About IITA

IITA is an international non-profit organization founded in 1967, with a mandate to develop sustainable food production systems in tropical Africa. It became the first African link in the worldwide network of agricultural research centers supported by the CGIAR. IITA works on banana & plantain, cassava, cowpea, maize, soybean, tree crops and yam. IITA operates throughout sub-Saharan Africa and is headquartered in Ibadan, Nigeria. IITA's mission is to enhance food security and improve livelihoods through Research-for-Development, a process where science is employed to identify problems and to create development solutions which result in local production, wealth creation and the reduction of risk. IITA works with the partners within Africa and around the world. Visit www.iita.org for details.

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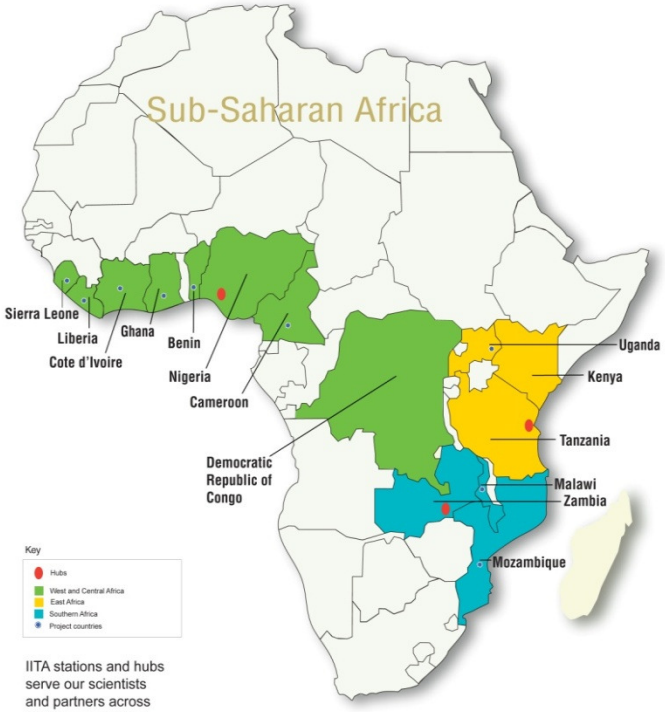

IITA stations and hubs serve our scientists and partners across sub-Saharan Africa. (Map by IITA)

Mycotoxins, Human Health and Agricultural Trade

One of the IITA's aims is to improve food quality, human health and livelihoods of smallholder farmers in sub-Saharan Africa by reducing mycotoxin contamination of maize and other agricultural commodities through dissemination and adoption of technical, policy and institutional options.

IITA recognizes exposure to mycotoxins as an important constraint to improving the health and well-being of African people. Rural poor in Africa are chronically exposed to unsafe amount of aflatoxins. Food consumed is usually produced, stored, prepared and marketed by farm families without much consideration for the risks of aflatoxin. IITA's pioneering research in collaboration with the University of Leeds highlighted the stunting effect of aflatoxins on growth and development of children. Overview of present IITA's Research-for-Development activities are presented in this flyer.

Mycotoxins in Agriculture and Health Project

Agriculture and Health is one of the eight IITA Research-for-Development initiatives dedicated to the linkages between agriculture and people's health. Research initiatives to tackle mycotoxin contamination are dealt under this project. Our approach in mycotoxin research for Development have the following elements:

Objective: Minimize mycotoxin contamination to improve health and enhance income

How: By developing, testing and deploying mycotoxin management practices on the foundation of a good knowledge base on key biological, environmental, institutional and policy drivers that influence contamination.

With whom: All relevant public and private sector actors in the crop value chain and with the health sector. Plus key collaborators internal and external to IITA.

Focus: Protect those vulnerable to mycotoxin

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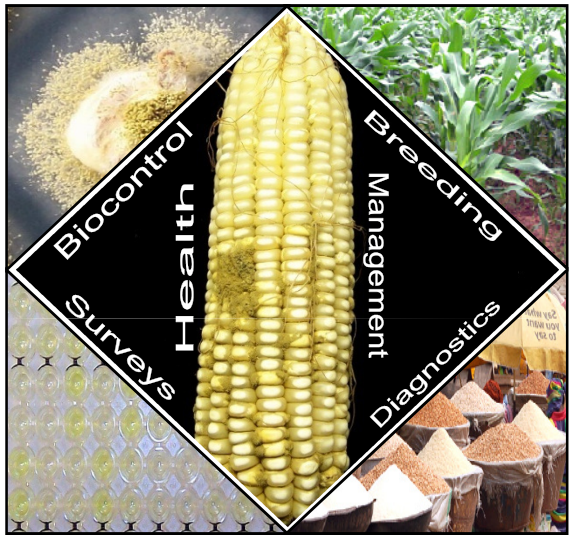
IITA
Research to Nourish Africa

