C A P S
A Cooperative Effort for Domestic Pest Detection & Surveillance of Invasive Species

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The primary function of CAPS is to survey, identify and monitor foreign pests of concern to US agriculture and natural resources. The CAPS program is managed cooperatively by USDA/APHIS/PPQ and State Departments of agriculture; those State regulatory personnel working towards the same objectives.

CAPS Program

Collaborate with Universities, industry groups, natural resource protection agencies and other stakeholders through their respective State CAPS Committee and outreach efforts.

Funding is 100% from Federal Government and allocated to State Departments of Agriculture through oversight and coordination by the via Cooperative Agreements.

• Day in the Life of CBP
  - 1,181,605 passengers and pedestrians
  - 333,226 incoming privately owned vehicles
  - 235,732 incoming international air passengers
  - 79,107 shipments of goods
  - 71,858 ship passengers and crew
  - 69,370 truck, rail and sea containers
  - 1,145 seized prohibited regulated articles including 147 agricultural pests at ports of entry

Slide credit: W. Dixon, FDACS/DPI
Safeguarding System

- **Offshore Risk Management**
  - Int'l Services, Pre-clearance & Clean Stock Programs, Risk analysis, Gathering info on pests and pathways
- **Port of Entry Measures**
  - DHS/CPB & USDA/APHIS/PPQ through MOA
- **Quarantine**
  - Permits, quarantine facilities
- **Pest Detection**
  - CAPS, Plant inspectors, NPDN, SITC, First Detectors, Master Gardener’s, the General Public.
- **Emergency Response**
  - Eradicate or mitigate?: Regulatory, Extension & Research and other stakeholders

Florida CAPS Surveys Conducted

- Citrus greening (HLB)
- Chrysanthemum white rust
- Sudden oak death
- Gladiolus rust
- Soybean rust
- Chili thrips
- Red palm mite
- Exotic mollusks
- Potato cyst nematode
- Light brown apple moth
- Avocado mite
- Rice cutworm
- Tile warehouses and others...

Florida CAPS Committee

Capscaps (Cooperative Agricultural Pest Survey)

- USDA/APHIS/PPQ has three legally mandated responsibilities:
  1. Protect American agriculture from foreign plant pest introduction and establishment.
  2. Facilitate export of American agricultural products.
  3. Control or eradicate pests as authorized by legislation and regulation.

- CAPS assists PPQ in meeting these responsibilities by providing means for detection, documentation, and rapid dissemination of information on plant pests in the U.S.

Advantages of early detection

- The establishment of pest-free regions allows the continued export of commodities from a particular area within a country if it can demonstrate that the area has been historically free of a particular pest, even if the pest is established in surrounding areas.
- **Negative data**
  - Important for determining Pest-free Regions, Countries or areas within a region or country.
- **Positive data**
  - Ability to respond rapidly when positive data/finds are confirmed to reduce economic and non-economic impact.
### Freer Trade

- **GATT**
  - General Agreement on Tariffs and Trade 1986-1994

- **WTO**
  - World Trade Organization - SPS Agreement on the Application of Sanitary and Phyto-Sanitary Measures 1995

- **NAFTA**
  - North American Free Trade Agreement 1992

- **DR-CAFTA**
  - Dominican Republic – Central America Free Trade Agreement 2005

### Florida's Overall Risk

**Entry Potential:**
- 31 ports of entry & 1,200 miles of coastline
- Extensive nursery industry (over 7,000)
- Major tourism (over 75 million/year)
- Hurricanes (bring in and move pests)

**Establishment Potential:**
- Tropical & Subtropical climates
- Wide variety of native & exotic plants

**Post-establishment proliferation & spread potential:**
- High trade movement, tropical & subtropical climates

**Economic Impact:**
- Florida’s Ag & Forestry = $100 Billion annually

**Non-economic Impact:**
- 35 State & 3 National Forests
- 160 State & 1 National parks
- 100’s of wetlands
- 15+ State & National preserves
- Many protected areas, etc.

