



Research priorities for the development of IPM

***What do we learn from
ENDURE's foresight scenarios?***

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FOOD
QUALITY
AND
SAFETY



Integrated Pest Management in Europe

Paris, November 2010





How can research provide innovative components to IPM strategies?

A foresight study as a basis for a research agenda

what are the main questions addressed to research?

IPM in the scenarios



European Crop Protection in 2030

A foresight study

Labussière E., Barzman M., Ricci P.

FOOD
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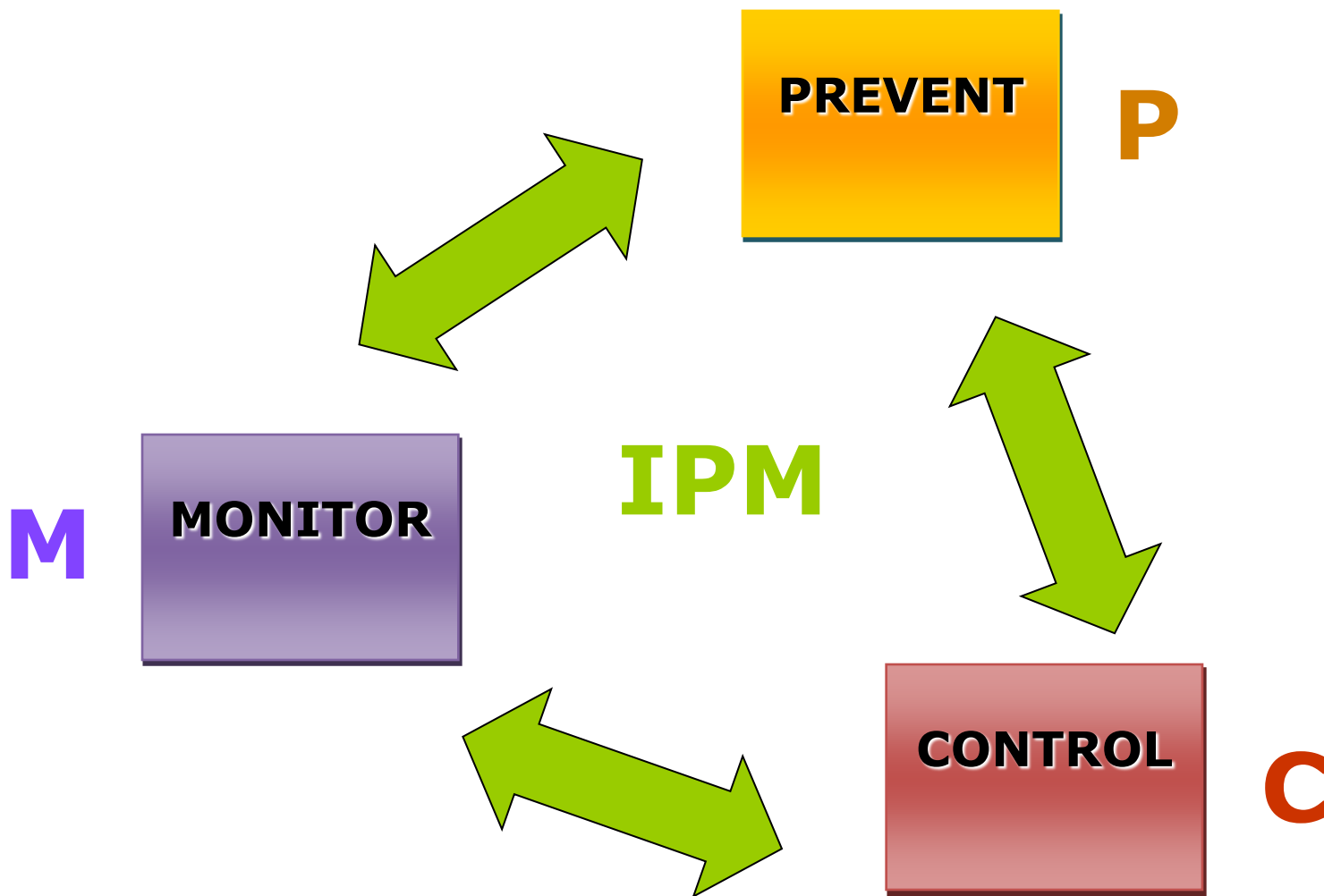


