

# Sphagnum growing

## Experiences of Klasmann-Deilmann

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Practical workshop. INTRODUCTION OF SPHAGNUM AND OTHER RAISED BOG PLANTS: ONE OF METHODS FOR RECULTIVATION OF CUT-OVER PEAT QUARRIES. Experience of Lithuania and foreign countries

November 11, 2021

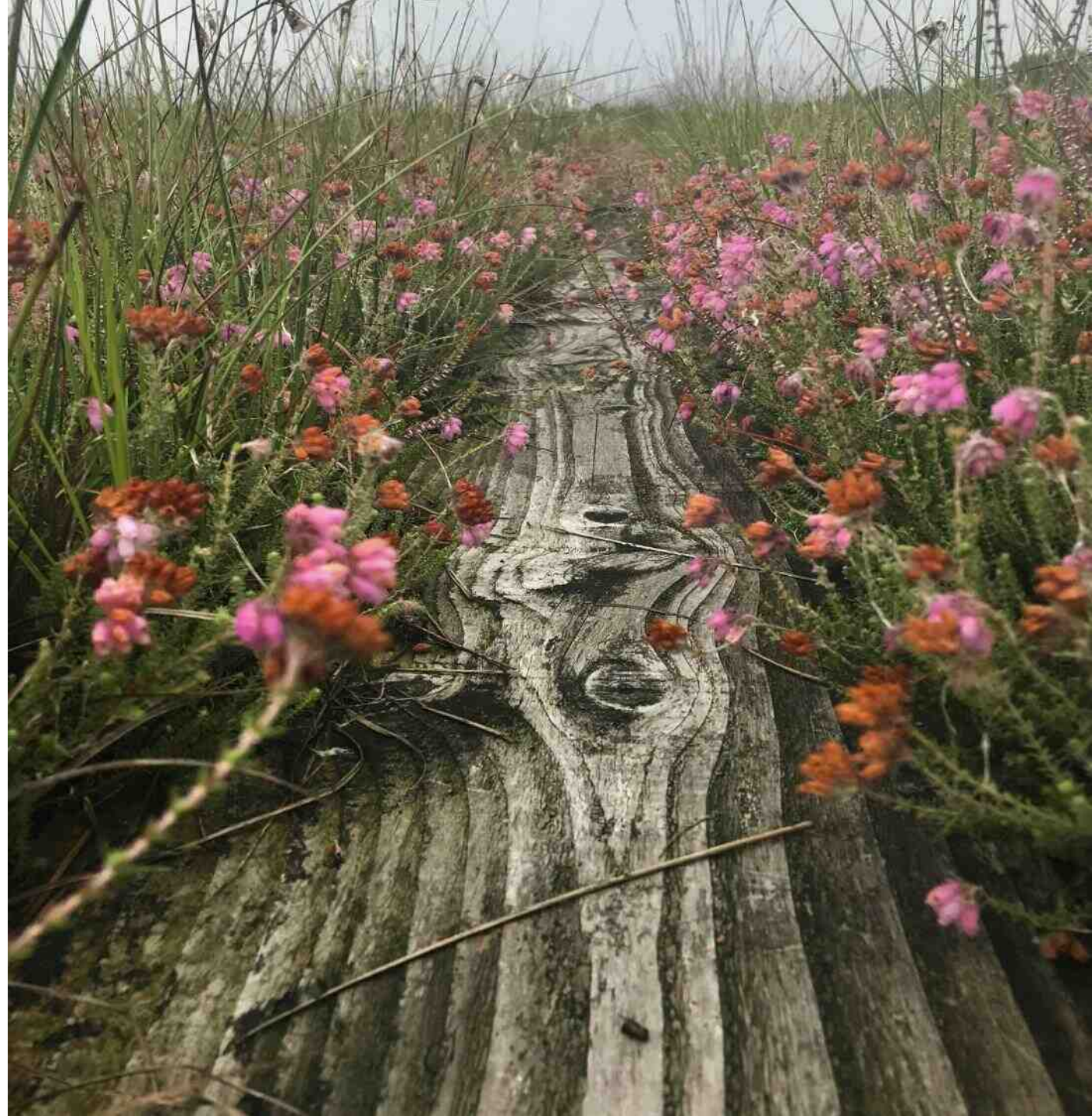


*we make it grow*



# Agenda

1. Peatland restoration
2. Latvia: Rakis
3. Lithuania: Aukstumala
4. Germany: Provinzialmoor & Drenth



# 1. Peatland restoration



# 1. Condition of peatlands in Germany and the Baltic States

	Estonia	Latvia	Lithuania	Germany
Total peatlands (km <sup>2</sup> )	9.150	9.232	6.460	12.800
Intact peatlands (km <sup>2</sup> )	3.250	3.165	1.781	250
