Theme 2: Forage conservation

MANAGEMENT OF SILAGE PIT (FEED OUT) - Level 3

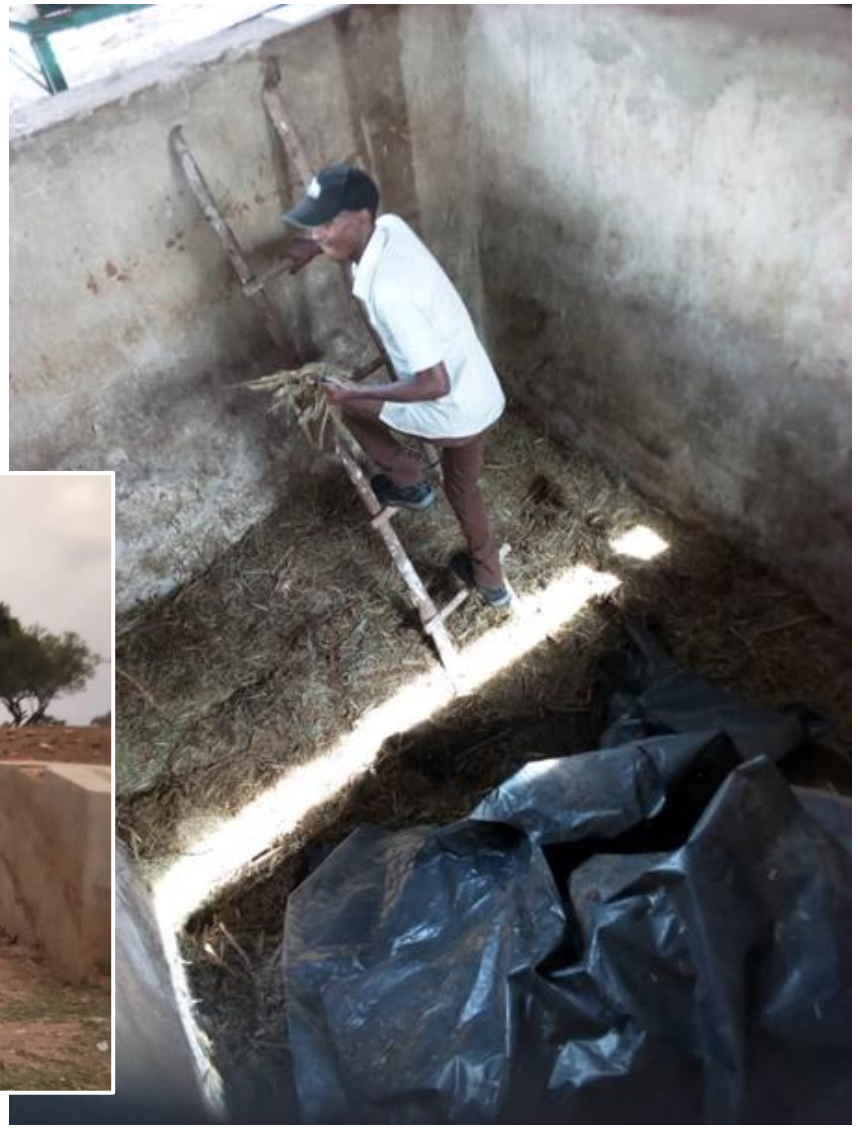
Topic	Training & information Content
2.1	Fodder conservation and storage
2.2	Estimating ideal time of harvesting
2.3	Guideline for silage making
2.4	Fermentation process in silage
2.5	Treatment of straw with Urea
2.6	Making of urea/molasses/mineral lick
2.7	Management of silage pit (feed out)
2.8	Estimating fodder supplies for dry season feeding & planning of feeding management

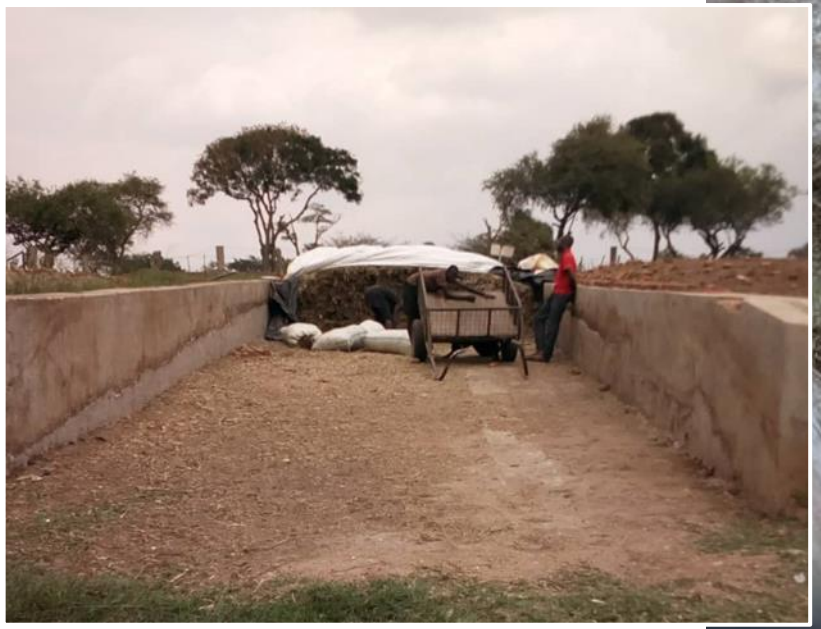
1. You will learn about (learning objectives):

- ❑ Considerations when making pit silage.
- ❑ Common mistakes made during silage feed out.
- ❑ Management practises before, during and after silage feed out.

2. Introduction

- The feed out period of silage accounts for a majority of losses.
- Decision made before, during and after feed out of silage greatly impacts reducing feed losses.
- Farmers should aim to reduce feed losses prior to and/ after end of feeding.

