BEEKEEPING LEVEL-I

Learning Guide

Unit of Competence: - Support Pasture Establishment and Preservation

Module Title: - Supporting Pasture Establishment and Preservation

Learning Guide -1

Unit of Competence: - Support Pasture Establishment and Preservation

Module Title: - Supporting Pasture Establishment and Preservation

LG Code: AGR BKGM1 11 0919 **LO01-LG-1**

TTLM Code: AGR BKG1TTLM 11 0919v1

LO 01: Prepare materials, tools and equipment for pasture establishment and preservation

Information sheet	Learning Guide #11

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics -

- Identifying required ***materials, tools and equipment***
- Checking and reporting all materials, tools and equipment with insufficient or faulty items
- Minimizing damage when loading and unloading to the load and the vehicle
- Selecting and checking Suitable ***Personal Protective Equipment (PPE)***
- supporting provided work according to OHS requirements and ***workplace information***
- Identifying and reporting ***OHS hazards*** to the supervisor

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

1. Identify required ***materials, tools and equipment***
2. Check and reporting all materials, tools and equipment with insufficient or faulty items
3. Minimis damage when loading and unloading to the load and the vehicle
4. Selects and check Suitable ***Personal Protective Equipment (PPE)***
5. support provided work according to OHS requirements and ***workplace information***
6. Identify and report ***OHS hazards*** to the supervisor

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” **in page -.**

5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	**Materials for Pasture establishments and preservation**

1. Identify and check the required materials, tools and equipment

The term 'materials' broadly describes everything we use to manufacture everyday objects from cars to bridges, toys to aero planes

1.1. Materials

Includes, hay, urea, molasses, salt, fuel, feeds, seed, seedling, grass cut, straw, empty sacks and plastic sheets, fertilizer, lime, etc

1.2. Tools and equipment includes;

Includes hoe, plough, harnesses, sickle, meter, rope, barrel, weighing scale, graduated cylinder, watering can, silo, store, chopper, watering plastic tube, spade, wheel barrow bailer, shovel, rack, hayfork, wheel barrow, water pump, and axe.

1.3. Definition of Terms

Forage:

- This refers to the edible parts of plants, other than separated grains, that can Provide feed for grazing animals, or that can be harvested for feed

Pasture:

- A grazing land area used to support a group of grazing animals for a grazing season.
- This can refer to a fenced or open grazing land covered by grasses, forbs, shrubs, and trees.

Pasture carrying capacity: is the capacity of a given pasture land that supports a given number of animals for a given period of time.

Stocking rat is The number of animal units per unit of land area at a specific time. Over sowing: The practice of spreading seed over an existing pasture without prior seed bed preparation.

Pasture renovation: Improvement of a pasture by the partial or complete destruction of the grasses/plants, plus liming, fertilizing, seeding, and weed control as may be required to establish desirable forage plants.

1.3. Personal protective equipment (PPE)

Personal Protective Equipment includes: -

- Safety helmet
- Goggles/safety glasses
- Dust mask
- Gloves
- Ear protection

- Work shoes
- Safety belts

1.3.1 Types of Personal Protective Equipment

There is a large variety of PPE available. It can range from simple safety glasses to full body suits. The selection and proper use of PPE is vital to health and safety on the job.

- **Eye Protection** - Employees and students are required to wear safety glasses or chemical splash goggles at all times when they perform laboratory work involving hazardous materials. If an employee is performing any operation such as sawing, grinding, welding, or spray painting, safety glasses\face shields specific to those tasks shall be worn. Employees in the clinics must wear safety glasses or face shields whenever there is possible exposure to a potentially infectious material. Specialized eyewear must be worn during work with lasers. Wearing personal glasses (not safety approved), with plastic side shields is not an acceptable substitute for safety glasses. Contact lenses should not be worn in laboratories or in any other work area where a chemical splash is possible.
- **Hand Protection** - Appropriate gloves are required to be worn when hands are exposed to potential hazards. These hazards may arise from exposure to any item or substance which has the potential to damage the skin or pass through the skin's protective barrier. Chemical hazards include acids, bases, flammables, and other toxic chemicals. Physical hazards include infectious agents, sharps, and temperature extremes. Selection of gloves is based upon the performance characteristics of the glove relative to the employee's work. EH&S staff members are available to make recommendations on the types of gloves required. Whenever hazardous chemicals are handled, gloves must be either thoroughly washed with soap and water before removal, or disposed of as hazardous materials in the appropriate receptacle.
- **Hearing Protection** - hearing protective devices may be recommended in certain areas that may experience elevated noise levels. Protecting oneself from unnecessary noise is always a prudent practice. Noise assessments are made by EH&S and recommendations for hearing protection may be made following these assessments. Elevated noise levels may be found in mechanical areas such as craft shops and duplicating.
- **Respiratory Protection** - Employees involved with asbestos removal, chemical emergency response, facilities maintenance, plant operations, and infectious materials may require respirators. If an employee performs a job for which respiratory protection is necessary.

