

Bacterial Wilt Resistant Banana Varieties

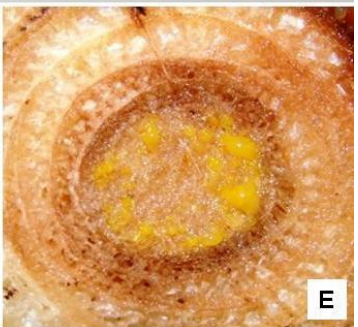
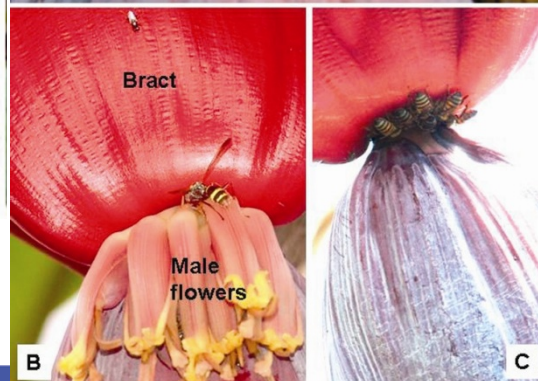
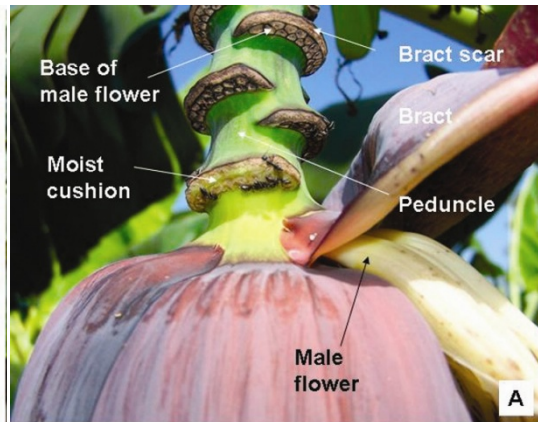
Leena Tripathi

International Institute of Tropical Agriculture, Nairobi, Kenya

Workshop on Demand led plant variety design, Nairobi, 14 -15 May 2014

Banana Xanthomonas wilt

- BXW caused by *Xanthomonas campestris* pv. *musacearum* endangers the livelihood of millions of farmers in east and central Africa.



Tripathi *et al.* 2009 Plant Disease

Need for variety development

- Banana is an important food crop
- Overall economic losses were estimated at \$2 billion to \$8 billion over a decade
- BXW attacks all banana varieties resulting in absolute crop loss
- No known resistance source of germplasm