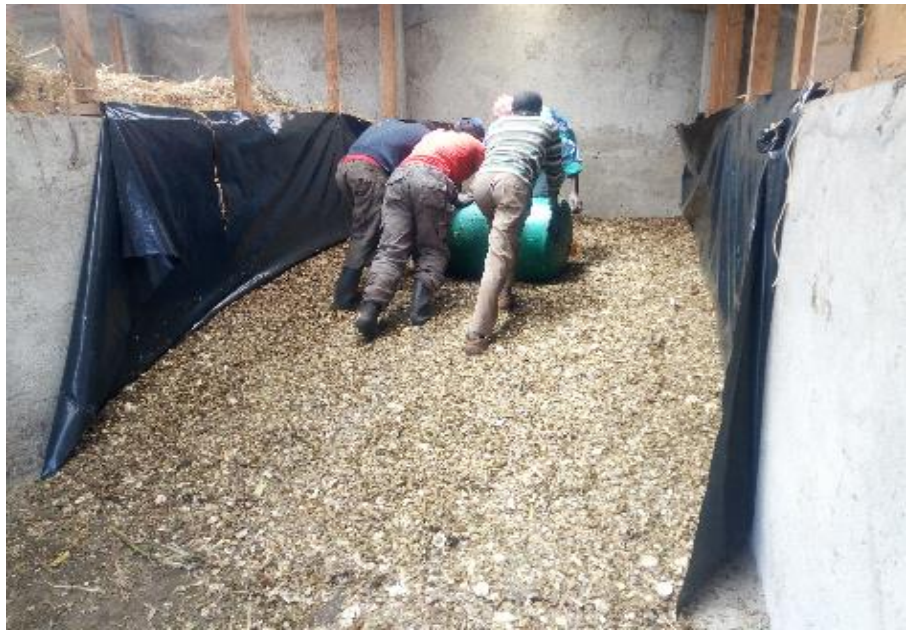




3. Factors to consider when creating a silage pit

i. Condition of the ground where silage pit/clamp is to be located, for example:

- Drainage of the ground - The area should not be low lying since such areas are usually prone to water logging.
- Slope/elevation of the area - Select a higher level on ground so that rainwater may not enter into the pit.



3.1 Factors to consider when creating a silage pit Cont'd…

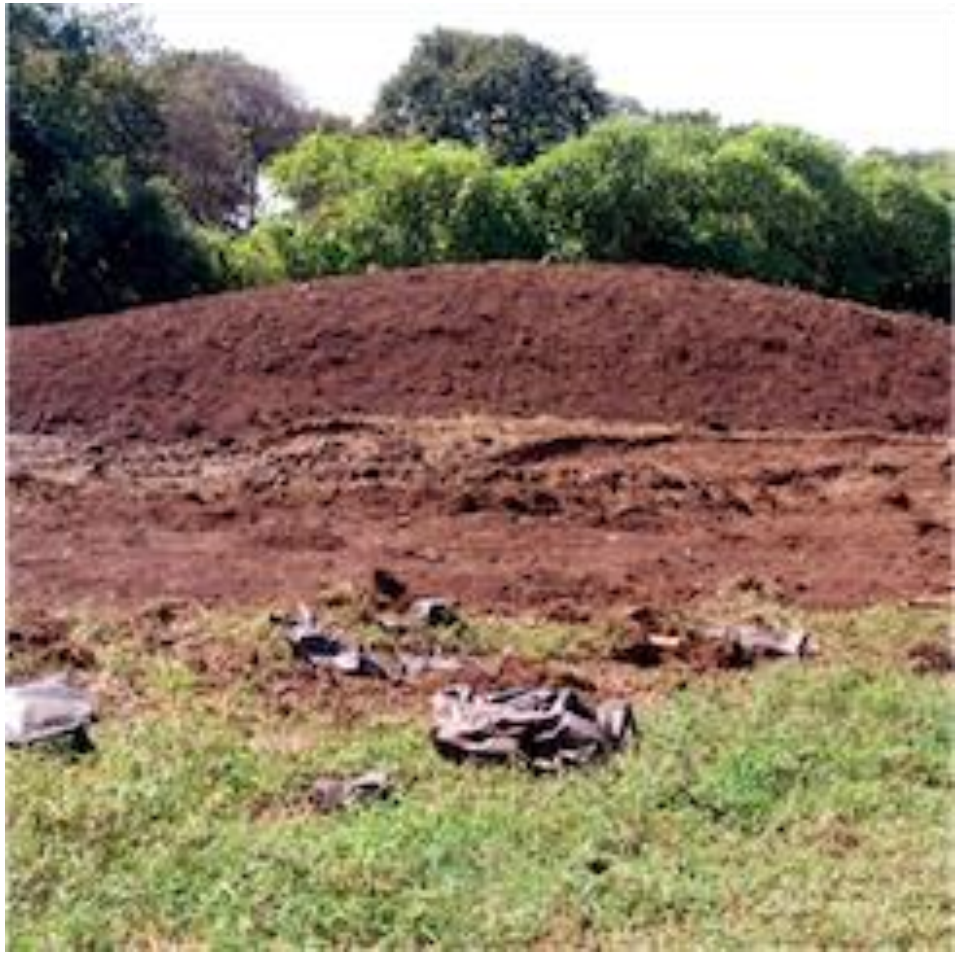
ii. Location of the silage pit, for example:
   - Should be easily approachable and accessible from the farm to the dairy unit.
   - Area should be away from trees.

iii. Number of animals.

iv. Average amount of feed used by the herd on a daily basis (per day).

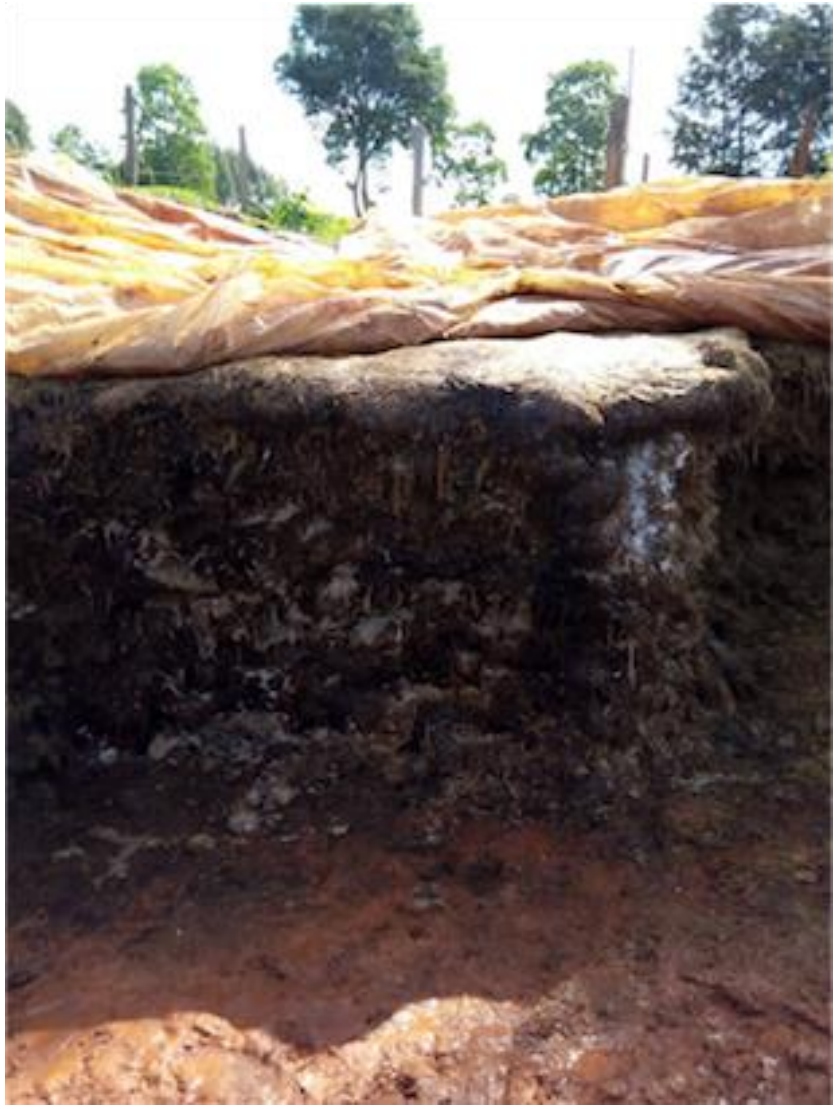
4. Importance of considering site for silage pit

