# IPM 2-morrow:

## current research trends from the point of view of the ENDURE foresight study "European Crop Protection in 2030"

Pierre RICCI

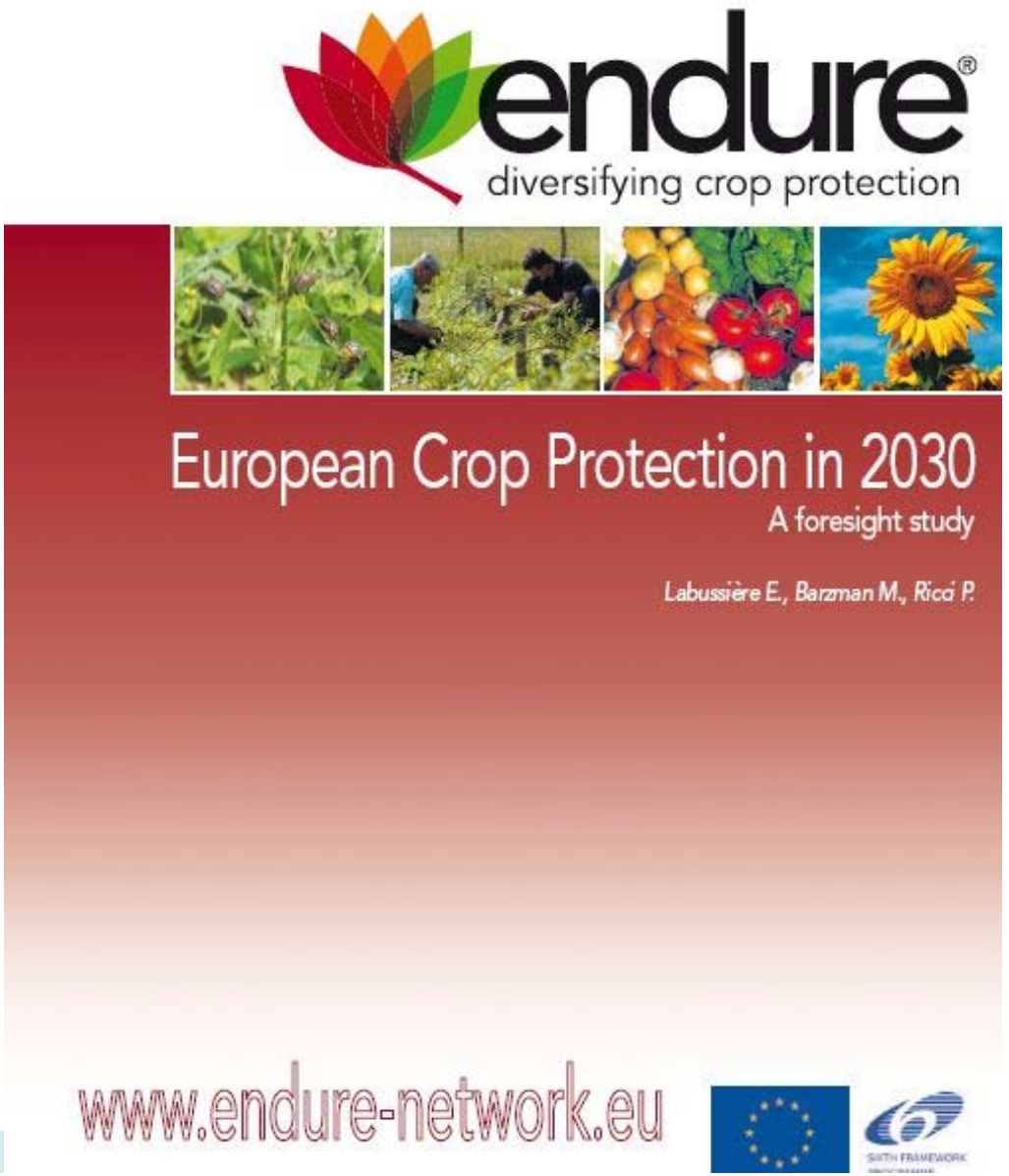
# New EU legislation on pesticides means significant changes in crop protection

