

Biological ensiling agent

SILASILENERGY®

The special biological ensiling agent range
for energy plants



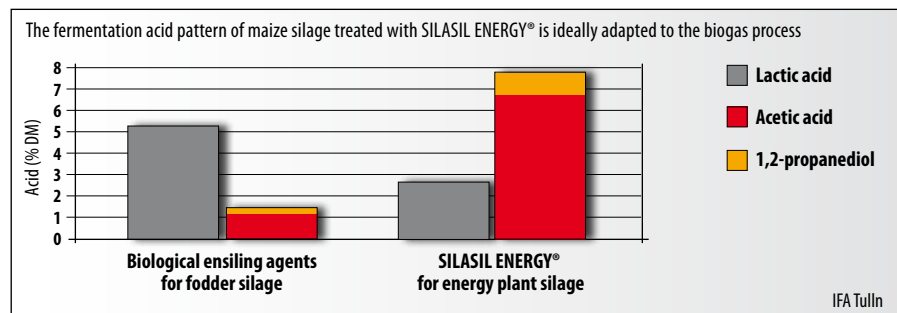
SCHAUMANN Biogas expertise
BIOENERGY



How SILASIL ENERGY® works

SILASIL ENERGY® acts through bacterial strains specially selected for biogas production and creates a specific fermentation acid pattern. Fast-acting homofermentative bacterial strains start off the fermentation process. After that, the heterofermentative

lactic acid bacterial strains act to promote acetic acid fermentation. The special fermentation acid pattern minimises energy losses in storage and increases the biogas yield per tonne of fresh matter or per hectare of useful area.



Area of use

SILASIL ENERGY® is the biological ensiling agent specially for high-carbohydrate energy plants:

Maize whole crop silage	28 – 40% DM
Maize grain products (e.g. CCM)	55 – 65% DM
Cereal WCS (as energy plant silage)	28 – 40% DM
Energy grass	30 – 45% DM
Sorghum	> 25% DM

Result

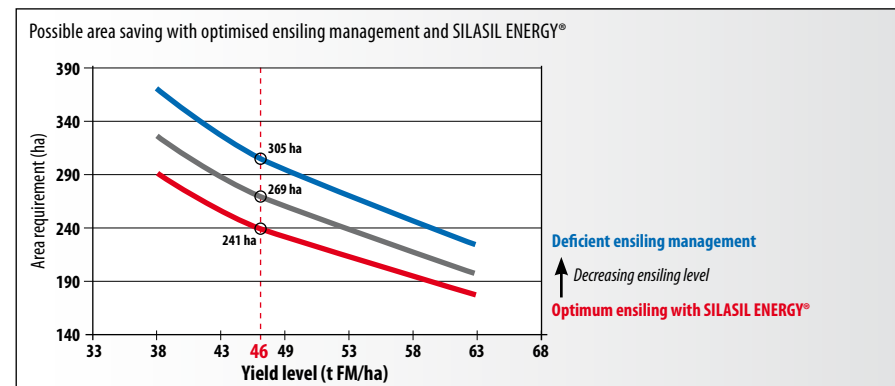
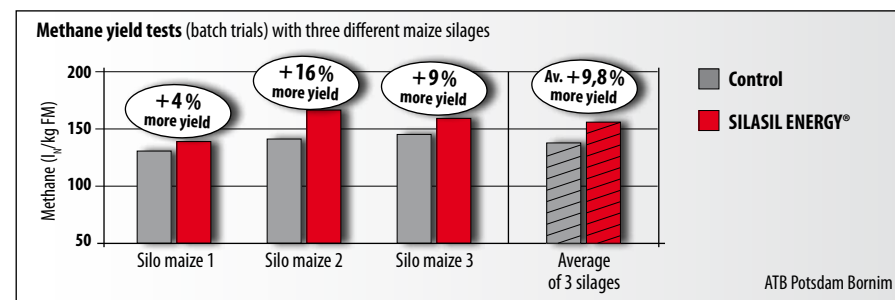
SILASIL ENERGY® controls the ensiling process with two perceptible effects:

Energy protection in the silo
The special fermentation acid pattern reduces the risk of aerobic instability, heating up, fungal infection and rotting in the silage, thus providing optimum protection for the energy and nutrients.

