

Midterm review/health check

Experiences and development of OSB

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Health check....

- Better title in future:
 - Climate change influence on pesticide leakage from biobeds and other filling places
 - Energy savings from biobeds
 - Biobeds as a source for renewable bioenergy fuel for cars.....



Jean-Claude

Poul Henning

Torsten

Margot

Bruno

Paul

Steve

Pieter

Niels Henrik

Peter

Maria

Harald

Eskil

Bill

Photo: Jens Husby,
Bayer Crop Science



Filling, parking-places in Sweden

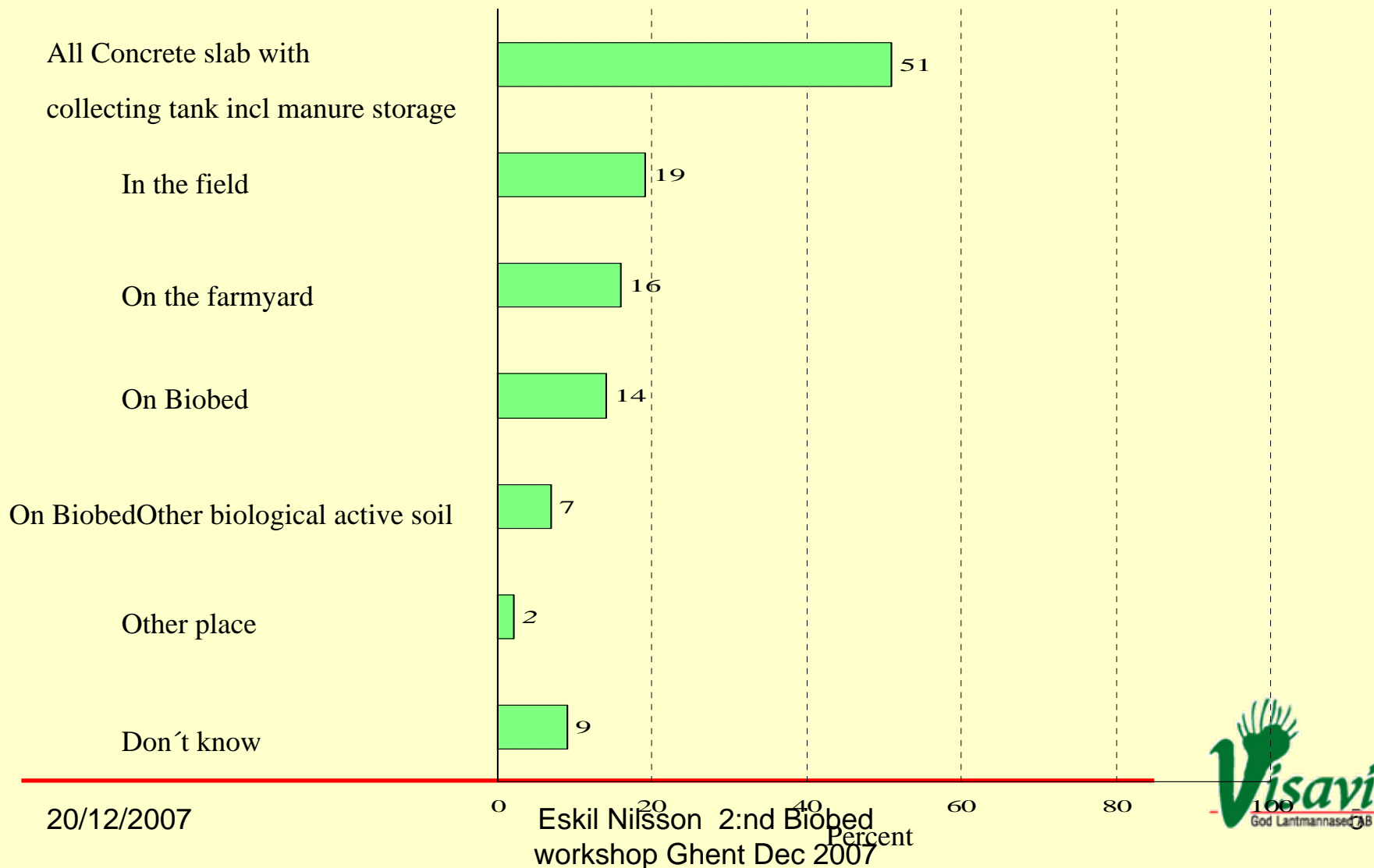
- Good places
 - Biological active ground
 - Field
 - On farm
- Safe(r) places
 - Concrete slab with collecting tank
 - Biobed
- Bad places
 - Farmyard
 - Other hard surfaces