Mycotoxin Research @ IITA

An overview



"to improve food quality, human health, income and livelihoods of smallholder farmers in sub-Saharan Africa"

www.iita.org

Ongoing Research-for-Development Activities

- Strategies to manage mycotoxins in maize, cassava, yam, cashew, sheanut and cocoa value chains.
- Technical, institutional and policy options for tackling the complex problem in commodity value chains.
- Surveillance of mycotoxins and diversity in toxigenic fungi in sub-Saharan Africa.
- Breeding for resistance to aflatoxins and fumonisins in maize.
- Biological control using the competitive exclusion principle in maize-groundnut cropping systems.
- Awareness campaigns, development and dissemination of cost-effective management strategies, and organizing information dissemination events.
- Simple and low-cost ELISA-based quantitative test for aflatoxins (developed in-house at IITA) to foster monitoring of mycotoxins in Africa.
- Spearheading initiatives on aflatoxin resistance breeding and an Africa-wide aflatoxin biocontrol program in collaboration with USDA-ARS.
- Building coalition and alliances of partners and stakeholders for mycotoxin management.
- Training students and national program scientists.

A farmer carrying a box of Aflasafe™ (a registered trademark of IITA) to protect his maize crop against aflatoxins. Biocontrol-producing spores in Aflasafe™ land on maize and outcompete toxigenic strains. Photo by IITA.

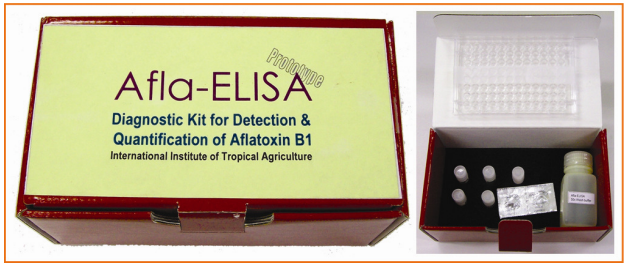
Selected Ongoing and Completed Special Projects

- Diffusion of cost-effective technologies for the control of mycotoxin contamination for increased health and income in Burkina Faso, Tanzania and Mozambique (ADA)*
- Development and evaluation of strategies to reduce aflatoxin contamination in maize (BMZ)
- Aflatoxin risk assessment, biological control options and interventions (BMZ, ADA, AATF, FAES, USDA)
- Novel integrated strategies for worldwide mycotoxin reduction in food and feed chains - MycoRed (EU)
- Integration of mycotoxin and toxigenic fungi research for food safety in global system (MYCO-GLOBE)
- Measuring, predicting and adapting to aflatoxin risk under climate variability and change (AHRP)
- Improvement in quality control of agri-food products in Benin, West Africa (STDF)
- Feasibility study on development, testing and deployment of a microbial exclusion technology in Africa (AATF)
- Pre- and post-harvest deterioration of grains and mycotoxin contamination in Zambia (IFAR)
- Determination of aflatoxin-resistance and marker identification in IITA maize breeding materials (USAID)
- Identification, characterization and development of corn germplasm with resistance to aflatoxin (USAID)
- Diversity in *Fusarium* species causing stalk and ear rot of maize and sorghum in West Africa (USAID)
- Evaluation of maize and sorghum grain for fungal and mycotoxin content (INTSORMIL)
- Assessing knowledge system dynamics in farmers' field school in Benin (IFAD)
- Evaluation of cocoa bean fermentation with respect to mycotoxin contamination in Nigeria (IFAR)
- Inactivation of aflatoxins by lactic acid bacteria commonly found in African fermented foods (IFAR)
- Comparative aflatoxin-producing potential of *Aspergillus* strains isolated from maize and sesame in Senegal (IFAR)
- SPS issues on the safe trade in plant and animal products in ECOWAS (CIDA)

**Donor*

Partners

- We work with several advanced research institutes in the US and Europe as well as many national programs in Africa.
- Prominent among the IITA partners are:
- African Agriculture Technology Foundation (AATF)
- Fondation Agir pour l'Education et la Santé (FAES)
- Institute of Sciences of Food Production (ISPA) – National Research Council (Italy)
- National Agency for Food and Drugs Administration and Control (NAFDAC)
- Nigerian Export Promotion Council (NEPC)
- United States Department of Agriculture (USDA)– Agriculture Research Service in New Orleans and at the University of Arizona
- University of Leeds (UK)
- Kansas State University (USA)
- University of Georgia (USA)
- University of Bonn (Germany)
- Università Cattolica del Sacro Cuore (Italy)
- University of Natural Resources and Applied Life Sciences (Austria)
- University of Aarhuus (Denmark)
- Nestlé
- National institutions in Benin, Burkina Faso, Cameroon, Ghana, Kenya, Mozambique, Nigeria, Senegal, Tanzania, Togo, and Zambia



Afla-ELISA™, an in-house aflatoxin estimation kit, provides sensitive, reliable, quantitative detection of aflatoxins in various agricultural commodities using an indirect competitive ELISA principle via colorimetric measurements.

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Mycotoxin Reasearch at IITA