Coordinating platform for Regional GMO detection and Biosafety Guidlines in West Asia and North Africa

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(AARINENA)

Regional Workshop on

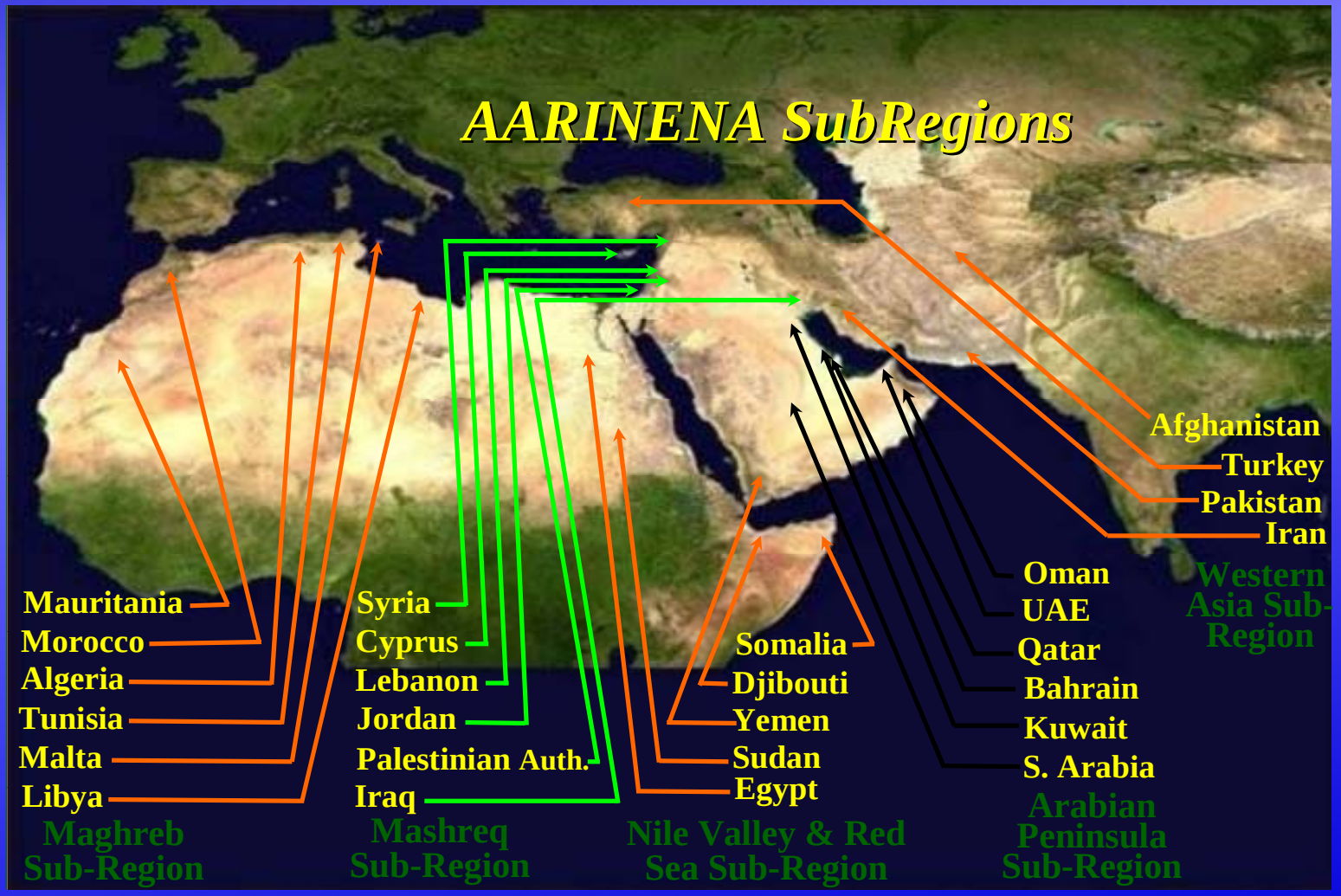
"Detection of Genetically Modified Organisms (GMOs) and Biosafety"

SYRIA - June 2010

AARINENA MISSION

- **To contribute to the enhancement of agricultural and rural development in the WANA region through fostering agricultural research and technology development.**
- **To promote the exchange of scientific and technical experience and information.**
- **To strengthen collaboration within and outside the region to achieve greater degree of self-reliance in food and agriculture.**

AARINENA (Cont.)