- Considering the location of the silage pit helps various factors such as:
    i. Reduces chances of spoilage.
    ii. Enables easy feed out.
    iii. Makes the pit filling process easy.
    iv. Decision made can reduces cost of silage making process.



5. Common mistakes relating to silage pit and feed out

i. Creating an unproportional pit in relation to animal herd size, mostly limiting pit to one.
ii. Picking silage from different sides of the pit instead of limiting the open face to one side.
iii. Poor feeding speed - Picking small quantities of silage than needed by the cows; also influenced by shape of the silage pit.
iv. Poor removal of silage from the pit face leaving behind loose silage that ends up being spoilt after a while.



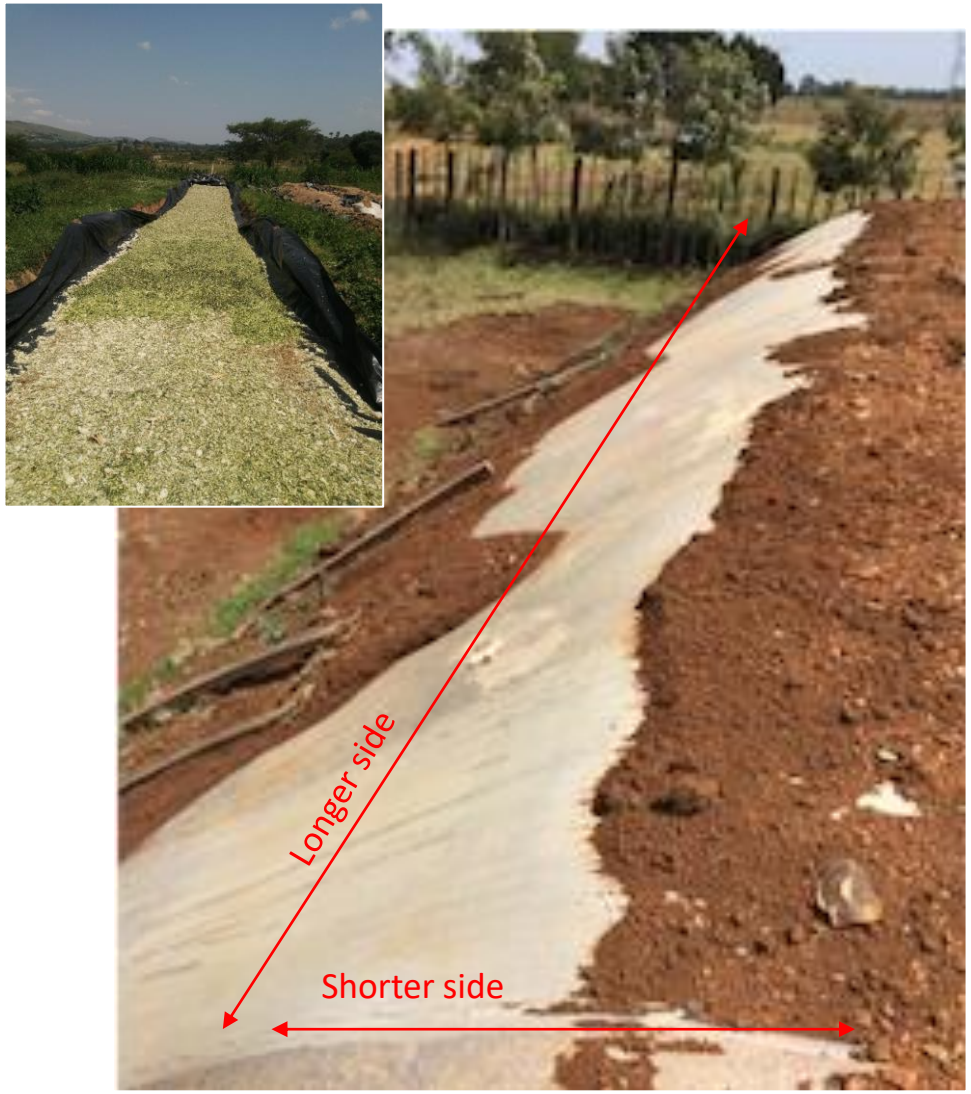
6. Management practices to consider at feeding out silage

i. Feeding speed. Once opened, silage should be utilized quickly.
ii. Ease of silage removal from the pit.
iii. Method of removing silage from the pit.
iv. Cleanliness at the surrounding and of the silage face.
v. When and when not to cover silage face.
vi. Feeding space.
vii. Losses during feeding.

7. Feeding speed

- Create the silage pit in accordance with your animal herd size. This is the best way to regulate size of pit.
- Pit should be shaped like bread and sliced from the shortest side.
- Pick 20 cm deep into the silage pit for 7 days that equals using 1 meter. During the dry season one can go up to 1.5 meter.

Note: On average farmers should work with maintaining a feeding speed of 1.5-2 meters per week.