### 2006 Cut Flower Imports into Miami and other Airports

- **MIA**: 85.0%
- **LAX**: 6.0%
- **JFK**: 5.4%
- **ORD**: 0.8%
- **DFW**: 0.1%
- **BOS**: 0.6%
- **ATL**: 0.2%
- **DCA**: 1.3%
- **ORD**: 0.4%
- **IAH**: 0.1%
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2006 Cut Flower Imports into Miami and other Airports

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<th>Miami #1</th>
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Most Imported Flowers

Dianthus (COL)  Roses (ECU)  Chrysanthemums (NET)  Bouquet Mixed (COL)  Tulips (NET)  Dendrobiums (THA)  Chrysanthemums (COL)  Roses (ECU)  Dianthus (COL)

2006 Fruits & Vegetable Imports into Miami and other Airports

- BOS 4.0%
- ATL 2.7%
- JFK 18.5%
- MIA 59.1%
- ORD 4.3%
- SFO 0.4%
- ALL OTHER 2.5%
- DFW 0.5%
- IAH 0.2%

Pest Categories & Lists

- Not known to occur in the United States
  - Old world bollworm – Helicoverpa armigera
  - Egyptian cotton worm – Spodoptera litura
- Not known to occur in Florida
  - Light brown apple moth – Epiphyas postvittana
  - European wood wasp – Sirex noctilio
- Limited distribution & under ‘official control’
  - Pink hibiscus mealybug – Maconellicoccus hirsutus
  - Red palm mite – Raischia indica

Wood boring insects

1) Coleoptera (Beetles)
   - Scolytidae
   - Buprestidiae
   - Cerambycidiae
   - Curculionidae
2) Lepidoptera (Butterflies & Moths)
   - Sesiidae
3) Hymenoptera (Wasps)
   - Siricidae
4) Diptera (Flies)
   - Agromyzidae

Wood boring insects

- Many bark & wood boring beetles cause damage by feeding on or injecting a fungus into the inner bark and/or sapwood of the tree where they destroy or limit vascular movement.

Solid Wood Packing Materials

- Photos: Leland & Humble
Invasive Alien Species

- Birch casebearer (Coleophora serratella) 1933 Live plant
- European pine sawfly (Neodiprion sertifer) 1939 Live plant
- Dutch elm disease (Ophiostoma ulmi) 1944 Lugs/packaging
- Elm leaf beetle (Pityophthorus turicola) 1945 Live plant
- European elm bark beetle (Colydiophora coccinea) 1948, 1970s Lugs/packaging
- Ambermarked birch leafminer (P. thomsoni) 1948 Live plant
- Apple ermine moth (Yponomeuta malinella) 1957 Live plant
- Pine false webworm (Acantholyda erythrocephala) 1961 Live plant
- Elm leaf beetle (Meadae rana) 1967 Live plant
- Scleroderris canker (European race) 1978 Live plant
- European larch canker (Lachnellula willkommii) 1980 Live plant
- European wood wasp (Sirex noctilio) 1989 Live plant
- Butternut canker (Sirococcus clavigignenti) 1991 Live plant
- Brown spruce longhorn beetle (Tetropium fuscum) 1990 Packaging
- Pine shoot beetle (Tomicus piniperda) 1993 Packaging
- Emerald ash borer (Agrilus planipennis) 2002 Packaging
- Red bay ambrosia beetle (Xyleborus glabratus) 2002 Packaging
- Asian longhorn beetle (Agrilus planipennis) 2003 Packaging
- Sirex woodwasp (Sirex noctilio) 2005 Packaging

European wood wasp (Sirex noctilio)
- Prefers mainly stressed & weakened pine trees (Pinus spp.).
- Female injects symbiotic fungus & toxic mucus with eggs.
- Endemic to Europe, Asia, and northern Africa.
- Arrived in SWPM.

Red bay ambrosia beetle (Xyleborus glabratus)
- Laurel wilt fungus (Ophiostoma sp.)
  - First detected in Georgia in 2005.
  - Now found in SC, GA and FL
  - Adult: inoculate tunnels in sapwood w/ fungus on which they feed.
  - Fungus (Ophiostoma sp.) similar to the infamous Dutch Elm Disease.
  - Confirmed hosts in Florida:
    - Red bay Persea borbonia
    - Swamp bay Persea palustris
    - Avocado Persea americana

Don’t transport RedBay Firewood

- Please do not transport firewood from plants outside the local area.
- Fungi have been known to transport firewood from somewhere else than first brought in.

Distribution of Countries with Laurel Wilt Disease by Year of Initial Detection

Information Provided by
- USDA Forest Service
- USDA APHIS
- USDA APHIS National Wildlife Research Center
- www.redbayambrosia.org
- jaigle@fs.fed.us

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Emerald ash borer

- Discovered in Southeast Michigan 2002
- Attacks weakened & healthy ash (*Fraxinus spp.*) and takes about 2-3 years to kill tree.
- Tens of millions of ash have been killed and cut down because of the EAB in 12 states and Canada (Ontario & Quebec).
- Arrived in SWPM from Asia.

