



National Institute for Public Health
and the Environment
Ministry of Health, Welfare and Sport

Water quality compliance checking for the Nitrates Directive

A discussion in the Netherlands
with scientific, managerial and
political dimensions

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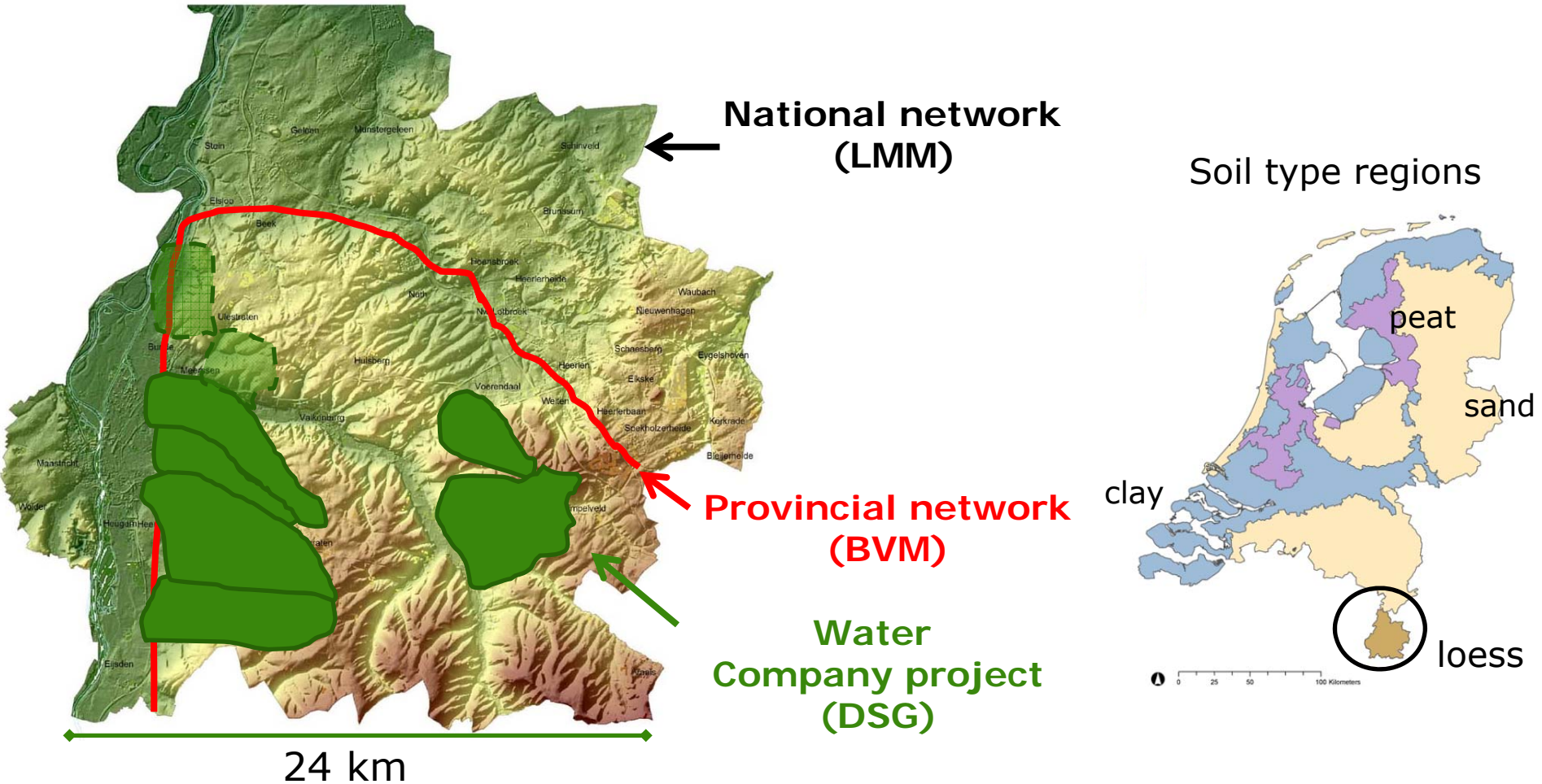
National Institute for Public Health
and the Environment
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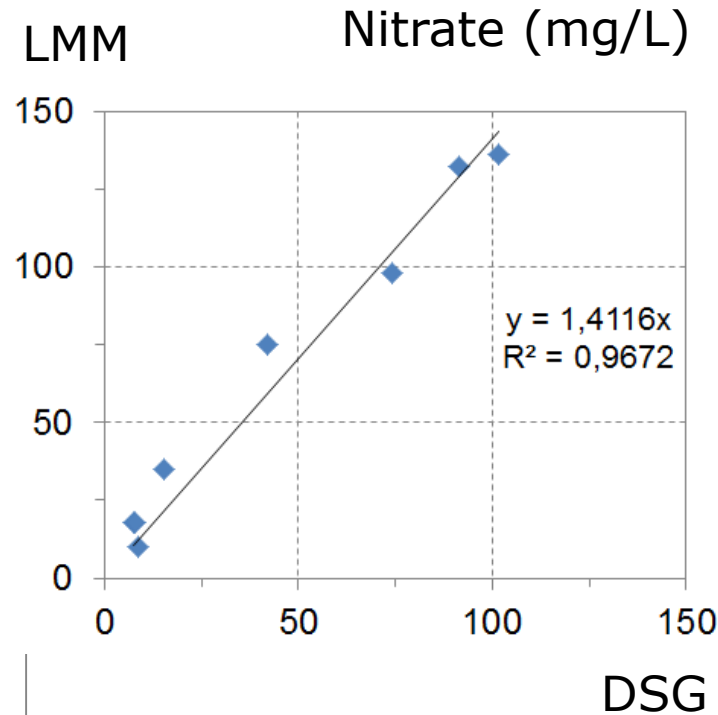
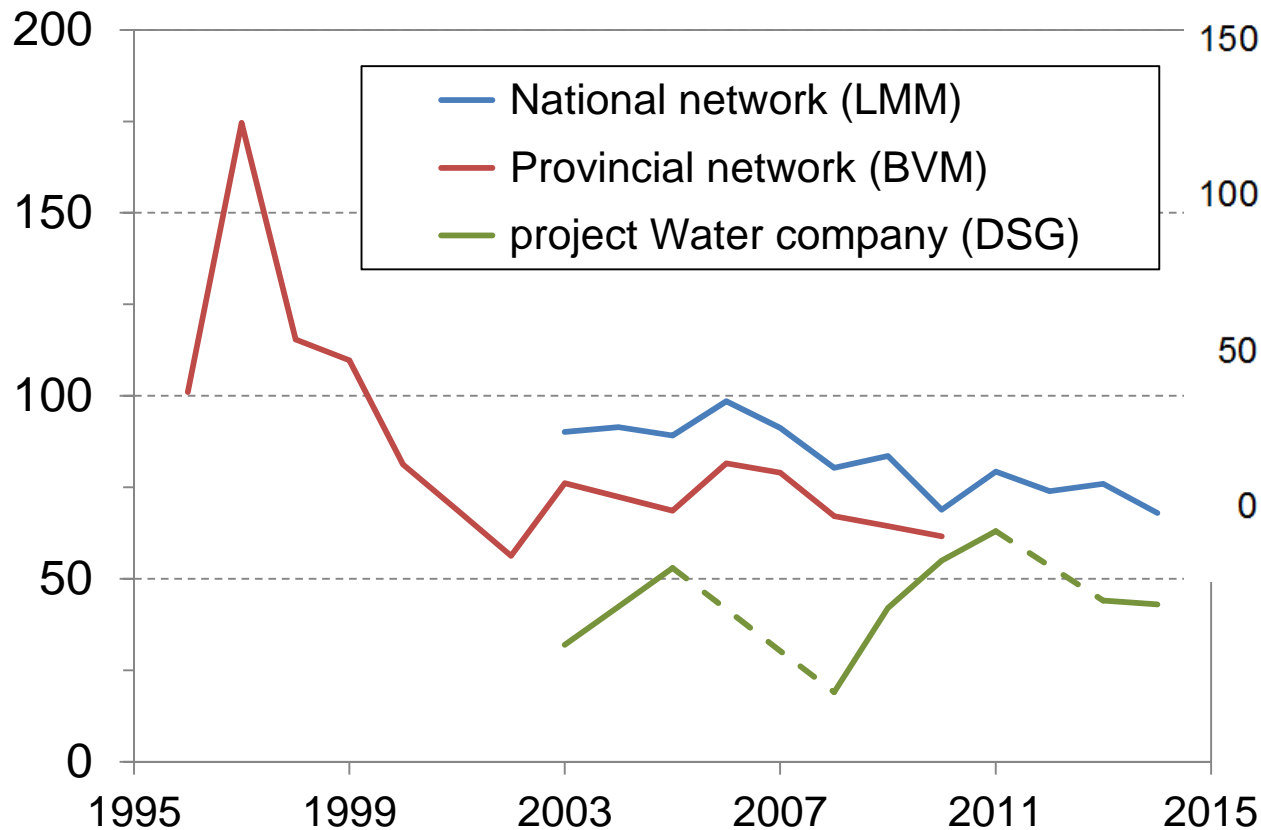
Monitoring networks in the Loess region





