

Giant African Land Snail

Wayne N. Dixon
Assistant Director

Fresh Florida DIVISION OF PLANT INDUSTRY
Florida Department of Agriculture & Consumer Services | Adam H. Putnam, Commissioner

Giant African Land Snail

A view from Florida

Wayne N. Dixon
Assistant Director

Fresh Florida DIVISION OF PLANT INDUSTRY
Florida Department of Agriculture & Consumer Services | Adam H. Putnam, Commissioner

Giant African Land Snail

An eradication program that partners the USDA APHIS PPO and the FDACS...

ONCE AGAIN!

Fresh Florida DIVISION OF PLANT INDUSTRY
Florida Department of Agriculture & Consumer Services | Adam H. Putnam, Commissioner

The Cost of Invasives

Invasions by non-indigenous species cost US taxpayers billions of dollars a year due to:

- Environmental degradation
- Lost agricultural productivity
- Expensive eradication efforts
- Increased health problems

Estimated cost of \$120 billion/year

Statistics above are from a specific study which has been viewed as an underestimate.

Fresh Florida DIVISION OF PLANT INDUSTRY
Florida Department of Agriculture & Consumer Services | Adam H. Putnam, Commissioner

Value of Agriculture

Total Value of Agricultural Products Sold (USDA/NASS)

\$8+ billion

Fresh Florida DIVISION OF PLANT INDUSTRY
Florida Department of Agriculture & Consumer Services | Adam H. Putnam, Commissioner

South Florida is Ground Zero


- Miami-Dade
- Broward and Palm Beach Counties
- Citrus Canker
- GALS
- Tree termite
- Exotic whiteflies

Fresh Florida DIVISION OF PLANT INDUSTRY
Florida Department of Agriculture & Consumer Services | Adam H. Putnam, Commissioner

Pest Introduction Risk

- South Florida (Miami-Dade County) is ground zero for US introductions

One+ new exotic insect or pathogen reported by FDACS/DPI per month



Commissioner Putnam at MIA viewing confiscated ag items



DIVISION OF PLANT INDUSTRY
Florida Department of Agriculture & Consumer Services | Adam H. Putnam, Commissioner

High Risk Characteristics

- Climate and geography
- Trade and tourism
- Multiple pest pathways (International ports)
- Urban encroachment

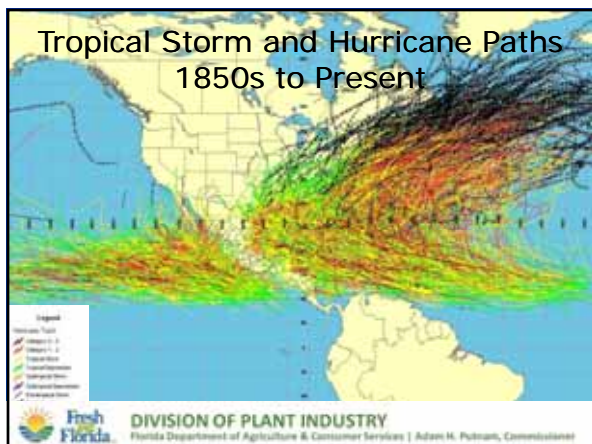
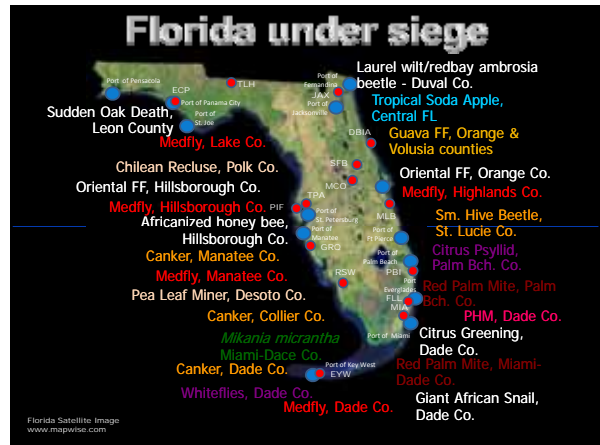








