

Restoring value to grasslands

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Seminar "Resource-use Efficiency: Implications for the Sustainability and Competitiveness of the European Livestock Sector" (Brussels, November 7th 2012)

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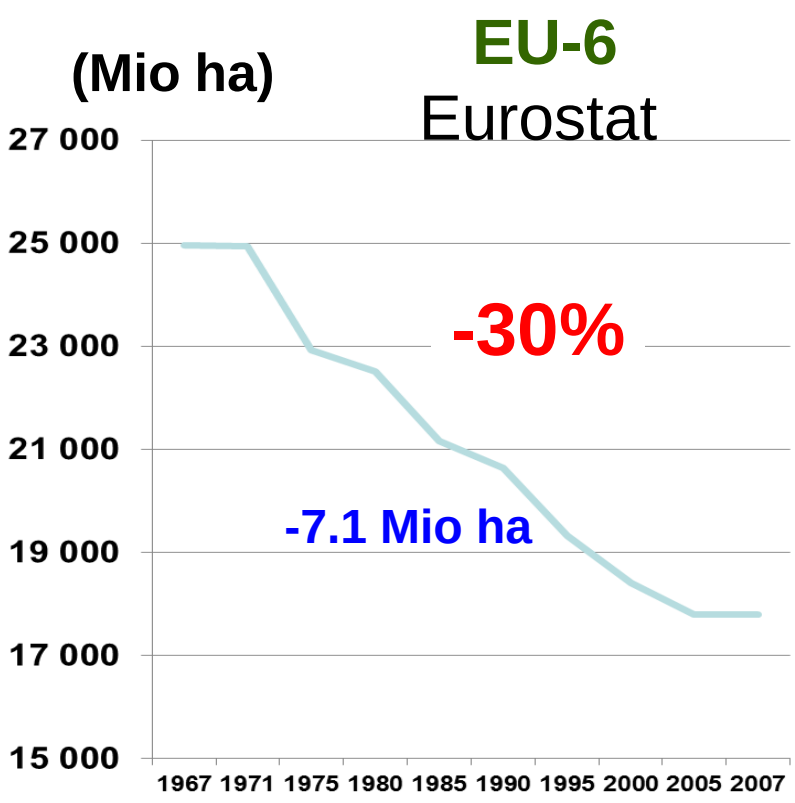
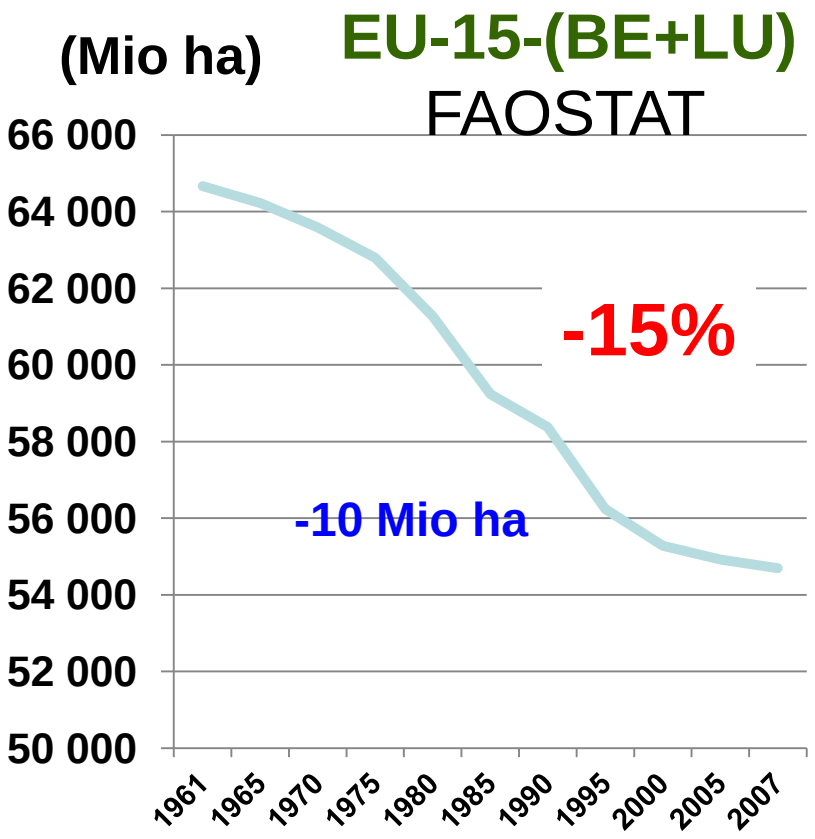
MULTI-SPECIES SWARDS AND MULTI SCALE STRATEGIES FOR MULTIFUNCTIONAL GRASSLAND-BASED RUMINANT PRODUCTION SYSTEMS

