Do we need biotechnology to secure sustainability?

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Important challenges for modern organic farming

- Nutrient efficiency and nitrogen losses to the environment.
- Low productivity low yields.
- Climate performance greenhouse gas emissions per produced unit.
- Over feeding protein to meet the need for essential amino acids.
- Low income poor working conditions.

- Hardly sustainable.
- Risk of losing consumer trust.





Biotechnology?



• Here used in a broad sense as technology, that can enhance the performance of organic agriculture.



Biogas in organic farming

- Retain nitrogen from manure and legumes during the winther.
- Safer import of nutrients from the cities (household waste)
- Better utilization of nitrogen quick ammonia uptake in the spring.
- Reduce methane losses from manure.
- Produce bio-energy possible future tractor fuel!



Bio-accidification of slurry in the stable

- Addition of sugar rich biomass to the slurry pit. (molasses)
- Keep pH in the slurry below 5.5 reduce the ammonia-emissions.
- Bio-accidified slurry is well suited to biogas production. Efficient N-utilization.



Source: JH Staldservice



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Green biorefinery – proteins from grass clover

- Replace imported soy proteins.
- Better amino acid composition than local seed legumes.
- Extracted from freshly harvested grass juice. Fermented with lactic acid bacteria, centrifuged and dried.
- Improved feed quality in the grass pulp as silage for cattle.
- Improved crop rotations with more clover grass (arable, poultry and pig farms)



Biogas from straw and undersown grass clover

- Straw has a high gas potential, but is difficult to use in biogas plants.
- Catch crops are unprofitable to harvest for gas production.
- Straw and catch crops after strip-harvest can be cut together into silage.
- Secure a large dry matter yield and a pretreatment of the straw.
- Good combination with grass for bio-refining.



Amino acid optimization

- Lysine, Methionine, and Threonine concentrate fermented from organic substrates.
- Combination of grass protein, mussel meal, and other products.
- Insect meal.
- Reduces the N-excretion and the physiological stress in the animals.





Other technical solutions

- Plastic roofs over apple and pear trees to protect against fruit scab.
- Weeding by robots in vegetable production.
- Robotic slurry spreaders for timely slurry application with low soil compaction.





Is it "organic" to use bio-technological solutions? Is it wise?

- Technological solutions are capital intensive.
- Difficult to apply on small farms.
- Will it undermine or improve consumer perception of organic farming?
- Could it also challenge the ban of GMOs?



Thank you for your attention



29. & 30. NOVEMBER VI SES PÅ COMWELL I KOLDING





