What is classical biological control?

Reuniting invasive pests with their highly specialized natural enemies to help reduce environmental/economic impacts of the pest in a safe and sustainable manner

What we do

- Import and screen new candidate biocontrol agents
- Mass rear approved agents
- Release approved agents
- Impact monitoring

External funding for Brazilian peppertree projects at IPRL

- USDA Animal and Plant Health Inspection Service (APHIS)
- Comprehensive Everglades Restoration Plan (CERP)
  - U.S. Army Corps of Engineers
  - South Florida Water Management District
- Florida Fish and Wildlife Conservation Commission (FWC)
- Miami-Dade County (Miami)
- Natural Resources and Conservation Service (NRCS)
- U.S. Air Force (USAF)

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Our collaborators

- University of Florida, Indian River Research and Education Center
- Florida Department of Agriculture and Consumer Services

Invasive Plant Research Laboratory

Our mission is to address the complex and multi-faceted problems of invasive plants in natural and agricultural ecosystems. Invasive plants pose one of the most serious threats to the health and integrity of natural and agricultural ecosystems. In order to restore the function and biological diversity of these systems, managing invasive plant populations is of critical necessity. The Invasive Plant Research Lab (IPRL) conducts research on the impacts of invasive plants as well as the safety and effectiveness of biological control and other methods used to manage them.

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USDA Agricultural Research Service

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Updates will be made when new information is available

A field guide to the biological control of Brazilian peppertree

Tiny insects are here to help

USDA Agricultural Research Service

Brazilian peppertree
Schinus terebinthifolia Raddi

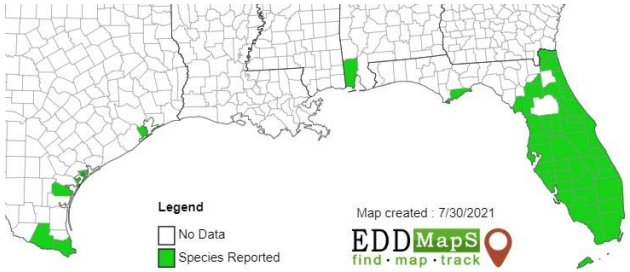
A woody shrub or multi-trunked small tree with pinnately compound leaves. Shiny new flush with reddish stems and leaves. Red fruit abundant in winter

Highly invasive in both natural habitats and urban landscapes

Natural habitat overwhelmed by Brazilian peppertree

Outcompetes native vegetation and forms dense stands

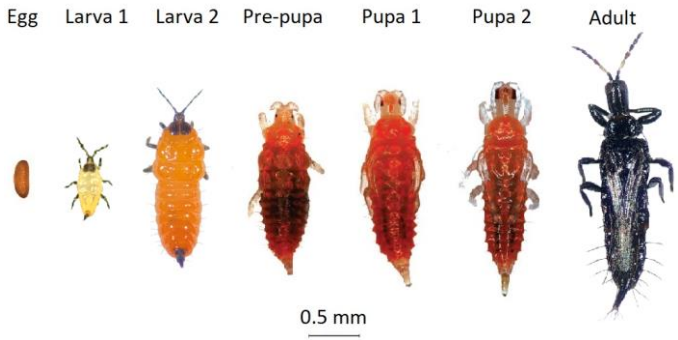
Covers over 700,000 acres in FL



Southeastern US distribution of Brazilian peppertree

Recognizing the biocontrol agents and the damage they inflict in the field

Pseudophilothrips ichini (Hood)
Thysanoptera: Phlaeothripidae



Thrips life cycle completes in ~ 1 month
Egg and pupae photos from Fig. 2 in Wheeler et al. 2016

Larvae and adults feed in groups on flushing leaves and stem tips. Larvae are bright orange and adults are black with wings folded over their bodies. When threatened, larvae and adults will curl their abdomens. Pupae hide in leaf litter on the ground.

* Defense posture

Actual size of adult

Thrips larvae feeding (circled area) on live portion of stem

Diagnosis of thrips damage

Depends on
- New growth
- Feeding recency
- Thrips densities

Dead patches on tender, new leaves Thrips usually present or recently present. Damage appears a few days after feeding begins and leaves will begin to crinkle

Dead, black tips on <u>new</u> stems Thrips may still be preset at base of the dead area. Damage first appears ~ 1 week after feeding begins. Damage/death to tender, new leaves typically accompanies. Dieback area depends on thrips density. Dead tips often break off in a few months

Older, crinkled leaves Young leaves that survive damage buckle around dead patches as they expand. A persistent form of damage visible months after feeding and when new growth is not occurring