Evolution of the permanent grassland area





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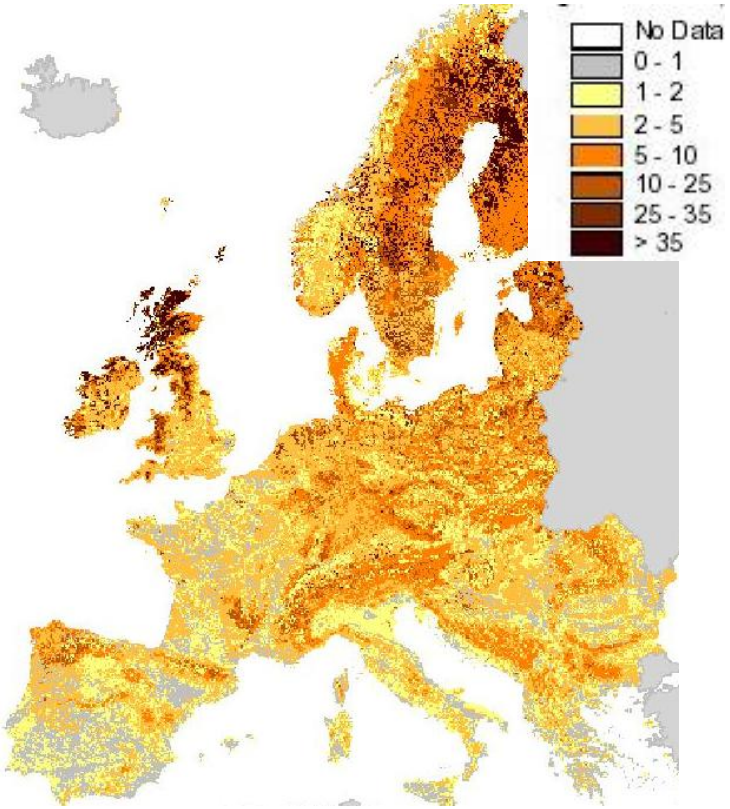
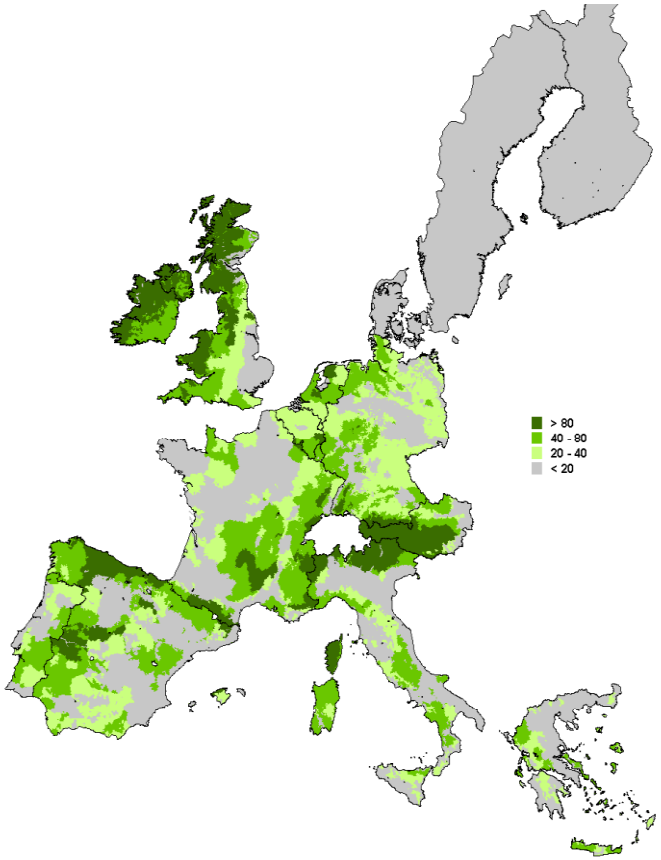
SOC content is higher under grassland