Results of monitoring network in the Loess region

Nitrate concentration (mg/L)





Questions raised after publication of comparison by farmers, press, and member of parliament

Rapport

Vergelijking protocol monstern
en nitraatanalyse bodemvocht
DSG – RIVM

Onderzoek uitgevoerd in opdracht
WML

Report by WML
Comparison of
soil moisture
sampling
protocols

Farmers' press:
Nitrate results RIVM too high

Nieuws

'RIVM meet te hoog nitraat' Tweede Kamer der Staten-Generaal

comments: 11 views: 988 label: Algemeen

Maastricht / Den Haag – De meetmethode die het RIVM toe
nitraatgehalte in bodemvocht van lössgrond leidt tot hogere
meetmethode die Waterleidingmaatschappij Limburg (WML)



Dat blijkt uit een or
uitvoeren, waarbij i
zijn vergeleken op
Oorzaak van de hc
kunnen zijn de ber
en opslag in het lal
combinatie darva

WML doet in het k
Grondwater (DSG)
Deze methode is v
nauwkeuriger dan
onder andere het c
bekritiseren de RIV
blootstelling van m

Questions raised in
parliament a/o
“What is your opinion on
the ... shortcomings of the
methods used by RIVM ..”

Vragen gesteld door de leden der Kamer, met de daarop door de
regering gegeven antwoorden

Vergaderjaar 2013-2014

Aanhangsel van de Handelingen

2

Antwoord van Staatssecretaris Ch. Berden (Een
vragen van de leden De Graaf (DSGP), Lodderus (VVD) en Geurts (CDA) aan
de Minister van Landbouw, Natuur en Voedselzekerheid (3-2014)

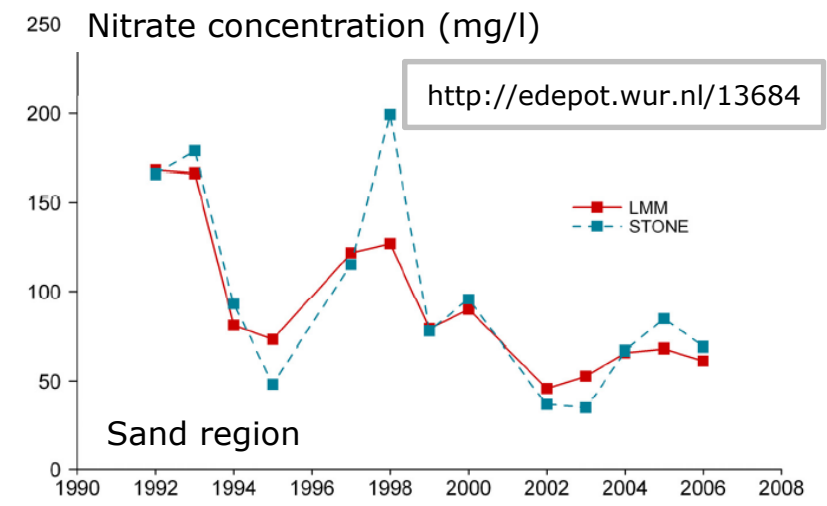
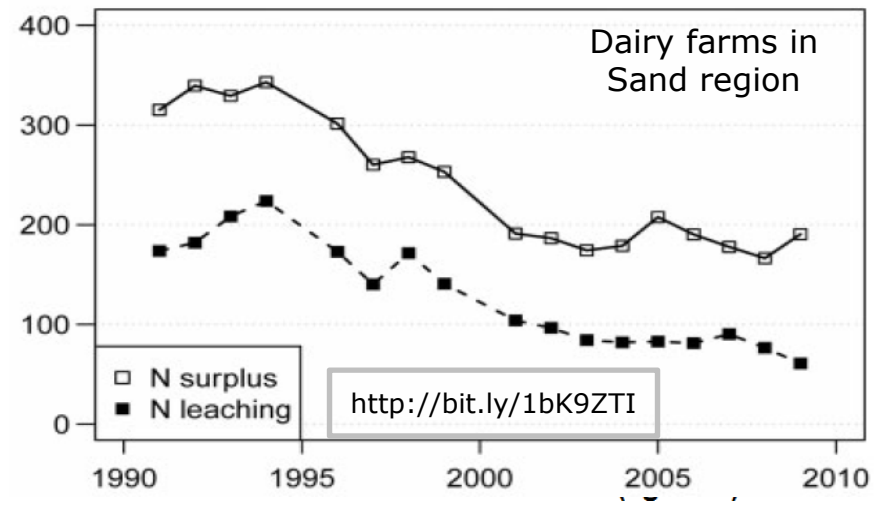
Heeft u kennisgenomen van het rapport van Watermaatschappij Limburg
(WML) over nitraatmetingen in bodemvochtonderzoek op lössgrond?

Antwoord 1
Ja.



The policy problem

- Farm income depends on nitrogen use
 - Nitrogen use is regulated
 - Regulations are also based on LMM measurements:
 - N use standards are based on relation between N leaching and N surplus derived from LMM data
 - Outlooks are based on a model (STONE) which is calibrated with LMM data
 - LMM data and STONE results are reported to the European Commission
- If LMM data overestimates leaching:
- N use standard may be too strict
 - Outlooks too pessimistic





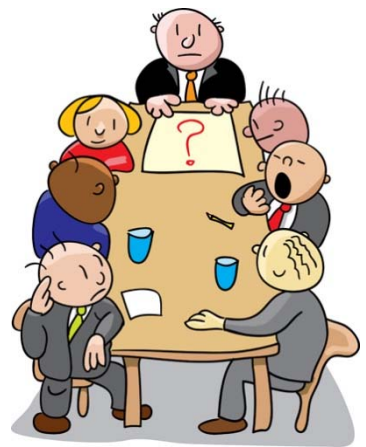
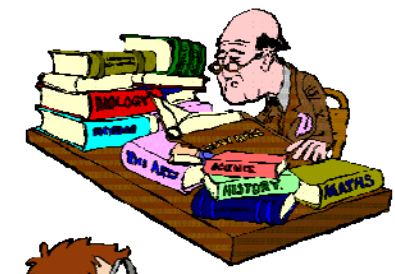
How has this challenge been approached



