

DESCRIPTION

The Peanut & Mycotoxin Innovation Lab (PMIL) is part of the whole of government approach to food security and nutrition programming called Feed the Future. PMIL is one of many Innovation Labs supported by the U.S. Agency for International Development (USAID) and hosted at top U.S. universities. While not physical laboratories as the name might imply, the Innovation Labs are networks of researchers in the United States and abroad working together to improve food security and reduce poverty in key countries of the Feed the Future initiative.

PROJECTS

Pre-harvest, post-harvest and processing

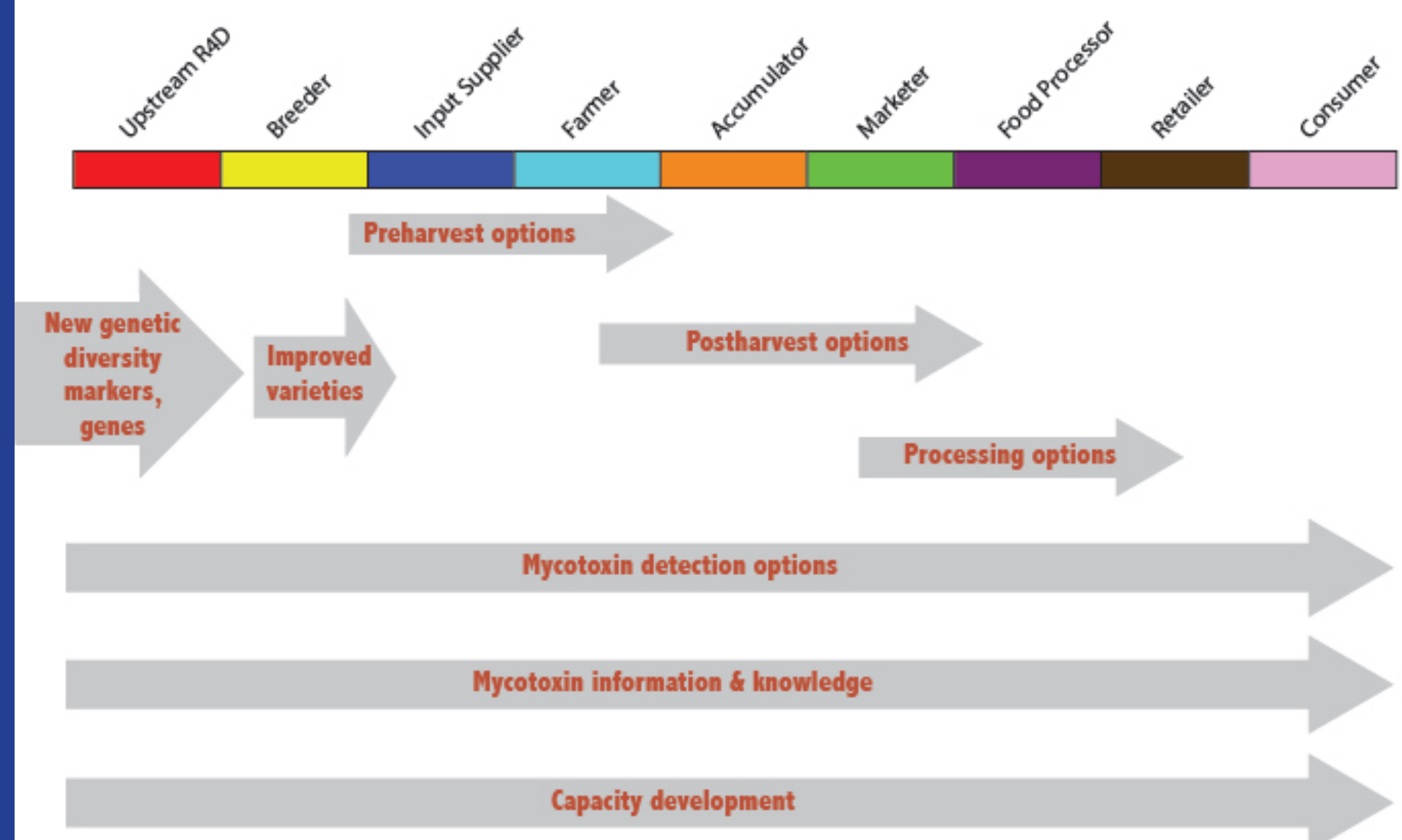
- *Technologies to Improve Peanut Production, Processing and Utilization in Haiti*, Greg McDonald, University of Florida
- *Using Applied Research and Technology Transfer to Minimize Aflatoxin Contamination and Increase Production, Quality and Marketing in Ghana*, David Jordan, North Carolina State University
- *Producer and Consumer Interventions to Decrease Peanut Mycotoxin Risk in Ghana*, Nicholas Magnan, University of Georgia
- *Aflatoxin Management Interventions, Education and Analysis along the Value Chain in Malawi, Mozambique and Zambia*, Rick Brandenburg, North Carolina State University
- *Farm-Level Analysis of Productivity and Profitability in Malawi, Mozambique and Zambia*, Boris Bravo-Ureta, University of Connecticut
- *Randomized Controlled Trial of the Impact of Treating Moderately Malnourished Women in Pregnancy*, Mark Manary, Washington University - St. Louis



