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Typha latifolia, *Typha angustifolia* and *Azolla filiculoides***

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Comparing greenhouse gas balances from three paludiculture crops after rewetting peat: *Typha latifolia*, *Typha angustifolia* and *Azolla filiculoides*

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With the increasing demand to reduce greenhouse gas (GHG) emissions to meet the climate goals, rewetting of peatlands has gained attention as a promising measure. To reduce or stop peat oxidation, peat should be brought in anoxic conditions again by elevating the groundwater table. With this action, land becomes less suitable for traditional agriculture. Paludiculture would be a form in which wetland plants are grown and biomass is commercially used.

In a field experiment, we studied the effect on GHG emissions from three different paludiculture species: *Typha latifolia*, *Typha angustifolia* and *Azolla filiculoides*. In this presentation we will focus on the following research questions: 1) Can CO₂ emission reduction compensate increased CH₄ emission when peatland is rewetted for paludiculture purposes? 2) What is contribution of ebullition and diffusive fluxes to the total CH₄ flux of the different crop types? 3) What is the contribution of CO₂ and CH₄ to the total GHG balance with different crop types?

From our results we show that all paludiculture crops reduce GHG emission compared to a drained peat meadow, with highest reduction for *Azolla* and lowest for *Typha latifolia*. CH₄ emission in CO₂-eq is as high or higher than the CO₂ emission from drained peatland, but is compensated by net CO₂ uptake. *Typha* roots in the sediment (resulting in plant mediated gas transport), which leads to lower contribution of ebullition to the total CH₄ flux. *Azolla* had the highest ebullition rate, but has nevertheless the lowest total CH₄ emission. Most probably because *Azolla* is a floating plant without roots in the soil. This means that less easily degradable carbon is brought into the soil by e.g. root exudates, and that there is also no CH₄ transport through the plants.