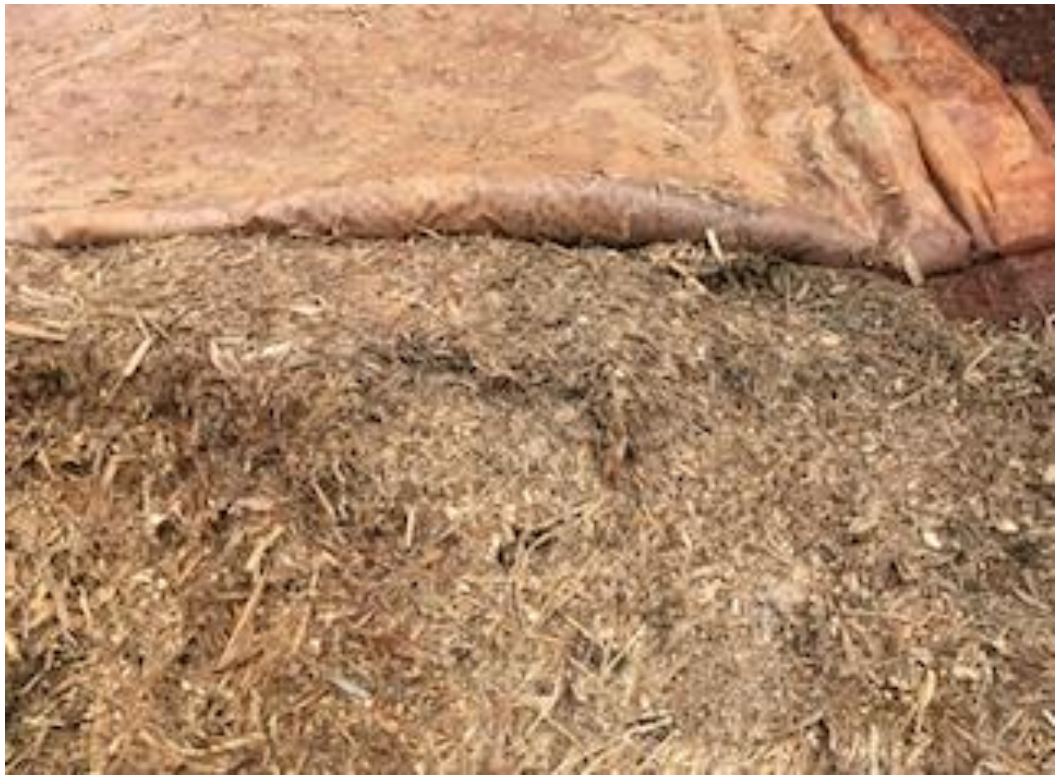
7.1 Reasons for keeping a good feeding speed

- Good feeding speed prevents heating up of silage.
- Avoids dry matter and energy losses.
  - Heating up of silage encourages mold growth and rotting at the face of the silage silo/pit.
  - Rotten and/or moldy silage should not be fed to cows.
  - Mold growth also increases the chances for mycotoxin infection in feeds.
  - These should be limited and avoided at all cost as it affects the animals health.

Further reference: Fermentation process in Silage Part I and II.

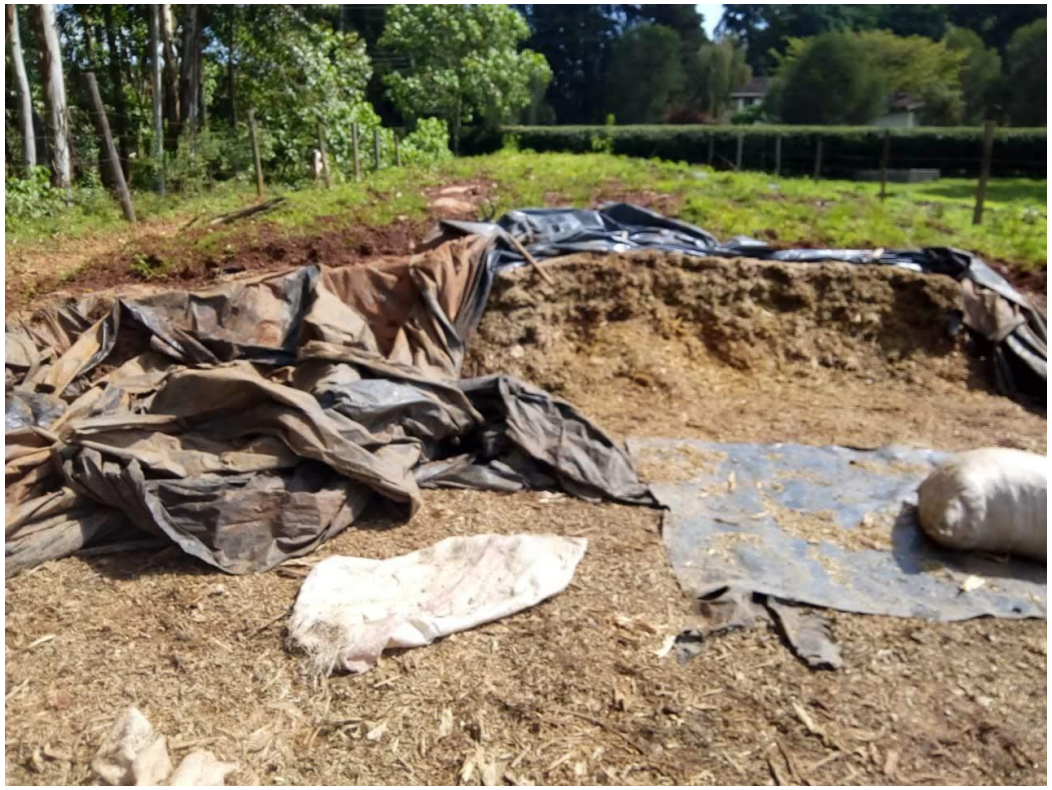
8. Ease of silage removal

- Farmers should ensure that silage can be easily accessed and removed. This is possible through proper site selection of the pit.
- Pit should be closest to the animal feeding area.
- Site for silage pit should also be well spaced to allow back and forth movement especially for manpower (staff/labour) and machinery.
- Staff should not have difficult time when accessing silage, feed should be as accessible as possible.



