Which policy and technical tools will be offered in France to ensure the transition

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What has been done during the ten last years?
Objective : Decrease by 50% of the use of pesticide within 10 years

Ecophyto R&D, Inra : Is it feasible ?

Multidisciplinary expertise

Agronomy : - 30% yes (efficiency/substitution), - 50% possible but with cropping system redesign

Economics : -30% yes (depends on prices),- 50% requires strong economic incentives (Butault et al. 2010, Jacquet et al. 2011)
Ecophyto 2008 - 2018

- Funded by the Tax on diffuse agricultural pollution (5 to 6% of pesticide price)
- Around 40 millions /year
- Innovation and Research
- Dissemination and demonstration (DEPHY Farms network and Experiments network)
- Monitoring the impacts
2008 – 2018 Pesticides use
Why?

Prices?

Socio-technical lock-in?

Insufficient development of alternatives?
Cropping systems more and more simplified

- Spécialisation régionale: régions de grande culture / régions d'élevage; recul constant des systèmes de la polyculture élevage

- Accroissement des surfaces en blé, maïs, colza; recul général des légumineuses

- Raccourcissement des rotations:
  - Colza-Blé-Orge
  - Colza-Blé-Blé
  - Maïs-Blé
  - Monocultures blé ou maïs

Augmentation de la fréquence des rotations courtes, illustrée par le pourcentage de la rotation Colza-Blé-Orge sur les terres labourables

1992-1997
1998-2003

source : Ministère de l’Agriculture et INRA Mirecourt
Change in farm structures
Hired/Family labor
Ag contractors

Some positive results

DEPHY FERME
Pesticides reduction (TFI)

- 33 % vegetables
- 19 % fruits
- 12 % vines
- 7 % arable crops
- 17 % crop- livestock

High number of research projects funded → need for capitalisation of results

Strong Increase in Organic Farming

![Graph showing evolution of number of operators and surfaces engaged in bio farming]

<table>
<thead>
<tr>
<th>Year</th>
<th>Numer of projects</th>
<th>M €</th>
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<tbody>
<tr>
<td>2008</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>2009</td>
<td>15</td>
<td>6.6</td>
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<tr>
<td>2010</td>
<td>18</td>
<td>2.4</td>
</tr>
<tr>
<td>2011</td>
<td>9</td>
<td>2.6</td>
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Annual 2008-2018

Source: Agence BIO / OC
What are the next steps?
Social concern is increasing

According to IFOP 96% of French people support the anti-pesticide decree issued by mayors.

Baromètre IRSN 2019

Ecophyto II+

- Budget increase to 71 million euros
- -25% by 2020, -50% by 2025
- Increase in the number of farms targeted by DEPHY FERME (x10 → 30000)
- More « 0 pesticides » long term experiments (DEPHY EXPE)
- CEPP : Pesticides saving certificates (distributors/practices to lower the use of pesticide)
- Increase in Research & innovation fundings
- Glyphosate exit plan
Research Program:
Cultiver et Protéger Autrement…
(alternative crop production and protection)
.. for a pesticide-free agriculture

- 30 million € Call for research projects
- Long term research programme (6 years projects)
- Fundamental research (TRL 1-4)
- Need to explore new research frontiers
  - Ambitious
  - Disruptive
  - Integrative
**Plant/plant interactions**
- Positive or negative interactions
- Functional diversity
- Combinations of species or varieties
- Intermediate crops
- Catch crops, companion plants

**Agronomy and Biocontrol**
- Diversify crop species in the field
- Functional biodiversity
- Introduction of macro and microorganisms, plant defense stimulators

**Genetics**
- Identification and use of new sources of genetic resistance taking into account interactions
- Developing varieties suitable for new cropping systems (diversification crops, minor species and companion plants)

**Microbiome**
- Understanding crop microbiomes and their use in plant health
- Understanding the effects of microorganisms on the regulation of pests and disease
- Identification of candidate microorganisms for use in biocontrol products

**Facilitate and accelerate transition**
- Understanding determinants of farmers behavior
- Understanding private companies strategies
- Support design of public policies
Will that be enough?

- Drivers for ecological transition
- National public Policies
- CAP
Thanks for your attention