

Palm Weevils

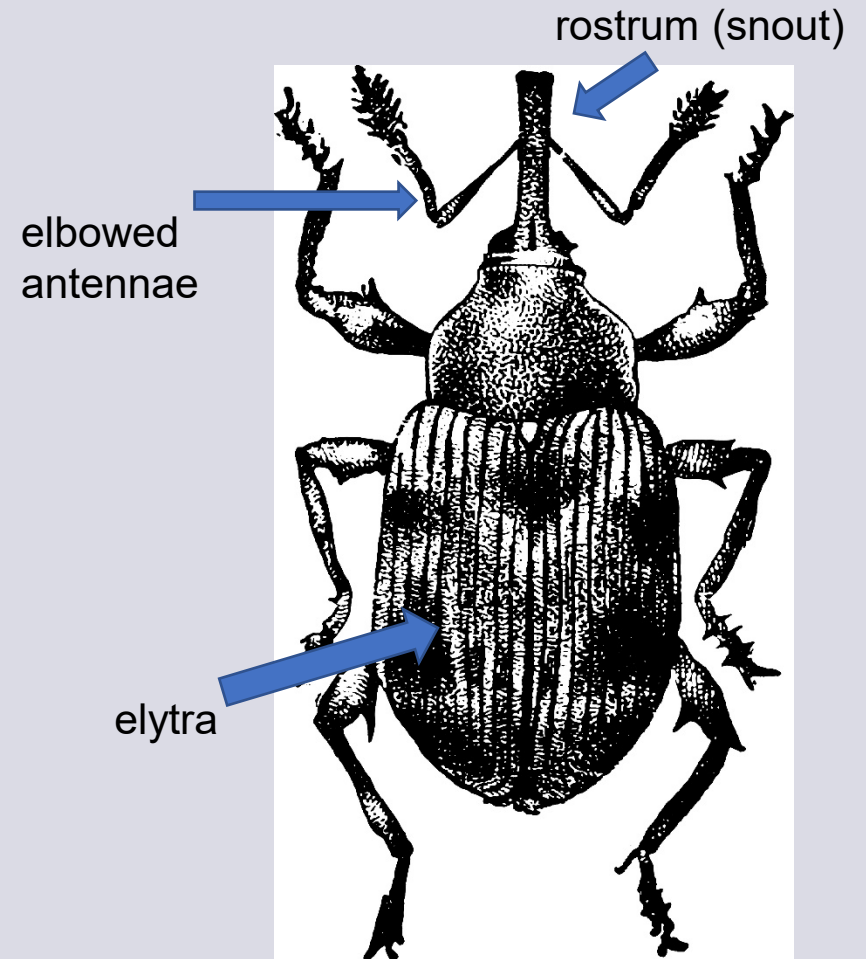


FLORIDA FIRST DETECTOR



What are Weevils?

- Beetles of the superfamily Curculionoidea
- Known for their elongated snouts
- There are about 97,000 species known with many being pests to wheat, grains, garden products, trees, and agricultural fields



Weevil Damage



Black vine weevil gnawing a leaf



Leaf damage from vine weevils



Sitophilus weevils on damaged grain

Palm Weevils

Palmetto weevil
(*Rhynchophorus cruentatus*)



Native*

Red Palm Weevil
(*Rhynchophorus ferrugineus*)



Invasive

South American Palm Weevil
(*Rhynchophorus palmarum*)



Invasive

***All three are pests!**

Native

Palmetto Weevil

Rhynchophorus cruentatus

Native

Palmetto Weevil

Rhynchophorus cruentatus



Photo: Top left: Doug Caldwell, Univ. Florida, Bugwood.org, #5429843; Right and Bottom Left: Robin M. Giblin-Davis, University of Florida

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Palmetto Weevil Susceptible Plants

Native host plant:

- Sabal palms
- Saw palmetto
- Florida thatch palm
- Royal palms



Saw palmetto

Other host plants:

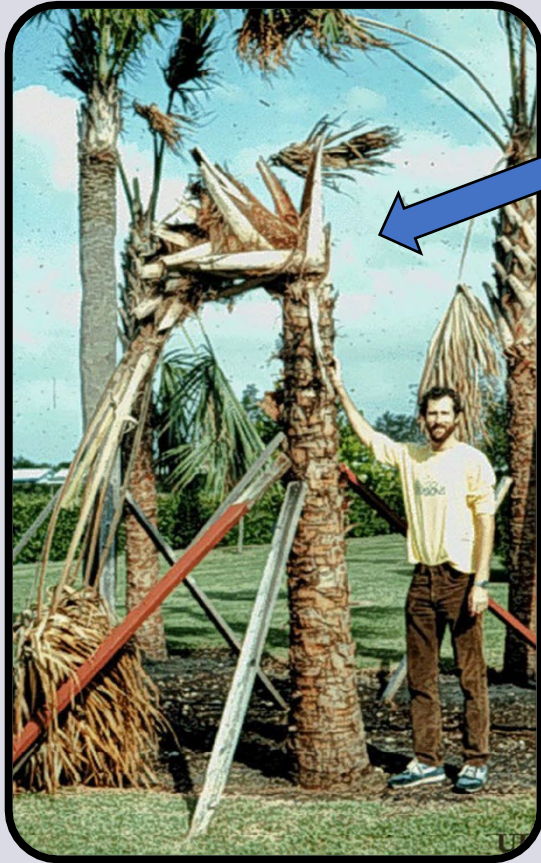
- Canary Island date palms
- Bismarck palms
- Fan palms
- Date palms
- Coconut palm
- Latania palms
- Fishtail palms



