How can we remove accumulated nitrogen by use of farming systems in order to protect our groundwater?

Per Grønvald & Pernille Stampe Jakobsen, Water Cooperation Aalborg, Denmark

Vandsamarbejde Aalborg

www.vandsamarbejdeaalborg.dk

SustainableNconference dNmark 2017

How can we remove accumulated nitrogen by use of farming systems in order to protect our groundwater? drinking water

Per Grønvald & Pernille Stampe Jakobsen, Water Cooperation Aalborg, Denmark

Vandsamarbejde Aalborg

www.vandsamarbejdeaalborg.dk

SustainableNconference dNmark 2017

Results





SustainableNconference dNmark 2017

2



Vandsamarbejde Aalborg

3

Regulation strategy (drinking water)

Catchment protection <-> Targeted protection



SustainableNconference dNmark 2017

What have we done?

Tools and measures

Rural areas

- Buy land
- Land swap
- Agreement
- Expropriation

Afforestation or Permanent grass



2016
✓ 57 agreements
✓ 1.400 hectare
✓ = half way



Afforestation

Multi functional:
Recreational opportunities
Increased biodiversity
CO₂ storage

SustainableNconference dNmark 2017

6

Afforestation

Co-financing agreements

- National Forestry Administration
- Municipality of Aalborg

Documentation

• Soil water (suction cups)





SustainableNconference dNmark 2017

Afforestation



Development in the root zone after afforestation on old arable land

Challenge: max. 25 mg Nitrate/l approach ! -> Targeted regulation

Hypothesis

versus Our reality



SustainableNconference dNmark 2017

Vandsamarbejde Aalborg

8

Our new research area

Objectives

- How to handle former arable land?
- How to design operations (focus N removal)?
- More comparable data

Imperative demands

- Max. 25 mg Nitrate/I (targeted regulation)
- Durable and resilient measure
 - not sacrificing groundwater recharge



SustainableNconference dNmark 2017

Our new research area

Collaborative project:

- Municipality of Aalborg
- University of Copenhagen (Per Gundersen)
- HedeDanmark (Private forest company)
- Area characteristics (soil, C/N ...)
- Soil water monitoring (NO₃..)
- Water balance (ex. TDR)
- Main species Oak and Beech
- Elements of Scots pine and clearings
- Focus on soil preparation before planting
- Operation of forest (removal of N ...)



YOUR new research area?

Alternative farming system Imperative (max. 50 mg Nitrate/I)

- Resilient measures
 - Documented (evidence)
 - Controllable
 - Durable
 - Applicable and feasible
- N Harvest

-> temporary sacrificing the recharge?



YOUR new research area?

Alternative farming system Cond feasible to the total of total of the total of the total of total Imperative (max. 50 mg Nitrate/I)

- Resilient measures
 - Documented (evidence)
 - Controllable
 - Durable
 - Applicab

arvest N -> tempotary sacrificing the recharge?



CI

View towards Aalborg from the protected catchment area in Drastrup

Thank you for your attention - time for questions!

Vandsamarbejde Aalborg

www.vandsamarbejdeaalborg.dk

SustainableNconference dNmark 2017