

Paludicultures – is it really worth it?

Ilze Ozola



LAKE AND PEATLAND RESEARCH CENTER

Before we start, I have 2 questions
😊

Mentimeter, please!

What is paludiculture?

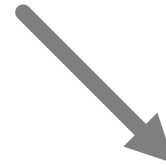
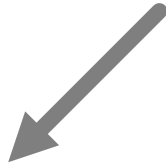
„*palus*“ - swamp + „*cultura*“ - cultivation

→ **productive use of wet and rewetted peatlands**

Objectives

- Production → agricultural or silvicultural utilisation
- Maintain peat → stop subsidence and soil degradation
→ reduce GHG emissions
- Optional → peat formation; other ecosystem services

Paludiculture



Bogs

- Peatmoss
- Sundew

Fens

- Reed
- Cattail
- Sedges
- Reed carnary grass
- Alder
- Willow
- Medicinal plants

Paludiculture on bogs

- Sundew



- Peatmoss



Paludiculture on fens

Reed

- Cattail
- Sedges
- Reed carnary grass
- Alder
- Willow
- Medicinal plants



Paludiculture on fens

- **Cattail, bullrush**



Paludiculture on fens

Sedges

- a) Energy: biogas, combustion
- b) Fodder: low feeding value (e.g. horses)
- c) Bedding material



Paludiculture on fens

Reed carnary grass

- a) Energy: biogas, combustion
- b) Fodder: low feeding value (e.g. horses)
- c) Bedding material
- d) Construction materials



Paludiculture on fens

Alder



Grazing: Water buffaloes

- In Germany: ca. 20 years, in the NE ca. 10 years
- NE (2015): > 1000 water buffaloes / ca. 30 farms



LET'S TAKE A LOOK CLOSER

- Due to the time limit – only on Sphagnum moss and cattail or bullrush.

Sphagnum moss fields

Moorkultur Ramsloh GmbH & Co



Aerial View of the peatland Hankausen

- *Sphagnum* productivity is high with a dry mass of around **8.7 t ha⁻¹ yr⁻¹**
- Fields established in 2011, first mechanical harvest in 2016.
- Two third of the upper *Sphagnum* mosses were cut as former experiences showed that residual *Sphagnum* stems left regenerate fast.
- The material was directly spread to newly prepared fields to enlarge the cultivation area to 14 ha.

• Cost estimation from Germany

Establishing *Sphagnum* cultures on bog grassland, cut-over bogs, and floating mats: procedures, costs and area potential in Germany S. Wichmann, A. Prager and G. Gaudig