Sabal palm

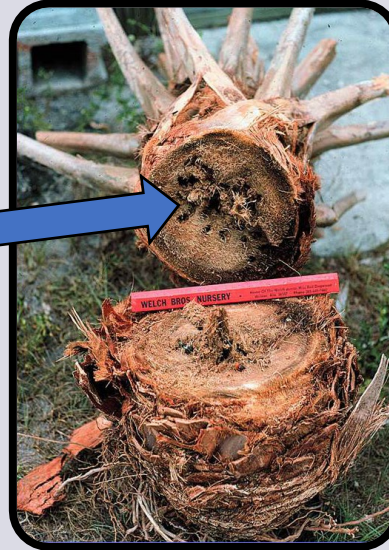
Native

Palmetto Weevil Damage



“Popped-neck”
condition on a
sabal palm

Larval damage in
sabal palm stem



Larval
damage of
petioles and
stem of a
Canary Island
date palm

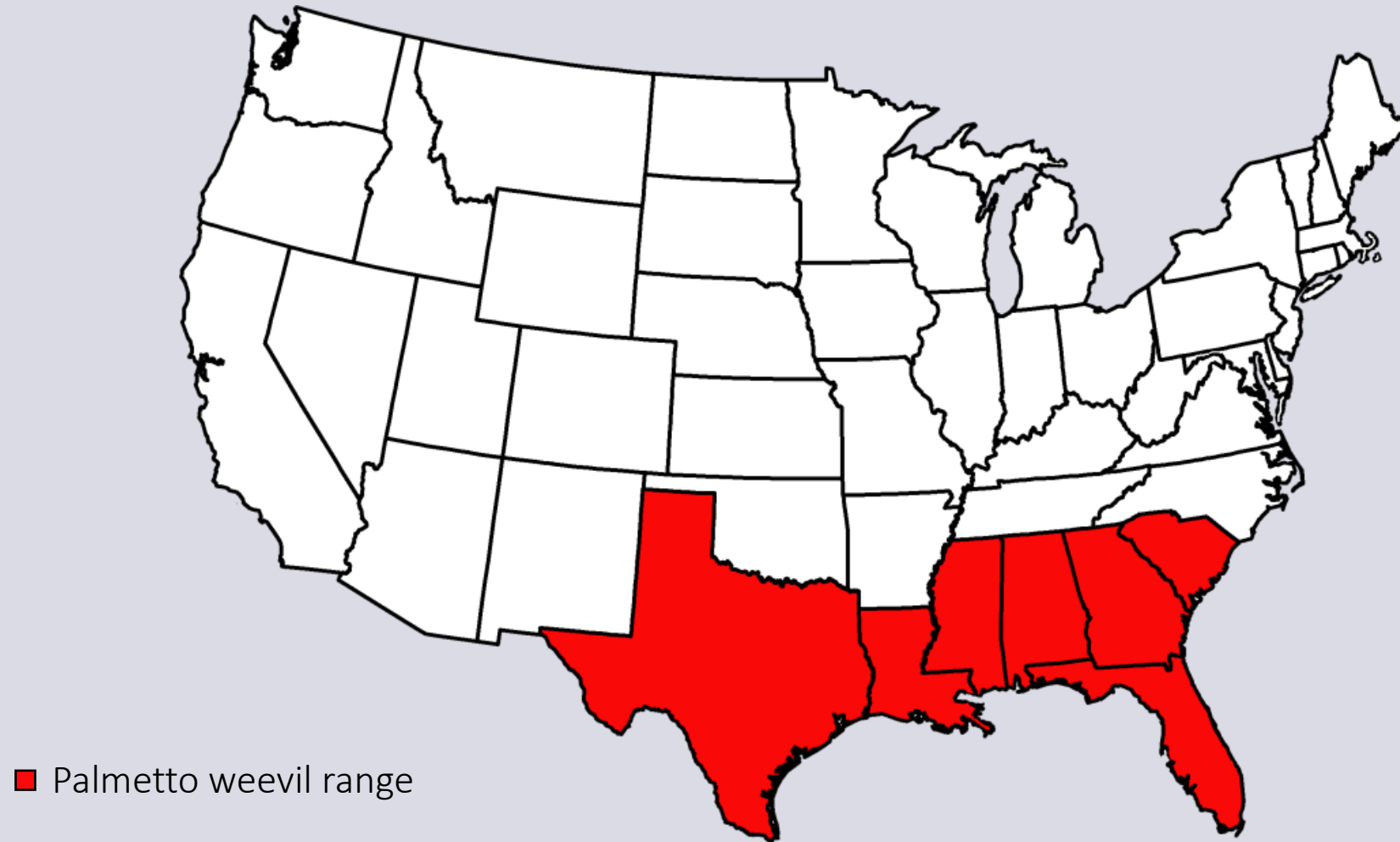


Damage to older
fan palm
(*Washingtonia*)