More energy in the fermenter
Silage treated with SILASIL ENERGY® is easier to hydrolyse. Biogas formation starts perceptibly earlier and biomass degradation to produce biogas is completed sooner.

Economic efficiency

Using SILASIL ENERGY® increases the area efficiency of the biogas plant. Because of the energy conservation and increased bioavailability of the substrate, the area requirement can be reduced with correct ensiling techniques and product metering.



Example of a biogas plant with 500 kW_{eI} installed capacity

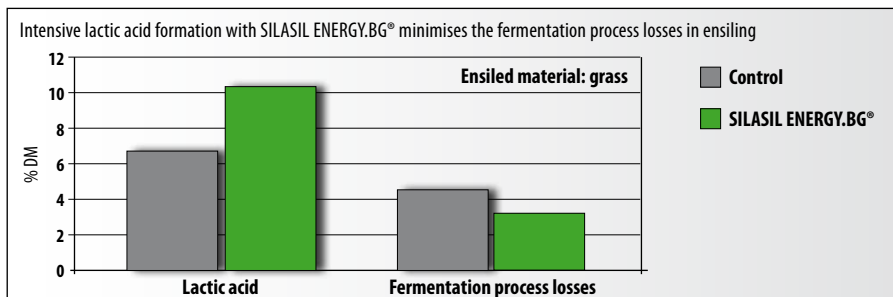
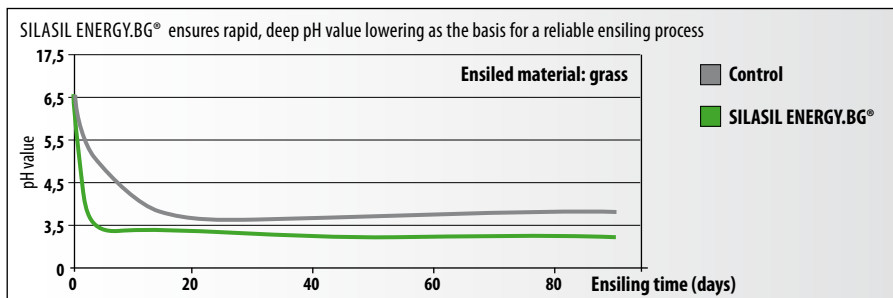
	Yield level		
	low	average	high
Yields per hectare t FM/ha	38	46	62
Area requirement [ha] 1,300 kW _{eI} / t DM (minimum losses with SILASIL ENERGY®)	292	241	177
Area requirement [ha] with defective ensiling management (15% losses)	326	269	198
Area saving [ha] Losses cut from 15% to 5%	34,3	28	20,8



How SILASIL ENERGY.BG® works

SILASIL ENERGY.BG® contains homofermentative lactic acid bacteria specially selected for biogas production to protect wet, high-protein, low-sugar energy plants.

The homofermentative fermentation acid pattern provides effective protection against energy losses through low pH values and a high lactic acid content.



Area of use

SILASIL ENERGY.BG® is the biological ensiling agent specially for wet, high-protein, low-sugar plants with 20-35% DM.

- Grass
- Clover-grass
- Green rye
- Alfalfa
- Intercrops

Result

■ Energy protection in the silo

The controlled inhibiting effect of SILASIL ENERGY.BG® on proteolytic and saccharolytic anaerobic fermentation pests protects the crop from energy losses and formation of toxic metabolites during the ensiling

phases. SILASIL ENERGY.BG® thus optimally conserves the energy from the storage process until use in the fermenter.



