



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



## Feed the Future Legume Innovation Lab Advancing the Productivity Frontier

### IPM-omics: Scalable and Sustainable Solutions for Pest Management of Insect Pests of Cowpea in Africa

#### The Challenge

Cowpea is an important protein source for tens of millions of West Africans, many of whom live on less than \$2 per day. Insect pests of cowpea, however, dramatically reduce crop yields for cowpea farmers in West Africa, often causing complete crop loss. Pesticides will not provide the long-term solutions needed to bring these pest populations under control within the economic constraints of smallholder cowpea farmers. The major pests of cowpea in northern Nigeria, Niger, Ghana, and Burkina Faso include the legume pod borer, coreid pod-bugs, thrips, and the groundnut aphid.

#### The Project

The project team works on addressing these insect pests through Integrated Pest Management, a strategy



Manu Tamo inspects *Tephrosia candida* plants for parasitoids of flower thrips in Benin.



Packaged neem oil for sale. The project has worked with communities to encourage the local production of neem oil, a natural pest control solution.

that involves diverse pest control solutions, including a combination of traditional pest control and deployment strategies along with cutting-edge technologies, genomics, and geographic information systems (GIS) to direct the deployment of these approaches most effectively; testing and deploying cutting-edge ICT (information and communication technology) tools is integral these solutions.

The project follows a three-step approach: defining the pest problems, developing appropriate pest control solutions, and then scaling these solutions. Training the next generation of cowpea scientists is also central to the project's long-term goals.

#### This project is funded by

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Two women farmers in West Africa watch an animated SAWBO (Scientific Animations Without Borders) educational video on Integrated Pest Management of cowpea on a cell phone.



A controlled release of *Therophilus javanus*, a type of shield wasp that attacks the cowpea pod borer in Benin, into a mesh cage inside a screen house.

## Project Objectives

1. **Define the pest problems.**
  - a. Scouting, field experiments, light traps
  - b. Genomic markers to define pest and biocontrol agent populations—movement patterns and sources of outbreaks
  - c. Computational modeling
  - d. Understanding the biology of pest populations to drive pest controls strategies
2. **Appropriate solutions.**  
A biocontrol and biopesticide pipeline to develop a series of environmentally and economically appropriate pest control solutions.
3. **Scaling of solutions.**  
Exploring solutions and mechanisms to effectively deploy them in a cost-effective and sustainable manner. There are three solution categories: a. direct release into the environment and natural establishment, b. educational solutions, and c. private sector and NGO involvement.

## Projected Outcomes

1. Biocontrol agents and cost effective deployment strategies in the field and release of biocontrol agents in host countries.
2. Field testing of resistance/tolerance traits for cowpea pests.
3. Validated and scalable FFF approaches to train other groups to scale these programs to impact their communities.
4. Training of the next generation of plant breeders.
5. Long-term breeding approaches.

## Major Achievements to Date

1. Development of biocontrol agents useful for scaling in cowpea pest management.
2. Detailed studies on insect behavior, ecology, and biology to maximize the impact of biocontrol agents in the field.
3. Analyses of field data that show animated educational videos are as effective as the use of extension agent presentations.



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