Native

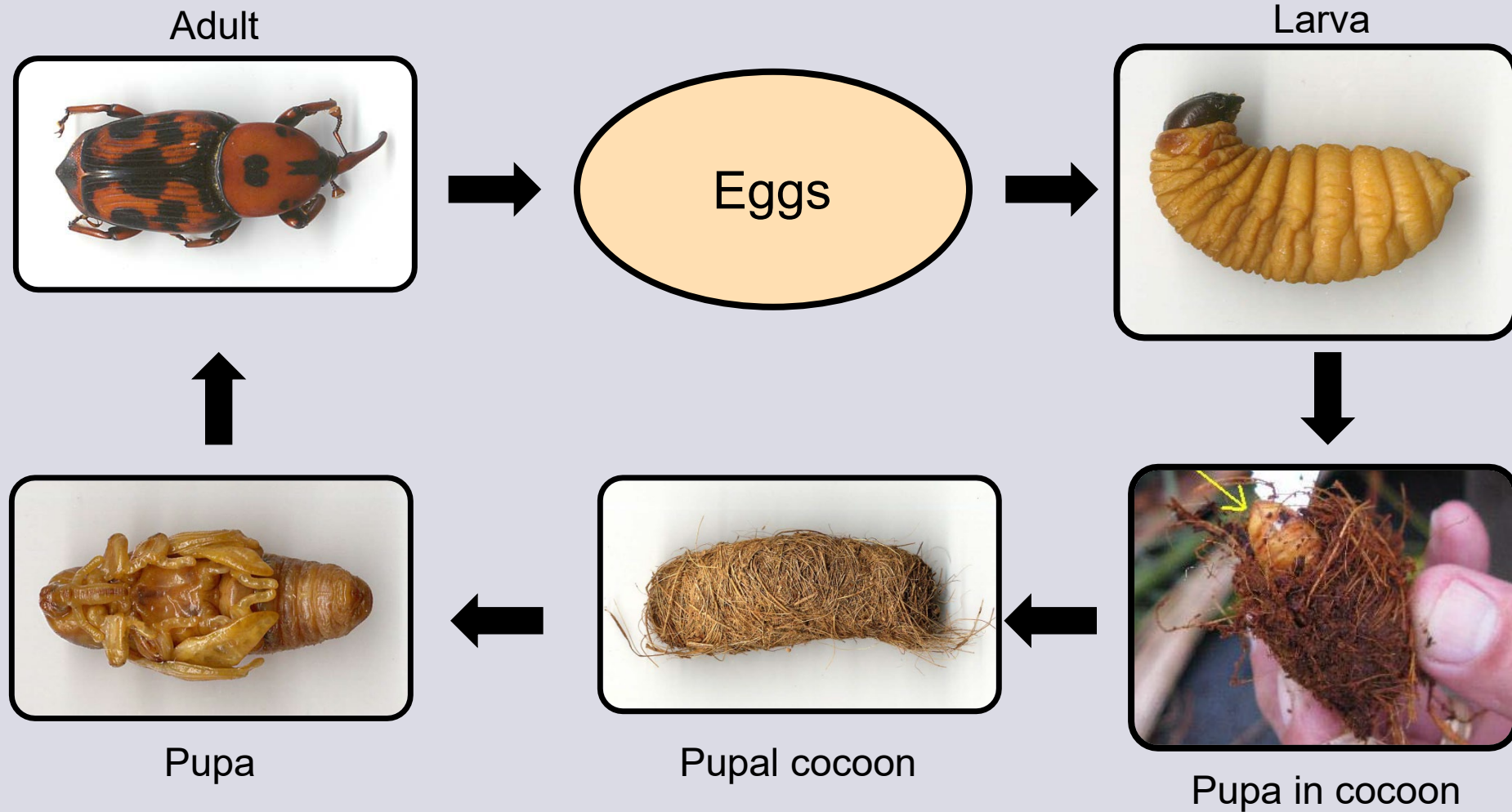
Palmetto Weevil Distribution



FLORIDA FIRST DETECTOR

Native

Palmetto Weevil Life Cycle



Photos: Robin M. Giblin-Davis , University of Florida

FLORIDA FIRST DETECTOR

Palmetto Weevil Monitoring & Management

- Bucket traps for monitoring
- Prevention is key
 - Promote plant health
 - Avoid pruning/wounding
 - Plant non-susceptible species
- Once infestation is detected, little can be done to save the tree



Palmetto weevil bucket trap

Invasive

Red Palm Weevil

Rhynchophorus ferrugineus

FLORIDA FIRST DETECTOR

Invasive

Red Palm Weevil

- Native to southeast Asia and Pacific Islands
- Most damaging pest of palms in the world!
- \$203 million U.S. palm industry at risk



Rhynchophorus ferrugineus

Invasive

Red Palm Weevil Identification



Photo: Center for Invasive Species Research, University of California, Riverside

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Red Palm Weevil Susceptible Plants

Some of the hosts found in Florida include:

- African oil palm
- Canary Island date palms
- Chinese fan palm
- Coconut
- Cuban royal palm
- Fishtail palm
- Sago palm
- Queen palm
- Washington palms

