Long-term Farming Systems Research in the SE of The Netherlands: Vredepeel

LTE conference Rothamsted, 22 May 2018

Janjo de Haan, Marie Wesselink & Harry Verstegen

WAGENINGEN
UNIVERSITY & RESEARCH

100years
1918 — 2018

Farming systems methodology

- Objective: Development of farming systems which meet a combination of societal goals
  - Production, income, emissions, environmental quality
- Method
  - Analyse – Design – Test & Improve - Disseminate
  - At (semi) practical scale
- Yearly changes in strategy possible
- At experimental and commercial farms
- Combining all available agronomical knowledge
- Integrated and organic farming

Farming systems research Vredepeel from 1989

Farming Systems Research

PROEFSTATION

1989
2000
Development of integrated and organic farming systems

Telen met toekomst

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

2005
2008
Nutrients Waterproof: How to comply with the nitrate directive and WFD in arable farming and outdoor horticulture

Soil Quality on sandy soils

BETER BODEMBEHEER

2011
2020
Effects of soil management (input of organic matter, soil tillage) on ecosystem services (yield, nitrate leaching) in arable farming and vegetables

Farming systems in research (since 2001)

LOW

1000 kg EOM/ha/year

Mineral concentrates & chemical fertilizer

STANDARD

2000 kg EOM/ha/year

Pig & cow slurry and chemical fertilizer

ORGANIC

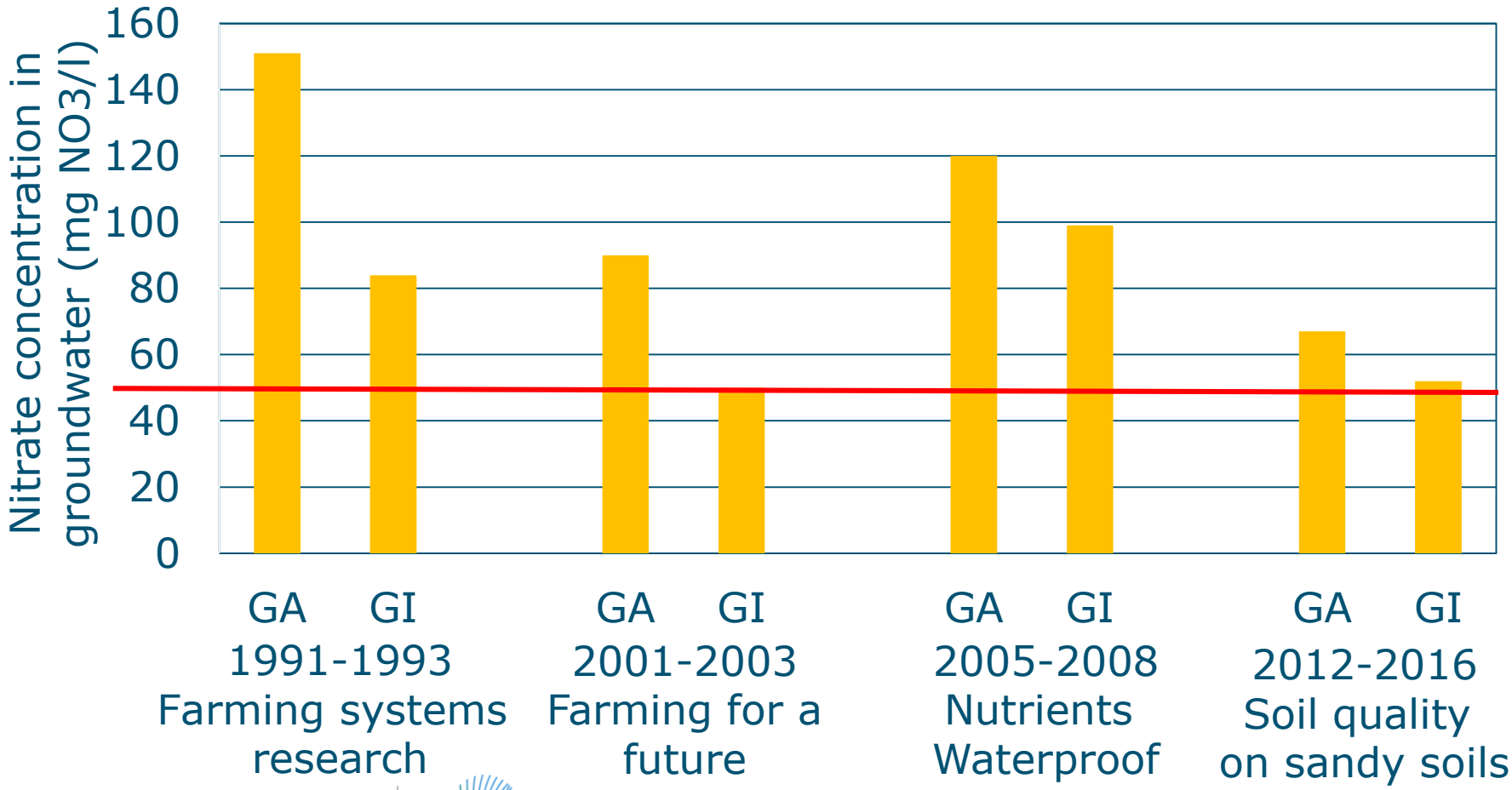
3000 kg EOM/ha/year

Farmyard manure, cow slurry & vinasse

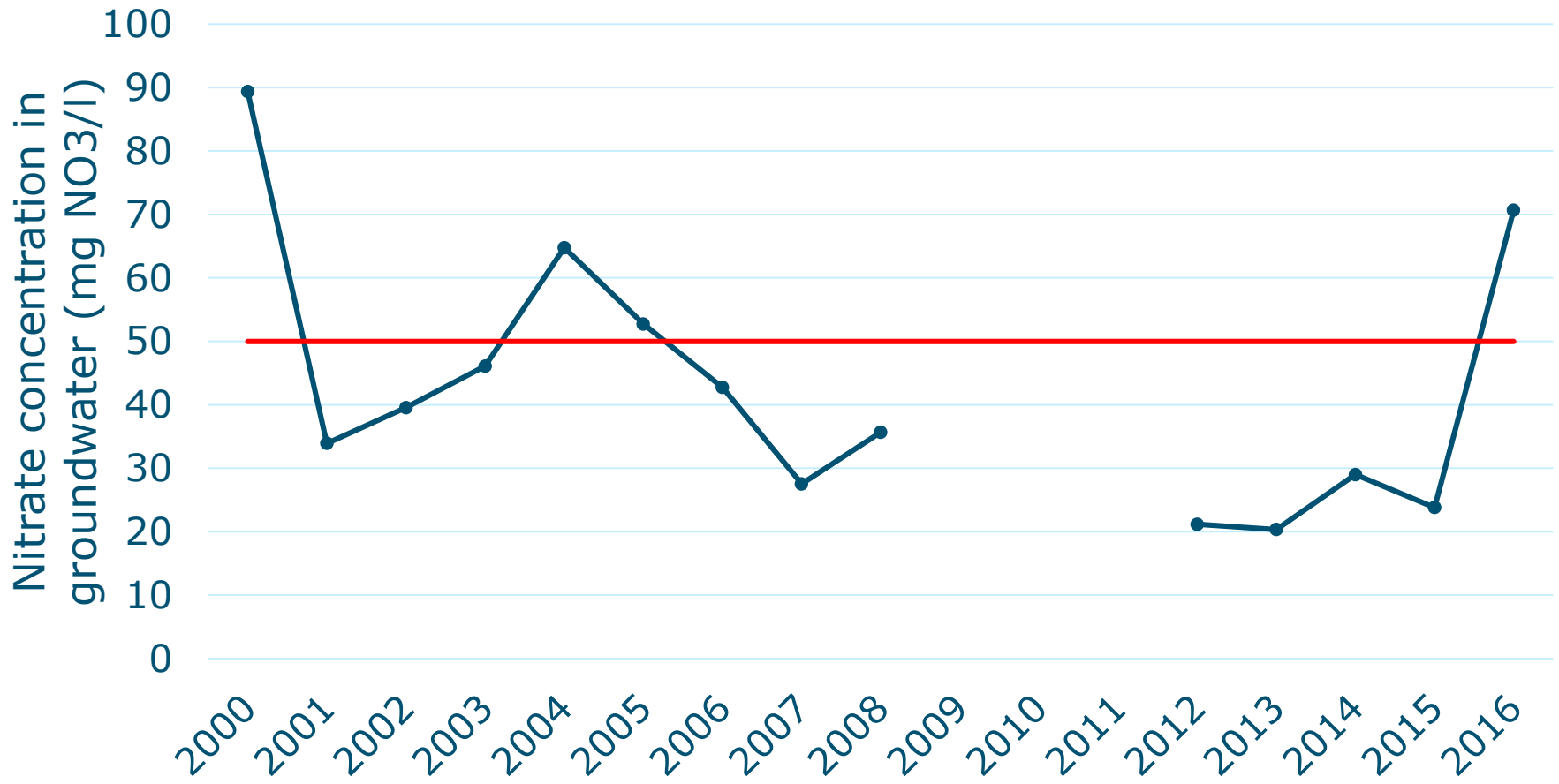
Since 2011 Compost plots on two fields per system

