Developing win-win outcomes across a range of grassland-based livestock farming systems

Preliminary results of collective expertise ‘Roles, impacts and services provided by livestock in Europe’

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Why to look for win-win outcomes in grassland-based LFS?

- Livestock farming systems undeniably contribute to improving human condition (proteins, income, social roles), but are regarded as a major cause of world’s most pressing environmental problems.

- Grassland-based systems limit competition with human food supply and provide products with + image and high nutritional Q.

- Grassland-based systems provide a large number of regulating and cultural services, and are more likely to lead to some win-win outcomes.
Where are European grassland-based territories?

LU/ha

Source: Eurostat 2010 at NUTS3 scale

Thresholds based on expert view, so that outcomes also match the ‘services provided by livestock’ map proposed for France by Ryschawy et al. (2015)
Grassland-based territories across Europe

Map by Jonathan Hercule, INRA DEPE, Paris
Four territories along an animal density gradient

- **Crop & Livestock**
- **High Animal Density**
- **Low Animal Density**
- **Grassland-based**
- **Grassland-based HD**
- **Grassland-based LD**

Map by Jonathan Hercule, INRA DEPE, Paris
How do we represent territories?
Animals and feed resources

2.8 LU/UAA

1.2 LU/UAA

0.9 LU/UAA

0.2 LU/UAA
Ecosystems
Social concern
These four contrasted territories provide ≠ levels of goods and services use various grasslands and ≠ input levels benefit from ES and cope with dis-services meet more or less consumer expectations.

In each territory, trade-offs exist between economic, environmental and social dimensions.

Both technical and organizational innovations can shift trade-offs towards improved productive, ecological and/or social performance.

- Redesign of systems
- Landscape management
- Collective organization
Switching from external inputs to ecosystem services

- A new equilibrium between inputs and productive objectives; increasing forage self-sufficiency in the RAD network (data 2014 from Dieulot 2015)

-91% pesticides (in €)
-92% fertilizers (in €)
+63% grasslands in UAA

- Feed costs ↓ -50% €/1000 l.

28 k€ vs. 16 k€

Production

- Moderate ↓ in productivity
  -22% l./cow, -20% LU/ha

- ↑ Decisional autonomy
- Not less work but more interesting work!
Organizing production cycle to better use rangelands

- Forage self-sufficiency: 73% ➞ 93%

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- **Ewes**
  - +18 ha fertilized grasslands (4t DM/ha)
  - Conserved forage + concentrate
  - Green grass on fertilized & native grassland
  - Native rangelands
  - Regrowths on fertilized grassland

- **Ewe-lambs**
  - compensatory growth
  - WEANING

- 260 ha
  - Native rangeland (+ hay if needed)
  - Green grass on fertilized & native grassland
  - Native rangeland with experienced peers
  - Regrowths on native rangelands

Gross margin: +40%, Stable GES emissions
Energy consumption: -29%  (Jouven et al. 2011)

Control of shrub encroachment, Preservation of species-rich grasslands
Managing landscape heterogeneity

- Increasing landscape heterogeneity shifts the production-biodiversity trade-off towards improved ecological performance.

- Preserving hedgerows and other landscape features (shade to livestock, ecological corridors/shelter to wildlife).

  An hedgerow network of greater aesthetic value was restored at a relatively low cost in the NL by accounting for all stakeholders view (Groot et al. 2007, 2010).

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**Diagram:**

- X-axis: Productive performance
- Y-axis: Ecological performance

**References:**

Sabatier et al. 2014
Sharing knowledge and views to create win-win situations

- Teaching farmers feedback loop between biodiversity, ecosystem services and management practices using role-playing games (Lamarque et al. 2014)

  + simulating changes in ES under climatic and socio-economic scenarios

  \[\Rightarrow\] Sharing knowledge between peers

  \[\Rightarrow\] Comparing his own farm ‘ecological performance with those from neighbours

  \[\Rightarrow\] Shifts in practices based on better understanding of agronomic and ecological processes (e.g. ↓ fertilization in a drought context)

  \[\Rightarrow\] ↑ productive and ecological perf.
Organizing production sector to create added value

- Institutional mechanisms of regulation allow protecting the competitive advantage resulting from the link between the product and the territory.
- Transparency of PDO rules guarantees system management to consumers.
- Consumer willingness to pay premium prices for products with a positive image.
- Leading products can benefit to others sold in the same ‘basket of goods’.
- Local transformation creates jobs and allows controlling product quality.
- LFS maintained in ‘marginal areas’ preserve landscape & species-rich grasslands.

⇒ ↑ productive, social and ecological performance.
Take-home messages

- Grassland-based territories provide different bundle of services according to livestock density and biogeographical areas

- In each territory, trade-offs exist between economic, environmental and social dimensions

- Various technical and organizational innovations can shift trade-offs towards improved productive, ecological and/or social performance

- Win-wins situations are more likely to occur when solutions have been co-designed by various stakeholders (Groot et al. 2007, 2010)

- Getting rid of the assumption that provisioning services should always dominate any other ES is likely to create win-win situations (Howe et al. 2014)

Thanks for your attention!