Invasive Species and Public Perception

John Kabashima, Ph.D.
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
- Regional containment
- Protect high value areas
- Biocontrol

Options:
- Do nothing
- Eradication
- Regional containment

Slide courtesy of Christy Martin - CGAPS
Invasive Species and Public Perception

Public Perception is a moving target.
Invasive Species and Public Perception

Who is the public?

• General Public
• Special Interests
• Public Agencies (includes Universities)
• Public and Private Landscapes
• Parks
  • Urban
  • Natural
  • Theme Parks
• Business Parks and Shopping Centers
• Arboretums and Zoos
• Golf Courses
• Agriculture and Nurseries
Invasive Species and Public Perception

When

Time of Year/Season

- Weather
- Trade
- Tourism

- Economic
  - Public and private
    - Recession
    - Growth
Invasive Species and Public Perception

Risks Associated with Invasive Species

- Plant Health
- Agriculture and Production Nurseries
- Landscapes
- Natural Systems
- Quality of Life
- Regulatory
- Quarantines
- Fire
- Legal
The Disease Triangle

Favorable Environment

Virulent Pathogen

Susceptible Host

Slide courtesy of Don Ferrin, Ph.D.
The Disease Tetrahedron

Man

Environment

Host

Pathogen

Slide courtesy of Don Ferrin, Ph.D
Invasive Species and Public Perception

- Glassy Winged Sharpshooter
- Ash Whitefly
- Red Imported Fire Ant
- Red Palm Weevil
- Bagrada Bug
Invasive Species and Public Perception

What
Glassy Winged Sharpshooter

Who
• Landscape
• Nursery
• Agriculture

Where
Regional – Southern California

When
First detected in Ventura County in 1989 and Orange County in 1990. Probably introduced in the mid to late 1980’s

Why
• Wide host range
• Efficient vector of Pierces Disease
• Strong flier
Glassy Winged Sharpshooter

CDFA checked w/other ag crops about importance

• No one was concerned initially

Dr. Redak at UCR speaks for the Oleanders early 90’s

CDFA down rated it from an “A” pest to a “B” pest

• Lack of an effective monitoring system

• Poor track record eradicating homopterous pests

• Difficulty treating in Urban Areas
Glassy Winged Sharpshooter

Now the insect pest of the 21st Century in California

Vector of Xylella fastidiosa – Pierces Disease

“B” being treated as a quarantine pest by various counties

Nursery industry shipment protocols tightened

- Zero tolerance in several northern counties
- 100% visual inspection at shipping and receiving locations
- Nursery Task Force develops Approved Treatment Protocol

Grape and Nursery industry, CDFA and USDA Funding, and working partnerships provided resources to quickly address the problem and find solutions.
Glassy Winged Sharpshooter

Urban Landscape
- Incubator
- Vector of landscape strains

Nursery
- Potential to transport
- Economic Impact of Shipment Protocols

Grapes
- GWSS makes PD A major threat

Natural/Riparian
- Important Alternate Host

Citrus
- Important Alternate Host
- GWSS feeding impact
Invasive Species and Public Perception

What
Ash Whitefly – *Siphoninus phillyreae* (Haliday)

Who
• Landscape
• Nursery
• Agriculture
• Natural System – native plant species

Where
32 counties in Calif., Arizona, Nevada, New Mexico

When
First detected in Los Angeles County in 1988 and spread to 32 counties within 2 years.

Why
• Wide host range
• Lack of natural enemies
• Favorable climate
• Endemic throughout Europe, no. Africa, and the Middle East.
Exotic Whiteflies

- **Urban incubator**
  - Rapid spread in time and space due to human mediated transport and the absence of natural enemies.
  - Wide host range

- **Damage**
  - Honeydew and Sooty Mold (Mercedes and BMW paint destroyer)
  - Weakened trees

- **Control**
  - *Eradication program unlikely*
  - Pesticides
    - marginally effective regionally
    - Short term
    - Negative impacts on environment
    - Mandated for nurseries by regulatory agencies
  - *Classical Biological control*
    - Regionally effective
    - Long term
    - Cost effective
Classical Biological Control
Conducted in Partnership w/CDFA