France

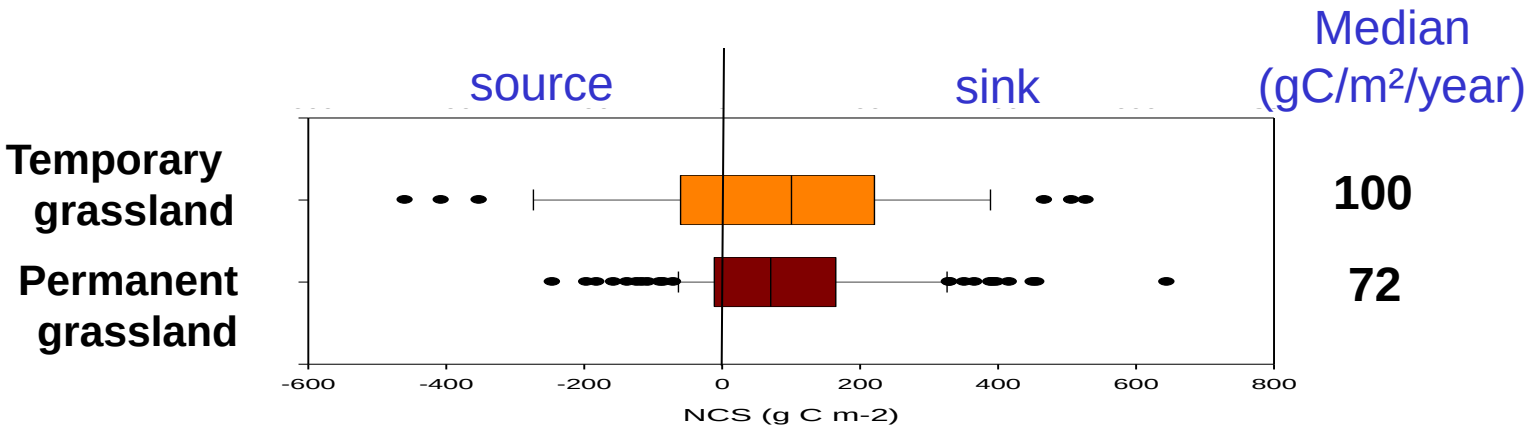
Cropland	**40 t SOC/ha**
Grassland	**70 t SOC/ha**

Dynamics of C flow under grassland and crop land

Land Use Change for European soils,

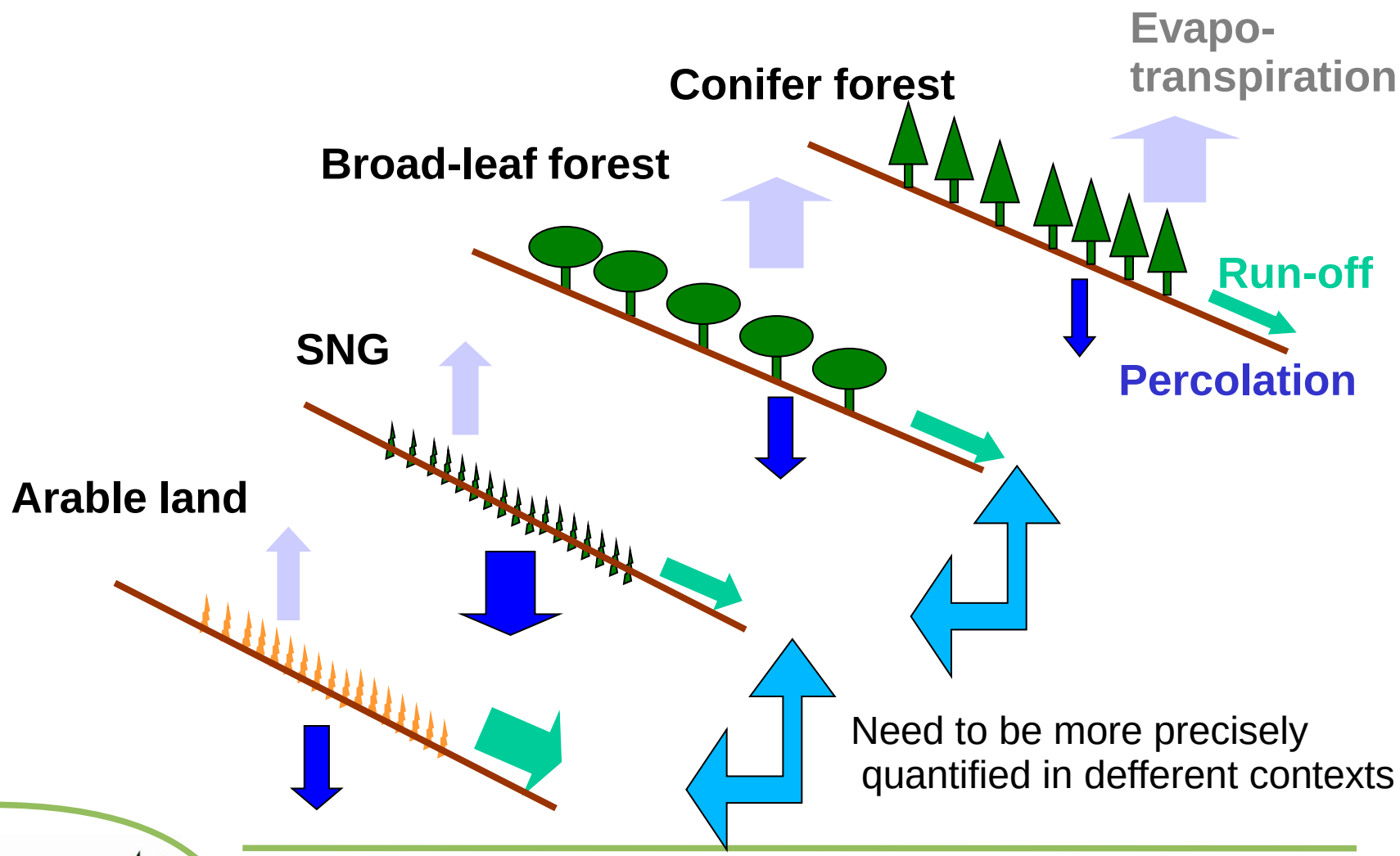
- Conversion of arable land to grassland leads to an estimated increase of Soil Organic Content of 1.44 t C/ha/yr
- Existing grasslands still build up SOC at a rate of 0.52 t/ha/yr
- Arable lands lose SOC at a rate of -0.84 ton C/ha/yr

