Bertrand de Launay – Chief Executive Officer

Agro

InVivo in figures

- **No. 1 farming cooperative group** in France
- **241 member cooperatives**
- **1 Centre** for referencing, negotiations, purchases, sales and services
- **€5,700 million** in revenue in 2011-2012
- **6,730 people,** 3,500 of whom outside France

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4 activities

Agro

Seeds and Agro-supplies

Nutrition et Santé Animales

Animal Nutrition and Health

Grains

International Grain Trading

Grand Public

Green Distribution

Agro

4 activities

Adding value to French produce for export and managing price volatility

- International trade: No.1 operator in EU
  No.1 exporter of French wheat to third countries
- Logistics and storage: 1.5 million-tonne capacity
- Financial services: interface between farming and financial worlds

Grains

Developing the expertise of the farming world with consumers

Gamm vert
le goût du jardin

- No.1 in green leisure: 1,000 stores
- Two main fields: vegetable garden and animal feed
- Two product lines with strong identity: Local “terroir” produce
  Clothing and footwear

Grand Public

Agro

4 activities

Nutrition et Santé Animales

Feeding and caring for animals

- Complete feed
- Service company
- Animal health
- Additives
- Laboratories

A multi-business, multi-species, multi-region approach (17 countries)

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Meeting economic and ecological challenges

- Agro-supplies: national centre for referencing, negotiations, purchasing and services
- Seeds: production and sales of certified seeds
- InVivo AgroSolutions, a new activity for network cooperatives: agro-environmental operator

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Sustainable agriculture

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Sustainable agriculture
The relevant scale

A field on a farm, in a territory within a production chain.

Environmental issue arises at the territorial and production chain scale

Diagnostic approaches
Sector and territory

InVivo

The agricultural reasoning is made at the field scale and/or farm scale

Decision making tools/advice
plot and farm

Key success factor

Ability to:

- **Be effective at all scales**
- **Give coherence**

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Sustainable agriculture and development

Remit: Help cooperatives take environmental practices on board

Main functions

1. Roll out the tools necessary to coordinate environmental farming practices
2. Develop products and services to foster and enhance sustainable agriculture policies

Example: 39 contracts (400,000 ha) won by the Sustainable Agriculture department on rational practices for priority catchment areas

InVivo’s strategy

Ways of development

- Protecting the farmers rights to produce
- Value environmental services made by farmers
- Value environmental marketing to the production chain
- Dissemination : reducing impacts and not inputs

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Services

- **Services** ➔ essential evolutions of teams in the field (organisation, skills, behaviour, etc.)

- **Decision support tools**➔ for advice and measuring practices

  - **Epiclès** for optimised fertilisation
  - **Phytnès** for the rational use of seeds and crop protection products

  2013 : 2.6 million hectares monitored with a DST ➔ French no.1
  1 advisor on **3** equipped with at least 1 DST in France

  2016 : 5 million hectares

40 IT people dedicated to implement the DST

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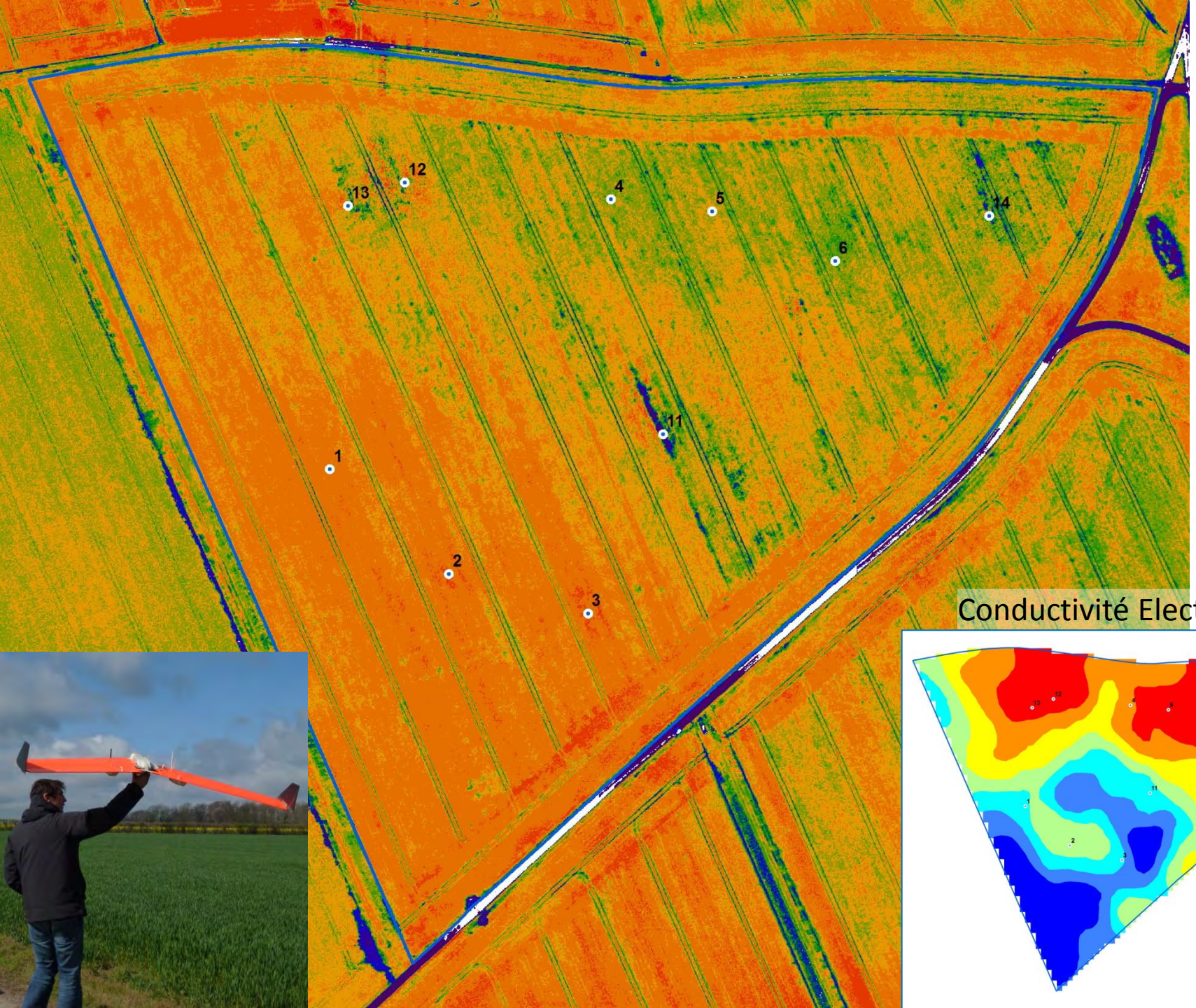
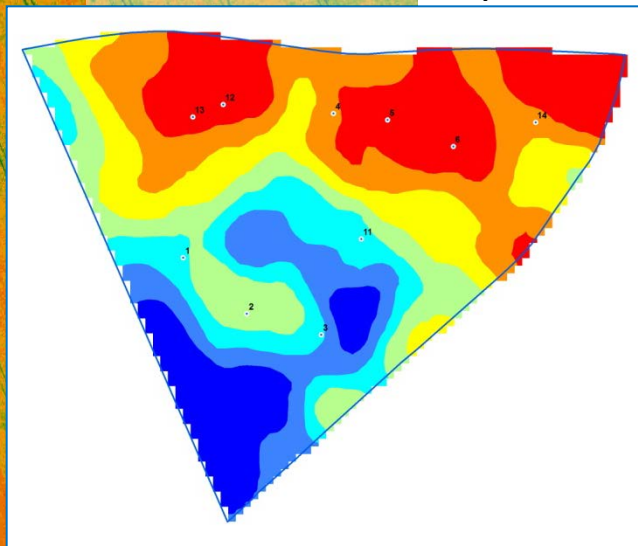