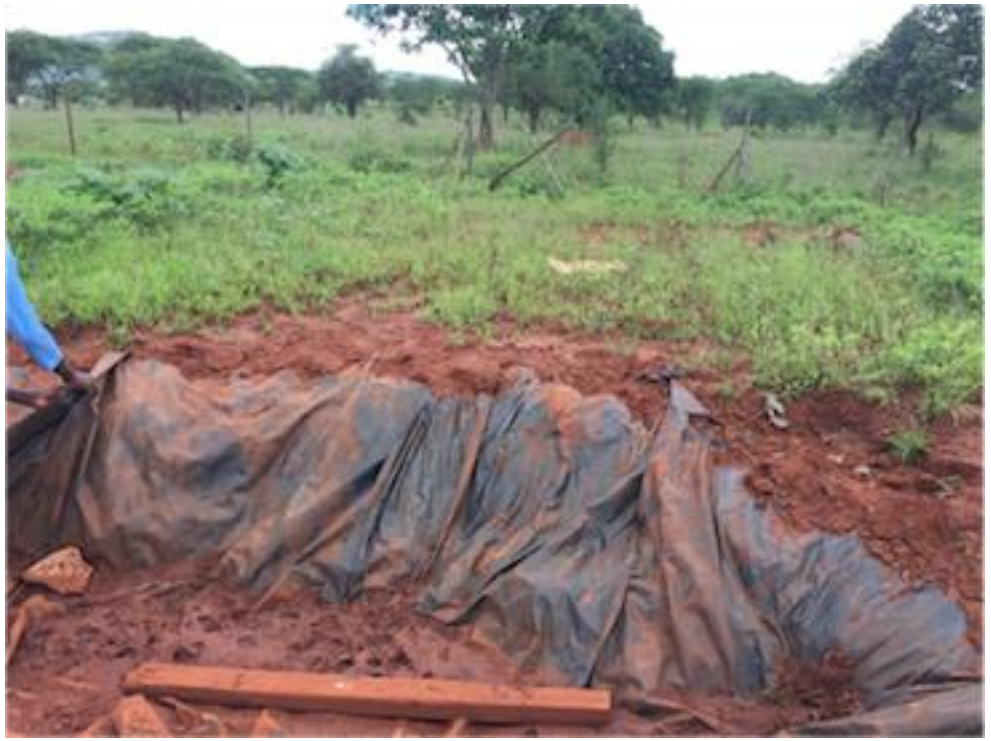
8.1 Importance of easy silage removal

- When feeds are inaccessible it discourages the staff to feed the cows to required amounts. This causes slow feeding speed.
- Remove silage from all corners of the open face every day and maintain straight and tightly covered silage pit face.



9. Method of removing silage from the pit

- Removing silage for feeding necessitates loosening the open side of the silage pit due to compaction so as to make silage loose and easy to scoop.
- Remove all loose silage materials from the open side of the silage pit face. These loose materials in front or in the bottom of silage pit can cause mold growth and rotting to occur, easily spreading to the good parts.
- After removing silage ensure the silage pit face is maintained straight and tightly covered.



Tightly cover the silage after feed out

10. Cleanliness around silage face

- Area around the silage pit should be clean and well drained to avoid water getting into the open face of the silage pit.
- Remove loose and dry materials at the entrance of the open face of silage pit. This prevents contamination of the good and fresh silage inside the pit and ensures that even after covering heating will not be facilitated.
- Practice proper silage removal and cleanliness to reduce wastage and contamination.

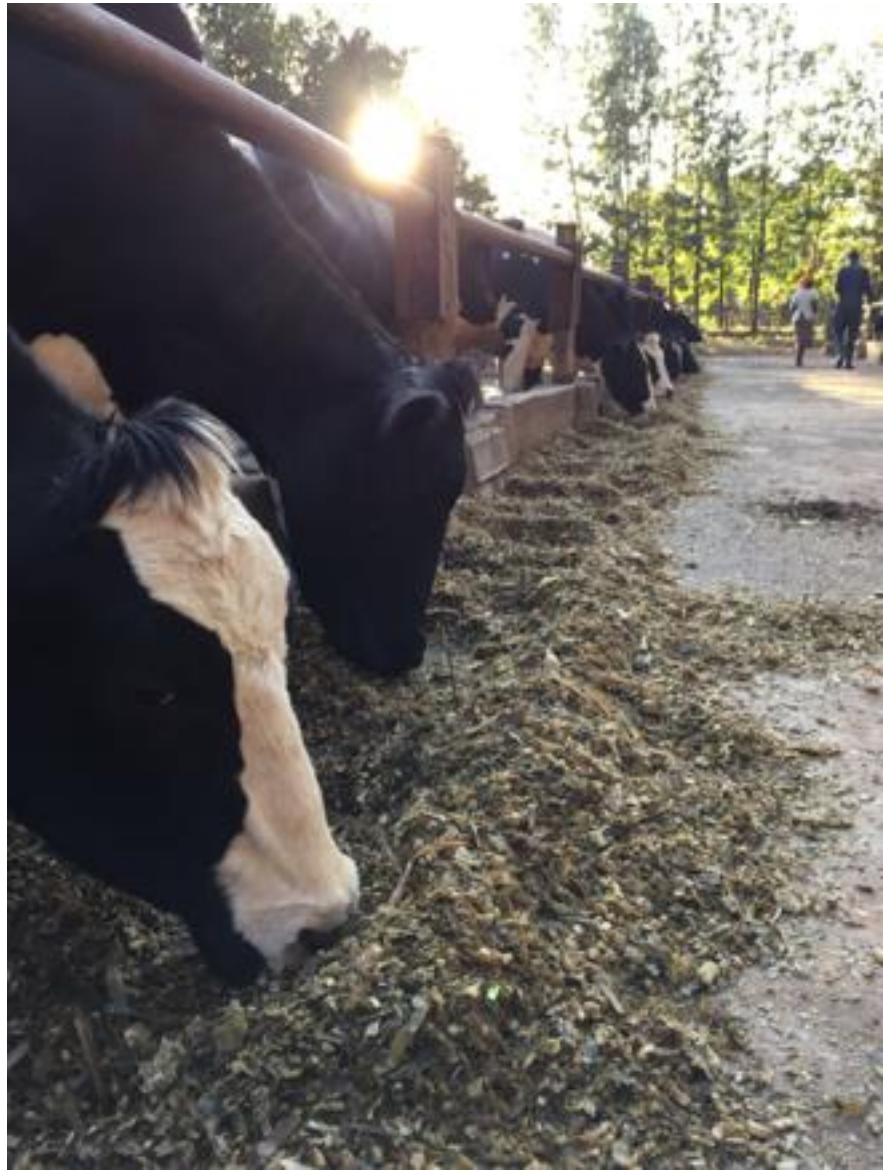
11. Covering silage face

- Loose cover will not avoid air from coming in but it can protect against rain. However during warm days the cover may encourage mold and bacteria growth.
- Removing silage everyday helps reduce water infiltration into the silage pit from the silage pit face. For this reason farmers are encouraged keep the face open and not to cover the open pit with polythene.
- The cover material in front of the open pit face protects it from rainfall thus getting wet and also create a micro-climate (underneath the cover material) which may encourage multiplication of bacteria and molds and bacteria in silage (first 10-20 cm).

