Circular agriculture and sustainable soil management

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Challenges in European agriculture

- Reduce emissions to air and water
- Contribute to climate change mitigation
- Reduce use of primary resources (circular economy)

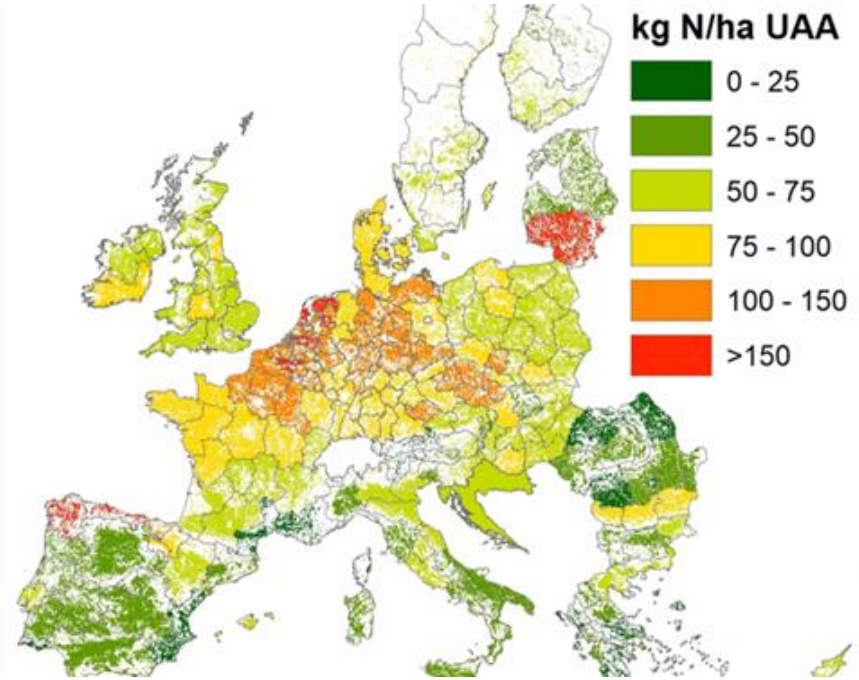
→ Sustainable soil management is key:

- Soil fertility and nutrient cycling
- Carbon sequestration in soils
- Water infiltration and retention