Degraded peatland (km <sup>2</sup> )	<b>5.900</b>	<b>6.066</b>	<b>4.679</b>	<b>12.550</b>
Restorated peatland (km <sup>2</sup> )	2,5	10	69	250
Total Extraction (km <sup>2</sup> )	312	484	248	330
Active extraction (km <sup>2</sup> )	199	244	130	90
Inactive extraction (km <sup>2</sup> )	112	240	118	210

*(Peters, von Unger, & Peters Moritz von Unger, 2017)*

# 1. Classic raised bog restoration after peat cutting



**Too wet (high methane emissions)**

Mostly:

- Flooded raised bog restoration area

**4-15 t CO<sub>2</sub>e./ha/a**



**Too dry (carbon dioxide emissions)**

E.g.:

- Drier pipegrass peatland stage
- Broom heath high bog degeneration stage
- Other bog degeneration stage

**6-12 t CO<sub>2</sub>e./ha/a**



**± optimal (sources and sinks in balance)**

E.g.:

- Near-natural high marsh
- Cotton grass-peat moss-fluctuating grassland
- Peat moss lawn with beaked reed vegetation

**0 t CO<sub>2</sub>e./ha/a**

# 1. Klasmann-Deilmann experience in peatland restoration



## Sphagnum mosses in Rakis, Latvia

- Private project (area 1 ha)
- Collaboration with „Lake and Peatland Research Centre”
- New forestry sites, natural peat field with a path-way, berries cultivation



## Aukstumala Bog, Lithuania

- LIFE Peat Restore (2016-2021)
- Sphagnum mosses planting with the „Lithuanian Fund for Nature“ (area 2 ha)



## Provinzialmoor, Germany

- More than 4,000 ha of bogland has been restored so far in Germany by KD
- Broad experience in bog restoration

## 2. Latvia: Rakis



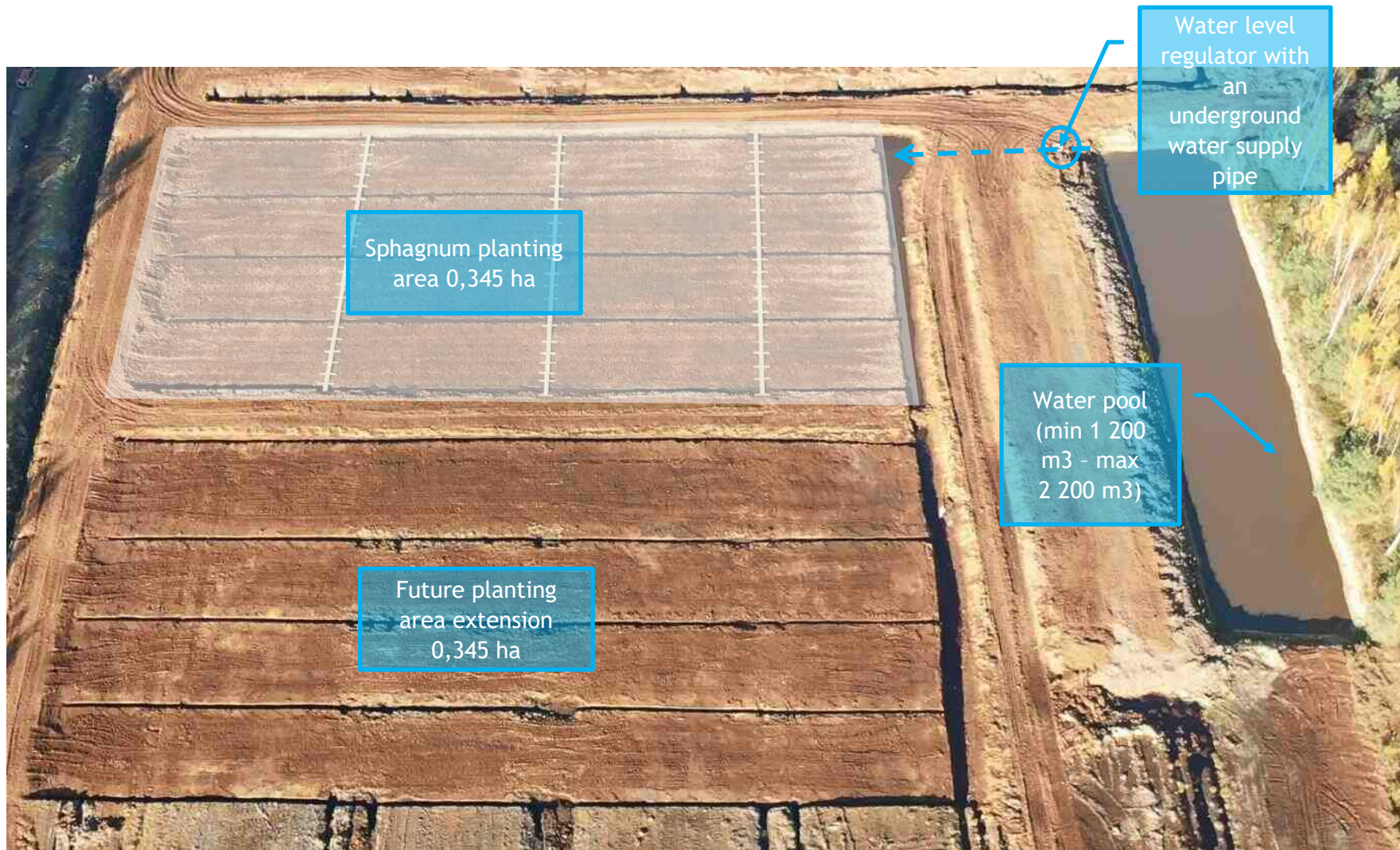
## 2. Project cultivation sites (I)

