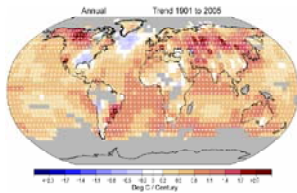


Increased interdependence on AMiGR as a result of climate change

Fen Beed, IITA



Increased interdependence on AMiGR as a result of climate change that originated or are found in other countries for the purpose of research, training or direct use in agricultural / food systems

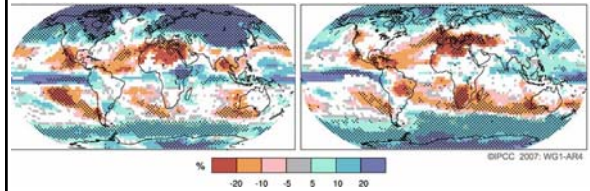


AMiGR

- Biodiversity
- Function
- Sustainable agriculture:
antagonists - disease
beneficials – nutrients & biocontrol

Climate change will increase:

- temperature
- CO₂
- unpredictability of rainfall (moisture)
- unpredictability of winds



Impact of climate change on microbes

- Range expansion / reduction
- Changes to ecosystem integrity
- Secondary microbes => predominant microbes
- Increased disease inoculum build up
- More rapid development and evolution
- Decreased crop and pesticide resistance

Increased interdependence on AMiGR as a result of climate change

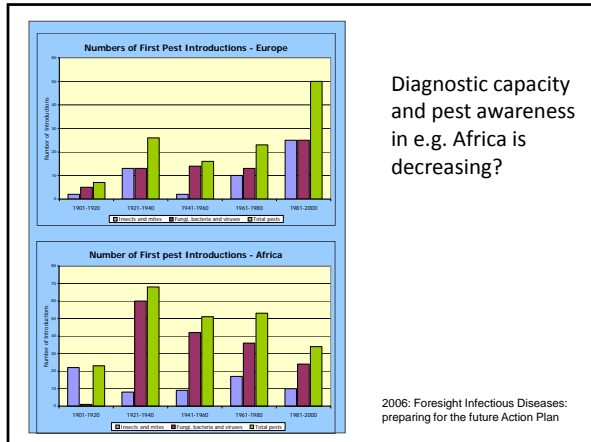
Global distribution of crop GR (ITPGRFA)



Ecological interactions with AMiGR

Characterisation of AMiGR:

- Development of diagnostic/detection tools
- Surveillance of antagonists and beneficials
- Selection of synergistic crop varieties
- Evaluate risk and develop adaptive strategies

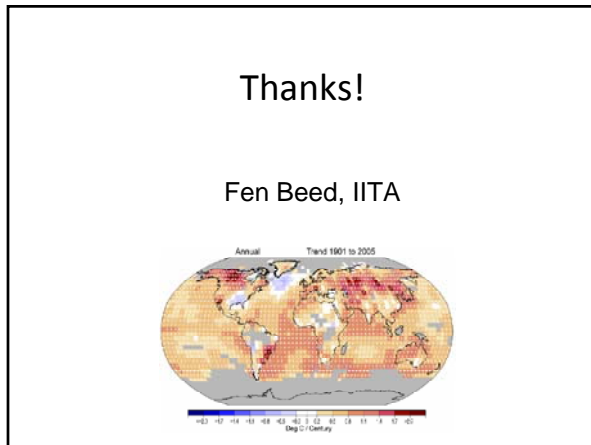


Diagnostic capacity and pest awareness in e.g. Africa is decreasing?

Adaptation to climate change

AMiGR collections to facilitate ABS and capacity building

- lagging in vulnerable regions
 - Under-resourced institutions
 - Knowledge and training gaps
 - Lack of credible scientific input for decision support
 - Lack of access to materials to provide solutions



The importance of internationally pooled microbial genetic resources for agricultural research: the case study of Fusarium

Luis Pocasangre, Scientist and Regional Coordinator for Latin America and the Caribbean, Bioversity International and Professor-Researcher, CATIE, Costa Rica.

CBD Ninth Meeting of the *Ad Hoc* Open-ended Working Group on Access and Benefit Sharing, Cali, Colombia, 22-28 March 2010.

- ### Contents
1. Importance of banana
 2. Fusarium wilt Problem
 3. Importance of beneficial and pathogenic microbial collection
 4. Summary

The banana Industry > one century of business

Fusarium wilt is a threat for exporting bananas and local consumption



Exporting

Food security

Natural Inhabitants of Rhizosphere

Pathogens

Beneficial microorganisms



Bacteria



FOC



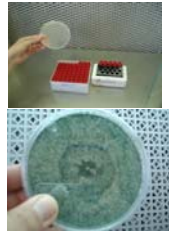
Fitonematodos



Endophytes collection at CATIE

899 endophytic fungi

320 endophytic bacteria



Public and private interest on the collection:
Still we do not have in public domain

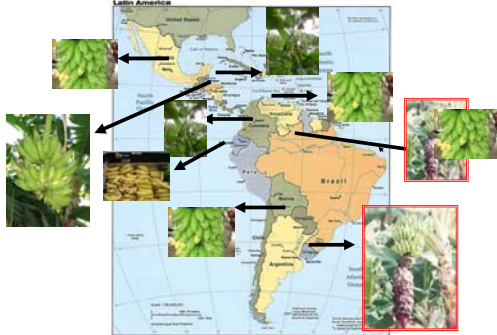
Destruction of Gros Michel industry by Fusarium (Panama Disease)



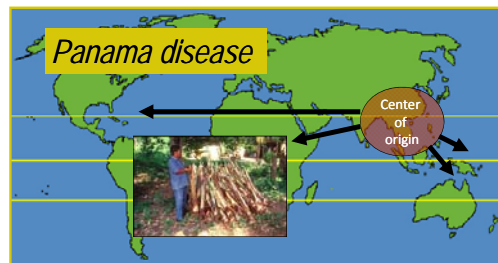
> 50,000 Ha
> US\$ 400 Mill.