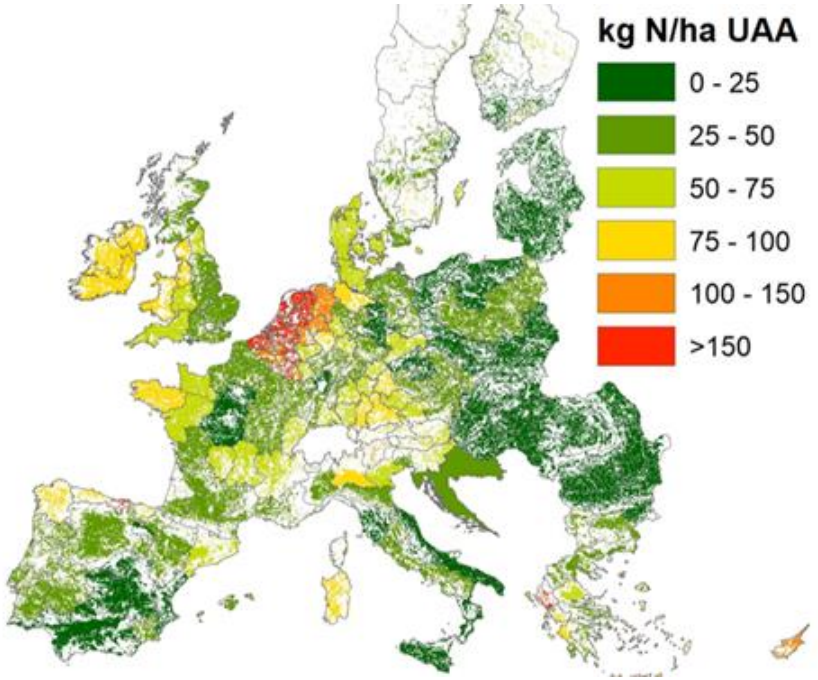


Nitrogen input to the soil

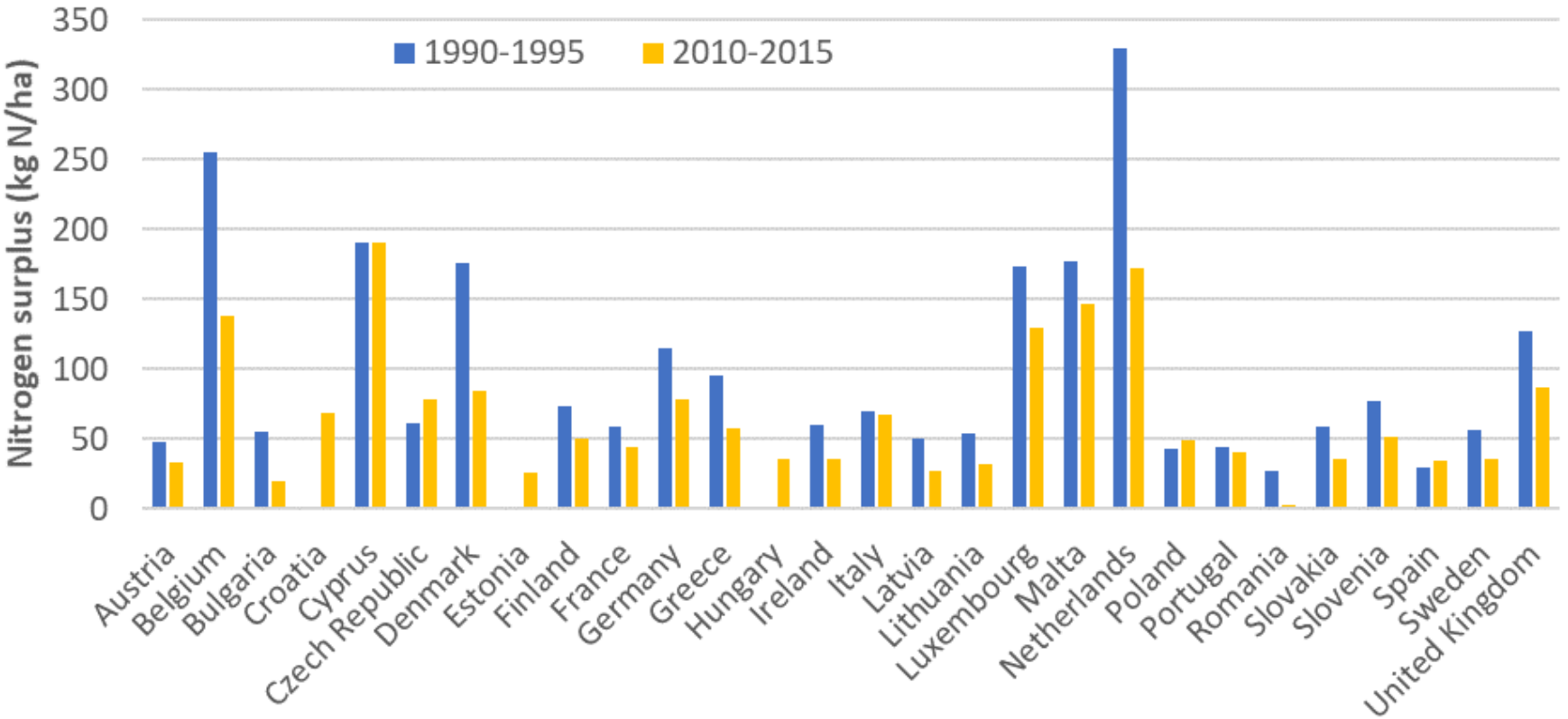
Mineral fertilizers



