The Cactus Moth Detection and Monitoring Network: A collaboration between MSU, USGS, NBII, and USDA-APHIS

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www.gri.msstate.edu/cactus_moth
Cactus Moth Detection Network

- Identification of Cactus Moth (Richard Brown)
- Survey for native pricklypear cactus (Victor Maddox)
- Early detection network for cactus moth (Maddox, Westbrooks)
- Predictive mapping of pricklypear cactus populations (Gary Ervin)
- Extension publications (John Madsen)
- Web-based database and ArcIMS map (Cliff Abbott and John Madsen)
- Coordination (John Madsen)

Larvas de *Cactoblastis cactorum*, plaga sudamericana del nopal. Al parecer no está presente en México, NO DEBE SER INTRODUCIDA!, ya que puede convertirse en una plaga exterminadora de las especies de nopal más utilizadas por la población mexicana. Si la ves, REPÓRTALA DE INMEDIATO!: portillo@cencar.udg.mx (imagen bajada de internet).

http://www.geocities.com/granacochinilla/fotos02.html

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Identification of Cactus Moth
(Richard Brown)

- Test, select, and implement cactus moth detection techniques.
- Identification and verification of cactus moth specimens
- Taxonomic methods for moth species
- Dr. Brown verifies hundreds of samples each year, as part of this project and work for USDA APHIS CAPS program

David Habeck, Univ. Florida

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Survey for Native Pricklypear Cactus
(Victor Maddox)

- Locate known populations of cactus in the region
- Utilize public and private land management professionals and volunteers to survey cactus locations in the southeastern region.
- Develop a GIS database of cactus for future searches of cactus moth

Victor with Opuntia in Rio Grande Valley, TX
Survey Points for Native Cactus

- Over 7,000 records
- Thirty-two collectors
- Twenty-five states
- Many more yet to be entered
- Most of these points were collected by Victor

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Predictive Mapping of Cactus and Cactus Moth (Gary Ervin)

- Predictive tools for both pricklypear cactus and cactus moth locations
- GIS models for predicting habitats and ecological range

Chris Brooks (left) and Gary Ervin (right) of MSU with two scientists in Argentina searching for cactus moth in its native range

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Model results from GARP, using data on: frost frequency, precipitation, max/min temperature, and wet-day frequency
Early Detection Network for Cactus Moth
(Victor Maddox, Randy Westbrooks)

- Implement a cactus moth detection network in the southeastern region, expanding to nationally
  - Public and private conservancy land managers, state plant inspectors, volunteers (Victor Maddox, Randy Westbrooks)
  - Sentinel Sites
  - Citizen observations

Chris May of Grand Bay NERR deploying a cactus moth pheromone trap
Sentinel Sites

Red dots are all of the prickly pear cactus populations that have been mapped.

Blue dots are the location of volunteer monitors

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Extension Publications
(John Madsen)

- Volunteer Manual
- Prickly pear and moth factsheets
- Cactus moth brochure
- Cactus moth identification guide
- Monthly progress reports (Jan 2005 – Mar 2009)
- Quarterly newsletter (beginning June 2009)
- E-mail list
- All are available on our webpage

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Web-based Database
Cliff Abbott and John Madsen

- Information
- Data entry
- Search reports
- Forms
- Arc-IMS map

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Projected “Natural” Dispersal of Cactus Moth

Expected to Reach Texas in 4 years

Solid lines are true expansion; Dotted lines projected expansion
(160 km per year = 100 miles per year)

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Cactoblastis cactorum detections in the Southeastern United States

Most Recent Westernmost Detection:
Dauphin Island, Alabama
July, 2004

1989 First Continental US Detection – Big Pine Key, FL

Bloem, 2003
Cactus Moth Distribution 2009

Horn Island, MS found 2008

E LA Island found 2009

Data projected on the ArcGIS map is property of MSU GeoResources Institute.
Cactoblastis Collaboration

- National Database and Detection Network
  - Mississippi State University, GeoResources Institute (database development/host mapping)
  - State Departments of Agriculture (CAPS)
  - USDA
    - APHIS PPQ- PDMP and CPHST
      - (Remote sensing, GIS, and database)
  - ARS
  - Dept of Interior
    - US Geological Survey
    - US Fish & Wildlife Service
    - US Park Service
    - Bureau of Land Mgmt
  - Department of Defense
  - The Nature Conservancy

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Overview of *C. cactorum* Control Activities: Host Removal and Sterile Release

(Joel Floyd, USDA APHIS PPQ)

Dauphin Island & Little Dauphin Island, Alabama

Fort Morgan Historic Park & Bon Secour National Wildlife Refuge, Alabama

Pensacola Beach, Santa Rosa Island, Florida

ARS Stephen Hight / crew and PPQ- CPHST Gulfport Lab

PPQ Maurice Duffel and PPQ TDY personnel

ARS Stephen Hight / crew

Scheduled for 2007-2008
Summary

- Facilitate government agencies, NGOs, and citizens to pull together in managing cactus moth
- Provide the best management tools possible based on the biology and ecology of cactus moth
- Develop decision support tools and web-based information to better manage cactus moth
- Provide web-based database access for distribution of pricklypear cactus and cactus moth
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