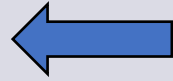


Invasive

Red Palm Weevil Damage



Larvae in palm tissues



Late-stage damage shown by drooping palm



Damaged palm frond

Empty pupal cases



Tunnels made by larvae



Invasive

Red Palm Weevil Distribution

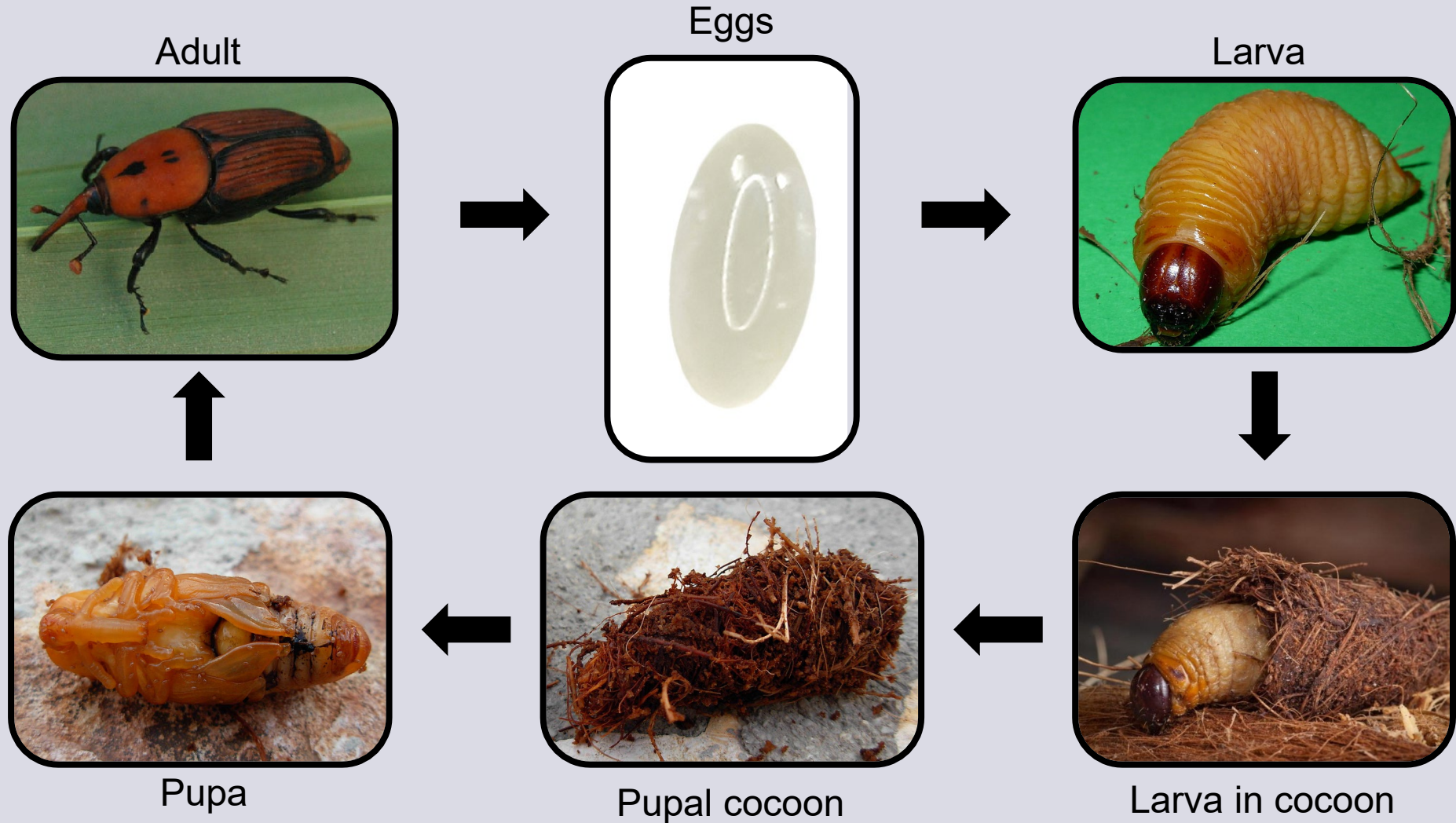


Map courtesy of Pest Tracker, National Agricultural Pest Information System (NAPIS) and Amy Roda

FLORIDA FIRST DETECTOR

Invasive

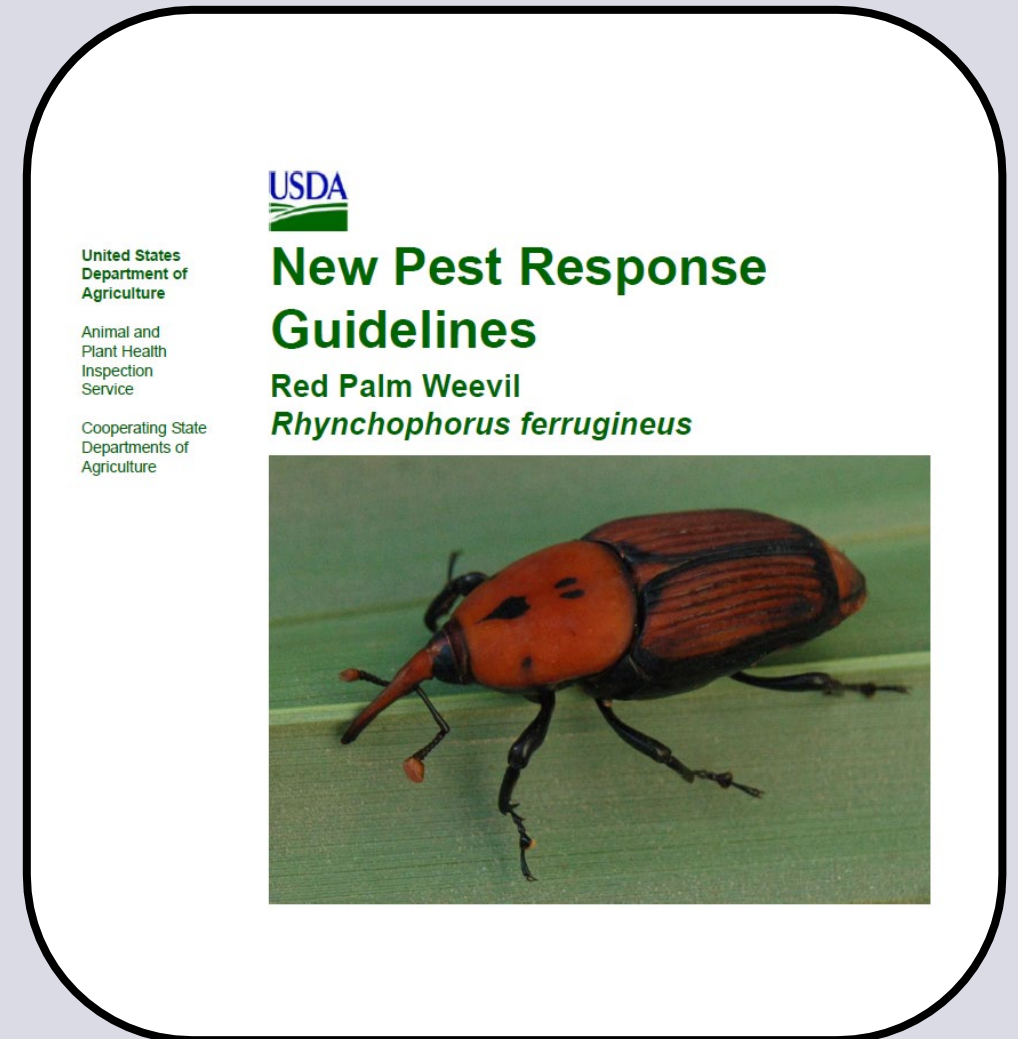
Red Palm Weevil Life Cycle



Photos: (Top left) Amy Roda, USDA APHIS; (Bottom right) - Mike Lewis, Center for Invasive Species Research, Bugwood.org #5430201; (Others) - Luigi Barraco, Wikimedia Commons

