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CLEAR  ANCE

Use-value of wetland buffer zones – Paludiculture options for a circular economy

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CLEARANCE Warsaw Workshop 15.3.2019

Dry arable land cultivation is we worldwide apply to originally wet soils...



Germany

Greta Gaudig

... a land use that has desertified millions of hectares...



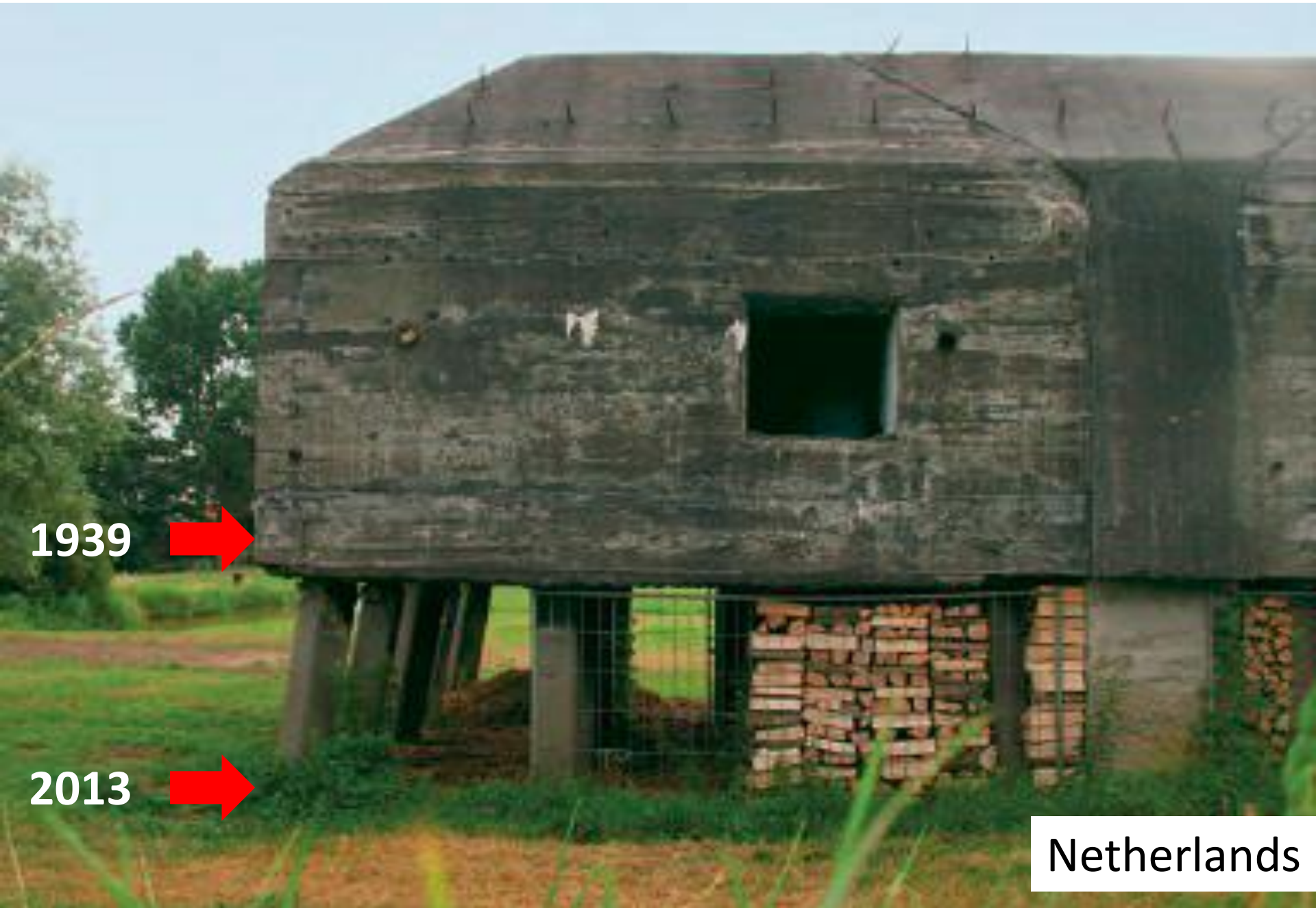
Ukraine

Drained peatlands become vigorous sources of greenhouse gases: CO₂, N₂O and often also CH₄



Kalimantan

...and cause even greater problems: subsidence!