Conductivité Electrique



InVivo's examples of achievments

Water quality
Biodiversity
Life Cycle Analysis (LCA)

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Water quality

Priority catchments areas

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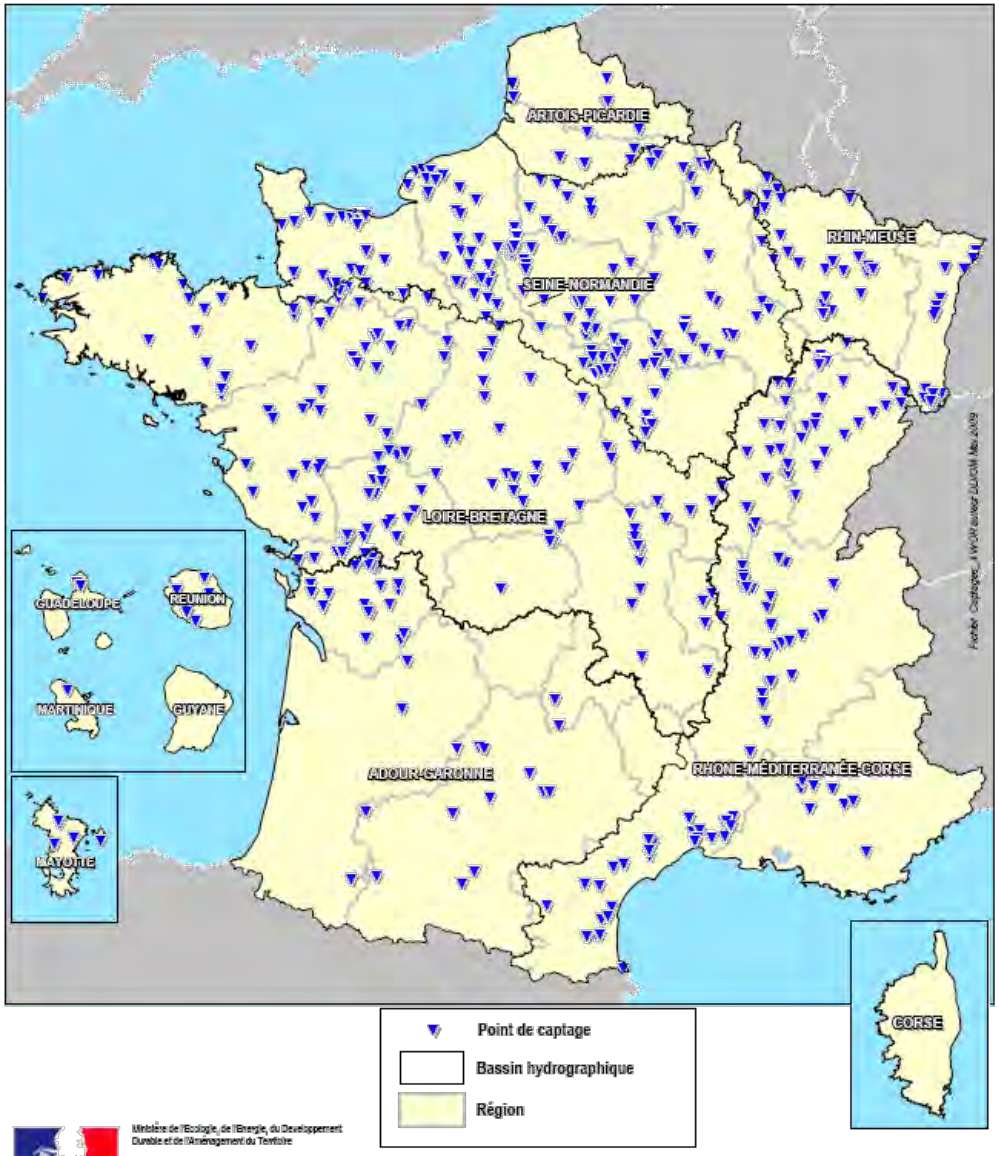
Action plans for reducing pollution at 500 priority water catchment areas …



…and for the other areas by 2015…corresponding to a surface area of roughly **20% of total arable land!!**

Ministère de l'Ecologie, de l'Energie, du Développement Durable et de l'Aménagement du Territoire
Ministère de la Santé et des Sports
Ministère de l'Agriculture et de la Pêche

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Water quality : a major concern

Mission : To reinforce and value the sustainable practices of farmers

To keep the right to produce

- ✓**39 catchments areas diagnosis In France (69 catchments)**
- ✓**400 700 ha (added up)**
- ✓**32 cooperatives involved**

20% of total arable land

16

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Water quality : a 3-step study

Step 1:

- Hydrology/Hydraulic survey and Hydrologic modelisation:

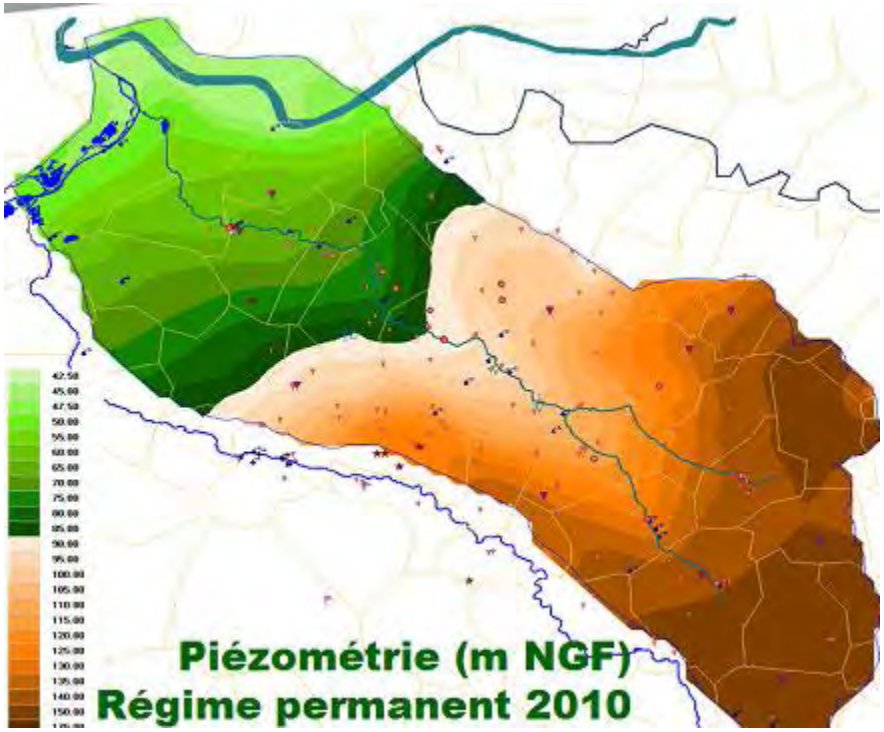
Step 2:

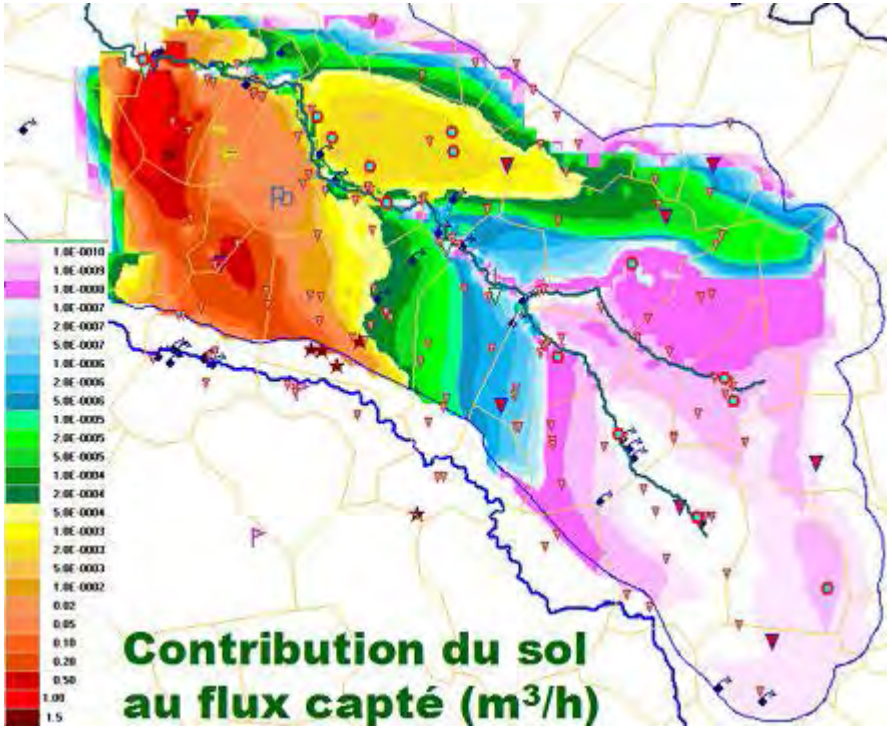
- Diagnosis of pollution risks

Step 3:

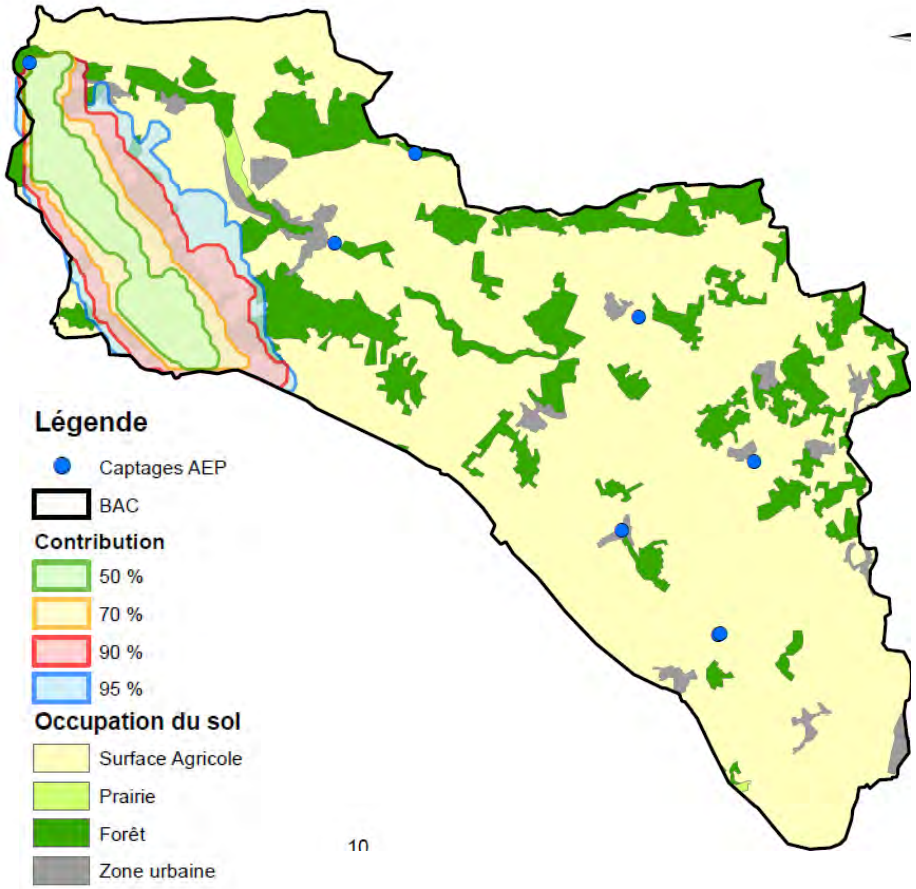
- Detailed actions plan

Step 1 : Spotting contributives areas (waterflow)





Step 1 : Spotting contributives areas (waterflow)



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Step 2 : Crops management diagnosis

Objectives :
To describe crops management and point-source pollution

Means :
Analysis of data base from InVivo's decisions support tools/ collect new datas from the field

Benefits:
Quicker and more efficient when advices software are used by farmer

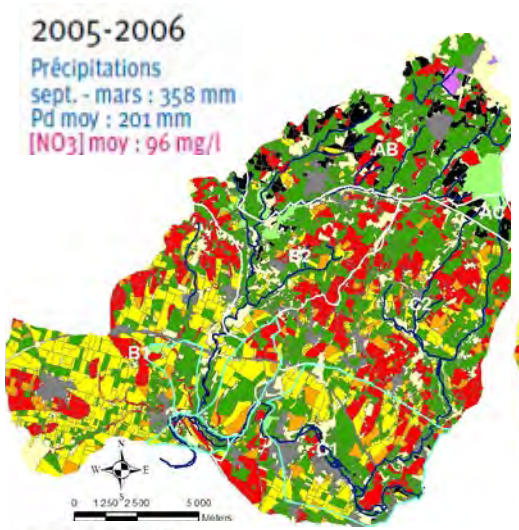
Step 2 : Diagnosis of nitrates risk of diffuse pollution

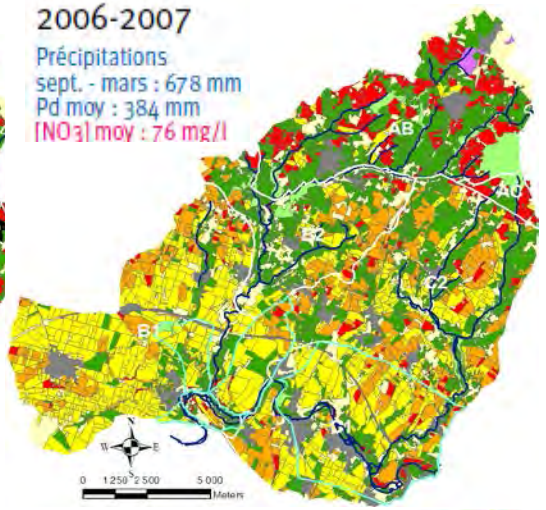
Excess of nitrogen from previous crop	68 Kg N/ha
Nitrogen in soil at harvest	62 Kg N/ha
Nitrogen in soil at autumn	54 Kg N/ha

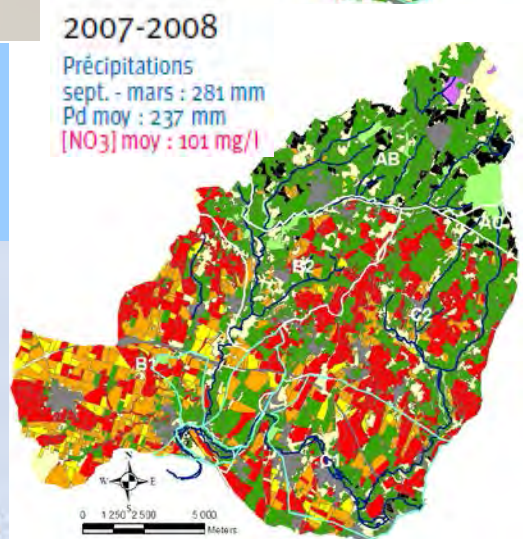
Lessivage de l'azote

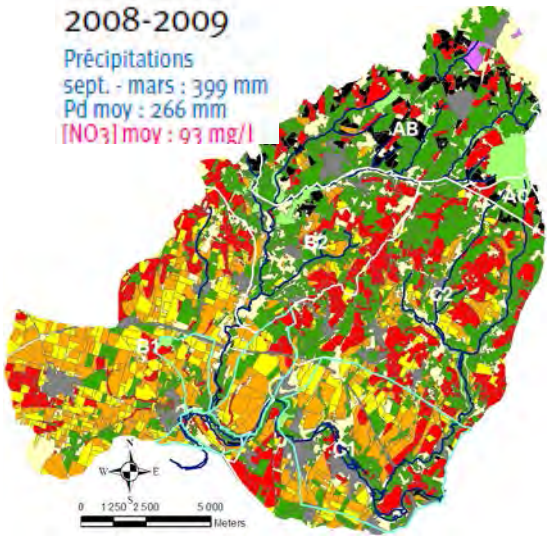
Winter rain	202 mm
Rain period	Sur les mois disponibles (Sept
Water leached	161 mm
% of Burns model	52 %
N leached	28 u
Nitrates concentration in leached water	78 mg [NO3] / l