- **Foot Protection** - It is a good work practice for employees who work in the maintenance shop, plant operations areas, EH&S, and housekeeping to wear steel-toe safety shoes. Safety personnel may also be required to wear safety shoes.
- **Protective Clothing** - All employees and students in research and academic laboratories should wear laboratory coats; laboratory workers may wear chemical resistant aprons/protective sleeves.

  Employees in clinical settings are required to wear laboratory coats/aprons whenever there is possible exposure to potentially infectious material, including human blood and related blood products. Any employee who performs work involving the maintenance or removal of asbestos-containing material must wear a protective suit. For cleanup of spills of hazardous materials, employees must wear either a laboratory coat, Tyvek suit, or other protective clothing depending on the degree of hazard during cleanup.

  Engineering and housekeeping staff must wear the appropriate clothing (uniform or coveralls) to prevent contact with hazards or potentially hazardous chemicals such as oils, solvents and thermal exchange chemicals.

  Animal caretakers are required to wear protective clothing such as a laboratory coat, Tyvek suit, or surgical scrubs, as needed.

  - **Head Protection** - All employees and students entering or working in a construction site must wear a hard hat to protect the head from falling objects, bumps, and abrasions.
  - **Torso Protection** - Many hazards can threaten the torso such as heat, splashes from hot metal and liquids impacts, cuts, acids, and radiation. The employees or students who are involved in activities that may affect the torso must wear the appropriate protective PPE such as a vest, jacket, apron, coveralls, or full body suit.

Self-Check -1	**Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What are the required material, tools and equipment which are required for pasture establishment and preservation? (5 pts)
2. What are the major personal protective equipment's which are important for pasture establishment and preservation? (5 pts)
3. Define forage? (5 pts)

You can ask you teacher for the copy of the correct answers.

Note: **Satisfactory rating – 15 points** **Unsatisfactory – below 15 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Question

Information Sheet-2	**OHS requirements and workplace information**

Hazards may include solar radiation, dust, noise, air- and soil-borne micro- organisms, fire hazard, chemicals and hazardous substances, sharp hand tools and equipment, manual handling, holes, and slippery and uneven surfaces OHS requirements always must be applied in accordance with regulations/codes of practice and enterprise safety policies and procedures.

1. **Identify and report OHS hazards.**

The main hazard includes: -

- solar radiation
- dust
- noise
- air and soil-borne micro-organisms
- chemicals & hazardous substances
- sharp hand tools and equipment
- manual handling
- holes, slippery and uneven surface

Those hazards which are listed above must be identified and recognized at all work performing activities. Safe work place is also available to exercise all work activities.

Self-Check -2	**Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. list five hazard that may include in work place?

Note: **Satisfactory rating – 2points** **Unsatisfactory – below 2 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short **Answer** **Question**

Information Sheet-3	loading and unloading materials, tools and equipment's

1. Techniques of loading and unloading materials

Gentle handling and good husbandry skills improve the overall productivity of the animal and help to diminish any setbacks that the animal might encounter. When trying to improve the handling and transportation practices on your farm there are many different factors to consider, including utilizing proper equipment, handling methods, practices for on the truck and tips for how to decide who is fit to transport.

Loading and unloading animals can be one of the most stressful times on a farm for the animals and herdsman. In order to insure ease of handling, we need to utilize proper handling tools, maintain the correct environment and have the correct ramp design. When assessing the flooring types on your farm it has been found that all surfaces where movement takes place should be non-slip. A light broom finish or imprinting concrete can add traction to handling areas, decreasing slipping and spreader injuries.

