bed to ensure it is not destroyed by scavenging birds, pests or diseases. Protect the bed from being damaged if need be.

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Important: *Remove the mulch immediately after germination*

- After 5 – 7 days, or as soon as you observe that germination has started, remove the grass mulch to allow the seedlings to grow.

Important: *Remove the shade gradually*

- From the third week, gradually remove the shade that is covering the seedlings to allow in more light. This will make the seedling stronger and ready for transplanting.

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Transplanting

Preparation for Transplanting

- Seedlings will be ready for transplanting within 4–6 weeks

- Before transplanting, **select a suitable field** or planting Brachiaria grass.

Field selection

- For ease of carrying the grass to the cows, select fields close to the feeding/zero grazing unit
- Fields for grazing can be further away from the homestead

https://www.infonet-biovision.org/AnimalHealth/Fodder-production

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Important: *It is recommended that planting takes place during the rainy season*

- Plant 1 - 1½ acre per cow. If well maintained high quality Brachiaria grass is enough to feed one cow, a heifer and a calf.

Root splits

- One can also use root splits to (trans)plant Brachiaria grass.

- Before transplanting (either nursery seedlings or root splits), prepare the selected field appropriately

https://www.infonet-biovision.org/AnimalHealth/Fodder-production

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Site preparation: Preparing the selected field for transplanting seedlings

- Select an area at least 2 x 6 m
  - Area close to the homestead is desirable to easily monitor/keep an eye on it
  - Have ease of access to water sources for ease of watering
- Clear the selected area from all weeds and grasses
- Plough the land and mix the soil thoroughly with manure

Important: *Preparation of the seedbed/site should take about 6-8 weeks before onset of rains*

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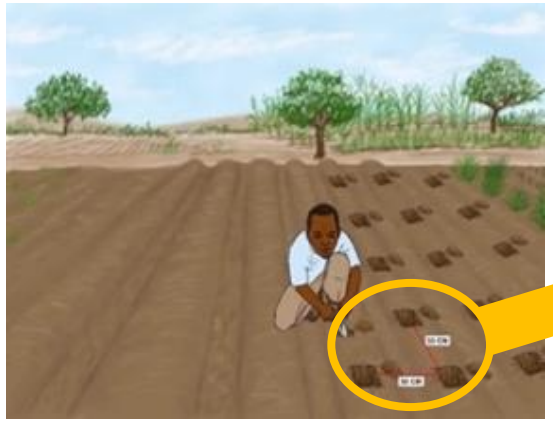
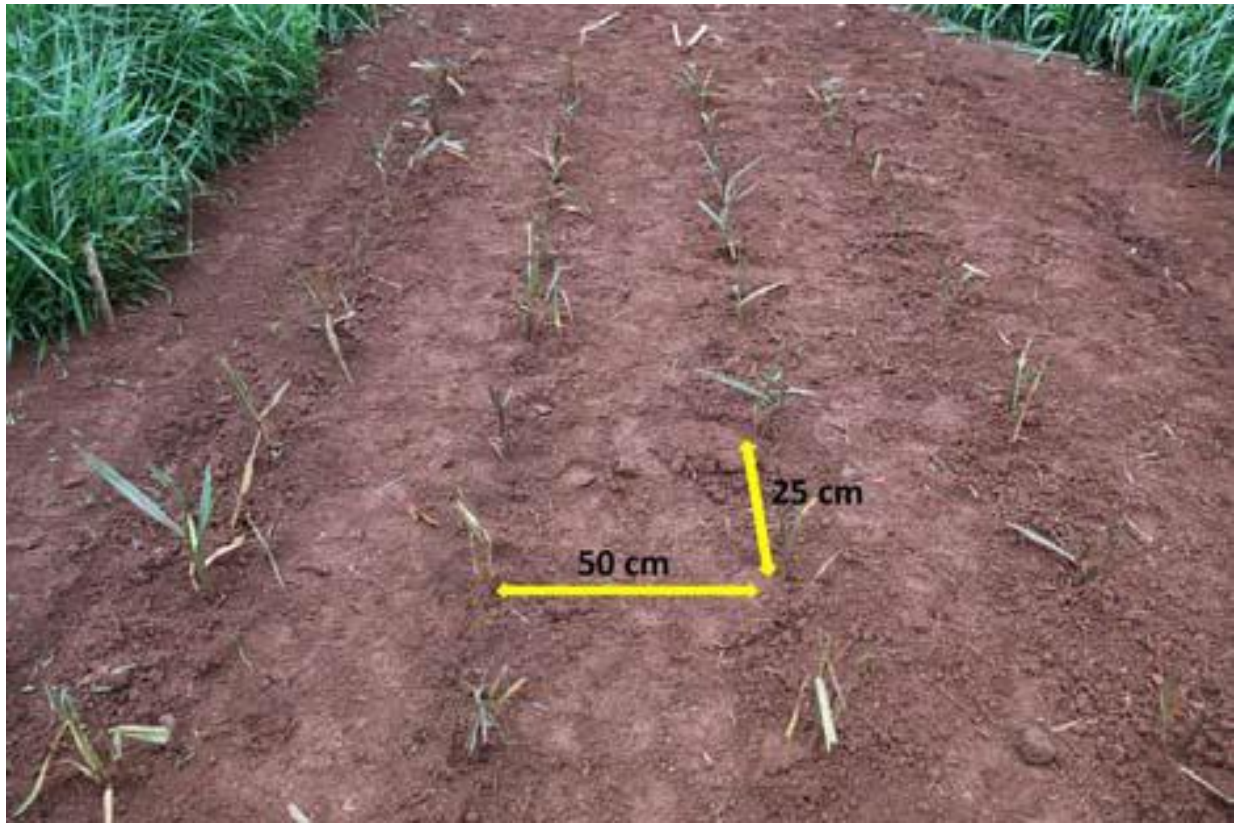
- Dig holes for plants 25 cm apart along lines 50 cm apart from each other. This will make weed control easier.