- **Changes for farmers**
  - Today, they look for ready-made alternatives as substitutes in their current c.p. schemes
  - Tomorrow, they will need ‘IPM2’ for sustainable c.p.
- **Changes for scientists in plant protection**
  - They contribute to renew and broaden IPM
  - Their outputs will be used in a different context
- ***We need to figure out what plant protection will look like in the future***

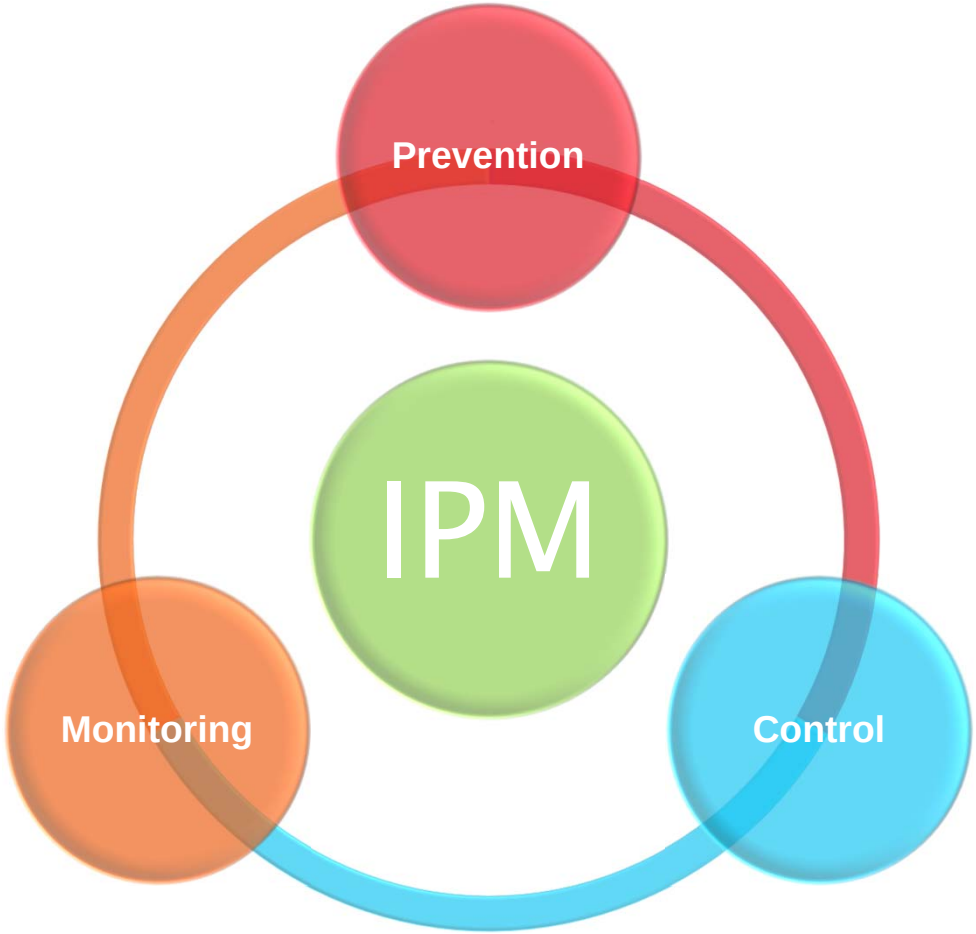
IPM 2.0
Towards future-proof crop protection in Europe

