

Impact of Invasive Pests on the Use of Pesticides in Urban Environments

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Landscape Pests & Bio Control

Pest

1. **Ash Whitefly**
2. Black Scale
3. Brown Soft Scale
4. **Cottony Cushion Scale**
5. Eugenia Psyllid
6. Giant Whitefly
7. Nantucket Pine Tip Moth
8. Red Gum Lerp Psyllid
9. **Gonipterous Weevil**

Bio Control

- a. ***Encarsia inaron***
- b. *Metaphycus luteolus*
- c. *Metaphycus luteolus*
- d. ***Rodolia cardinalis***
- e. *Tamarixia sp.*
- f. *Idioporus affinis*
- g. *Camploplex frustranae*
- h. *Psyllaephagus bliteus*
- i. ***Anaphes nitens***

Invasives

1890s

Argentine Ant

1980s

Eugenia Psyllid

Ash Whitefly

Euc Long Horned Borer

1990s

**Blue Gum
Psyllid**

**Eucalyptus
Weevil**

**Euc Long
Horned
Beetle**

**Red Gum
Lerp
Psyllid**

**Trachymela
sloanei
1998**

**Red
Imported
Fire Ants**

**Ficus Gall
Wasp**

GWSS

**Pink
Hibiscus
Mealybug**

**Giant
Whitefly**

**Olive Fruit
Fly**

**Citrus
Leafminer**

**Persea
Mite**

Invasives of the 2000s

**Lemon Gum
Psyllid
2000**

**Brown Marmorated
Stink Bug
2000**

**Red Haired
Bark Beetle
2002**

**Diaprepes
Root Weevil
2003**

**Spotted Gum
Psyllid
2000**

**Hackberry Woolly
Aphid
2002**

**Chrysophtharta
m-fuscum
2003**

**Myoporum
Thrips
2005**

**Olive Psyllid
2008**

**Bougainvillea
Looper
2005**

**Avocado Scale
2006**

**Indian Stick
Insect
School Break**

**Tipu Psyllid
2008**

**Asian Citrus
Psyllid
2007**

**Light Brown
Apple Moth
2007**

**Bagrada Bug
2008**

**Gold Spotted Oak
Borer
2008**

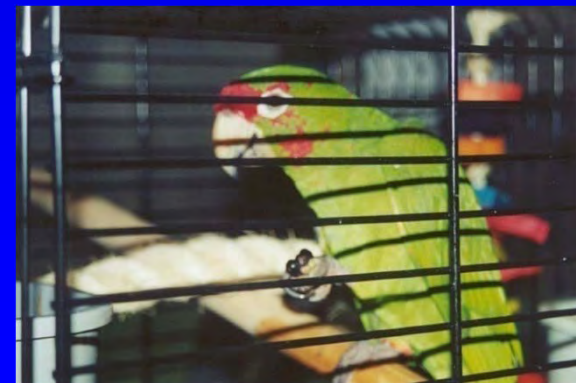
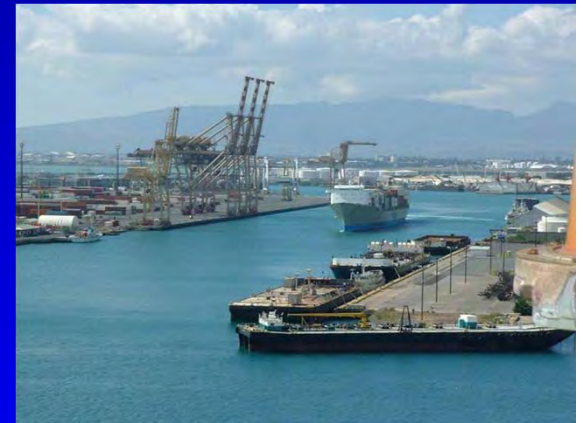
**Red Palm
Weevil
2010**

**Duponchelia
fovealis
2010**

Invasive Species Pathways

Purposeful introduction via legal and illegal means; unintentional introduction

- aircraft and cargo, hand-carry & luggage
- ships, hulls, ballast water and ship cargo
- mail & freight forwarders
- forestry activities
- horticulture trade
- aquaculture
- pet trade, pet owners
- botanical gardens
- agriculture experiment stations
- garden enthusiasts



Protecting Hawai'i



Pre-entry
(laws & agreements)

Port-of-entry
(inspection)