1939

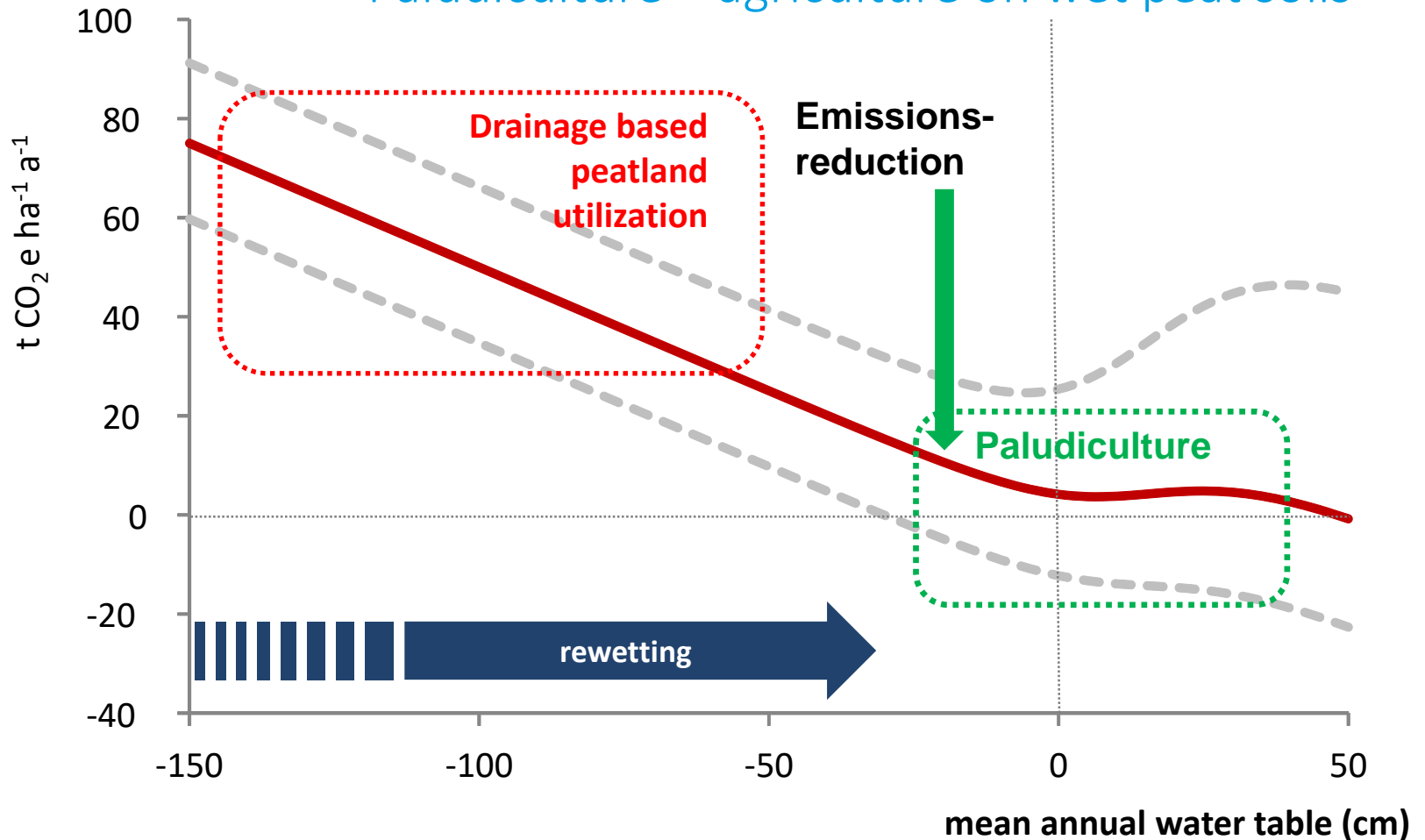


2013



Netherlands

Paludiculture – agriculture on wet peat soils



- Rewetting former drained peatlands for agriculture not natural peatlands

Paludiculture International



About 33 results (0.37 seconds)

Restoring Peatlands In Russia | Russia | UNFCCC

Furthermore, the potential for peatland cultivation (**paludiculture**) and trading in carbon credits are being assessed. The problem of fire risk and greenhouse gas ...