Panama Disease in Americas (Race 1 and Race 2 of *Foc*) WE DO NOT HAVE RACE 4 OF FOC



TR 4 of Fusarium = Asia Pacific and potential dissemination



Stakeholders meeting for awareness campaign on Tropical Race 4 of Fusarium Wilt for Latin America and the Caribbean



El Salvador, July, 2009

- Stakeholders:
- Plant protection departments of 14 countries of LAC
- OIRSA from 9 countries in the region
- Banana Growers Associations of 9 countries
- Companies: Chiquita, Dole, Del Monte
- Universities: Florida, Wageningen, Bonn, UCR, UNACH
- Research institutes: CIRAD, CORBANA, CATIE, CENIBANANO

Resolutions of the stakeholders meeting

1. To strengthen inspection measures in ports of entry in the west LAC.
2. Development of a risk analysis for *Foc* TR4 in the region.
3. Establish a global collection of FOC in a neutral (biologically) country
4. Training technical personnel and producers about the entrance pathways of *Foc*TR4 to (LAC)

Problems facing the international banana scientist community

- There is little information about biology of the fungus
- There are small collections in different countries in bad shape
- Scientists do not have access to the FOC isolates
- Lack of trained scientists on the identification and management of the pathosystem

Solutions to the problems= Global collection of FOC

- The collection will be the official platform for sharing isolates
- Better characterization of the isolates
- To avoid illegal introductions of Fungi
- Better understanding of the biology of the fungus for a better management of the disease
- Development of workshop for training new scientists

Summary

1. The global collection of Foc is a need for the international scientific community for a better understanding of biology and management of the disease
2. The role of the global collection to control the exchange of isolates worldwide and prevent introductions of TR4 of *Foc* to the Americas and Africa
3. The need to have public domain of beneficial endophytes for biological control of pests on bananas
4. Looking for joint partnership with the private and public sector in order to develop commercial product from beneficial microorganisms

Gracias por su atención



Opportunities for future development of ABS norms re: agricultural microbial genetic resources under the International Regime/Protocol

WG/ABS 9
March 22-28, 2010
Cali, Colombia

Michael Halewood, Bioversity International

- The “microbial research commons” with
 - virtually linked culture collections
 - fully integrated information systems
 - traceability of identification of materials in research chains
 - standard legal instrument for all exchanges of materials ...

... cannot thrive without a supportive ABS policy environment

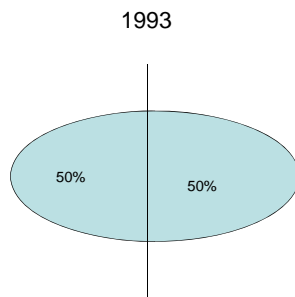
Legal uncertainties with negative impacts

- Significant level of ‘informal’ activity
 - Uncertainties about how to bring the system in line with CBD
 - Proliferation of responses, practices, MTAs at organizational levels

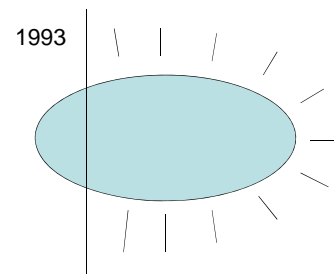
Legal uncertainties with negative impacts

- Would-be suppliers are not confident to make new materials available for potential global distribution
 - Uncertain if terms and conditions of access and benefit sharing are appropriate
 - Unwilling or unable to assume responsibility

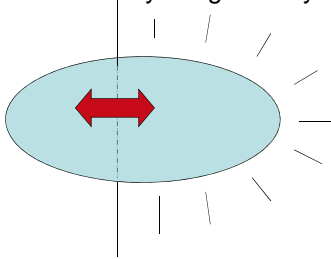
% of collections acquired before/after CBD



Shifting proportions over time ?



How to ensure that this material gets integrated into the fully integrated system?



The importance of international governance

- Enormously important potential role
 - Create legal space and legal certainty
 - Develop and or endorse elements of the system (e.g. benefit sharing mechanisms)
 - Provide a forum for consideration/resolution of implementation challenges
 - Provide momentum, support

International governance

- Critically important in terms of supporting conservation and use of PGRFA
 - International Undertaking, 1983 -- international network of *ex situ* collections
 - FAO-CGIAR In Trust Agreements, 1994
 - International Treaty – MLS

Possible ABS agreements/arrangements under the Protocol to support of use of microbial genetic resources in agriculture

An international treaty

- (e.g. ITPGRFA)

Agreements between collections or countries and intergov body

- (e.g. International network of *ex situ* collections, FAO-CGIAR Centres In Trust Agreements)

Endorsement/adoption of MTA(s)

Possible ABS agreements/arrangements under the Protocol to support use of microbial genetic resources in agriculture

Some form of endorsement of novel arrangements between participating organizations/countries

Non-legally binding guidelines, codes of conduct

- (e.g. FAO International code of conduct for plant germplasm collecting and transfer, Bonn Guidelines)

Preserving flexibility

- More time is necessary to work through a number of related issues at the level of the governing body of the Protocol
- Impossible to say at this point at what level, and in how much detail, the governing body of the Protocol will want to engage the issue
- Governing body will need to consider this at early meetings
- Meanwhile, awareness raising and preliminary discussion of the issues is important