http://mires-and-peat.net/media/map20/map_20_03.pdf

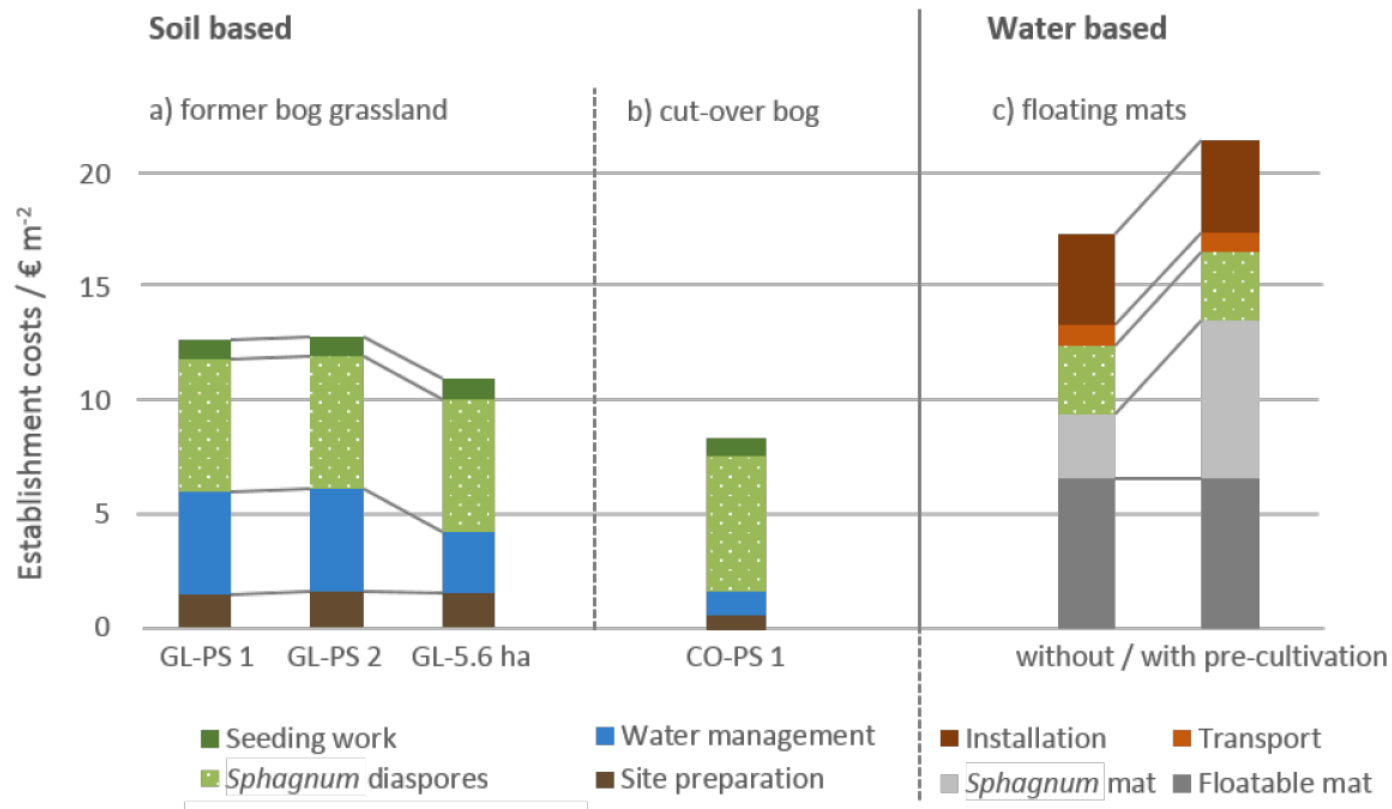


Figure 6. Establishment costs *per* net production area (€ m⁻²), from left to right: a) on bog grassland for GL-PS 1, GL-PS 2, and with proportionate investment costs for automatic water management reduced by considering the area enlargement from 2 ha to 5.6 ha moss production in 2016 (third column); b) on cut-over bog for a fictional site CO-PS 1 with assumed water supply by wind pump and mobile pump; c) on floating mats without (left column) and with (right column) pre-cultivation of *Sphagnum* mats.

Table 4. Labour, machinery and investment costs of establishing *Sphagnum* cultures on a cut-over bog after milled peat extraction, at a fictional site (CO-PS 1) in Lower Saxony, Germany.

		CO-PS 1	
Net production area (m ²)		20,000	
Site preparation			
Pegging and levelling	€	1500	1
Smoothing and poldering	€	3840	2
Shaping and compacting causeways	€	2880	3
Irrigation ditches along the causeways	€	1360	4
Irrigation ditches in the field	€	2550	5
Water outlet	€	350	6
Total	€	12,480	
<i>Proportionate costs per partial area</i>	<i>€ m⁻²</i>	<i>0.62</i>	
Water management			
Wind pump (basic supply)	€	15,000	7
Mobile pump (demand peaks)	€	5000	8
Total	€	20,000	
<i>Proportionate costs per partial area</i>	<i>€ m⁻²</i>	<i>1.00</i>	
Seeding work			
<i>Sphagnum</i> diaspores	€	118,500	9
Straw	€	500	10
Loading, storage and chopping	€	2726	10
Transport to the field, loading, supporting work	€	9705	10
Spreading with adapted snow-groomer	€	3034	10
Total	€	134,465	
<i>Proportionate costs per partial area</i>	<i>€ m⁻²</i>	<i>6.72</i>	
Overall establishment costs	€ m⁻²	8.35	
Overall establishment costs (without moss)	€ m⁻²	2.42	

