Geographic Targeting for Diagnostic of Banana Fusarium Wilt

David Brown
ESRI User Conference
July 14-18, 2014
Presentation outline

- What is Bioversity International
- What is Fusarium Wilt
- Work description – Geographic Targetting
- Results
- Conclusions
Bioversity International

Bioversity International is a research-for-development organization seeking solutions to global issues through the **use and conservation** of **agricultural and forest biodiversity**.
Our Vision

Our vision is a world in which smallholder farming communities in developing countries are thriving and sustainable.
Our purpose

Using and conserving agricultural and forest biodiversity for…

Livelihoods  Nutrition
Sustainability  Productive & Resilient Ecosystems
Our global reach

We work in areas of significant levels of rural poverty where very often the world’s remaining biodiversity is found. We focus on rain-fed farming systems, primarily managed by smallholder farmers, in areas where large-scale monoculture is not a viable option.
What is Banana Fusarium Wilt?

- Also known as “Panama Disease”

- Soilborne fungal disease caused by the fungus *Fusarium oxysporum f. sp. cubense*

- It blocks the pass of nutrients from roots to the rest of the plant

- Fungus can persist in soil for decades and cannot be managed using chemical pesticides

Source: ProMusa
For more information visit: www.promusa.org
Typical symptoms

Images: F. Haddad
Export Market - Monocrop

Shift from Gros Michel to Cavendish variety

Image: National Museum of Costa Rica
Consequences on Export Market

Changes in packing

Images: D. Brown
Local Markets (Smallholders)

Keep growing susceptible varieties

Image: D. Brown
Local Markets (Smallholders)

Consumers prefer Gros Michel

Image: F. Haddad
The study location

- District: San Luis de Shuaró
- Province: Chanchamayo
- Department: Junín
- Country: Peru
Study purpose

- **MSc Thesis:** Carlos Hugo Román Jerí. (2012). Consideraciones epidemiológicas para el manejo de la Marchitez por Fusarium (*Fusarium oxysporum f. sp. cubense*) del banano en la región central del Perú.

*Epidemiological considerations for Banana Fusarium Wilt management in the central region of Peru*
Defining the target
Farmers Survey – 149 Farms

San Luis de Shuarro District

- Banana Farms
- Roads
- Rivers

Elevation
- High: 2499
- Low: 697

Villa Rica
San Luis de Shuarro
Chanchamayo
Perene
Farms characterization
Fusarium Wilt presence

San Luis de Shuarro District

- Fusarium
- Fusarium Free
- Roads
- Rivers

Elevation
- High: 2499
- Low: 697

Villa Rica
San Luis de Shuarro
Chanchamayo
Perene
Results

- 76 Farms selected (Total)
- 60 Farms with Fusarium Wilt presence
- 16 Farms without Fusarium Wilt
- Visualization of Spatial Distribution
  - Fusarium Wilt
  - Production System
Conclusions

- ArcGIS Desktop was a key tool defining the target farms

- Farms targeting was traduced into a more efficient resource allocation

- Visualization of the spatial distribution allows to outline study hypothesis
Many thanks