Although workers may be knowledgeable about powered equipment, they should take precautions when stacking and storing material. When picking up items with a powered industrial truck, workers must do the following:

- Center the load on the forks as close to the mast as possible to minimize the potential for the truck tipping or the load falling,
- Avoid overloading a lift truck because it impairs control and causes tipping over,
- Do not place extra weight on the rear of a counterbalanced forklift to allow an overload,
- Adjust the load to the lowest position when traveling,
- Follow the truck manufacturer's operational requirements, and
- Pile and cross-tier all stacked loads correctly when possible

What safeguards must workers follow when stacking materials?

Stacking materials can be dangerous if workers do not follow safety guidelines. Falling materials and collapsing loads can crush or pin workers, causing injuries or death. To help prevent injuries when stacking materials, workers must do the following:

- Stack lumber no more than 16 feet high if it is handled manually, and no more than 20 feet if using a forklift;
- Remove all nails from used lumber before stacking;
- Stack and level lumber on solidly supported bracing;

- Ensure that stacks are stable and self-supporting;
- Do not store pipes and bars in racks that face main aisles to avoid creating a hazard to passersby when removing supplies;
- Stack bags and bundles in interlocking rows to keep them secure; and
- Stack bagged material by stepping back the layers and cross-keying the bags at least every ten layers (to remove bags from the stack, start from the top row first).

Self-Check -3	**Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List at least five safeguard that follow during stalking materials?

Note: **Satisfactory rating – 2 points** **Unsatisfactory – below 2 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short **Answer** **Question**

Operation Sheet-1	Load and unload materials

Task 1. loading and unloading bee hives from the tracker

procedures

1. Properly design loading/unloading areas
2. Park vehicles and conduct loading/unloading only in designated loading/unloading areas
3. Clean loading/unloading areas regularly to remove potential sources of pollutants**.**
4. Reduce exposure of materials to rain**.**
5. Use drip pans underneath hose and pipe connectionns and other leak-prone spots during liquid transfer operations, and when making and breaking connections.
6. Inspect equipment regularly
7. If possible, conduct loading and unloading in dry weather

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within

Task 1. loading and unloading bee hives from the tracker?

List of Reference Materials

1994. United states department of agriculture; miscellaneous publication no. 194

1995. Pasture-cattle-coconut systems: chief crop and grassland service (agpc) plant production and protection division faoviale dell Terme di Caracalla 00100 Rome Italy

2010. Pasture and grazing management in north west, Washington state university

2017. SNV: forage production and management; training package for extension workers extension

BEEKEEPING LEVEL-I

Learning Guide -2

Unit of Competence: -Support Pasture Establishment and Preservation

Module Title: - Supporting Pasture Establishment and Preservation

LG Code: AGR BKGM1 11 0919 **LO02-LG-2**

TTLM Code: AGR BKG1TTLM 11 0919v1

LO 02: Undertake pasture establishment and preservation activities

Information sheet	Learning Guide #2

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics -

- Following and clarifying **Instructions** and directions when necessary.
- Undertaking Work **task** in a safe and environmentally appropriate manner
- Practicing, handling and disposing enterprise policy and procedures observed in relation to workplace of materials.
- Report problems or difficulties to supervisor in completing work to required standards or timelines

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- Follow and clarify **Instructions** and directions when necessary.
- Undertake Work **task** in a safe and environmentally appropriate manner
- Carry out Interactions with other staff and customers in a positive and professional manner
- Practice, handle and dispose enterprise policy and procedures observed in relation to workplace of materials.
- Reporting problems or difficulties to supervisor in completing work to required standards or timelines

Learning Instructions:

8. Read the specific objectives of this Learning Guide.
9. Follow the instructions described
10. Read the information written in the "Information Sheets 1". Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
11. Accomplish the "Self-check 1" **in page -.**
12. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).