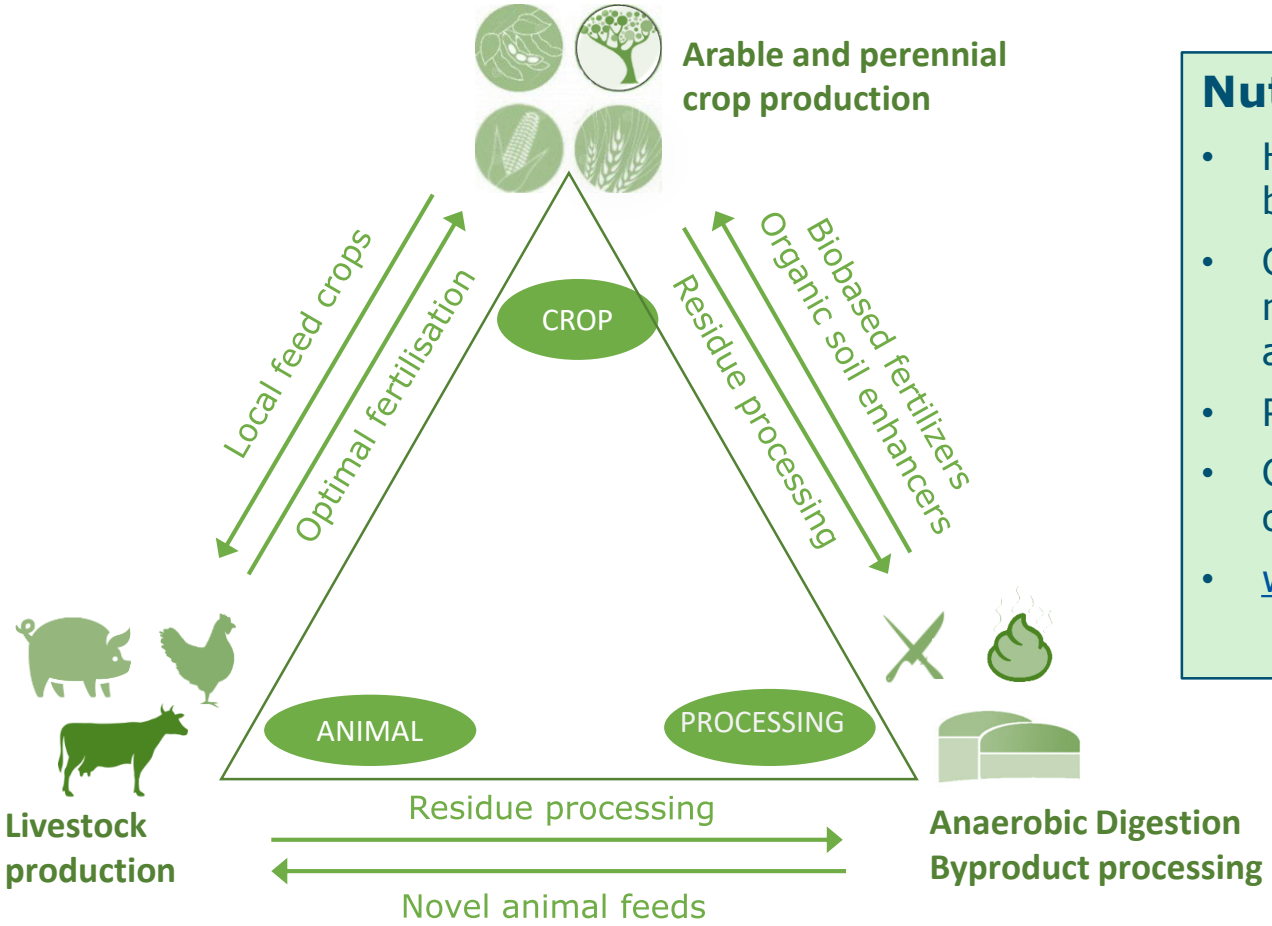
Animal manure



Nitrogen surplus EU countries



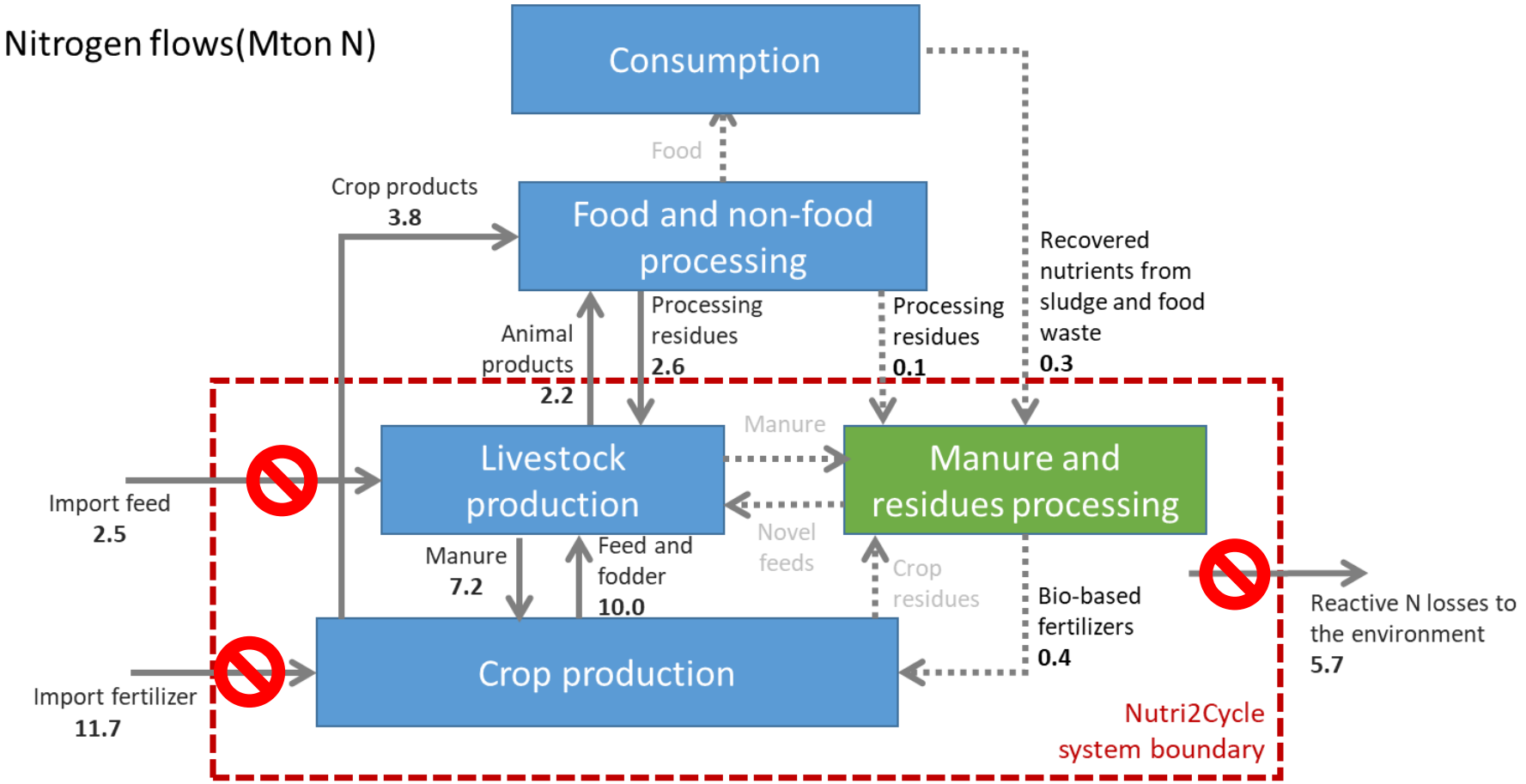
