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Her Royal Highness Princess Sumaya bint El Hassan

President of El Hassan Science City

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Enlargement,
International Collaboration
& Capacity Building

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1st International Workshop on Harmonization of GMO Detection and Analysis in the Middle East and North Africa (MENA) Region

Organised by:
European Commission Joint Research Centre (JRC) and
Directorate General for Health and Consumers (DG SANCO)
in collaboration with
Royal Scientific Society (RSS) of Jordan

Dead Sea, Jordan
4 - 5 June 2012

European Commission

Workshop organised in the context of the DG SANCO 'Better Training for Safer Food' Programme

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State of GMO Detection, Networking and Harmonization in MENA Region

Nisreen AL-Hmoud

Royal Scientific Society, Jordan

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The beginning

Biotechnology Initiative in Jordan

- In 2004, Jordan started a biotechnology program upon the direction of His Majesty King Abdullah II.
- The Royal Scientific Society recognized the importance of developing a national-regional experience for detecting GM products to ascertain their potential risks on animal, human health and biodiversity.

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The First Global Conference on GMO Analysis

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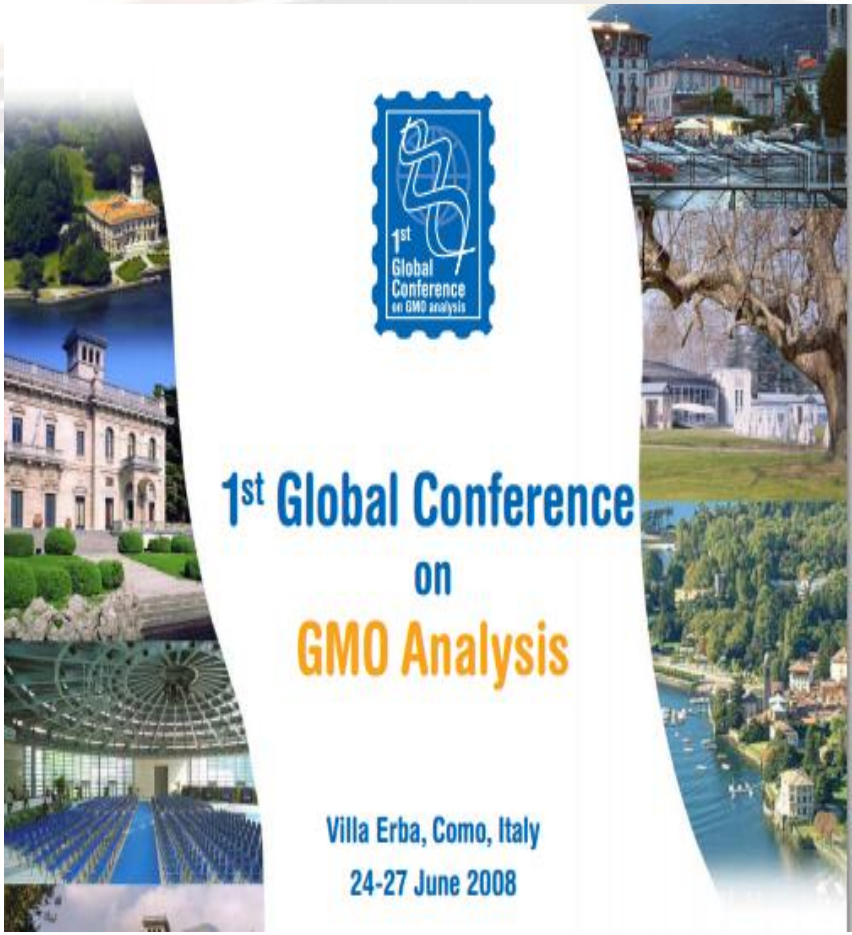
The First Global Conference on GMO

- Around six hundred participants from over seventy countries attended the "*First Global Conference on GMO Analysis*", which was held at Villa Erba in Como (Italy) from 24 - 27 June 2008.
- The conference was organized by European Commission - Joint Research Centre.



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The First Global Conference on GMO

For the first time , the GMO detection community had a *global platform* for scientific exchange and the chance to strengthen collaboration among laboratories all over the world.