13. If you earned a satisfactory evaluation proceed to "Information Sheet 2". However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
14. Submit your accomplished Self-check. This will form part of your training portfolio

Information Sheet-1	**Pasture establishment and preservation techniques**

1.Pasture establishment and preservation techniques

1.1. Establishing pasture: -

- Pasture establishment or renovation is an expensive process that requires considerable Planning and preparation to gain the maximum benefit.
- Preparation for pasture establishment needs to begin at least one full year before the seed is actually sown.
- Establishment principles include; land preparation, species and variety selection, planning, seeding date and rate, seeding method and seeding, fertilization and weed control.
- Basically the establishment of forage crops begins with the proper soil environment. Soil test indicate whether the PH of the soil is suitable for maximum production.
- Under most situations, the optimum PH value should fall between 6.5&7.5. In addition to the PH value the availability of elements such as phosphorous, potassium, calcium, magnesium &other trace elements in the soil are needed for proper growth.
- To ensure a highly stand of forages, in addition to providing adequate fertility one must also select the best seed which can adopt to the area, can produce high quality and quantity of forage bio mass. Working task.

Pasture establishment procedures may include:

- Soil testing and treatments
- Preparation of soil for planting
- Fencing of stock and pest animals
- Chemical, cultural or biological control of weeds and wild animals.

Selecting pasture and forage crop species

- The selection and use of forage species for pasture depends primarily on the soil characteristics of the site, particularly pH and drainage, and the type of grazing system employed.
- For instances, Alfalfa requires a well-drained soil having a pH of 6.5 to 7.0 while birds foot trefoil, clovers, and grasses will grow on slightly acid soils of variable drainage.

Sowing of pasture &forage crops

- If we plan to develop pasture on cultivable land, land preparation is most important. However, if we plan to improve a natural pasture, land preparation/cultivation may not be necessary.

Common ways of establishing forage plants are;

- Direct seeding
- Seedlings
- Cutting &Splits
- The choice for these methods of establishment is determined by plant species, planting material availability &environmental conditions.

Direct seeding

Includes the following

- Broadcasting
- Spot seeding
- Row seeding

Maintaining pasture

- Once a natural /cultivable pasture is established, it needs maintenance or management because vegetative cover and nutritive value of the soil will deteriorate.
- Management includes applying appropriate grazing system rotational (grazing, strip grazing.etc.), weed control, utilization of the pasture at the right growing stage and to protect the animals not to graze until it will be ready for grazing/harvest.

Suggested strategies for Pasture establishment and preservation

The recommended strategies for tropical rangelands development are

1. Destocking - limiting livestock number as low as possible in balance with carrying capacity (the feeding resources) of the rangeland.

2. Develop effective grazing system, i.e., maintain plant composition in favors of plant use.
3. Elimination of undesirable plants
4. Re seeding (over sowing) with desirable forage Spp.
5. Fair distribution of watering facilities, so as to ensure more equitable grazing pressure over the rangeland.
6. Extension service
7. Veterinary service
8. Establish feed lots (fattening centers), Establish cattle breeding center

Feed resources

1. Natural pasture & browse (edible shrubs). These include herbaceous plants growing under coffee plantation.
2. Forage materials found around farm boundaries
3. Bottom land pasture
4. Crop residues

Feed resource development

Some of the feed resource development practices are:

1. Effective utilization of horticultural crop by-products e.g. Enset leaves, coffee residues.
2. Production of labor intensive fodder crops.

Backyard fodder production

E.g. fodder beet, alfalfa, browses trees & shrubs (Leucaena, Sesbania, etc.)

3. Agro forestry
   Planting fodder trees for the dual use as coffee shade and browse

Under sowing tree crops with forage plants or interplant with enset, banana and other crops

4. Reclamation of bottom lands for forage production

Water logging tolerant spp. like *Brachiaria mutica* (Para grass)

5. Bottom lands are least suited for coffee, and cannot be cultivated due to their water logging problem.

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

Note: **Satisfactory rating – 15 points** **Unsatisfactory – below 15 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questio

Information Sheet-2	Method of preservation

The aim of conservation is to provide animals with sufficient feeds at dry season and to avoid the loss of forage (surplus quantity as well as quality) of fed at the time of rainy season. Conservation/preservation methods include hay or silage making, crop residue conservation and treatment.

1. **Crops suitable for hay making**

   The fodder crops having soft and pliable stem are more suitable for hay making. Lucerne, cowpea, phalaries, buffel grass, panicum, Rhodes grass, oats etc The nutritive value of fodder goes dawn as the plant mature. In order to prepare quality hay, the plant should be harvested at flowering stage or when about 10% of the crop is in bloom stage.