Texas Phoenix Palm Decline

- Transmitted by phloem feeding insects
- Symptoms –
  - Loss of flowers/fruit
  - Dead fronds in the canopy with slight reddish tinge (Sabal Palms)
  - Later symptoms – progressive death of spear leaf and bud, along with outer fronds; weak root system
- Host range:
  - Silver date (*Phoenix sylvestris*)
  - Canary Island date (*P. canariensis*)
  - Edible date (*P. dactylifera*)
  - Senegal date (*P. reclinata*)
  - Queen (*Syagrus romanzoffiana*)
  - Cabbage (*Sabal palmetto*) palms

Advanced symptoms

- Dead 'Flag' leaf

Florida monitoring initiative is in State Parks, National Forests, & a few others.
- Risk is presence of ash species and number of visitors from quarantine areas of US and Canada.

Texas Phoenix Palm Decline

- Citrus county unconfirmed

2006
2007
2008
2009
Giant African Snails (Achatina fulica, A. achatina, Archachatina marginata & Limacolaria aurora)

- A group of several large species of snails of African origin.
- Large snails mean large appetites and several species feed on hundreds of plants, woody ornamentals and trees.
- Often found in the pet trade, schools for educational programs and even as food.
- All of these species are **ILLEGAL** in the United States due to their voracious appetites on many plants and possible zoonosis.

Granodomus lima

- Crushed cars from PR destined for Jax
- Many interceptions of G. lima, an actionable mollusk
- Survey environs around port of interceptions
- Survey final destination where cars are processed

Giant African Snails

- Established in Hawaii and several Caribbean islands such as Martinique, Guadeloupe, St. Martins, St. Lucia and Barbados.
- They can reach over 8 inches long and 5 inches wide.
- They have both male and female reproductive organs and can lay several hundreds of eggs many times throughout their life.
- They are also known to carry zoonotic diseases; just another reason to keep these unwanted mollusks out of the United States.
Cotton seed bug (Oxycarenus hyalinipennis)
- Not yet found in US. (March 10, 2008)
- A seed feeder on order Malvales, especially Malvaceae
- Primarily on cotton, kenaf & Hibiscus spp.
- From Africa, widespread; found throughout Asia
- Found in 1994 in Bahamas
- Not found in Mexico, U.S.A. or Canada

Lime swallowtail (Papilio demoleus)
- NOT YET FOUND IN THE U.S. (July 9, 2009)
- Pest of Citrus spp. and other plant species in family Rutaceae including natives.
- This swallowtail has no tail and has red spots on inner margin of hindwing helping identify it from other swallowtails.
- Capable of producing 6 generations/yr.
- Some potential pathways may be:
  - Unintentional introduction of immature stages on citrus material and on secondary host (Rutaceae).
  - Accidental escape from butterfly farming/exhibit enterprise.
  - Deliberately imported for wedding, event releases.
  - Unintentional introduction by individual.

Light Brown Apple Moth
- Detected early 2007 in CA
- Currently found in 11 California Counties
- 33,000+ traps in 51 counties in CA
- Very wide host range (250+ species) of nursery stock, cut flowers, fruits, and vegetables
- Never detected in Florida
- Monitoring 29 Florida Counties at this time
- High risk FL nurseries receiving large shipments of stock from CA.
- Year round monitoring and changing protocol according to new information!
Brown Marmorated Stink Bug
(Halyomorpha halys)
- Found in OR, SC, PA, NJ, MD and WV so far but NOT established in Florida as of July 9, 2009.
- Host range very wide and includes fruit & shade trees, woody ornamentals, legumes and many vegetables.
- Overwinters in houses and other protected areas.
- Could be confused with native stink bugs Brochymena spp.
- BMSB has alternating light & dark antennal markings.

Red Palm Mite (Raiolla indica)
- FOUND IN DECEMBER 2007!
- Newly emerging & destructive invasive mite threatening Florida & US palms, bananas, gingers and heliconias.
- First confirmed in Caribbean in 2004.
- Currently in 13 countries & territories in the Caribbean.
- Threatens Florida’s nursery industry and native Florida palms (Sabal, Coccothrinax, Thrinax and others).

The Red Palm Mite has been found ONLY in Florida and only 5 counties within Florida:
- Monroe
- Miami-Dade
- Broward
- Palm Beach
- Martin counties

The Red Palm Mite can be transported in several ways:
- Smuggling infested plants & plant parts
- Palm handicrafts via tourism
- International trade
- Wind currents (Hurricanes)
Getting involved and staying informed

- Submit any samples to County Extension Agents
- Insect ID Services at UF. ($8.00/sample)
- http://www.doacs.state.fl.us/pi/caps/pestgallery.html

Cooperative Agricultural Pest Survey

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http://www.doacs.state.fl.us/pi/caps/index.html