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The First Global Conference on GMO

Only two countries from MENA region participated in the conference: Jordan & Algeria

JRC
EUROPEAN COMMISSION

1st Global Conference on GMO Analysis
Villa Erba, Como, Italy 24-27 June 2008

Toward Establishment of Middle East Regional Biosafety Laboratory

Nisreen D. Al-Hmoud, Mohammed A. Al-Obaide, Bassam O. Hayek
Environmental Research Center, Royal Scientific Society, Amman , Jordan

Royal Scientific Society (RSS)

RSS is an independent Jordanian organization mainly engaged in scientific and technological R&D, technical studies, consultations and training.

Environmental Research Center (ERC)

ERC has been active in the field of environmental management and protection since 1976. In addition to water quality management, ERC is a house of expertise in major aspects that directly affect public health and the environment. Recently, the Environmental Research Center had established a biosafety laboratory equipped with necessary facilities for detection of GM products. Moreover, realizing the importance of regional cooperation to counteract the possible risks of GM products, the Center is planning to establish of regional biosafety laboratory in cooperation with International and regional partners.

Background

In the last decade genetically modified (GM) food products made a great contribution to the world's economic development. However, there are rising international concerns about possible potential risks of GM products. The Middle East Countries in general , and in Jordan in particular, no specific regulatory systems are currently in place. As the region countries are dependent on imports of foods, they face potential risks on health and environment.

Objectives of Regional Laboratory

The general objectives for the establishment of regional laboratory are to introduce regional biosafety regulations, improve biosafety management, protect biodiversity, raise public awareness, strengthen personnel skills for the assessment of potential risks of genetically modified food and to build up public awareness about their benefits and risks in the participant countries. The proposed project is aimed to encourage regional cooperation and to outline plans for the specific needs of Middle East countries for training courses, reorganize biosafety laws and to encourage and support regional research work .

Outcomes

The results of this project will develop and strengthen the indigenous capability in modern biotechnologies in order to assess food safety in Jordan and the region. This will be achieved with support and assistance of well established international GM laboratories.

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Toward the establishment of a "Middle-East" regional Bio-safety Laboratory

N.D. Al-Hmoud, M.A. Al-Obaide and B.O. Hayek

Establishment of a Regional Laboratory

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The general objectives for the establishment of a regional laboratory are to:

- introduce regional bio-safety regulations;
- improve bio-safety management;
- protect biodiversity;
- strengthen personnel skills for the assessment of potential risks of GM food;
- *encourage regional cooperation and to outline plans for the specific needs of Middle East countries for training courses*; and
- build up public awareness about their benefits and risks in the participant countries.

1st International Workshop on Harmonization of GMO Detection and Analysis in the Middle East and North Africa (MENA) Region

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1st International Workshop on Harmonization of GMO Detection and Analysis in the Middle East and North Africa (MENA) Region

Fifteen Countries from MENA region

Algeria, Bahrain, Egypt, Iraq, Kuwait, Jordan, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Tunis, UEA.

European Commission/Joint Research Center

Belgium, Germany, Italy

African Union Commission

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MENA Countries, CBD and Cartagena Protocol

The Convention on Biological Diversity is an international treaty for the *conservation of biodiversity*, the *sustainable use of the components of biodiversity* and the *equitable sharing of the benefits derived from the use of genetic resources*.

The Cartagena Protocol on Biosafety is a subsidiary agreement to the CBD.

It seeks to protect biological diversity from the *potential risks posed by living modified organisms resulting from modern biotechnology*.

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Cartagena Protocol

- Recognizing that modern biotechnology has great potential for human well being if developed and used with *adequate safety measures* for the environment and human health.

- Aware of the rapid expansion of modern biotechnology and the growing public concern over its potential adverse effects on biological diversity, taking also into account *risks to human health*.

