

STOPPING THE SPREAD: CACTUS MOTH

Request

- Stop the spread of the damaging, non-native cactus moth by allocating \$130,000 in FY04 to conduct a pilot control project with the release of sterile moths.
- Allow USDA's Agricultural Research Service (ARS) to implement full field testing of the sterile moth release technique in early FY05 by allocating \$250,000.
- To conduct the full control program, USDA's Animal and Plant Health Inspection Service (APHIS) will need \$1.5 million in FY06.



Adult cactus moth and larvae. (Photos: D. Habeck and F. Bennett, Univ. of Florida; University of Technology, Sydney Australia)

Rationale

The cactus moth is a critical ecological and economic threat in the United States, and a small investment now will prevent huge costs later. The cactus moth (*Cactoblastis cactorum*) is a non-native invasive species whose caterpillars feed exclusively on the suite of prickly pear cactus (*Opuntia*) species with flat pads (the platyopuntiae). The moth is native to South America and has been

used in other countries since the 1920s as a biological control agent to control prickly pears where they are undesirable. For this reason, the moth was intentionally introduced to several Caribbean nations in the late 1950s and 1960s. It somehow made its way to the U.S. as an unintentional introduction in 1989, when the moth was discovered in the Florida Keys. By 1990 it was threatening viability of an endemic opuntia species (*Opuntia corallicola*: Florida state endangered, federal candidate species) (1). Over the last decade, the moth has dispersed northward and is moving along both the Atlantic and Gulf Coasts. It has traveled as far north and west, respectively, as South Carolina and Alabama (2), and prickly pear cactus populations have significantly declined along its path.

If the cactus moth spreads into the Southwestern U.S. and Mexico, it will have enormous and lasting economic impacts, too. Ornamental opuntias provide millions of dollars for the southwestern horticulture industry, while ranchers feed opuntia pads to their cattle in times of drought. Opuntia are one of Mexico's most important agricultural products and a staple food for poor, rural Mexicans.

The Agricultural Research Service (ARS) has developed a sterile cactus moth release program designed to stop the spread of this pest and prevent it from reaching the southwestern states and Mexico, where cacti are of great economic and ecological importance. The Animal and Plant Health Inspection Service (APHIS) is working collaboratively with ARS on this program, which needs a full field test so its effectiveness can be evaluated. Failure to pursue control aggressively in FY04 and FY05 will jeopardize public and private resources in all parts of the country where prickly pear cacti grow.

Impacts to Biodiversity

There are 31 platyopuntiae species across the U.S. (9 found nowhere else in the world), including the federally endangered *Opuntia treleasei*, and 56 in Mexico (38 found nowhere else in the world) (1). Prickly pear species are



One of two remaining populations of the state-endangered *Opuntia corallicola* survives on a TNC preserve in Florida. (Photo: Alison Higgins, TNC)

native to the Americas and Caribbean but have been introduced to other continents for horticultural purposes, agricultural production, and soil stabilization. Florida alone has six native species of vulnerable prickly pears, three of which are state listed. In some areas of Florida, 95% of the opuntia cacti have been attacked by the moth, though small individuals are at greatest risk of death from these attacks (3).

Indirect effects on biodiversity include impacts to the many bird, reptile, mammal, and insect species that eat, nest in, and are otherwise dependent on opuntia. For example, in southern Texas, the cacti can comprise 90% of the winter diet of peccaries and 55% of the winter diet of white-tailed deer (4). Additionally, in desert systems where opuntias dominate the flora, it is likely that significant reductions in their abundance will have ecosystem level effects: decreased soil moisture, increased erosion, and changes in species composition as resources are altered.

Economic Consequences of the Cactus Moth

- **Millions of dollars of lost business to the nursery industry** -- Horticultural production of prickly pears for use in arid systems occurs in Arizona, California, Nevada, New Mexico, and Texas. Annual revenues for opuntia horticulture in Arizona alone are estimated at \$14 million (5).
 - **Increased cattle feed costs to ranchers** -- In drought years, ranchers in Texas burn the spines off opuntia and feed them to cattle. This practice is even more important in Mexico, where opuntias are critical for the cattle industry (6).
 - **Severe failure of agricultural crops** -- In Mexico, the agricultural impacts would be devastating: the area of cultivated and harvested wild cactus is estimated to be 3 million hectares. Opuntia products are the seventh most important agricultural product and the third most important subsistence food source for Mexico's rural poor (6). Further, opuntia are cultivated for agricultural purposes in at least 28 other countries.



Cactoblastis-infested opuntia pad.
(Photo: Alison Higgins, TNC)

Funding

The cactus moth reproduces and increases its range three times per year in peninsular and northern Florida: April-May, July-August, and October-November. Securing the funds in FY04 to conduct the sterile male release pilot test during the moths' second flight in July-August 2004 is essential in order to evaluate the technique's effectiveness. Even more important is ensuring continuing funding of the testing protocol for the moths' third flight of the season, which will take place in early FY05. In addition, FY05 funding will be necessary to begin the full field implementation trial of the technique in December 2004 – January 2005. If field trials are successful, a sterile insect release program should be funded in FY06.

Sources

- (1) Stiling, P. 2002. Potential non-target effects of a biological control agent, prickly pear moth, *Cactoblastis cactorum* (Berg) (Lepidoptera: Pyralidae), in North America, and possible management actions. *Biological Invasions* 4: 273-281.
- (2) Hight, S.D., Carpenter, J.E., Bloem, K.A., Bloem, S., Pemberton, R. W., and Stiling, P. 2002. Expanding Geographical Range of *Cactoblastis cactorum* (Lepidoptera: pyralidae) in North America. *Florida Entomologist* 85: 527-529.
- (3) Johnson, D.M. and P. D. Stiling. 1998. Distribution and dispersal of *Cactoblastis cactorum* (Lepidoptera: Pyralidae), an exotic *Opuntia*-feeding moth, in Florida. *Florida Entomologist* 81: 12-22.
- (4) Hellgren, E.C. 1994. Prickly-pear cactus (*Opuntia* spp.) and its use by wildlife. pp. 87-93 in: Felker and Moss (eds). *Proceedings*, 5th Annual Texas Prickly Pear Council. Texas.
- (5) Irish, M. 2001. The ornamental prickly pear industry in the southwestern United States. *Florida Entomologist* 84: 484-485.
- (6) Soberon, J., J. Golubov, and J. Sarukhan. 2001. The importance of *Opuntia* in Mexico and routes of invasion and impact of *Cactoblastis cactorum* (Lepidoptera: Pyralidae). *Florida Entomologist* 84: 486-492.

For more information, contact The Nature Conservancy
nature.org

Chelsea Maxwell
(703) 841-5300
cmaxwell@tnc.org

Doria Gordon
(352) 392-5949
dgordon@tnc.org