The risk varies each year with winter rain









Nitrates concentration in leached water (mg/l)

-]0-25]
-]25-50]
-]50-75]
-]75-100]
-]100-125]
-]125-150]
- Zones urbaines

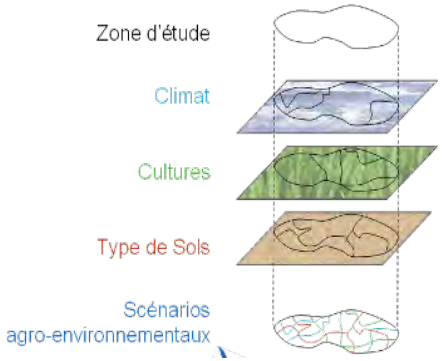
Step 3 : action plan

Soils
5 Soils types

Meteological data
Daily rain, temperature, wind speed, water loss

5 Crops
Wheat, Rape, barley, Maize

82 actives substances
46 herbicides, 21 fungicides, 11 insecticides et 4 growing regulators
Date et rate of application
117 differents applications

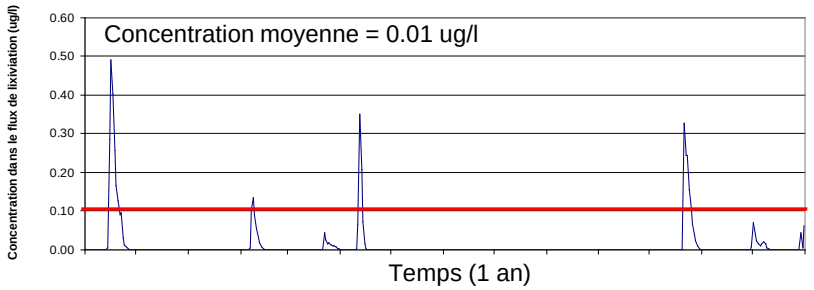


9 000 different combinations

MACRO parametrization

Daily pesticides loss in 10 years

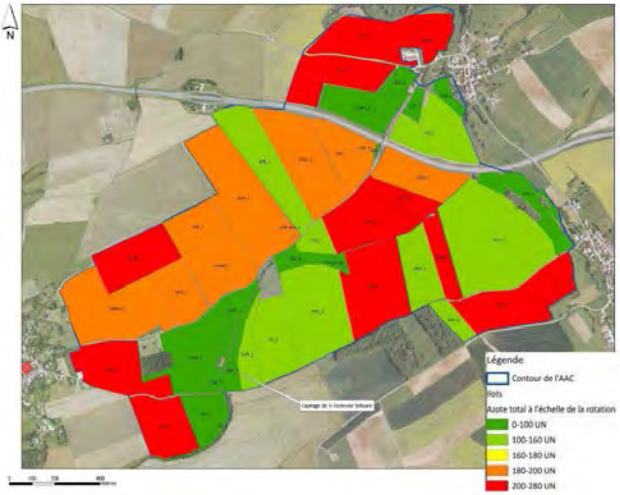
- Water leached
- Active substances loss
- Concentration of active substances



Leaching risk :
Mean concentration in 10 years at 2m deep under the plot

Low risk	Concentration < 0.01 µg/l
Moderate risl	Concentration [0.01 ; 0.1 µg/l[
High risk	Concentration [0.1 ; 1 µg/l[
Very high risk	Concentration ≥ 1 µg/l

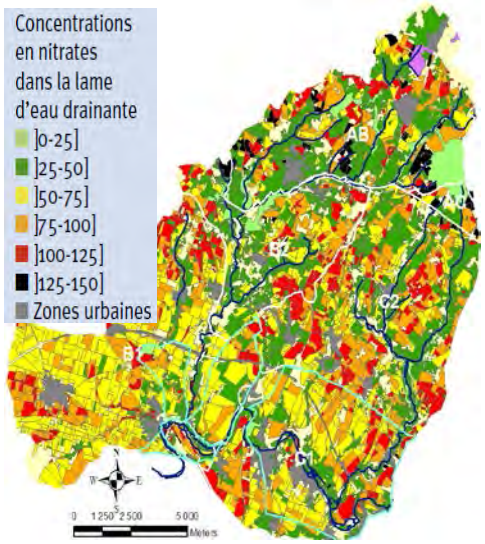
Environmental and economical performance: Impact rather than inputs



Classical action plan

- Inputs limitation
- From crops to grass
- Organic agriculture

- Less productivity
- Loss of competitivity and incomes for the farmers
- Chain production (loss in quantity and quality)
- environnemental inefficiency



InVivo action plan

- Piloting fertilization
- intercrops
- Struggle against one-time pollutions
- Agronomics levers for a reduction of bioagressors s
- Landscape planning
- …

- Maintening the added value of the territory
- Restoration of the water quality
- Capacity of the environmental efficiency follow-up

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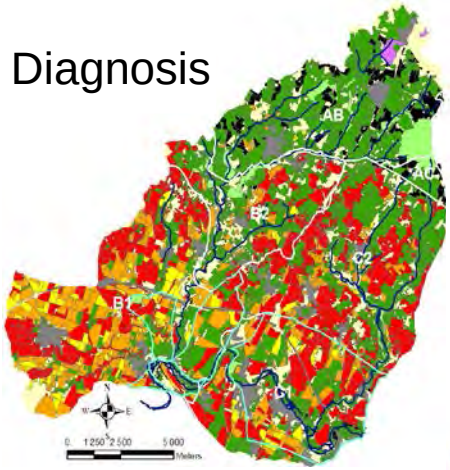
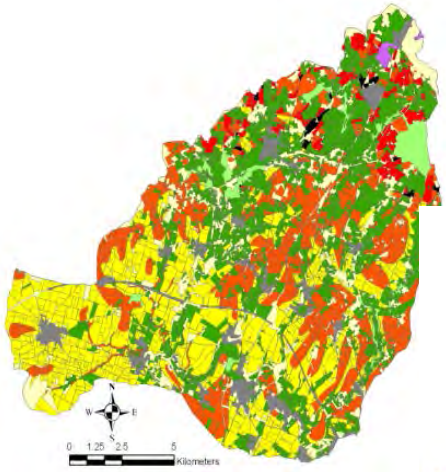
Step 3 : to define voluntary actions and test their efficency (model)