(Vleeshouwers & Verhagen, 2002).



CarboEurope, GHG-Europe project, (Klumpp , Soussana et al)
38 Eu sites during 3 to 8 years

Water flows according to land use



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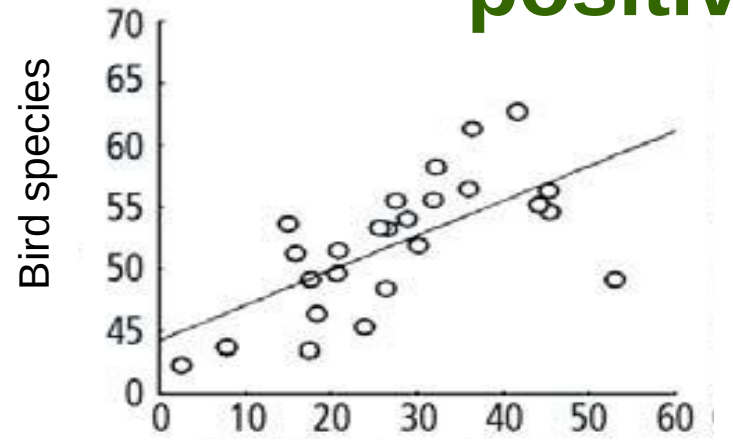
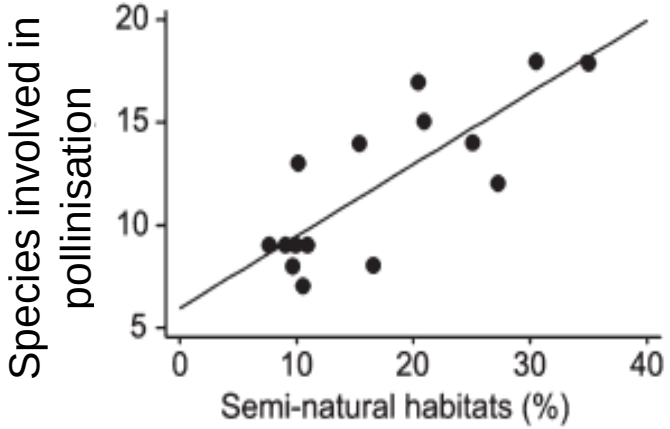
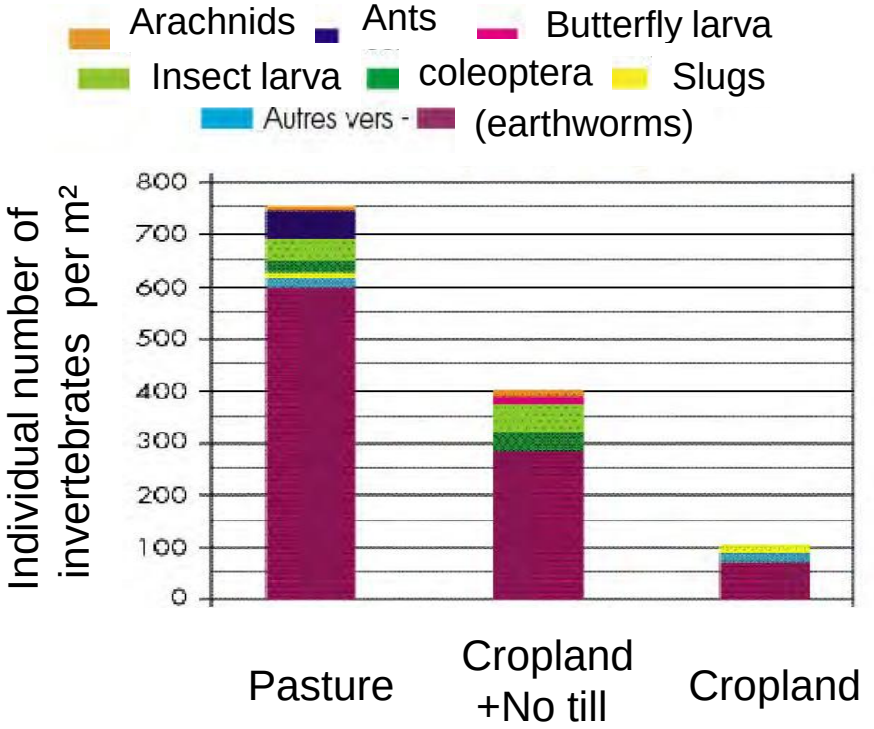
(Semi-natural) grasslands contribute positively to the biodiversity