Further reference: Fermentation process in Silage Part I and II.

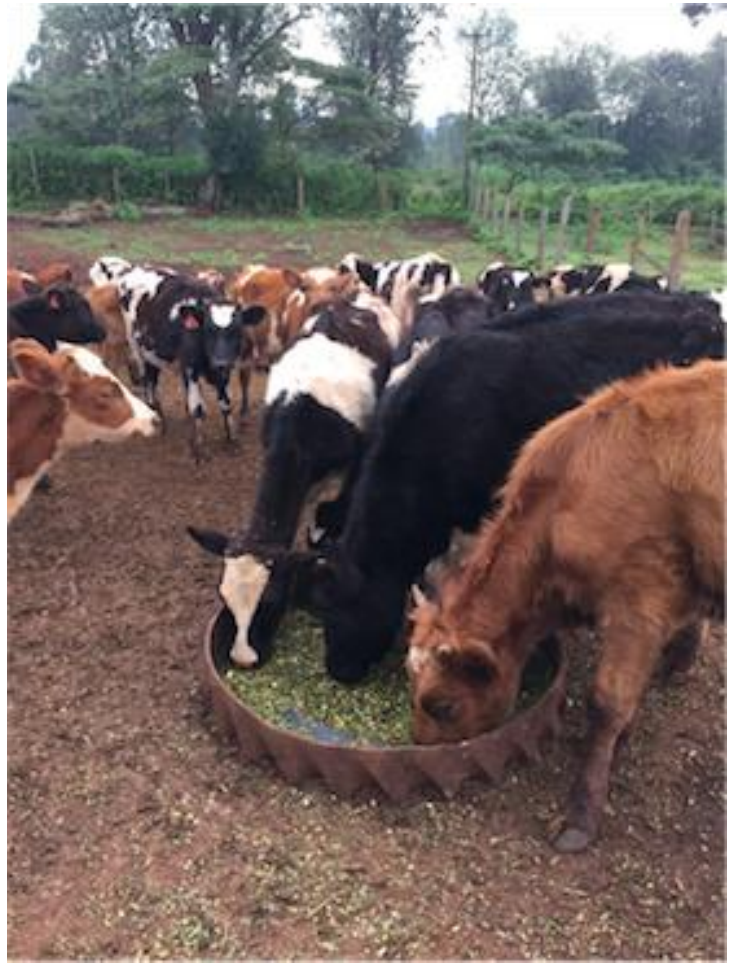
12. Feeding space

- Provide enough space at the feeding area in a cow house/barn to avoid competition at the feed trough.
- Provide a minimum of 65 cm per cow to ensure high feed intake.



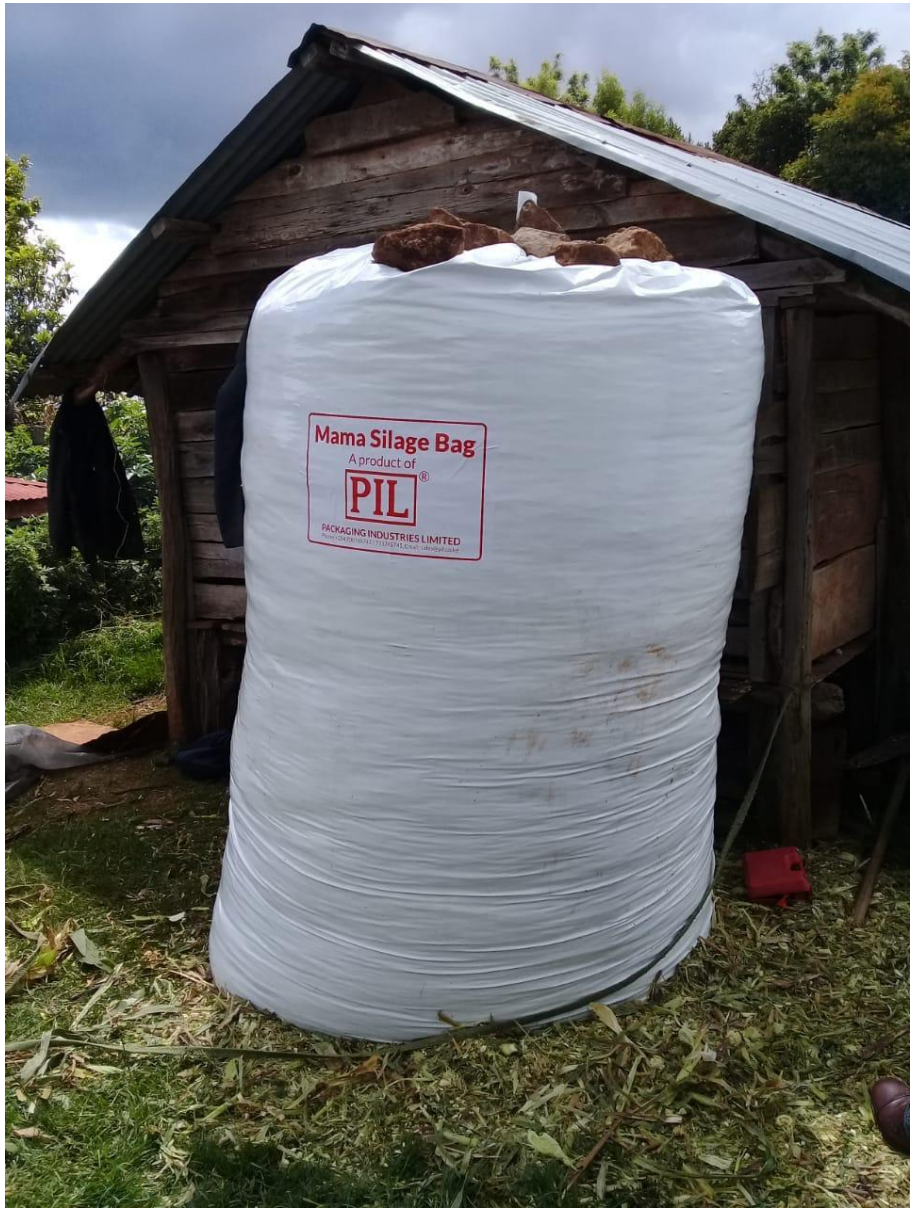
13. Losses during feeding

- Once silage is open feed regularly only what a cow can take within two successive feedings and not in excess.
- Cows should not trample on silage. Keep the open face of the silage pit, feed troughs and alleys clean to prevent contamination of fresh batches.
- Feeding high quality feed (silage) reduces wastage.
- Well managed (cleaned) feed storage and feeding facility reduces losses in the form of leftovers and waste.