Swedish Survey of use 2006

3300 farmers

Ca 50 % use PPP

Where do you fill the sprayer?



The project

- Fundings: The Swedish Board of Agriculture
Swedish Farmers' Foundation for Agricultural Research
Bayer Crop Sciences
Visavi
- Part 1. Study of 2 biobeds with collecting tank
 - 2 - ? seasons
 - Sampling of percolate
 - Clay layer: is there a difference
 - Natural
 - Artefact
 - Straw length

Partly parallell project by Odling i
Balans. Some cooperation

The project

- Part 2
 - Survey of OSB practically used on farms
 - Samples of biomixture
 - Samples of clay under biomix
 - Digging
 - Interviews

The project...

- Part 3 Lab studies
 - Straw length
 - Humidity
 - Grass varieties exudates
 -
 -
 -

Maria

The OSB in Dalby rebuild to lined 2005



20/12/2007

Photo: Jens Husby

Eskil Nilsson 2:nd Biobed
workshop Ghent Dec 2007

Dalby

Sampling 23 December 2005



20/12/2007

Photo: Visavi

Eskil Nilsson 2:nd Biobed
workshop Ghent Dec 2007

Analyses Results		Samples from Göran Ohlssons biobed in Sjötorp							
Sample 1	Water sample taken directly from the effluent tubing							03-Oct-05	
Sample 2	Water sample taken directly from the effluent tubing							05-nov-05	The well was empty
Sample 3	Water sample taken directly from the effluent tubing							03-dec-05	
Sample 4	Water from the surface of the filled well							23-dec-05	
Sample 5	Water from the surface after the well was emptied around 50%							23-dec-05	
Sample 6	Water and sediment from the bottom of the well when almost all water was pumped out							23-dec-05	The well was empty
	Water and sediment were pumped out with an aquarium sediment pump								
Active substance		Sample 1	Sample 2	Sample 3	Detection limit	Determination limit	Sample 4	Detection limit	Determination limit
	Units	03-Oct-05	05-nov-05	03-dec-05	µg/l	µg/l	23-dec-05	µg/l	µg/l
Diquat dibromide		na	na	na			na		
Clethodim		na	na	na			na		
Prothioconazole		na	na	na			na		
Tau-fluvalinate		na	na	na			na		
Bentazon	µg/l	20	1	0,5	0,02	0,1	0,8	0,04	0,1
Fluroxypyr	µg/l	0,8	nd	nd	0,02	0,1	nd	0,05	
Clopyralid	µg/l	1,5	0,2	nd	0,1	0,2	traces	0,07	0,2
Quinmerac	µg/l	nd	nd	nd	0,1		nd	0,06	
MCPA	µg/l	nd	nd	nd	0,2		nd	0,1	
Mecoprop *	µg/l	0,1	nd	nd	0,02	0,1			
Glyphosate	µg/l	2,3	0,12	0,11			0,3	0,02	0,05
AMPA	µg/l	1,2	0,72	0,5			2	0,3	
Amidosulfuron	µg/l	0,8	0,1	traces	0,06	0,1	traces	0,06	0,2
sodium	µg/l	nd	nd	nd	0,06		nd	0,06	
sodium	µg/l	nd	nd	nd	0,06		nd	0,06	
Metsulfuron-methyl	µg/l	0,2	nd	nd	0,1	0,2	nd	0,1	
Sulfosulfuron	µg/l	nd	nd	nd	0,06		nd	0,06	
Tribenuron-methyl	µg/l	nd	nd	nd	0,05		nd	0,06	
Azoxystrobin	µg/l	nd	nd	nd	0,08		nd	0,03	
Diflufenican	µg/l	traces	nd	nd	0,01	0,02	traces	0,005	0,02
Esfenvalerat	µg/l	nd	nd	nd	0,005		nd	0,05	
Fenitrothion	µg/l	nd	nd	nd	0,02		nd	0,02	
Fenpropimorph	µg/l	nd	nd	nd	0,01		nd	0,01	
Flurtamone	µg/l	nd	nd	nd	0,08		nd	0,05	
Metazachlor	µg/l	traces	nd	nd	0,03	0,2	nd	0,02	
Propiconazole	µg/l	traces	nd	nd	0,04	0,2	nd	0,05	
Prosulfocarb	µg/l	nd	nd	nd	0,01		nd	0,02	
Pyraclostrobin	µg/l	nd	nd	nd	0,3		nd	0,1	
na: not analyzed		nd: not detected		* Was not used on the biobed. Where is it coming from?					

