Development of Biotechnology in Asia Opportunities and Challenges

Dr. George Fuller.
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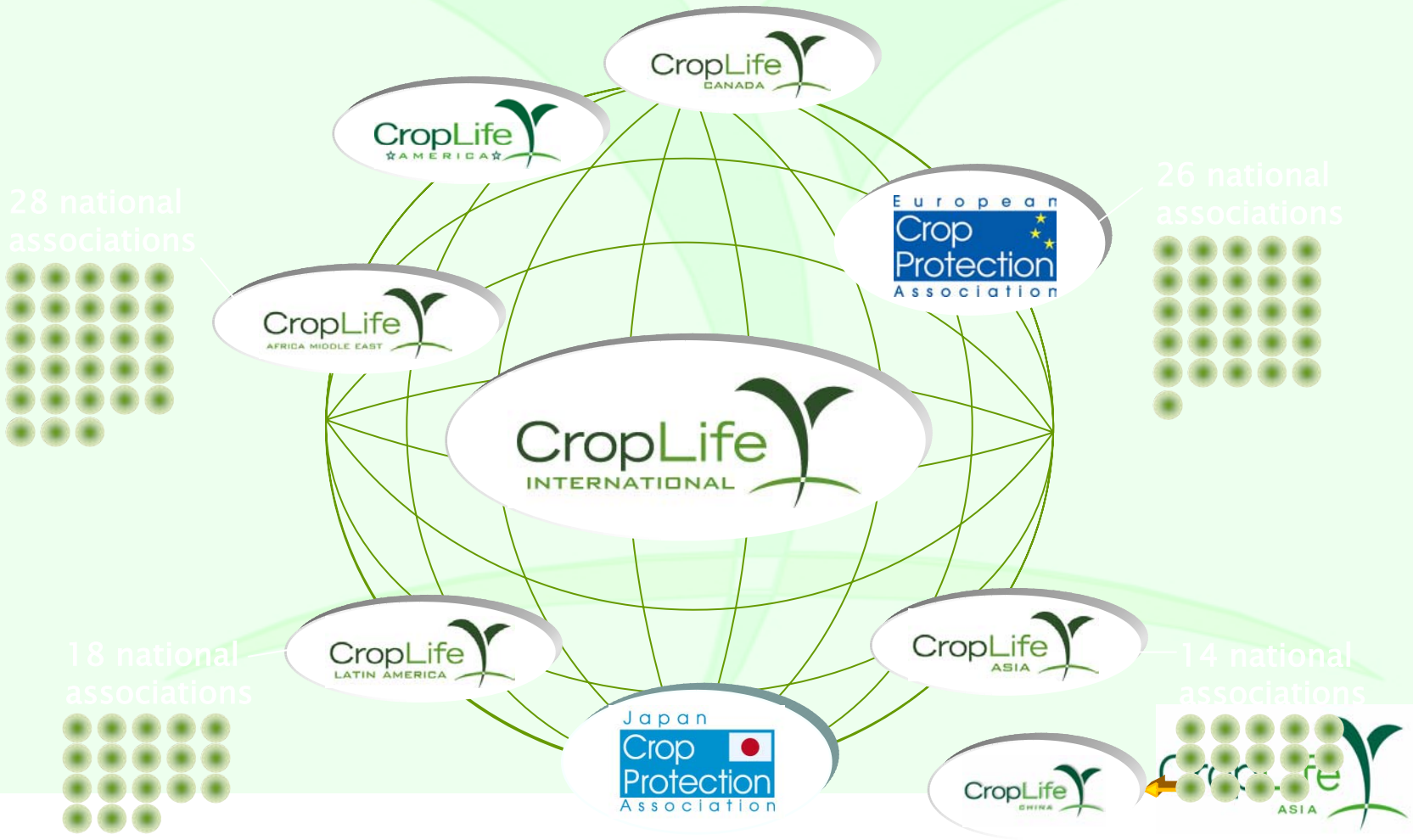
Hundreds of companies through a network of Associations in 88 countries…

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AGCARM
A Regional
Network of 14 National
Crop Protection Associations &
6 Multinational R&D Corporations

Opportunities for Biotechnology in Asia

- Meet the need to sustainably increase productivity
- Create benefits for consumers and the environment
- Create benefits for developing countries
- Build on and accelerate momentum of adoption

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The Global Challenge

"How can agricultural production rise to meet demand in a framework of equitable, environmentally, socially, and economically sustainable development?"

