Arizona State University

Global Locust Initiative

USDA

Grasshopper Rearing in Support of Methods Development for Rangeland Research

OVERVIEW

The primary goal of this cooperative agreement between the USDA and Arizona State University is to better support critical laboratory experiments with insecticides outside of the summer field season and further Rangeland Unit's mission of developing novel management methods while improving existing ones for grasshoppers and Mormon crickets in the rangelands of the 17 contiguous western states.

USDA-LED PROJECTS	COLLABORATION BACKGROUD	ASU-LED PROJECTS

UAS-Simulation System

Using a robotics-based system to simulate the flight abilities of Unmanned Aircraft Systems (UAS) to more easily and cheaply test various sensors and develop machine learning algorithms to enhance surveying abilities before initiating flight-based field tests.

Diflubenzuron Effects on Adults

Assessing the efficacy of late-season treatments on adults and impact on fecundity.
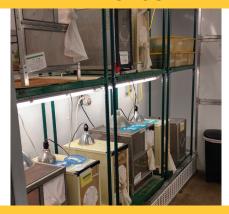
Diflubenzuron Comparison

Comparing the efficacy of Dimilin2L and two generics.

Sonic Weaponry & Nutritional Warfare

Investigating the physiological effects of multiple sound frequencies (infra to ultra) on all life stages for the purposes of attracting/repelling grasshoppers and/or altering their nutritional needs.

The Migratory Grasshopper, *Melanoplus sanguinipes*

(Fabricius, 1798) is an ideal reasearch candidate because it is the most economically damaging grasshopper pest in rangeland habitats. This species is native to a majority of the U.S. (and parts of Canada), and can be reared into a healthy colony with minimal difficulty.

Biopesticide-Environment Interactions

Investigating how the fungal pathogen *Metarhizium robertsii* (isolate DWR2009), affects the nutritional physiology and thermal regulation of *Melanoplus sanguinipes*, and how this information could be used to suppress outbreaks. This project includes field research on wild populations and controlled studies using the lab colony.