# ENDURE foresight study (2010)

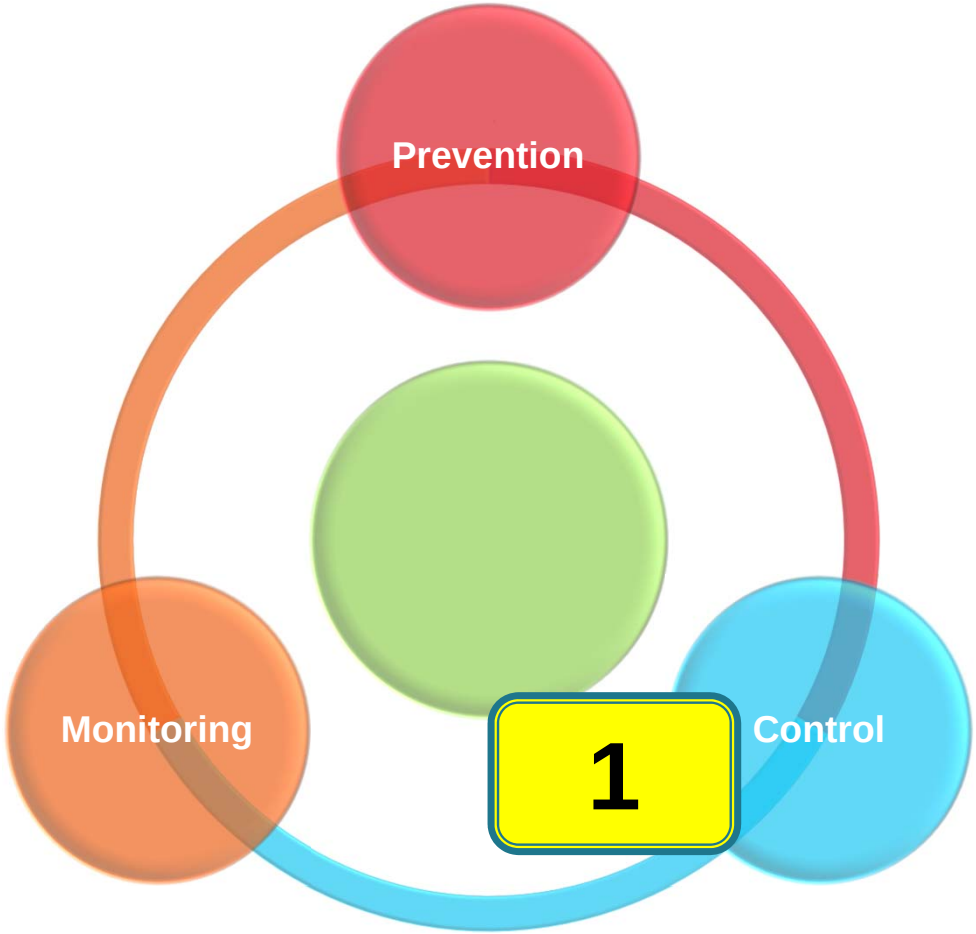
- We identified the major drivers
- We designed five contrasted scenarios
- We discussed implications for stakeholders



