Supporting crop-livestock farmers in redesigning their production systems: The CLIFS approach

Designing and testing a support approach dedicated to crop-livestock farmers

✓ Focus on farm projects (short- and mid-term)
  - Strategic orientations (which activities?)
  - Entreprise sizing (crops, herd)
  - Selection of techniques to be implemented (including technological innovations)

✓ Based on the comparison between prospective scenarios (what if?)

✓ Using a generic simulation tool called CLIFS (Crop-Livestock Farm Simulator)
  - Representation of flows between crop and herd entreprises
  - Structure and operation understandable by farmers
  - For use by advisers in the future
A three-stage support process

Base scenario = modelling the current situation

Benchmark scenario

Alternative scenarios

Current practices

Farmer’s evaluation

Farmer

Researcher / Advisor

Production project

Suggestions of technical and organizational changes
CLIFS structure

Parameters
- Feed characteristics
- Animal type and growth requirements
- Crop characteristics
- Input characteristics

(Same values for a range of farms at regional level)

Inputs
- Lactation curve
- Reproduction scheduling
- Ruminant female diet
- Fatten ruminants
- Growing ruminants
- Pork and poultry
- Manure production
- Family structure
- Cropping pattern
- Technical practices & yields
  - Hay - Silage
  - Input costs
  - Sale prices

(Farm data)

Calculations

Outputs
- Staple/marketed crop balance
- Forage balance
- Hay-Silage stocks balance
- Crop by-products balance
- Manure balance
- Economic results

(Farm data)
### Production de Lait liée à la Ration 1

**Pour la reproductrice "moyenne"**

<table>
<thead>
<tr>
<th></th>
<th>Janvier</th>
<th>Février</th>
<th>Mars</th>
<th>Avril</th>
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**Attention : les calculs de production liées à la ration ne sont valables que pour les vaches laitières**

**Concentrés**

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**Productions Lait**

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Four contexts with crop-livestock farmers

**Morroco**
Irrigated dairy farms
5-60 cows over 2-30 ha
Alfalfa + Silage Maize

**Brazil**
Rainfed dairy farms
10-30 cows over 15-30 ha
Pasture + Sugarcane/Silage

**Madagascar**
Irrigated + Rainfed dairy farms
1-3 cows over 3-8ha
Diversified forages and residues
Conservation agriculture

**Peru**
Irrigated dairy farms
3-65 cows over 1-60 ha
Diversified forage crops
A Peruvian case

- 25 cows, 3500 l/year/com, RG/Clover/Alfalfa + Oat/Vetch + corn silage
- Objective: increasing milk production with the same herd size

Excess of green forage

Using the excess ➞ + 6500 l/year

Comparing alternative scenarios
Lessons drawn from the four experiences

✓ As viewed by farmers

- Support based on their own situation
- Promotes a more holistic focus
- Scenarios realistic and tangible
- Provided perspective and reorientation of projects
- Knowledge gain (e.g. animal nutrition)
- Highlights the value of data recording and activity planning

✓ As viewed by researchers

- Participatory approach: interaction and involvement with farmers
- Possibility to address a large range of issues in many production contexts
- Better understanding of farmers’ objectives, strategies and decision-making processes
- Linking biotechnical knowledge with farm management knowledge
The way forward

- Extending the support approach to larger populations of farmers by transferring it to agricultural advisors

- Improving the Input / Output interfaces of the simulation tools and simplifying their use (in progress)

- Formalizing an evaluation methodology which takes into account the various aspects of stakeholders’ learning processes

- Strengthening the relationship with biotechnical researchers for using adequate technical and biophysical references
Thanks for attention