Maize Case Study and Maize-Based Cropping Systems Case Study

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FOOD QUALITY AND SAFETY

SIXTH FRAMEWORK PROGRAMME

Integrated Pest Management in Europe

Paris, November **2010**

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- **Maize in the EU:**
  - grain maize: 8.3 million ha, green maize: 5.0 mill. ha:
    - acreages, commodity and value;
    - pesticide use and environmental impact.

- **Goals:**
  - Overview and description of maize maize cultivation practices, focus on short-term solutions for reducing pesticide input;

  - Provide important technical expertise towards a system based approach for developing IPM.

- **Activities:**
  - Knowledge compilation and analysis of current maize production systems and their main plant protection problems (pests, diseases, weeds) in European regions;

  - Identify options and restrictions to shift from current to advanced crop protection strategies.

- **Maize Case Study**:
  - Leader: ART, CH
  - Partners: 11 institutes
  - Regions:
    - Spain: Ebro Valley
    - Italy: Po Valley
    - Hungary: 2 counties
    - Poland: Southwest
    - Germany: Southwest
    - Denmark: Whole country
    - Netherlands: Whole country
    - France: Normandie, Grand-Ouest and Southwest

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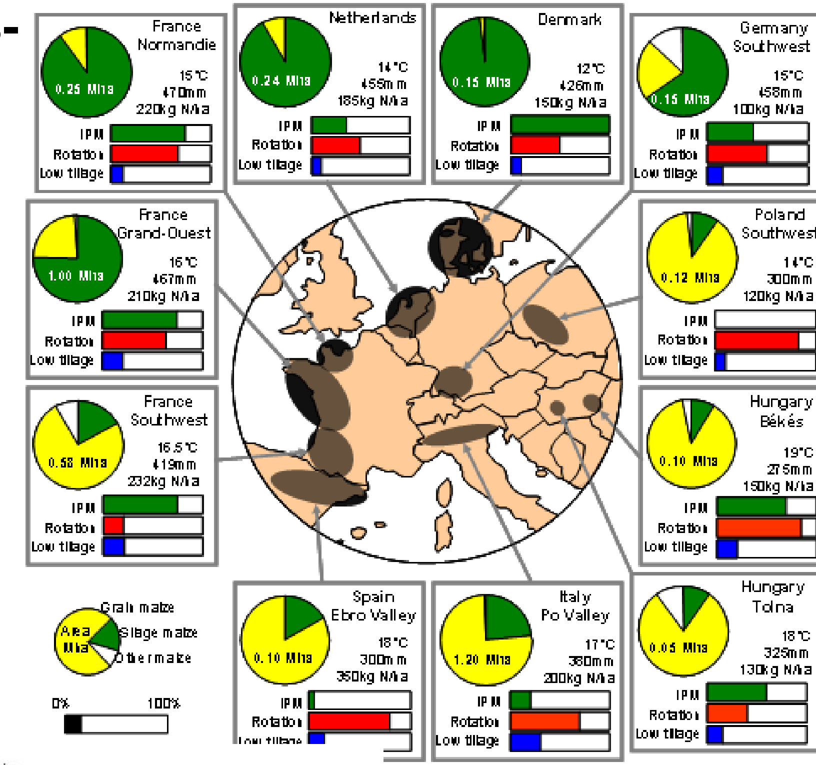
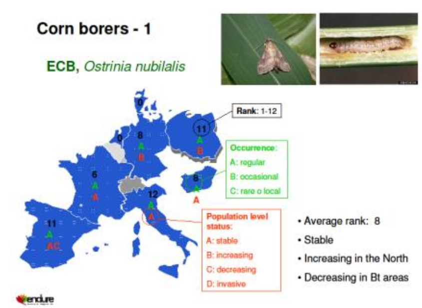
- **Maize production characteristics in 11 regions in Europe:**
  - – climatic conditions,
  - – share of maize crop,
  - – production purposes,
  - – cultivation frame:
    - ◇ conventional,
    - ◇ integrated, organic,
  - – agronomic practices:
    - o rotated/continuous,
    - o fertilization,
  - – plant protection:
    - o diseases, weeds, pests:
      - ▪ present status,
      - ▪ tendencies,
    - o control strategies, tools,
    - o pesticide use, tendencies.





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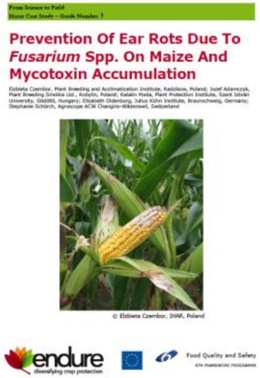
Maize Case Study: Outputs

- **Scientific paper, talks at conferences, workshops:**

- **Leaflets:**



- **Inputs to other WPs,** specifically Maize-Based Cropping System WP, highlighting:
  - regional differences in pests, cultivation practices, etc.
  - certain pests, disease and weeds CAN NOT BE MANAGED within one single crop and year:
    - o their lyfe cycle extends two or more cropping seasons,
    - o effect of pre-crop (host of pathogens), rotation,
    - o effect of adjacent crops on pest level, economic issues.

