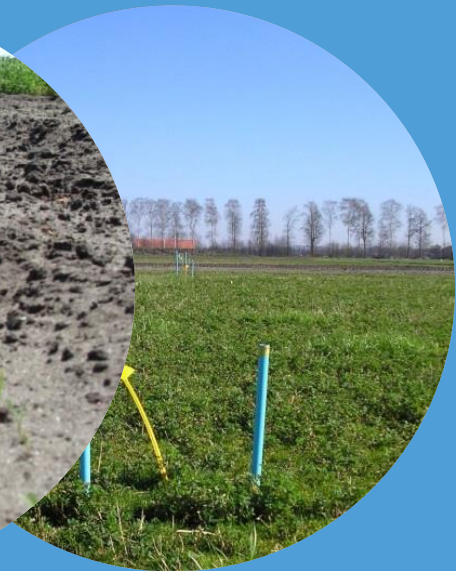


# Nutrient emissions in field cropping in the Southern Sand area in the Netherlands

Study tour, 9 November 2017

Janjo de Haan & Marc Kroonen



WAGENINGEN  
UNIVERSITY & RESEARCH







Wageningen University & Research  
Applied Plant Research  
experimental location Vredepeel



# Experimental location Vredepeel



Since 1959



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# Experimental location Vredepeel

## Soil

- Sandy soil
- Organic matter 4-5%
- Rooting depth 50-60 cm
- Susceptible for drought and winderosion
- Water management: drainage and irrigation



# Experimental location Vredepeel 170 ha

## 2017

■ Potatoes	40 ha
■ Sugarbeets	25 ha
■ Maize	40 ha
■ Triticale + Barley	25 ha
■ Peas and beans	12 ha
■ Carrots	6 ha
■ Scorzonera	7 ha
■ Leek	4 ha
■ Unions	2 ha
■ Asperagus	0.4 ha
■ Grass	5 ha
■ Nature management	1 ha
■ Other research	5 ha





# Activities Applied Arable & Vegetable Research – Wageningen University & Research

Disciplinary  
research

*Field trials*

*Lab trials*

*Desk studies*



Systems research

*Comparing  
strategies*

*Development of  
cropping and  
farming systems*

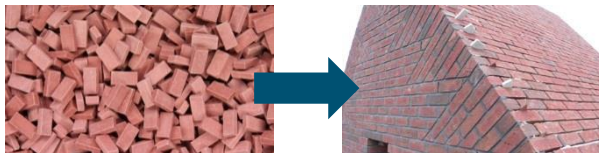


Tool  
Development

*DSS's*

*Handbooks*

*Schemes*



Knowledge  
circulation

*Farmers  
networks*

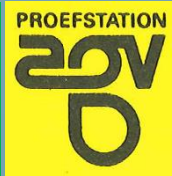
*Communication*

*Field days*





# Farming Systems Research



1989  
2000 Development of integrated and organic farming systems



2001  
2003 Farming with Future: How to comply with the nitrate directive in arable farming