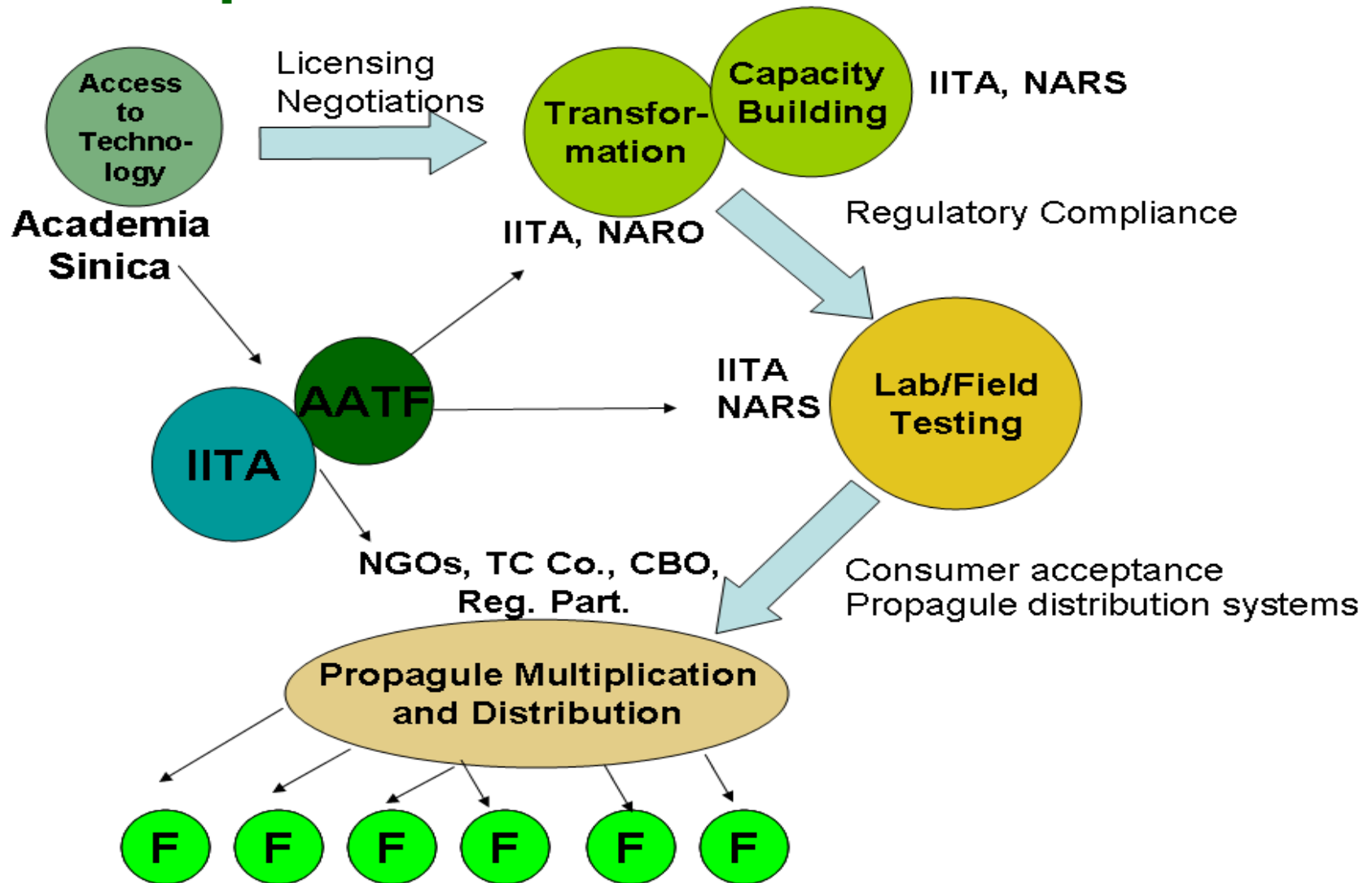


Tripathi 2008 IITA R4D Review

Tripathi 2011 IITA R4D Review



Development of a BXW-Resistant Banana



- IITA approached AATF for negotiating licensing. AATF signed licence with Academia Sinica and provided sub-license in 2006.
- Tripartite agreement has been signed among partners (IITA/NARO/AATF) in 2009 for product development.

- Over expression of Hypersensitive Response Assisting Protein (*Hrap*) or Plant Ferredoxin Like Protein (*Pflp*) genes from sweet pepper provide enhanced resistance.
- 65 transgenic lines tested in CFT in Uganda for three successive crop cycles.



Tripathi *et al.* 2010 Mol. Plant Pathology
Namukwaya *et al.* 2011 Transgenic Research
Tripathi *et al.* 2013 Acta Hort.

BXW resistant lines

➤ 11 lines showed absolute resistance in field for 3 generations.