Submission on behalf of Wetlands International

Jun 13, 2013 ... Sustainable livelihood options: **paludiculture**. Keeping or making peatlands wet prevents and reduces negative impacts such as subsidence ...

Submission by the Food and Agriculture Organization of the United ...

Mar 30, 2014 ... **paludiculture**. **Paludiculture**, biomass cultivation on wet and rewetted peatlands, presents opportunities for climate change mitigation as well as ...

Submission on behalf of Wetlands International

paludiculture. The drainage of peatlands has other significant impacts besides GHG emissions. Key among these is soil subsidence, a phenomenon whereby ...

Overzicht van het bedrijf

Dec 6, 2012 ... **Paludiculture** or climate smart agriculture. - Low hanging fruit. - Combine wise use, conservation and restoration. - open to all peatlands ...

Key messages

Mar 30, 2018 ... forms of use, such as **paludiculture** (

Russia | Restoring Peatlands - Momentum for

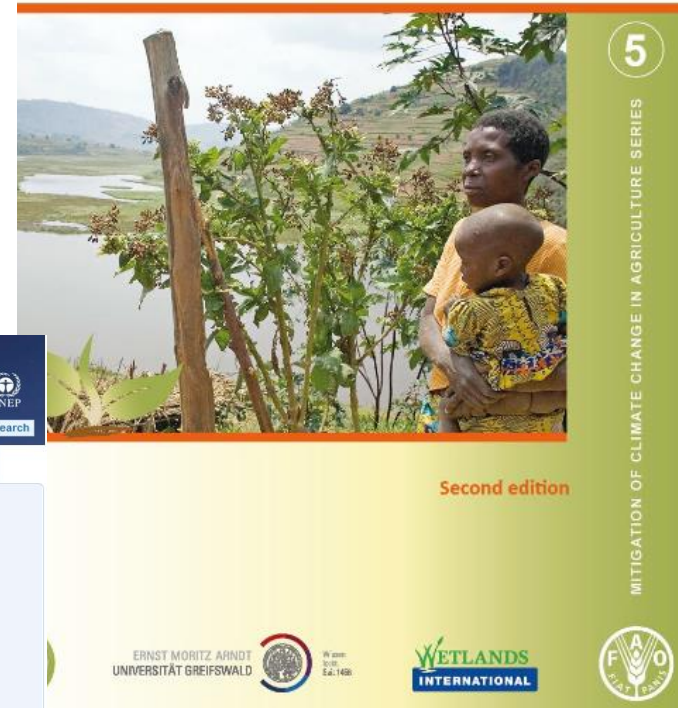
... Moscow region by using complex hydro-technical f

Terrestrial wetlands In Europe: Importance for

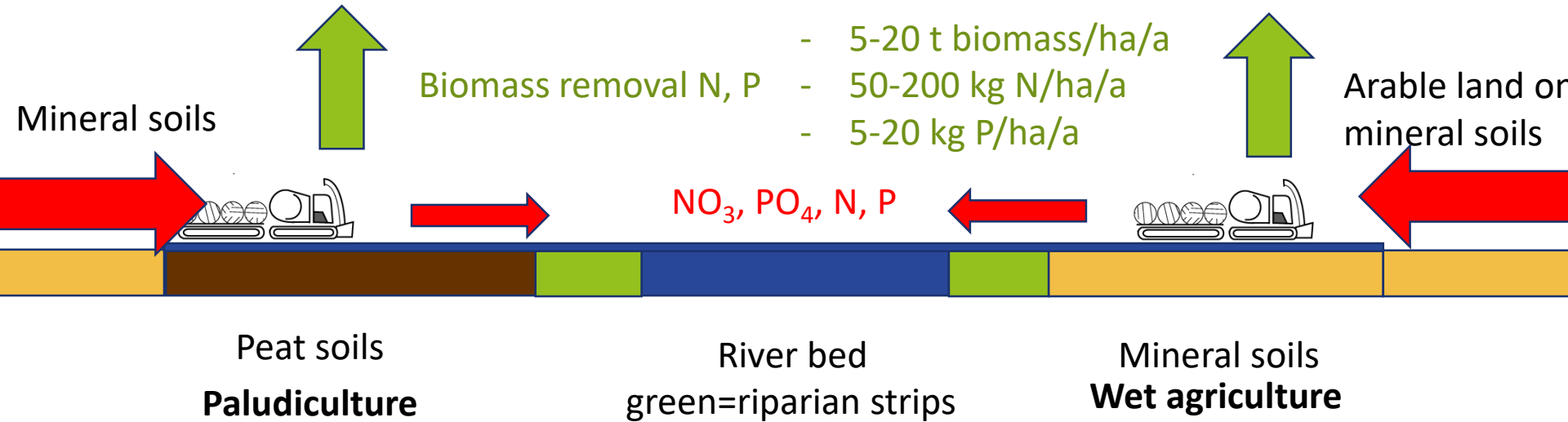
Oct 24, 2013 ... interesting option, but who is respons