Diagnosis



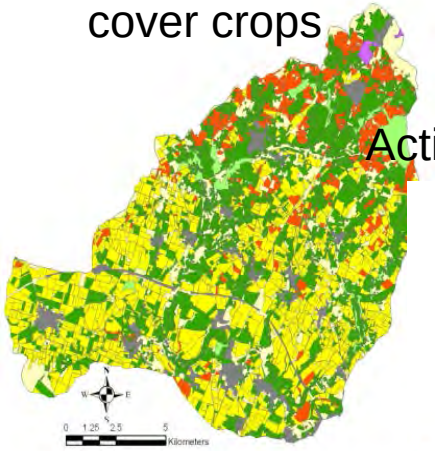
[NO3]=70 mg/l

Action 1: composting organic manure



[NO3]=55 mg/l

Action 1+2: cover crops



[NO3]=45 mg/l

Action 1+2+environmental advice with Epiclès

[NO3]=35 mg/l

Objective reach

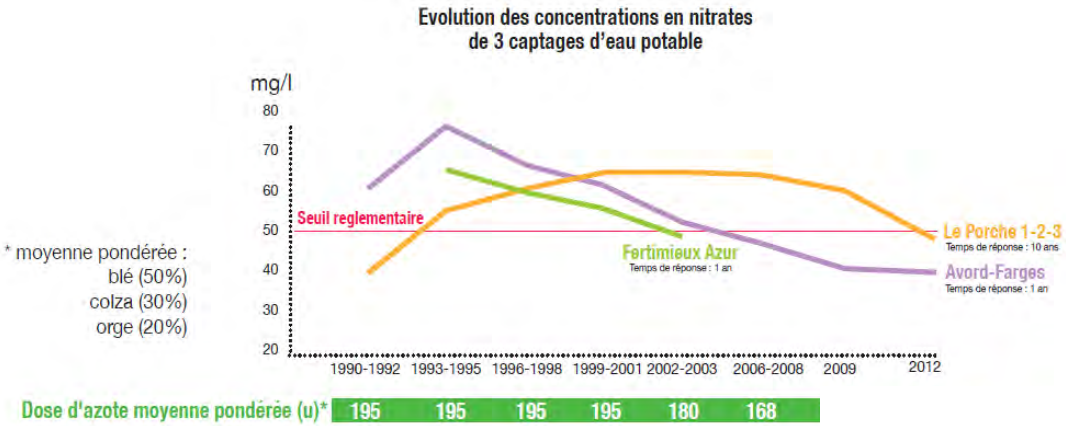
Nitrates concentration in leached water (mg/l)

-]0-25]
-]25-50]
-]50-75]
-]75-100]
-]100-125]
-]125-150]
- Zones urbaines

Water quality and economic performance

25

Results obtained though action plans based on coordinated fertilisation (Axéréal : French cooperative)



Biodiversity

Bee project

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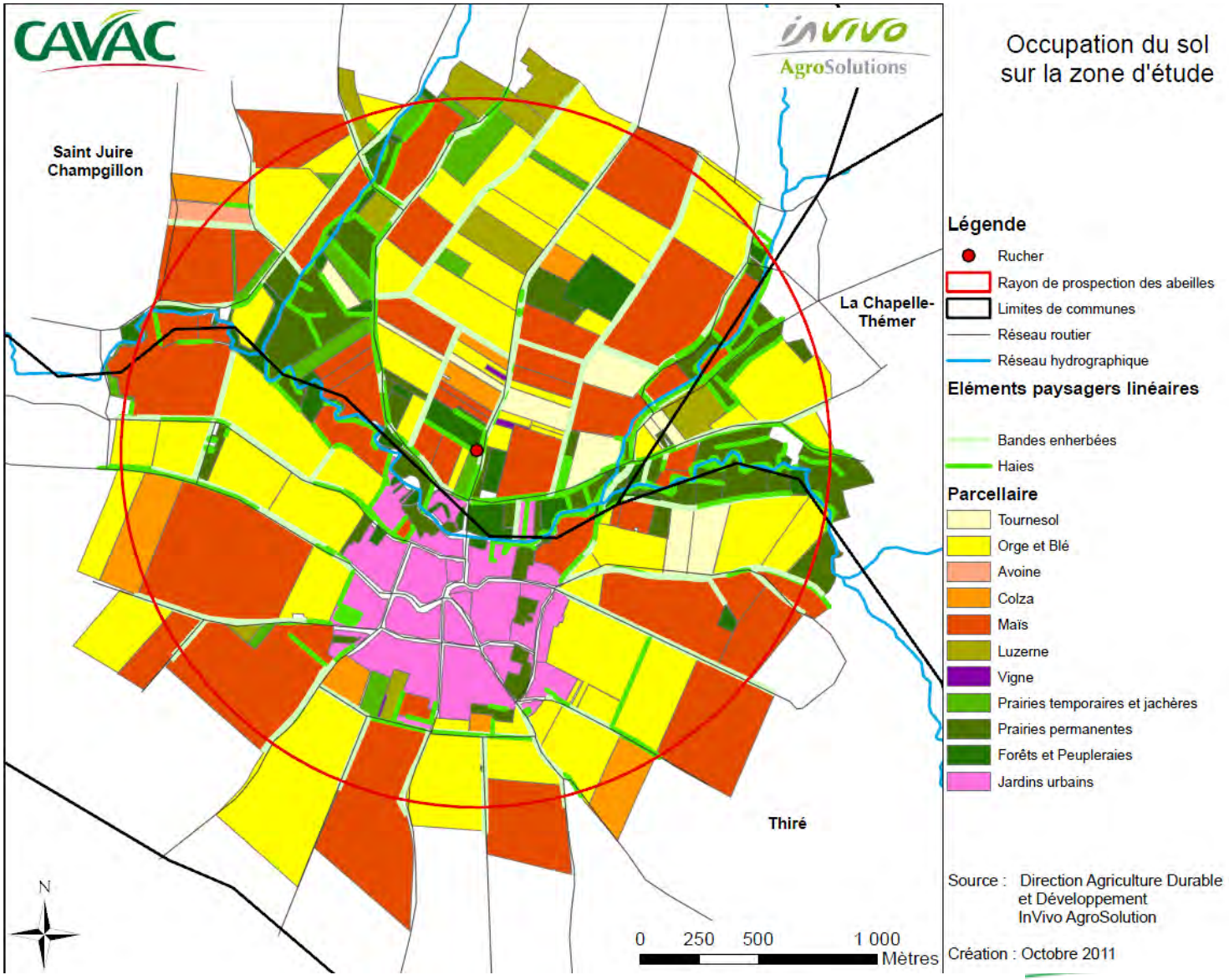
Bee project