2005 Nutrients Waterproof: How to comply with the nitrate directive and WFD in arable farming and outdoor horticulture

2008

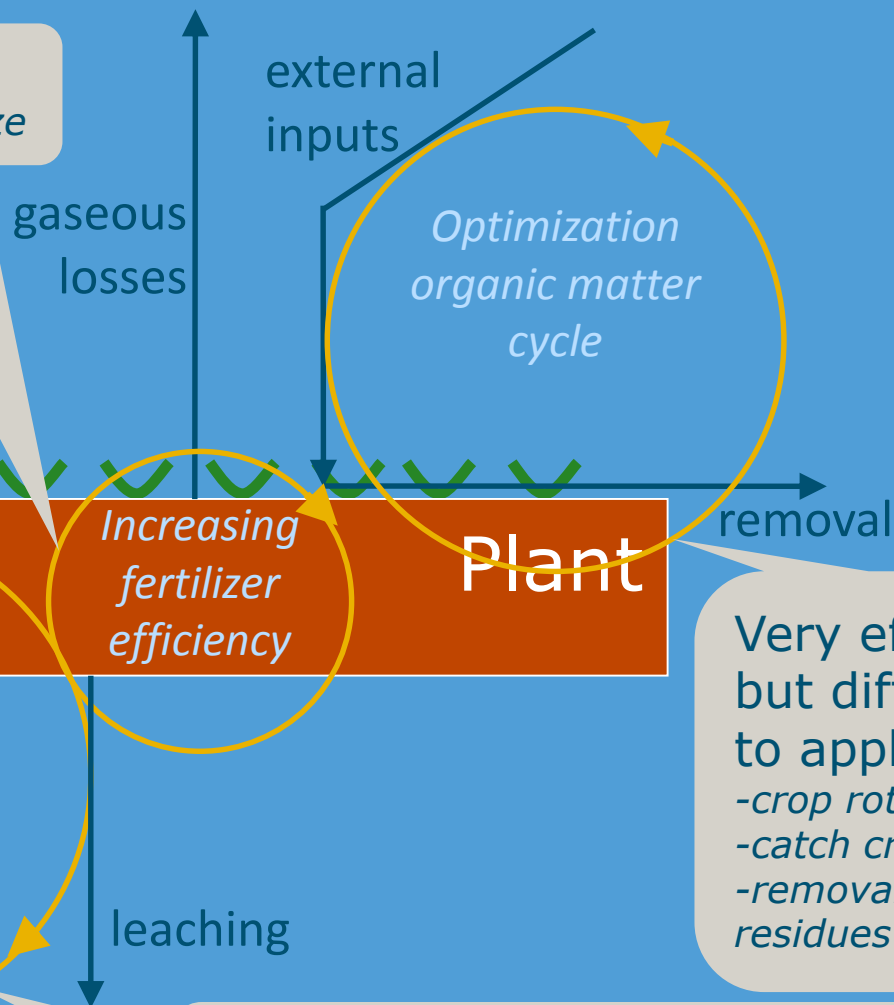
## Soil Quality on sandy soils



2011  
2016 Effects of soil management (input of organic matter, soil tillage) on ecosystem services (yield, nitrate leaching) in arable farming and vegetables

# Possible solutions and results

Limited effect  
*-row fertilization maize*



Very effective  
but difficult  
to apply  
*-crop rotation*  
*-catch crops*  
*-removal of crop residues*

Effective but difficult to apply  
*-re-use of drainage water*  
*-constructed wetlands*

Potato

Grass  
clover

Leek

Summer  
barley

Carrot

Silage  
maize





# Perspectives: Two development directions

## 1. Sustainable soil management, including

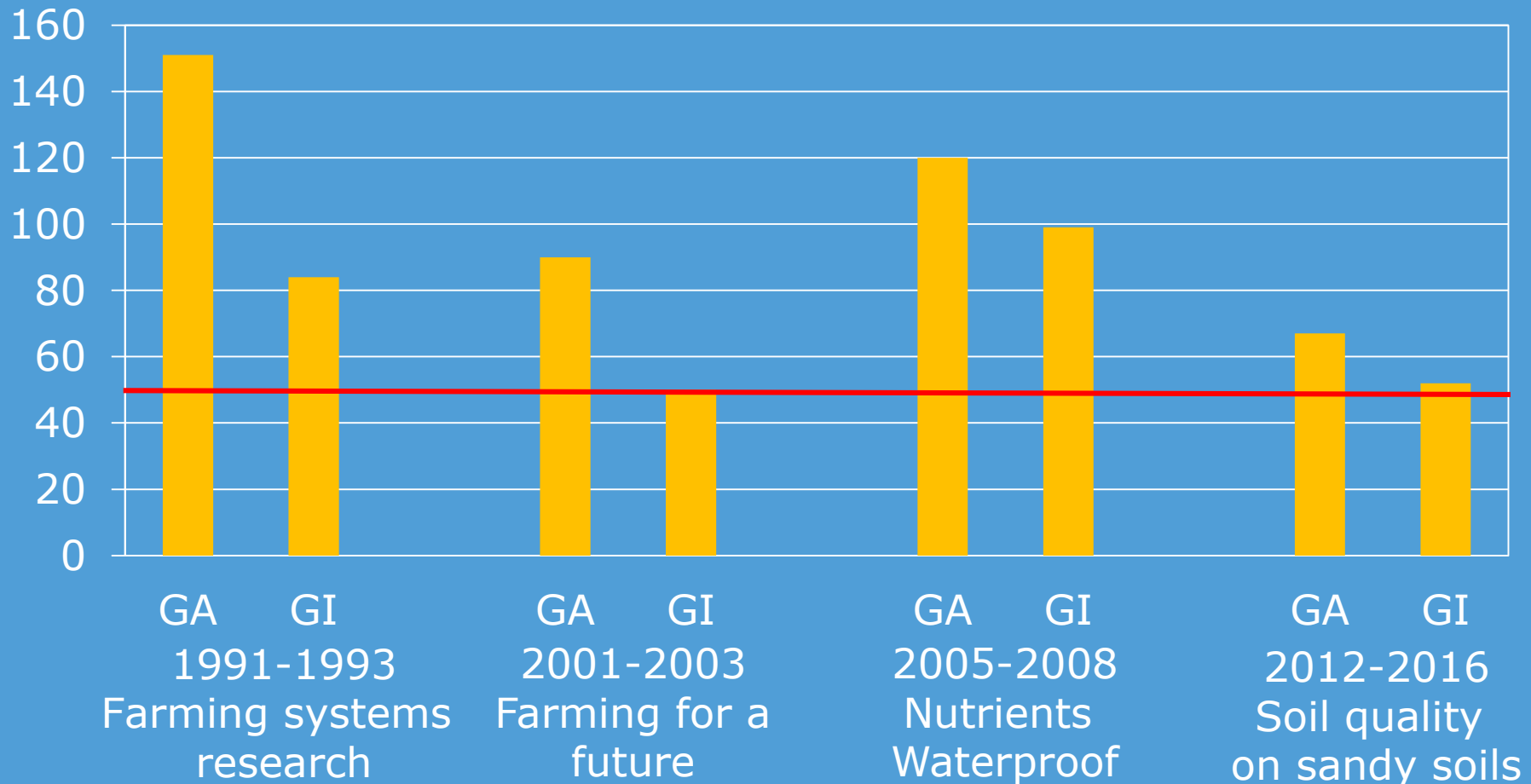
- extensification of crop rotations
- organic farming principles



