

The Foundation for Food and Agriculture Research (FFAR)

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New Innovator in Food and Agriculture Research Award

Addressing barriers to integrating research and adoption of sustainable practices for managing locusts in Senegal, South America, and Australia.



OVERVIEW

Co-sponsored by the Foundation for Food and Agriculture Research (FFAR) and Arizona State University (ASU), also with support from ASU's Swette Center for Sustainable Food Systems, this project addresses challenges and opportunities in managing and researching grasshopper and locust pests. It spans from biological research identifying land use practices that suppress locust populations to comparing governance structures for how different regions around the world manage locusts, to create common global resources for stakeholders.

PARTNERS



AUSTRALIA

Australian Plague Locust Commission (APLC)

New South Wales Department of Primary Industries (DPI)



SENEGAL

Plant Protection Agency (La Direction de la Protection des Végétaux) (DPV)

Gaston Berger University (GBU)



SOUTH AMERICA

The National Agricultural Technology Institute (INTA)

Inter-American Institute for Cooperation on Agriculture (IICA)

National Food Safety and Quality Service (SENASA)

National Service of Agricultural Health and Food Safety (SENASAG)

National Service for Plant and Seed Quality and Health (SENAVE)

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OBJECTIVE 1

Identify opportunities to help farmers reduce locust outbreaks through lab and fieldwork that determines culturally appropriate land-use practices that will suppress locust populations.

BIOLOGICAL RESEARCH

Research in **AUSTRALIA** led to a better understanding of locust interactions on a landscape level. Results showed Australian Plague Locusts avoid significantly woody vegetation, and clumpy distribution of optimal food sources influences where locust eat and if gregarization will occur. The team also found these locusts maintain a consistent self-selected protein to carbohydrate ratio regardless of local conditions. Further investigation could help improve forecasting and modeling of locust swarms.

The team in **SENEGAL** is answering questions like, "Do carb-biased landscapes result in higher numbers of Senegalese Grasshoppers?" by conducting research in five villages and working collaboratively with women's groups and farmers.

They are also investigating nutritional regulation and performance of the Senegalese Grasshopper by measuring its nutritional preference and regulation across two generations using artificial diets and plant choice experiments.

In **SOUTH AMERICA** the goal of reducing risks and impacts of locust outbreaks led the team to progress field and laboratory research on the South American Locust. They identified plant species in outbreak areas of Argentina and conducted experiments on locust dietary preference and performance on local vegetation.

In the **UNITED STATES** ASU students are creating a bridge between the distinct worlds of insect nutritional ecology and livestock agriculture. They plan to compare methods for testing forage quality, review current literature, and conduct lab experiments with locusts on fertilized crops also relevant to livestock.



OBJECTIVE 2

Work with stakeholder groups from three global regions to compare and contrast the governance structures and identify pathways for sustainable locust management.

GOVERNANCE WORKSHOPS

In February 2020, the first workshop in Tucumán, Argentina, brought together 38 participants from 5 countries: Argentina, Bolivia, Paraguay, Uruguay and USA working in national and provincial locust control agencies, as well as researchers, farmers and representatives of farming associations and ministries.

The team crafted a participatory approach to explore governance and network components to locust management.

Participants learned institutional analysis techniques, and conceptual model-building with ample time for extensive small-group discussion.

Supplementary components highlighted the latest in locust modeling and forecasting tools, a well as opportunities for creating the best infrastructure to respond to locust emergencies and to sustain locust expertise during non-outbreak years.

The other three participative workshops had to be postponed and rescheduled online due to the COVID-19 pandemic.



OBJECTIVE 3

Build international capacity for sustainable locust management by connecting global stakeholders across regions, sectors, and disciplines, and institutionalizing locust research and response knowledge and techniques.

GLOBAL LOCUST NETWORK

The Global Locust Network is growing and the team is working to keep the website up to date with all the ongoing locust outbreaks and create a virtual community to connect global stakeholders to share ideas and resources.

A paper with over 35 Network member co-authors is in the final states of editing, "Institutional perspectives on global locust and grasshopper management and research: expansion from the first Global Locust Initiative Conference".