

## Fact Sheet: Early Detection and Reporting of Cactus Moth in the U.S.

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**Introduction.** Cactus moth (*Cactoblastis cactorum*), which is one of the most successful biological control agents in history, has been transported around the world, in various programs for control of prickly pear cactus (*Opuntia* spp.). Ironically, in recent years, it has also become an invasive species that threatens native and endemic prickly pears. By 2002, free-living populations of the moth had spread from the Florida Keys to the Florida Panhandle and South Carolina. As such, it poses a serious threat to native prickly pear cactus populations in the southern U.S., as well as the cactus industry and desert ecosystems of the Southwest and Mexico. The cactus moth in the United States, directly threatens a total of 31 species of native prickly pear cacti plus numerous other native species associated with cacti. In Mexico, 53 species of prickly pear are threatened, including 38 endemic species.

**Historical Background.** After being successfully used to control prickly pear cacti in Australia and South Africa, earlier in the 1900s, the South American cactus moth was introduced into the Caribbean island of Nevis to control native and introduced prickly pear cacti. Subsequently, it spread throughout the Caribbean islands. Cactus moth first appeared in the Florida Keys in 1989 – and may have been introduced as a hitchhiker on ornamental cacti imported from one of the Caribbean islands. By 2002, the moth had spread along coastal areas of the Southeast and had established free-living populations as far west as Pensacola Beach, along the Gulf Coast of the Florida Panhandle, and on Folly Island, a barrier island just south of Charleston, South Carolina. By the fall of 2004, cactus moth had spread as far west as Dauphin Island, Alabama, and as far north as Bull Island (Cape Romain National Wildlife Refuge), South Carolina. It appears that cactus moth populations are concentrated on barrier islands and coastal areas of the Atlantic and Gulf Coasts.

**Biology of Cactus Moth.** After maturing and mating, the female cactus moth lays eggs in the form of a chain, with the first egg attached to the end of a cactus spine and succeeding eggs stacked to form an **egg-stick**. After hatching, the **larvae** burrow into the cactus stem (cladode) and begin feeding. During feeding, frass from the stem tissue is pushed from entrance holes onto the ground. Mature larvae usually spin white cocoons in leaf litter, crevices in nearby trees, or similar protected niches. The **adult moth** later emerges and the cycle is repeated.



Figure 1

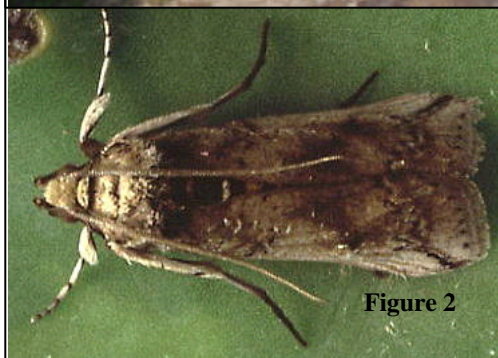


Figure 2



Figure 3

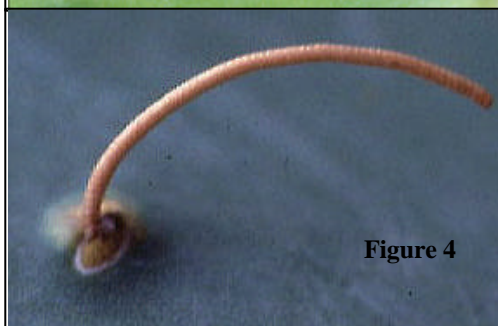


Figure 4

**Figure 1.** *Opuntia ficus-indica* damage from cactus moth in a residential area. **Figure 2.** Adult moth. **Figure 3.** Larva. **Figure 4.** Egg-stick.

**Development of a National Strategy for Cactus Moth.** In order to prevent the spread of cactus moth from the southeastern U.S., a number of agencies and organizations are cooperating to develop strategies to detect and eradicate confirmed infestations. Ultimately, the National Cactus Moth Strategy will include:

- Sentinel Sites (native and ornamental prickly pear populations) for detection and reporting cactus moth outbreaks on public and private lands;
- Monitoring of ornamental cactus plantings and cacti at plant nurseries and other commercial outlets;
- A regulatory program to prevent the movement of infested cacti in the nursery trade from affected states and foreign countries;
- Environmentally safe methods of eradicating cactus moth outbreaks including sterile insect release technology;
- Training of land managers, scientists, and volunteers for detection and reporting of suspected infestations.

**Monitoring of Sentinel Sites on Public and Private Lands.** The first step in preventing further spread of cactus moth in the United States will be to determine how far it has already spread. This will be done through monitoring of selected native and ornamental cacti populations (**Sentinel Sites**) on public and private lands within the potential ecological range of the cactus moth (North Carolina to California and south). Major advantages of establishing such a monitoring network on conservation lands include ready access by researchers and constant monitoring by resident managers and stewards. Federal land units, state land units, and Nature Conservancy preserves that have sizeable native prickly pear cactus populations could be very helpful in this effort.

**Role of Volunteers.** In the past three years, cactus moth has been detected on ornamental cactus plantings in beachfront communities of the Southeast and the Gulf Coast. Therefore, Garden Clubs, Master Gardeners, and other Volunteer Groups can be very helpful by monitoring ornamental cactus plantings throughout the southern U.S.

**Survey Schedule.** In the southern U.S., cactus moth produces three generations per year and can spread naturally about 53 km (33 miles) during each generation. Three generations are produced a year in Florida, with adult flight periods during late March, late July, and Mid-September to October. Larvae have been observed in April, July, and September in South Carolina. Larvae can be generally found throughout the season, but sentinel sites should be surveyed on a certain schedule depending the time of year and on the distance from a confirmed infestation.

<u>Nearest Infestation</u>	<u>Survey Schedule**</u>
0-33 miles	Weekly
33-66 Miles	Bi-Weekly
66-100 Miles	Monthly
>100 Miles	Routine Surveys

\*\*Starting from the Date of Larval Emergence.

**Survey Methods.** Initially, survey and monitoring protocols will include visual inspection of prickly pear cactus plants for damage, and the presence of cactus moth larvae and egg sticks. Eventually, sticky traps with an experimental sex lure will be made available for detection of adult male moths at some locations.

**Reporting of Suspected Infestations.** Specimens of suspected cactus moth larvae (preserved in 70% alcohol) should be submitted to Dr. Richard Brown at Mississippi State University, for identification. Information about confirmed infestations will be provided to appropriate state and federal officials who will determine a proper course of action for addressing the problem. Be aware there are a number of native species of Lepidoptera larvae that can be found feeding on prickly pear and may be confused with *Cactoblastis cactorum*, so correct identification by a qualified entomologist is important.

Information on recording and submitting information about sentinel sites and suspected cactus moth infestations can be found on the Cactus Moth Detection and Reporting Website at: [http://www.gri.msstate.edu/cactus\\_moth](http://www.gri.msstate.edu/cactus_moth). Negative observations at established sentinel sites should be periodically reported as well.

**Control of Cactus Moth Infestations.** To prevent further spread of cactus moth in the U.S., it is very important to detect, report and rapidly respond to all new outbreaks of the pest. The first priority must be to make a serious attempt to eradicate such infestations. Until sterile insect release technology and other control methods are developed and tested by the USDA Agriculture Research Service and other groups, confirmed infestations should be eradicated by manual removal and destruction of egg-sticks and infected cacti stems. Effective control of the cactus moth using insecticides is still in the testing phase.

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