

# Assessing and Monitoring the Impacts of Genetically Modified Plants on Agro-ecosystems (AMIGA)

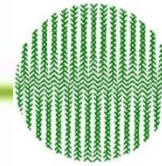
**Geert Kessel, Ewen Mullins,  
Antoine Messéan  
and Salvatore Arpaia**



# Partnership



Italian National Agency for New Technologies,  
Energy and Sustainable Economic Development



# INRA

Institut National de la Recherche Agronomique



AARHUS UNIVERSITY



# GEOSYS



Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria



# THÜNEN



# University of Reading



ALMA MATER STUDIUM  
UNIVERSITA DI BOLOGNA



WAGENINGEN UR  
For quality of life



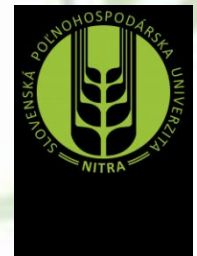
AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY



UNIVERSITY OF HELSINKI



# The James Hutton Institute



Instituto Nacional de Tecnología Agropecuaria



# LUND UNIVERSITY

# BüroLang



PLANT RESEARCH INTERNATIONAL  
WAGENINGEN UR

# umweltbundesamt

ENVIRONMENT AGENCY AUSTRIA

**ERA**

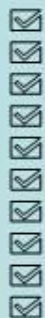
**PMEM**

**Economic  
Impact**

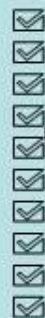
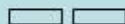


**European receiving environments**

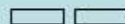
**Knowledge gaps**



**Reduce  
uncertainty  
in decision  
making**



**Increase  
confidence in  
ERA  
guidelines**



**Contribute  
to PMEM  
designs**



# Underlying principles

- Selection of **specific receiving environment** trying to encompass the largest possible variability of environmental conditions;
- Selection of “**focal**” **species and/or ecological functions** as potential bioindicators of environmental effects according to crop-trait-environment and agricultural practices in the selected areas;
- Planning experimental designs according to a **prospective power analysis and to the experimental designs** advised in the EFSA Guidelines.

# Project objectives

1. To provide **baseline data on biodiversity** in selected agro-ecosystems and adjacent habitats through field surveys in non-GM cultivations;
2. To translate **regional protection goals** into measurable assessment endpoints;
3. To define lists of **suitable potential bioindicators** (species assemblages and/or ecosystem functions) fine tuned for specific European regions;
4. To improve knowledge on potential **long term environmental effects** of GMPs;
5. To provide **practical examples** for testing the efficacy of the new EFSA Guidelines for the ERA of GMPs;
6. To explore possible strategies for data-driven **post market monitoring** of GMPs;
7. To estimate the **compatibility and sustainability of GM crops** within the principles of Integrated Pest Management which represent the sole pest management options in the EU after 2014;
8. To provide a systematic analysis of **economical aspects** of cultivation of GMPs;
9. To set a **training and communication plan** that addresses current public concerns about GMPs in Europe



# Crops

- Maize



- Potato



# Work Packages

- WP1: Project Management
- WP2: Biogeographic regions & Protection goals
- WP3: Long term effects
- WP4: Biol. Comp. Soil Fertility
- WP5: Trophic structures
- WP6: Env. Impact on pollinators
- WP7: Post Market Environm. Monitoring
- WP8: IPM for GM
- WP9: Statistical analysis & design for ERA
- WP10: Economical assesment of GM crops in EU
- WP11: Communication, dissemin. and education

# Communication



[www.amigaproject.eu](http://www.amigaproject.eu)



# Communication

The screenshot displays the AMIGA project website. At the top left is the AMIGA logo with the tagline 'Assessing and Monitoring the Impacts of Genetically modified plants on Agro-ecosystems'. A navigation menu includes 'Project', 'Partners', 'Newsroom', 'Documents', 'Research', and 'Events & Activities'. Below the menu is a banner image of potted plants with the text 'Calendar of events'. The main content area is titled 'AMIGA PROJECT OTHER EVENTS' and features a section for 'EVENTS 2013'. This section lists events for May, June, and September 2013, including the EuroBlight Workshop, ICAFUS 2013, the 3rd World Biotechnology Congress, the Global Food Security Conference, and the VIII Congreso Nacional de Entomologia Aplicada. On the right side, there are three boxes: 'Events & Activities' with links to Summer Schools, Calendar of events, and Photogallery; 'News' with a list of recent news items; and a 'Search' box.

