

# **MYCORED**

### Reducing mycotoxin contamination in the food and feed chains

# The Challenge

Mycotoxins are secondary metabolites produced by fungi that are toxic to humans and animals consuming food/feed products. The mycotoxins represent one of the most important and sensitive problem for our world and our life, as various many products we normally use in our diet are exposed to their contamination. Mycotoxins are dangerous for feed and food chains as they can create contamination in pre- and post-harvest processes.

Mycotoxin research is making strong efforts to improve knowledge and reduction of aflatoxins, trichothecenes, zearalenone, fumonisins and ochratoxin A, that are considered the most potent mycotoxins . Mycotoxin reduction targets of vital importance have been identified by some international food organizations (e.g. FAO, CIMMYT, EFSA, IITA, SAFE consortium), EU reports and relevant food industry representatives.

However, over the last 5-6 years significant advances, particularly in industrial countries, have been made in the development of genomic, proteomic, metabolomic and ecophysiological information on host plant, mycotoxigenic moulds.

MycoRed aims at developing strategic solutions to reduce contamination by mycotoxins of major concern in economically important food and feed chains. The project builds on the outcomes of several European projects (through most coordinators/partners of FP5 and FP6) on mycotoxins by supporting, stimulating and facilitating education and cooperation with countries having major mycotoxin concerns related to international trade and human health. The direct involvement of ICPC countries (Argentina, Egypt, Russia, and South Africa) and international organizations (CIM-MYT, IITA) together with strong scientific alliances with international experts strengthen the project through sharing experiences and resources from several past/ongoing mycotoxin projects in a global context.

# **Project Objective**

The overall objectives of MycoRed are:

- To develop novel solution driven methodologies and handling procedures to reduce both pre- and post-harvest contamination in selected feed and food chains
- To generate and disseminate information and education strategies to reduce mycotoxin risks at a global level. High risk areas will receive major attention by cooperation with international agriculture and food organizations

In this project novel methodologies, efficient handling procedures and information, dissemination and educational strategies, are considered in a context of multidisciplinary integration of know-how and technology to



## EATIP Thematic Area of Relevance

**TA1:** Product Quality, Consumer Safety and Health

TA2: Technology and Systems

TA3: Managing the Biological Lifecycle

TA4: Sustainable Feed Production

**TA5:** Integration with the Environment

TA6: Knowledge Management

**TA7:** Aquatic Animal Health and Welfare

**TA8:** Socio-Economics and Management

## **Key Words**

Mycotoxins, toxigenic fungi, biocontrol, plant resistance

## **Project Information**

# Contract number: 222690

#### Contract type:

Collaborative project for specific cooperation actions dedicated to international cooperation partner countries (SICA)

#### Research area:

KBBE - Reduce mycotoxin contamination in the food and feed chain **Duration:** 

48 months (01/04/2009 – 31/03/2013) **Coordinator:** 

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reduce mycotoxin exposure worldwide.

The need to improve prevention to minimize mycotoxins in products at different critical steps of the food chain (raw materials, storage, feed supply, food processing, final products) will be addressed by MycoRed through vertical (across food and feed chains) and horizontal (among methodologies and procedures) integration of experiences to develop a set of systems with clear breakthrough solutions to specific mycotoxicological problems.

# **Key Points**

MycoRed aims to develop practically useful tools for quantifiable and significant reductions in toxin contamination of economically important commodities for food and feed.

Innovation is achieved at different levels in the food/feed chain and in the SME applications based on:

- The development of new pre- and post-harvest strategies for achieving the required specifications addressed due to the selected applications;
- The combination of advanced technological solutions for improving specifications;
- Cost reduction for novel analytical/molecular solutions at the laboratory level, allowing the massive use and thus, the improvement of monitoring of safety and quality;
- Application of very high-tech multidisciplinary solutions (i.e. ambient intelligence, web-inar, DNA arrays, biomarkers) to traditional activities (i.e. conferences, training courses) in Europe.

## Key New Knowledge Expected

MycoRed will implement **dissemination of information and best practice education strategies** to enhance the involvement of operators at all levels along food and feed chains, facilitating the participation and co-operation at European but also at global level, commensurate with the interest of the EU community.

Consumers' awareness on mycotoxin will be raised, increasing food safety for humans and feed safety for animals. Moreover, useful tools will be provided to agro-food producers in pre- and post-harvest solutions to mitigate mycotoxin in plant products and in the subsequent food/feed chains. Improved handling procedures, (bio)control measures against toxigenic fungi and new detection kits to be applied during storage and process-ing will reduce mycotoxin contamination.

Information and know-how for evaluating mycotoxin risks, including possible outcomes of climate change and increased international trade, will be provided to policy makers and legislators. Finally, through the improvement of global communication, international networking and dissemination, innovative research results on mycotoxins will be widely spread to the scientific community.

# **Potential Impacts**

RTI

- Optimization of plant resistance & fungicide use
- · Biocontrol reducing mycotoxins in cropping systems
- Advanced technologies for diagnostics, quantitative detection and novel approaches to control toxigenic fungi
- Advanced analytical tools for rapid multi-toxins detection of mycotoxins and relevant biomarkers
- Prepare standards for mycotoxins and toxigenec fungi detection
- Demonstrating the creation of an "ambient intelligence ", strategies post-harvest and the collection of physical parameters

SME

Decrease in the costs of rejection of contaminated raw crop materials

- Increase in the European agro-food industries competitiveness
- · Promotion of new spin-off SMEs in Europe and ICPC countries
- Modelling and development of Decision Support System
- Novel post-harvest and storage handling practices
- Novel application of food processing technologies

## Policy

- Address the evaluation of research policy at the global level through conferences focused on advanced research tools.
- Assure effective control systems
- Increase in the safety of feed and foodstuffs
- Improved ability to reduce safety problems due to mycotoxin
- Manage international relations with Third Countries
- · Promote science-based risk management

## Knowledge Transfer

Information/dissemination and education to developing countries (Africa, Asia, South America) and sharing information with advanced third countries (USA, Canada and Australia) by conferences, workshops, training and short mobility missions.

# **Related Publications/Projects**

CONFFIDENCE