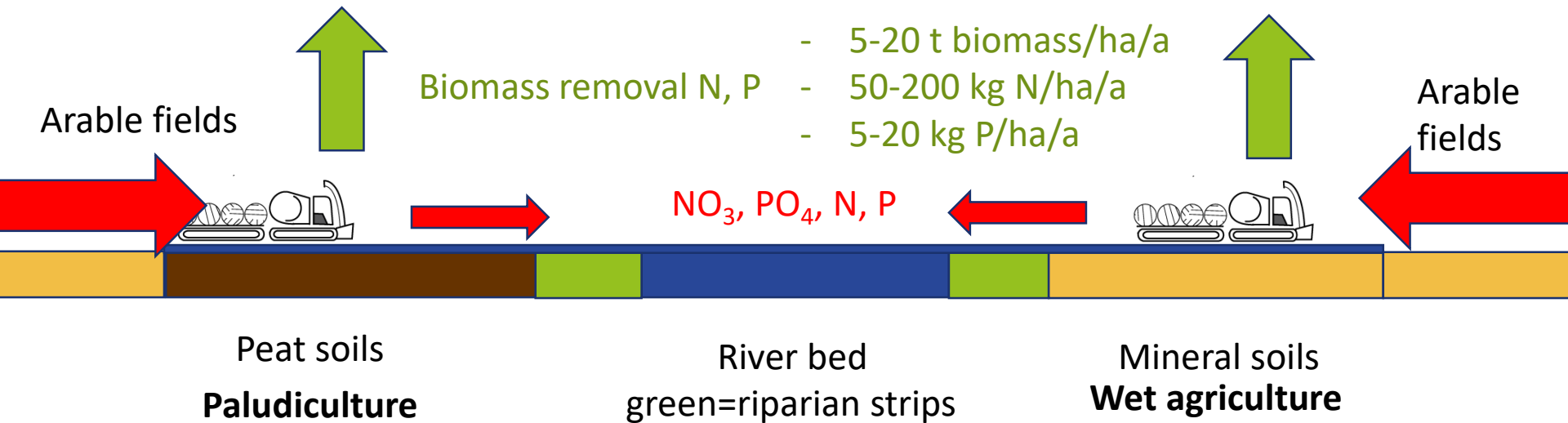
Peatlands - guidance for climate change mitigation through conservation, rehabilitation and sustainable use



Paludiculture and wet agriculture in buffer zones



Paludiculture and wet agriculture in buffer zones

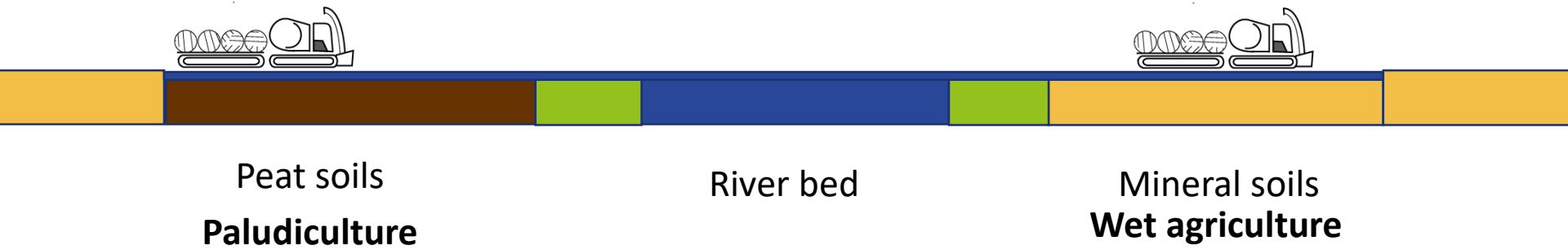


- reduces GHG emissions
- preserves peat soils as agricultural land
- water and nutrient retention
- flood protection
- adapted biodiversity

