

Emerging Issues in Biological Control and the ARS Foreign Labs

Dan Strickman

USDA Agricultural Research Service

Daniel.Strickman@ars.usda.gov

Biological Control

- ▣ Use of organisms to reduce the number of pests (weeds and arthropods) below damaging thresholds
 - Agriculture
 - Environment
 - Human health
- ▣ Classical
- ▣ Augmentative

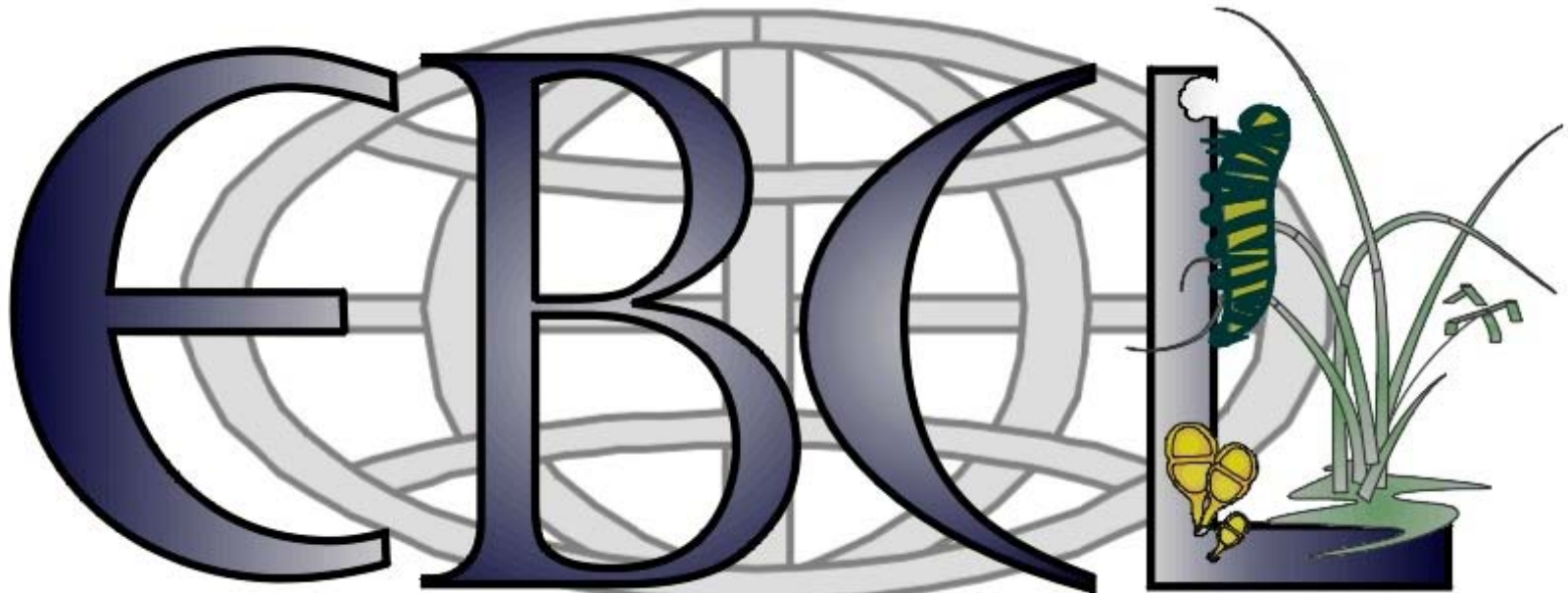
Domestic Resources

- ▣ Domestic biocontrol labs with quarantine
 - Albany, CA
 - Beltsville, MD
 - Gainesville, FL
 - Sidney, MT
 - Stoneville, MS
- ▣ 66 projects

Resources Overseas

- ▣ European Biological Control Laboratory
 - Montpellier, France
 - Thessaloniki, Greece
- ▣ Foundation for the Study of Invasive Species
 - Hurlingham, Buenos Aires, Argentina
- ▣ Australian Biological Control Laboratory
 - Brisbane, Australia
- ▣ Sino-American Biological Control Laboratory
 - Beijing, China