LMM & DSG advisory boards



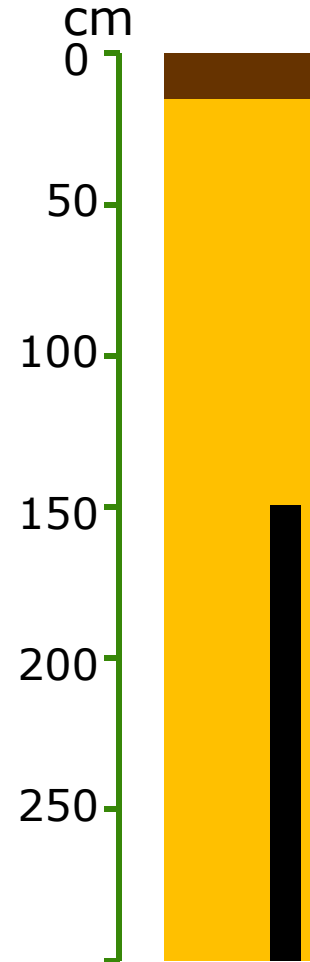
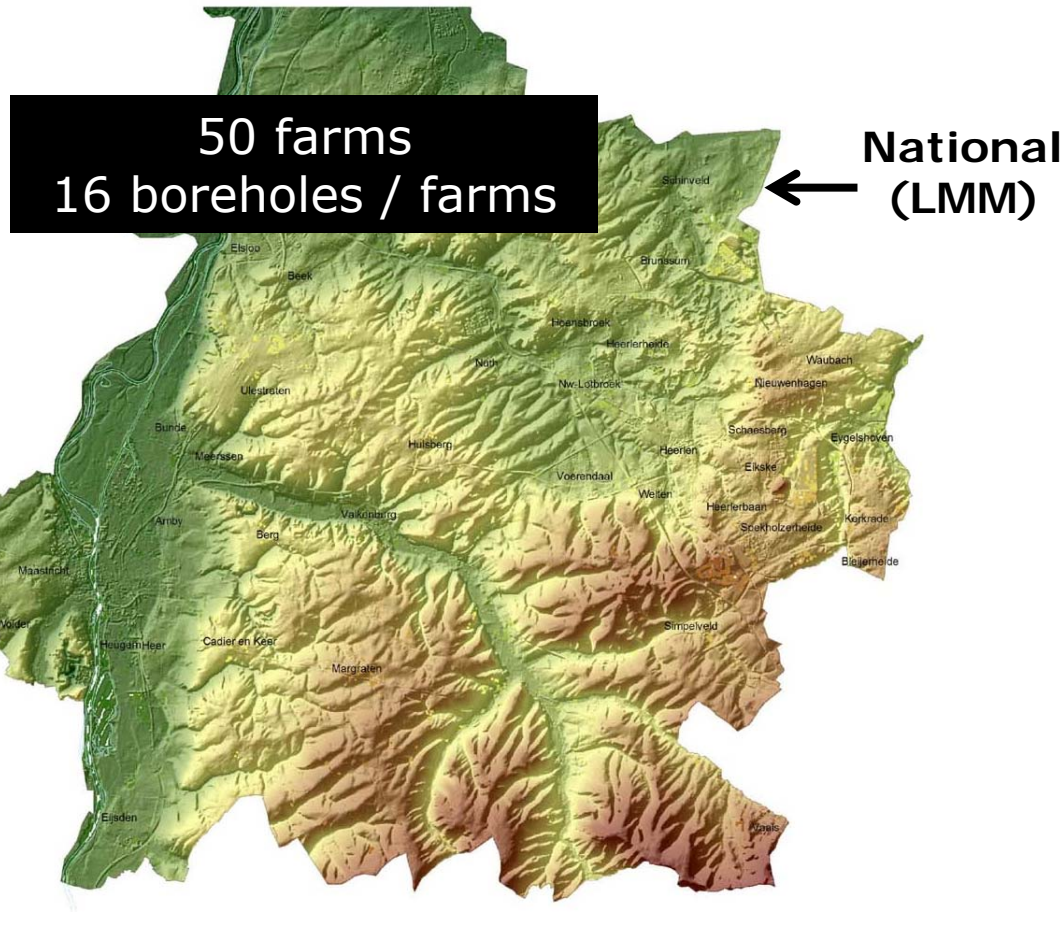
Working group
- LMM, DSG, BVM
- Other scientists