Mycotoxin detection & information

- *AflaGoggles for Screening Aflatoxin Contamination in Maize*, Haibo Yao, Mississippi State University
- *Development and Validation of Methods for Detection of Mycotoxins Exposure in Dried Spotted Blood Samples*, Jia-Sheng Wang, University of Georgia
- *Comparative Study on Analytical Methods for Detection of Aflatoxin in Peanut Products*, Kumar Mallikarjuna, Virginia Tech

Addressing each link in the value chain



New genetic diversity & improved varieties

- *Translational Genomics to Reduce Preharvest Aflatoxin Contamination*, Peggy Ozias-Akins, University of Georgia
- *Silencing of Aflatoxin Synthesis through RNA Interference (RNAi)*, Renee Arias, USDA-ARS National Peanut Research Laboratory
- *An Integrated Global Breeding and Genomics Approach*, Mike Deom, University of Georgia

STUDENTS

More than 30 MSc and PhD students study with PMIL support at universities in the U.S. and overseas.

- Khon Kaen University, Thailand
- Kwame Nkrumah University of Science and Technology (KNUST), Ghana
- University of Georgia, U.S.
- University of Ghana, Ghana
- University for Development Studies, Ghana
- Lilongwe University of Agriculture and Natural Resources, Malawi
- University of Connecticut, U.S.
- Eduardo Mondlane University, Mozambique
- University of Tampere, Finland
- University of Zambia, Zambia



PARTNERS

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| <p>Burkina Faso
University of Ouagadougou</p> <p>Ghana
CSIR-CRI
KNUST
University of Ghana
University for Devt. Studies
CSIR-SARI</p> <p>Haiti
Meds & Food for Kids
Acceso Peanut Enterprise Corporation</p> <p>India
Tamil Nadu Agricultural University
ICRISAT</p> <p>Kenya
ICRISAT
Kenyatta University</p> <p>Malawi
University of Malawi
Lilongwe University of Ag. and Natural Resources
Chitedze Agriculture Research Service
Exagris Africa Ltd.
ICRISAT
Nat'l. Small Holder Farmers Association of Malawi</p> <p>Mozambique
Eduardo Mondlane University
Instituto de investigação Agrária de Moç.</p> | <p>Nigeria
International Institute of Tropical Agriculture (IITA)</p> <p>Senegal
Institut Senegalais de Recherches Agricoles (ISRA)</p> <p>Uganda
National Agricultural Research Org.</p> <p>U.S.A.
Auburn University
California Polytechnic State University
University of Connecticut
Int'l Food Policy Research Inst. (IFPRI)
University of Florida
Frank's Designs for Peanuts
University of Georgia
Tufts University, School of Nutrition Science
Meds & Food for Kids
Washington University School of Medicine
Mississippi State University
United States Department of Agriculture (ARS)
North Carolina State University
New Mexico State University
Cornell University
Texas A&M University
Virginia Polytechnic Institute and State University</p> <p>Zambia
Zambia Ag. Research Institute (ZARI)
University of Zambia</p> |
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SOME KEY ACCOMPLISHMENTS

- More than 110,000 SNPs identified for use in mapping the peanut genome.
- DNA of several hundred isolates of *A. flavus* from Ethiopia, Uganda and Malawi sequenced to help design RNAi strategies, and provide potential atoxigenic strains for biological control of *A. flavus* and aflatoxin contamination.
- First rosette-resistant Valencia peanut variety identified. Three groundnut leaf miner-resistant lines identified and used in initial crosses. New lines for introduction in Haiti identified.
- Best spectral wavelengths for aflatoxin screening identified and prototype detection unit built for a rapid, inexpensive monitoring device.
- Partnership developed with Mobile Assay to test a new electronic tablet reader that allows for in-the-field measurement of aflatoxin levels.
- Dried-blood sampling method validated, and more than 3500 serum samples from Kenya and Uganda analyzed.
- Nearly 1500 participants enrolled in the clinic trials to determine benefits of treating moderately malnourished pregnant women with

a peanut butter-based nutritional supplement.

- Best interventions identified for Ghana – Results from second year (of three) trials on-station and on-farm in Ghana indicated that Best Management Practices significantly increase yields as compared to farmer practices in all sites. Results indicate that drying peanuts on a tarpaulin is best as compared to A-frames or other drying methods. An inexpensive solar dryer tested at UGA gave good results and is being deployed to Ghana for further evaluation.
- Completed surveys in Ghana at household and processor levels – Found that aflatoxin and microbial contamination of peanut and peanut products produced by local processors are high and likely due to contamination at the milling stage. Future efforts will focus on possible interventions. Based on results in Ghana, aflatoxin levels are twice as high in peanuts kept for home consumption as opposed to those destined for markets.
- Completed surveys of local processors in Malawi – Survey of aflatoxin and microbial contamination in locally produced peanut butter in Malawi indicated high levels of contamination. Training



has been provided on best practices and follow-up conducted to determine the impact. Established new partnerships with local private-sector peanut producers and processors.