Solutions from Nature



European Biological Control Laboratory





Molecular biology
laboratory



Certified quarantine facility and plot
space



BL3 lab and growth
chambers



Lab is Embassy inspected and ICASS
served

Weed Targets

- ▣ Hoary cress (*Lepidium draba*)
- ▣ Perennial pepperweed (*Lepidium latifolium*)
- ▣ Medusahead rye (*Taeniatherum caput-medusae*)
- ▣ Swallow worts (*Vincetoxicum nigrum* and *rossicum*)
- ▣ French broom (*Genista monspessulana*)
- ▣ Russian olive (*Elaeagnus angustifolia*)
- ▣ Russian thistle (*Salsola*)
- ▣ Yellow star thistle (*Centaurea solstitialis*)
- ▣ Guinea grass (*Panicum maximum*)
- ▣ Giant reed (*Arundo donax*)

Insect Targets

- ▣ Vine mealybug (*Planococcus ficus*)
- ▣ European grapevine moth (*Lobesia botrana*)
- ▣ Asian longhorned beetle (*Anoplophora glabripennis*)
- ▣ Citrus longhorned beetle (*Anoplophora chinensis*)
- ▣ Olive psyllid (*Euphyllura olivina*)
- ▣ Olive fruit fly (*Bactrocera oleae*)
- ▣ Diamondback moth (*Plutella xylostella*)
- ▣ Southern green stink bug (*Nezara viridula*)
- ▣ Tarnished plant bug (*Lygus lineolaris*)
- ▣ Western tarnished plant bug (*Lygus hesperus*)