# All scenarios comply with IPM principles



# 1.The Commodity Market Player



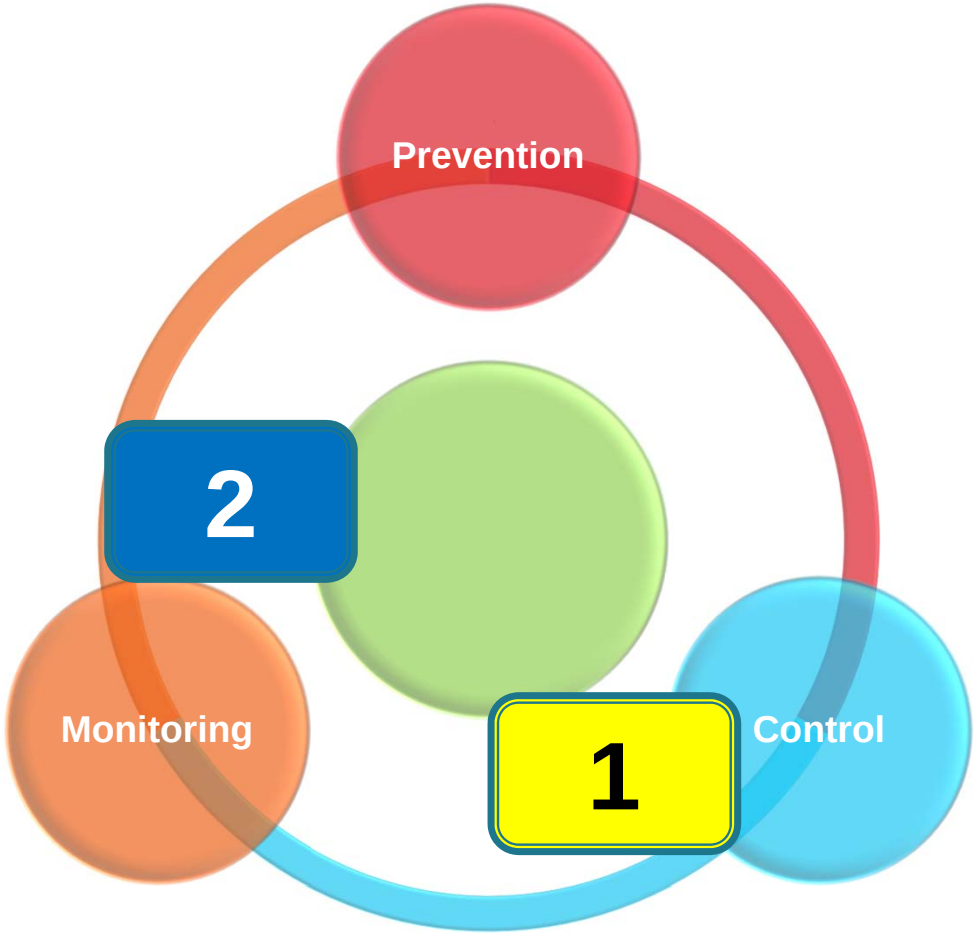
# 1.The Commodity Market Player

**Context:**

- **Commodity crops for export**
- **Large farms with reduced manpower**
- **Homogeneous simplified cropping systems**

- Plant protection is based mostly on pesticides
- Impacts are monitored and traced back to users who are liable for consequences
- Industry has replenished its portfolio with low risk substances of diverse modes of action