List of MENA countries which signed the CBD and Cartagena Protocol on Biosafety

Countries	Cartagena Protocol	CBD
Algeria	2000	1992
Bahrain	2012	1992
Egypt	2002	1992
Iran	2001	1992
Iraq	-	2009
Jordan	2000	1992
Kuwait	-	1992
Lebanon	-	1992
Libya	2005	1992
Mauritania	2005	1992
Morocco	2000	1992
Oman	2003	1992
Pakistan	2001	1992
Qatar	2007	1992
Saudi Arabia	2007	2001
Sudan	2005	1992
Syria	2004	1993
Tunisia	2001	1992
United Arab Emirates	-	1992
Yemen	2006	1992

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State of GMO detection in MENA region

- Although the 20 countries of MENA region signed the CBD of which 16 countries signed Cartagena Protocol on bio-safety, there is a need for further work in the direction of enactment of laws and legislation.
- The participants from several MENA countries will present the status of GMO legislation in their countries in two sessions this afternoon.

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Status of GMO in Jordan

- There are regulations issued by Ministry of Environment for GM food and feed products.
- The research conducted by the Biosafety Group/RSS showed the presence of unlabeled genetically modified maize and soy food and feed products in the Jordanian market.

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Monitoring of GM products in Jordan

- Research activities started in 2008 to monitor GM products in Jordan by Biosafety Unit/RSS.
- Results are published in international journals & proceedings of scientific conferences.
- Postgraduate research project.

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Publications of Biosafety Unit: Research papers

1- Nisreen Al-Hmoud, Nawar Al-Husseini, Hiyam Al-Rousan, Eric Kübler, Mohammed A. Ibrahim, 2012. ***Identification of Gateway pSITEII-8C1 sequence in genetically modified MON 810 maize marketed in Jordan***. Submitted for publication.

2- N. Al-Hmoud, H. Al-Rousan, B.O. Hayek and M.A. Ibrahim, 2010. ***Detection of Genetically Modified Maize and Soybean Food Products in the Jordanian Market***. Biotechnology, 9: 499-505.

3- Hiyam Al-ROUSAN, Nisreen Al-HMOUD, Bassam HAYEK and Mohammed IBRAHIM, 2010. ***A study on the occurrence of genetically modified soybean and maize feed products in the Jordanian market***. Journal of Cell and Molecular Biology 8(2): 87-94.

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Publications of Biosafety Unit: Conferences

- First Global Conference on GMO Analysis. Como, Italy, 24-27 June 2008: N. Al-Hmoud, M. Al-Obaide and B. Hayek. *Toward the establishment of a "Middle East" regional Biosafety Laboratory*.
- Third International Congress on Food and Nutrition. Antalya, Turkey, 22-25 April 2009: M. Ibrahim, N. Al-Hmoud, H. Kilani. *Evaluation of CTAB method for genomic extraction of cereal derived products in Jordan's markets.*

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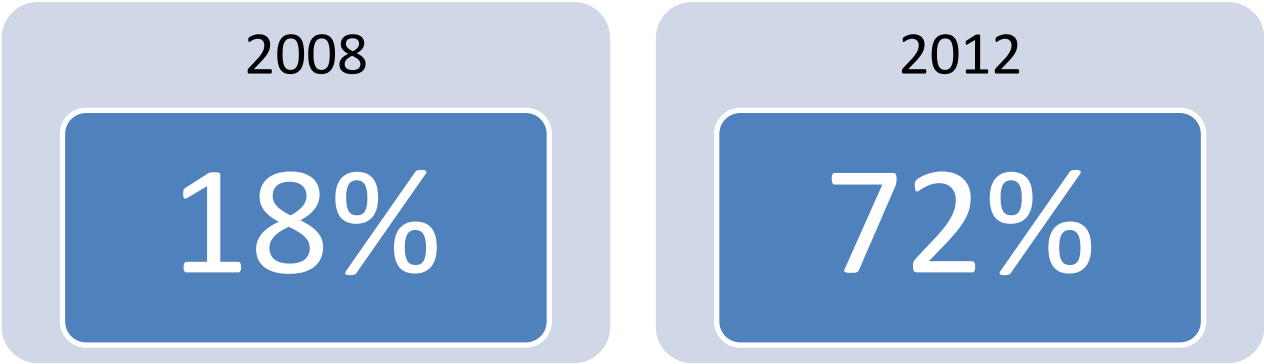
Summary of research results on GMOs in Jordan

- The results indicated significant increase in the percentage of GM maize sold in Jordan's markets during the period 2008 and 2012.