Foundation for the Study of Invasive Species

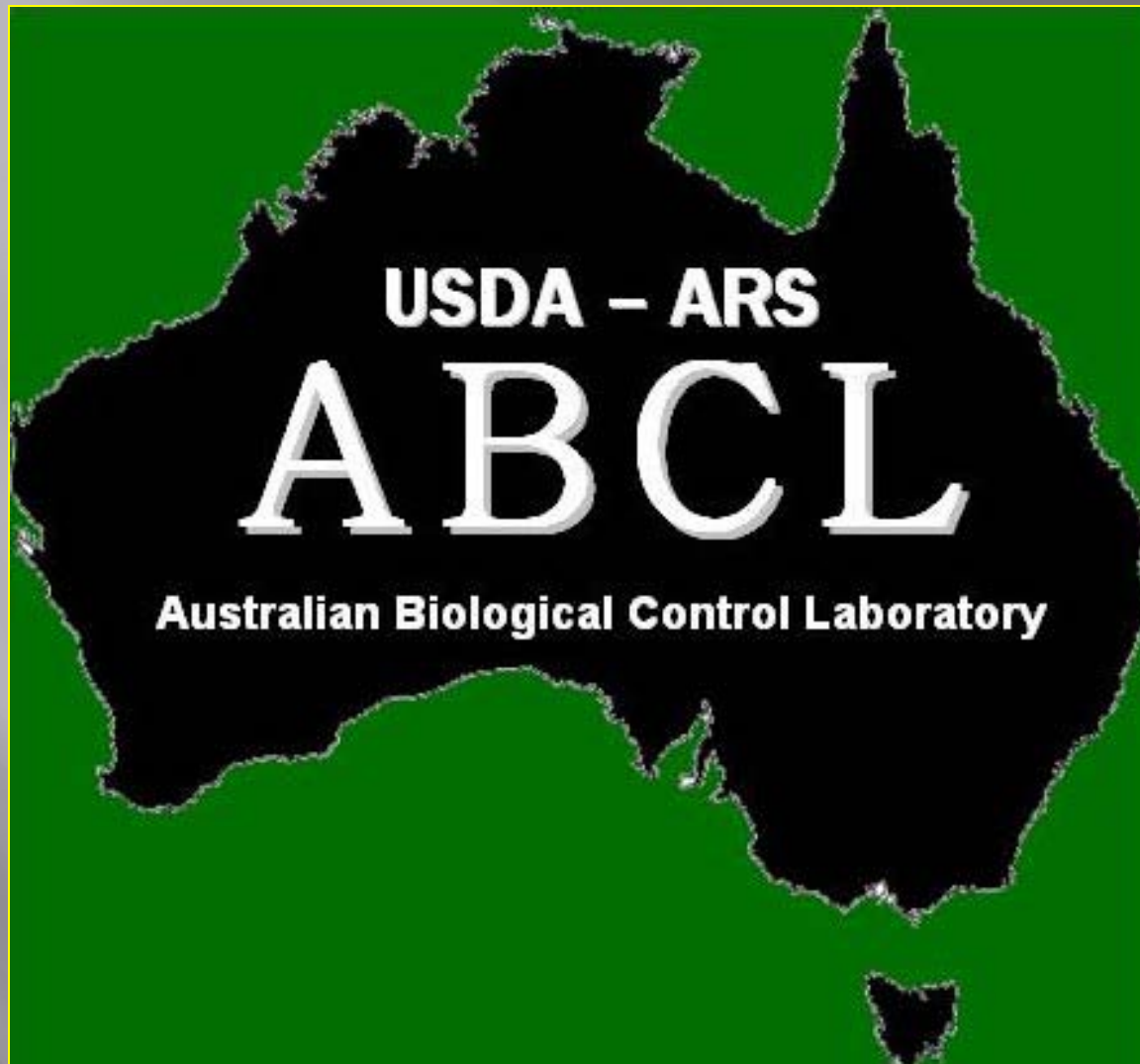


Weed Targets

- ▣ Brazilian peppertree (*Schinus terebinthifolius*)
- ▣ Brazilian waterweed (*Egeria densa*)
- ▣ Water primrose (*Ludwigia hexapetala*)
- ▣ Water lettuce (*Pistia stratiotes*)
- ▣ Waterhyacinth (*Eichhornia crassipes*)

Insect Targets

- ▣ Cactus moth (*Cactoblastis cactorum*)
- ▣ Little fire ant (*Wasmannia auropunctata*)
- ▣ Harrisia cactus mealybug (*Hypogeococcus pungens*)
- ▣ Red imported fire ant (*Solenopsis invicta*)
- ▣ Black imported fire ant (*Solenopsis richteri*)
- ▣ Glassy-winged sharpshooter (*Homalodisca vitripennis*)





Weed Targets

- ▣ Broad-leaved paperbark tree (*Melaleuca quinquenervia*)
- ▣ Old World climbing fern (*Lygodium microphyllum*)
- ▣ Australian pines (*Casuarina*)
- ▣ Skunk vine (*Paederia foetida*)
- ▣ Downy rose myrtle (*Rhodomyrtus tomentosa*)
- ▣ Chinese tallow (*Triadica sebifera*)
- ▣ Hydrilla (*Hydrilla verticillata*)

Insect Target

- ▣ Asian citrus psyllid (*Diaphorina citri*)

CAAS.net.cn

CHINESE ACADEMY OF AGRICULTURAL SCIENCES





Insect Targets

- ▣ Wheat stem sawfly (*Cephus cinctus*)
- ▣ Soybean aphid (*Aphis glycines*)
- ▣ Brown marmorated stink bug (*Halyomorpha halys*)
- ▣ Spotted wing drosophila (*Drosophila suzukii*)
- ▣ Mosquitoes (*Culex Huangae*, *Aedes japonicus*)

So what does this have to do with me?

- ▣ General benefit
 - Reduces pesticide use
 - Restores natural ecosystems
- ▣ Ash and trash lab safety
- ▣ Field work hazards
- ▣ Access and Benefit Sharing
- ▣ Quarantine design and enforcement
- ▣ Shipment