## 2. Soilless cropping of intensive outdoor horticultural crops



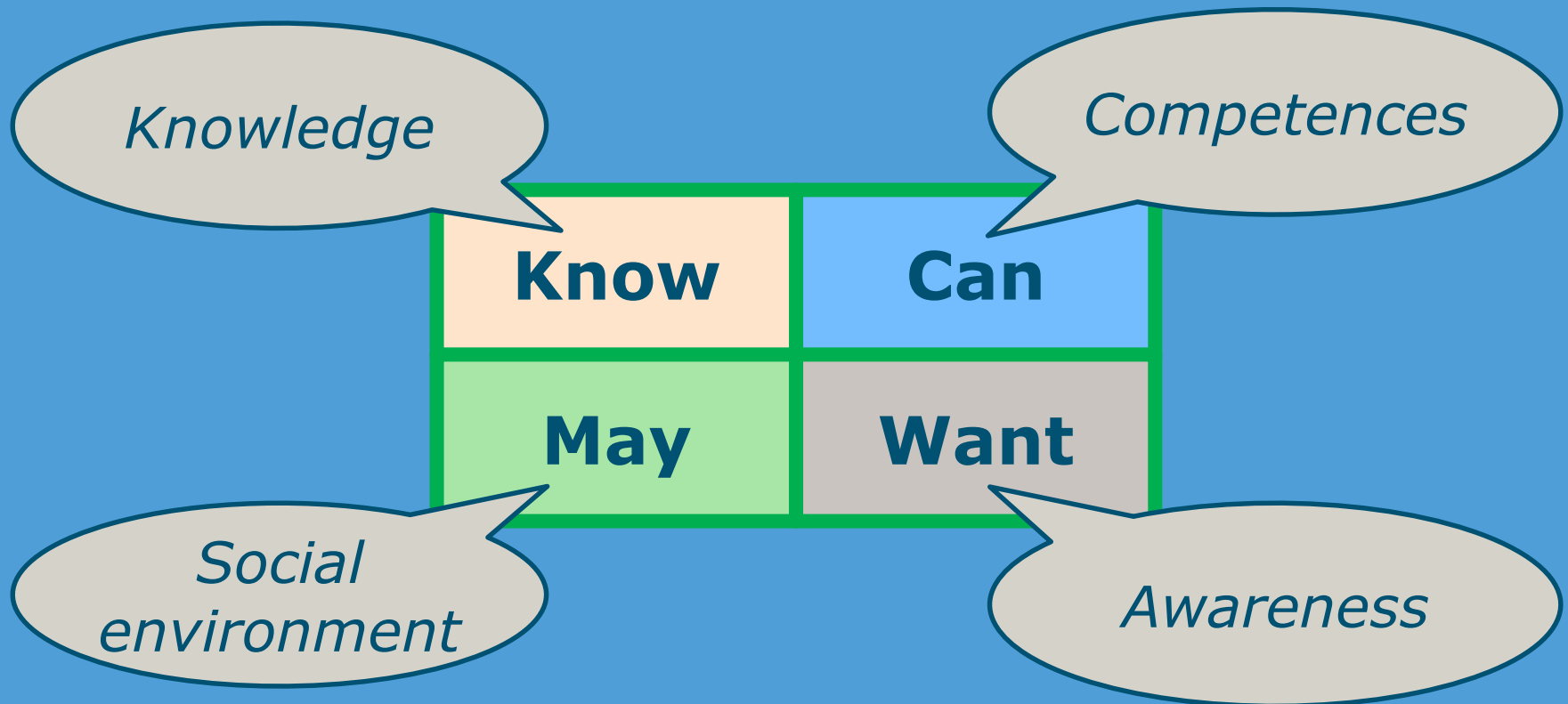
# Nitrate concentrations in groundwater in various project periods (mg NO<sub>3</sub>/l)





# Knowledge circulation: the big challenge

- Knowledge to practical measures
- Start the change
- Reach out the peloton
- Persist the change



*And now  
the field!*



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