

Theme 2: Forage conservation

GUIDELINES TO MAIZE SILAGE MAKING (Level 2)

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
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



Guidelines to Maize Silage making (Level 2)

1. You will learn about (learning objectives):

- ❑ The right steps for making maize silage:

Identifying the right stage of harvesting, using right machinery for best results and ensuring proper management of pit / clamp before and after feed out.



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2. Making Maize silage

- Maize silage is a way of preserving maize fodder for future use
- The silage provides low cost metabolizable energy (ME) for dairy cows and can be a key ingredient in a cow's daily feed ration/diet
- Maize silage is low in Crude protein (CP), Calcium and Vitamin D
- If prepared in enough quantity, it helps a farmer to counter seasonality in milk production



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3. Stage of harvesting maize fodder for silage

- The ideal stage of harvesting is when the kernel is dough-ripe / ripe
- That is, when twisting the stem, only few drops of moisture can still be seen coming out – see next slide
- The leaves below the cob are dry
- The milk line is at half to three quarters of the kernel
- Aim at a DM level of 30-35% for the whole crop



Leaves below the cob are dry

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3.1 Estimating the dry matter on the stem

- Take the maize stem, twist it on your knee as shown alongside

4 drops \leq 18 % DM 100 % green

3 drops \approx 21 % DM 75 % green

2 drops \approx 24 % DM 50 % green

1 drop \approx 27 % DM 25 % green

0 drops \geq 30 % DM 0 % green



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4. Chopping

- Chop length should be between 8 – 12mm
- Sharpen the knives at least every day
- When harvesting is done at dough-ripe stage the chopper needs a kernel crusher
- Preventive maintenance and servicing of the machines during harvesting should be done daily



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5. Location of the pit

- The location of the silo (silage pit) should;
 - be dry with no stagnant water
 - be protected from animals and wildlife
 - have a high elevation or on a slope
 - be as close as possible to the cow or cow barn.



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6. Transportation

- The choice of means of transport is determined by the amount of harvested maize, distance and road network
- The distance between the field and pit/clump must not be more than 3km, if motorized transport is available
- Plan in such a way that silage pit can be covered in 12 hours



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7. Filling of the Silo: Pit / clamp / bag

- Fill the pit layer by layer. Make layers of 10 cm silage every time
- Additives such as molasses can be added at this stage
- Compact after every layer
- Prevent contamination with soil, dirt and manure.



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8. Silage pit dimensions and location

- The silage pit should be narrow and long
- Determine how far the clamp/pit is from the barn, how well-drained the location is, how safe from any other traffic and from birds, rodents and wild animals.



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9. Compacting

- Compaction is necessary to remove air (oxygen) from the chopped maize
- Tools used for compaction need to have enough weight for effective compaction
- Ensure equal compaction of the silage surface.



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10. Sealing

- Ensure that the polythene sheet is not punctured and has a good overlap to cover the silage pit / clamp completely
- Ensure that the thickness of polythene is >500 gauge
- Seal silage pits or clamps within 24 hours after starting to make the pit
- Care needs to be taken that the polythene is not damaged.



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11. Covering with soil

- Soil cover of at least 20-30cm is important for four reasons:
 1. Continuously compacts the silage
 2. Protects the polythene sheet against direct sunlight
 3. Protect the polythene sheet from being damaged by birds and small wildlife
 4. Protect the silage underneath the polythene sheet from heating up.



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11.1 Covering with soil Cont'd...

- Soil or sand bags keep the polythene sheet tighter and continue exerting pressure on the silage pit
- Tires are not preferred; they do not keep out the heat. Tires can also puncture polythene.



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12. Silage making in transportable bales

- Baling eases transportation of the ready-made silage from one location to another
- This can be useful for farmers with dairy cows and not enough land to plant their own fodder crops
- Also, farmers in dry or very dry areas where rainfall pattern does not support the growth of forages can benefit from this technology.



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13. Fermentation

- Sometimes circumstances for ensiling may not be very ideal, for example; the maize is too wet or too dry. To enhance fermentation, additives may be added during filling of the pit
- Ensure regular and equal application of the additive over the silage surface
- After closing the pit / clamp, it should stay closed for 6 weeks before opening
- Making a narrow pit / clamp will ensure feeding speed on feed out.



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14. Feed Out

- The feeding speed should be 1.5 - 2 meters per week (20-30 cm per day)
- Slow feeding speed will increase the risk of secondary fermentation
- Make sure that all the silage is removed from the face of the pit to avoid heating up.



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14.1 Feed Out Cont'd...

- Remove all loose materials from the open side (face) of the pit and feed immediately. Loose materials in front or on the bottom of the silage pit or clamp cause moulds and rotting bacteria to grow. From here moulding and rotting will spread to the good parts of the clamp
- Clean the open silage face from all rotten and loose materials daily. This removes moulding and rotting materials therefore preventing contamination of good feed.



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15. Feeding

- A mature cow can consume between 15-35 kg of maize silage per day
- Feed more maize silage in the early lactation period when the cows milk production is highest
- Maize silage contains very little protein, supplement milking cows with high protein feeds.



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