

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



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The banana industry > one century of business

- One of the most important crops worldwide
- More than 90 millions tons/year
- More than 100 countries
- Most important source of carbohydrates in many rural areas



Natural inhabitants of rhizosphere

Pathogens



Bacteria

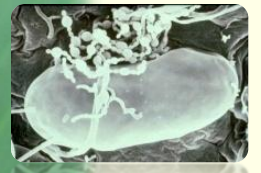
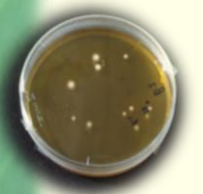
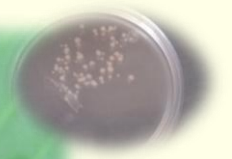


Foc



nematodes

Beneficial microorganisms

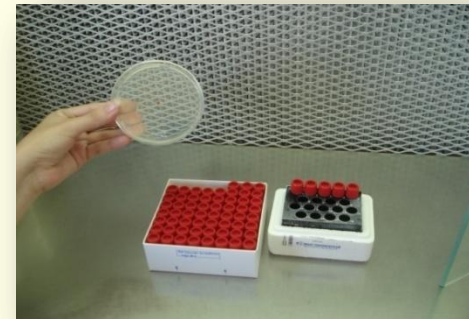
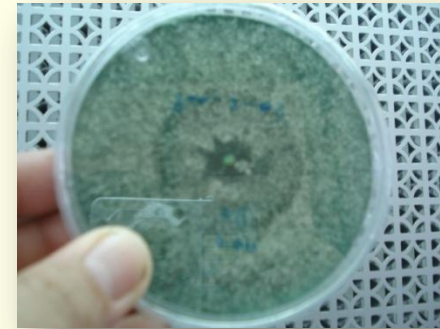


Endophytes collection at **CATIE**

899 endophytic fungi



320 endophytic bacteria



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

Fusarium wilt is a threat for exporting bananas and local consumption



Exporting



Food security



Destruction of Gros Michel plantations by Fusarium (Panama Disease)



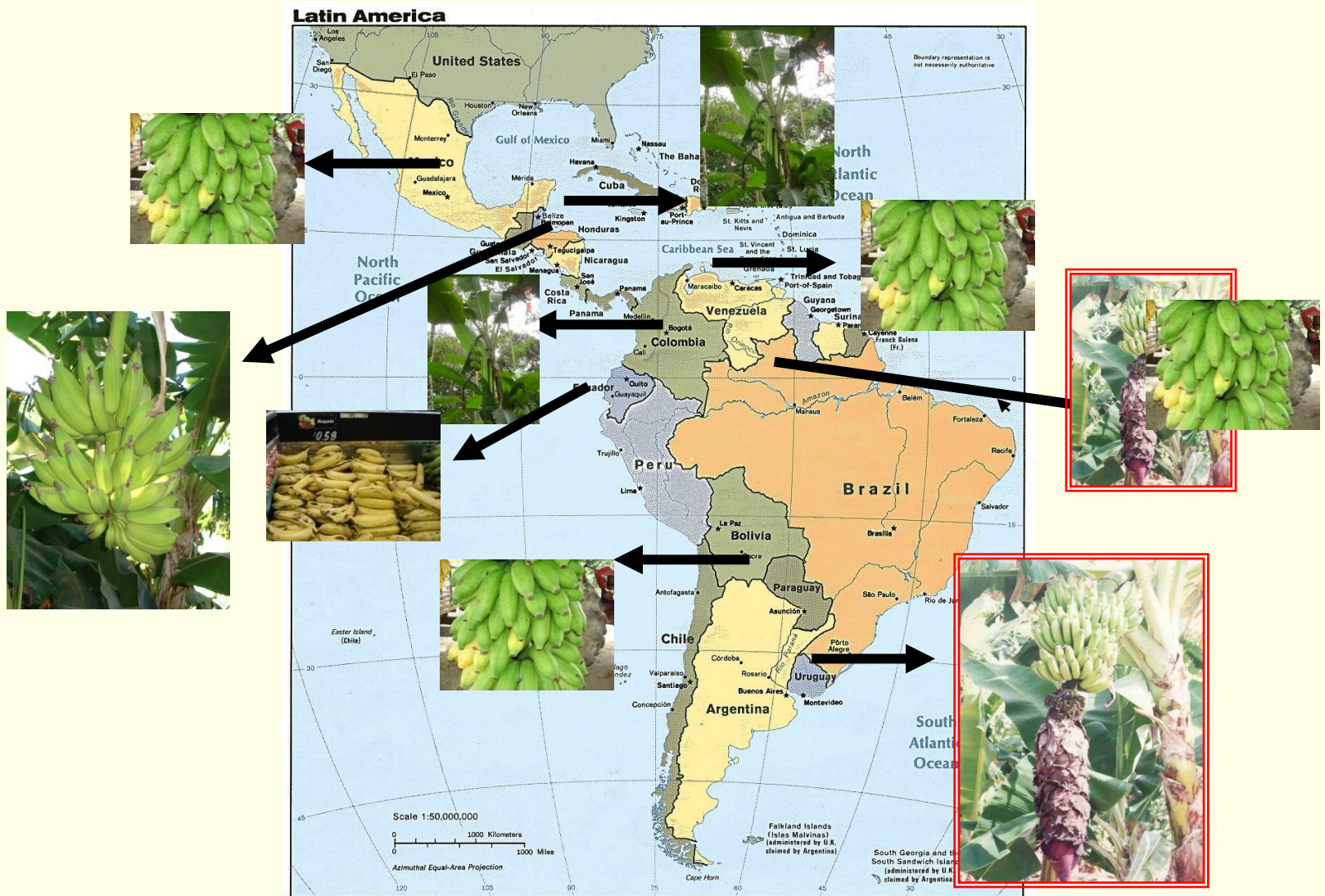
- 50,000 Ha
- US\$ 400 Mill.