**amiga** Assessing and Monitoring the Impacts of Genetically modified plants on Agro-ecosystems

Project Partners Newsroom Documents Research Events & Activities

Calendar of events

## AMIGA PROJECT OTHER EVENTS

### EVENTS 2013

**MAY 2013**

**EuroBlight Workshop**  
12 – 15 May  
Limassol, Cyprus

**ICAFUS 2013 : International Conference on Agriculture, Food and Urbanizing Society**  
15 – 16 May  
Amsterdam, The Netherlands

**JUNE 2013**

**3rd World Biotechnology Congress**  
3 – 6 June  
Boston, USA

**SEPTEMBER 2013**

**Global Food Security Conference**  
29 Sept – 2 Oct  
Noordwijkerhout, The Netherlands

**OCTOBER 2013**

**VIII Congreso Nacional de Entomologia Aplicada**  
21 – 25 October  
Barcelona, Spain

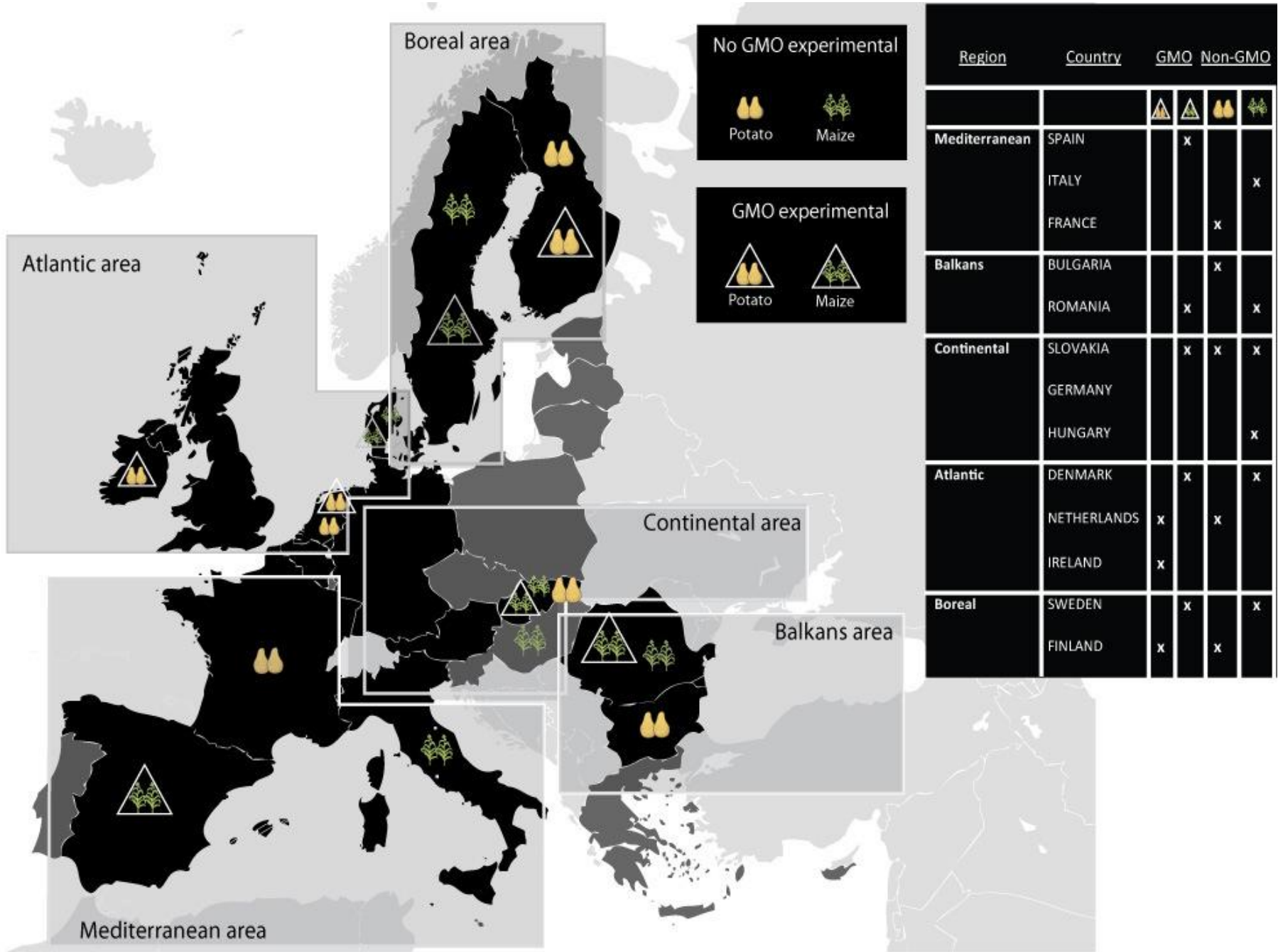
Events & Activities

- Summer Schools
- Calendar of events
- Photogallery

News

- First results of the AMIGA project to be presented around Europe
- Ti and AMIGA at the EU US Environmental Biotechnology Workshop
- Potato field trials damaged in the Netherlands
- University of Reading presented AMIGA at the World Congress of Agricultural Biotechnology in China
- First publication from AMIGA project

Search



Country	Partner	GM in confined conditions (WP4, WP5, WP6)		GM field trials (WP4, WP5 - WP8)		Monitoring of commercial GM fields (WP7)	Survey on non-GM agroecosystems (WP2 - WP6)	
		Potato	Maize	Potato	Maize		Potato	Maize
Spain	INIA				X	X		
Italy	UNIBO		X					X
Italy	ENEA	X						
France	INRA						X	
Bulgaria	ABI	X					X	
Romania	INCDSB				X	X		X
Slovakia	SAU		X		X	X	X	X
Germany	WUE	X	X				X	X
Hungary	Subcon. AU							X
Denmark	AU				X			X
Netherlands	PRI			X				
Netherlands	WU	X	X	X			X	X
Ireland	Teagasc			X				
Finland	UHEL			X			X	