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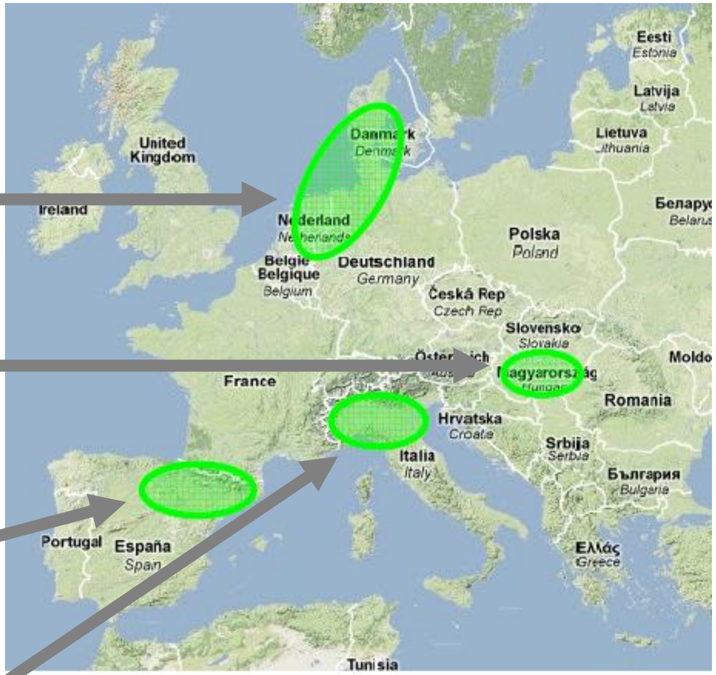
- **IPM development NEEDS a system approach**:
  - o in time (crop rotation)
  - o in space (fields, farm, landscape)

- **Goals:**
  - – Evaluation of actual Maize-Based Cropping Systems (MBCSs) and possible innovations for Sustainable Plant Protection,
  - – Designing Innovative crop protection strategies in Maize-Based Cropping Systems.

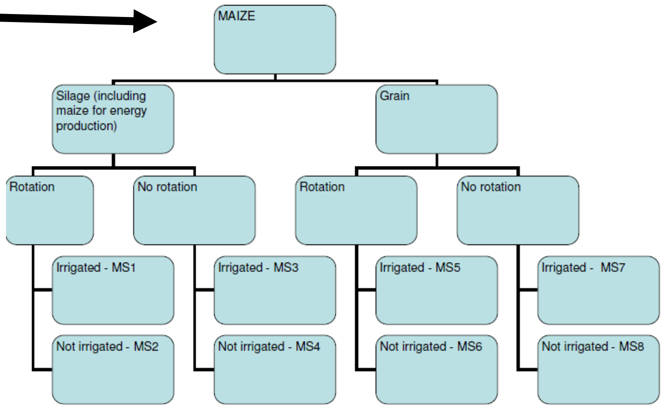
- **Activities:**
  - – Identification of economic pest problems, pest control practices in the selected regions, SWOT analysis existing MBCSs,
  - – Recommendations for sustainable plant protection with innovative methods, approaches and implications for IPM,
  - – Adaptation of environmental and social components of DEXiPM to MBCSs.

- Inputs for other WPs, scientific papers, leaflets, recommendations.

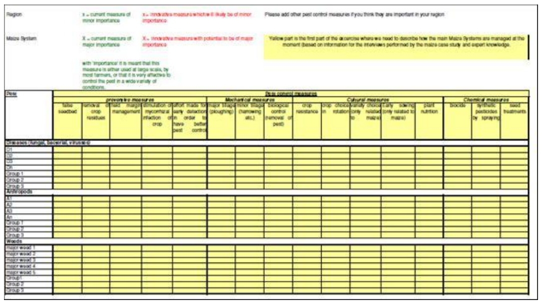
- **Maize-Based Cropping Systems**
  - Leader: SZIE, Hungary
  - Partners: 8 institutes
  - Regions:
    - o northern region
      - ▪ Denmark
      - ▪ The Netherlands
    - o central-eastern region
      - ▪ Hungary (2 counties)
    - o south-western region
      - ▪ Spain (Ebro Valley)
    - o southern region
      - ▪ Italy (Po Valley)