DIVISION OF PLANT INDUSTRY
Florida Department of Agriculture & Consumer Services | Adam H. Putnam, Commissioner



Giant African Land Snail

- In the USA, illegal to possess live GALS without a permit
- Regularly intercepted at ports of entry





National Plant Board Meeting 2012

Mystic, Connecticut

WN Dixon

Giant African Land Snail



Movement on commodity
Survival in transit
Ability to colonize
Ability to spread
= probability of establishment

Climatological Match
■ Known Risk
■ Potential Risk

Based Zhou et al. 1998; Raut & Barber 2002

National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail

Impacts

- Shells --tripping, cuts, puncture tires, projectile mower debris
- Reduced export market for potted plants and produce
- Increased regulations on movement of produce to prevent spread of snail and disease
- Increased use of pesticides to control snails, and impact on the environment
- Direct competition with native plants and animals



National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail

The Trifecta:

Major landscape and agricultural pest

Public nuisance - even eats stucco

Public health threat



DIVISION OF PLANT INDUSTRY
Florida Department of Agriculture & Consumer Services | Adam M. Putnam, Commissioner

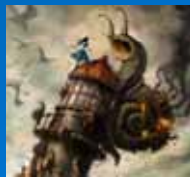
National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon



Giant African Land Snail



National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail



Food for thought:
During the 7-year eradication program in the 70s,
17,000 snails collected . . .

In the first eleven months of the current infestation, that number has been vastly surpassed


National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail

- ***Achatina (Lissachatina) fulica***
 - many common names world wide
- **Native to tropical East Africa**
 - Earliest dispersals out of Africa began in the early 1800s
- **Second worst Invasive Alien Species in the Global Invasive Species Database**



National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

Identification

- Terrestrial, NOT aquatic
- Large body
- Shell elongate, striped
- Columella curled inward and truncate at apex
- Small GALS can be confused with native snails



National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

Why would anyone want GALS?

- Edible
- Pets
- Shells

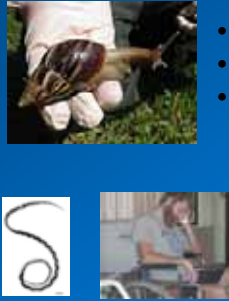


Religious Ceremonies

National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

- Feeds on over 500 plant species
- Eats stucco, plaster and cement
- May carry parasitic nematode that causes eosinophilic meningitis
- No rat lungworm nematode found to date

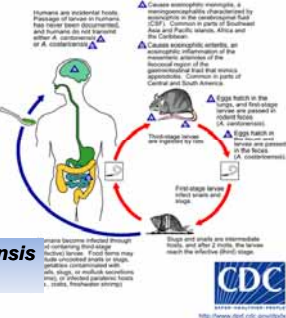


National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

Rats, Snails and Humans

Angiostrongylus cantonensis 1944 Taiwan

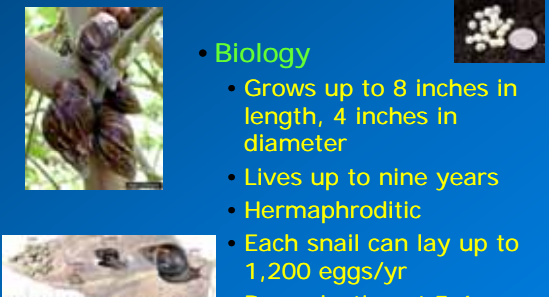


National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

Biology

- Grows up to 8 inches in length, 4 inches in diameter
- Lives up to nine years
- Hermaphroditic
- Each snail can lay up to 1,200 eggs/yr
- Reproductive at 5-6 mos.