Why we need Biotech/GM Crops

The most compelling case for biotech crops is their capability to contribute to:

- Increasing crop productivity
- Increasing stability of productivity
- Economic, health and social benefits
- Renewable resources
- Conserving biodiversity
- Efficient use of inputs

Number of events approved

Number of events approved per crop

Crop	Number of events
Maize	35
Cotton	18
Canola	14
Soybean	7
Tomato	6
Potato	4
Carnation	3
Sugar beet	3
Polish canola	2
Tobacco	2
Squash	2
Rice	2
Aflalfa	1
Creeping grass	1
Chicory	1
Falx	1
Melon	1
Papaya	1
Sweet pepper	1
Petunia	1
Wheat	1
Total events	107

Most approved events-Top 8

Event	Trait	No. of approvals
Soybean GTS 40-3-2	HT	21
Maize MON810	IR	18
Maize NK603	HT	18
Cotton MON531/757/1076	IR	16
Maize Bt 11	HT+IR	16
Maize GA21	HT	14
Maize Bt 176	HT+IR	13
Maize TC1507	HT+IR	13

Total crops received approvals: 21

Maize	210
Cotton	105
Canola	76
Soybean	38

Traits introduced

Herbicide tolerance, insect resistance, fertility restoration, modified lysine content, modified oil content, delayed ripening or altered shelf life, virus resistance, modified flower color, and nicotine reduction.

Global Crop Problems
Where biotechnology can complement

- Cotton – **insects, virus, drought, salts, fiber quality, weeds, hybrids etc**
- Wheat - **Rusts, drought, heat, salts, aphids, weeds**
- Rice - **Stem borer, blight, drought**
- Maize - **Shoot borer, high temperature, weeds, hybrids, salts**
- Sugarcane – **Top/stem borer, red rot, rust, mosaic, weeds, low sugar**
- Oil seeds (12) - **High Erucic acid and Glucosinolate)**
- Pulses (8) - **Gram (pod borer), blight, rust**
- Vegetable (40)- **Fruit fly, mildews, mosaic viruses, blight, worms**
- Fodder crops (10)- **Diseases, pests, weeds, quality**
- Fruits (10) – **Fruit fly, delayed ripening, insects, salinity, drought**
- Others – **Floriculture, Forest, medicinal plants etc**

Potato Viruses

Powdery Mildew

Rust

Constraints to Sustainable Agricultural Development in WANA

- typical fragile ecosystems of dry areas
- hot spot for climate change impact
- water scarcity & drought is becoming a common phenomenon
- land degradation & desertification
- population boom & poverty
- weak investment in agricultural research for development
- Inadequate policies
- Geo-politically fragile environment
- gender imbalance
- constraints in human resources and institutional capacities
- the largest food deficit region in the world

Challenges

- **Recent advances in biotechnology applications provide good opportunities for immediate benefits to the WANA region. The applications made in the region include the development of new genetic germplams using advanced Agriculture biotechnology applications.**