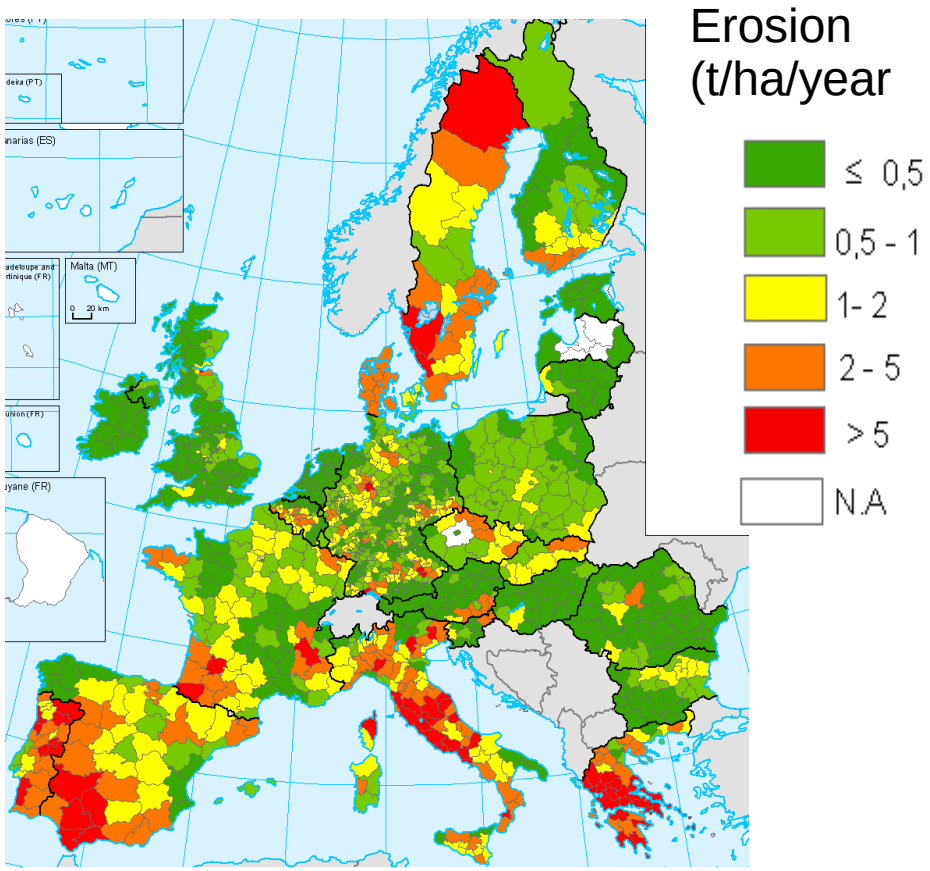




Integration of perennial crop in rotations increase the specific wealth and abundance of invertebrates

Billeter et al (2008)

