SOMEBODY IN BELGIUM...
A DYNAMIC FARMERS’ NETWORK
A CONTRIBUTION TO ES DELIVERY?

Agroecological systems

- Food production
- Flood protection
- Water quality
- Landscape aesthetics
- Nitrogen cycle
- Pollination
- Pest control
- Erosion protection
A CONTRIBUTION TO ES DELIVERY?

Conventionnal systems

- Food production
- Water quality
- Landscape aesthetics
- Pest control
- Erosion protection
- Nitrogen cycle
- Pollination
- Flood protection
CONTRIBUTION OF AGROECOLOGICAL SYSTEMS TO THE DELIVERY OF ECOSYSTEM SERVICES

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STUDY DESIGN

Landscape 1  Landscape 2  Landscape 3
INTEGRATED ECOSYSTEM SERVICE ASSESSMENT

Ecosystems & Biodiversity

Structure & Processes → Functions → Services

Biophysical ES assessment

Humans

Benefits → Values

Social ES valuation

Functions → Services

Structure & Processes

Biophysical ES assessment
FOOD PRODUCTION

• Cereal production
  • Quantity (t/ha)
  • Quality (tbc)
PEST CONTROL

• Predation rate = (#mummies/#mummies + #aphids)

(e.g. Roschewitz et al. 2005, Balzan and Moonon 2013)
PEST CONTROL

Statistics: R - glm and Tukey test
SOIL FERTILITY

• Organic matter degradation rate
  - Bait lamina stick
  - Tea bag index

  ➔ Macro-organisms activity

  ➔ Micro-organisms activity

(e.g. Van Gestel 2003)

(Keuskamp et al. 2013)
SOIL FERTILITY

Bait lamina test

Landscape 1
AE
CONV

Landscape 2
AE
CONV

Statistics: R – glm & Tukey test
SOIL FERTILITY

• Soil respiration
  
  \[ \text{NaOH electrical conductivity} \]

\[ 2\text{NaOH} + \text{CO}_2 \rightarrow \text{Na}_2\text{CO}_3 + \text{H}_2\text{O} \]

(e.g. Fontaine et al. 2007)
SOIL FERTILITY – SOIL RESPIRATION

Pval = 4.31e-12 ***
EROSION PROTECTION

- Structural stability of soil aggregates

(Herrick et al. 2001)
EROSION PROTECTION

Average stability score

Landscape 1

AE: a
CONV: b

Landscape 2

AE: a
CONV: c

Statistics: R – Kruskal Wallis test + post hoc Nemenyi test
OTHER ES INCLUDED

✓ Flood protection ➔ permeametre
✓ Soil formation ➔ worm’s density, biomass, diversity
✓ Water quality ➔ nitrate potentially leaching
✓ Soil fertility
  • Cation exchange capacity
  • Base saturation rate
  • Total organic C content (labile and stable pool)
✓ Aesthetic landscape ➔ Presence, size and connectivity between appreciated landscape elements (UAV)