Red Palm Weevil Monitoring & Management

- Control methods
 - Systemic insecticides (i.e. trunk injections, soil applications, etc.)
 - Mass trapping with aggregation pheromones
 - Chipping and burning infested material
- Refer to *New Pest Response Guidelines: Red Palm Weevil* (USDA PPQ)



Invasive

South American Palm Weevil

Rhynchophorus palmarum

Invasive

South American Palm Weevil

- Native to Mexico, Central and South America
- Vector of Red Ring Nematode (*Bursaphelenchus cocophilus*)



Rhynchophorus palmarum

South American Palm Weevil

Susceptible Plants

- Primary hosts include:
 - Coconut palm
 - African oil palm
 - Sago palm
 - Canary Island date palm
 - Date palm
 - Sugar cane
 - Juçara palm



Coconut palm

South American Palm Weevil Damage

Palm trunk damaged
by *R. palmarum* in
Costa Rica

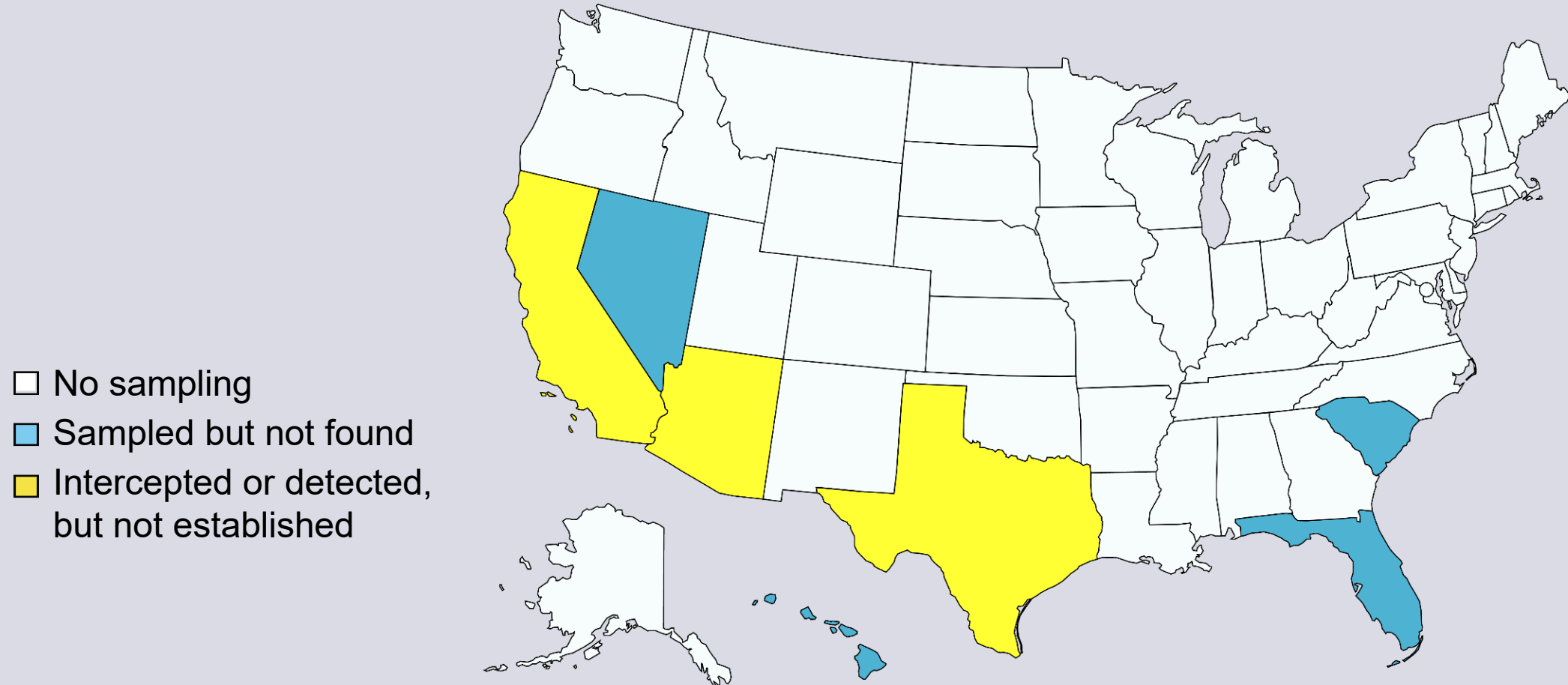


Palm frond
damage caused by
larval tunneling of
R. palmarum

Red ring disease
showing the
characteristic “red ring”
in a coconut palm



