The Newsletter for biogas generation – by Schaumann BioEnergy

BioEnergy News

# This year's dry maize is proving a challenge?

## The answer: BC.ZYM AL

Caused by the weather, 2018 has seen a range of unusual maize compositions in many regions with frequent high dry matter contents in addition to varied cob development. In feed analyses this is reflected as strongly elevated crude fibre contents which often present biogas plants with severe engineering obstacles. The light, dry maize displays high buoyancy which tends to result in floating layer formation. Also, mixing as well as organic breakdown are impeded. The digestate gets "thick".

### ESOM and swelling capacity act as indicators

High crude fibre contents (ADF/NDF, hemicellulose, cellulose) always come with a decrease of enzyme-soluble organic matter (ESOM) in the plant cell walls, i.e. the component of degradable carbohydrates that constitutes a feedstock's gas yield. Generally speaking: the higher the ESOM, the better degradable a feedstock will be.

ESOM of maize silages from the 2018 harvest lie significantly below the past years' average (fig. 1), which will likely lead to impeded degradation and a strong tendency to form floating layers in digesters.

Additionally, increased NDF-contents (Neutral Detergent Fibre) lead to reduced

**Fig. 1:** ESOM versus $DM_{total}$ in maize silages, harvests 2016 - 2017 - 2018

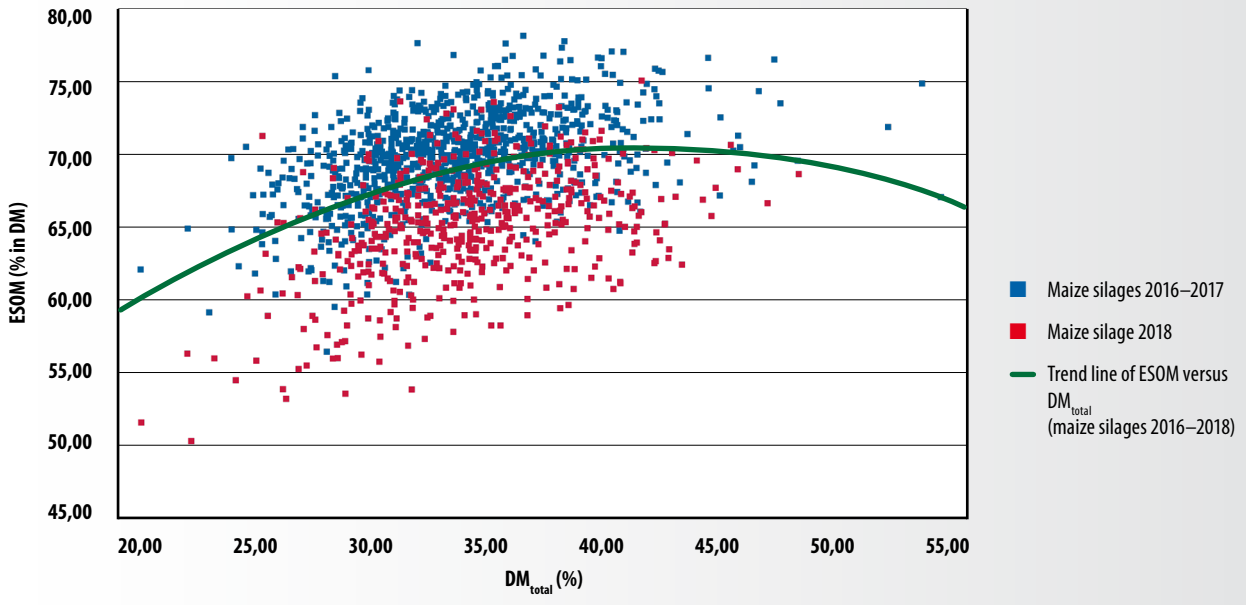
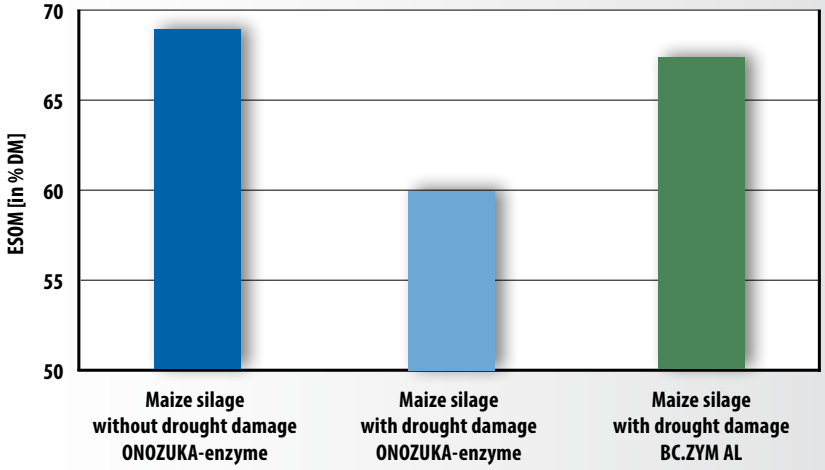


**Fig. 2:** Improvement of ESOM of drought-damaged maize silage by application of BC.ZYM AL




ONOZUKA-enzyme is a highly expensive and highly specialized analytical standard tool for determination of ESOM in animal feed.

swelling capacity of maize tissue, substantially interfering with its enzymatic breakdown. Drought stress, as seen this year, further reduces swelling capacity by collapsing micro-cavities in the plant tissue that were previously filled with water.

The facts mentioned above explain why this year's maize silages frequently impede entry and degradation of feedstocks in digesters: their high buoyancy tends to cause floating layers, high dry matter contents and associated mixing issues.

## Beating the benchmark

To counteract these problems, ISF Schaumann Research has developed the enzyme product BC.ZYM AL (Anti Layer) specifically targeting dry maize silages and their related issues.

In its effect, BC.ZYM AL outperforms even the benchmark enzyme-mix (ONOZUKA-enzyme) used in feed analysis to determine ESOM. Results from lab trials clearly show that BC.ZYM AL significantly improves enzymatic solubility of drought-damaged maize silage over the effect of ONOZUKA-enzyme.

Therefore, ESOM values no longer represent the maximum, but only the maximum under standard conditions. BC.ZYM AL has proved to beat the benchmark standard.

## BC.ZYM AL – a two-stage approach

Alongside essential, fibre-degrading enzyme complexes, BC.ZYM AL contains enzymes that specifically improve the swelling capacity of maize silages in the digester thereby reducing buoyancy and avoiding floating layer formation. Furthermore, the increased swelling of desiccated fibre accelerates organic degradation because enzymes require water to do their cleaving and provide bacteria-available carbohydrates as methane precursors.

In this way, BC.ZYM AL optimizes the degradation of fibre-rich maize silages in a targeted way and gets the most out of your feedstocks within the available retention time! Thereby, adverse effects due to this year's extreme weather will be alleviated substantially.

BC.ZYM AL is applied be applied in a two-stage approach. After a two-day initial phase with 200 g/m³ of BC.ZYM AL 1, follows a long-term secondary stage with daily dosing of BC.ZYM AL 2 at 5 g/m³. Dosing may vary slightly due to a site's individual feedstock composition. *Dr. Udo Hölker*

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