World Bank Assessment of Agricultural Science & Technology, August 2003

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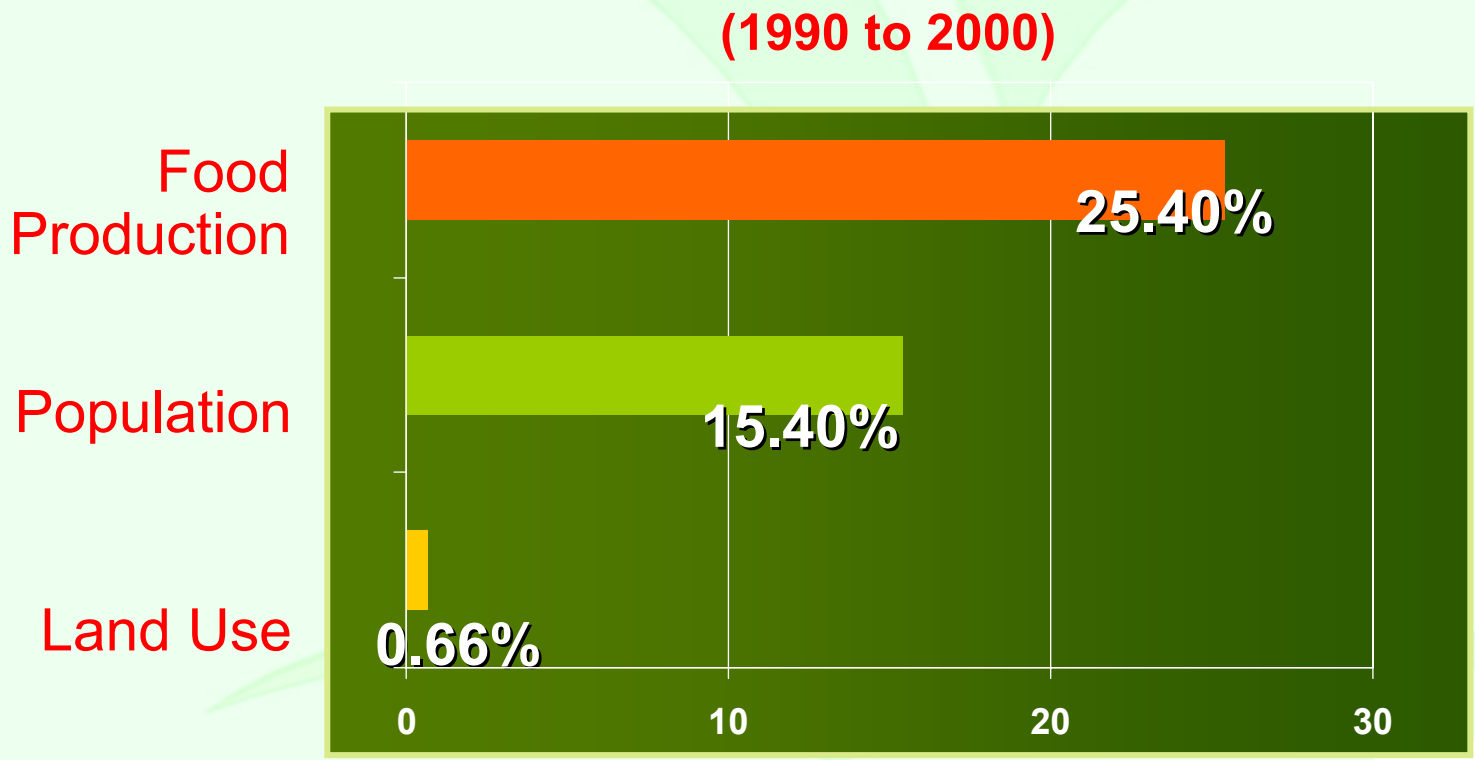