South American Palm Weevil Distribution

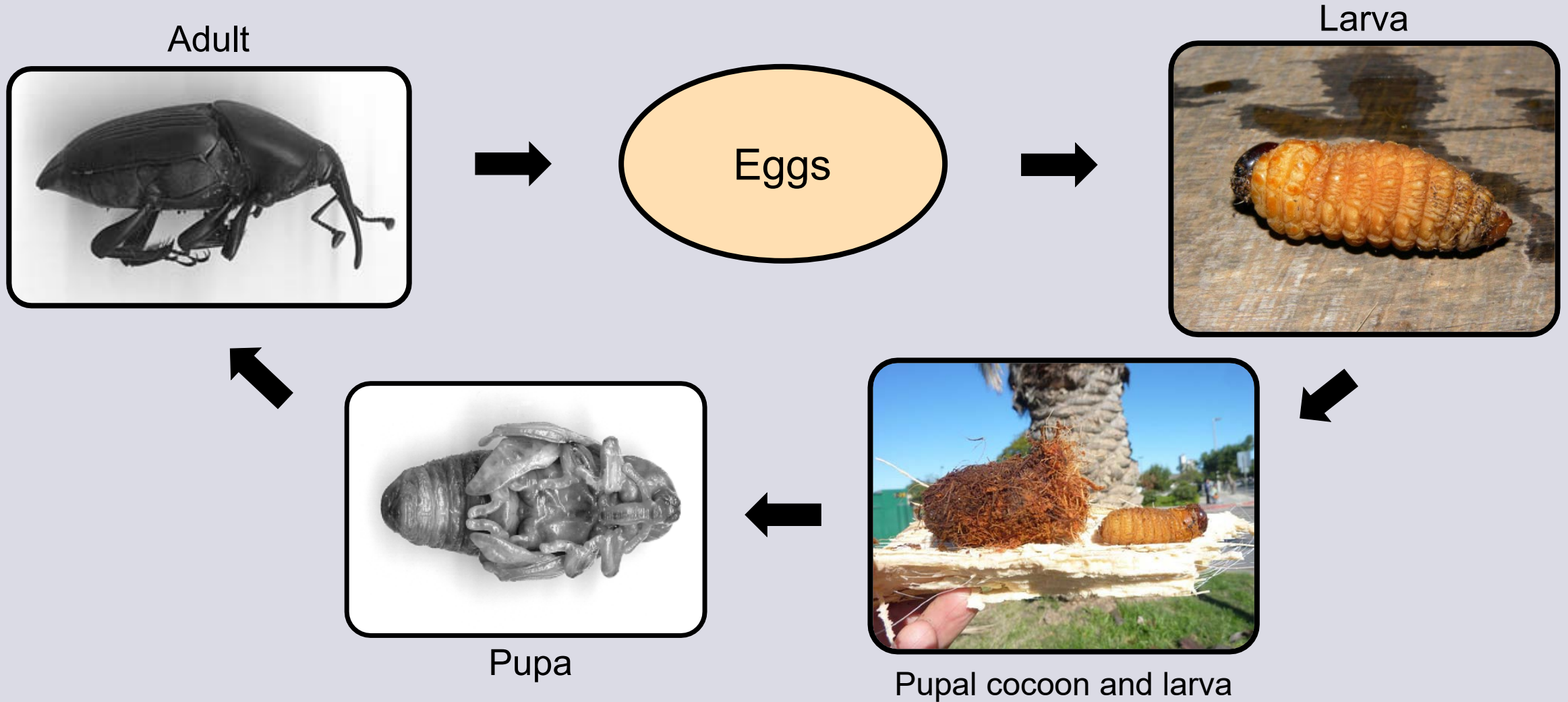


Map courtesy of Pest Tracker, National Agricultural Pest Information System (NAPIS)

FLORIDA FIRST DETECTOR

Invasive

South American Palm Weevil Life Cycle



Photos: Adult - Robin M. Giblin-Davis , University of Florida ; Larva - Reinaldo Aguilar; Pupal cocoon and prepupa - Center for Invasive Species Research, University of California, Riverside; Pupa - Robin M. Giblin-Davis , University of Florida

South American Palm Weevil Monitoring & Management

- Monitoring by:
 - Pheromone traps
 - Visual inspection
- Management by:
 - Pheromone traps
 - Phytosanitation
- Management of red ring disease by control of *R. palmarum* populations



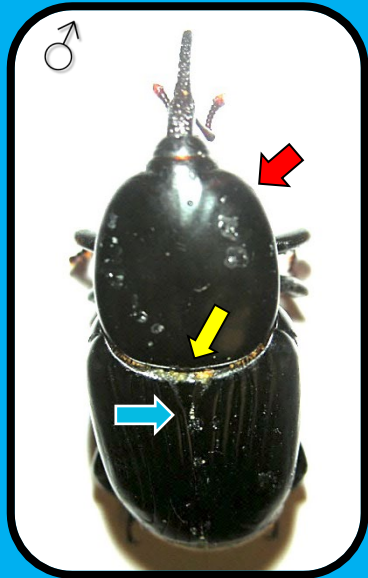
Homemade weevil trap

Side by Side Comparison

Native

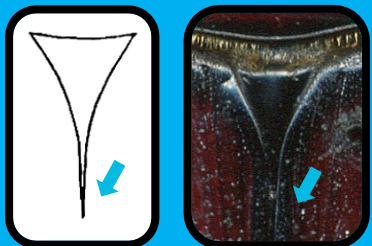
Palmetto weevil

Rhynchophorus cruentatus



Pronotum: anterior with **broad** shoulders (red arrow); posterior edge **flat** (yellow arrow)