Hay (poorly harvested and managed)

Hay making procedure:

- Cut the forage crops for hay making soon after reaching an early bloom stage of maturity
- Cure or dry in god weather condition at least for two days in thin layer
- Turn the hay during curing to facilitate curing
- Rake the hay before the forage crop completely dry to avoid excessive shattering and exposure
- Bale when the moisture content is about 22% or stack it when moisture content is 25%

- Store the hay in barn to avoid exposure to sun light or rain

Advantage of silage making

- To keep more animal stock in certain area of land
- To have high quality succulent feed for any season of the year at lower expense.
- Enables to ensile plant materials when the weather does not permit preparation of the hay.
- Avoids feed wastage
- Easy and economical for conservation and storage
- Due to early harvesting of the forage crop, to make the land free for cultivation of other crops
- Weedy and forages that could be prepared for hay making could be used to prepare silage

2. Preparing Silage

Objective: To conserve fed of high moister (succulent) for animal feeding

Silage is green material produced by controlled fermentation of green fodders crop retaining the high moisture content fresh fodder when packed in container and allowed to ferment under an aerobic condition in a **silo**

Silo is a pit in a ground, trench or tower where green fodder is stored as silage. The size and type of silo depends on the number of animals, quantity of available feed and the period of feeding. A commonly used type and size is a medium Pit silo of 17.5-meter X 1.75 meter X1.75 meter

Above ground silos

- Silage could be prepared in a pit (underground pit or above ground pit indicated above)
- Pit could be prepared in two ways and the size is determined on the amount of silage to be prepared at a time.
- At a farmer level, it can be started with small size (1.5 X1X1 meter).

- If underground pit is used, the pit must be located far from water run and other damage full things or it should be protected and should be constructed in a form of three wall type (the first silo above) to ease silage making and utilization (to get entrance space).

To construct a pit

- Dig the required size of pit and cement the floor and walls using cement and sand (very durable and produce quality silage)
- Dig the required size of pit and cover the floor and walls with plastic when making silage in un cemented pit.
- If above ground silo is required three side wall of required height, width and length (at a farmer level height of wall could 1 to 1.5 based on the amount of silage to be prepared.

Steps to prepare silage.

- It should be prepared during clear day
- Fodder crops should be harvested at right growth (flowering for grasses and legumes and for maize and millet when the grain is milky) stage. In general the moisture content should be 65-70% moisture
- Use un chopped fodder up to 5-6cm thickness and thereafter chop the material to smaller size (1-2 cm) and make it to wilt.
- Fill the silo as much as possible (with in a day) and compact it properly to have anaerobic fermentation and to produce quality silage at each 20 to 30 cm thickness. If the fodder crop is not rich in protein add urea at each compacting stage, on the other hand if fodder is not in carbohydrate like maize adds molasses or similar ingredients to enhance fermentation. If the pit is not cemented the pit should be covered by plastic before filling.
- If the pit is not cemented cover the pit by plastic completely from all sides to protect from sun and rain. Even if it is cemented it should the pit should be covered properly after filling.
- Cover the pit covered by plastic by soil and compact it.
- After one week the plastic should be removed and compacted again and covered as it was.
- The silage prepared as indicated above could be utilized after 4-6 or 8-12 weeks

To prepare silage

- 8-10 kg molasses per ton dry matter
- 1-2 kg Urea per ton dry matter (3-4 kg per ton DM for low protein fodder)

Feeding silage

- Taking out silage from the silo carefully for immediate without exposing the silo and the remaining silage
- Provide to the animal in small amount until the animal well familiarized with it. Later one animal can consume up to 15-20 kg.
- Indications of good quality silage

The main indications are color and smell. Quality silage has a smell of hot Injera or breed. The color tends yellowish. On the other hand, bad silage has snitching bad smell black- brown color.