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Transplanting seedlings: Time to plant the seedlings onto the field/seedbed

- Water the nursery in the morning to soften the ground to allow easy of uprooting the seedlings

- Remove each seedling with soil attached to the roots. Seedlings should be carefully arranged on trays or gunny bags and transported for planting

A seedling with soil (lump) attached to the root

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- Plant the Brachiaria grass seedlings with well-dried farmyard manure. Apply one handful of per hole.

- DAP can be used as an alternative at the rate of one soda bottle top per hole.

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Planting one rooted tiller per hole

- The seedlings should be transplanted during the cool hours of the day i.e. preferably early in the morning (from 6–10 am) or late in the evening (from 4–6pm) when temperatures are lower. This is to avoid exposing the seedlings to excess heat
- Prun/trim long roots on the seedlings to avoid fungal infections
- Plant one rooted tiller per hole. Planting more than this creates competition between plants and reduces the plantable area.
- Keep some seedlings in the nursery to replace seedlings that die after they are transplanted (i.e. to do **gapping**).

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Maintenance of Brachiaria grass

- Keeping plants healthy and areas around the crop free of weeds is the best way to begin preventing pests and diseases
- Growing in shadows, in a very dry or very wet environment can be stressful to Brachiaria grass
- Make sure the plants have enough water and nutrients (manure or fertilizer) to keep the plants healthy

Brachiaria Grass Management (Level 2)

Weeding

- Keep the growing Brachiaria grass free of weeds. Weeding before sprouting will reduce the weed burden very much. Weeding during the dry season will control vigorous weeds.

- Weeding can be done manually by pulling out the germinating weeds.

Field of Brachiaria grass being kept free of weeds

Weeding can also be done using herbicides

Brachiaria Grass Management (Level 2)

Fertilizer/Manure Application

- To make use of fertilizers/manures effectively, it is important to understand Good practices for fertilization of pastures i.e.
  - Take soil samples before fertilization. This will inform nutrients deficient in the soil and enable you use correct fertilizers
  - Fertilize adequately
  - Use the correct Nitrogen (N) source

Note: *Brachiaria grass will also grow on low fertile soils but with lower levels of production. Higher and more frequent fertilizer applications are necessary on low fertile acid soils*

Brachiaria Grass Management (Level 2)

i. During planting

- During planting/initial fertilizer application, use a phosphorus (P) dominated fertilizer such as DAP to support root development

ii. Subsequent fertilizer application

- Subsequent applications (as top dress) should be done annually with Nitogen (N)-based fertilizer like CAN. Apply CAN at the rate of 100 kg/ha.

- All fertilizer applications should be done after rains when the soil is wet enough to dissolve the fertilizer; alternatively, use irrigation.