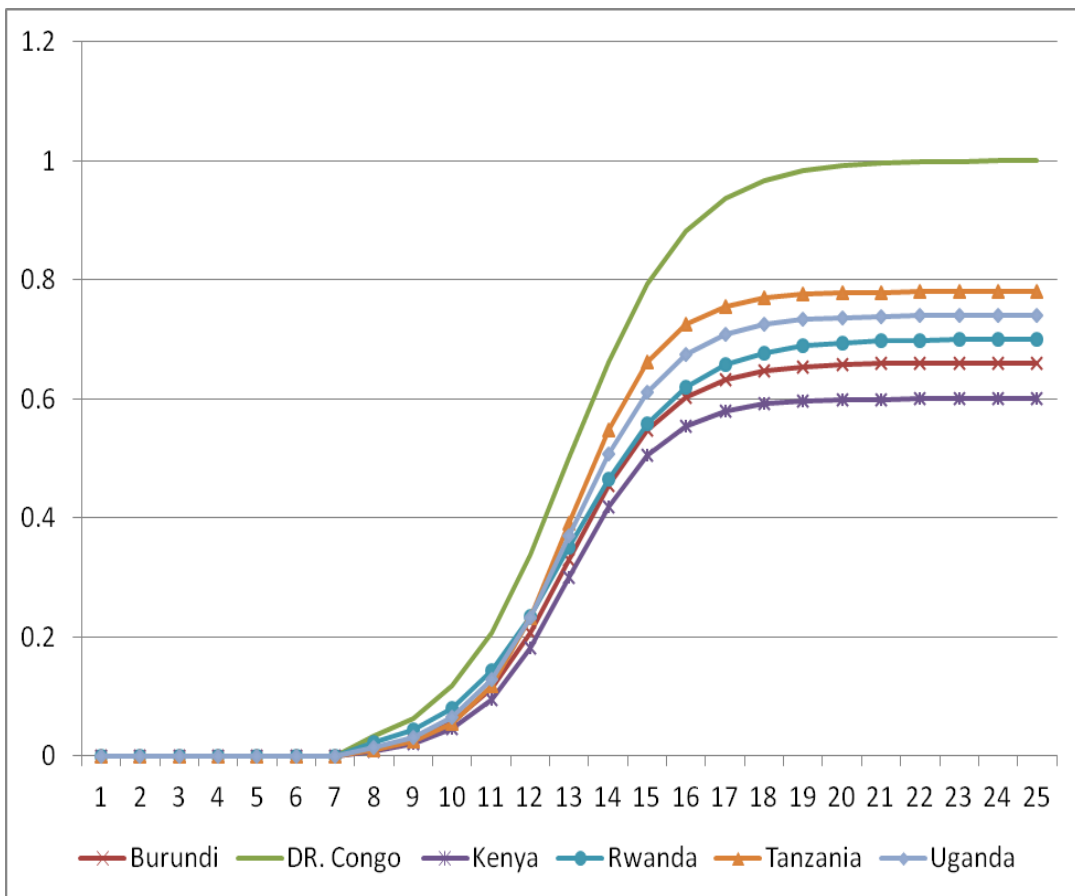
Partners

- IITA
- AATF
- NARO

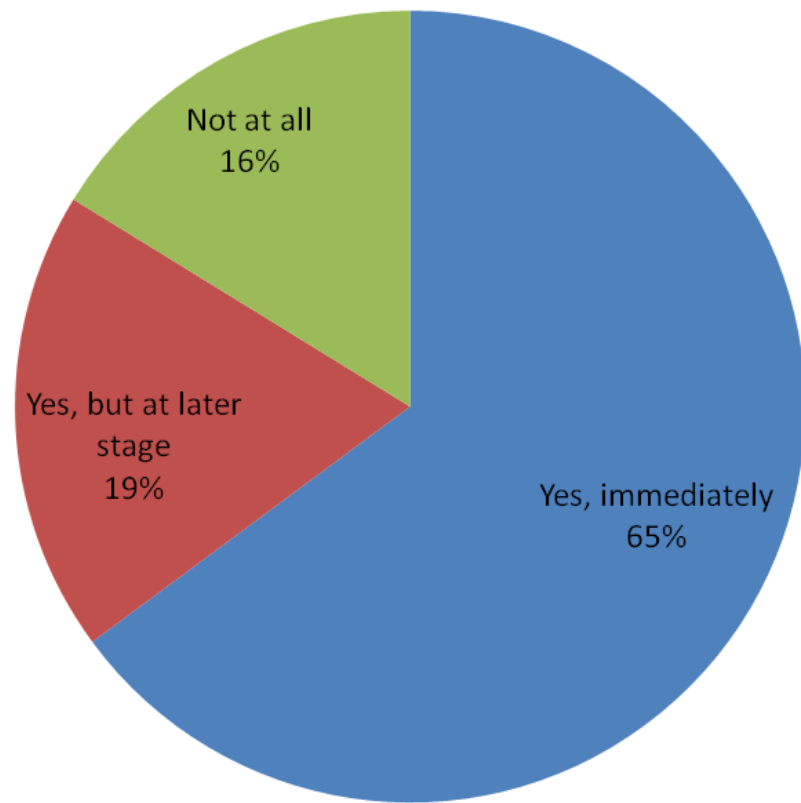
Supported

- Gatsby Charitable Foundation
- USAID
- ABSPII

Adoption- Ex ante impact analysis



Projected adoption rate of BXW resistant GM banana



Willingness to adopt BXW resistant GM banana

- Policies
 - Biosafety laws
- Regulatory issues
- Capacity
- Intellectual property rights
- Public awareness

NATIONAL

Wilt-resistant banana plant now available, says Museveni



guardian.co.uk

Ugandan scientists grow GM banana as disease threatens country's staple food

Ban on GM crops waived after bacterial disease causes annual banana crop losses of \$500m

UGANDA

SAVE OUR BANANAS!

Climate change reports on the battle to stop precious fruit sliding into extinction

CNN: Earth's Frontiers

Genetically Modified bananas in Uganda



<http://edition.cnn.com/video/#/video/international/2011/03/24/ef.genetic.modification.bk.a.cnn>