Comments to 1:st results

- Why Glyphosate when there is a clay layer???
- Why substanses that are not used?
 - metribuzine, mecoprop, bromoxynile, atrazine, terbutylazine, imazapyr??
- Residues in clay, straw?
- Caused by plastic foil, tube?

- Sampling methods?
- Laboratory error?

Building of the biobed

12 april 2006
like farmers do but little more



6000 €

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The biobed



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Some Results

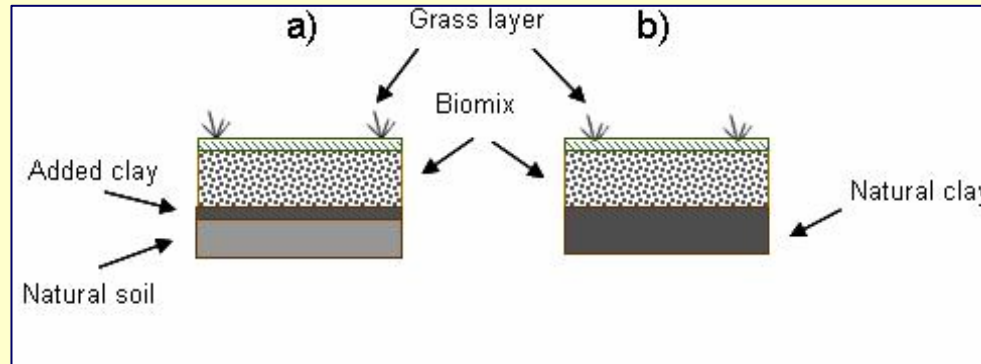
- The OSB mixture:
 - 50 % chopped straw, winter wheat
 - 25 % peat
 - 25 % top-soil, no clay
 - Inoculated by old mixture
- Clay, granuled, clean.
- April- July no rain
 - Irrigated
- August > 200 mm
- Samples when tank is full
- 1:st samples 11 July

- 1:st samplings
- Everything used was found + some extra
- 29 a.i.
- Glyphosate!!
- Benazoline
 - Used on the farm in 2000
- Others not in analysis?