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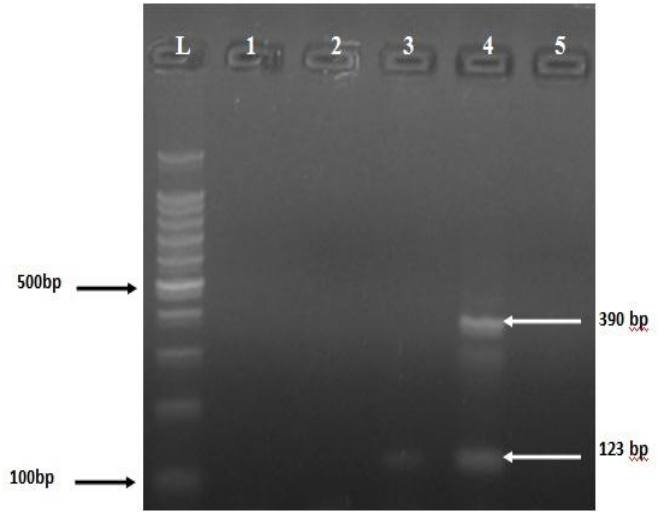
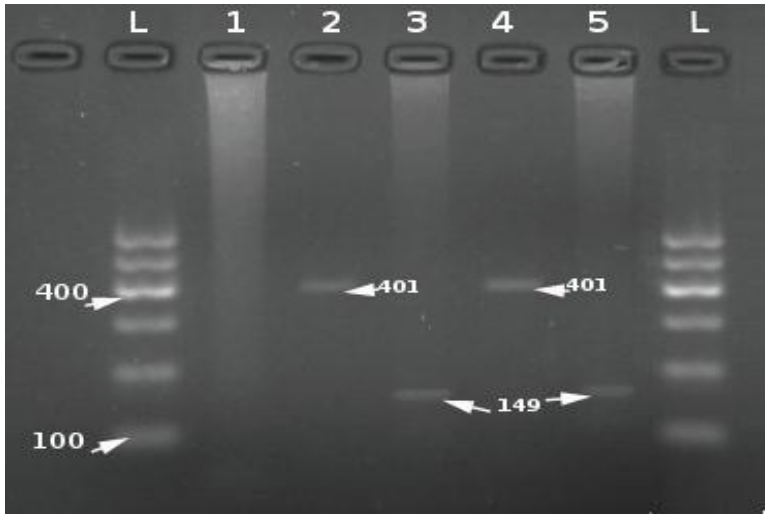
- The primer pair (p35S-cf3, F & p35S-cr4, R) used for detection of CaMV 35S promoter normally amplify a 123 bp fragment.
- Amplified 390 bp fragment was observed in some but not all GM maize sold in Jordan's market carrying MON810 event .
- The 390 bp fragment was not detected in the standard authorized genetic event GM maize MON810.





Origin of 390 bp fragment

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- Sequence analysis of 390 bp fragment indicated that it originates from part of the pSITEII-8C1 plant transformation vector.

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421 cgttgaagat gcctctgccg acagtggtcc caaagatgga cccccaccca cgaggagcat
481 cgtggaaaaa gaagacgttc caaccacgtc ttcaaagcaa gtggattgat gtgataacat
541 ggtggagcac gacacacttg tctactccaa aaatatcaaa gatacagtct cagaagacca
601 aagggca[att gagacttttc aacaaagggt aatatccgga aacctcctcg gattccattg
661 cccagctatc tgtcacttta ttgtgaagat agtgg{aaaag gaaggtggct cctacaaatg
721 ccatcattgc gataaaggaa aggccatcgt tgaagatgcc tctgccgaca gtggtcccaa
781 agatggaccc ccacccacga ggagcatcgt ggaaaaagaa gacgttccaa ccacgtcttc
841 aaagcaagtg gattgatgtg atatctccac tgacgtaagg gatgacgcac aatcccacta
901 tccttcgcaa g]acccttcct ctatataagg aagttcattt catttggaga gga}cgtcgag
961 agttctcaac acaacatata caaaacaaac gaatctcaag caatcaagca ttctacttct
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The Status of GMO in MENA region

- Have high excellence Biotech laboratories, but the capacity building in GMO detection is limited.