Ministry of Economic Affairs

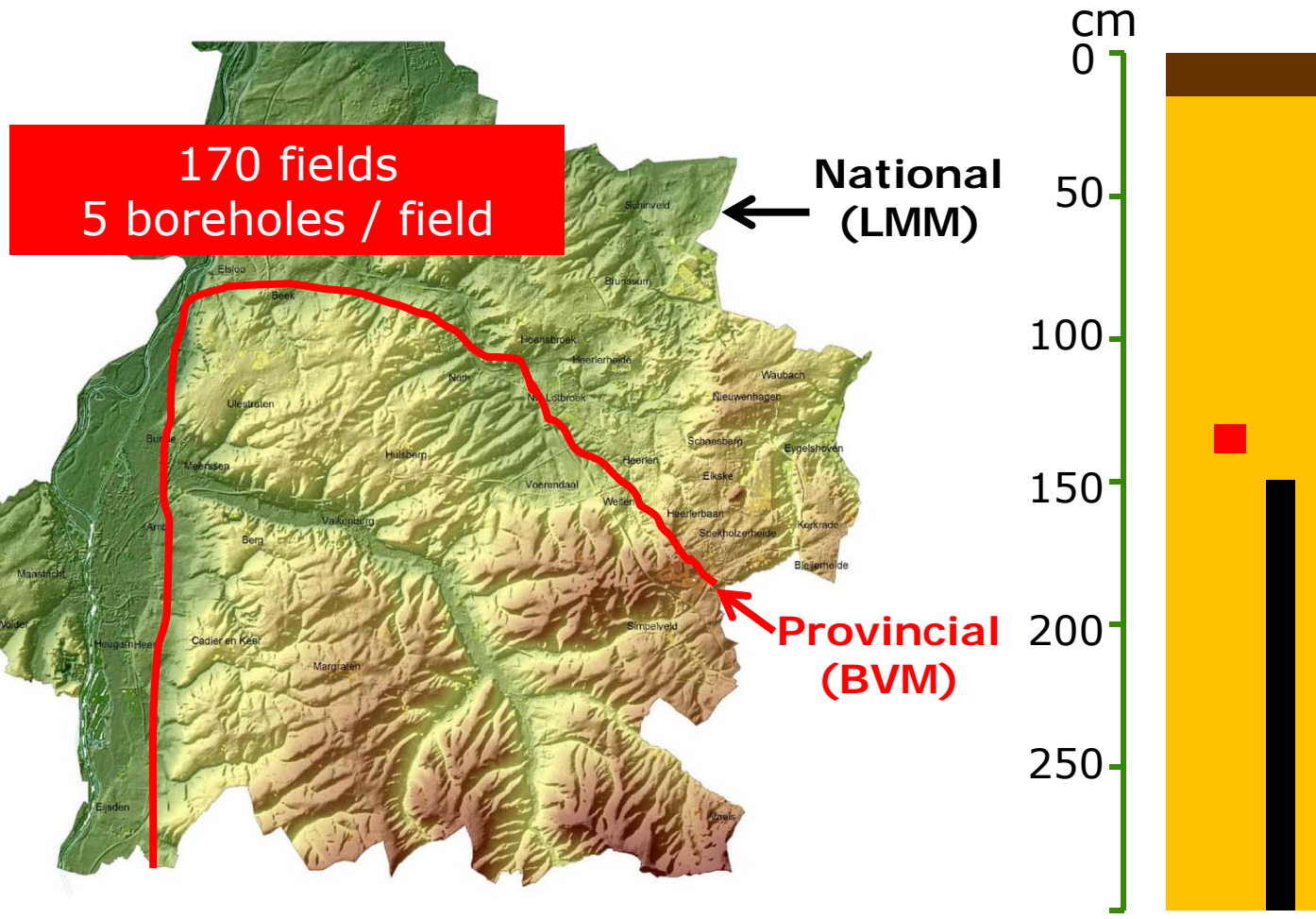


Comparison of networks and methods





Comparison of networks and methods



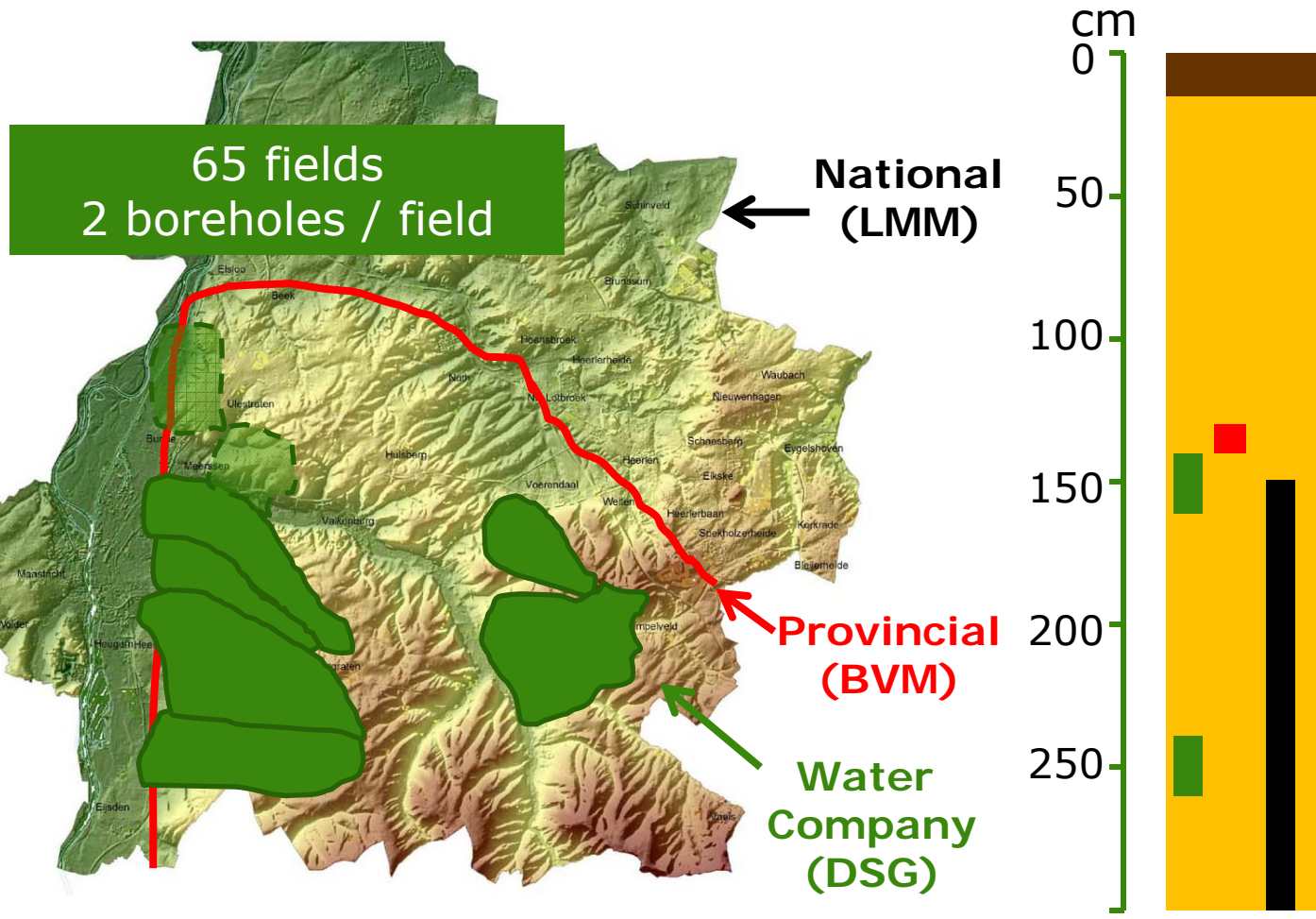
Drainage centrifugation



Batch extraction