3. Chemical treatment of crop residues

3.1. Straw treatment

In the mainly mixed agriculture areas (crop producing areas) of our country, crop residues are the main sources of animal feed. However, these feed sources are poor nutrients and improvement. Therefore, straw treatment is one of the improvement measures. The amount of crop residues to be treated depends on:

- The number of animals
- The daily crop residue intake (consumption) by the animals
- The duration of feeding period (Number of days)

As a rough estimate it can be said that animal's daily straw intake is 2 to 3 percent of live weight. i.e. Maximum of 3 kg of straw for every 100 kg body weight

Steps to treat straw

- Prepare two boxes from timber or wood (width 1 m, depth 0.5 m and length 2 m) to put the treated straw. These boxes can hold 150 kg straw. Similar size plastic containers could be also used.
- To protect the straw in the boxes from contamination air circulation cover all the sides with plastic or sacks or hay and after the boxes are filled completely cover the upper parts in the same manner.
- Crop residues that could be treated may be Teff, barely, wheat, oat straws, maize and millet stovers etc. To have better results from treating these feed staffs it is wise to cut in to small size.

Preparing urea solution: - Use the following table.

S.N	Crop residue	Water (lt)	Urea (kg)	Molasses (kg)	Remark
	100	100	4	10	If molasses is available
	100	100	4	-	
	150	150	6	15	If molasses is available
	150	150	6	-	
	200	200	8	20	If molasses is available
	200	200	8	-	
	300	300	12	30	If molasses is available
	300	300	12	-	

- Mix properly the urea, water and molasses in a container
- Measure the crop residue to be treated
- To mix the solution with the crop residue use plastic or other material that couldn't damage with liquid. Put the amount of straw to be on the container (plastic) and apply the solution on it, mix it properly.
- Put the mixture in the box/container and properly compact it until all the air is out.
- Feed the treated straw after 7 days one after the other container and continue preparing treated straw in the same manner using the empty container.

Stack method (storage method implies a pile of crop residues on the ground surface) could be used although it some disadvantages.

Materials, tools and Equipment required

- Timber or wood to prepare Container/box or Plastic containers
- Plastic or sacks to cover the container if wooden container is used

- Weighing scale or other measuring unit to measure the materials used for treatment (straw, urea, molasses etc)
- Container to mix the urea, water and molasses solution
- Plastic or iron sheet or other water resistant substances to mix the solution and crop residue/straw

- Crop residue
- Measuring balance
- Bucket
- Spade-
- Pick axe-
- Wheel barrow-
- Sacks-
- Watering can
- Weighing scale or suspended balance (to measure the animals)
- Heart girth tape (incase weighing scale is not available use heart girth tape to measure body weight of the animals)
- Chopper (manual or mechanical chopper)
- Calculators
- Note book

1. Prepare Urea Molasses Block (Amole)

It is prepared from molasses, urea, wheat bran/oil, small size straws, salt and cement. It more or less replaces concentrate feed requirements. It is provided to cattle with crop residues and increases consumption of crop residues and digestibility. It is important source of feed especially during dry periods. Materials, tools and equipment required to prepare the block.

- Container/Genda, washing pan/Safa, half barrel/gurd Bermel for mixing
- Small buckets/Baldis, deep small tray/godguada sahin or small wood boxes (3-5 liters' capacity)
- Stick for agitating

S.N	Input	Inputs in percent for the different options		
		Block 1	Block 2	Block 3
1	Molasses	50	60	55
2	Urea	10	10	7.5
3	Salt	5	5	5
4	Cement	10	5	10
5	Oil cake		20	22.5

6	Wheat bran/small size straw	25		
7	Total	100	100	100

- Thin size plastic

To prepare Urea molasses block different compositions could be used. Three options are given in the following table Preparion

Prepare a Urea molasses block using one of the above options (option 1)

- Mix 10% urea with 50% molasses in the container until it is dissolved (solution 1)
- Mix 10% cement and 5% salt in another small container with water (amount 4% of the total solution). Mix it proper to have uniform solution (the of water is to dissolve the cement, avoid drying of cement) (Solution 2)
- Mix both solutions (1 and 2) together (solution 3)
- Mix properly solution 3 with 25% wheat bran or teff straw or small size barely/wheat straw (Solution4)
- Add the final mix (solution 4) in to the block forming boxes. Covered the boxes with thin plastics before adding the solution.
- Take out the block after 12 hours carefully and put in a dry place having sun heat
- Start to feed animals with other feed staffs when it became dry and strong to be used by animals

If a farmer is not a position to treat crop residues, at least he should feed his animals chopped crop residues mixed with feed staffs of legume sources (legume forages).