Sweden	LUND				X			X
Argentina	INTA					X (more events)		

Partner BL and JHI will provide support to field activities in different locations



# The EFSA GD



European Food Safety Authority

EFSA Journal 2010;8(11):1879

## SCIENTIFIC OPINION

### **Guidance on the environmental risk assessment of genetically modified plants<sup>1</sup>**

**EFSA Panel on Genetically Modified Organisms (GMO)<sup>2,3</sup>**

European Food Safety Authority (EFSA), Parma, Italy

# The Stakeholders Consultation Platform

- Institutional European bodies (DG Research, DG SANCO, EFSA)
- International Institutions (FAO)
- National Bodies (Competent Authorities, Scientific Advisory Boards)
- Applicants (EuropaBio)
- NGOs
- Producers' Associations



# Experiments with potato

- GM (IPM):
  - The Netherlands
  - Ireland
- Non GM (Baseline data on biodiversity):
  - Finland
  - Romania



# Experimental design

- GM experiments:  
Must distinguish between of effects of:
  - Genetic modification
  - Resistance
  - Specific events
- Duplicate experiments in Netherlands and Ireland

# Experimental design

- Full factorial design
- 3 potato cultivars (Desiree, Desiree+ Vnt1, Sarpo mira)
- 3 IPM options (no control, standard control, IPM2.0)
- 7 Replicates
- 6x6 m plots

Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Block 7
3	6	3	8	2	5	1
6	4	6	9	9	9	8
2	8	4	4	6	1	2
4	1	7	3	3	2	5
8	3	9	5	1	6	7
7	7	2	6	5	4	4
9	2	5	7	4	3	3
5	9	1	2	8	8	6
1	5	8	1	7	7	9

# Observations

- NTO's:
  - Soilborne:
    - Rhizosphere bacteria & fungi
    - Nematodes
    - Earthworms
  - Foliar (insects, flying, plant dwelling, soil surface, natural enemies)
  - Pollen & Pollinators
- Adaptation in *P. infestans*

# Thanks. Salvatore & Co.