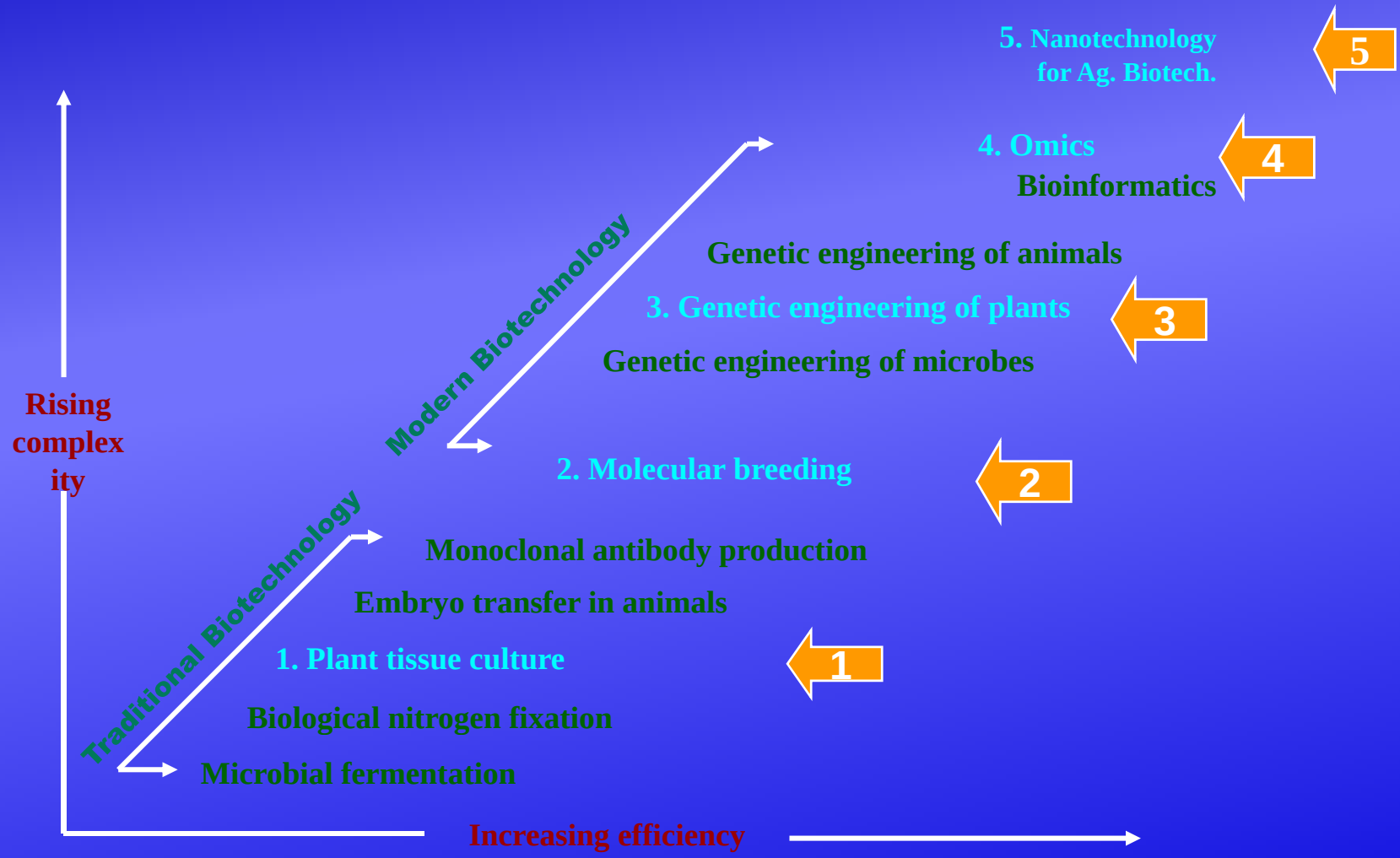
- **Most of the commercial applications have occurred in developed countries. Much of the expertise is concentrated in the commercial private sector, there by restricting developing countries' access to patented technology.**

- **In order to strengthen research partnership in the Region, AARINENA established 6 regional research networks for Date-Palm, Cotton, Olive , Medicinal & Aromatic Plants, Water Use Efficiency and *Agricultural Biotechnology* .These networks are contributing to the generation of information, training, extension and inter-regional research and development programs in the WANA region and with other Regional Networks such as APAARI APCoAB & INCANA .**