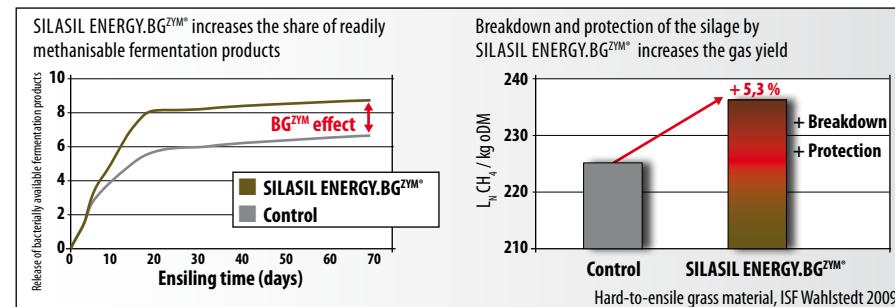
How SILASIL ENERGY.BG^{ZYM} works

The BG^{ZYM} enzyme system, comprising cellulases, xylanases, beta-glucanases, pectinases and acetate kinases, breaks down the fibre fraction. Highly effective lactic acid

bacteria straight away convert the sugar released by enzymatic action into acids and lower the pH value. This inhibits Clostridia contamination.

SILASIL ENERGY.BG^{ZYM}® for extra reliability

- Breaks down the hard-to-ferment fibre content and reserve carbohydrates
- More acids to rapidly lower the pH value
- Reduces Clostridia contamination
- Efficient substrate breakdown – increased gas yield



Area of use

SILASIL ENERGY.BG^{ZYM}® for high-fibre, hard-to-ensile, low-sugar plants with 30 – 40 % DM.

Grass and clover grass from landscape management schemes, surplus growth, late cuts high in raw fibre

Result

■ Breakdown

Enzymatic breakdown of the hard-to-ferment fibre fraction and the additional ensiling reliability increase the gas yield from the ensiled material.

■ Protection

Through the breakdown of fermentable carbohydrates and the resulting increased bacterial activity, the BG^{ZYM} effect protects even hard-to-ferment substrates from spoiling. Energy losses and the formation of toxic metabolites are reduced.

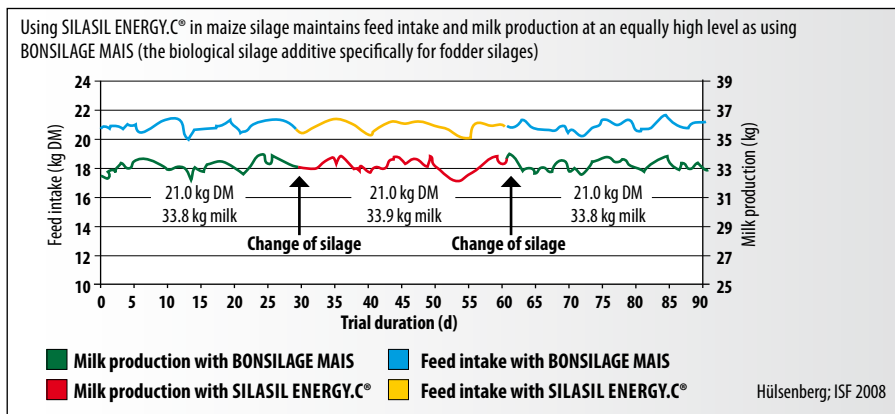


Combined use

SILASIL ENERGY.C® for biogas production and animal feed

SILASIL ENERGY.C®, the special combination of one heterofermentative and two homofermentative lactic acid bacterial strains, protects the silage from energy-consuming pests and promotes both ruminant feed intake and the fermenter biogas yield.

With its combination of bacterial strains that promotes feed intake SILASIL ENERGY.C® enables both the biogas plant and the herd to be supplied efficiently from a single batch of silage.