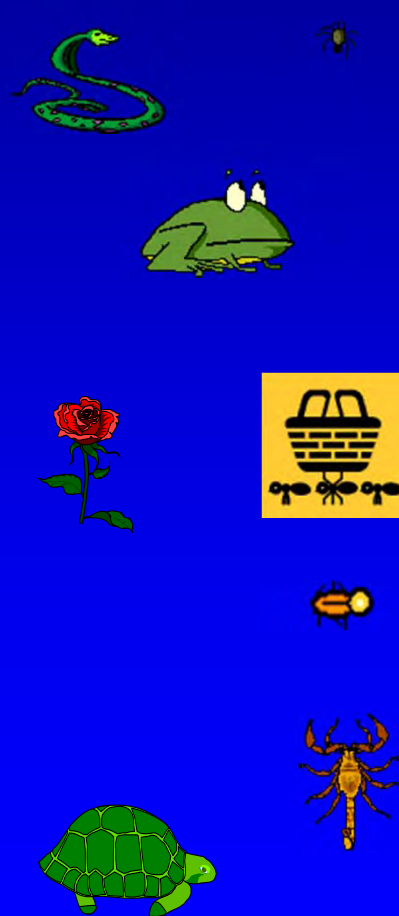
Rapid-response
(response crews/regional containment)

World's Biota

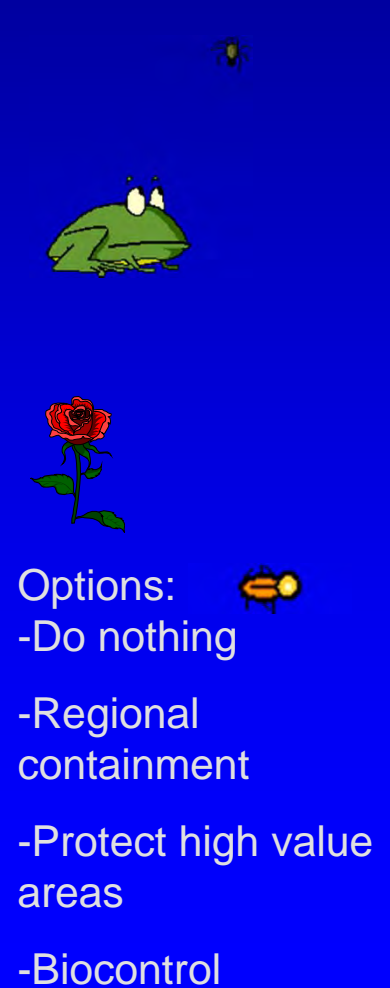
Arrivals

Escapes

Widespread



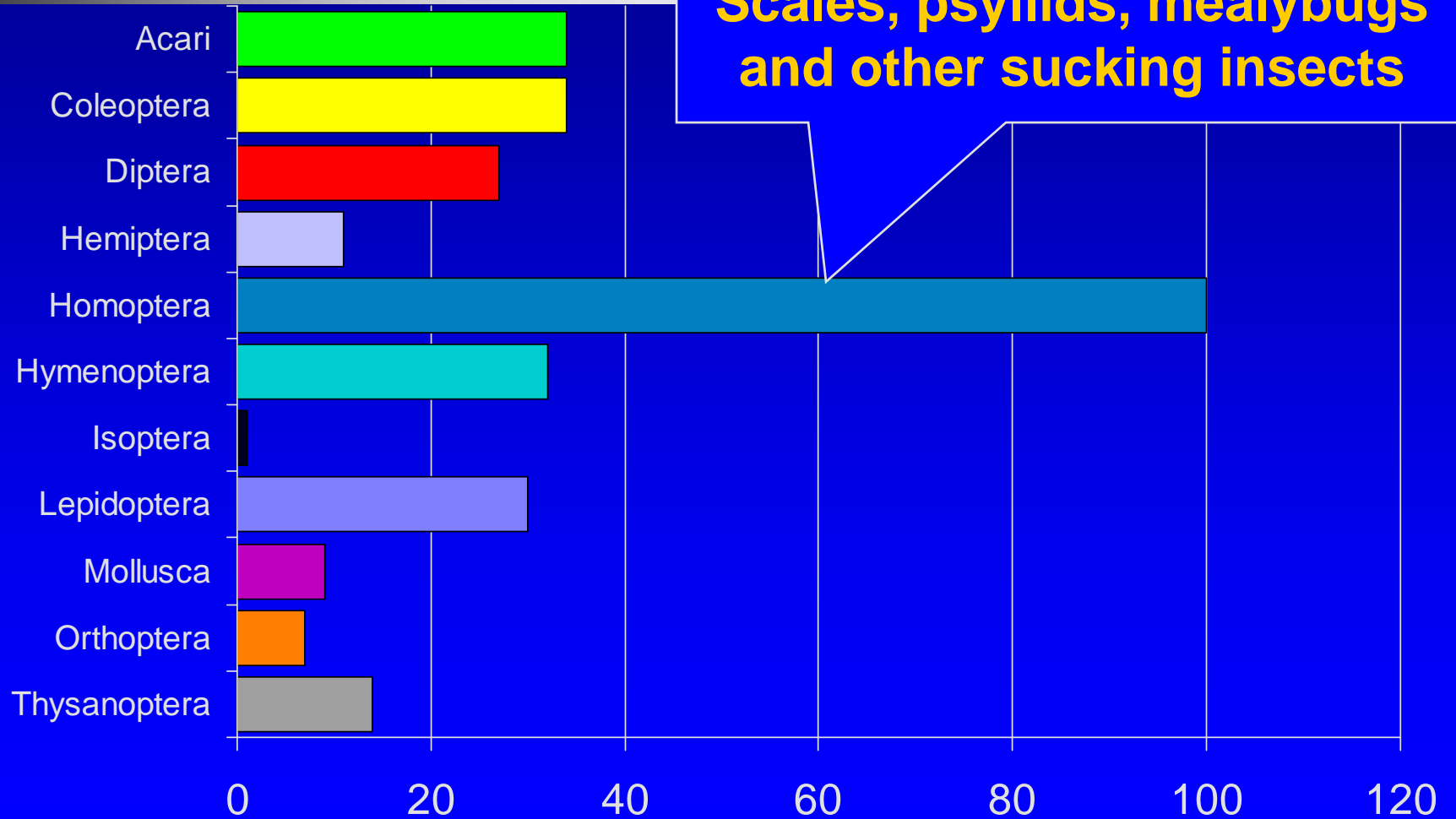
- Options:
- Do nothing
 - Eradication
 - Regional containment