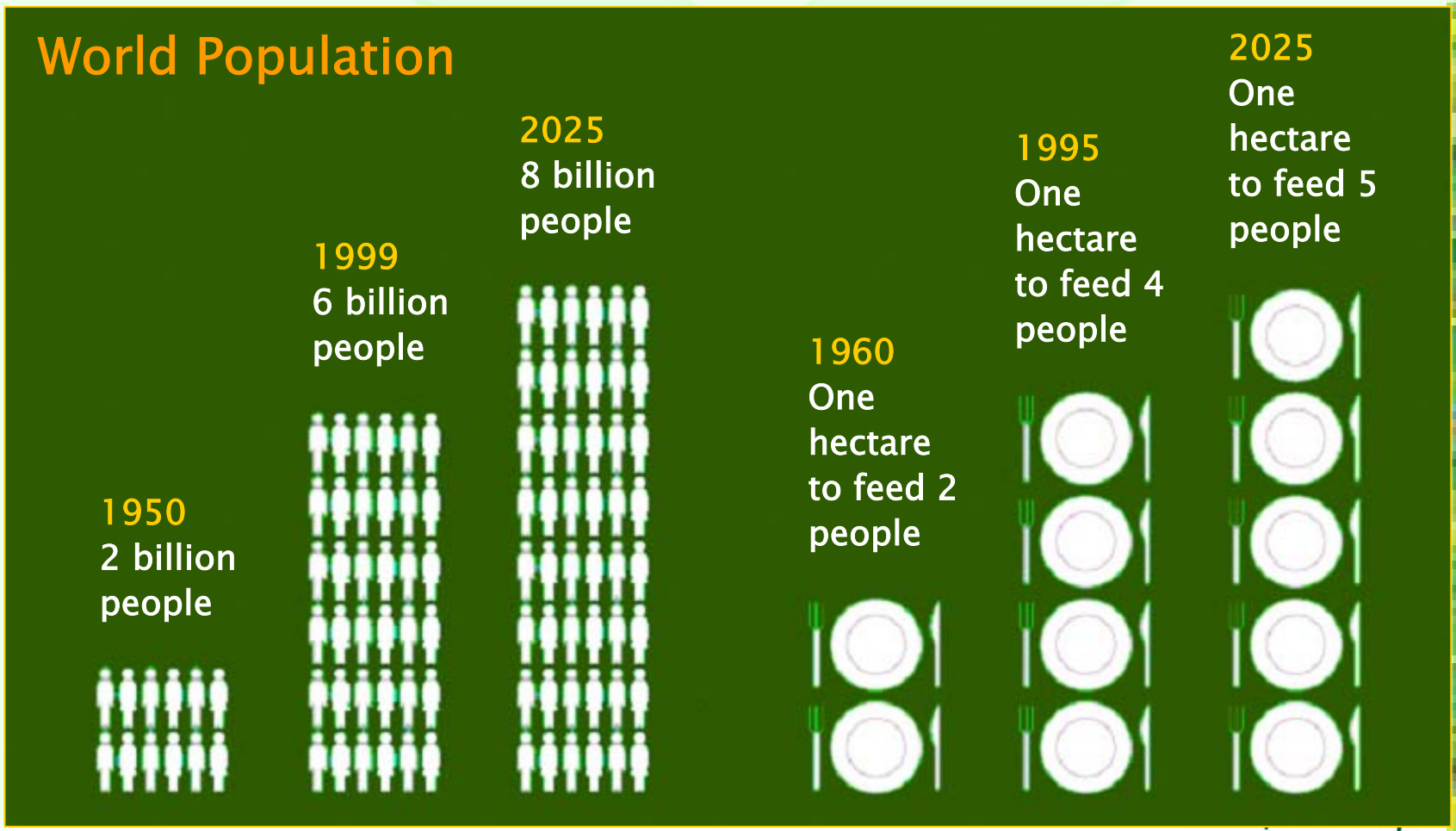
The Intensification of Agriculture has Met the Challenge of Feeding the Increasing Population