Comparison of networks and methods



Drainage centrifugation

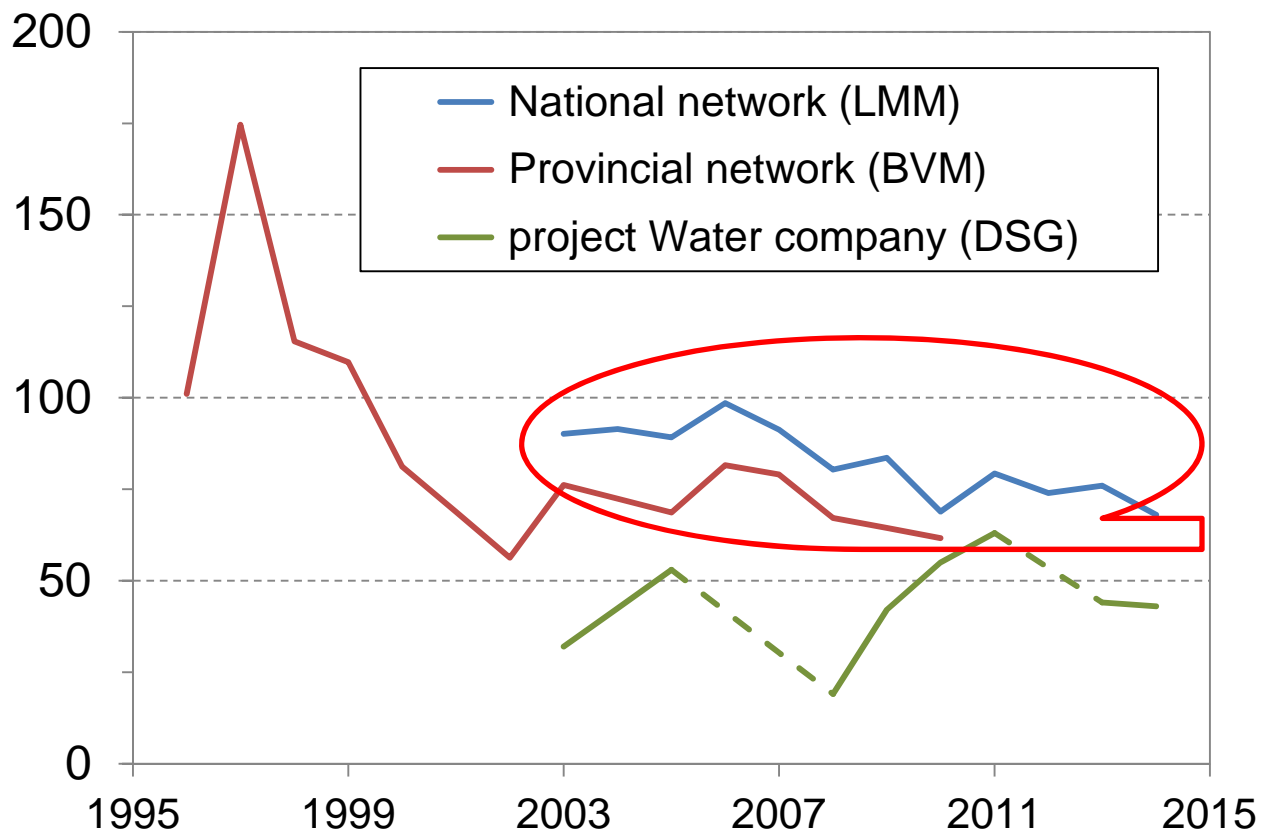


Batch extraction



Comparing monitoring network results

Nitrate concentration (mg/L)



Focus on:

Comparison of LMM and BVM:

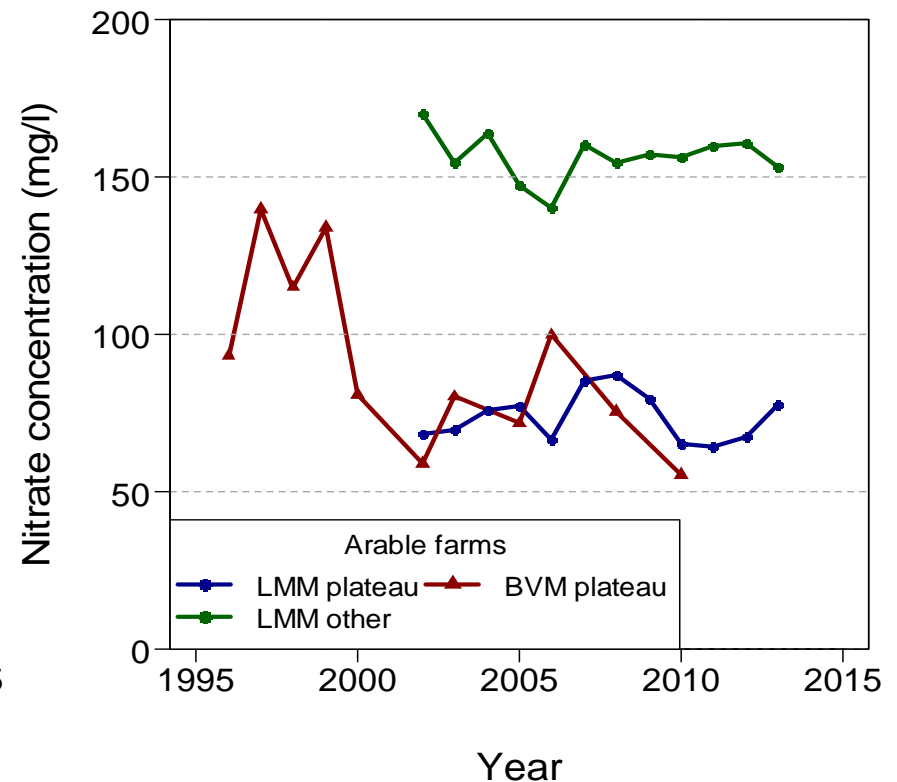
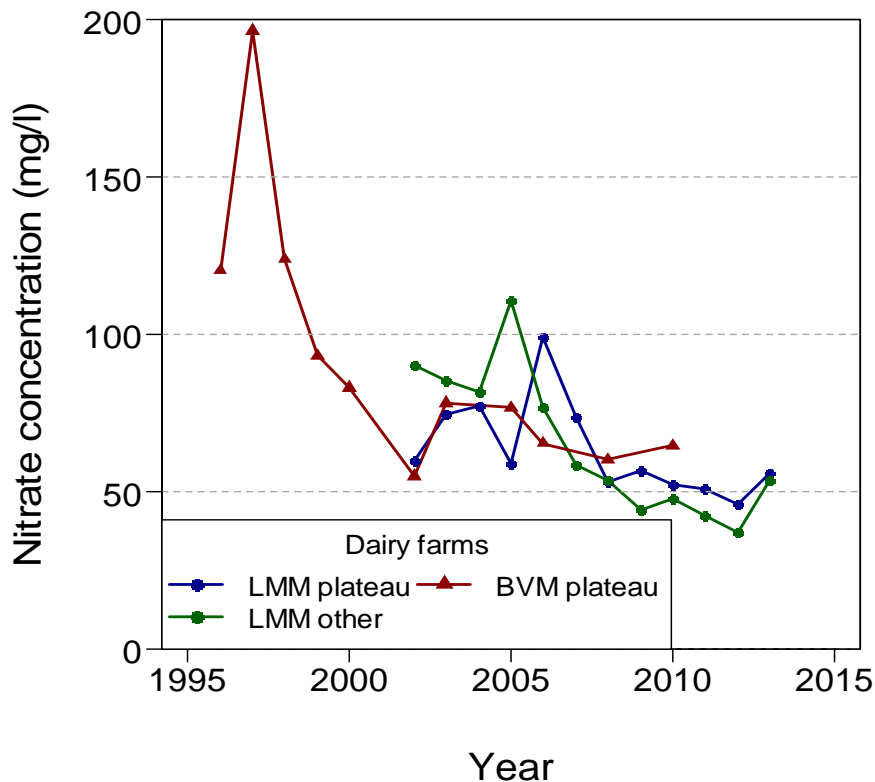
- Area represented
 - Pore water extraction
- Literature review

About 20% difference



Effect of differences in area in network

Dairy farms (left) and arable farms (right) inside and outside 'Plateau', comparing national (LMM) and provincial (BVM) networks



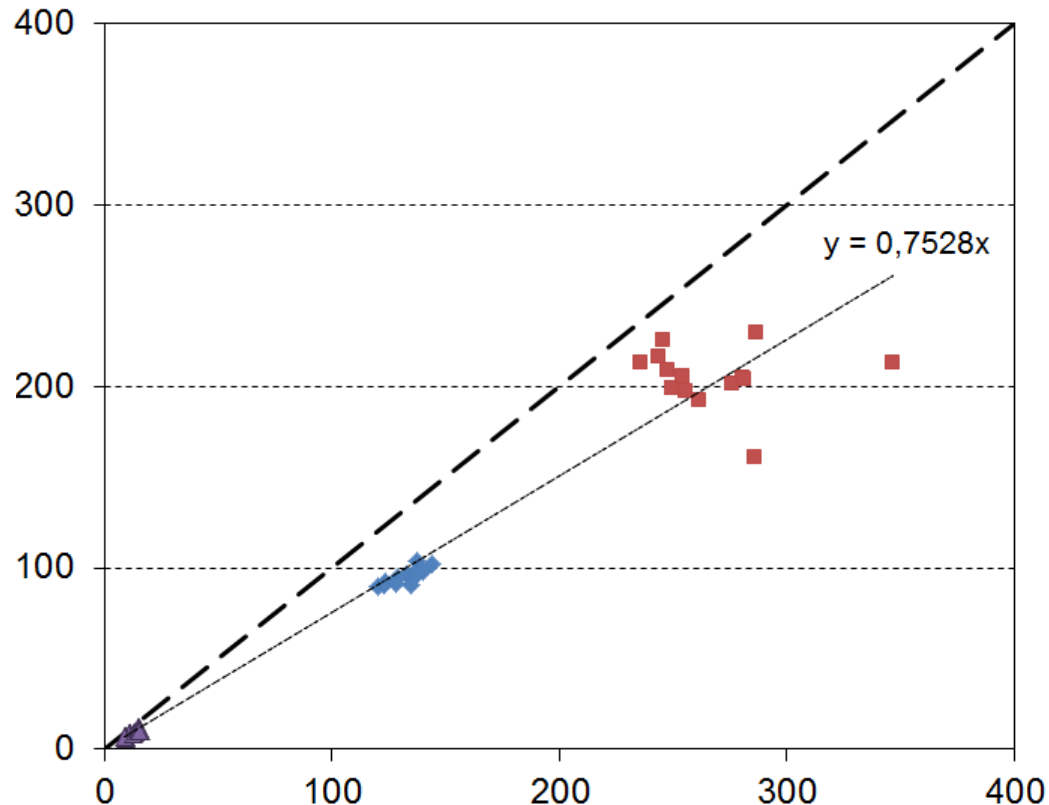


Effect of pore water extraction method

Nitrate concentration in pore water extracted with drainage centrifugation versus nitrate in all pore water

NO₃ (mg/l)
in all pore water

weighed average of
centrifugation extract
and batch extract of
remaining pore water
with milliQ water (soil
: water ratio of 1:1)



- ◆ Location A
- Location B
- ▲ Location C
- 1 : 1

NO₃ (mg/l) in
centrifugation
pore water



Review of literature

Literature was not conclusive regarding question:

“Which protocol provides best estimate of nitrate concentration in water leaching from the root zone ?”