Nutri2Cycle project



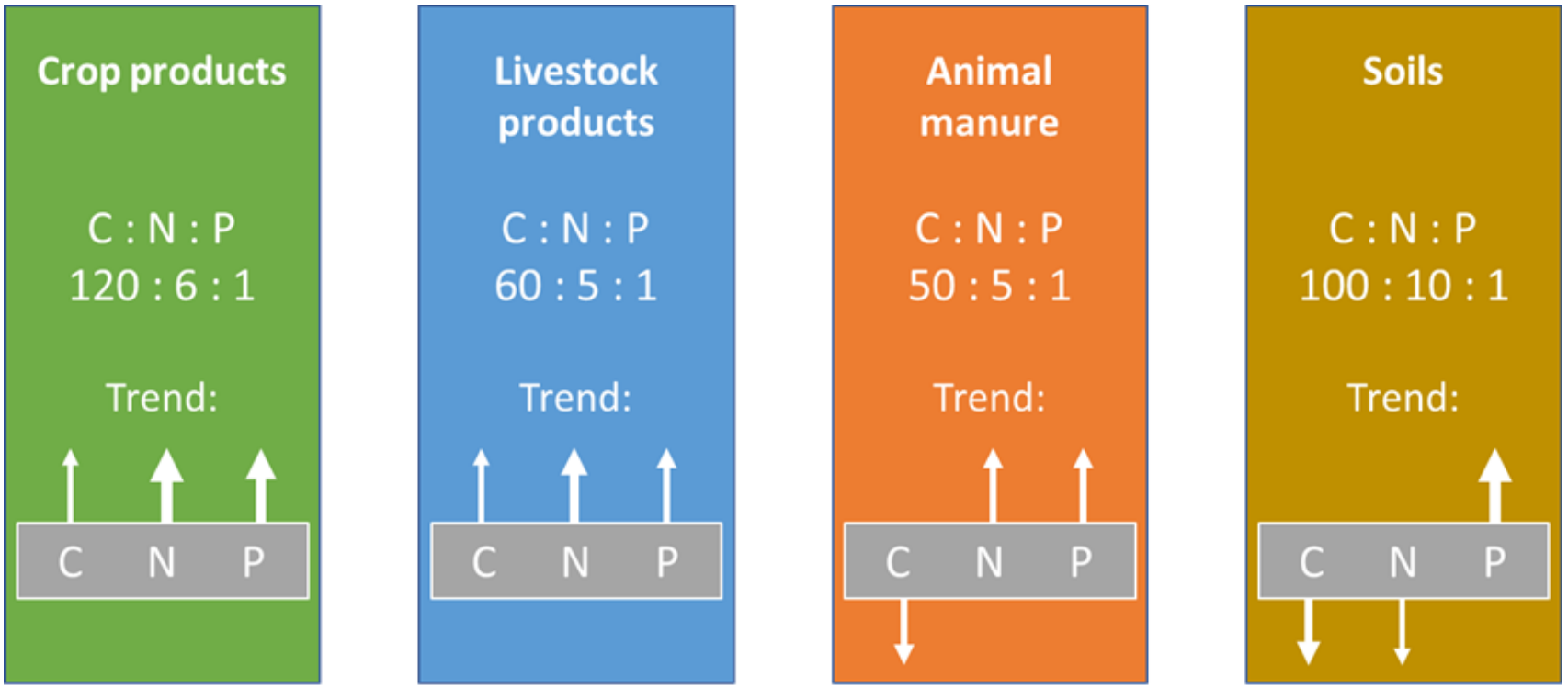
Nutri2Cycle

- H2020 project financed by European Commission
- Objective: Improve nutrient cycling in EU agriculture
- Period: 2018-2022
- Coordinated by University of Ghent
- www.nutri2cycle.eu