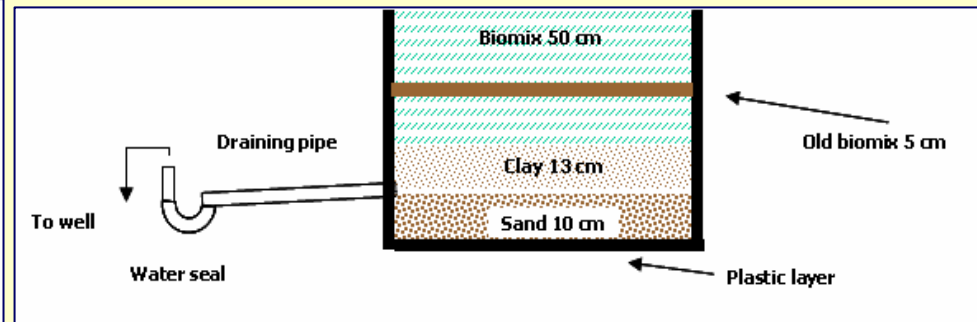
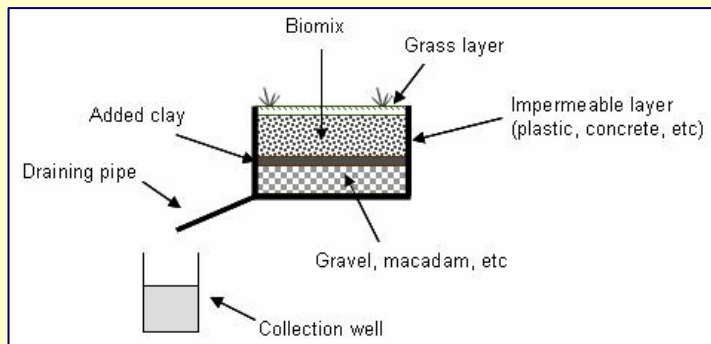
Results and Comments

- Lower values in later samples
- Young biobeds leak PPP
- Clay layer is a problem to solve
 - Layer under can drain and cause cracks
 - How is it practise?
- Design of outlet from lined biobeds needs more knowledge
- Grasses are very different
 - Varieties
 - Method for establishing

Unlined biobeds with a) natural clay layer and b) artificial added clay layer



Lined biobeds with drain to tank



The project part 2

- Survey of OSB practically used on farms
- Samples of biomixture
- Samples of clay under biomix
- Digging through mixture
- Interviews

Survey of on-farm biobeds



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Mixture



Phanerochaete chrysosporium
White rot fungi

Lignocellulosic material - Straw



- Phenoloxidasases – transform toxic compounds
 - Peroxidases (eg manganese and and lignin peroxidases
 - Polyphenoloxidasases (eg laccases)

Layers



Some results

- Biobeds are not always built according to guidelines
 - Layers instead of mixture
 - Straw not chopped
 - Topsoil with clay
- Biobeds can be used for other purposes – clean fertilise spreaders etc.....
- Wrong components used
 - Horse manure, onion peels
- Dead grass oftn not renewed (higer concentrations in areas)

Conclusions

- Biobed is still cheap, robust tool to improve farm situations
- NOT a bioremediation plant!!
- Unlined biobeds may leak
- Fresh biobeds leak
 - Build after spraying season !
- Layer under clay may drain and cause cracks in clay
- Maintenance is important:
 - Refill chopped straw
 - New mixture (5-8 years)

- Biobed is part of system
 - Filling and parking place
 - Field cleaning of sprayer
 - Some cleaning on biobed
 - Size for sprayer and tractor +> 1m
- Lined biobeds
 - Drained water can be spread on biological active soil
 - Recirculated?

Farmers advice

- Level 1: Filling on biologic active soil
 - On farm
 - In field
- Level 2: Unlined biobed "normal amounts"
- Level 3: Lined biobed
 - Contractors
 - Bigger farms
 - Intensive use: vegetables, orchards, green-houses
 - Areas with high rainfall

Biobeds is spreading.....



- Projects with developing countries and
- Demo-farms with biobeds in Baltic projects
 - Estonia
 - Latvia
 - Lithuania
 - Kaliningrad
 - Poland
 - S:t Petersburg and other Russian oblasts

Local projects in

Asia

South and Latin America

Africa

Wishes for future...

- Maria

- Straw length
- Different straws, wheat, barley...
- Grass layer
 - Varieties – exudates
- Increased degradation
- Combine fungi and bacteria (pH etc ?)
-

- Eskil

- Simple understandable advises
- When lined – unlined ?
- Chopped straw – according to farmers practise or...?
- Straw varieties
 - Possible with different advises on volume for mixture
- All grasses are OK?
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Thank you for your kind attention
and patience

Special greetings and best
wishes to Maria