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Enhancing mixed crop-livestock systems sustainability:

A partnership evaluation of innovative scenarios.

Ryschawy J
Joannon A
Choisis JP
Gibon A
Le Gal PY

Dynafor

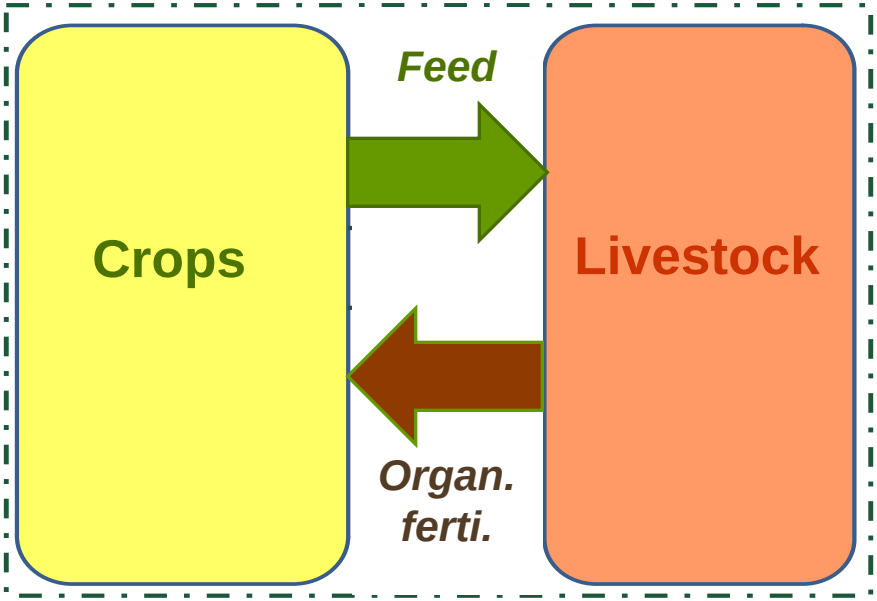
SAD Paysage

INRA SCIENCE & IMPACT

INP ENSAT

Study rationales

- Worldwide regain of interest in mixed crop-livestock systems:
  - Way to produce efficiently
  - While limiting environmental impacts
- Drastic regression of MCLS in Europe:
  - Agricultural prices & CAP
  - Lack of agricultural work forces

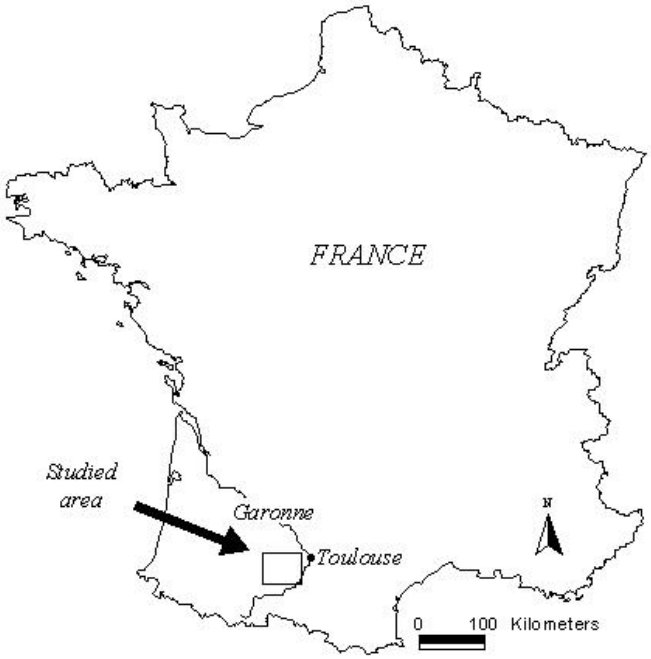


Ad. Schiere et al., 2002

Objective : Evaluating scenarios including technical innovations that could enhance sustainability of MCLS.

Case-study

The French ‘Coteaux de Gascogne’