- Options:
- Do nothing
 - Regional containment
 - Protect high value areas
 - Biocontrol

Slide courtesy of Christy Martin - CGAPS

Number of Newly Established Invertebrates (1955-2000) by Order



Responses to Invasive Pests

➤ Regulatory

➤ Quarantines

- Eradication efforts

- Compliance agreements

 - Green waste disposal restrictions

 - Plant movement outside of quarantine

 - Plant destruction

 - Fruit destruction

 - Mandatory pesticide applications

Responses to Invasive Pests

➤ Escapes/Incipient

➤ Options:

➤ -Do nothing

➤ -Eradication

➤ -Regional containment

➤ Widespread

➤ Options:

➤ -Do nothing

➤ -Regional containment

➤ -Protect high value areas

➤ -Biocontrol

Red Bug

Scantius (=Lodosiana) aegyptius



Peter J. Bryant, UCI

Red shouldered bug



Peter J. Bryant, UCI

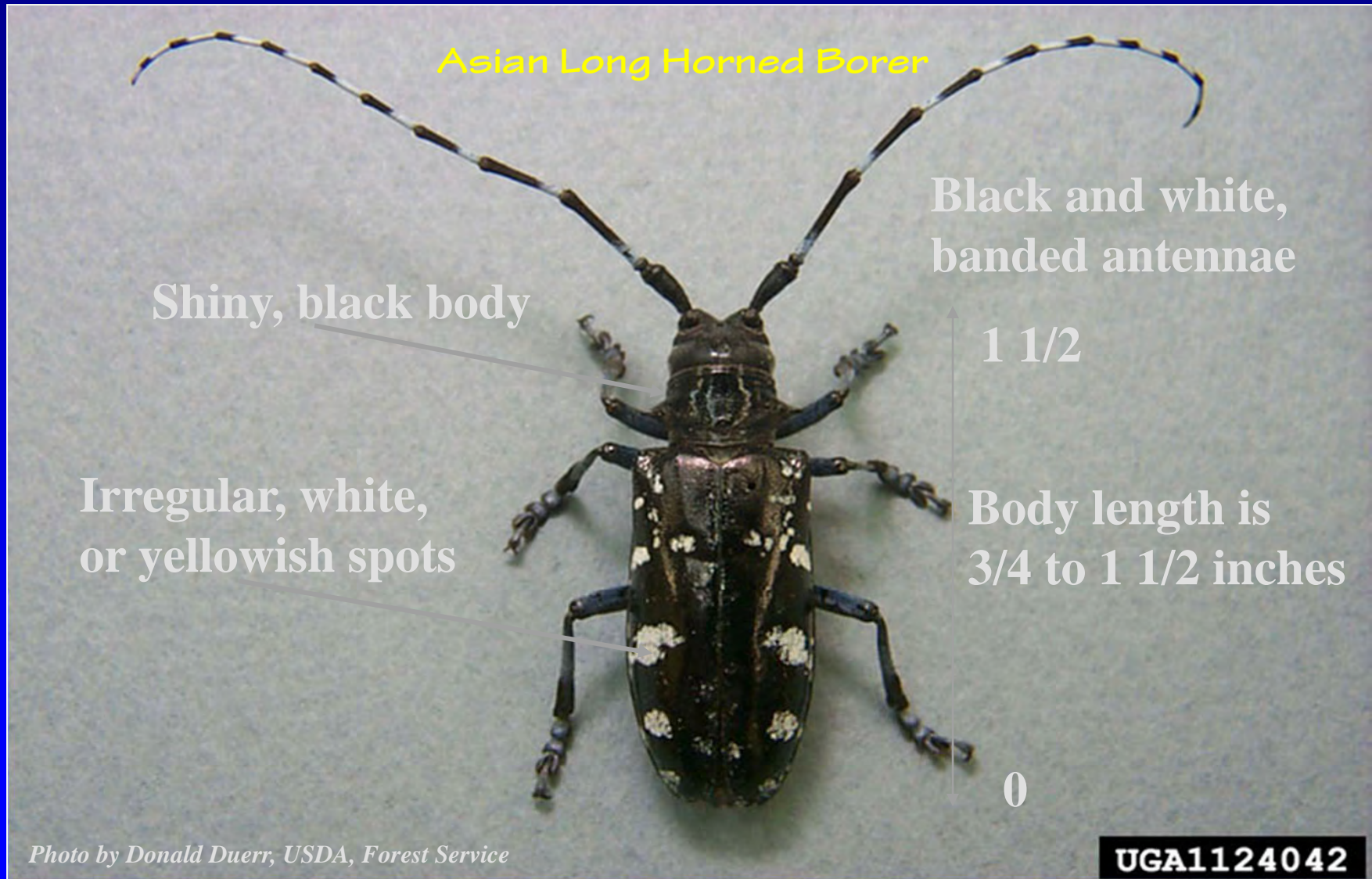
Box elder bug



Milkweed bug



What to look for from early spring through late fall



Asian Long Horned Borer - CANADA



Responses to Invasive Pests

➤ Widespread

➤ Options:

➤ -Do nothing

➤ Argentine Ant

➤ -Regional containment

➤ Red Imported Fire Ant

➤ -Protect high value areas

➤ Glassy Winged Sharpshooter

➤ -Biocontrol

➤ Ash whitefly

Impact of Invasive Pests on the Use of Pesticides in Urban Environments

➤ Widespread

- Disrupt established IPM Programs

 - Avocados

 - Citrus

 - Pest outbreaks

 - Potential impacts on non-target organisms

Impact of Invasive Pests on the Use of Pesticides in Urban Environments

➤ Widespread

➤-Biocontrol

➤Costly

➤Slow until established & fragile