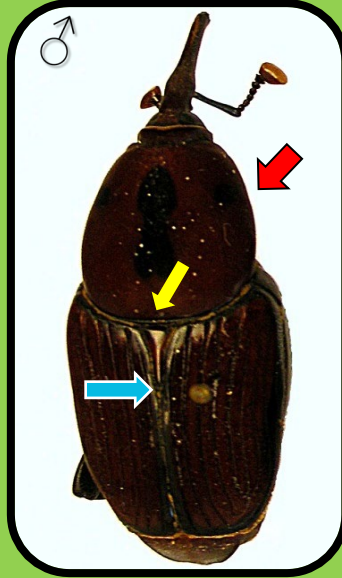
Tapers **acutely**



Invasive

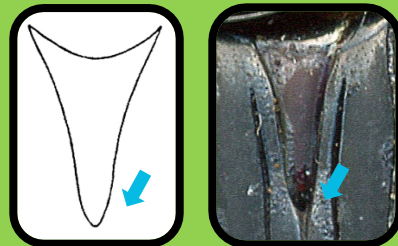
Red palm weevil

Rhynchophorus ferrugineus



Pronotum: anterior with **tapered** shoulders (red arrow); posterior edge **flat** (yellow arrow)

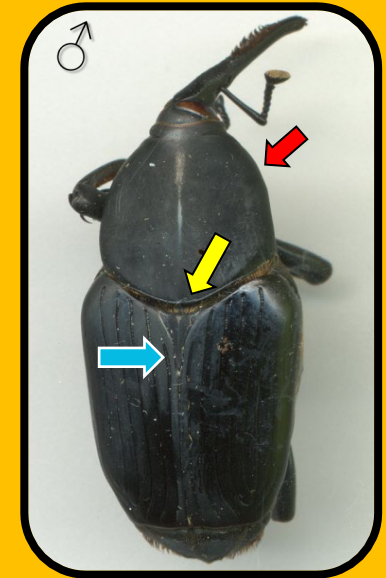
Tapers **broadly**



Invasive

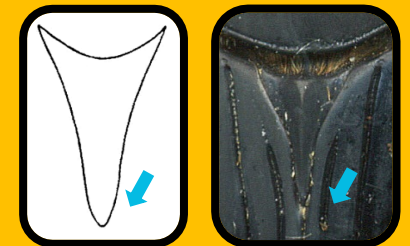
South American palm weevil

Rhynchophorus palmarum



Pronotum: anterior with **tapered** shoulders (red arrow); posterior edge **lobed** (yellow arrow)

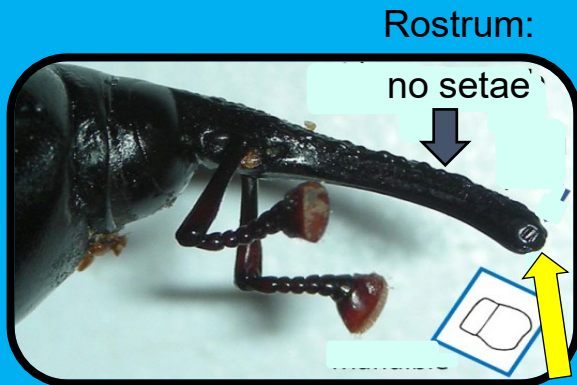
Tapers **broadly**



Dorsal view:
Scutellum of
both sexes
(blue arrows)

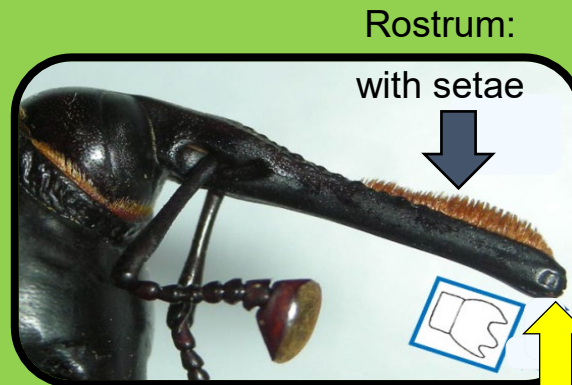
Lateral view of male head: Rostrum (blue arrows) & Mandible (yellow arrows)

Palmetto weevil



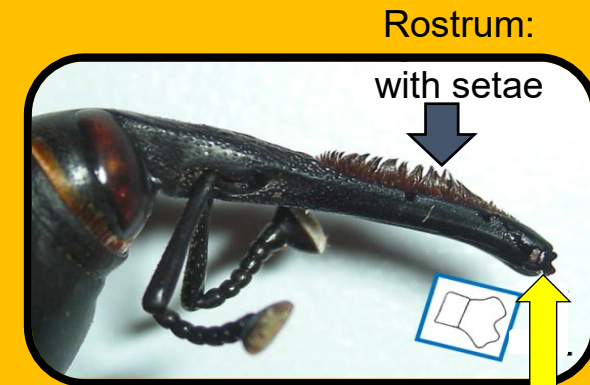
Mandible unidentate

Red palm weevil



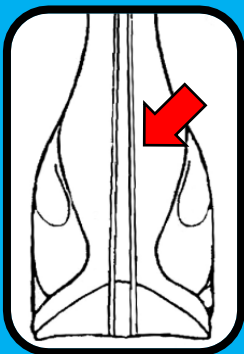
Mandible tridentate

South American palm weevil

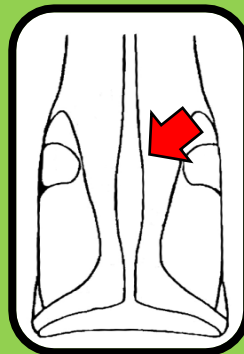
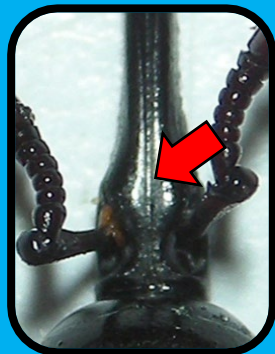