Integrated Pest Management in Europe
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IPM 8 principles



European Crop Protection in 2030

> The Commodity Market Player



> The Sustainable Food Provider



> The Specialised High-tech Grower



> The Community-conscious Farmer



The Commodity Market Player



- **Chemical control remains dominant based on new “green chemicals”**
- **Opportunity for biocontrol, if feasible on a large scale**

C M P

Context:

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

The Commodity Market Player



C **M** **P**

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- Forecasting-based DSSs contribute to reduce the use of control methods

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- Forecasting-based DSSs contribute to reduce the use of control methods

- Durability is managed by combining diverse control methods with resistant varieties

The Specialised High-tech Grower



- Intensive pest monitoring of and modelling potential damage allow to finely target control methods in time, location and intensity (incl. precision spraying), according to real needs

C M P

Context:

- High added-value specialty crops
- Knowledge-intensive production processes
- Greenhouse containment facilities or instrumented open farmland

The Specialised High-tech Grower



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- Healthy planting material, clean substrates and other prophylactic measures are a must

- Plant immunity mechanisms are exploited to pile up multiple resistance in single genotypes

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- Healthy planting material, clean substrates and other prophylactic measures are a must

- Plant immunity mechanisms are exploited to pile up multiple resistance in single genotypes

- Emphasis is on biological and physical control; chemical control is a last resort option

The Specialised High-tech Grower



C M P

Context:

- High added-value specialty crops
- Knowledge-intensive production processes
- Greenhouse containment facilities

- Intensive monitoring of physical and biological parameter

- Pest exclusion by confined environment

- climatic control and biological control are combined

- chemical control is a last resort option

The Community-conscious Farmer



C **M** **P**

Context:

- Ecological services + food products
- Ecological management for pest management
- Constraints on control methods from the local community

- Cropping systems are designed to be resilient to pests and to reduce pest population build up
- Using a diversity of locally adapted varieties spreads the risks
- Diversified crop successions and landscape management exploit biodiversity to counteract epidemics

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- Permanent monitoring addresses pests + functional biodiversity and watches for invasions
- “Health” of natural resources is monitored in relation to ecological services

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- Permanent monitoring addresses pests + functional biodiversity and watches for invasions
- “Health” of natural resources is monitored in relation to ecological services

- Options for control measures are limited: cultural control, biocontrol and biopesticides are preferred

The Sustainable Food Provider



- Cropping systems are designed to be resilient to pests and to reduce pest population build up
- Plant breeding designs varieties adapted to these systems
- Functional biodiversity is exploited (incl. landscape management)

C M P

Context:

Diversified European agriculture aiming at food self-sufficiency

Sustainable agriculture preserving natural resources for future production

The Sustainable Food Provider



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Diversified European agriculture aiming at food self-sufficiency

Sustainable agriculture preserving natural resources for future production

- **Cropping systems are designed to be resilient to pests and to reduce pest population build up**
- **Plant breeding designs varieties adapted to these systems**
- **Functional biodiversity is exploited (incl. landscape management)**

- **Pest monitoring networks and forecast models feed DSSs that incorporate the prevention components**
- **“Health” of natural resources and evolution of pest populations are monitored in relation to durability**

The Sustainable Food Provider



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Sustainable agriculture preserving natural resources for future production

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- Pest monitoring networks and forecast models feed DSSs that incorporate the prevention components
- “Health” of natural resources and evolution of pest populations are monitored in relation to durability

- Reduced pest pressure opens larger opportunities in control methods
- Control relies on a combination of synergistic methods including biological, cultural and physical control
- Chemical control calls for green chemicals and targeted applications

CONCLUSIONS

- IPM may take different forms according to contexts
- No “silver bullet”, crop protection always relies on a combination of different levers
- Innovative methods must be designed *ab initio* in view of being effective in combination
- A broad range of scientific domains are called upon
- Offers many opportunities for public-private cooperation
- Long-term thinking implies long-term programmes and experiments