

# Selecting and using a Maize inoculant

The starch, energy and intake characteristics of maize silage together with its high dry matter yield potential make it a good feed option for livestock, but it is one of the riskiest forages in terms of preserving it. With aerobic spoilage (heating) caused by yeasts and moulds in the presence of air and risks to fermentation especially when making greener, moister maize silage it only takes one error in management to significantly reduce its feed quality or volume of dry matter in the clamp.

The digestibility and starch content of maize silage improves with time in the clamp. Ideally, maize silage should be left for at least a month before feeding to allow pH and feed quality to stabilise. However, it can be fed immediately if needed urgently.

## Harvesting

Maize should be harvested when the DM content of the crop is between 28 – 35 %. No trials show that there is not improvement in animal performance above 35% DM content. Some trials have shown that animal performance is actually reduced when maize silage is above 40% DM as a consequence of starch being less available and lower feed value in the senesced leaves.

Where possible a longer maize stubble should be left (at least 15 cm) not only to reduce soil contamination in the clamp but as a rule of thumb, fresh yield is reduced by 1 T / acre for a five inch increase in cutting height. Chop length should be around 1.5 – 2 cm to aid consolidation, which will help improve the fermentation and reduce heating at feed out.

| Grain Description          | Clear Grains                                                                        | Milky Ripe                                                                          | Soft Dough                                                                           | Firm Dough                                                                            | Hard and Mature                                                                       |
|----------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Starch Level               | No Starch                                                                           | Starch Kernel can be found                                                          | Good Gritty Starch                                                                   | Smallest drop of moisture can be squeezed from grain                                  | Floury Starch                                                                         |
| Approx. Time until Harvest | 1 month+                                                                            | 2-3 weeks                                                                           | 7-10 days                                                                            | Harvest for Forage now                                                                | Combine                                                                               |
| Appearance of Grain/Cob    |  |  |  |  |  |
| Approx. Whole Plant DM%*   | Less than 18%                                                                       | 18-25%                                                                              | 25-28%                                                                               | Approx. 30%                                                                           | More than 35%                                                                         |

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## Ensiling

Filling the clamp quickly after harvest with very good consolidation is a must for maximising the quality of maize silage. An even fill in thin layers of a maximum of 15 cm will help consolidation as this is the maximum depth that can be compressed effectively.

As with any other clamp, sealing completely for rapid, anaerobic (without oxygen) fermentation is a must. A drier crop is less readily compacted than wetter forage. As the areas of the clamp most prone to spoilage are the top layer and shoulders it would be more sensible to harvest later maturing crops last to improve compaction. The later maturing crops will also have softer starch which is more readily available within the rumen.

Thin undersheets can provide an airtight seal. Weighing down the over sheet with tyres, bales or weights will also help fermentation.

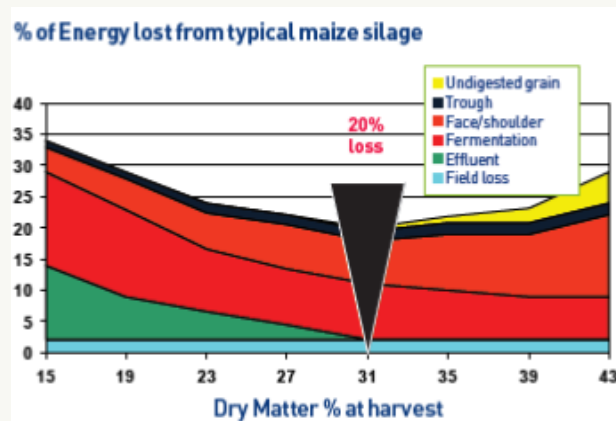
Practical tips:-

- A maize crop will usually yield 15 – 18 t / acre
- The clamp must be rolled heavily and consistently
- Sealing out air is vital
- Effective and consistent top weight is a must.
- Control of vermin is vital.

## Using a maize inoculant

Maize silage can be prone to losses from inefficient fermentation. These losses are invisible and can be approx. 8% for maize harvested at the recommended dry matter content. In some cases they can be higher with some suggestions as high as 20 – 30% between the field (pre-harvest) and what is finally in the rumen of the animal.

