USDA Agricultural Research Service
National Program Overview of Biocontrol of Weeds

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Invasive Plants

- Reduce diversity of native plants
- Reduce habitat
- Alter ecosystem services
- Displace rare species
Biological Control of Weeds

Control of pests using natural enemies

Herbivores:
- goats, cows
- herbivorous insects and mites
- plant pathogens

Biocontrol methods
- Inundative
- Augmentative
- Classical
Invasive Plants

Classical biocontrol
Steps to Biocontrol

1. Identify the target
2. Identify the target’s native home
3. Look for natural enemies (biocontrol agents)
4. Propagate “pure” cultures
5. Test for host specificity and efficacy
6. Get permits for release
7. Mass propagate and release
Biological Weed Control

**Benefits**

- Once developed, very cheap to use
- Works in ecologically sensitive areas
- Works in difficult-to-reach areas
- Harnesses ecological processes to reverse plant invasions
Biological Weed Control

Cons

- Takes a long time to develop initially
- Requires knowledge about the origin of the invasive plant
- Effective natural enemies can be hard to find
- Safety testing can be time consuming and expensive
- Cannot easily be reversed
Agricultural Research Service
USDA’s chief scientific in-house research agency.

Mission: Conduct research to find solutions to agricultural problems that affect Americans every day from field to table.

Scope:
• 750 research projects, 17 National Programs
• 2000 PhD Researchers + 6000 other employees
• 90 research locations, including 4 overseas labs
ARS Laboratory Locations
Administrative Structure

Sonny Perdue (nominated)  
[Formerly Thomas Vilsack]  
USDA Secretary

Acting Dr. Anne Bartuska  
[Formerly Dr. Cathie Woteki]  
Under Secretary, Research, Education, and Economics (REE)

Dr. Chavonda Jacobs-Young  
Administrator  
Agricultural Research Service
USDA-ARS National Programs

**Crop Production & Protection**

- Crop Genetics and Breeding
- Crop Production
- Plant Protection
- Plant Pathogens
- Insects/Arthropod Pests
- Weeds
Invasive Plant Research Lab
St. Lauderdale, FL
Air potato biocontrol

June 2012

Prior to biocontrol

Dr. Min Rayamajhi
Air potato biocontrol

Aug 2013

Plants after beetle release

Lilioceris cheni
Air potato biocontrol

Restoration of native vegetation

Sept 2016
Biocontrol of Waterhyacinth

No Biocontrol

Biocontrol

41-68% less biomass
90% less seed.
Greater susceptibility to herbicides.
Biocontrol of Giant Salvinia

Before Biocontrol

70.4% less biomass

45% more open water

After Biocontrol
ARS Area-wide Pest Management Program

- Targets pests of significant economic or ecological consequence
- Targets pests that require an area-wide approach for effective control
Melaleuca

Soil accretion
Preawide Pest Management
Melaleuca Biocontrol Agents

- Reduce plant growth
- Limit reproduction
- Suppress seedling survival
- Initiate leaf abscission
- Decrease plant density
- No non-target effects

*Oxyops vitiosa*

*Boreiglycaspis melaleucae*
New projects

- *Rhodomyrtus tomentosa*
  Downy Rose Myrtle
- *Lygodium microphyllum*
  Old World climbing fern
- *Schinus terebinthifolia*
  Brazilian Peppertree
- *Triadica sebifera*
  Chinese tallow
- *Acacia auriculiformis*
  Earleaf acacia
More accurate cooperator list

City/county
- Miami-Dade County
- Broward County

State/district
- SFWMD.gov
- SWFWMD
- Texas Parks & Wildlife
- SJR
- Louisiana
- Southwest Florida Water Management District

University
- UF
- Florida A&M
- Texas A&M
- LSU
- US

Federal
- APHIS
- USDA Forest Service
- USGS

Foreign
- FUEDEI
- FURB
- INTA
- CSIRO
- SENASA
- www.cabi.org