Grassland reduces the risk of soil erosion

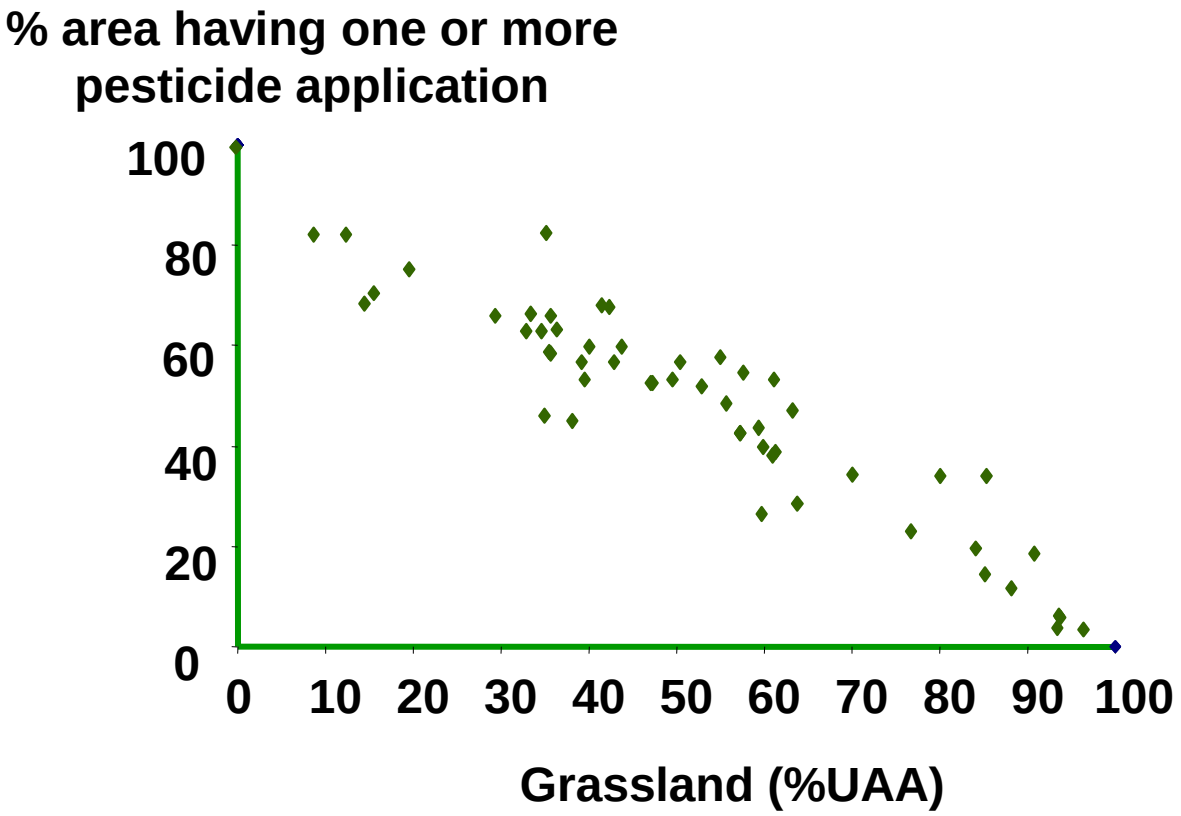


EU = 1,5 t/ha/year
Grassland: 0,3 t/ha/year
Cropland: 3,6 t/ha/year

Permanent soil cover
Dense root system

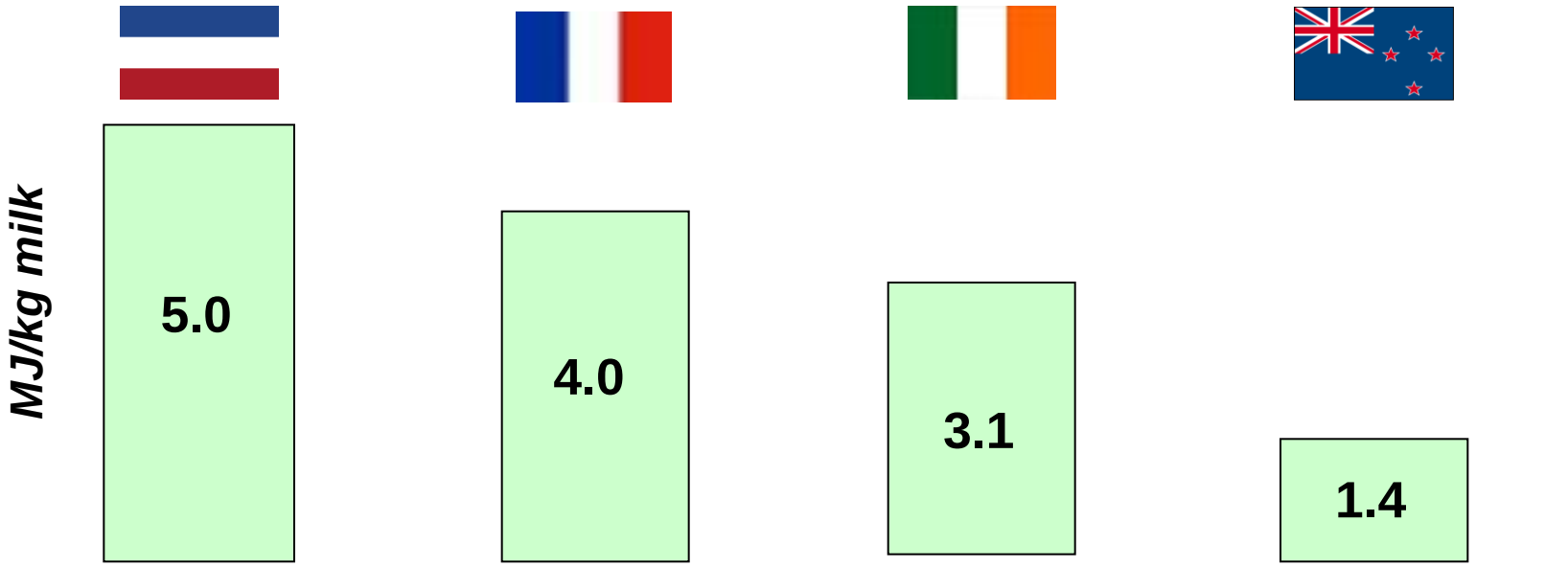
Cerdan et al. (2010)
Multisward (delivrable 1.1)