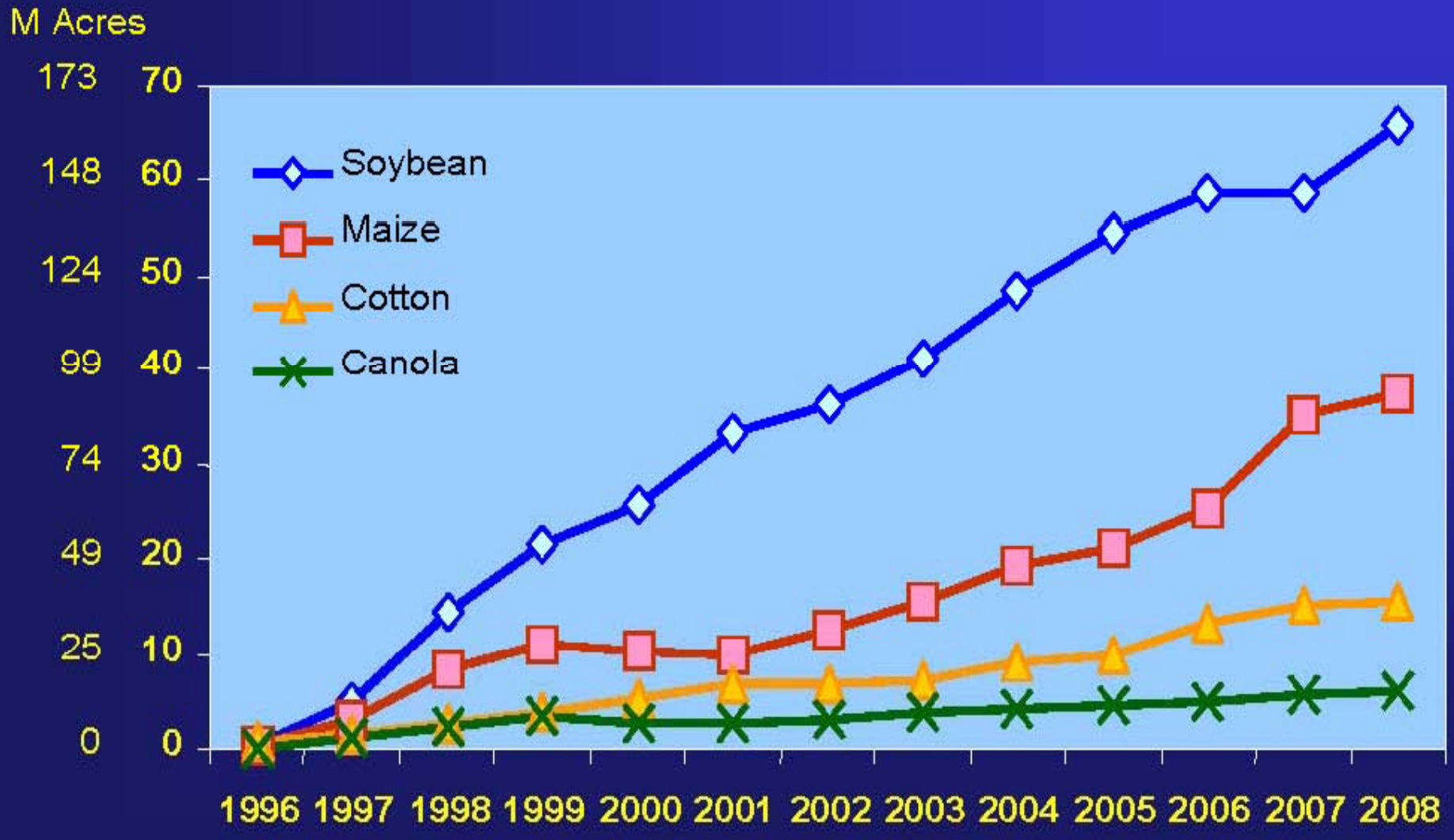
Constraints Facing Biotechnology in WANA Region

- Little integration of biotechnology in national policy framework
- Important local crops and small holder farmer problems not addressed
- Limited in public resources and investments
- Tools for technology transfer inadequate and often inaccessible
- Lack of institutional capacity
- Dialogue among stakeholders is lacking