Since 2011 Comparison reduced tillage - ploughing

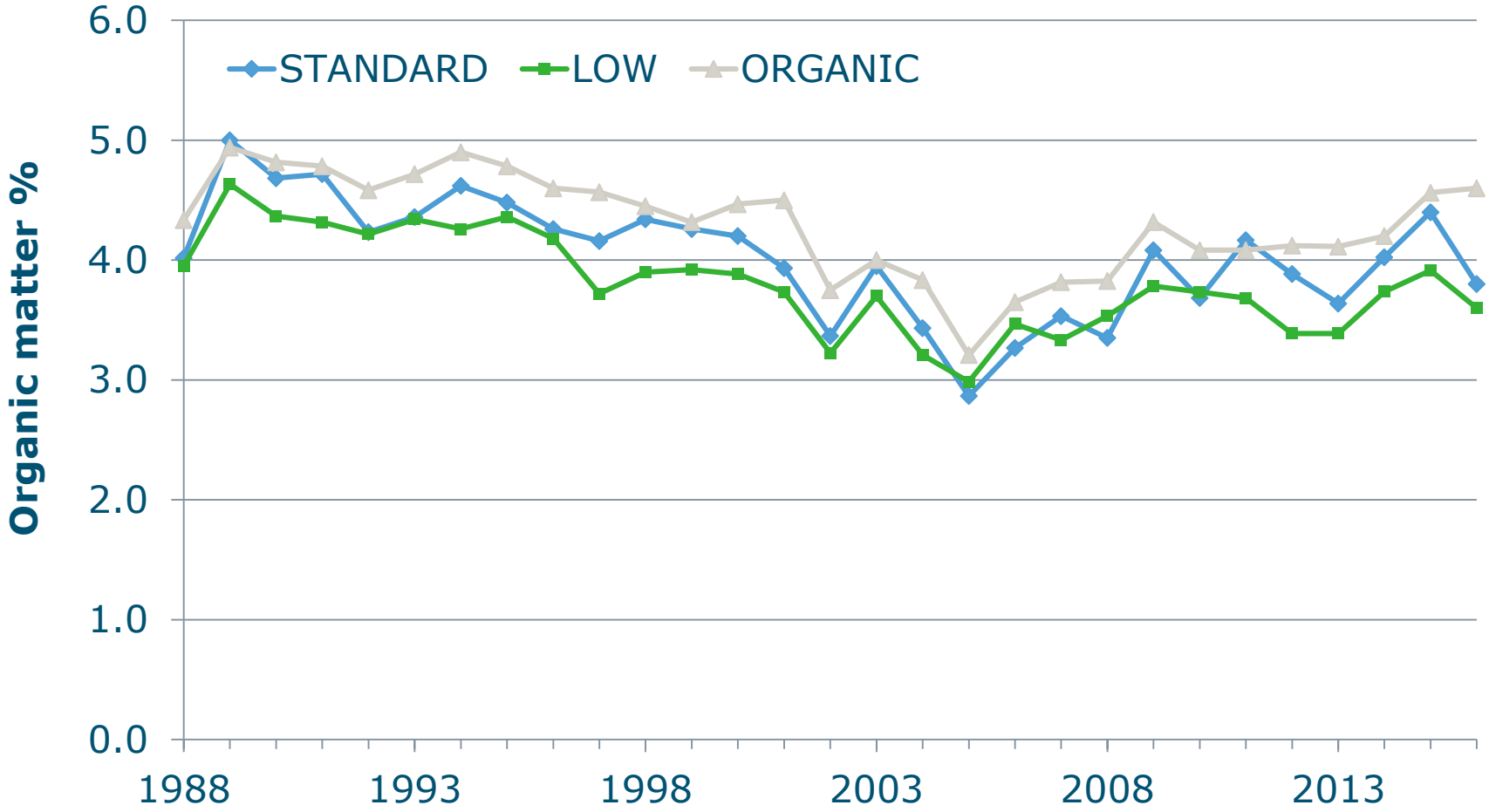
Nitrate concentrations in groundwater in various project periods (mg NO_3/l)



