

Climate change mitigation in the Netherlands: What can be the possible contribution of short rotation *Salix* plantations?



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Introduction

- Climate change mitigation
- Kyoto protocol → substitution and sequestration
- Short rotation forestry is one possibility
- Production data is currently unknown
- Total mitigation potential is currently unknown



Research questions

Growth analysis:

- Different plant densities
- Different clones

LCA with regard to greenhouse gases:

- Substitution effect
- Emissions due to management
- Carbon sequestration in soil

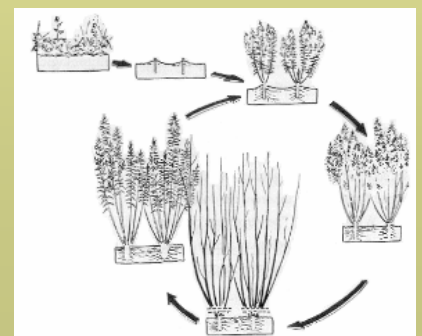
Interpretation:

- Relative contribution
- Visions for the future



Theoretical framework

- Short rotation forestry: fast growing species with ability of resprouting
- Interaction between crop and environment → management can be used to influence production
- Short rotation forestry improves soil quality and enhances nutrient cycling
→ sink for CO₂



Growth analysis (1/2)

- Four different sites, situated in Flevoland
 - Three different clones & three different densities
 - Central plots:
 - Proportion of living plants (144 plants (S))
 - Number of shoots per plant
 - Fresh weight per plant
 - Diameter of each shoot
- } 20 plants
- Dry matter content (dmc) → 10 stem pieces
 - $B = (\sum FW_{\text{plant}} / 20) * \text{dmc} * C * S$

Growth analysis (2/2)

Regression formulas

- Diameter and dry weight of 30 shoots
→ $DW_{\text{shoot}} = b * (Ds)^c$
- Proportion of surviving plants (144 plants (S))
- Diameters of shoots of 30 plants
→ diameter range (pDs_i, \dots, pDs_k)
- $B = (C * S * AN_{\text{shoot}}) * (pDs_i * DW_{\text{shoot}_i} + \dots + pDs_k * DW_{\text{shoot}_k})$



LCA Method

- Borders of system has to be set
- Literature research
 - Emissions due to fertilisation
 - Emissions due to rest of management
 - Carbon sequestration
- Mass balance with help of Global Warming Potential



Planning

When / what	Jan.	Feb.	March	April	May
Proposal					
Growth analysis					
LCA					

When / what	June	July	Aug.
Quantifying effect			
Concept report			
End colloquium			
Final report			



Thank you for your attention!

Questions
or
remarks?