The use of an inoculant can minimise the face and shoulder losses while helping to control the fermentation.



Maize silage heats up more quickly when it is less well compacted, which is also influenced by maturity and chop length. More mature, woody material and longer chopped silage is more difficult to compact.

The below image shows that the top half and shoulders are always warmer by at least 10–15°C than the bottom of the clamp.



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Whilst air exposure can't be avoided completely once the clamp is opened its damage can be minimised by using a block cutter or shear grab to keep the face tidy. Another way to reduce heating after opening is to cross the face more quickly or divide wider clamps into two.

Aim to cross face:-

- Summer in under three days
- Autumn / spring four days
- Winter six days.

When selecting an inoculant both fermentation and aerobic spoilage need to be addressed. Treating to improve fermentation can certainly pay dividends. Maize silage should also be treated to help improve animal performance.

The benefits of using an inoculant to produce a faster, more efficient initial fermentation include:-

- Improves use of available sugars
- Preserves more nitrogen as true protein
- Reduces fermentation DM losses
- Minimises undesirable microbial activity
- Improved animal performance

The benefits of using an inoculant to inhibit the activities of the yeasts and moulds that cause spoilage include:-

- Less heating
- Lower DM losses
- Less physical waste
- Higher energy feed
- Less risk of mycotoxins

## What are the savings of correct clamp management?

Temperature Increase effect

| Temperature in silage ( C ) | D Value |
|-----------------------------|---------|
| Cool                        | 69      |
| 30 – 35                     | 67      |
| 50 – 60                     | 61      |
| 70 – 75                     | 48      |

There is an inverse relationship between silage temperature and D value (the content of digestible organic matter in the DM). When the silage temperature increases, the D value of the silage will drop off, which causes a potential energy deficit in the cow.

To keep yields and cow health where they need to be, this energy will have to be made up from other sources which will significantly impact the farm profitability.

Physical dry matter will be lost over time and it is also affected by a heating silage clamp. When opened, oxygen will generally penetrate up to 2m into the clamp face.

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## What product to use?



### Sil - All Maize Plus

Contains three bacterial strains and an enzyme complex. Includes *Propionibacterium acidipropionic* for improved aerobic stability and reduced DM losses on higher DM silage.

Heterofermentation plus cell wall breakdown. Shown to reduce ensiling losses by 5%. Claimed to reduce mould growth and improve palatability. European approval for reducing aerobic spoilage. One unit treats 100t. Apply 10mls to 2l/t



### Ecocool

Provides aerobic stability and fermentation. Supplies *Lactobacillus plantarum* for a fast efficient fermentation and *Lactobacillus buchneri* for reduced heating and spoilage at feedout. One bottle treats 100t. Application variable from 20ml to 2l/t.



### DA Ecocorn

Provides aerobic stability and fermentation. Supplies *Lactobacillus plantarum* for a fast efficient fermentation plus potassium sorbate as it is a very effective inhibitor of the yeasts and moulds that cause aerobic spoilage. One bottle treats 50t. Application rate 2l/t.



### Pioneer 11A44

Reduces aerobic heating. Suitable for crops up to 45% DM. Provides very good improvement to aerobic stability. Good for silage with lack of compaction and long chop length. One bottle of 500ml treats 50t or 2500ml treats 250t. Application rate 10 mls – 2l/t



### Pioneer 11C33 Rapid React

Reduces aerobic heating and fermentation losses. Contains *L.plantarum*, *E.faecium* and *L.buchneri*. Fast fermentation for improved palatability. Can be fed 7 days after ensiling. One bottle of 500ml treats 50t or 2500ml treats 250t. Application rate 10 mls – 2l/t

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## **Pioneer 11CFT**

Reduces fermentation losses and aerobic heating. Increases fibre digestibility. Contains unique strain of *L.buchneri* to release enzymes to break down cellulose and lignin. One bottle of 500ml treats 50t or 2500ml treats 250t. Application rate 10 mls – 2l/t



## **Advance Maize**

Reduces fermentation losses and aerobic heating. Contains *L.plantarum*, *P.Pentosaceus* and *L.Brevis* plus enzymes. One unit treats 50t. Application rate 40 mls – 2l/t