National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

- Can aestivate 6 months without food or water, burying itself up to 8 inches deep
- Natural enemies –rats, other snails

Rosy Wolf Snail, *Euglandina rosea*
 Florida native
 Released in other countries to control GALS



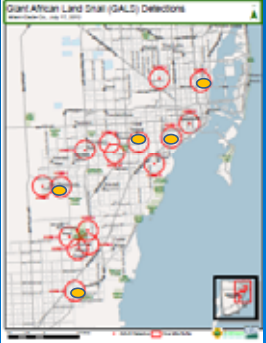
National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

Detected September 2011

16 cores

5 cores comprise:
 - 85% of positive properties
 - 95% collected snails (#1,2,4,5,10)



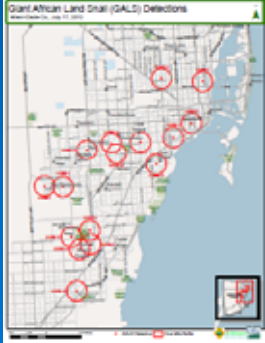
National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

Survey activities completed in all 1/2 mile arcs around cores except newest-- #16

316 positive properties

88% of positive properties from calls to the helpline



National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

- By eye, snail sign
- By hand
- By dog




National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail



**Core 2:
65 positive properties
21,703 snails collected**



National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

**Quarantine Zones:
A - K**

**Core Teams:
Alpha, Bravo,, Charlie Delta, Echo**

“Neighborhood Beats”



National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail



Residential Inspections

- 73,000 snails collected

Commercial Inspections

- Nurseries and Stock dealers – *No snails*
- Solid-waste recycling, transfer stations (CA) – *No snails*
- Lawn maintenance (CA) – *No snails*



National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

Control treatments

Physical removal

- Regular hand collection
- Removal of organic detritus to reduce food sources – Division of Forestry assist was critical




National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail





Iron Phosphate:
Organic snail
bait that is pet
friendly

- **Chemical Control**
 - Snail bait-treated properties: 15,000+ 24-44 Lb./acre or 1 lb per 1000 square feet 1% a.i.
 - Sluggo: iron phosphate, pellets
 - At least every two weeks out to 200 yds
 - 94% sign waivers ; otherwise the "Mark Factor" is engaged
- **Staffing**
 - 45 employees
 - Two-week rotations ~ Tues - Sat
 - 10-14 hr days ~ 8 hrs + evening shift

National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

Founded by four suburban youths in 1983, Sluggo ambushed the unsuspecting Cincinnati music scene with its brand of fast, loud, straight-edged hardcore influenced primarily by the Dischord bands from Washington, D.C.

National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

Dispersal

- Natural dispersal slow, many barriers (roads, rivers, canals) --Like to stay in good habitat
- Intentional human-aided dispersal : pets, rituals
- Unintentional dispersal concern: garbage, recyclables, yard waste, hitch-hiker on vehicles, potted plants, produce crates





National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

Pathways

- **Nigeria**
 - Snails used in ritualistic ceremonies
 - 14 of 15 cores
 - Right-hand twist
- **Ecuador**
 - Cosmetic treatments
 - 1 of 15 cores
 - Left-hand twist

National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail



Snail Juice and Slime

- Santeria ritual as practiced by some individuals promoted use of snail juice to cure various medical ailments
- Ecuador immigrant promoted use of snail slime for facial treatments
- Snail use documented in Wales in 1600-1700s. Skin of dead puppies, oils made of swallows, and juice of snails for various ailments



National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail



Persuasion

What does traveling on Florida Turnpike, a red car, a deer and an eagle have in common?

National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

Biological Research

- Growth rates, age/size of maturity
- Fecundity, mortality with/without bait exposure
- Food preferences over life stages
- Depth vs. mortality in egg clutch



Neonates can travel up from a 8" egg depth....

And hug concrete footers for months and months



National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

Biological Research

- Seasonal, age-related activity
- Field population densities
- Parasitism, do we have rat lungworm question continues




National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

Alternative Control Treatments

- Test available baits for effectiveness against GALS




- Testing various attractants
- Testing pitfall trap designs – few designed for large snails



National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

- To survey the most of South Florida and monitor the rest of the state for dispersal events----

Public awareness and assistance needed to find other populations and prevent spread



GIANT AFRICAN LAND SNAIL
CARACOLIS UICHALES AFRICANOS

Look for it! Report it!
¡Búsquenlos! Reportenlos!