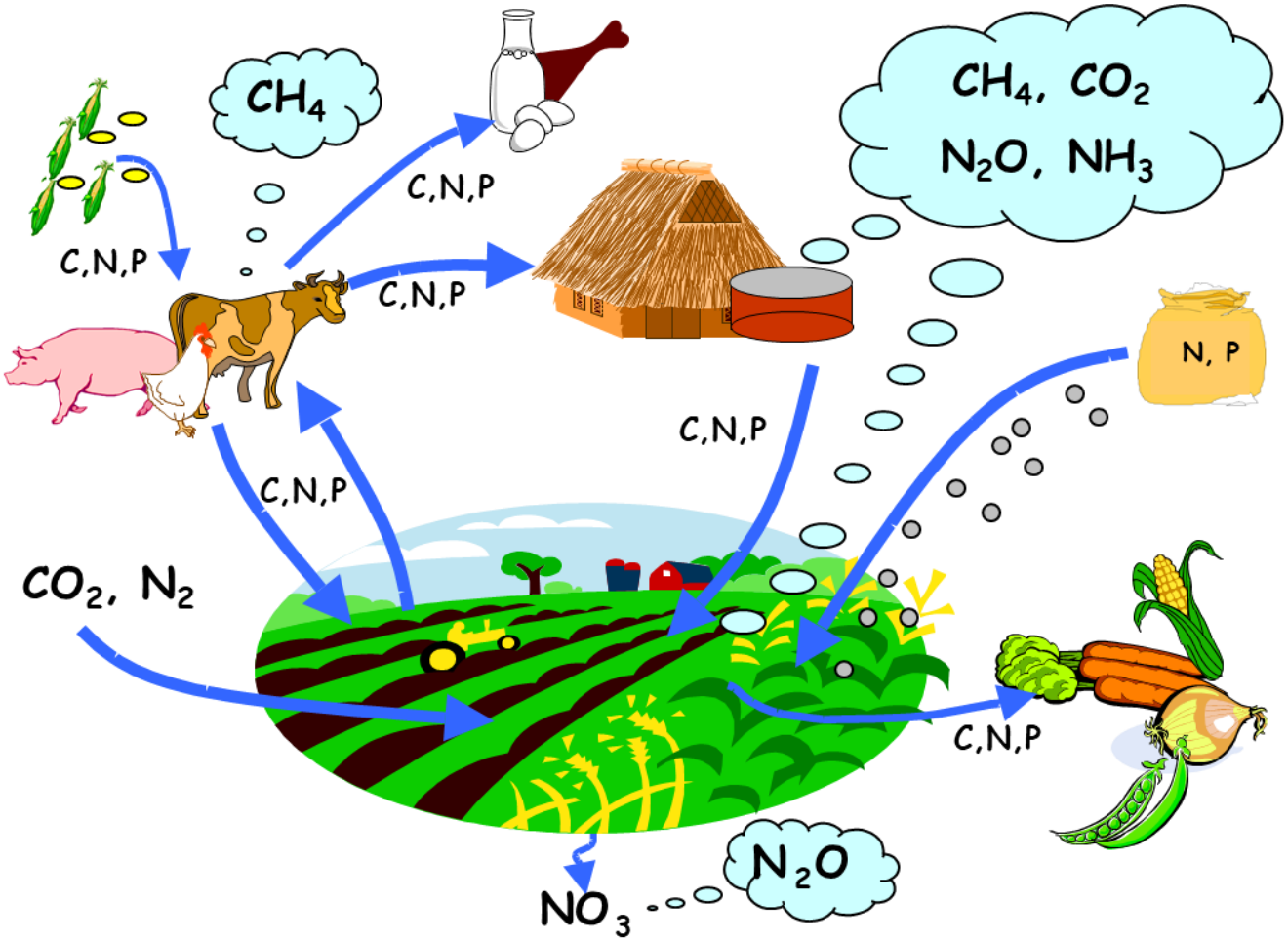
Nutrient flows in the EU food system



CNP stoichimetry in EU agriculture



CNP flows at farm level



Measure to improve circularity for farmers

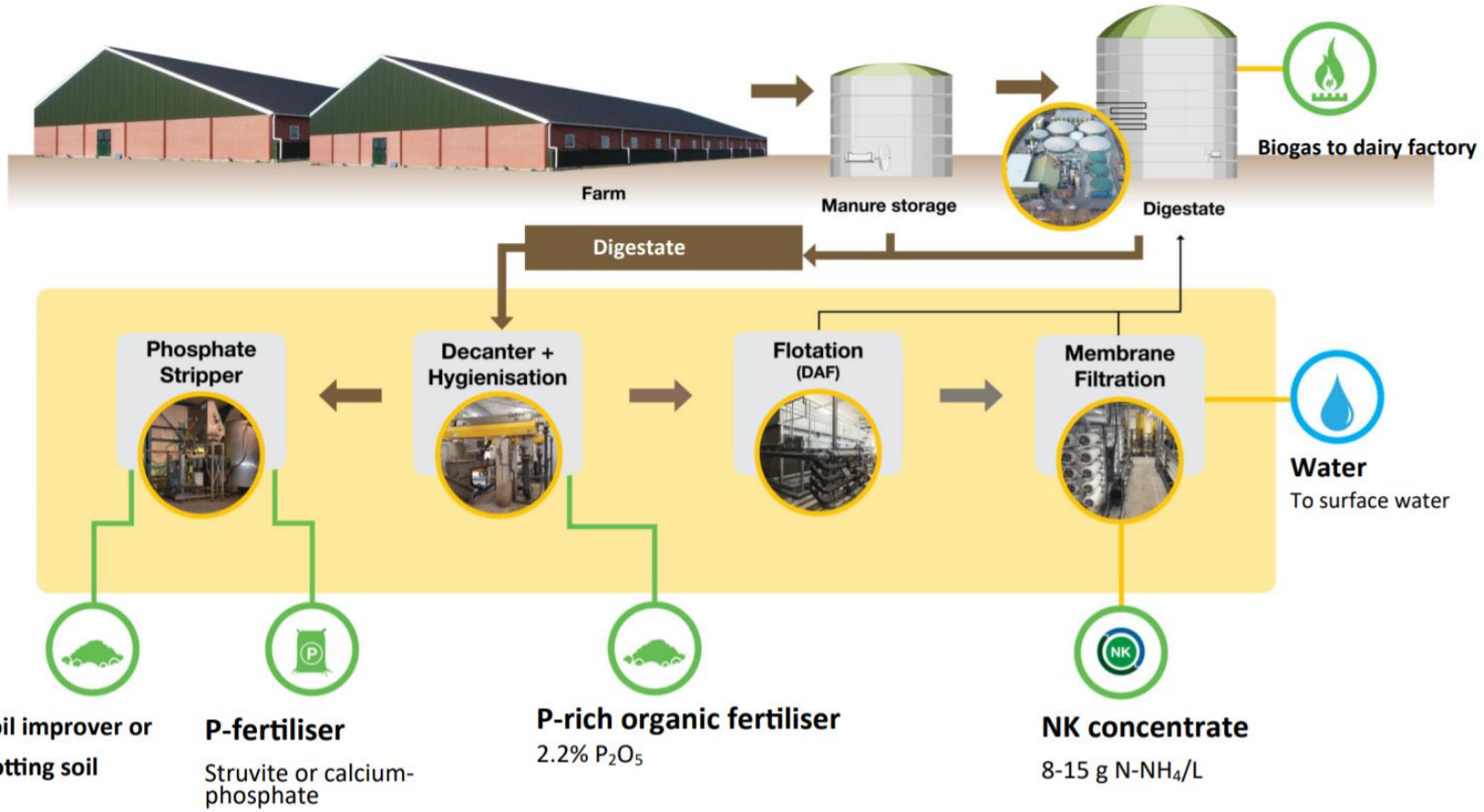
- Nutrient recovery from manure
  - Reduce export of manure
  - Improved use of nutrients
- Precision fertilisation
  - Improved crop yield
  - Improved nutrient use efficiency
- Increasing soil carbon
  - Dutch climate target for soil carbon sequestration
  - Soil carbon is key for other soil functions