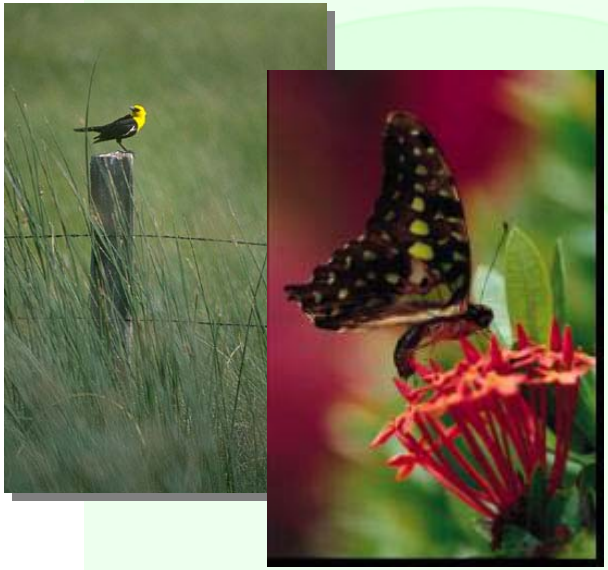


Source: **FAOSTAT data, 2004**

More Food Per Acre Will be Needed



Benefits to Consumer, Improved Environment




- **Integrated Pest Management:**
  - Preserves non target species & improves biodiversity
  - Protects workers, natural resources, soil and water
- **Adoption of sustainable production practices:**
  - Conservation tillage enhances wildlife habitat, soil structure and water quality
  - Improved yields reduces need for cropland
- **Reduced Mycotoxin concentrations improve health**

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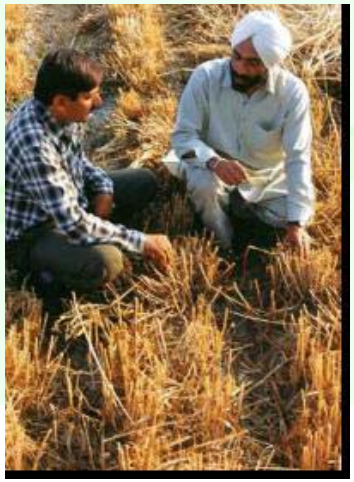
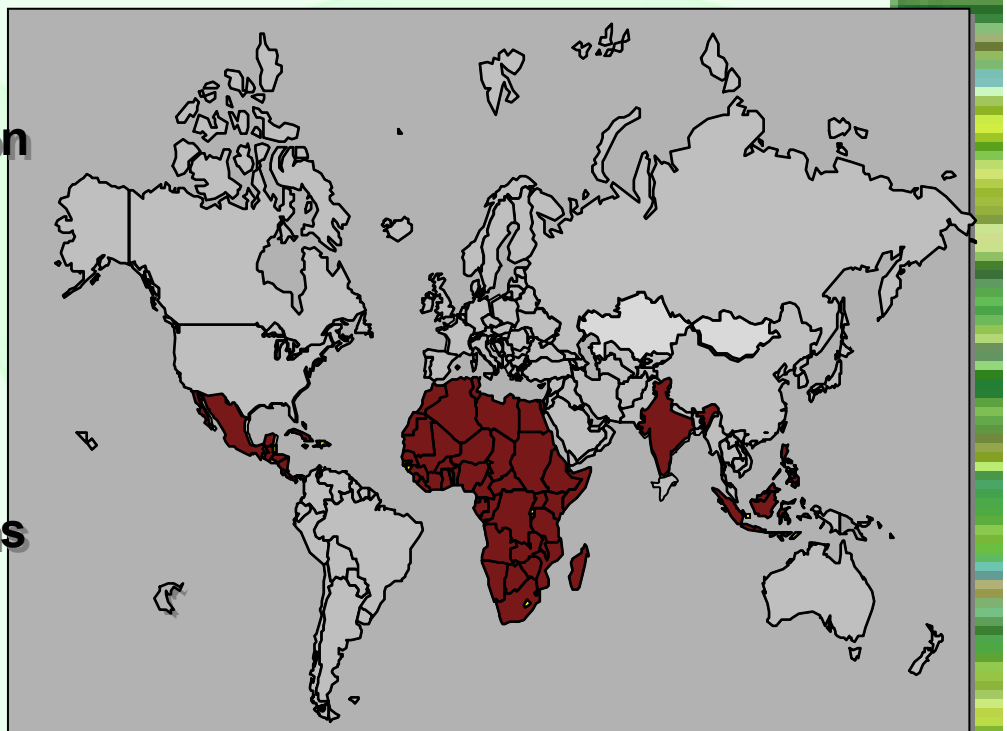
• Rockefeller Foundation 2000 & Doane Market Research

Benefits to Developing Countries

Biotech is Scale Neutral

- Greater productivity, fewer inputs
- Improved nutrition, ease malnutrition
- Subsistence farmers become merchant farmers
- Increasing post-harvest longevity
- Ease pressure on fragile ecosystems

