What is aerobic spoilage?

Cut to Clamp

A **Volac** initiative

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What is aerobic spoilage?

On exposure to air silage can begin to break down resulting in heating and high DM losses. This process is known as aerobic spoilage.

Aerobic spoilage is initiated mainly by yeasts which can grow using a variety of different substances particularly residual sugars and lactic acid.

After the initial yeast activity, moulds join in. They are able to grow on a wider range of substances so spoilage accelerates. Such silages will also have reduced palatability.

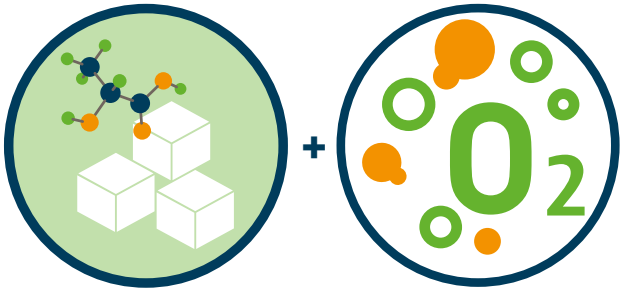
Example of aerobic spoilage

Aerobic spoilage - the process

Silage

Sugars & Lactic Acid

Oxygen + yeast & moulds



Aerobic spoilage: process

In the presence oxygen yeasts break down sugars and lactic acid in the silage, raising the ph. This in turn allows moulds to grow.

Heating Silage

CO2 + heat

DM losses

Consequences

The growth of yeasts and moulds generates heat and CO_2, resulting in high DM losses, reduced palatability and nutritional value, and increased mycotoxin risk.

What are the major influences on aerobic spoilage?

Ensiling

- Yeasts and moulds present at ensiling
- Several factors influence the exposure to air, including
  - Crop DM
  - Speed of filling
  - Compaction
  - Effective sealing

What are the major influences on aerobic spoilage?

Feedout

- Feedout rate and technique
- Silages with high yeasts at opening
- Silages high in sugars
- Silages fed in warm weather
- Aerated silages, eg mixed in TMR

How do we minimise aerobic spoilage?

Minimise spoilage from harvest to feed out:

Short chopping

Can improve compaction and exclude air

+

Ecocool inoculant to help with aerobic stability

Inhibits spoilage from micro-organisms

+

Good Sealing & Weighting

To exclude air

+

Good Clamp Management

Face management & Feed out techique

What is Ecocool?

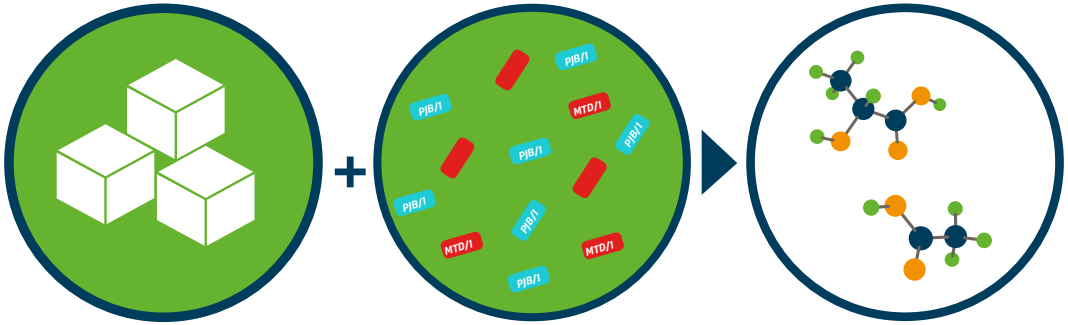
Specially formulated to control aerobic spoilage and fermentation.

- It provides two specially selected high-performance bacterial strains PJB/1 and MTD/1
- PJB/1 for aerobic stability: PJB/1 is a unique strain of *Lactobacillus buchneri*
- MTD/1 for fermentation: MTD/1 is a unique strain of *Lactobacillus plantarum*

How does Ecocool minimise aerobic spoilage?

