

Carbon budget and cycling in a Danish willow short rotation coppice ecosystem– climate sensitivity and climate change mitigation potential

Ibrom, Andreas; Pilegaard, Kim

Published in:
Geophysical Research Abstracts

Publication date:
2018

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):

Ibrom, A., & Pilegaard, K. (2018). Carbon budget and cycling in a Danish willow short rotation coppice ecosystem– climate sensitivity and climate change mitigation potential. *Geophysical Research Abstracts*, 20, [EGU2018-11939].

DTU Library

Technical Information Center of Denmark

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.



Carbon budget and cycling in a Danish willow short rotation coppice ecosystem– climate sensitivity and climate change mitigation potential

Andreas Ibrom and Kim Pilegaard

Technical University of Denmark, Department of Environmental Engineering, Lyngby, Denmark (anib@env.dtu.dk)

The demand for carbon dioxide neutral carbohydrate production for energy purposes has raised the societal and scientific interest in new perennial biomass plantations. These plantations are fast growing and require low input in work, machinery and fertiliser. However little is known on the ecosystems that are being formed by growing such plantations. Especially short rotation coppices (SRC) form entirely new ecosystems in the temperate biome. It is easy to assume that SRC behave somehow in between forests and agricultural crops or grasslands, but there is almost no data on how these systems work, what their carbon budgets are, and how effective they sequester atmospheric carbon dioxide, especially in the soil. All these uncertainties make it difficult to evaluate, whether or not producing biomass with SRC is environmentally sustainable (Bikuña et al., 2017).

In 2010, a willow SRC was established on the DTU-Risø Campus (Roskilde, Zealand, Denmark, DK-RCW). Since 2012 CO₂, water and energy fluxes are being measured along with plant structural parameters and soil respiration. The results show that, on average, the SRC is very effective in absorbing atmospheric CO₂ and produces after initially lower values, ca. 20 t biomass per ha in three years. The carbon budgets fluctuate on average around 500 g C m⁻²yr⁻¹ but can also reach more than 800 g C m⁻²yr⁻¹, i.e. indicating a much higher net carbon uptake than accumulated in the yielded biomass.

We describe here the first time results from 6 years' continuous flux measurements at this site in and evaluate their climatic sensitivity of the net carbon dioxide fluxes and the climate change mitigation potential of SRC cropping in Denmark.

Reference

Bikuña, K.S.d., Hauschild, M.Z., Pilegaard, K. and Ibrom, A., 2017. Environmental performance of gasified willow from different lands including land-use changes. *GCB Bioenergy*, 9: 756–769.