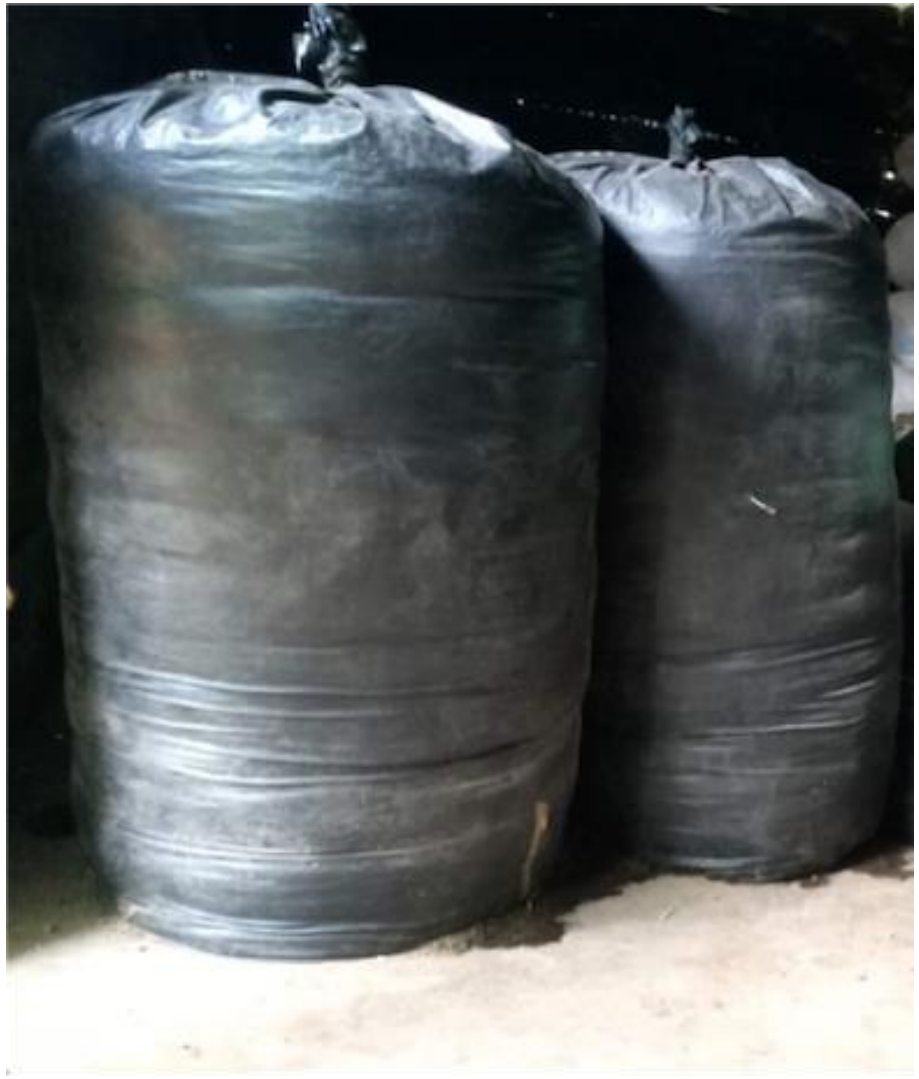
14. Packaging bags

- Packaging polythene bags/packages are common among Ugandan smallholder dairy farmers making silage.
- Forage maize is harvested and packaged in polythene packages.
- It uses manpower to press silage layer by layer by stumping and sealing/tying tightly with a rope.



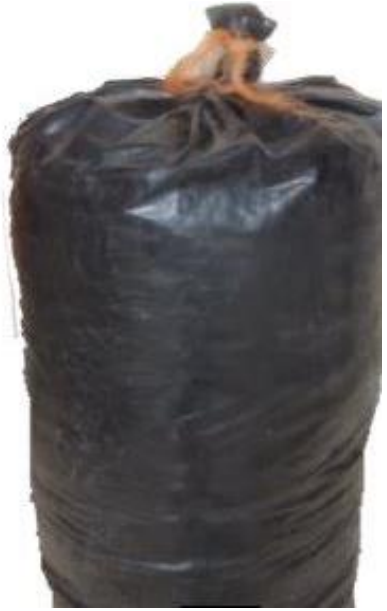
14.1 Handling of packaged silage

- Site where packaged silage is place should be clean and free from objects that can pierce through the plastic.
- Before, during and after feed out, carefully inspect the packaged silage for holes and seal immediately with masking tape to control air entry.
- Stack packaged silage properly to avoid falling over of silage that are on top of other packaged/baled silage.
- Stack the packaged silage well to facilitate easy removal during feed out.