- Ecocool contains *L. buchneri* which produces acetic acid.
- Acetic acid is very effective at reducing the levels of yeasts and moulds
- Reducing yeast levels leads to less heating and lower aerobic DM losses when exposed to air.
- Reduced mycotoxin risk

Ecocool mode of action



Natural plant sugars

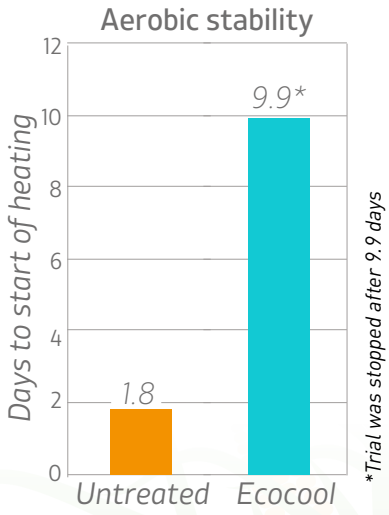
Ecocool's *L. buchneri* PJB/1

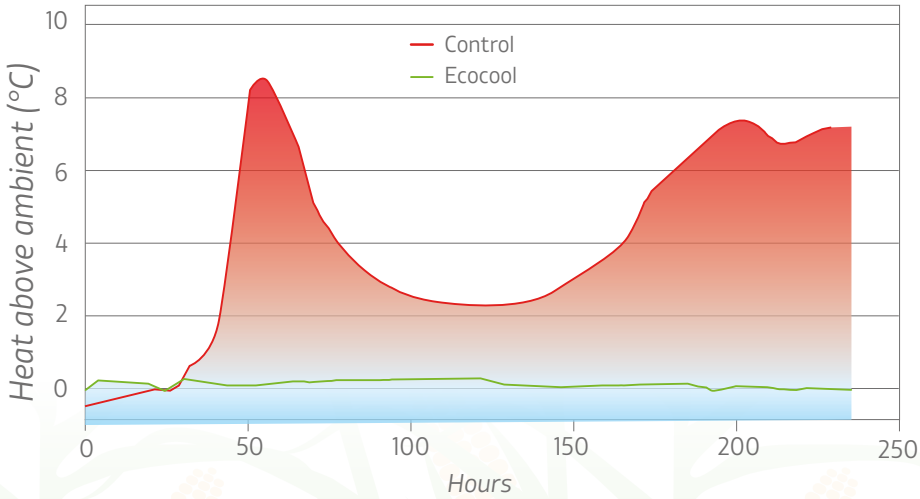
Lactic acid and Acetic acid

Acetic acid has stabilised the silage

PJB/1 for aerobic stability

Maize (37% DM)

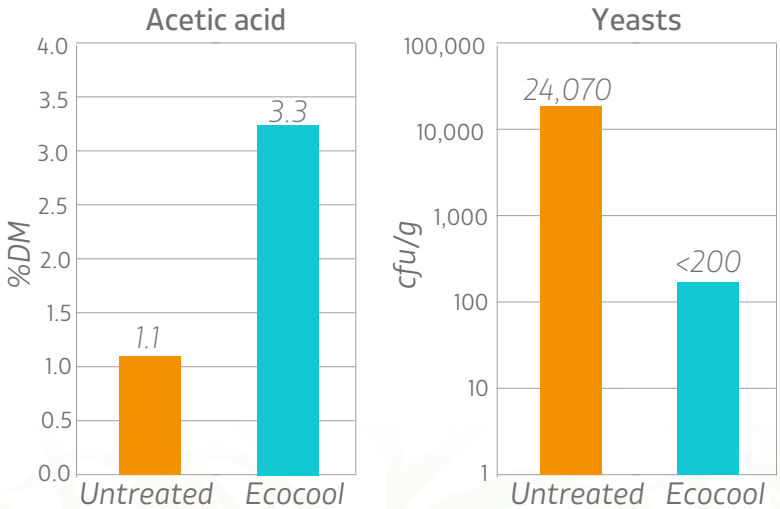




- The Ecocool treated silage remained completely stable throughout the trial*
- Ecocool significantly reduced heating relative to the untreated silage

Ecocool vs Untreated trial work

Maize (37% DM)



- *L. buchneri* in Ecocool generated more acetic acid than untreated silage
- The higher acetic acid levels in Ecocool silage reduced yeasts by more than 100 fold

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