MycoRed developed novel solution driven methodologies, handling procedures and practically useful tools to reduce significantly both pre- and post-harvest toxin contamination of selected and economically important commodities in food and feed chains.

MycoRed applied integration of specific technologies to a set of **food/feed chain** targets with respect to **wheat, maize, grape, nuts and dried fruits,** by new advanced integrated approach based on multidisciplinar know-how and technology. A significant reduction of mycotoxins in **pre-harvest** was obtained by optimization of plant resistance, fungicide use, biocontrol, modelling and developing a decisional support system (DSS).

Resistance to Fusarium Head Blight and Fusarium Ear Roat were identified in Wheat genotypes and maize hybrids respectively. A significant reduction in DON contamination (80-90%) was reached by using fungicide optimization technology and additional 50% reduction compared to the best technology found was reached by developing a better nozzle composition.

Field trials, also on large scale in Nigeria, Argentina, The Netherlands and Italy, were successfully conducted by using selected biological control agents in maize, peanuts and wheat; so far up to **80%** AFLA control reduction in maize and in peanuts was achieved with non-toxigenic Aspergillus strains while *F. graminearum* inoculum was decreased about **70%** in wheat stubble by using antagonists. Predictive models for DON/ZEA contamination in wheat, , FUM and AFLA in maize, OTA in grapes, were developed and validated supporting DSS. In **post-harvest and processing**, relationships between environmental factors and dry matter loss relevant to EU legislative limits (DON, FUM and AFLA) were identified in wheat, maize and hazelnuts. Novel solution driven methodologies and handling procedures based on gases O_3 in wheat and maize, reduced the fungal growth and FUM production (100%) in maize. In addition, **novel anti-fungal natural compounds** were identified and economically evaluated to be potentially used for post-harvest control of DON, FUM and AFLA. An intelligent system based on wireless sensor network devices was developed to monitoring temperature, humidity and CO_2 into grain silos. Some agricultural by-products can find technological applications as low cost feed/food additives/ adsorbents for mycotoxin reduction mycotoxins (up to 95% AFB_1, 83% ZEA, 83% OTA and 47% FB_1). They represent a potentially valuable source of phenolic antioxidants and undegradable fibre, which could promote health through their ability to "trap" in the digestive tract. Dried fruits processing by sulphuration, dehulling/peeling, sorting and roasting reduced AFLA B1 in apricot seeds (up to 99.5%), in pistachio (83%), and almonds (50%).

Advanced **molecular technologies** were developed for identification of toxigenic fungi from several host plants, and **novel approaches by application of light at different wave length (up to 90%),** permitted a better control of fungal growth and toxin production/reduction. Advanced **analytical methods** were developed and validated for multi-mycotoxin analysis in a range of food matrices from the chosen food chains and simultaneous determination of multi-biomarkers for main mycotoxins in human and animal urine. Rapid **test kits** (strip tests) for the detection of DON, AFLAs and FUMs were throughly validated and checked for cross-reactivity against conjugated and other altered forms of mycotoxins.

The project had a significant impact in the scientific international community as well as in the stakeholders, policy makers and industry. In addition the project improved **awareness** and **advanced knowledge** on mycotoxins concerns at global level, by dissemination and training with unexpected interest expressed by different communities. **International events**, in cooperation with **ISM** and/or other organizations, were organized in different continents (Austria 2009, Malaysia 2010, Africa 2011, Argentina 2011, Canada 2012, Italy 2013) with participation of about 2000 experts; workshops on specific topics (Hungary, 2010, Turkey 2010, Russia 2011, Egypt 2011, The Netherlands 2012); 4 training courses on detection techniques, on line too (Italy, Malaysia, Indonesia). Young researchers/students were involved in this learning process, participating at Short Term Visits mostly from ICPC countries (24) in EU/Africa labs and Home Education sessions in China/Argentina/Indonesia/USA. Twinnings (EU-Canada; EU-Argentina) and **scientific networks** were activated by signing 20 alliances/agreements worldwide.