

# Optimising Sphagnum farming in water management, climate impact, biodiversity & product development - the new joint project OptiMOOS

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The Hankhauser Moor (NW Germany) is mainly used as bog grassland. In 2010 we started to convert parts into a Sphagnum farming site, which is meanwhile 17 ha in size. This enables intensive long-term and large-scale research. High biomass yields show that Sphagnum farming is feasible. Additionally, ecosystem services has been improved: reduction of greenhouse gas emissions, water and nutrient retention, local cooling, increase of biodiversity. Still there is a potential of optimisation.

**Optimising water quality:** *Sphagnum* biomass production is very high, but other than target *Sphagnum* species were promoted due to nutrient-rich site conditions with the irrigation water as a major source for P and K. Filter basins (ca. 30 cm flooded), planted with cattail and reed, aim at the reduction of nutrient concentrations in the water before irrigating *Sphagnum*. Its impact on *Sphagnum* species composition is being investigated. In climate chamber trails optimal NPK ratios and levels for best growth of different *Sphagnum* target species will be determined.

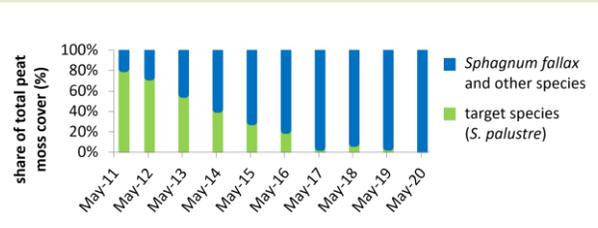


Fig. Development of target and other *Sphagnum* species at the Sphagnum farming site in the Hankhauser Moor, 2011-2020

**Developing substrates from paludiculture biomass:** Beside *Sphagnum*, also cattail and reed are suitable raw materials for horticultural substrates. Preferably, a 100% paludi-substrate will be developed within the project.

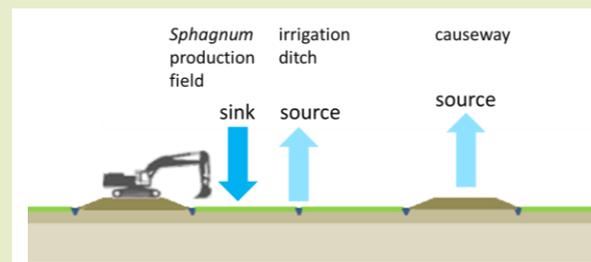


Fig. GHG sink and sources at the Sphagnum farming site

**Reducing greenhouse gas emissions:** The whole Sphagnum farming site emit  $\sim 2.5 \text{ t CO}_{2e} \text{ ha}^{-1} \text{ yr}^{-1}$  with removed topsoil (deposit as causeways) and ditches as GHG sources. There is a potential to further reduce GHG emissions from the Sphagnum farming site.

In the project we investigate *Sphagnum* growth and GHG emissions for:

1. Minimising topsoil removal: test of 0, 10 and 30 cm topsoil removal and a mixture of *Sphagnum* species applied as founder material to meet micro-relief differences.
2. Minimising proportion of ditches and causeways: test of different irrigation systems with ditches at 10 or 35 m intervals, temporary ditches at 10 m interval (establishment phase), and subsoil irrigation with pipes at 8 m interval.