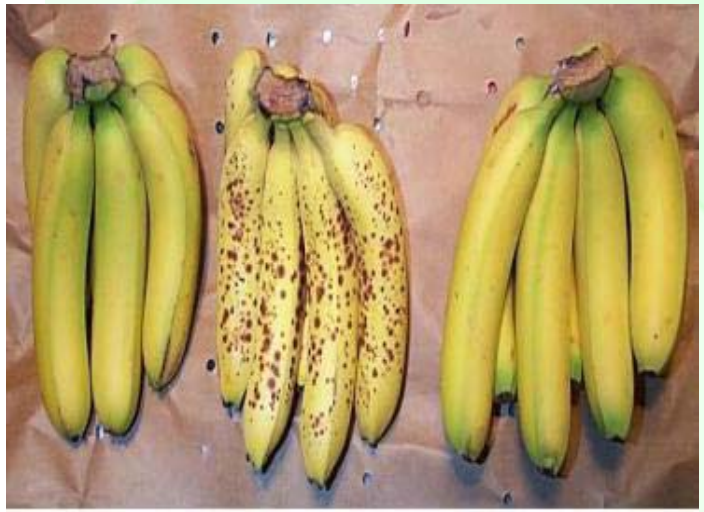




Examples of goodwill technology:

- Virus resistant sweet potato
- Crops with more Vitamin A
  - 'Golden Rice'
  - 'Golden Mustard'
- Sharing rice genome
- Virus resistant papaya
- Virus resistant potato

Technology transforming crops important to Asia: examples



Slow ripening bananas

Partnerships with food companies to develop products with premium quality, nutrition and value. Providing consumers with improved product quality and convenience

'Golden Rice'

- *can reduce blindness and other diseases caused by Vitamin A deficiency. Public-private sector collaboration. Available free-of-charge for humanitarian uses in any developing nation*

Source - Syngenta

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Discovery: Stress (Drought, Heat, Cold Tolerance)

Grower Benefits

- Crops reach their genetic potential
  - Less risk from weather
  - Earlier planting, longer season
  - Faster germination, healthier start
  - Improved pollination