888-397-1517

National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail



Outreach

- Newspapers
- TV: the "ick" factor
- YouTube, Twitter, Word Press
- Billboards
- Radio



National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail



Outreach

- Jr. Detective 5th Grade School Program
- Municipal Leaders
- Multiple Agencies:
 - FDACS, USDA APHIS PPO
 - USFWS, ECISMA, UF/IFAS
- Airline Video



National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail



Movie PSA at:

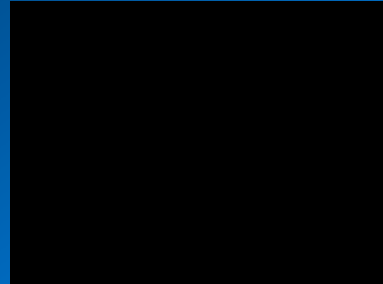
- Dark Knight Rises
- The Amazing Spider Man
- Ice Age 4

National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail



National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail

Established a Helpline 888-397-1517 or dpihelpline@freshfromflorida.com

- Ask questions
- Call in potential sightings
- E-mail pictures



14 of 16 – 88%

known populations discovered through public assistance!

National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail

Established webpage

www.freshfromflorida.com/pi/plantinsp/gals.html



National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail

Educational talks and training

- Regional staff of parks and public areas
- Conservation and environmental groups
- Lawn maintenance services



National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail

Fliers, door hangers, posters, educational materials in English, Spanish and Creole



National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail

News paper ads, billboard, bus sides, park benches, radio and other public service announcements



If you move as slow as a snail.....

National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail

Jr. Detective Program



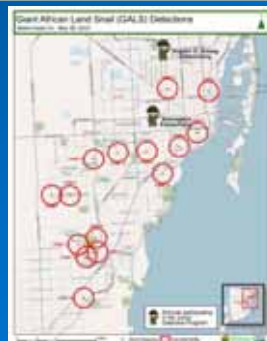
National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail

Jr. Detective Program



National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail

Local, Regional, National, International press



National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon

Giant African Land Snail

Electronic Media postings

GALS messages relayed through DPI's social media.

65,186	GALS messages relayed through DPI's social media.
YouTube 11,517	total views of 5 videos, 15% of total channel views.
flickr 1,545	total views of 50 photos in 2 GALS photo albums.
Pinterest 38	impressions of 2 pins by 19 followers.
44,202	impressions by 655 followers of 101 tweets by March, 10% of total followers mention GALS discussions themselves.
facebook 7,674	impressions of 55 posts.
WORDPRESS 210	views of 7 blog posts.

National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Case Study: Giant African Land Snail

Why ongoing eradication program is working

- **Creative public outreach initiatives (Junior Detective, movie theater PSA)**
- **Continued local, national and international media interest**



Phillipe Cousteau, Jr.
CNN International

Wall Street Journal

CBS Sunday Morning

French TV



GIANT AFRICAN LAND SNAIL

Help Eradicate It! Look for It! Report It!

DPI 888-397-1517
www.healthinflorida.com/gals

National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Case Study: Giant African Land Snail

Why ongoing eradication program is working

- **Early detection system (homeowner approached state fruit fly trapper)**
- **Immediate public outreach**
- **Cooperation of the public (88% of new cores reported through calls to helpline)**
- **Incident Command System**
- **Commissioner Putnam's support**



National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

Giant African Land Snail Eradication Program Costs

Estimated to be **\$10 million** for eventual eradication




National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

THANK YOU!

And please when you travel,



Ask me about the secret weapon under development



DIVISION OF PLANT INDUSTRY
Florida Department of Agriculture & Consumer Services | Adam M. Putnam, Commissioner

National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail



National Plant Board Meeting 2012 Mystic, Connecticut W N Dixon

Giant African Land Snail

National Plant Board Meeting 2012

Mystic, Connecticut

W N Dixon