1. Target Selection and assessment
2. Preliminary taxonomic and survey work
3. Selecting areas for exploration
4. Selecting natural enemies for collection
5. Exploration, collection, and shipment of candidate natural enemies
6. Quarantine and evaluation of effectiveness
7. Agent efficacy and program evaluation
   – 100 per leaf to 1 per 100 leaves

Van Driesche & Bellows, 1996
Encarsia inaron

0.5 mm
Invasive Species and Public Perception

What
Red Imported Fire Ant – *Solenopsis invicta* Buren

Who
- Urban Landscapes and golf courses
- Nursery and Agriculture
- Natural Environments

Where
Orange County, Parts of Los Angeles and Riverside County, Coachella Valley, Central Valley, San Bernardino and San Diego County.

When
First detected in Orange County in 1998.

Why
- Urban Quality of Life - Stinging
- Crop and equipment damage
- Species displacement and food chain disruption
- Worker safety
Red Imported Fire Ant

• **1998**: A nursery in Nevada found RIFA in a shipment from Orange County.

• **1998-2000**: California Department of Food and Agriculture conducted intense surveys in O.C.

• **January 2000**: CDFA signed contracts with:
  – County Agriculture Commissioners
  • Los Angeles, Riverside, San Bernardino, San Diego, Orange
    – Orange County Vector Control District
    – Coachella Valley Vector Control District

• **2004**
  – State Budget Deficit = End of statewide eradication
  – Orange County and Coachella Valley Pass Fee Assessments
**Red Imported Fire Ant**

- Entire nursery industry in OC, and parts of Los Angeles and Riverside county are quarantined.
- Nurseries are spending $1-2,000/acre. Every plant must be treated with Chlorpyrifos, Diazinon, or **Bifenthrin** before leaving the nursery.
  
  Quarterly spam baiting every 50 feet.

  1 RIFA triggers quarantine protocol.

- CDFA and USDA - exclusion & eradication
- CDPR - monitored offsite pesticide movement
- UC ANR research and education
Red Imported Fire Ant
Invasive Species and Public Perception

What
Bagrada Bug, *Bagrada hilaris*

Who
• Major pest of agriculture and urban crops

Where
• Southern California and southern Arizona

When
• Found June 2008 in Los Angeles County
• New USA and Western Hemisphere record

Why
• adults and nymphs insert their needle-like mouth parts and suck juices from the plant.
• **Status**  = No regulatory action

Photo by G. Arrabban
Protecting Hawai‘i

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Invasive Species and Public Perception

The Recession = reduced budget and resources in the face of:

- Continuing invasive pest introductions
- Increasing Urban/Agriculture/Natural Environment Interface conflicts
- Partners suffering comparable reductions and reorganization
  - Will their plans fit with CDFA plans
    - UC ANR (UC IPM, UCCE)
Invasive Species and Public Perception

Retirements = loss of institutional and technical knowledge. The challenge is how to prevent:

• Re-inventing the wheel
• Missed opportunities
• Poor implementation and letter of the law vs spirit of the law enforcement
• Inter-agency
  • Duplication of efforts or poor coordination
  • Blurring of responsibility and jurisdiction
Invasive Species and Public Perception

The CDFA Exclusion, Detection, Eradication, Regulatory model isn’t broken.

- Just needs more funding and resources
- More input and synergistic partnering to develop Systems Approaches
- Adoption of the latest technology and science
- Fixing administrative bureaucracy (e.g. hiring procedures)
- Improving pest risk analysis and response
  - GWSS, Bagrada
Invasive Species and Public Perception

- Home gardeners and hobbyists want a quick response to invasive pests that affect them.
- Organic growers and special interest groups concerned about the use of pesticides for eradication programs.
- Public agencies, commercial landscapes, theme parks, etc.
- Depending on if the Public is directly or indirectly affected they can be:
  - uninformed, not interested
  - misinformed,
  - subconsciously interested,
  - Informed, interested
Invasive Species and Nursery Perception

The CDFA Exclusion, Detection, Eradication, Regulations

• Reduce impact and cost of quarantine to growers.
• Establish a tiered structure e.g.
  • Platinum standard/level nurseries
    • bad guys inspected more frequently
    • first inspection free and next ones cost more.
  • Levels the cost of business playing field
• Merge programs such as RIFA, GWSS, LBAM when feasible
• Develop strike teams