  - Personnel Skills
  - Detection methods
  - Accredited GMO Laboratory

- Enactment of laws and legislation to implement GMO detection and labeling.

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Networking and Harmonization in MENA Region

- This workshop considers trends and the desirability of participants representing the MENA countries for achieving greater harmonization of GMO detection and analysis in collaboration with EC/JRC.

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The special interest is in:

- *Improving capacity building* of MENA countries to achieving the acceptable level of monitoring of GMO detection and analysis.
- *Common understanding* of international and regional biosafety laws, regulations and guidelines.
- *Commitment* to networking and harmonization.

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Requirements for capacity building in MENA region

- Establishing of affiliated EC/JRC reference GM laboratory in MENA region.
- MOU for strengthening regional-EC/JRC collaboration.
- A regional system to provide services.
- Data sources and exchange of data; there are three main sources for data collection at:
  - Country,
  - Sub-regional / regional, and
  - International

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Steps for networking and harmonization

- Identification of national laboratories in MENA countries.
- Establishment of laboratories network in MENA countries.
- Coordination with the EC/JRC.

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Experience of Jordan in Identification of National Laboratory

Situation Analysis: The hosting organization of Biotech laboratory is engaged in conducting testing of food and feed with validated and accredited laboratories

1. General criteria
    - Infrastructure
    - Equipment
    - Skilled personnel

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Experience of Jordan in Identification of National Laboratory

2. Specific criteria: the laboratory should be *internationally recognized* and must take appropriate measures to ensure that it is capable of providing data of the required quality. Such measures should include:
   - Using validated methods of analysis
   - Using internal quality control procedures
   - Participating in proficiency testing schemes; and
   - Becoming accredited to an International Standard, normally ISO/IEC 17025.

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Steps for Networking and Harmonization

- Identification of national laboratories in MENA countries.
- Establishment of laboratories network in MENA countries.
- Coordination with the EC/JRC.

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Establishment of laboratories network in MENA countries

- It is expected that workshop will recommend establishment of laboratories network to improve exchange of information and to strengthen collaboration.

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Steps for networking and harmonization

- Identification of national laboratories in MENA countries.
- Establishment of laboratories network in MENA countries.
- Coordination with the EC/JRC.

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Coordination with the EC/JRC

- MENA GMO laboratories network should work towards quality assurance and harmonization of genetic testing services in coordination with the EC/JRC.
- Organizing annual workshop on *Harmonization of GMO Detection and Analysis* in collaboration with EC/JRC.

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International-Regional Experiences

Twelve workshops (2 international and 10 regional) were held during

April 2009 and July 2012

Region	Place	Date
Central and South America	Colombia Mexico Brazil	3-4 July 2012 2-3 March 2011 4-5 Dec. 2009
MENA	Jordan	4-5 June 2012
African Countries	South Africa	7- 8 February 2012 28-29 Oct. 2010
EU-Asia regional network meeting	Philippines Singapore Singapore Malaysia	23 May 2012 7 June 2011 9-10 June 2010 16-17 June 2009
International workshop	Croatia Turkey	29-30 Sept. 2010 27-28 April 2009

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……In addition,

- There is a need for strengthening the action plan through:

i. The introduction of electronic platform for networking and information dissemination between MENA countries and EC/JRC.

ii. Identifying countries, sub-regional and regional priorities.

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Tasks of MENA Laboratories Network

- On-line exchange of information
- Co-ordination of scientific activities
- Drafting MENA network agreement
- Supporting public activities

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In conclusion…..

- *It is expected that the MENA GMO laboratories network will be established to*:
  - Assist in solving problems facing the members laboratories in GMO detection and analysis.
  - Enhance the capabilities of GMO laboratories.
  - Encourage collaborative work with EC/JRC.
  - Support GMO research; in particular detection of un-authorized genetic event and tracking GM sequences in food chain.

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