Grassland contributes to reduce the use of pesticides



(Raison et al., 2008), Greendairy project

Grassland-based systems consume less non-renewable energy



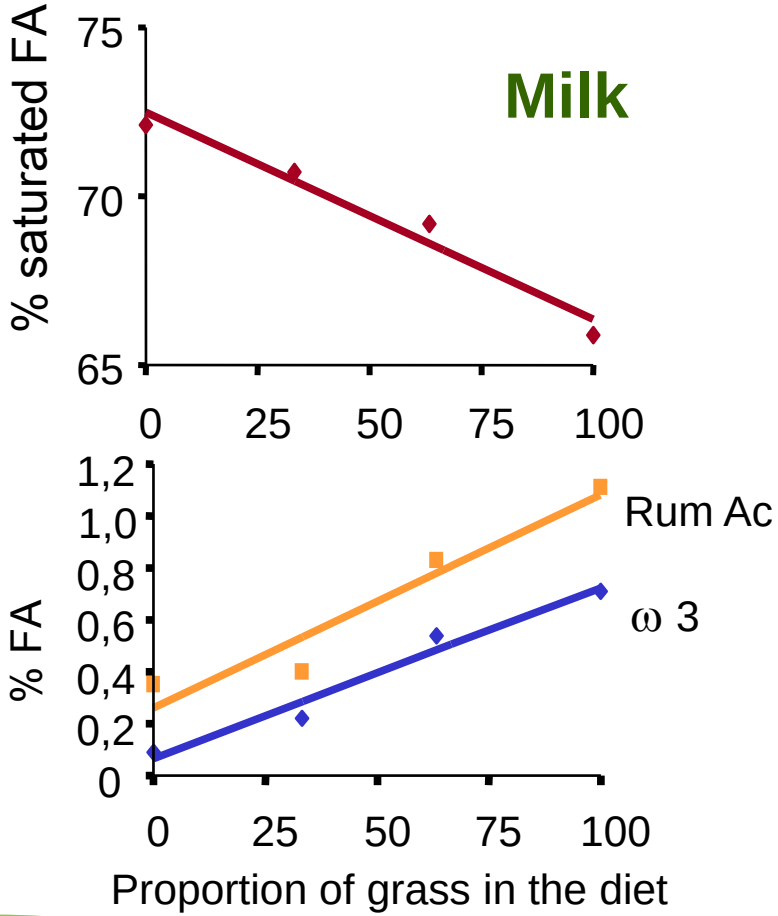
Le Gall et al., 2009

Most significant public goods associated with EU agriculture

	Arable land	Intensive grassland	SNG	Forest
Agricultural landscapes	+	++	+++	+
Farmland biodiversity	+/- -	+	+++	- - -
Water quality	- - -	- -	+++	+++
Water availability	-	++	+++	- -/+
Climate stability / C storage	- -	+	++	+++
Control of GHG emissions	-	0/-	+	+++
Air quality	-	+	++	+++
Resilience to flooding	- -	+	+++	+/-
Resilience to fire	+++	+++	+++	- - - /+

Grassland contributes positively to the quality of animal product

Milk



(Couvreur et al., 2006)

Meat

Compared with grain-fed beef, grass-fed beef is

- Lower in total fat (1/4 to 1/3)
- Lower in saturated fatty acids
- Higher in total omega-3
- Healthier ratio of ω6 to ω3 FA (1.7 *vs* 5 to14)
- Higher in CLA (cis-9 trans-11)

(Duckett *et al.,* 2009)

Grassland and legumes based systems increase protein self-sufficiency

Imports of soybean meal

- EU-27 net imports = 32 Mt SBM equivalent to
  - 19 M ha of 'virtual land' (2007-8) (Witzke and Noleppa 2010)
  - 25% of grassland area on CP basis (Swolfs 2011, Peeters)

Atmospheric N fixation vs mineral N utilisation

- 180 à 200 (peas), 150 à 250 (white clover), 350 (Lucerne) kg N/ha
  (Peeters, 2006; Vertès et al., 2010)