- **Maize-Based Cropping Systems in 4 European regions:**
- **Survey scheeme**:
  - production purpose
    - o grain/green (silage, energy)
  - cultivation practice
    - o rotated/continuous maize
  - cultivation methods
    - o irrigated/non-irrigated
  - „role” in the cropping system
    - o main economic/minor but important crop in the rotation
  - economic driving forces, socio-economic implications



Expert Survey



- **Leaflet: SWOT Analysis and IPM of MBCSs in 4 Regions**

From Science to Field
Maize Based Cropping Systems (MBCS) Case Study – Guide Number 1

Maize Based Cropping Systems in Four European Regions: SWOT Analysis and IPM Considerations

Vasileios P. Vasileiadis, Stefan Otto and Maurizio Sattin, National Research Council (CNR), Italy; Zoltán Palinkás, Andrea Veres, Rita Bán and Jozsef Kiss, Szent István University (SZIE), Hungary; Xavier Pons, Universitat de Lleida (UdL), Spain; Per Kudsk, University of Aarhus (AU), Denmark; Rommie van der Weide, Applied Plant Research Wageningen UR (PPO), The Netherlands; Elzbieta Czembor, Plant Breeding and Acclimatization Institute, IHAR, Poland

Maize in four European regions. Clockwise from top: Spain (© Belén Lumbierres, UdL); Italy (© Maurizio Sattin, CNR); Netherlands (© Jos Groten, PPO); Hungary (© Jozsef Kiss, SZIE).

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Conclusion:

In order to assess current Maize Based systems and develop IPM, a broader view and adjusted TOOL is necessary.

- Adaptation of **environmental components** of DEXiPM:
  - Adapting pesticide mobility and pesticide eco-toxicity attributes,
- Adaptation of **social compo-nents** of DEXiPM:
  - social sustainability assessment
  - social changes caused by conver-ting the system to innovative IPM.

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- **EXPERT SURVEY**
  - Innovative IPM tools,
  - Their potential from agronomic, environmental, economic and social impacts (- 0 +) on MBCS,

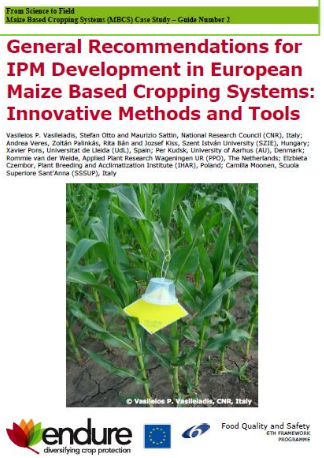
- **RECOMMENDATIONS FOR IPM DEVELOPMENT**
  - The adoption of **more diversified crop rotations in MBCSs** is essential to develop "new" systems.
  - **Regional policies to encourage sustainable systems** based on crop rotation and advanced/innovative IPM strategies should be developed.
  - Applied research should evaluate **systems that have longer term benefits** and be economically competitive.
  - **Subsidies to farmers through agri-environmental schemes** will encourage the adoption of innovative IPM systems.
  - **Improved links among stakeholders** can be the basis for a better understanding and efficient use of innovative IPM strategies through mutual recognition and information sharing.

Maize-Based Cropping Systems Case Study: Outputs

- **Scientific paper, talks at workshops:**

Crop protection in European maize-based cropping systems: current practices and recommendations for innovative Integrated Pest Management. **Agricultural Systems** (**Submitted**)

- **Leaflets:**
  - General Recommendations for IPM Development in MBCSs: Innovative Methods and Tools



  - 4 Regional Recommendations for IPM Development…

Thank you for the attention

Teams involved:

	Institute	Country
ACTA	Association de coordination technique agricole	France
AGROS	Agroscope Research Station ART	Switzerland
AU	University of Aarhus	Denmark
CNR	Consiglio Nazionale delle Ricerche	Italy
DAAS	Danish Agricultural Advisory Service	Denmark
IBMA	International Biocontrol Manufacturers Association	
IHAR	Instytut Hodowli i Aklimatyzacji Roslin	Poland
JKI	Julius Kühn-Institut (former BBA)	Germany
SSSUP	Scuola Superiore Sant'Anna (Pisa)	Italy
SZIE	Szent István University	Hungary
UdL	Universitat de Lleida	Spain
WUR/PPO	Wageningen University and Research Centre/ Praktijkonderzoek Plant & Omgeving (Applied Plant Research)	Netherlands

Teams involved

SZIE	Szent István University, Hungary
CNR	National Research Council, Italy
SSSUP	Scuola Superiore St' Anna, Italy
UdL	University of Lleida, Spain
AU	Aarhus University, Denmark
PPO	WAU and Res. Center, Appl. Plant Prod., The Netherlands
IHAR	Plant Breeding and Accl. Institute, Poland

ACTA/ARVALIS, France