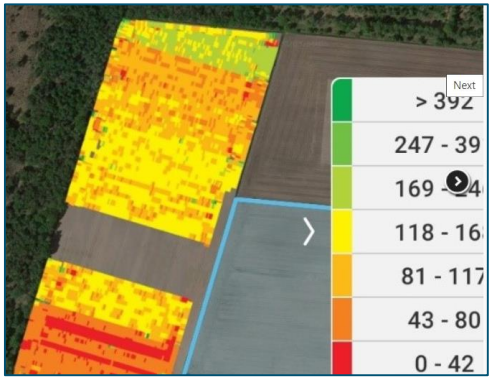
Nutrient recovery system

Systemic
Circular solutions for biowaste

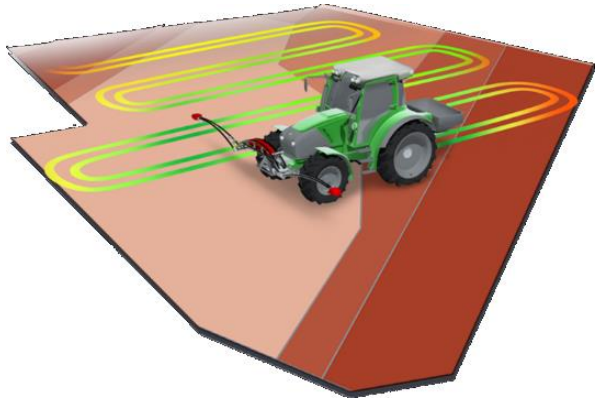


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Precision fertilization



- 4R Nutrient strategy: applying the right type, in the right rate, at the right time, and at the right place



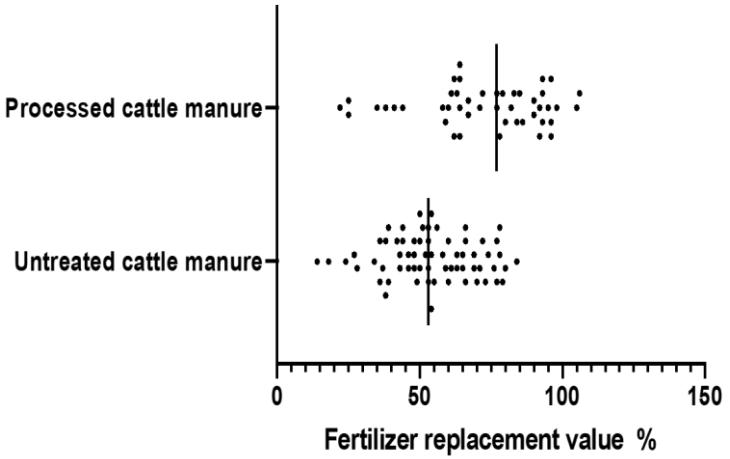
- Main measures:
  - Controlled traffic
  - Variable Rate Technology