- Fertilizer application after harvesting/cut should also be done when the soil is wet, for quicker regrowth. Application should be done after every harvesting/cut.

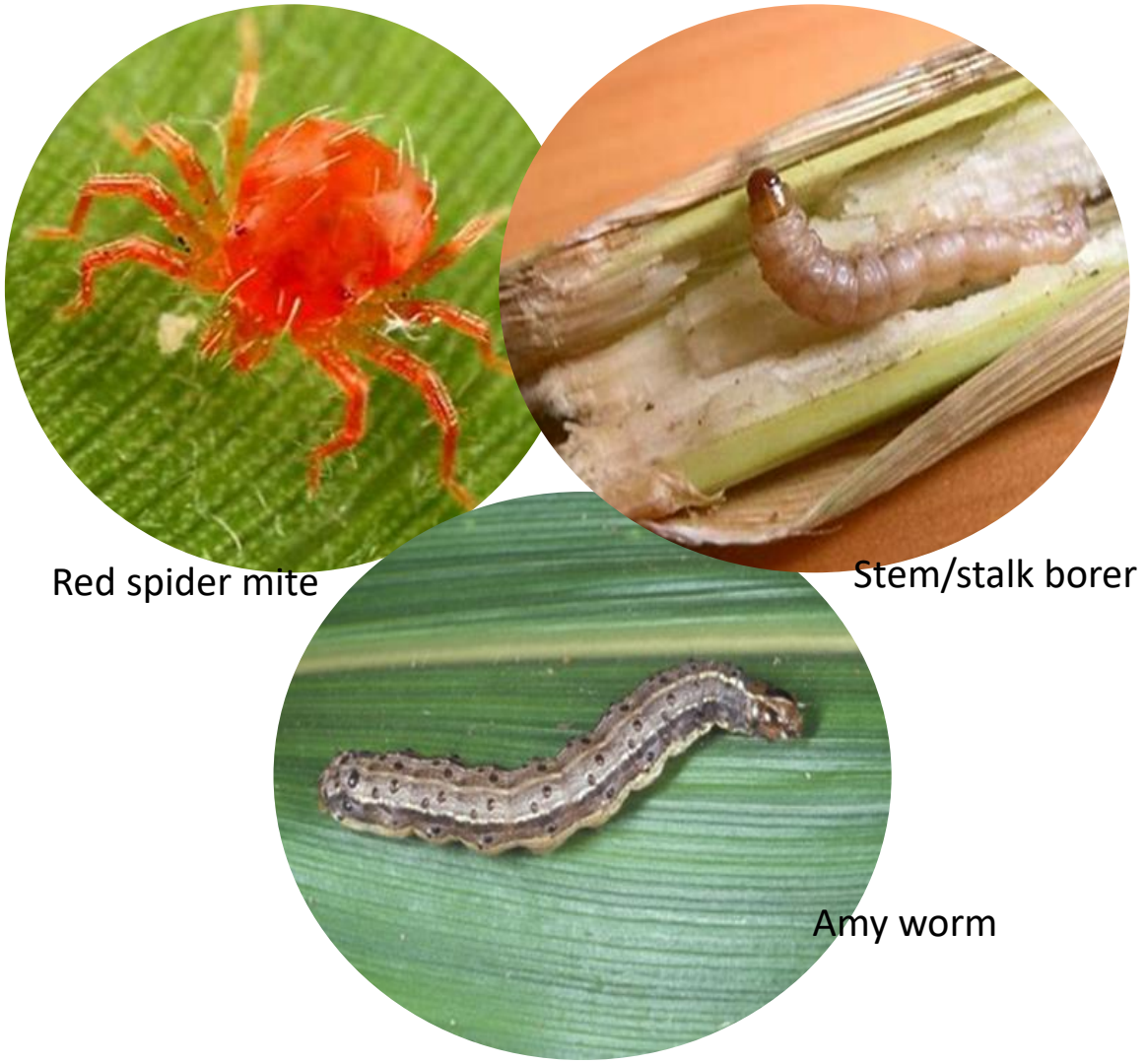
Brachiaria Grass Management (Level 2)

Pests and Diseases

Pests

- During the growing period, inspect the grass crop for pests and diseases. Carry out inspections at least 2 times every week.