- water and nutrient retention
- flood protection
- adapted biodiversity

-> allows the production of renewable biomass that also replaces fossil resources

Paludiculture and wet agriculture in buffer zones



Common Reed



Sedges



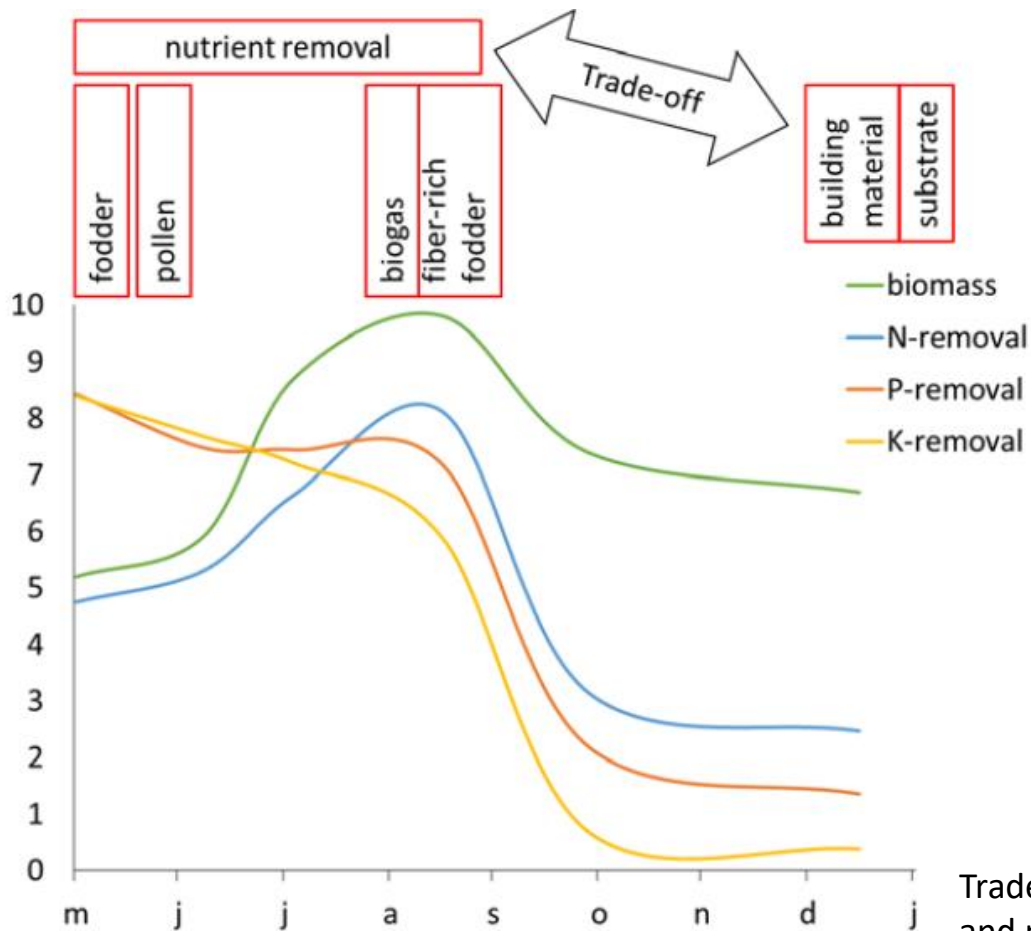
Reed Canary Grass



Typha latifolia



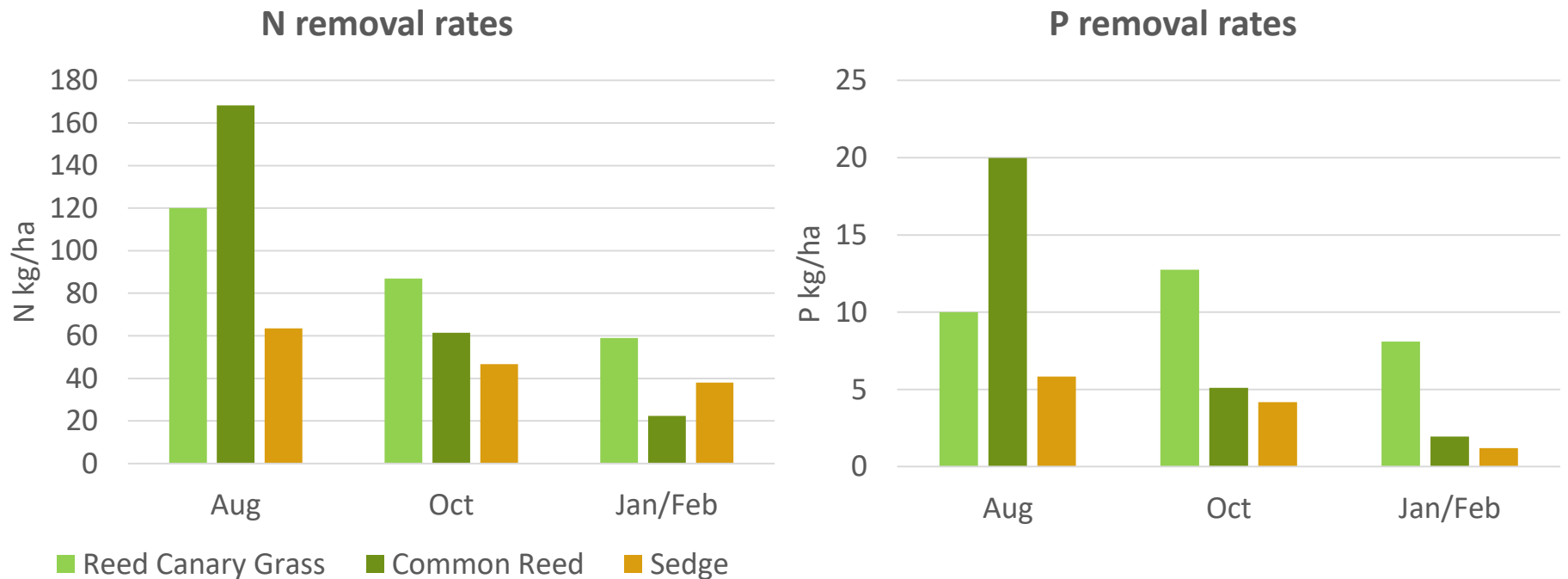
Nutrient removal versus use options



Trade offs between harvest date, biomass yield and nutrient removal (Geurts et al. 2017)

Nutrient removal potential of Paludiculture

depends on plant species, harvest dates and site characteristics



highest nutrient removal potential in summer or late summer

Biomass use options - Materials



Wetland products

GramiTherm



Insulated packaging made of straw



Landpack



NewFoss

Biomass use options - Materials



Wetland products

GramiTherm



Recycling by composting

NewFoss



Insulated packaging made of straw



Landpack

Biomass use options - Energy

Biomass heating plant
Malchin (Germany)



Biomass pellets



PPP (Paludi-pellets-Project), Germany

Biomass use options - Energy

Biomass heating plant
Malchin (Germany)



- 350 ha
- Sedges and Reed Canary Grass
- Substitutes 350.000 l heating oil

Biomass pellets



PPP (Paludi-pellets-Project), Germany

Biomass use options - Energy

Biomass heating plant
Malchin (Germany)



ash recycling as fertilizer



- 350 ha
- Sedges and Reed Canary Grass
- Substitutes 350.000 l heating oil

Biomass pellets



PPP (Paludi-pellets-Project), Germany

Biomass use - Fodder

Reed Canary Grass and Cattail



Cows like Cattail!

Geurts et al. 2018 Nijmegen University, Netherlands

Paludiculture in wetland buffer zones

- concept gives lots of advantages and solutions for environmental problems,
- biomass products are on the way to the market

but, still a lot has to be done for large-scale implementation!



Pictures: Monique Bestmann in Geurts et al. 2018

Paludiculture in wetland buffer zones

- Recognition of paludiculture as a form of agriculture
- Discontinuation of counterproductive incentives
- Application of the polluter pays principle
- Rewarding the land use associated to ecosystem services

Lessons learned ... for managing wetland buffer zones

- Rewetting and the implementation of new crop cultures is costly, but possible
- Paradigm shift in agriculture needs time, not only for the farmers but also for the society
- Farmers have to be paid for the ecosystem services they provide when they promote nutrient retention and increase water quality
- administrative institutions have to be involved in the process of paradigm shift
- Pilot studies are needed: for rewetting, plant cultivation, biomass harvest and product development -> knowledge transfer
- To establish a completely new production chain may need 20 years...



Thank you for your attention!

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