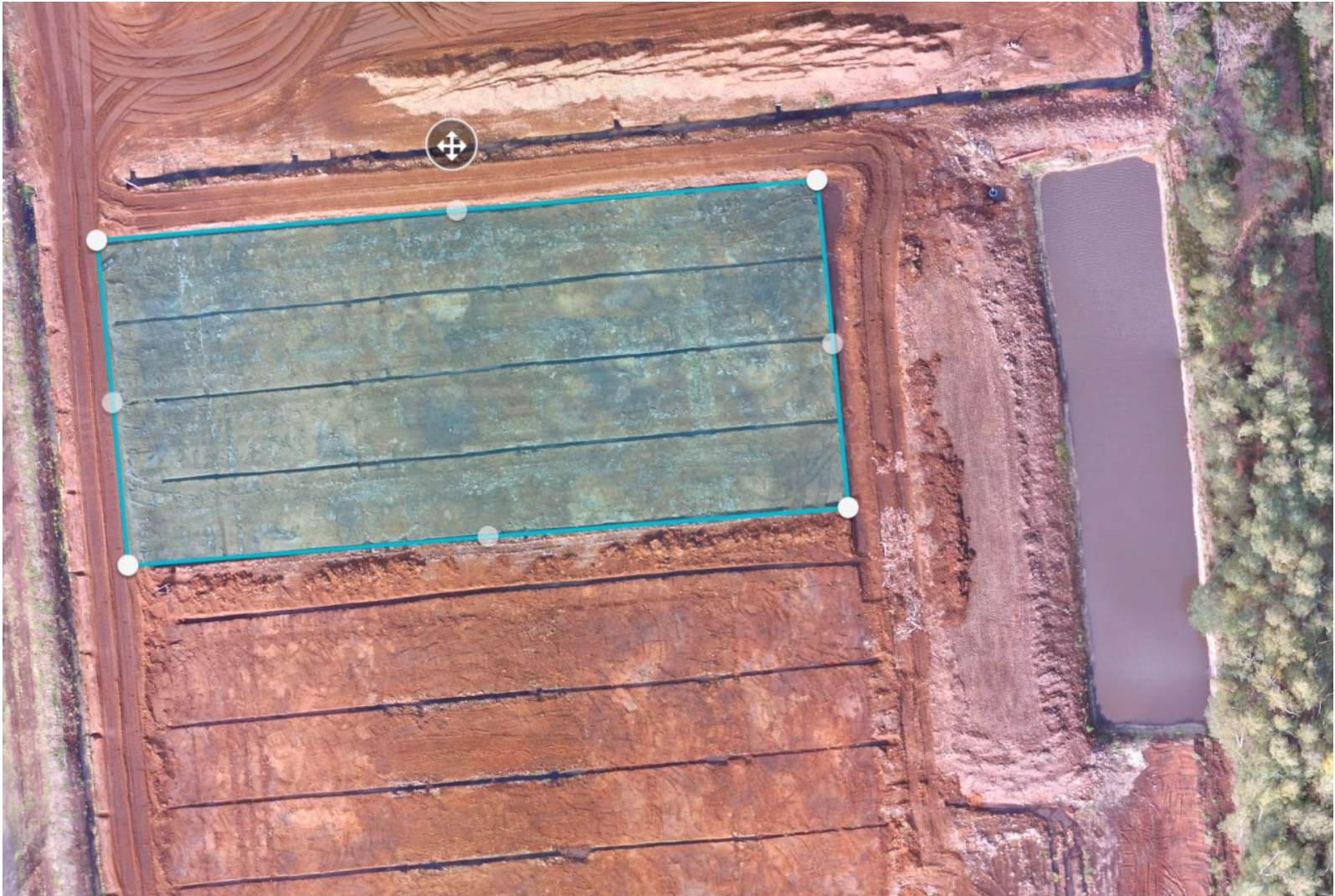
Sphagnum moss substrate



1 m³ Sphagnum moss substrate = 150 eur

Sphagnum field trials in Klasmann-Deilmann Latvia

- 0,35 ha covered with Sphagnum two days ago.
- Costs 0.8 - 1 euro/m²









A new super plant!



- Clean waters – remove 600 kg N/ha and 80 kg P/ha per year
- marketable products + high demand,
- fodder for dairy cows,
- isolation and construction material,
- for biogas,
- pollen for predatory mites living on tomatoes,
- installation costs can be different – from 0 euro – to 120 000 euro for less than 1 ha,
- To isolate 3 stand farm house – 15 t DM,
- To make 10 cm thick 1 m² plate = 90 m³ DM
- Processing 200 – 600 euro.
- 1 kg = 1.3 euro,
www.wetlandproducts.com
www.typhatechnik.com
www.naporo.com

More info

Commercial viability of paludiculture: A comparison of harvesting reeds for biogas production, direct combustion, and thatching.

