Guidelines for Forage Maize Production and Ensiling

Kenya Market-led Dairy Programme (KMDP)

1 LAND CULTIVATION

WHAT	HOW
a. Field selection	Select suitable fields for forage production
b. Ploughing	Plough with a mould board plough or a fixed chisel tine cultivator with leveling harrow attached. Avoid disc ploughs!!
c. Seed bed preparation	Cultivate to a fine tilth and level by cross cultivating.

2 SEED SELECTION

WHAT	HOW
a. Seed variety	Select forage maize variety or hybrid suitable for forage production i.e. with low NDF, cob stem ratio of 50:50 (on DM basis), high in starch and gradually maturing.
b. Seed size	The size of the seed should suit the planter to be used.

3 PLANTING

WHAT	HOW
a. State of implement	Check the settings of the planter. Fertilizer placement should be 5 cms beside and below the seed. There should be no blockage.
b. Seed rates	Determine the correct seed rate to get the desired plant population.
c. Fertilization	Analyze the soil: supplement the required amounts of nutrients at planting and top dressing as per the soil analysis.

4 CROP PROTECTION

WHAT	HOW
a. Weed control	Use appropriate herbicide in the recommended concentration, apply correctly and under the right conditions.
b. Pest control	Use appropriate pesticide in the recommended concentration. Apply correctly and under the right conditions.

5 HARVESTING

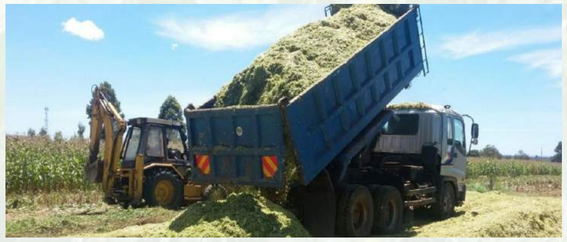
WHAT	HOW
a. Stage of harvesting	Aim at a DM level of the whole crop of 30-35% and a starch level of at least 30%. The most accurate method of deciding when to harvest is to determine the dry matter on samples of the whole maize plant. DM can be determined with a probe, by NIRS or in an oven. The kernel should be at dough ripe stage
b. Machine to be used (kernel crushers) and servicing	The machine should have a kernel crusher. The machine needs proper preventive maintenance and servicing during harvesting (e.g. calibration and sharpening of knives).
c. Additives	Adding inoculants based on lactic acid bacteria.
d. Location of clamp or pit	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.
e. Weather	Check the weather if appropriate for machines to enter the field and right for harvesting.

6 CHOPPING AND KERNEL CRUSHING

WHAT	HOW
a. Chopping length	The machine used should be able to chop the crop into pieces of 8-12 mm.
b. Kernel crushing	The machine used should be able to crush the grains into at least 3 parts each.

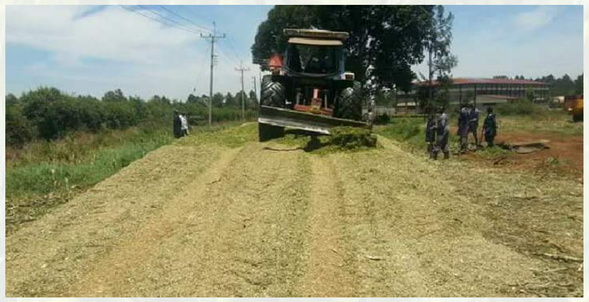
7 TRANSPORTATION

WHAT	HOW
a. Distance field to pit. Speed of work	The distance should be as short as possible. The pit or clamp must be compacted and closed within 12 hours
b. Truck or tractor	Should be selected depending on distance, access and state of roads.
c. Accessibility and field conditions	The field and farm should be accessible to the forage harvester but also to trailers and trucks when loaded.



8 COMPACTION

WHAT	HOW
a. Machine/ equipment	The silage should be compacted using the heaviest machine available: a tractor or a shovel.
b. Pit dimensions	The dimensions should be designed to give appropriate feeding speed of 1.5 to 2 meters per week. Narrow and long is better than short and wide. Ensure sufficient height of the trench.
c. Shaping of the pit	The sides should be as upright as possible. Avoid flat “chapati shaped” edges
d. Layering and spreading	Spread and compact each layer the moment it is tipped, i.e. keep a shovel or tractor on the pit during the ensiling process.



9 COVERING

WHAT	HOW
a. Sealing	Seal silage pits or clamps immediately when that particular pit has been filled.
b. Choice of plastic	The polythene should be preferably one continuous sheet, without any holes, of good gauge (>500) specially produced for silage making. Many farmers use a second, heavier gauge sheet to protect the vulnerable polythylene sheet.
c. Soil/ sand bags/ tires	Dig a trench around the pit, place plastic, tighten the plastic with soil around the pit, and gently place soil up to 15 cm (6 inches) thick on the top and sides of the pit. Do not puncture the polythene; repair holes before covering with soil.
d. Fencing	Fence-off the area to keep away animals from walking on the pit.
e. Inspection	Weekly walk around the silage pit/clamp/bales.

10 MANAGEMENT & FEEDING-OUT OF SILAGE

WHAT	HOW
a. Feeding speed	The feeding speed should be 1.5 - 2 meters per week based on the feed planning tool.
b. Ease of removing	Make sure the silage can be removed easily and is accessible.
c. Removal of silage	Remove all loose materials from the open side (face) of the pit and feed immediately.
d. Cleanliness around	Clean the open silage face from all rotten and loose materials daily.
e. No cover on open silage face	Do not cover the open pit or clamp with polythene but keep the face open.
f. Feeding space	Provide enough feeding space at the feeding rack in the cow barn. A minimum of 65 cm per cow is recommended to ensure a high feed intake.
g. Avoid losses during feeding	Cows should not trample or foul the silage. Feed regularly and not in excess, only what animals can eat between two successive feedings. Keep feed-out areas, feed troughs and feed alleys clean to prevent contamination of fresh batches.

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