Gradients of Biotechnology Applications in Agriculture

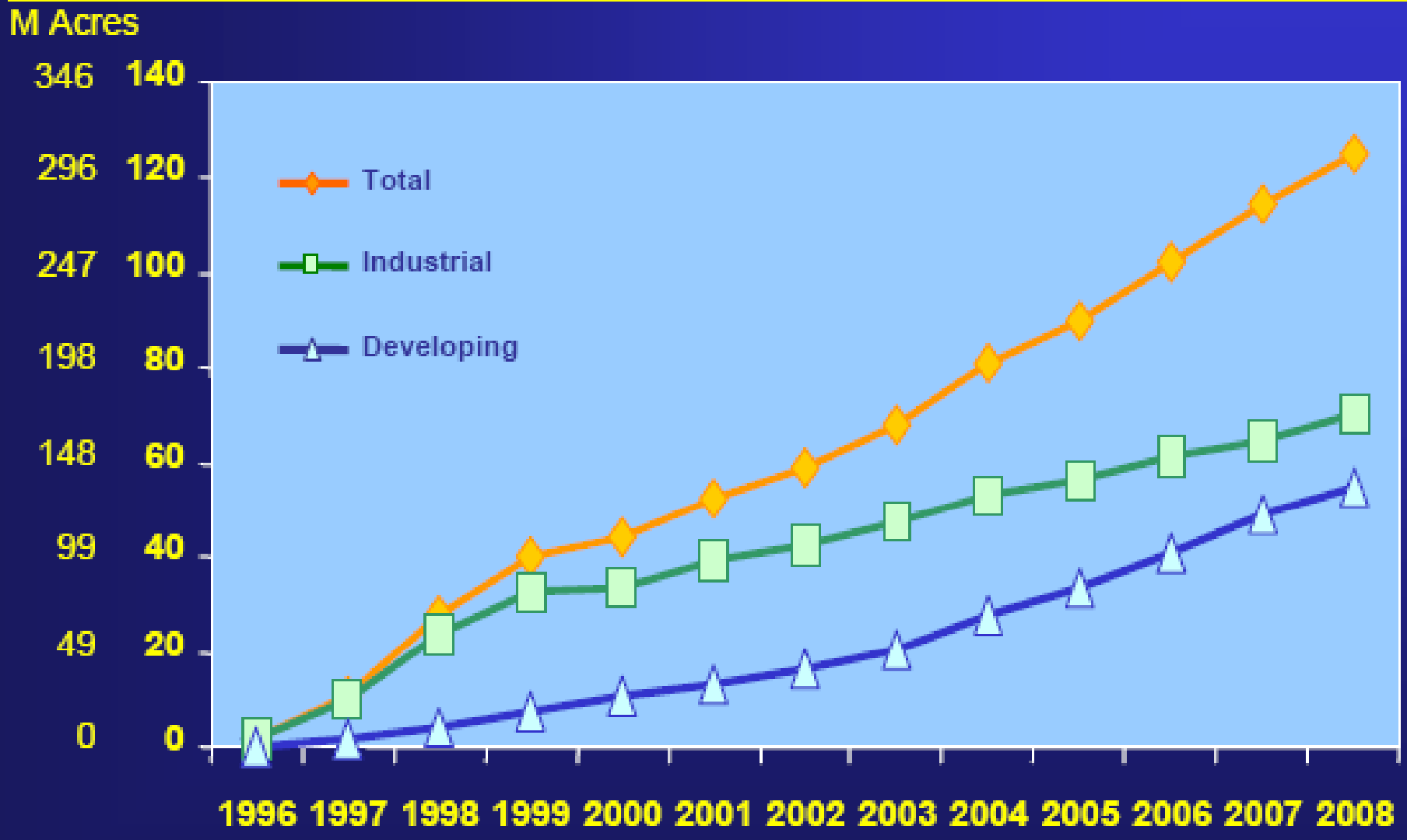


Global Area of Biotech Crops, 1996 to 2008: By Crop (Million Hectares, Million Acres)



Source: Clive James, 2009

Global Area of Biotech Crops, 1996 to 2008: Industrial and Developing Countries (M Has, M Acres)



Source: Clive James, 2009

GM crops and regulation

- From the start, GM crops raised questions about:
  - Their safety for human health and the environment
  - Their socio-economic impact (e.g. small vs. large farmers)
  - Their impact on food security and agricultural trade
  - Their moral acceptability

GM crops and regulation: how not to regulate innovation

- All these concerns were telescoped in a regulatory regime that **officially** deals only with biosafety