# 2. The Specialised High-tech Grower



# 2. The Specialised High-tech Grower

**Context:**

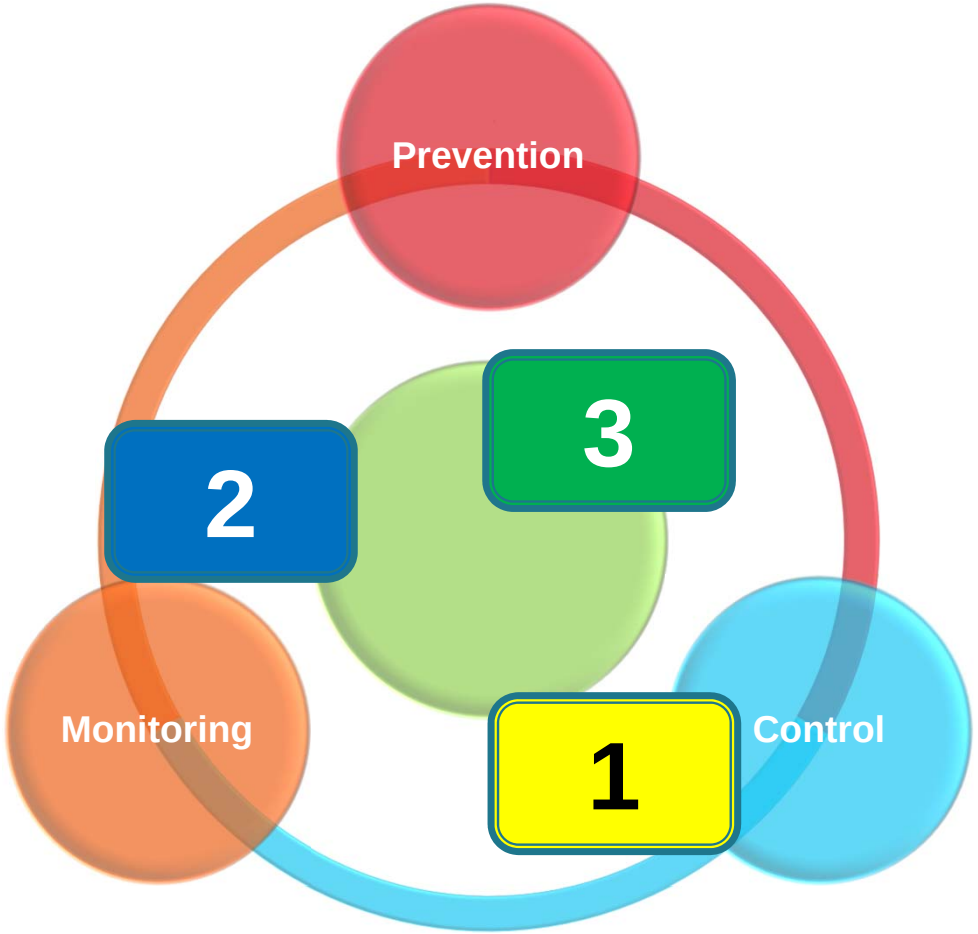
**•High added-value specialty crops**

**•Knowledge-intensive production processes**

**•Greenhouse containment facilities or instrumented open farmland**

- Combination of high technologies in
  - Plant breeding
  - Pest monitoring
  - Epidemiological modelling
  - Physical and climatic control
  - Precision spraying
- make chemical control a last resort option used as a safety net

# 3. The Sustainable Food Provider



# 3. The Sustainable Food Provider


**Context:**

**Diversified European agriculture aiming at food self-sufficiency**

**Sustainable agriculture preserving natural resources for future production**

- Robust cropping systems designed for build-in low vulnerability to pests by
  - managing a diversity of crops and varieties
  - exploiting biological regulations
  - Combining synergistic control methods
- provide a steady production, while preserving natural resources

# The French NAP

*Area 3:*

*Innovating in the design and implementation of techniques and cropping systems with low-input pesticides*