S.Wichmann

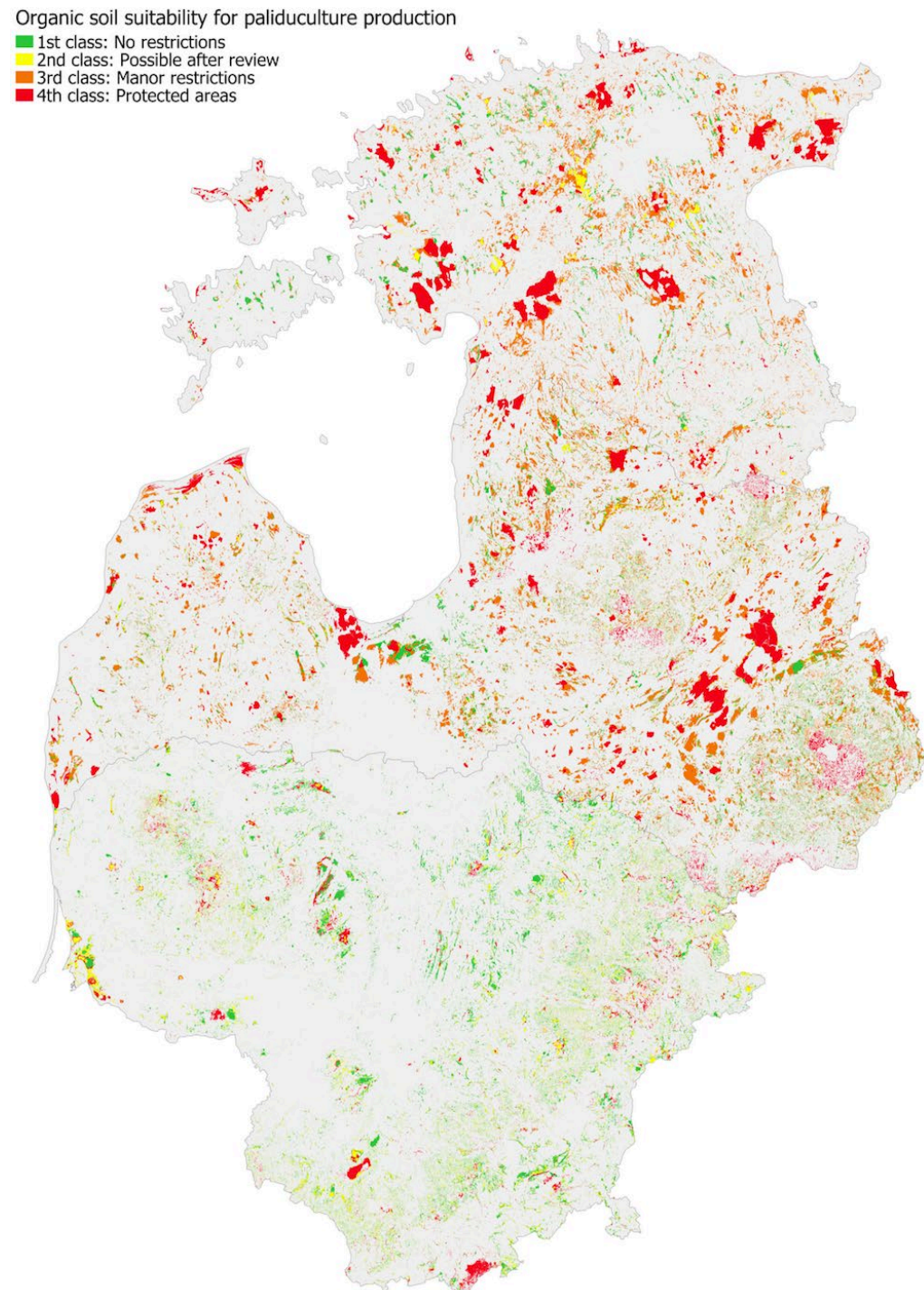
Establishing *Sphagnum* cultures on bog grassland, cut-over bogs, and floating mats: procedures, costs and area potential in Germany

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There is already a lot of research going on on paludiculture topic, if you are interested, please ask!

Potential areas for paludicultures in Baltics

- First result of project “Paludicultures in Baltic states”.



So – is it worth it?

- My personal opinion – YES!
- “Cost accounting clearly showed that there is not only one valid answer whether paludiculture is profitable. Decision makers (e.g. farmers, site managers, politicians) require precise figures, but with current knowledge, point estimates of profitability are easily miscalculated, and deterministic accounting using fixed values is restricted to specific cases”.