Less favoured area:
- many slops
- frequent summer droughts

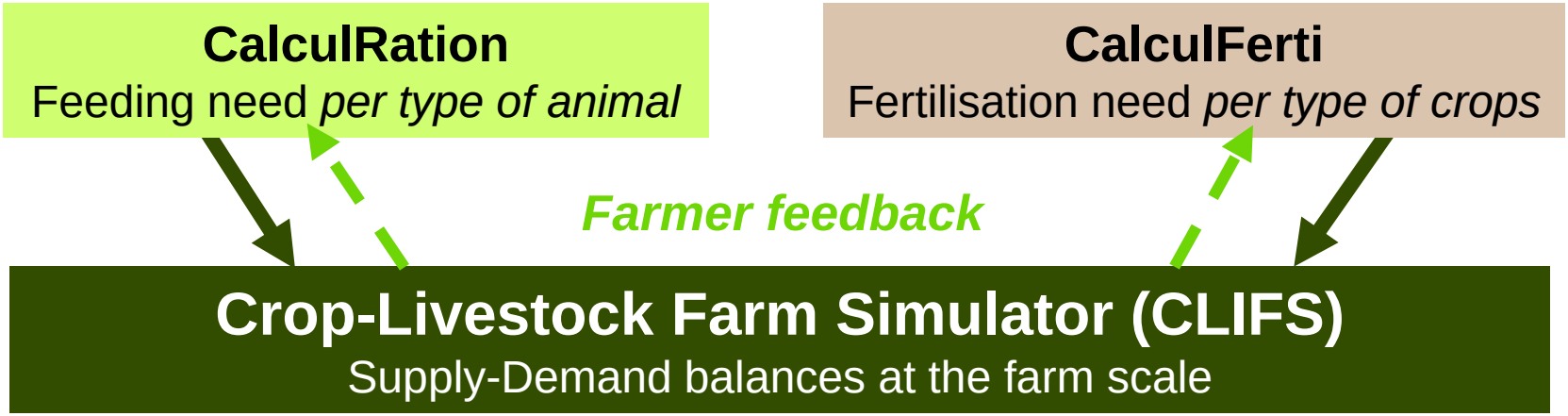
➔ Low specialization of agriculture (50% MCLS)

- ELTER Network
- Partnership working with local actors

A participatory elaboration of scenarios

- Definition of innovative scenarios:
  - through a participatory process with farmers & actors
  - In line with farmers long term strategies to maintain MCLS *(Ryschawy et al., 2013)*

- Computer-based simulations (with individual farmer)



Focus on ‘forage intercroping’

- Innovative scenario in line with the strategy “maximizing farm autonomy”

- Based on sowing forage intercroping between two cash crops to :
  - achieve autonomy in herd feeding
  - while maintaining soil fertility

Farm selected

- *133 ha - 50% crops & 50 % grasslands*
- *43 suckler cows – Limousine breed*
- *1 Working Unit*

Scenario specification with farmer

- Two types of intercroping to insert in the rotation
  - *« Short » : between two winter crops*
  - *« Long » : before a summer crop*

- Major constraints identified:
  - *Periods of sowing and harvesting/ work organisation*
  - *Feeding quality of intercroping species*
  - *Seeds and phytosanitary costs*

Legumes intercroping : pure or mixed

- **S1 :** Violet clover as short intercroping to stock and oat-vescia as long intercroping to bury
- **S2 :** Premium on violet clover

Simulations

Scenarios	Overall Gross Margin	Nitrogen balance	*Feed inputs*
S0 :Control	*683 euros/ha*	*+ 6,2 kgN/ha*	*8,91t /an (3118 euros/an)*
S1: Stocks of violet clover	704 euros/ha *(+21 euros/ha)*	- 0,3 kgN/ha	0 t
S2: CAP premium on violet clover	744 euros/ha *(+61 euros/ha)*	- 0,75 kgN/ha	0 t

- Innovations tested into two contrasted political and economic futures*: (Agrimonde, 2010)*

  i) heightening of the current globalisation trends
  ii) political and market incentives for a relocation of production

➔Technical innovations did not offset drastic shocks
➔ Political support would also be needed

Strong involvement of local actors

- Interest in local adapted study
  - Relevance of real cases

  «For once, it was concrete and corresponded to our ideas »
  - Discussion about technical routines and work organisation

- Importance of collective meetings
  - Posture of researchers

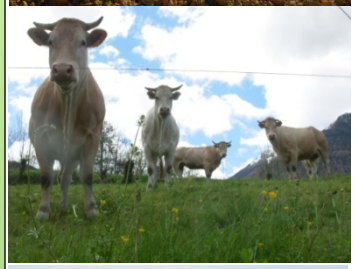
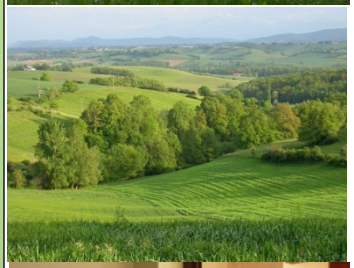
  « We have been listened and have expressed our views. »
  - Interactions research/local actors

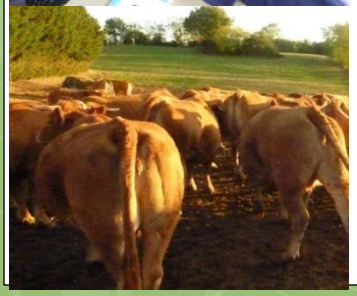
  « It is really interesting to share views with other core works »





Conclusion



- Improvements through technical innovations :
  - Relevance of participatory methodology
  - «Old wine in new bottles?»
  - Marginal improvements through local lever for action
- Political lever to mobilise:
  - Premiums on maximisation of interactions between crops and livestock
  - Larger scales to be considered (regional, …)

Thank you for your attention.