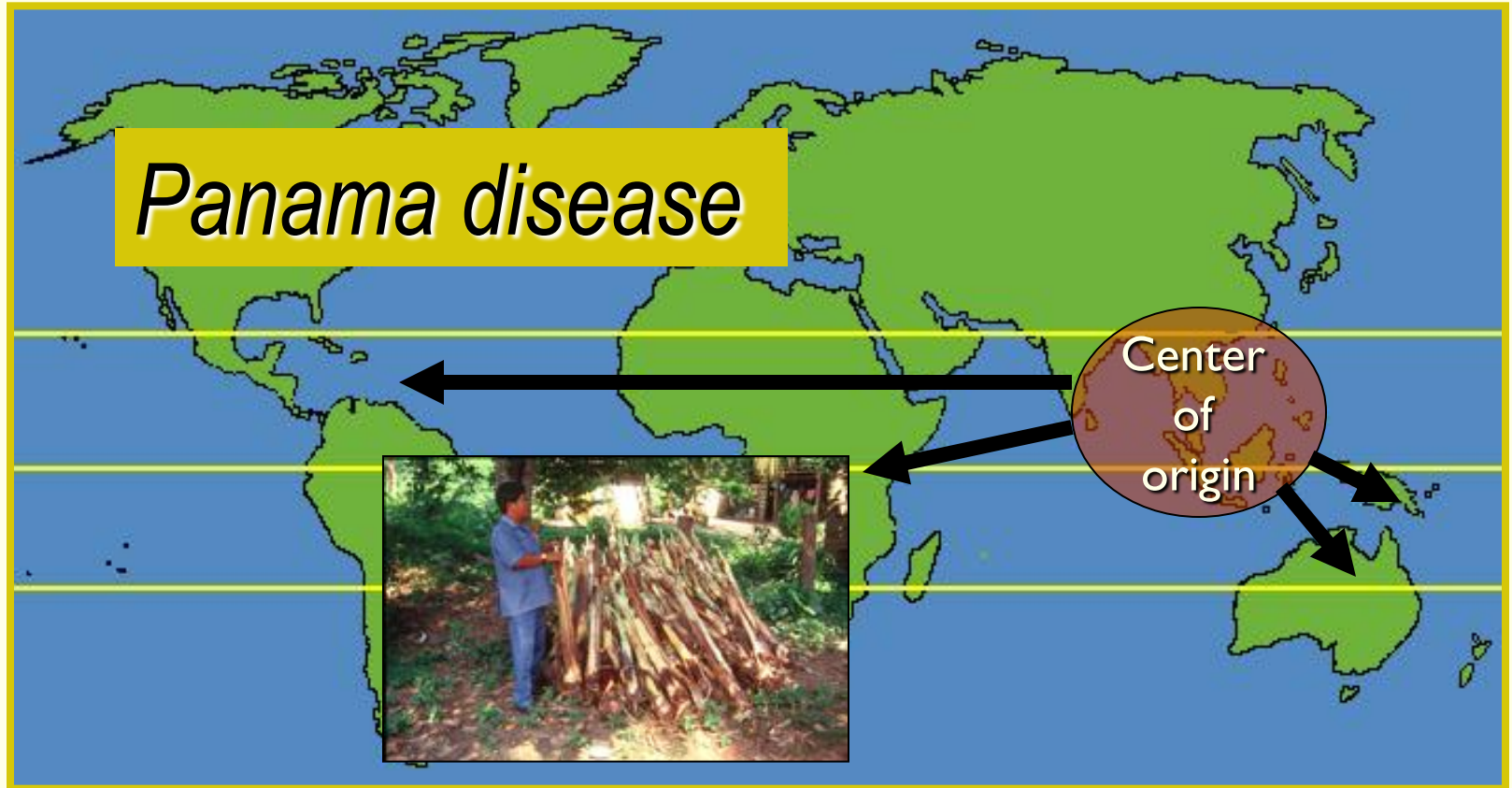
Foc can stay in the soil for long time

Panama disease in the Americas (Race 1 and 2 of *Foc*)

WE DO NOT HAVE TROPICAL 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 a risk analysis for *Foc* TR4 in the region.
3. Establish a global collection of *Foc* in a neutral 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 *Foc* biology
- Small collections in \neq countries, in bad shape
- Scientists do not have access to *Foc* isolates
- Lack of trained scientists on the identification and management of the pathogen system



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

- The global collection of *Foc* is a need for a better understanding of biology and management of the disease
- The role of the global collection is to control the exchange of isolates worldwide and to prevent the introduction of TR4 of *Foc* to America and Africa
- The need to have public domain of beneficial endophytes for biological control of pests on bananas
- Benefit-sharing of isolates to recognize country of origin





THANK YOU!