➤1 out of 3 odds

➤Excellent to partial control

Impact of Invasive Pests on the Use of Pesticides in Urban Environments

- Widespread

- -Protect high value areas

 - Glassy Winged Sharpshooter

- -

Impact of Invasive Pests on the Use of Pesticides in Urban Environments

➤ Widespread

➤-Regional containment

➤Red Imported Fire Ant

➤Failed eradication due to lack of \$\$\$

➤OC & Coachella Valley RIFA Fee Assessment control programs.

Impact of Invasive Pests on the Use of Pesticides in Urban Environments

➤ Widespread

➤ -Do nothing

➤ Myoporum Thrips

➤ Argentine Ant



John Kabashima



John Kabashima

Treatment Performance

- Meridian
- Allectus
- Arena
- Safari
- Orthene
- Tristar
- Merit
- Control

Most Effective

Least Effective

Impact of Invasive Pests on the Use of Pesticides in Urban Environments

➤ Argentine Ant

- ❑ Major economic and ecological impact on urban, agriculture, and natural environments.
- ❑ Extremely disruptive to biological control and IPM Programs..
- ❑ No biological control
- ❑ Number 1 reason (90% of calls to Llyods pest control in 2006) for using insecticides around homes.

Impact of Invasive Pests on the Use of Pesticides in Urban Environments

➤ Argentine Ant

- Sodium arsenite in syrup (1890s)
- Chlordane (banned in 1978)
- Organophosphates & Carbamates (residential uses cancelled in 2000-2001 by EPA)
- Synthetic pyrethroids – **Homeowner /Residential**
- Fipronil + less toxic baits and insecticides
 - **Primarily professional use**
 - **CDPR Pest Management Alliance Grant**