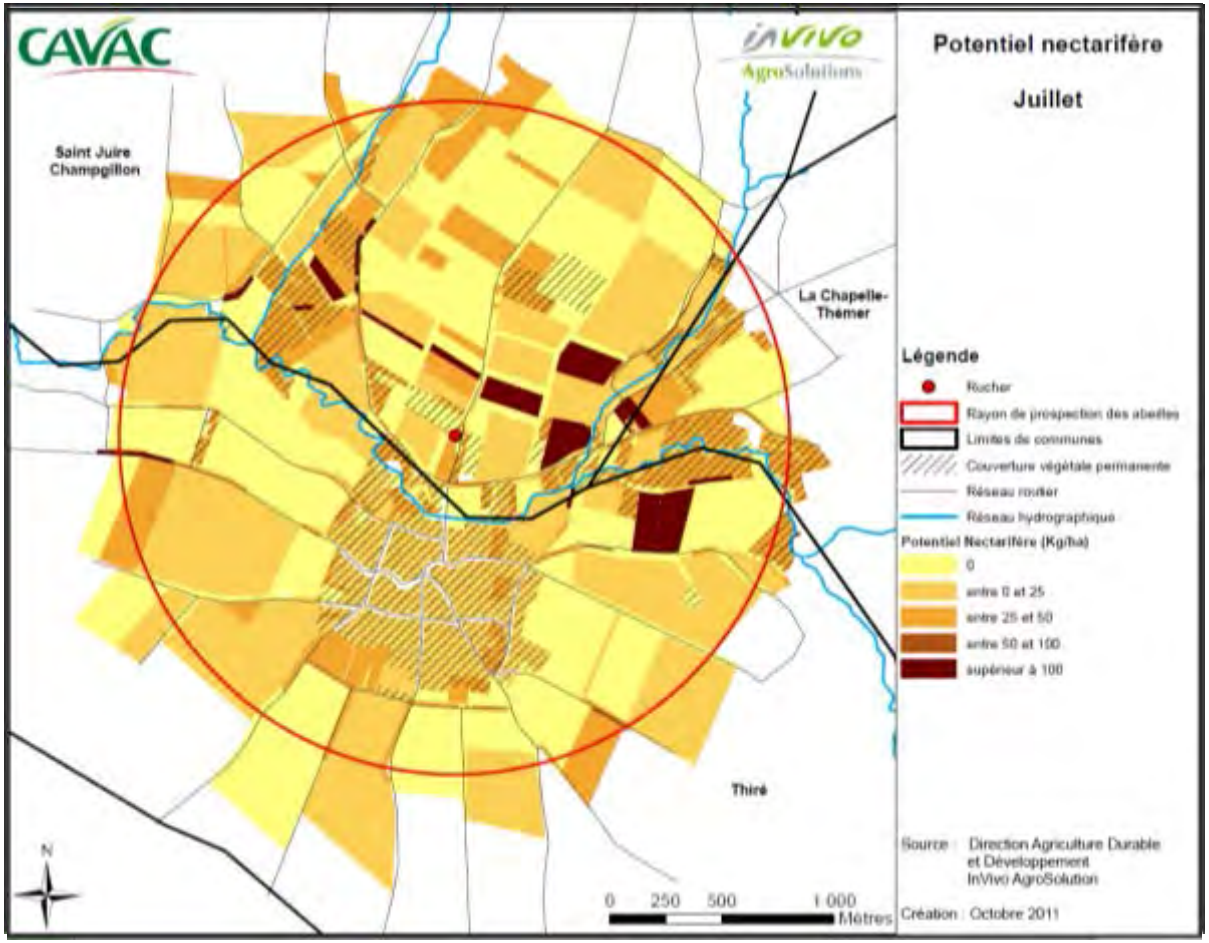
✓ Target

- Quantify nectar and pollen production in the bees area for 1 or more hives
- Identify abundance or deficit periods of food
- Analyse the reasons and consequences
- Action plan

Data recorded



Biodiversity: Bees and colony collapse disorder



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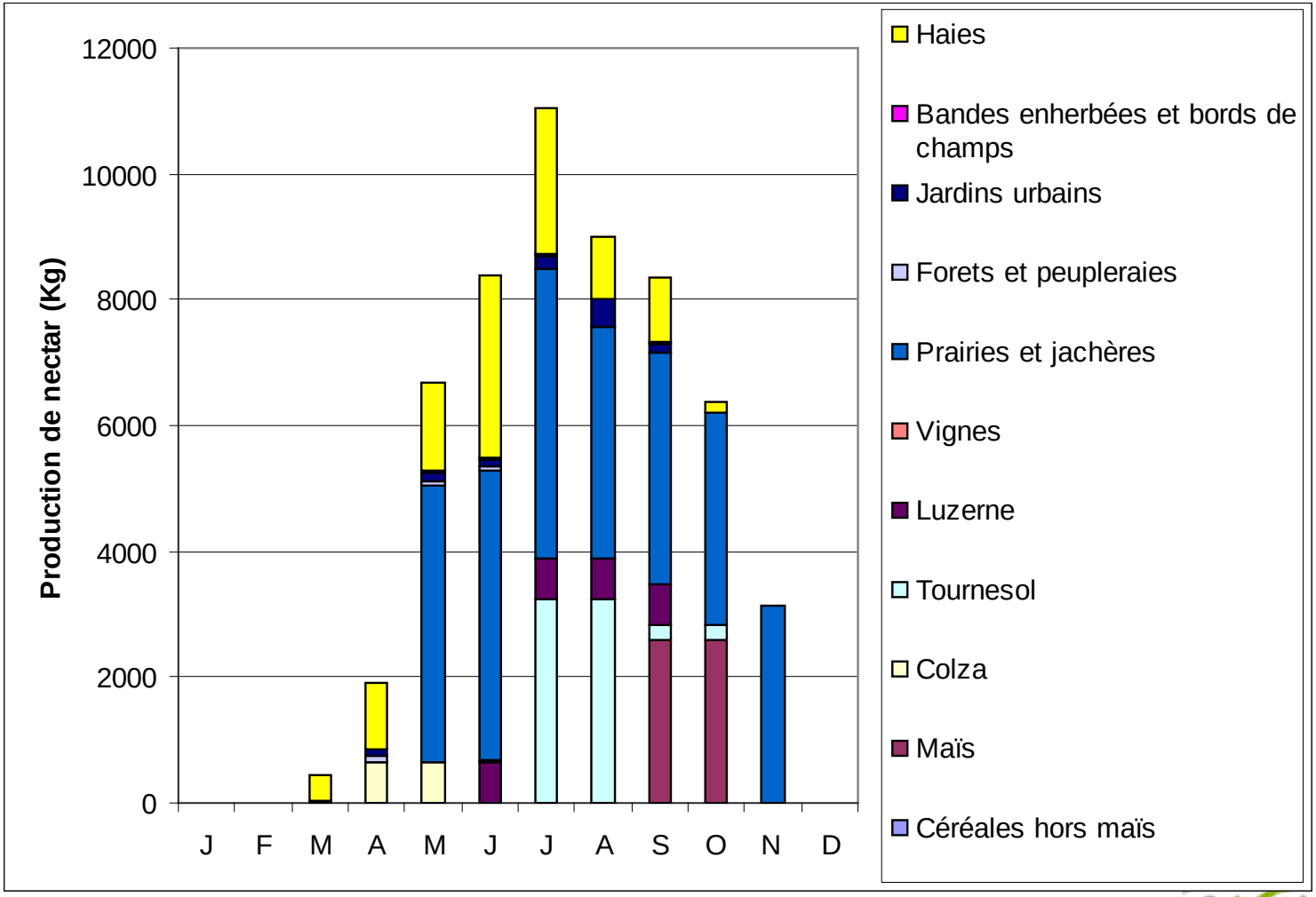
Biodiversity: Bees and colony collapse disorder