- Pilot at Van den Borne Potato combining precision fertilisation and processed manure products

Pilot with processed manure products

- Test fertilizer replacement value in pot and field experiment
- 3 products from pig manure:
  - Liquid fraction
  - K concentrate
  - Scrubbing salt (high N)
- First results: no significant difference between chemical and bio-based fertilizers for plant height





Soil carbon measures

- Less soil disturbance (reduced tillage, maintain permanent grassland)
- More plant residues (cover crop, green manure, incorporate straw, improved crop rotation)
- Addition of external organic matter (animal manure, compost, other organic soil improvers)
- Perennial crops and agroforestry
- Increase waterlevel in peat soils (sub-merged drainage, paludiculture)



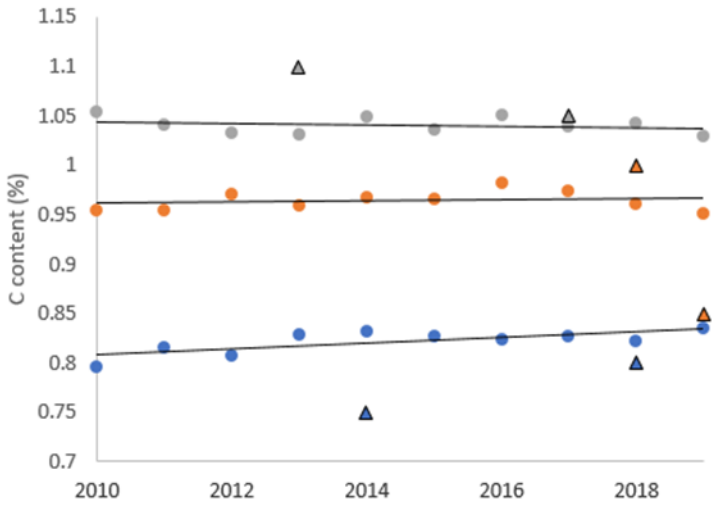




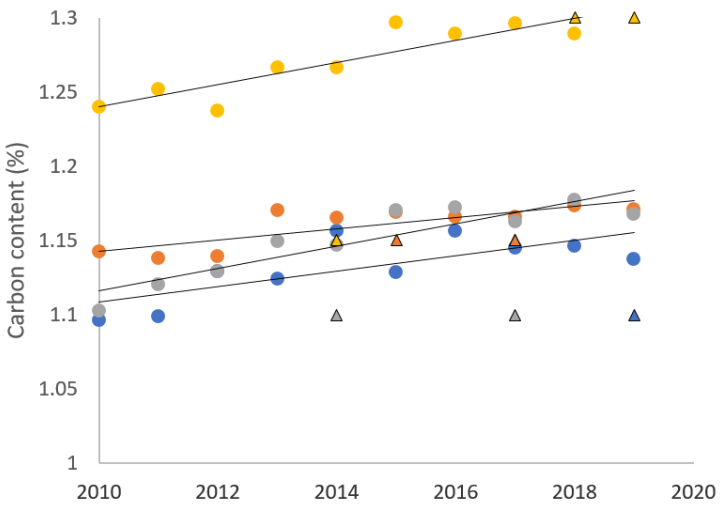
Soil Heroes initiative

- Platform for promoting **regenerative agriculture** by providing farmers with financial incentive and offering buyers a reliable way to become planet positive.

Conventional



Regenerative since 2010



Final remarks

- No single solution, region and farm specific measures are required
- Importance of soils now more widely recognised by farmers and in policy initiatives. Next step is how to come to individual advice. Monitoring will become much more important.
- What are the incentives for farmers?
  - Post 2020 Common Agricultural Policy will include new options: Climate measures, eco-schemes, ...
  - Value chain initiatives, labelling, (carbon) credit systems
  - Consumers willing to pay higher prices?

Questions?



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