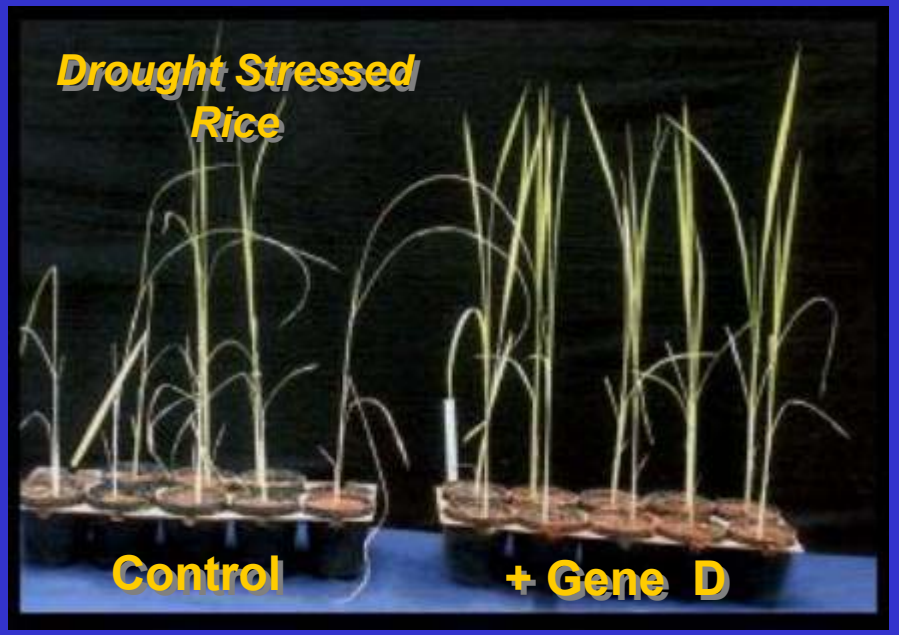
Value

- 5-10% yield increase
- Increased crop acres

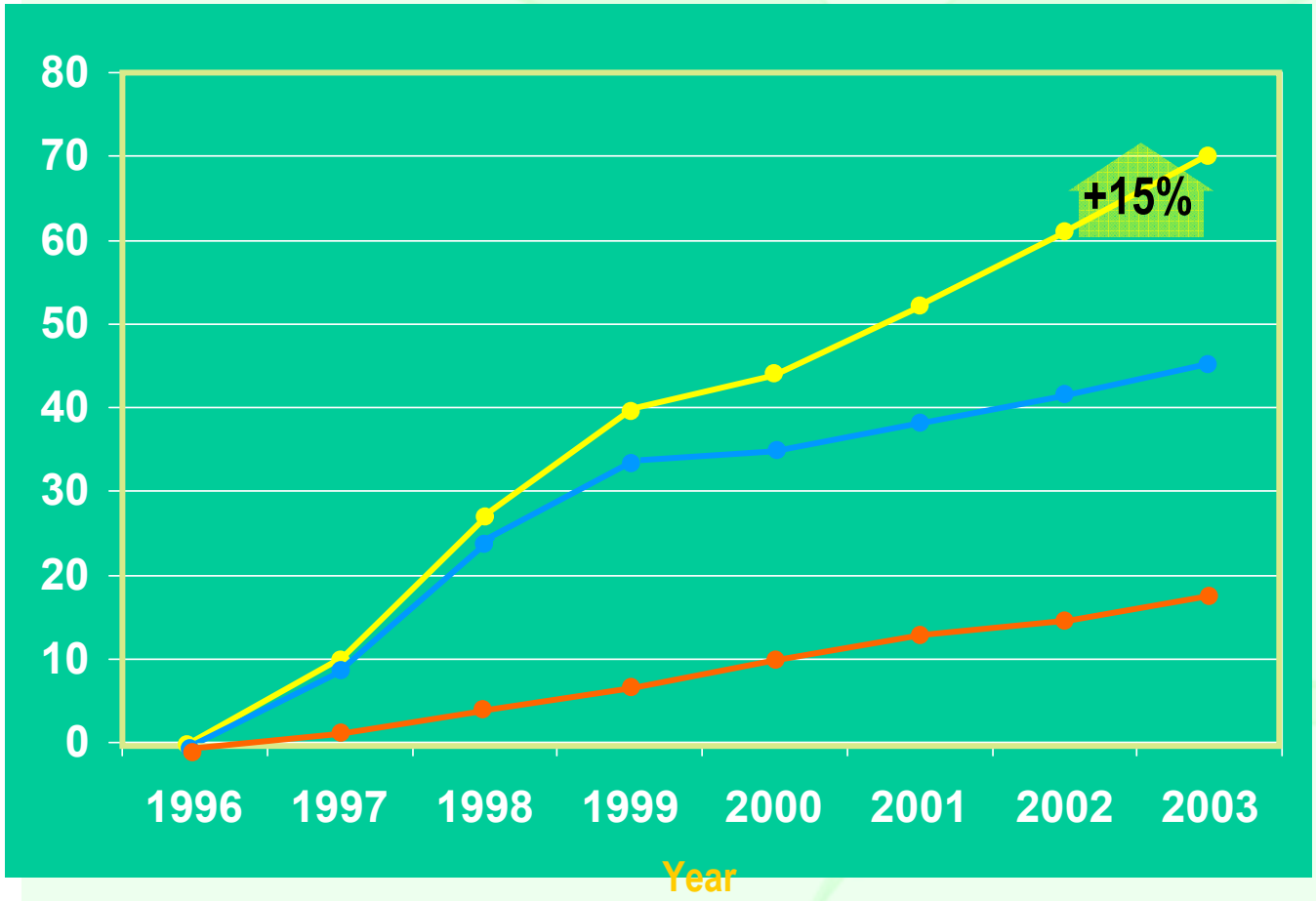
Source - Monsanto

1. Identify Gene & Test in Model System

2. Confirm Activity Translates in Crop



Global Area of Biotech Crops (mm hectares)