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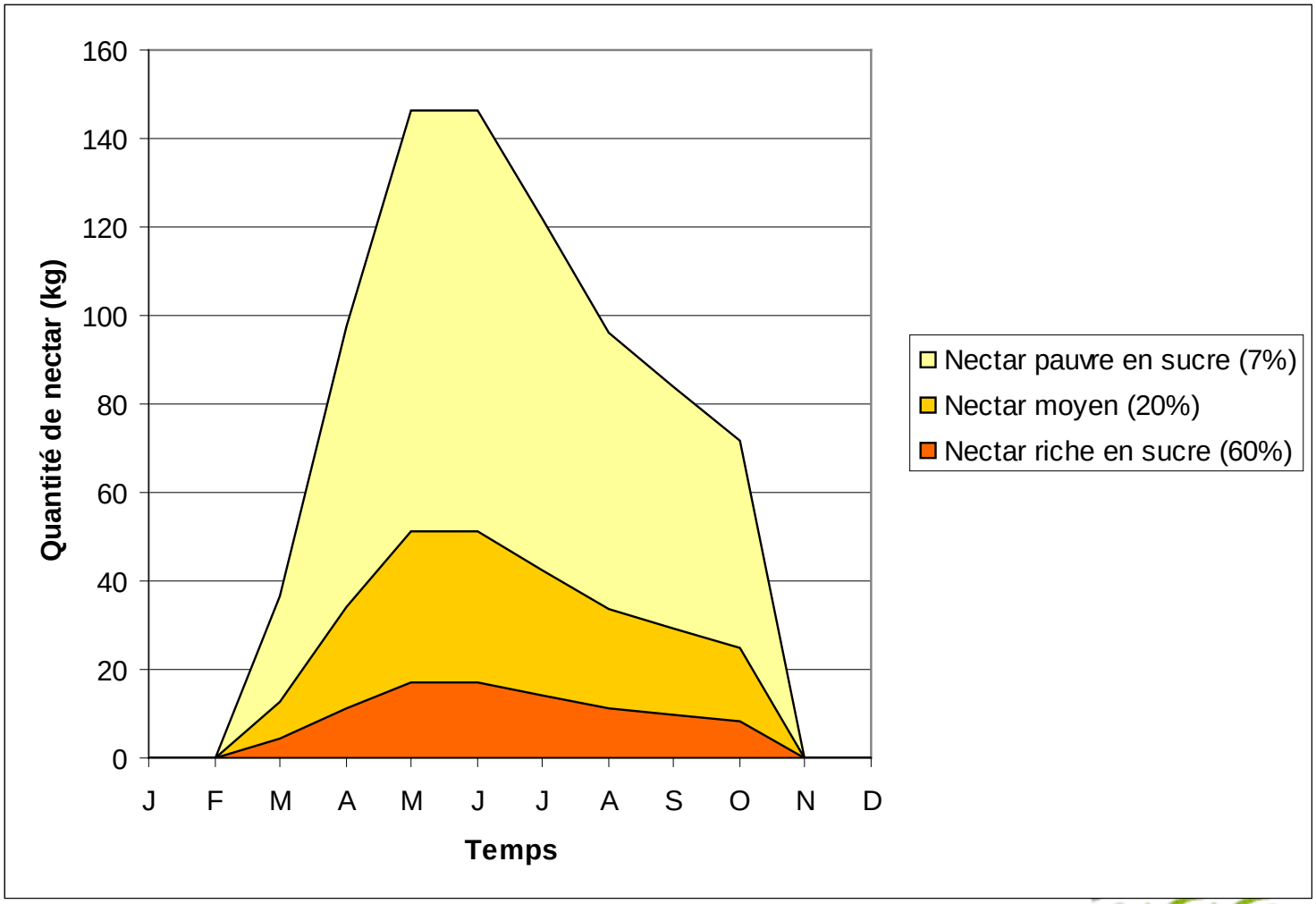
Biodiversity: Bees and colony collapse disorder



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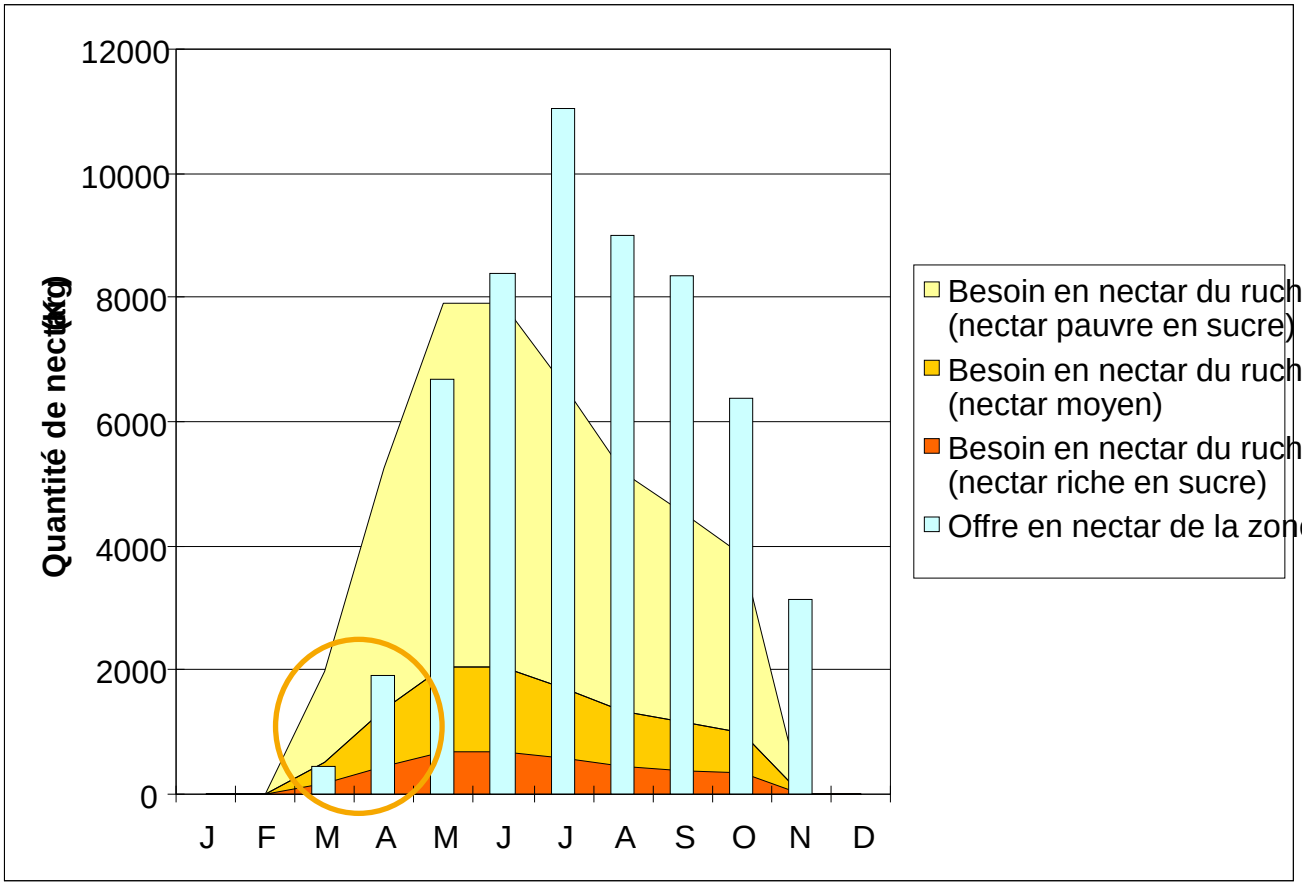

Highlight of :

✓Period of lack

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Life Cycle Analysis (LCA)

InVivo's methods and results

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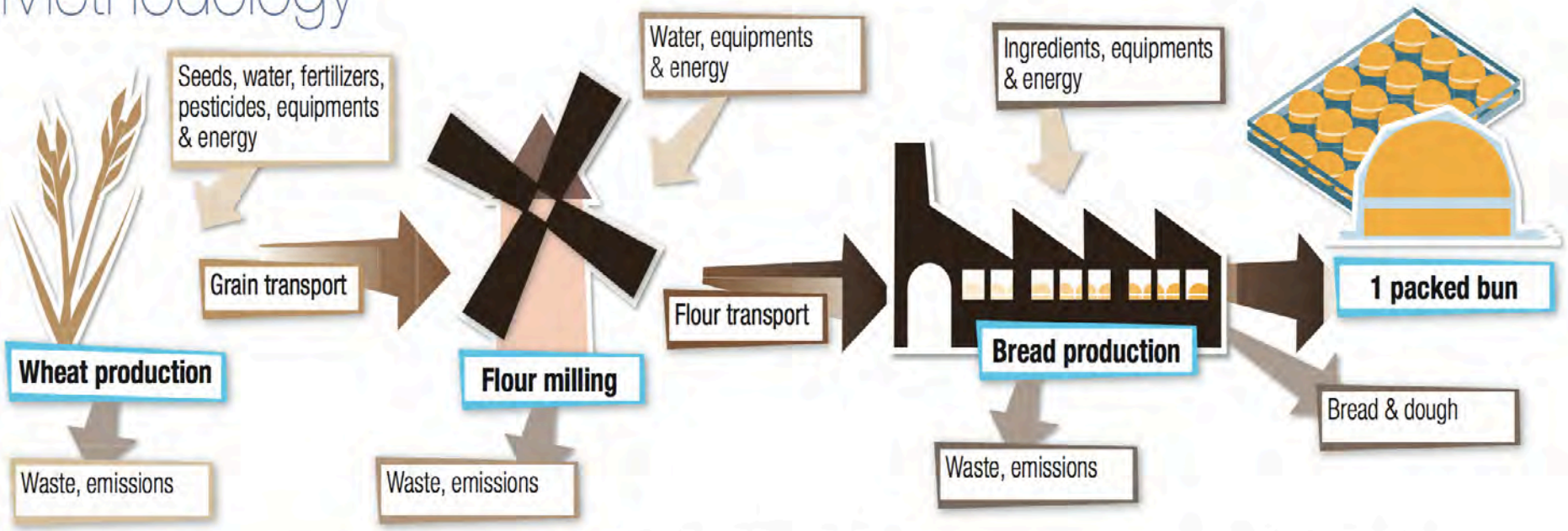
LCA of Industrial Bread : from field to bakery

