



Cactus Moth Detection and Monitoring Network on Public and Private Lands in the United States.

A partnership between USDA-APHIS, USGS, and Mississippi State University

Progress Report April 2005

Introduction. Cactus moth (*Cactoblastis cactorum*), one of the most successful biological control agents in history, has been transported around the world in various prickly pear cactus control programs. By 2002, free-living populations of the moth had spread from the Florida Keys to the Florida Panhandle and South Carolina. It now poses a serious threat to native prickly pear cactus populations in the American Southwest, as well as the cactus industry and desert ecosystems in Mexico.

A research, extension, and coordination effort to monitor the spread and develop integrated control of cactus moth has been developed as part of collaborative research between USGS and Mississippi State University, with assistance from USDA-APHIS. This project has the following components: Early Detection and Reporting of Cactus Moth, Distribution of Prickly Pear Cactus, in the Region, Cactus and Cactus Moth Extension Information, Web-Based Database of Cactus and Cactus Moth Locations, and Regional Coordination

I. Early Detection and Reporting of Cactus Moth. Task Description: Cactus moth detection techniques will be tested to find an optimal approach for detection, and a network of detection sites at known cactus locations will be implemented. The MSU insect collection will develop instructional information for potential volunteer monitors at the selected monitoring sites, and provide for moth species verification and vouchering.

Summary of Objectives:

1. Develop and test techniques for (a) detecting cactus moth infestations, (b) delimiting infested areas, and (c) determining effectiveness of control actions.
2. Develop a cactus moth detection network in the project area.
3. Develop protocols for reporting and verifying suspected cactus moth infestations.

Progress this month:

- Surveyed populations of *Opuntia humifusa* in Bon Secour N.W.R. and Gulf State Park and *Opuntia ficus-indica* in Gulf Shores, AL for presence of cactus moth during April 2-3. All were negative.
- Provided reference specimens of cactus moth larvae to LeeTuten, Alabama Pest Survey Coordinator.
- Reviewed and edited Cactus moth survey plan for PPQ and State Cooperators by Joel Floyd.

II. Distribution of Opuntia in the Region.

Task Description: MSU staff, natural resource agency professionals, and volunteers will be used to search for populations of *Opuntia* cactus in the region. Native cactus populations will be located using herbarium records, contact of federal, state, and NGO biologists, and surveys. The location and description of all *Opuntia* cactus populations in the region and of cactus moth monitoring sites will be placed on a web-accessible database, as part of extension efforts listed below. We will also develop a spatial model to predict cactus distribution in a GIS framework.

Summary of Objectives:

1. Develop and test methods to locate and map populations of cactus in support of surveys to detect and delimit cactus moth infestations in the region
2. Utilize professionals and volunteers to survey cactus locations in the Southeastern region.
3. Develop a cactus distribution prediction model

Progress this month:

- Meeting with State Coordinator for Master Gardener programs in Mississippi to set up a training workshop date set for Master Gardeners.
- Continuation of database data collection in Mississippi and Alabama. (AL, AR, MO, MS, TN).
- Continuation of database data form entry.

III. Cactus And Cactus Moth Extension Information.

Task Description: We will develop web-based information to aid in the identification of cactus and the cactus moth.

Summary of Objectives:

1. Web-based educational materials on cactus and the cactus moth
2. Educational program on cactus moth, including on-line and printed fact sheets and brochures.

Progress this month:

- Reviewing and editing completed on three *Opuntia* fact sheets (*O. humifusa*, *O. pusilla*, and *O. stricta*).

IV. Web-based database for cactus and cactus moth distribution.

Task Description: We will develop a web-based avenue for reporting suspected locations on the web, and web GIS database to display the movement of the moth and locations of natural cactus populations.

Summary of Tasks:

1. Operational web database for locating and mapping cactus and cactus moth populations.

Progress this month:

- Cooperated with Ron Weeks to develop ArcPad forms and the transmission of data to the database system.
- Duplicated the database system for a system that will house the forms and herbarium records that come in that are incomplete in their information. This data will be shown as a separate layer on the mapping and records will be moved to the "completed" system as they become complete.
- Re-worked the online forms to make them easier to follow and responded to feedback from people who are entering data.
- Added the data variable descriptions for each item as web links accessible from the online forms.

V. Coordination.

Task Description: A collaborative project of this size involving multiple agencies requires a concerted effort to coordinate activities and agree on the tasks to be done and data to be collected.

Coordination activities this month:

- Met with Mississippi CAPS (Cooperative Agricultural Pest Survey) Committee to plan work for 2005.

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