→ Generally poor fit between concerns and the way they are dealt with

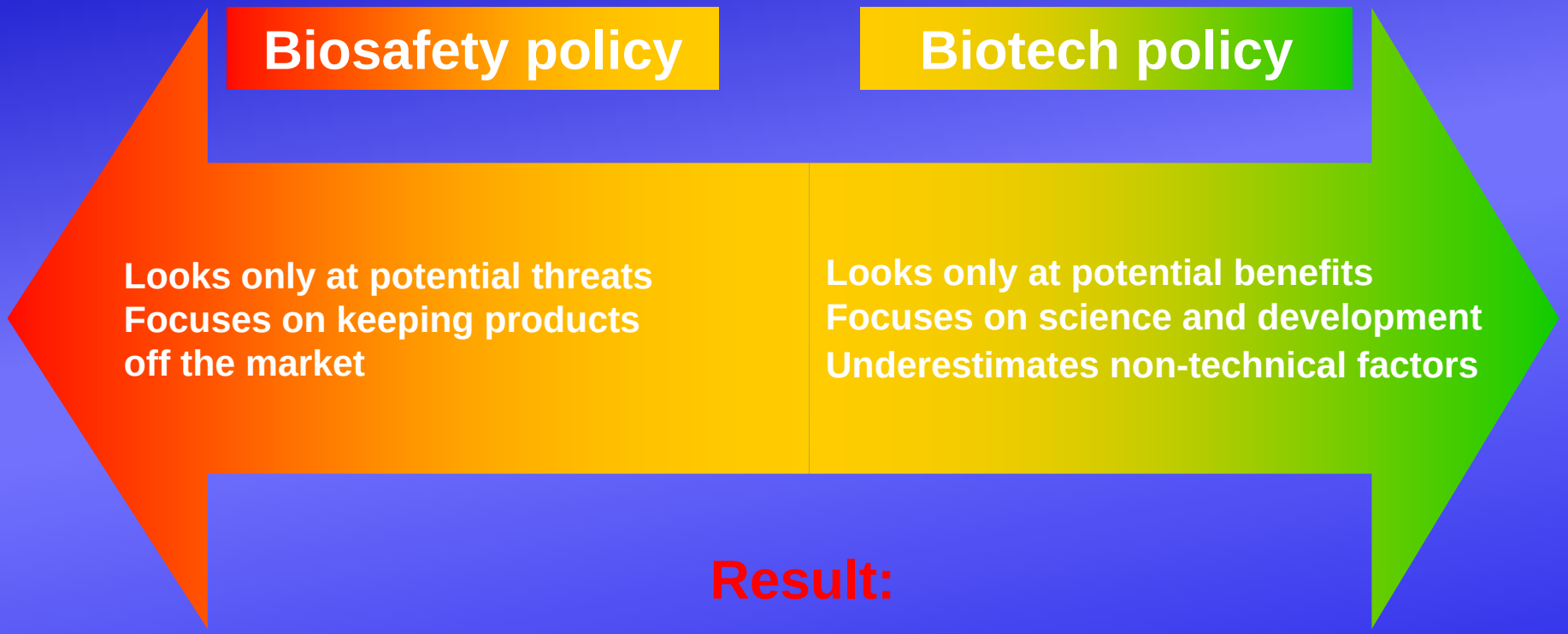
→ Massive confusion in application of biosafety regulations

→ Mismatch between biotech policy and biosafety policy

Are there real working regulatory systems?

Biotech policy and biosafety policy

- Safety and other societal issues are integral parts of innovation policy
- For ag-biotech, this principle has been abandoned early in its evolution
- Led to parallel (and often opposite) policy making



Result:

A lot of controversy and conflict

Nothing is accomplished

Focusing on biosafety…

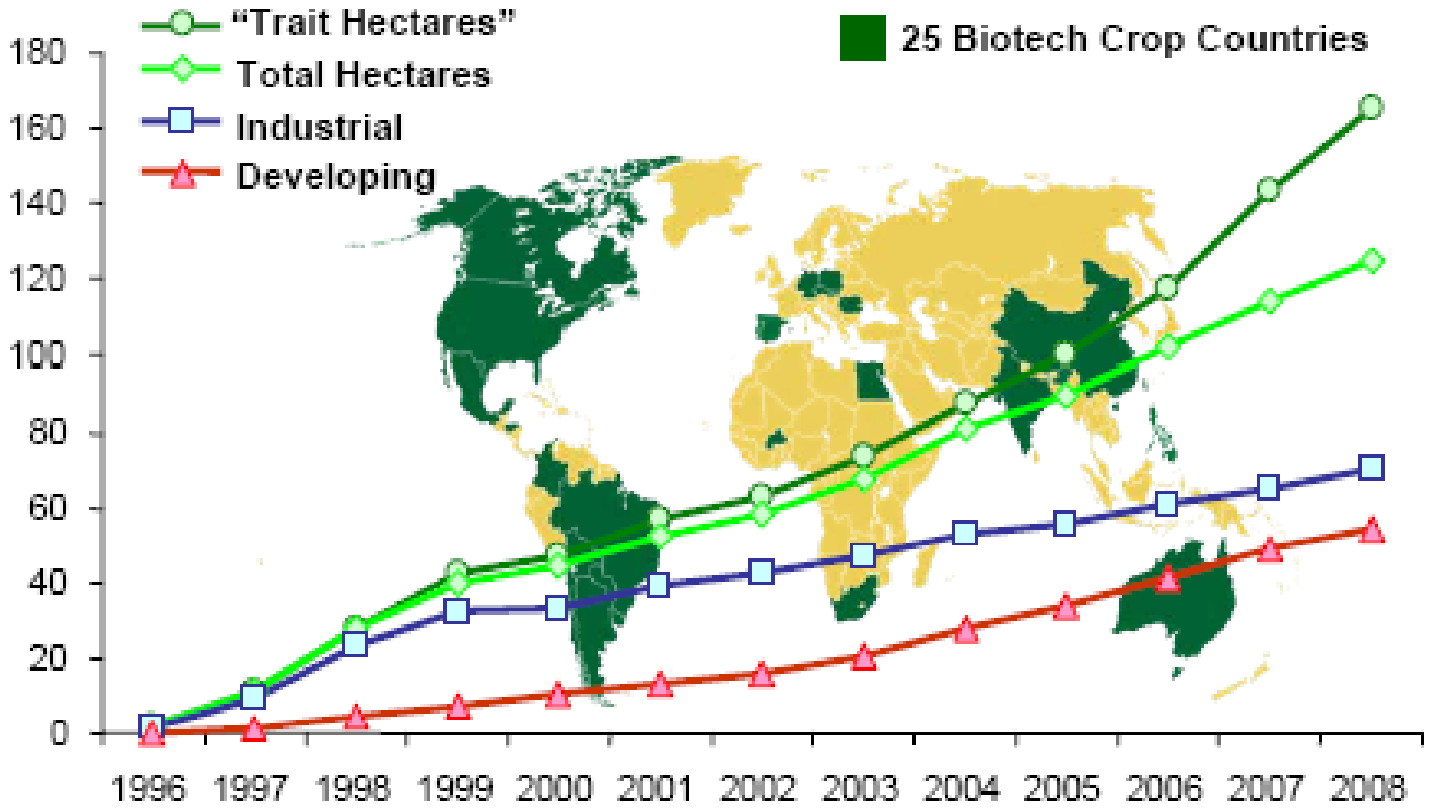
- Safety management is essential in modern decision making
- Has three major components:
  - Risk assessment
  - Risk management
  - Risk communication
- A good system:
  - Is strong in all these fields and well coordinated
  - Learns from experience, and evolves on basis of new info

Focusing on biosafety…

- Biosafety **also** deals with **risk perception**
  - Much fear and confusion has been generated about the safety of GM crops
  - No ground in facts, but **the fear** of stakeholders is **very real**!

→ The need for top class risk communication

GLOBAL AREA OF BIOTECH CROPS
Million Hectares (1996 to 2008)



An "apparent" increase of 9.4% or 10.7 million hectares between 2007 and 2008, equivalent to a "real" increase of 15% or 22 million "trait hectares"

Source: Clive James, 2009.

GMOs Impact- 1

- **First decade 1996-2006**
  - **Exceeded 100 m. ha**
  - **10 million farmers planted Biotech crops**
  - **India (3.8 m. ha) exceeded China**
  - **Accumulated Biotech crops (1996-2006) = 500 m. ha**
  - **60 fold increase in 11 years period represents the highest adoption rate for any crop technology in recent times.**
  - **The very high adoption rate by farmers reflects the fact that biotech crops have consistently performed well and delivered significant economic, environmental, health and social benefits to both small and large farmers.**
  - **This is a strong vote of confidence resulting from Aprox. 45 m. individual decisions by farmers in 25 countries in 11 years period to plant biotech crops.**

Continued

GMOs Impact- 2

- **Economic benefit (1996-2005): 27 billion $**
- **Reduction in pesticide use (1996-2005):**
  - **Active ingredient: 224,300 Metric tons (25% reduction)**
  - **Equivalent to 15% reduction in associated environmental impact of pesticide use on these crops.**
  - **Reduced fuel and labor cost**
  - **No/Low tillage**
  - **Reduction in CO2 emission-results in higher carbon sequestration in soil – Approx. savings: 9 billion kg in 2005 alone.**
- **Reduction in greenhouse gases and climate change**
  - **CO2 saving (2005): reducing 0.43 million cars**
  - **Tillage (carbon seq)2005: Removing 3.6 m. cars**

GMOs Impact- 3

- **Strong growth will continue in second decade**
- **Projected gain by 2015: $ 210 billion**
- **Arae: 200 m. ha; 20 m. farmers in 40 countries**
- **Stacking of traits (1-10 traits)**
- **Expanded range of crops with more agronomic traits**
    - **Drought and salts**
    - **Quality traits- healthier oils and nutritious products**
    - **Vaccines and special products**
- **Contribute to Millennium Development Goal- Reduction in poverty and hunger by 50% by 2015.**

Origin and Historic Background 1

The **Convention on Biological Diversity (CBD) was adopted in** May 1992 in Nairobi, and was opened for signature in Rio de Janeiro on June 1992 at the UN Conference on Environment and Development. It entered into force on 29 December 1992, and as of 20 August 2002 has 185 Parties.