Methodology



Impact indicators	Methods
Global warming	IPCC 2006
Freshwater and marine eutrophication + terrestrial acidification	Recipe v1.06
Water depletion and non-renewable energy	Simple fluxes balance
Freshwater ecotoxicity	USEtox

Functional unit: "bun, packed, ready to be exported from the industrial bakery"

Data collection:

- **Milling process:** miller's activity data + Ecoinvent inventory
- **Bread production:** baker's activity data + Ecoinvent inventory
- **Wheat collected by the miller**
  - 37% cooperatives → data on agricultural pratices collected thanks to the two cooperatives' traceability tools (= 1500 ha on 2009 and 2010 harvest) + calculation of particular inventory fluxes (N_2O, NO_{3-}, P_2O_5…) thanks to several models
  - 63% other suppliers → Ecoinvent data inventory

What are the stakes of LCA

- From a supplier of Raw material…
  - Quantity
  - A form of quality (protein, humidity,…)
- to a supplier of added value
  - Environmental issues
  - Society impacts

From the specific actions to the global plan « FermEcophyto »

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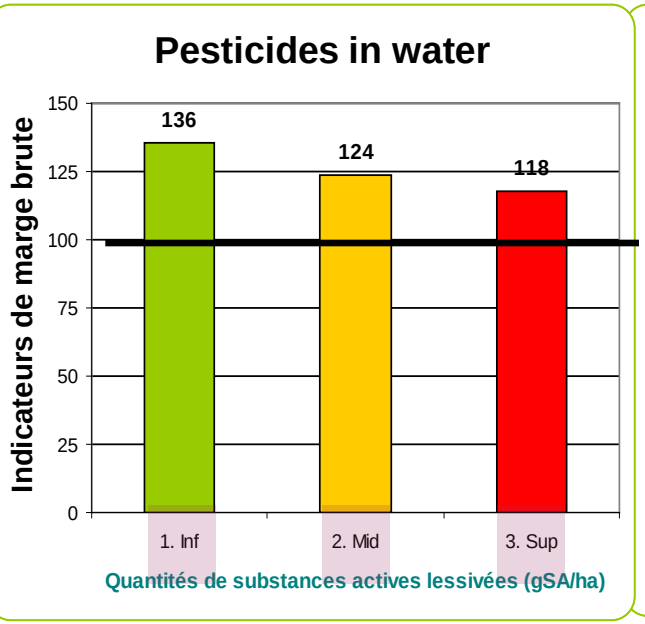
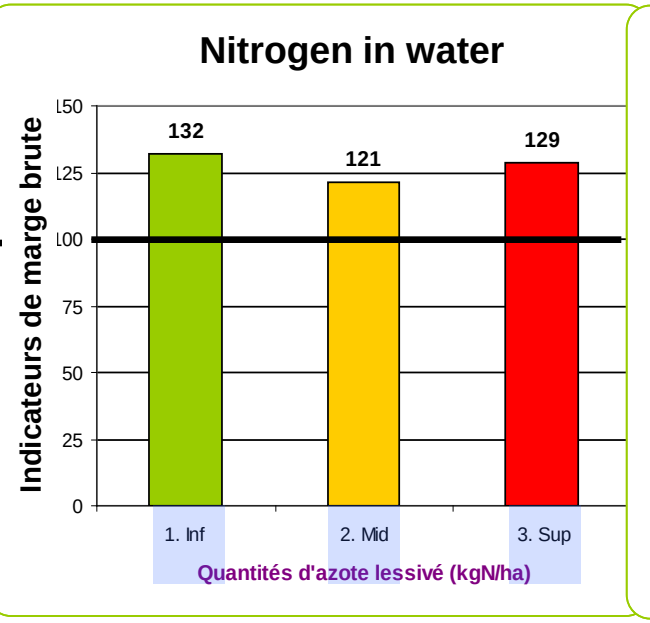
FERMEcophyto
The cooperatives are in!

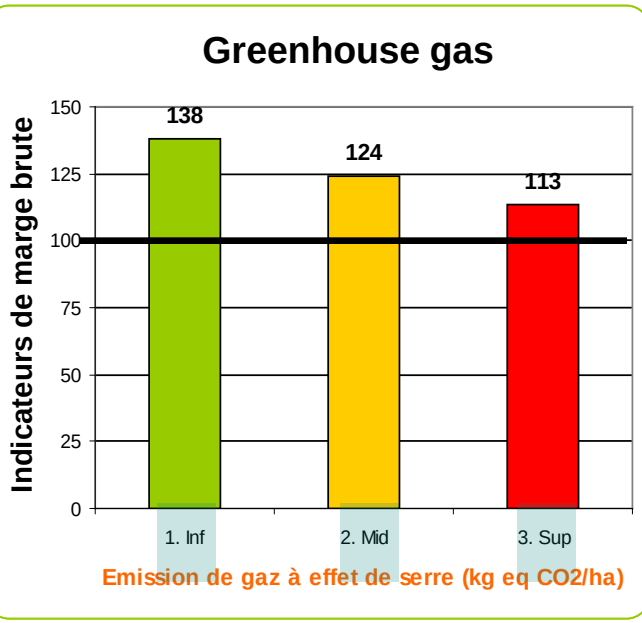
Dynamic network

- **32 farming cooperatives in 2012**
- **320 agricultural holdings**
- **5 sectors**
- **17,116 hectares**
- **950,000 items of data fed back and analysed**

Environmental performance and economic performance are compatible







1. **Low**: Low-polluting land
2. **Mid**: Medium-polluting land
3. **High**: High-polluting land

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Consequences

écophyto2018

Réduire et améliorer l'utilisation des phytos :
moins, c'est mieux

"The Ecophyto plan aims to reduce pesticide use in France by 50% if possible by 2018"

-NODU indicator
-TFI

ÉCOPHYTO

RÉDUIRE ET AMÉLIORER L'UTILISATION DES PHYTOS

"The Ecophyto plan aims to reduce the use of pesticides in France while maintaining high levels of agricultural production in terms of quality and quantity"

The ministry has asked the profession to make a voluntary commitment to new indicators

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In conclusion

- From a constraint to an opportunity
  - We must not suffer from environmental aspects
  - Let’s be pro-active
    - If we do not propose clever things, others will impose non realistic programs
    - Let’s generate added value in the production chain
    - We have to give back to the farmers
      - The value they bring
      - The pride to be a farmer

In conclusion

- From a constraint to an opportuniy

  - We must demonstrate that the farmers can be the best land managers.
    - Train people (Coops advisors and farmers)
    - Have a rational approach vs emotional

  - InVivo wants to share our Know How all over the world with farmers

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In conclusion

a central role for the Decision Support Tools

- A crucial investment to anticipate agricultural evolution

- People who do not invest in these tools won't be on the market any more tomorrow !!

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Thanks for your attention !

Au cœur de nos métiers, le vivant

83 Avenue de la Grande Armée – 75782 Paris Cedex 16

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