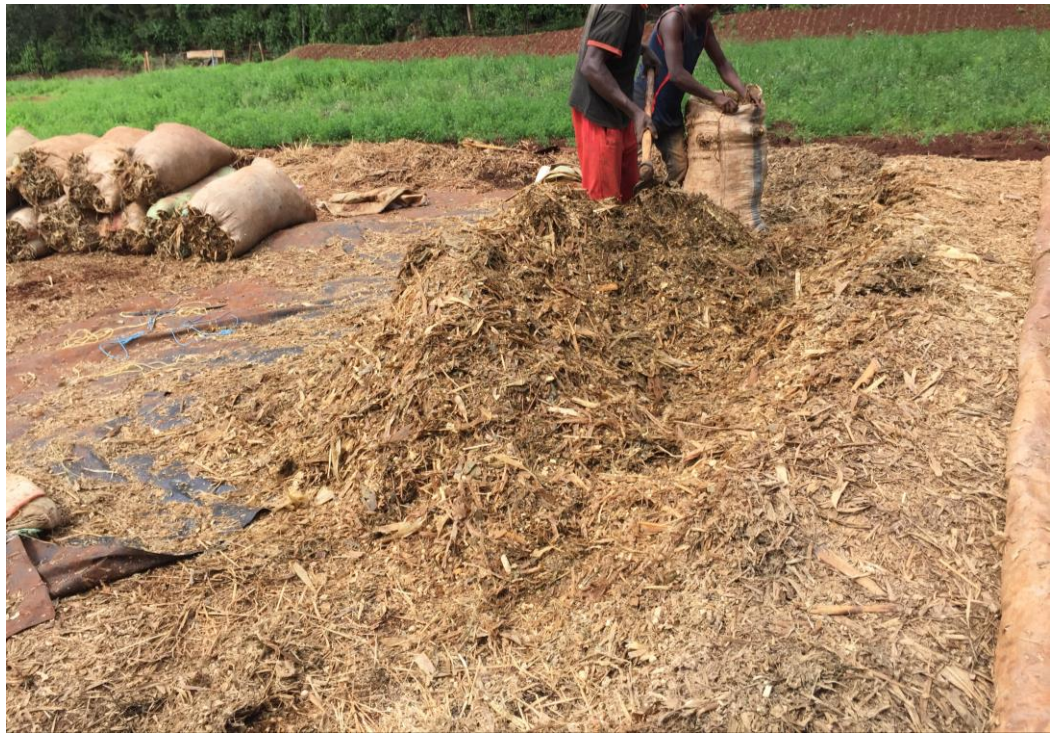
14.2 Feed out of packaged silage

- Open packaged silage at the tip. This should be the width-side and open/tear off the polythene around it safely to scoop feed for cows.
- Use one packaged silage at a time, avoid opening more than one at a time to avoid spoilage and better management.
- The bale should be used up within a week (feeding speed).
- Properly cover the bale to avoid exposing it to the air so as to minimize feed spoilage and losses.



15. Condition of silage during feed out

- Silage is undergoing aerobic fermentation.
- There is fungal revival.
- There is presence of acetic bacteria, yeast and molds.
- The pH is between 6-9.
- The dry matter loss is averagely below 47% (<47%).



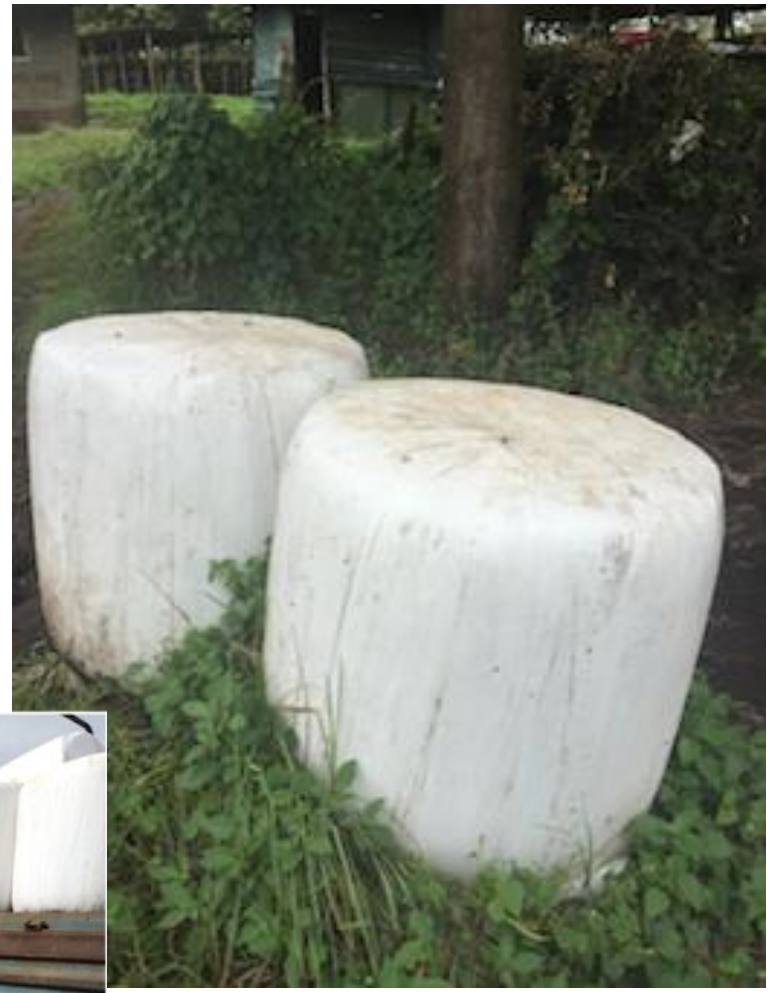
16. Fermentation losses at different harvesting stages

Maturity stage of kernel	Dry Matter %			Ensiling losses (%)	
	Cob	Total plant	% Cob in DM	Dry Matter	Energy
Milky	30	18-21	30-35	10-15	15-20
Early dough	40	21-25	40-45	8-12	11-15
Dough	50	25-29	45-50	6-10	8-12
Late dough	55	29-35	50-55	4-8	6-10

Further reference: Module on Fermentation process in silage part I and II

17. Baled silage is the future!

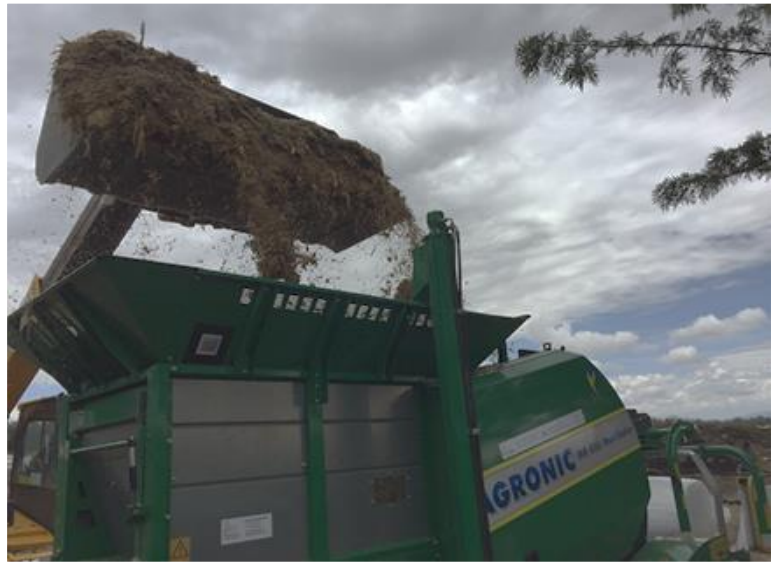
- The future for farmers and distributors is baled maize silage.
- Bales enables producers to tightly wrap maize silage in bales that are easily transportable and ready for use by farmers.
- This eases access to silage by farmers with feed shortage or those without capacity to grow and make own maize silage.
- Baled silage offers a great solution to dairy farmers but is yet to be undertaken fully in the Ugandan dairy sector.



17.1 Baled silage Cont'd…

- Baled silage can be made at two different stages depending on farmer/producers preference:

    1. **At silage harvesting stage -** Forage maize is either grown, harvested and baled after being chopped awaiting to be ready for selling and for use.
    2. **At feed out stage -** Forage maize is grown, harvested, placed in a silage pit/clamp until it is ready for use, then it is baled ready for use by farmer once bought.



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