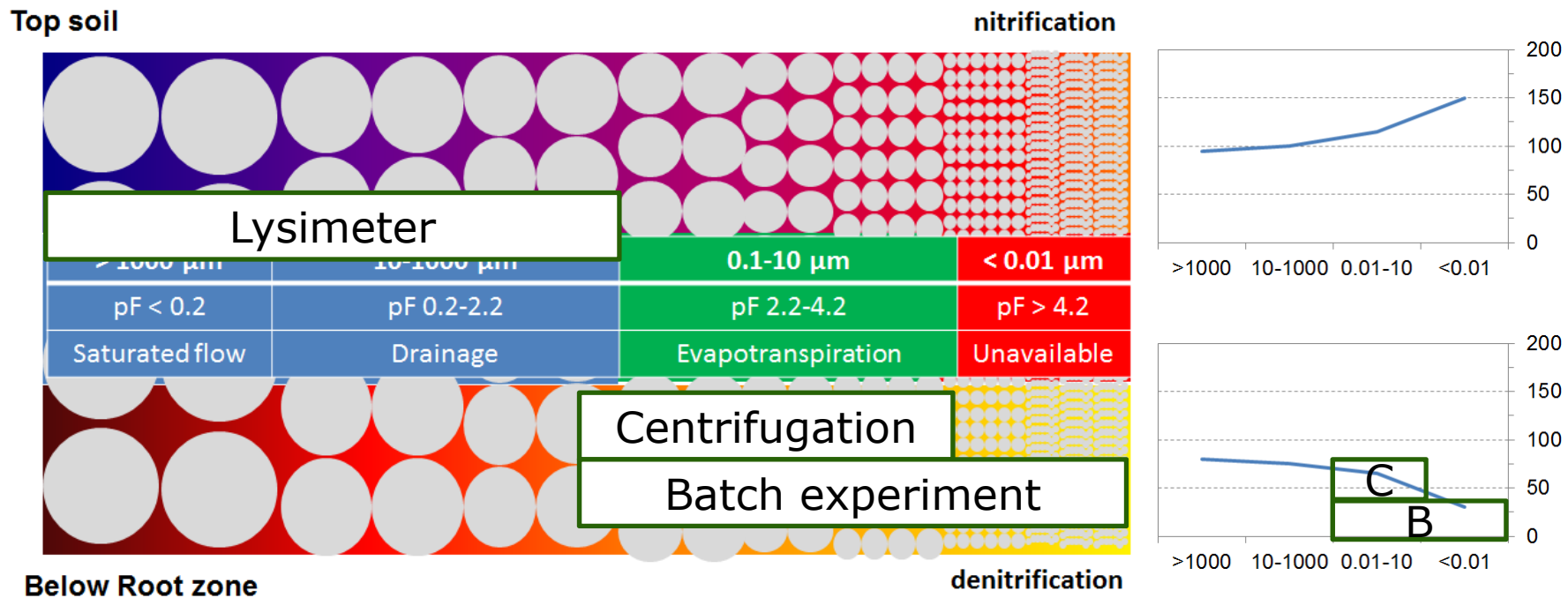
As most of the research is limited to:

- the upper metre of the vadose zone, and
- sandy soils under nature, i.e. mainly forested areas
- a limited study period (only once or during one year)



Summary of literature and research results

General idea of what might be the case for silt loams under agriculture (conceptual model)

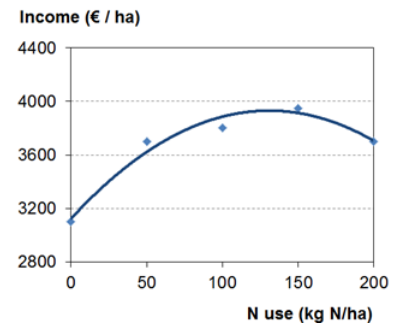
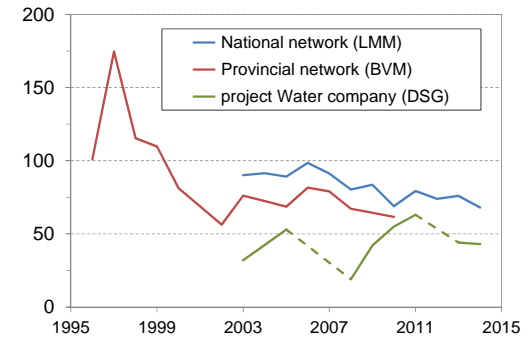


<http://www.rivm.nl/bibliotheek/rapporten/2015-0052.pdf>



Wrap-up

- A difference in results between commonly used soil moisture sampling protocols has led to a lively debate in the agrarian, scientific and political arena in the Netherlands
- The stakes are high, changing N use standards may affect agrarian incomes as well as nitrogen leaching
- All stakeholders have been involved from the start of the discussion and will be involved in the remainder of the process; so, involvement from problem recognition to policy decision and an open process





Next steps

Ministry has requested advise from the Scientific Committee of the Manure Act (CDM)

CDM will give advise and publish advice and report on the internet

The government use this advise when drawing up the next Nitrates Directive action programme (2018-2021)

In 2016-2017 the draft of the next action programme will be discussed:

- in parliament in view of a revision of the Manure Act
- with the European Commission in view of the next Dutch derogation request

Thank you for your attention