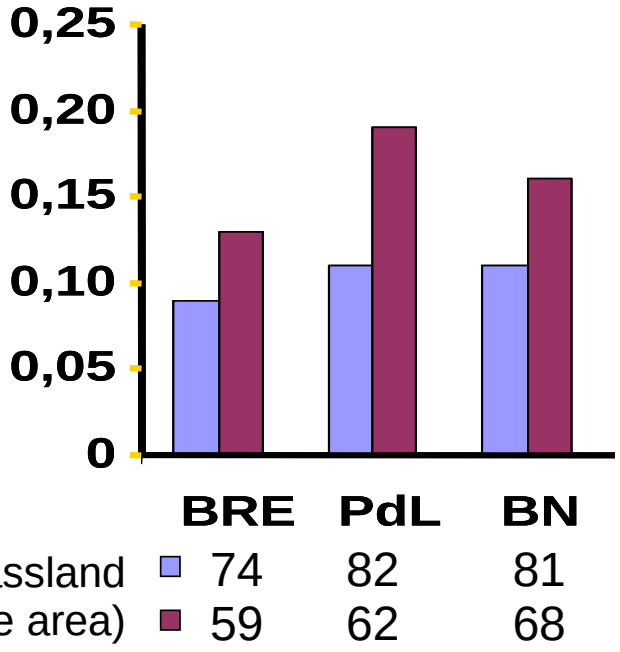
Reduction of the use of soybean meal (Peyraud *et al.* 2009 for synthesis)

- Tall legumes are good complements to maize silage
  MS + 5 kg alfalfa (red clover) silage = - 2 kg SBM for similar milk yield
- Milk yield is higher on WC-PRG pasture than on PRG pasture

Dairy systems based on grazing are competitive

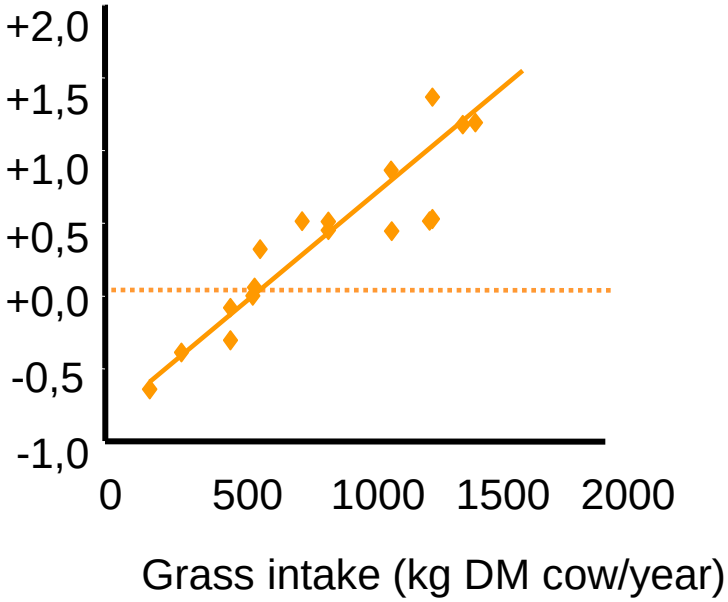
FADN data

Production cost (€/L)



(Samson et al., 2011)

Net income difference between grazing and indoor feeding (€/100 kg milk)



(Van den Pol-van Dasselaar , EGF 2010)

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SWOT analysis of grassland vs Maize

Strength

- Low production costs
- Positive/very positive effect on biodiversity
- Soil and water protection (N, pesticides, permanent soil cover, C storage)
- Consumption of fossil energy
- Protein self sufficiency
- Pillar of organic farming (+ PDO products)
- Healthier and more tasty meat and dairy products

Weakness

- Management (grazing, weather conditions at harvest)
- Relatively low productivity
- Forage quality / high animal demand
- Relative high cost for silage making
- Risk of nitrate losses under Intensively managed temporary grassland

Opportunities

- Greening component of the CAP reform
- Social demand and political willingness / environment
- Increase price of fossil energy
- Meat and dairy products world market

Threats

- Reduction of agricultural support
- Reduction of the rural development policy
- Agro-fuel vs grassland
- High price of cereals
- Consumption of beef and sheep
- Accuracy of C accounting methodology

Challenges for research

Challenges for EU farming systems

- Less fossil energy demanding and more efficient converter of resources / increase of fossil fuel prices
- Environmental impact, environmental services and animal welfare / Societal acceptance of ruminant production systems:
- Competitiveness and resilience / price volatility

Progress

- A new integration of grassland and arable land at the farm and/or the region levels : management for maximising benefits
- N fixation by legumes : yield, management of rotation, benefits for animals
- The right cow for the right system
- A special effort by livestock systems: less energy efficient than arable systems per kg of food produced / production of other services
- Political and economical tools to facilitate transitions: Cost of public policy, implication of all the food chain actors



Thank you



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