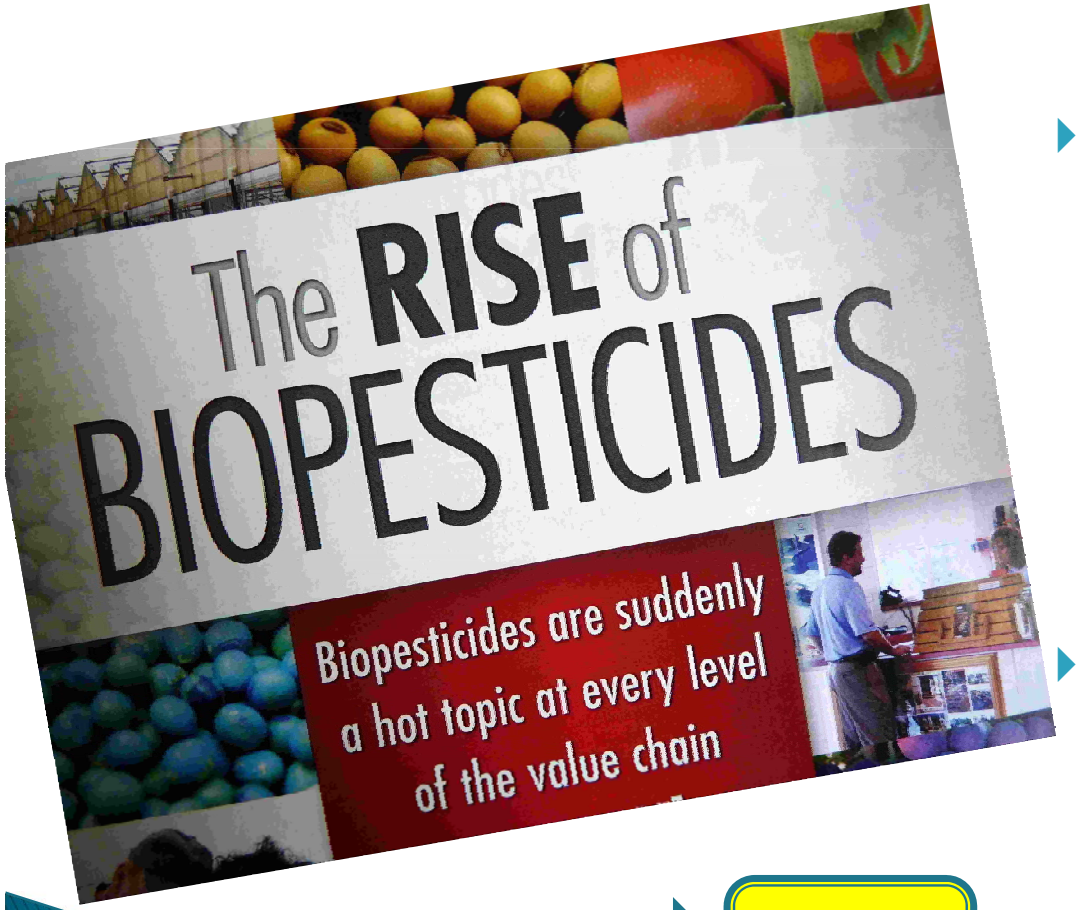
> A research agenda based on identified needs

> Funds for calls supporting research in these specific items

# Biocontrol:
# how to stimulate its development ?

- The small size of BCA-producing companies make it difficult for them to hit the market

# Biocontrol:
# how to stimulate its development ?




- Major Agrochemical companies promote biopesticides and control programs combining them with chemicals
- They use biopesticides to diversify rapidly their portfolio and to address residue issues

1

# Biocontrol: in the context of sc. 3

- Conservation biocontrol
  - Favouring habitats for beneficials by landscape management
- Plants providing services by
  - Trapping nematodes
  - Controlling soil pathogens by allelopathy
  - Cover crops for controlling weeds

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# Plant breeding for low pesticide input in sc. 3

- New objectives
  - e.g. competitiveness towards weeds
  - Broad spectrum resistance
- A larger portfolio to adapt to the changes and diversification of practices
  - Exploiting genotype x environment x practices
  - Modifying approach for registering varieties
- Management of major R gene deployment by spatial layout to ensure durability

# Plant breeding
## for durable resistance

**Cisgenesis**

See presentation by
**Geert Kessel** on Friday

+ intensive molecular monitoring of emerging virulent races

# Decision Support Systems

**1**

Tactical decisions based on

- Epidemiological modelling and pest forecasting
- Economic thresholds

Adapted to the diversity of control agents

**2**

Tactical decisions based on

- **Early sensitive detection (presymptomatic)**
- **Low thresholds**

Calling for rapid decision making

**3**

Tactical decisions based on

- Regional / local monitoring +modelling
- higher thresholds (resilient systems)

+ Strategic decisions

- Crop succession
- Choice of cvs.
- Sowing date
- Etc…

# From uniformity to diversity

- The scenarios are not mutually exclusive: they are likely to coexist in accordance to the variety of regional situations occurring in Europe
- We are leaving a world of relative uniformity of plant protection in mainstream agriculture
- We, as scientists, should pay attention to the future diversity in pest management approaches and to the consequences for the type of knowledge and innovation they demand

# Thank you for your attention

- http://www.endure-network.eu