Mandible bidentate

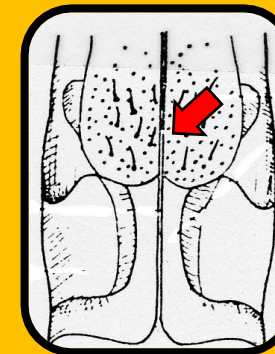
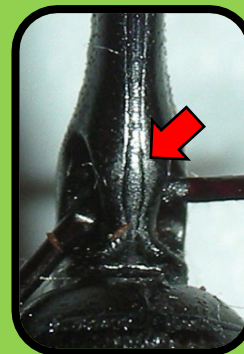
Ventral view of head, both sexes: Submentum (red arrows)



Straight subgenal sutures



Concave subgenal sutures



Narrow suture and sculpturing between antennal scrobes



Reporting to UF/IFAS Faculty in Florida

- Local county extension office

<https://sfyl.ifas.ufl.edu/find-your-local-office/>

- Insect ID Lab - Dr. Lyle Buss

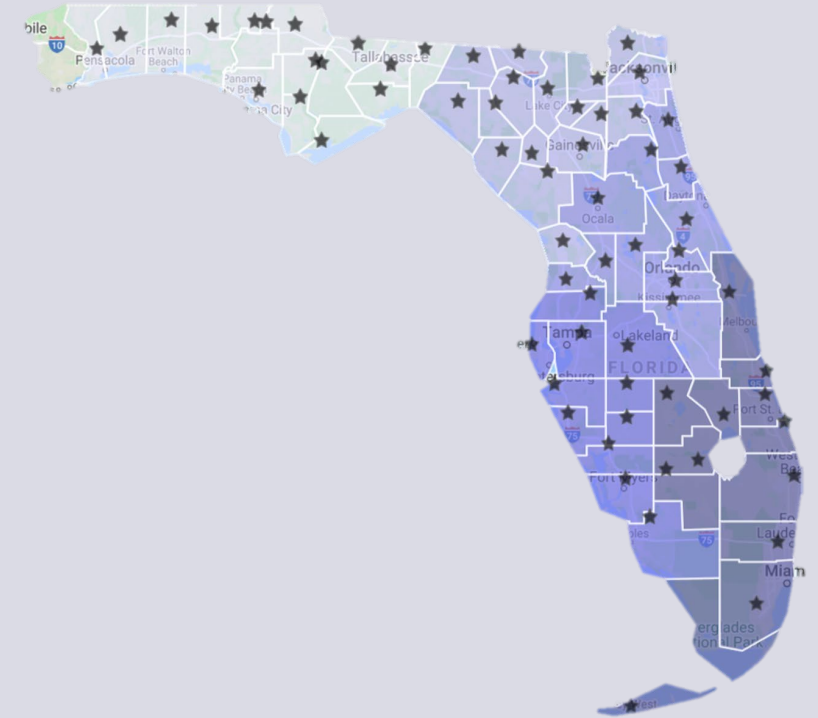
<http://entnemdept.ufl.edu/insectid/>

- Nematode Diagnostic Lab - Dr. Billy Crow

<http://nematology.ifas.ufl.edu/assaylab/index.html>

- Plant Diagnostic Center - Dr. Carrie Harmon

<https://plantpath.ifas.ufl.edu/extension/plant-diagnostic-center/>



Reporting to FDACS-DPI in Florida

Florida Department of Agriculture and Consumer Services (FDACS)
- Division of Plant Industry (DPI)

- FDACS, DPI Responsibility
 - Announcing detection or establishment of new invasive species.
 - Reporting is a legal obligation under Florida Statute 581.091.
- Submission Form
 - <http://forms.freshfromflorida.com/08400.pdf>
 - <https://www.fdacs.gov/Agriculture-Industry/Pests-and-Diseases/How-to-Submit-a-Sample-for-Identification>

FDACS, DPI Contact

- Dr. Leroy Whilby, Bureau Chief-Entomology, Nematology and Plant Pathology
 - 352-395-4661
 - Leroy.whilby@freshfromflorida.com
- Dr. Paul Skelley, Assistant Chief-Entomology, Nematology and Plant Pathology
 - 352-395-4678
 - Paul.skelley@freshfromflorida.com
- Division of Plant Industry Hotline
 - 1-888-397-1517
 - DPIHelpline@FDACS.gov

Reporting using DDIS in Florida

Digital Diagnostic and Identification System (DDIS)

- Digital Diagnostic Collaboration
 - Extension agents
 - Laboratories
 - Clinics
 - Specialists
- <https://ddis.ifas.ufl.edu/>



The screenshot displays the DDIS website interface. At the top, there is a blue header with the UF IFAS Extension logo on the left and the DDIS logo on the right. Below the header is a navigation menu with links for Home, Media Library, Diagnostic Labs, Equipment, Training, and Contact Us. A login section includes links for 'Become a User' and 'Forgot Your Password', along with input fields for 'user name' and 'password', and a 'Sign In' button. The main content area features a photograph of a yellow and black striped caterpillar on a green leaf. To the right of the image, the following sample information is displayed:

Sample Type: Insect (Plant)
Common Name: Snowbush spanworm
Scientific Name: *Melanchroia chephise*
Family: Geometridae
Sample Submitter: Joe Swards
Sample ID: 15-2335

Lab Team

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Collaborating Agencies

- U.S. Department of Agriculture Animal and Plant Health Inspection Service (USDA-APHIS)
- Cooperative Agricultural Pest Survey Program (CAPS)
- Florida Department of Agriculture and Consumer Services (FDACS)
- National Plant Diagnostic Network (NPDN)
- Sentinel Plant Network (SPN)
- University of Florida Institute of Food and Agricultural Sciences (UF-IFAS)
- Protect U.S.

Educational Disclaimer and Citation

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