Its objectives originally were :
1- conservation of biological diversity
2- sustainable use of its components
3- fair and equitable sharing of benefits arising out of the utilization of genetic resources

Origin and Historic Background 2

Th CBD contains three provisions directly related to living modified organisms (LMOs).

-*One article in particular (19-3) has generated the negotiations of the Cartagena Protocol.*

-Article (8-g) deals with domestic measures generally. It requires Parties to regulate, manage or control risks associated with LMOs resulting from biotechnology which are likely to have impacts on the conservation and sustainable use of biological diversity, taking also into account the risks to human health.

Origin and Historic Background 3

Article (19-4) deals with transboundary movement or transfer of LMOs from one Party to another.

It requires each Party to provide information on domestic regulations concerning use and safety to any other Party to which a LMO is provided, as well as any available information on the adverse effects which the introduction may have for this Party.

The term “living modified organism” used in the Protocol means those LMOs resulting from modern biotechnology.

In Cartagena Protocol, it is clearly stated

In Article 4: The Scope of this protocol shall apply to the transboundary movement, transit, handling and use of all LMOs that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health

In Article 5

this Protocol shall not apply to the transboundary movement of living modified organisms which are pharmaceuticals for humans that are addressed by other relevant international agreements or organizations.

In Article 8

The Party of export shall notify, or require the exporter to ensure notification to, in writing, the competent national authority of the Party of import prior to the intentional transboundary movement of a living modified organism. The notification shall contain, at a minimum, the information specified in Annex I. The Party of export shall ensure that there is a legal requirement for the accuracy of information provided by the exporter.

In Cartagena Protocol, it is clearly stated

In Article 11

Mainly specifies the Procedures for LMOs that are intended for direct use as food, feed or processing.

A Party may take a decision on the import of LMOs intended for direct use as food or feed, or for processing, under its domestic regulatory framework that is consistent with the objective of this Protocol.

In Article 13:

The protocol provide some guidelines to what kind of informations the Party of Import should look for, as well as the information the Party of Export should expect to deliver.

In Article 15 Risk Assessment studies should be carried out in a scientific manner *Risk assessments undertaken pursuant to this Protocol shall be carried out in a scientifically sound manner. Such risk assessments shall be based, at a minimum, on information provided according to Article 8 and other available scientific evidence.*

Biosafety

National Biosafety Frameworks (NBFs)

NBFs in the WANA region vary from country to country, but usually have a number of common components:

- A policy on biotechnology and biosafety
- Regulatory framework for biosafety
- System to handle notifications/requests for permits
- Systems for enforcement and monitoring
- Public information and public participation

Biosafety

Current status of National Biosafety Frameworks in West Asia and North Africa

- 11 Countries have completed their NBF under UNEP-GEF projects:

  Algeria, Egypt*, Iran, Jordan, Lebanon, Mauritania*, Syria, Tunisia*, Yemen

- Countries developing NBFs without GEF support:

  Oman, Saudi Arabia

* *These countries completed their NBFs under the UNEP-GEF pilot projects 1997-99*

Source: N. Mohamed

Proposed Measures

- Awareness campaigns through high level regional conferences and seminars
- Designate the relevant data collecting and research institutions for coordinating Climate Change research
- Development of research capacity at national and regional level
- Allocation of more funds from internal resources and mobilization of justified share of UNFCC adaptation fund and from other donor agencies
- Participation of high level national delegates and international organizations/NGOs in international communications

Proposed Measures (cont.)

- Innovations in faster growing, drought and salt tolerant crops will be required to deal with these challenges.
- The importance of collective action at the global and regional levels to harness against climate change impacts, for example joined efforts to dam the Mediterranean to regulate the sea level.
- Strategic approach, based on public education, awareness-raising and behavior-change to address unsustainable consumption patterns and pollution


Thank you