- Keep the Brachiaria grass free of pests and diseases. The following pests are common:
    i. Red spider mites
    ii. Army worm
    iii. Stem and stalk borer



Red spider mite

Stem/stalk borer

Amy worm

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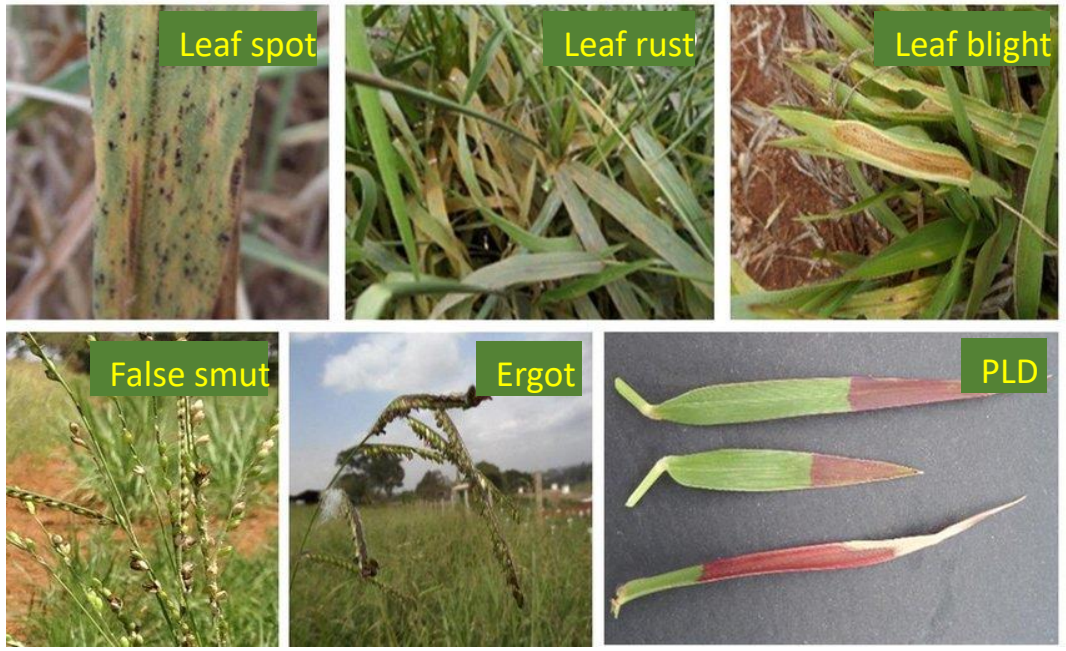
Diseases

- Some of the common diseases of improved Brachiaria cultivars include:
  - Leaf spot
  - Leaf rust
  - Leaf blight
  - False smut
  - Ergot
  - Physiological leaf disorder (PLD)



Source picture: *Njarui, D.M. et al. (2016)*

- A common viral disease includes the <u>Guineagrass Mosaic Virus</u>

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Harvesting/When to cut

- Brachiaria grass takes 80-150 days till the first harvesting/cut. During this period, the grass will be about 1 meter high.

- Harvesting/cuts can be made on rotational basis as follows:
  - **Rainy season:** Every 25–45 days
  - **Dry season:** Every 60–70 days

Smallholder dairy farmers in East Africa who prefer to feed their dairy cows in stalls can use Brachiaria grass as cut-and-carry fodder. Cut to about 5 cm above the ground level

Harvested Brachiaria grass

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Conservation of Brachiaria grass

- Brachiaria grass can be conserved either as hay or silage using different types of silos.

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Feeding Brachiaria grass

Cutting/Chopping

- After harvesting/cutting and carrying the grass to the feeding unit chop the grass in small pieces of 1-2 cm length

- Young grass can be chopped with a machete, chaff cutter of mechanical chopper. Chopping increases voluntary cattle's feeding/intake and digestion of the grass.

Feeding

- Feed at the following rates:

	Rainy season (good quality Brachiaria)	Dry season (good quality Brachiaria, but drier material)
Large size cows (Friesian, Fleckvieh, Ayrshire)	90-110 kg per day	70-80 kg per day
Small size cows (Jersey, Guernsey)	65-85 kg per day	55-65 kg per day

Photo: Felix Opinya | BMK Farm, KE

Note: *An empty 50kg fertilizer bag, filled with chopped grass is equal to 25kg of feed*

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