Feeding

When feeding treated crop residues for the first time follow the animals try to familiarize with it. The urea molasses block should not be contaminated with water, dust faces, and urine.

Self-Check -2	**Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Write common methods of feed conservation methods?
2. Write unique advantage of hay conservation methods?
3. Write unique advantage of silage conservation methods?

4. List at least six strategies for tropical range land development?
5. The advantages of making silage?
6. list the methods of feed preservation?

Note: **Satisfactory rating – 18 points** **Unsatisfactory – below 18 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Question

Information Sheet-3	**Report problems or difficulties**

1. Agrichemical

Chemicals used in agriculture include pesticides, herbicides, fungicides, pest and vermin poisons, dips, pour-ons and solvents. The basic precautions are as follows:

- Obtain product safety information from chemical suppliers.
- Determine the health hazards associated with the chemical
- Store chemicals correctly in a secure place.
- Use the chemical in accordance with the manufacturer's instructions. Store chemicals correctly in a secure place.
- Wear all necessary protective equipment and maintain and store this equipment properly.
- Ensure washing and changing facilities are provided where necessary.
- Dispose of empty chemical containers in accordance with regional council requirements.

Employers to ensure safety of employees

Every employer shall take all practicable steps to ensure the safety of employees while at work; and in particular shall take all practicable steps to ensure that while at work employees are not exposed to hazards arising out of the arrangement, disposal, manipulation, organization, processing, storage, transport, working, or use of things—

I. In their place of work; or
II. Near their place of work and under the employer's control; and

Electrical safety

The electrical wiring and fittings of machinery connected to the mains supply (or similar) must comply with the Electricity Regulations. All portable or hand-held machinery that derives power from

an electrical current should be used with an isolating transformer or residual current device properly connected. Specific guidance on the suitable types and use of these devices should be sought from the appropriate electrical supply authority or from an electrical inspector

Hazard identification and control

Managing health and safety effectively begins with identification of the actual and potential hazards that can harm people in the place of work. Once identified, the significant hazards should be appropriately controlled. The Health and Safety in Employment Act 1992 requires employers, with the involvement of their employees, to identify and control hazards. Once the hazards are identified, the following steps should be taken:

- The first attempt should be to eliminate or remove the hazard. (An example of elimination is the substitution of a hazardous chemical with a non-hazardous chemical).
- If it is not practical to eliminate the hazard, then employees should be isolated from the hazard. An example of isolation is machinery guarding which isolates people from the hazardous parts of the machine (the hazard has not been eliminated by the provision of a guard because it is still there behind the guard).
- If it is not practical to do either of these things, then the effects of the hazard on the employees in the place of work should be minimized. This in effect means doing everything else practicable to make the work safe, and may include:
- Providing and ensuring the use of protective equipment and clothing;
- Monitoring employees' exposure to the hazard;
- With the employees' informed consent, monitoring their health;
- Providing the employees with the results of the monitoring of their health; and
- Providing employees with results relating to the monitoring of the place of work

Self-Check 3	**Written Test**

Directions*:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. What are some persecution that perform during application agriculture chemicals?

2. Write some correction action if you just identify hazards before proceeding your activities?

Note: Satisfactory rating – 8 points Unsatisfactory - below 8 points

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Question

Operation sheet-1	**Silage preservation**

prepare silage for preservation

1. Dig a pit having a size of $1m^2$
2. Prepare silage following the steps provided in steps of silage making in learning outcome 2 and information sheet 2 using available forage/fodder (try it at least for exercise, simulate)

Operation sheet -2 Treatment crop residues by urea molasses

Steps	**Urea or urea-molasses treatment of crop residues**
1	**Pit/bunker Method-**Build the pit, cover the floor and sides of the pit with plastic sheet **Stalk method-** Select an area with an elevated, dry and even surface, then covered it with plastic sheet.
Step 2	Weight the crop residue using weighing scale
Step 3	Spread the chopped crop residue on the floor
Step 4	Fill water can with water
Step 5	Measure and take urea, pour in to water container
Step 6	Mix the urea and the water thoroughly using wooden stirrer to make urea solution
Step 7	Sprinkle the urea solution on the crop residues and then thoroughly mix the solution and the straw/stover
Step 8	Compact the straw/stover by trampling with your foot to remove air as much as

possible

Step 9 Repeat step 2, 3, 4, 5, 6, 7, and 8 until enough straw has been treated to suite the requirement