Source: **Clive James, ISAAA, 2003**

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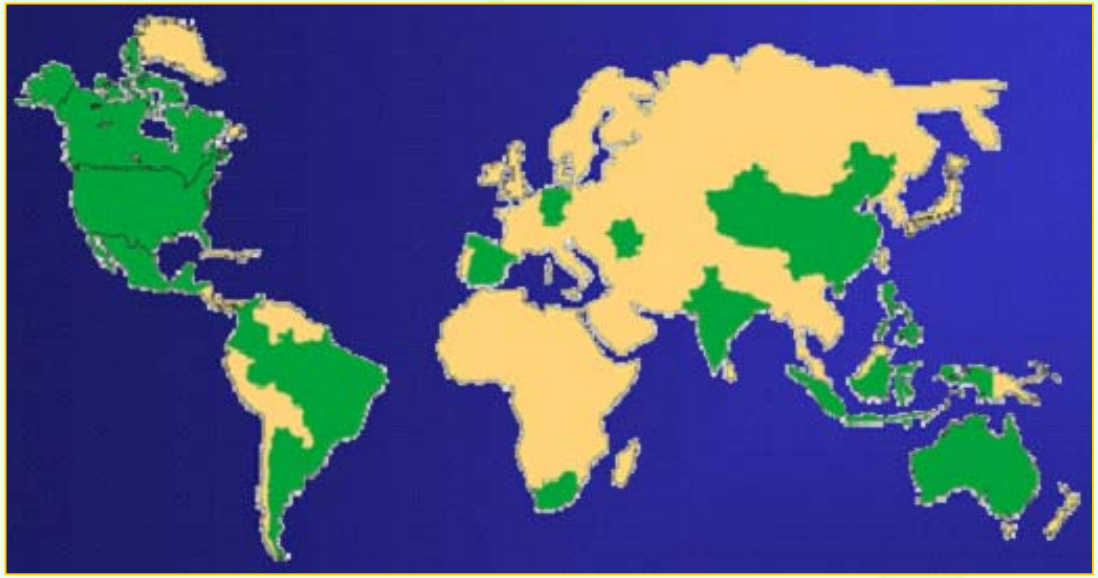
Global Area of Biotech Crops (Countries)



- 18 countries have adopted biotech crops.
- 3.4 billion people live in countries where GM crops are grown.

Mega Countries > 50,000	
USA	42.8 MM
Argentina	13.9 MM
Canada	4.4 MM
Brazil	3.0 MM
China	2.8 MM
South Africa	0.4 MM
Australia	0.10 MM
India	0.10 MM
Romania	>0.05 MM
Uruguay	>0.05 MM

< 50,000 hectares	
Spain	Bulgaria
Mexico	Honduras
Philippines	Germany
Colombia	Slovakia

Source: **Clive James, ISAAA, 2003**

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Challenges in the Development of Biotechnology in Asia

- Regulatory environment, especially the BSP
- Perceptions of public perception
- Funding and managerial expertise to commercialize locally developed products
- Difficulty in satisfying both the U.S. and the EU

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Regulatory Environment

- Not harmonized in the region, and no fully developed international standards
- Biosafety Protocol has been taken over by opponents of biotechnology
- Regulations created in response to fear of MNCs create serious problems for local researchers

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Public Perception

- Opponents skilled at sound bite attacks
- Proponents need training in Risk Communication
- Misleading consumer surveys create perception of public rejection
- No clear understanding of what consumer acceptance would look like

Research in the Region

- Many important research projects still in laboratories
- Researchers lack skills, funding and incentive to bring these projects to the farmer
- Researchers have not been sufficiently active in supporting their interests

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U.S. vs. EU

- Fundamental agreement at regulatory and technical level
- Fundamental disagreement at political level
- Asia torn between EU demands for “GMO free” food and need to develop agricultural productivity

A Way Forward - Regulatory

- Create predictable, consistent, harmonized regulatory structure
  - Based on good science and not political opportunism
  - Reflecting global diversity of agriculture
  - Meeting Asian needs

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A Way Forward - Incentives

- Reward innovation
  - Rewards for industry and academic innovation
  - Engaging with stakeholders in both benefits and risks
  - Preventing misuse of data and proprietary inventions

A Way Forward – Local Research

- Create turnkey product development infrastructure
  - Create Asian fund for development of Asian biotechnology research
  - Hire expertise and experience from the private sector

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A Way Forward – U.S. vs. EU

- Use science based regulatory structures to make local decisions
- Recognize the cost of meeting EU import requirements and assess that cost equitably

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Conclusions

- Biotechnology offers tremendous benefits to agriculture in Asia
- Serious challenges need to be overcome to realize these benefits
- The way forward is difficult and requires alignment of multiple stakeholders

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Thank You