- Main objective
  - Rewetted bog area with recovering measures as possible close to the natural conditions
  - Successfully planted and grown Sphagnum
- Project area: 0,68 ha → 2,72 ha
- Projekt time 4 years: 2018 to 2021
- Involved parties:
  - SIA Klasmann-Deilmann Latvia
  - Lakes and Mires Research Center, Ilze Ozola





## 2. Project cultivation sites (II)



## 2. Project implementation

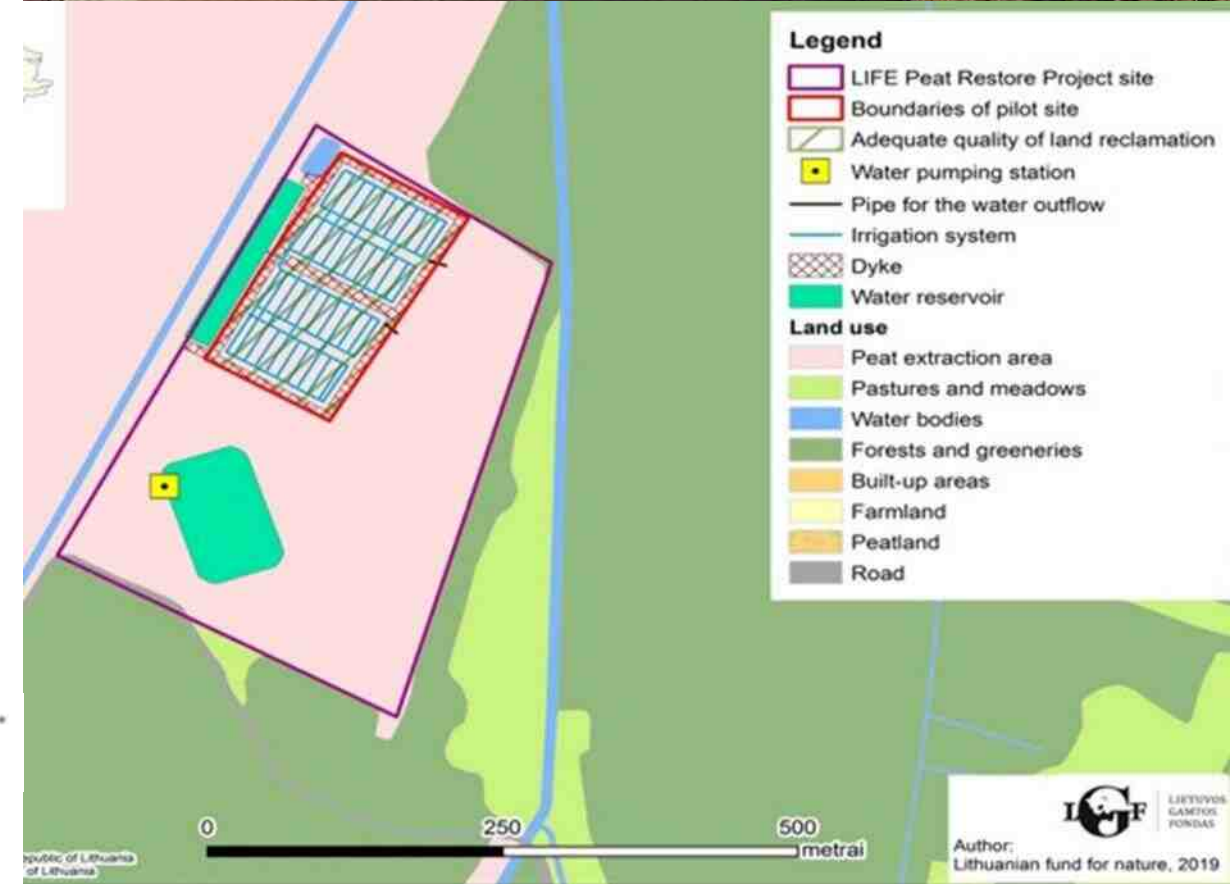


### 3. Lithuania: Aukstumala



### 3. Project cultivation sites

- 3 *Sphagnum* restoration sites
- KD set them up together with the Lithuanian Fund for Nature
- Main objective „restore and maintain the favourable conservation status of the "7110 Active Raised bog" habitat“
- First trials already in 2011
- Problem
  - Impact of existing drainage ditches
  - Changed hydrological regime causes degradation of peat layer



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### 3. Project implementation 2011-2016



### 3. Project implementation 2019



## 4. Germany: Provinzialmoor & Drenth





## 4. Our research on Sphagnum farming & Sphagnum restoration in Germany

### Active introduction of peat mosses

- Research projects 2015-2021 on the cultivation of peat mosses and the potential for climate protection and biodiversity
- 5 ha moss area created after peat cutting (black peat)
- Scientific research on biodiversity, greenhouse gas emissions and economy
- Various Sphagnum species e.g.
  - *S. papillosum*
  - *S. magellanicum*
  - *S. palustre*