Nitrate concentrations in groundwater organic system (mg NO_3/l)



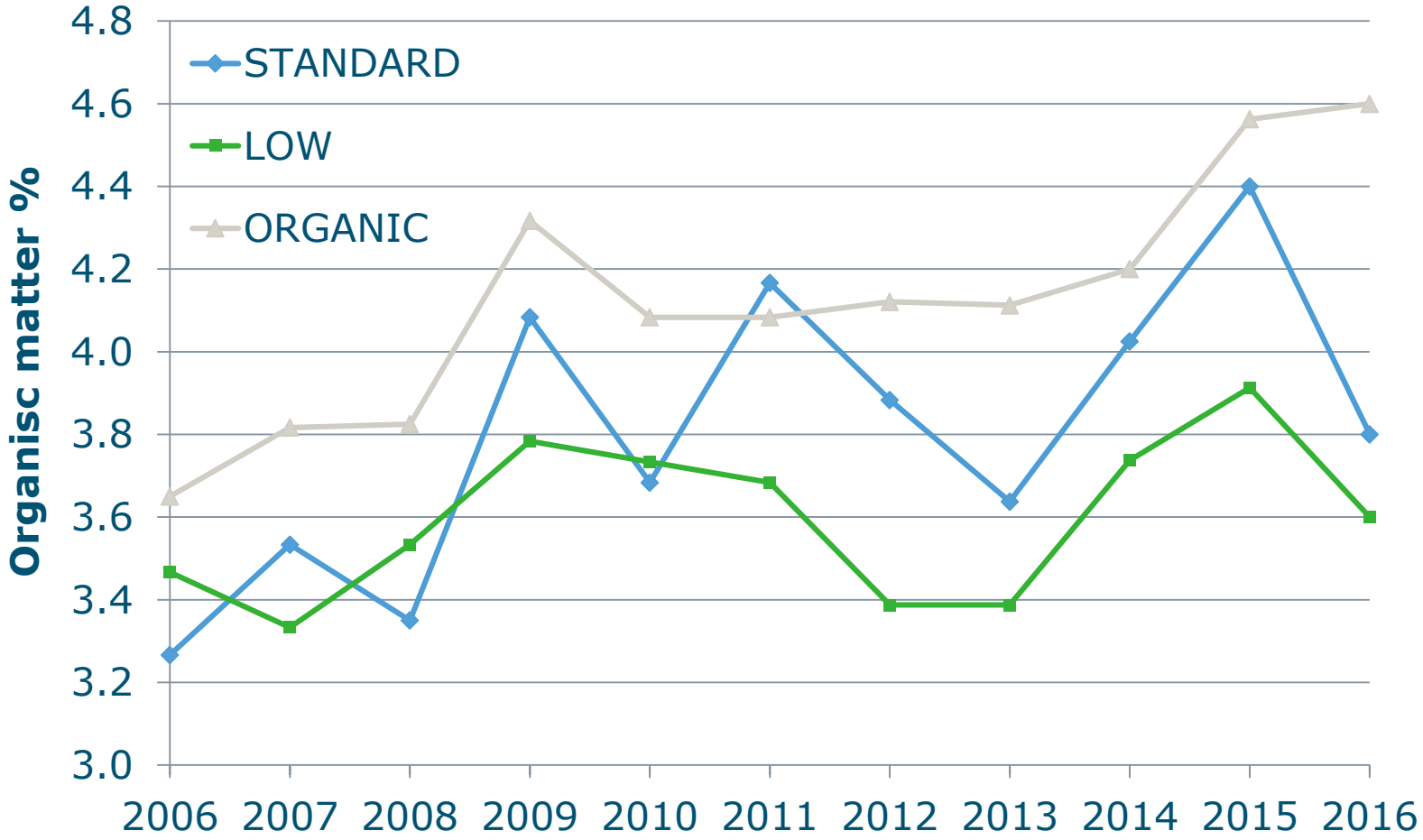
Trends in organic matter 2006-2016



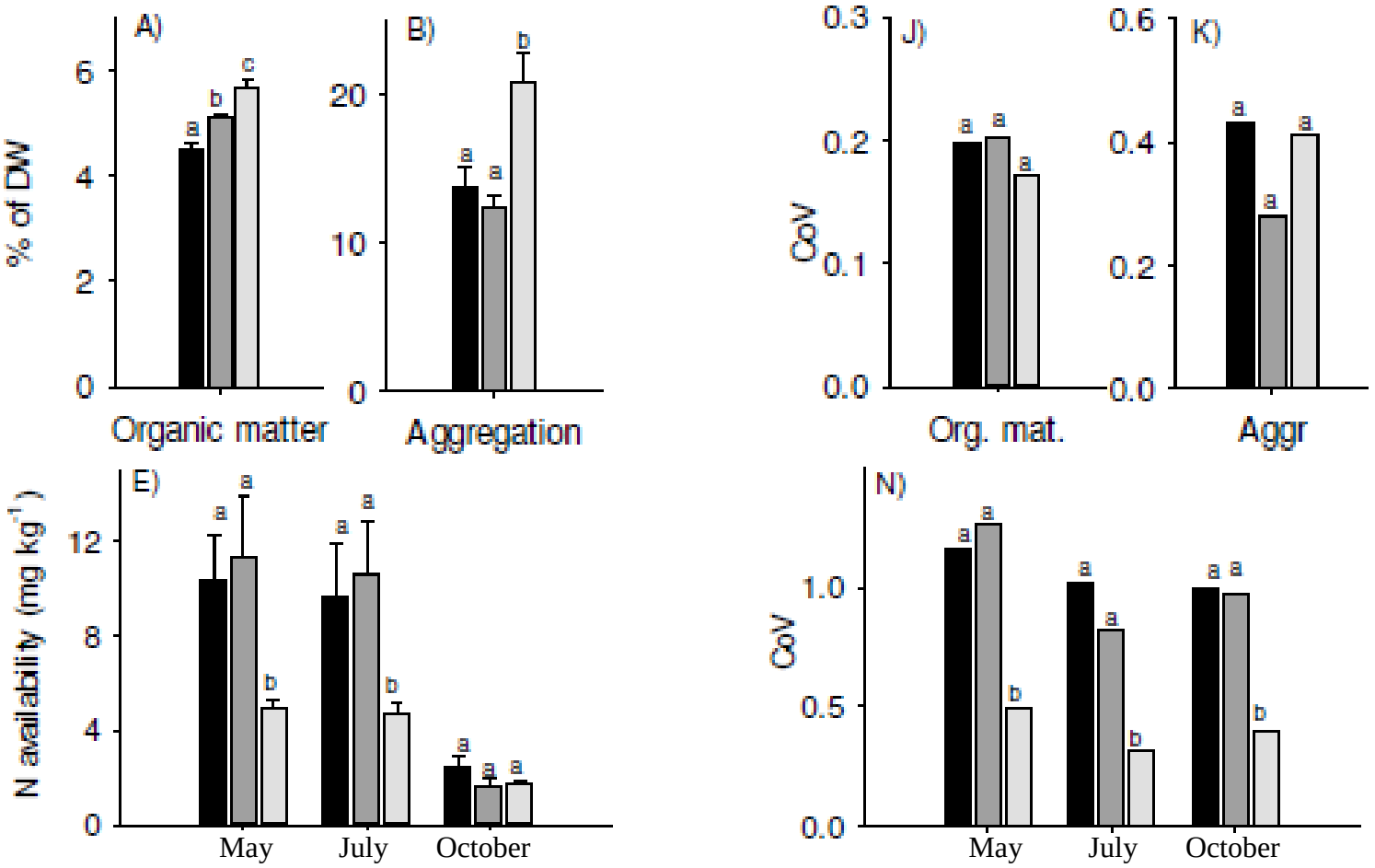
WAGENINGEN
UNIVERSITY & RESEARCH

100years
1918 — 2018

Trends in organic matter 2006-2016

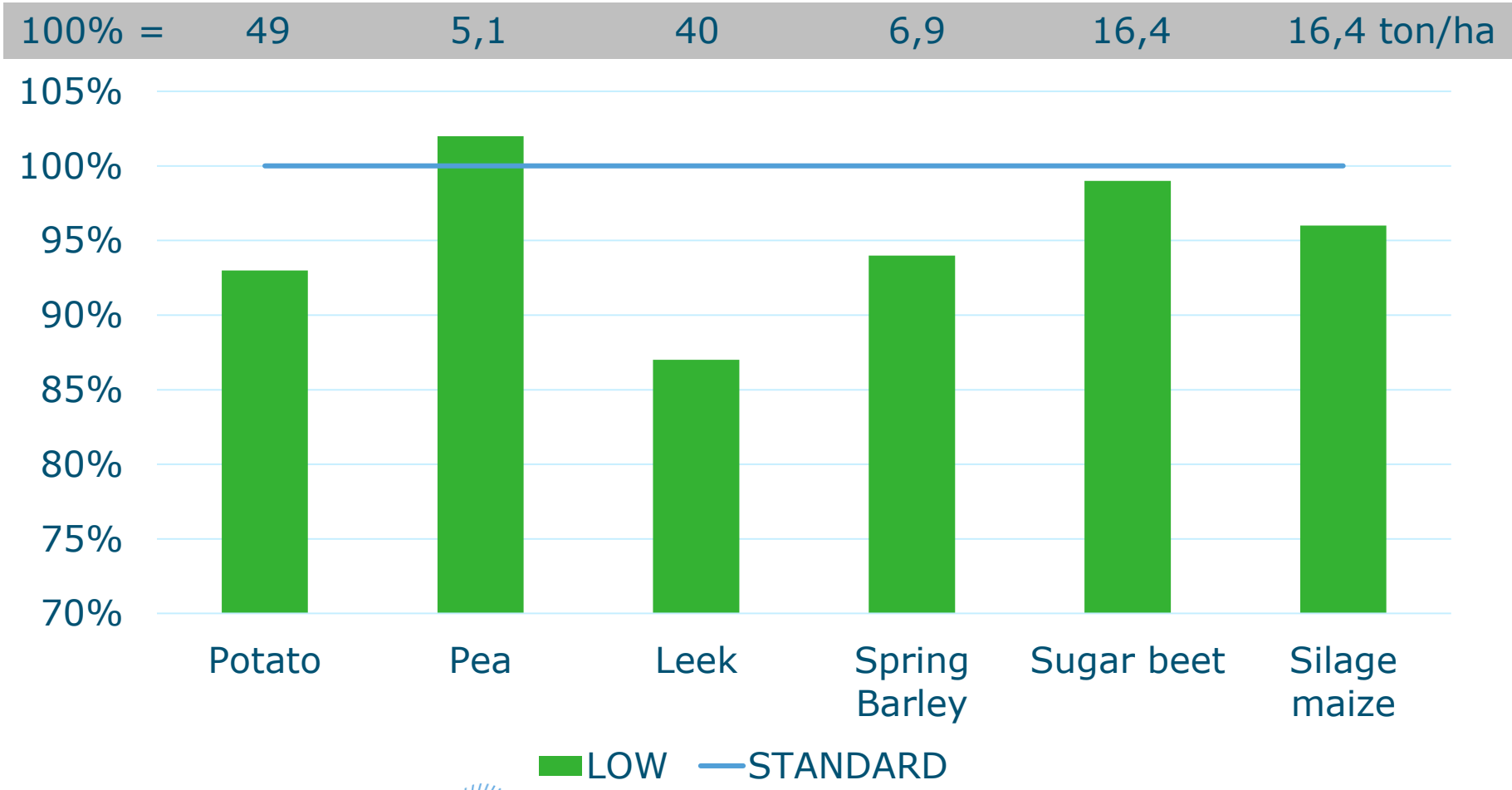


Differences in variation of soil parameters between systems



Schrama et al. 2018

Relative yield LOW compared to STANDARD 2011-2016



Value of organic matter (2011-2016)

- $Value\ EOM = \frac{\Delta\ Financial\ yield\ (STANDARD-LOW)}{\Delta\ EOM\ input\ (STANDARD\ -LOW)}$
- Average 0,54 €/kg EOM
  - Pea -0,05 €/kg EOM
  - Leek 2,24 €/kg EOM

- Value or organic matter in NL
  - Slurry negative
  - Compost 10 €/ton = ca 0,06 €/kg EOM
  - Green manure crop 1000 kg EOS/ha, 100 €/ha → ca. 0,10 €/kg EOS

Dissemination of knowledge to farmers

- Farmer networks
- Field days
- Demonstrations
- Workshops and presentations
- Flyers & brochures
- Articles

Telen met toekomst

Landbouw Centraal

Grondig boeren met maïs

STICHTING VELDLEEUWERIK

Thank you for your attention

WAGENINGEN
UNIVERSITY & RESEARCH

100years
1918 — 2018