Area of use

SILASIL ENERGY.C® is a biological silage additive developed for high-carbohydrate ensiled material with 25 – 40 % DM for universal use in biogas production and animal feeding:

Silo maize | Cereal WCS | Sweet sorghum | Energy grass

Result

■ Protection against loss of energy and nutrient degradation

SILASIL ENERGY.C® protects against energy loss and nutrient degradation and breaks up the silage for high methane yields. Owing to the specifically adjusted fermentation acid pattern and the

'feed intake plus effect', silages treated with SILASIL ENERGY.C® are universally suitable for biogas generation and for animal feeding.



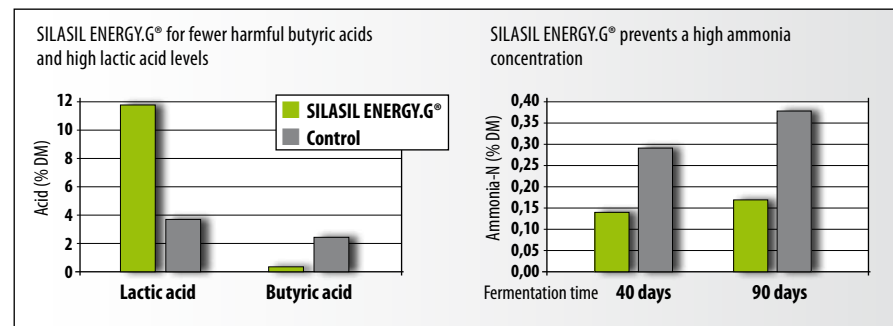
Combined use

SILASIL ENERGY.G® for biogas production and animal feed

SILASIL ENERGY.G® activates the protective mechanisms of the purely homofermentative lactic acid bacteria for high-protein, low-sugar plants with a high moisture content. Effective control of the pH value with a high lactic acid concentration gives the silage long-term protection against undesirable nutrient degradation.

SILASIL ENERGY.G® controls the ensiling process because its special lactic acid bacteria produce a specific fermentation acid pattern with a strong lactic acid emphasis. The substrate hygiene achieved is the basis of successful animal feeding and a smooth-running biogas process.

Ensiled grass	pH	Acetic acid	Lactic acid	Butyric acid	NH ₃ -N
Animal nutrition guide values	< 4.3	< 2.0	> 5.0	< 0.3	< 10
SILASIL ENERGY.G®	4.0	1.4	12.7	0.1	7.5



Area of use

SILASIL ENERGY.G® is the biological ensiling agent specially for wet, high-protein, low-sugar plants with 20 – 35 % DM for universal use in biogas production and animal feeding:

Grass | Clover-grass | Green rye | Alfalfa | Intercrops

Result

■ Energy protection in the silo

The special fermentation acid pattern reduces the risk of anaerobic instability due to Clostridia and the production of process inhibitors such as ammonia and endotoxins.

SILASIL ENERGY.G® thus optimally protects the energy and nutrients in the silage.



SILASIL ENERGY® – the first ensiling agent range for energy plants

- Controls the ensiling process
- Protects the ingredients
- Increases the methane yield

Recommended quantities for liquid application

SILASILENERGY®

2 g powder in 0.05 – 2.0 l water/t ensiled material, corresponds to min. 200,000 CFU/g ensiled material, container quantity for 100 t FM, for biogas production

SILASILENERGY^{BG}®

1 g powder in 0.05 – 2.0 l water/t ensiled material, corresponds to min. 200,000 CFU/g ensiled material, container quantity for 100 t FM, for biogas production

SILASILENERGY^{BG 24M}®

5 g powder in 0.05 – 2.0 l water/t ensiled material, corresponds to min. 200,000 CFU/g ensiled material, container quantity for 50 t FM, for biogas production

SILASILENERGY^F®

1 g powder in 0.05 – 2.0 l water/t ensiled material, corresponds to min. 200,000 CFU/g ensiled material, container quantity for 100 t FM, for biogas production and animal feed

SILASILENERGY^G®

1 g powder in 0.05 – 2.0 l water/t ensiled material, corresponds to min. 200,000 CFU/g ensiled material, container quantity for 100 t FM, for biogas production and animal feed

All products are suitable for ultra-precise metering.

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