Step 10 **Pit/bunker method** -Cover the pit with polyethylene sheet and load it with stones, woods or soil to prevent ammonia escaping

11 **Stalk method**- Seal the top and the sides by rolling them with the bottom plastic sheet to prevent ammonia escaping

Caution: - Urea has acidic behavior. Therefore, it needs care when mixing and should not be more than the recommended amount. To dilute cement, the proper amount of water and don't use other substances.

Operation sheet-3	**Procedures for treating teff straw**

Teff straw treatment

1. Treat teff straw for 8 cows (each weighing 350 kg) and 6 ploughing oxen (each weighing 400 kg) to feed for 25 days with urea or urea molasses following the steps indicated in the information sheet
2. Prepare Urea molasses block using the inputs of option 1 (use teff straw) provided in information sheet

LAP Test	**Practical Demonstration**

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 6:00 hour.

Task 1. Silage preparation for feed preservation

Task 2. Crop residue treatments by urea-molasses chemicals

Task 3. Treat teff straw for 8cows and 6polughing oxen?

List of Reference Materials

1994. United states department of agriculture; miscellaneous publication no. 194

1995. Pasture-cattle-coconut systems: chief crop and grassland service (agpc) plant production and protection division faoviale dell Terme di Caracalla 00100 Rome Italy

2010. Pasture and grazing management in north west, Washington state university

2017. SNV: forage production and management; training package for extension workers extension

BEEKEEPING LEVEL-I

Learning Guide -3

Unit of Competence: -Support Pasture Establishment and Preservation

Module Title: - Supporting Pasture Establishment and Preservation

LG Code: AGR BKGM1 11 0919 **LO02-LG-3**

TTLM Code: AGR BKG1TTLM 11 0919v1

LO 03: Handle materials and equipment

Information sheet	Learning Guide #3

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics -

- Storing Waste ***material*** produced during work in a designated area
- Handling and transporting materials, equipment and machinery
- Mentoring a clean and safe work site while working.

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- Store Waste ***material*** produced during work in a designated area
- Handle and transport materials, equipment and machinery
- Monitoring a clean and safe work site while working.

Learning Instructions:

15. Read the specific objectives of this Learning Guide.
16. Follow the instructions described
17. Read the information written in the "Information Sheets 1". Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
18. Accomplish the "Self-check 1" **in page -.**
19. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
20. If you earned a satisfactory evaluation proceed to "Information Sheet 2". However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
21. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-4	Handle materials and equipment

1. Storage of waste material

Every waste material must be handled in a safe manner and avoided from farm area as soon as possible. The major waste materials include

- Plant debris,
- litter and broken components,
- plastic,
- metal, and
- Paper-based materials. These may be recycled, re-used, returned to the manufacturer or disposed.

Tools and equipment used during silage and straw treatment should be cleaned and properly stored.

2. Handle and transport materials, equipment and machinery.

- ❖ Clean by using disinfecting materials e.g. soap, savelon and others, dry properly by using clean clothes or by sun light.
- ❖ All materials and equipment must be collected properly at the end of any husbandry practices,
- ❖ Transport to storing house put at their suitable place.
- ❖ Broken components, plastic, metal, and paper-based materials should be Stored and disposed accordingly.

3. Clean and safe work site

Preventive maintenance and good housekeeping are essential parts of an effective loss control program. These practices reduce:

- fires,
- Property losses and injuries due to accidents.
- They also increase production efficiency.

In addition to keeping facilities relatively clean, good housekeeping facilitates an orderly flow and

Self-Check	**Written Test**

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. List the major waste materials?
2. What are some activities performing during handle materials and equipment?

Note: Satisfactory rating – 8 points Unsatisfactory - below 8 points

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Question

List of Reference Materials

1994. United states department of agriculture; miscellaneous publication no. 194

1995. Pasture-cattle-coconut systems: chief crop and grassland service (agpc) plant production and protection division faoviale dell Terme di Caracalla 00100 Rome Italy

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