## 4. Project implementation



## 4. Established cultivation sites



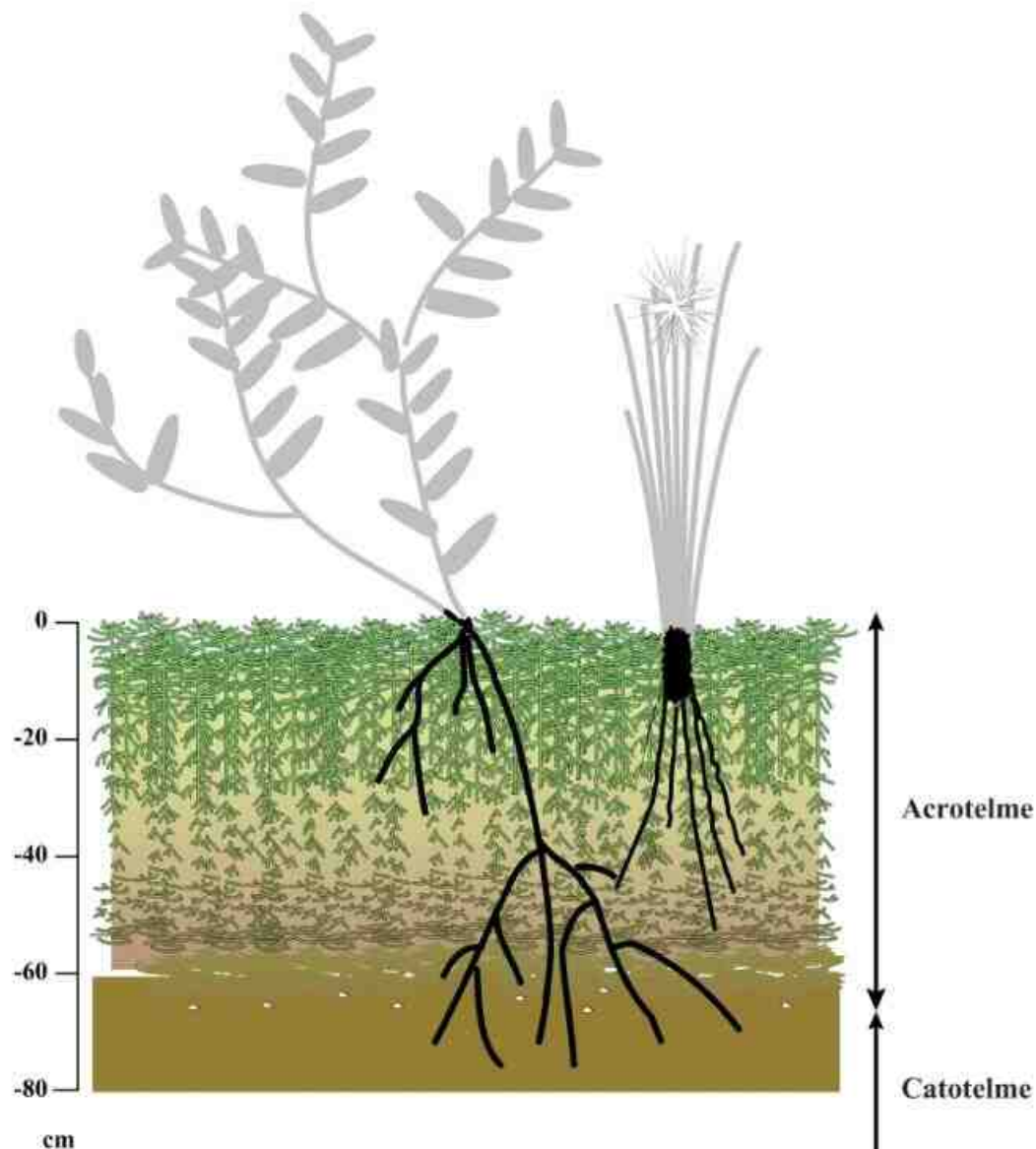
## 4. Results: Climate

### Increasing the carbon sink (Acrotelm)

- Growing Sphagnum mosses binds carbon and sequester parts
- Our peat moss areas sequester up to. 2 t CO<sub>2</sub>e/ha/year

### Securing the carbon sink (Catotelm)

- Waterlogging stops oxidation in the long -term
- A 1m thick peat layer stores 1,800 t CO<sub>2</sub>e per hectare
- This corresponds to 9 t CO<sub>2</sub>e per hectare and year with a decomposition time of 200 years
- The intensity of decomposition depends largely on the use and depth of drainage





## 4. Results: Biodiversity

### Flora

- Up to eight different sphagnum species
- 50 other plant species
  - 20 species on the red list

### Fauna

- Insect as well as spider species can be transmitted through inoculation material
- Potential habitats for species, e.g.:
  - Hunting area for amphibians
  - Breeding area for ground-nesting birds and dragonflies
  - Nectar plants for butterflies



## 4. Results: Growing media

- 350-600 wild weeds per m<sup>2</sup> (Phragmites, Juncus, Calluna, etc.)
- Hygienisation via damping-off required
- Diameter and fresh mass similar to white peat
- Very similar properties to white peat (pH, N immobilisation, nitrogen, potassium, phosphate)
- But, slow growth of Sphagnum and competition with agriculture use -> not economical

### Conclusion

Qualitatively very well suited as a peat substitute in growing media!



## Conclusion

- Peat mosses are rare and protected in Germany
- Propagation is currently only carried out on small experimental sites, but
  - they are the key for the successful restoration of raised bogs
  - offers, if economical, a high-quality substrate feedstock
- Peat mosses can
  - make a significant contribution to climate protection and biodiversity in raised bog restoration
  - and potentially become a high-quality peat substitute



## What we do...

- Advice on project development and application
- Own Implementation of restoration projects
- Advice on project implementation
- Provision of peat moss for restoration
- Improve GHG calculation and CO<sub>2</sub>-certificates
- Research on peatmoss restoration and improvement of water management



<https://klasmann-deilmann.com/en/competencies/innovation/sphagnum/>

# Thank you for your attention!

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