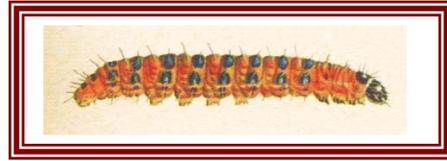
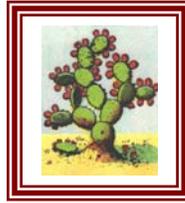


Cactoblastis cactorum Activities Report for July 2006



Joel Floyd, USDA-APHIS-PPQ-EDP, Riverdale, MD

MEETINGS/BRIEFINGS/COMMUNICATIONS. On July 18th -19th, a meeting organized by Ken Bloem APHIS-PPQ-CPHST was held at the ARS laboratory in Tifton, GA to discuss rearing challenges and suggested improvements. Jim Carpenter was the hosting scientist. Retired rearing experts invited to the meeting included Alan Bartlett, Allen Cohen, John Hamm, and Frank Davis, Mississippi State University, and in addition, representatives of FDACS- DPI, including Ed Burns, George Schneider, and Abbie Fox.

On July 23th through 26th, Stephanie Bloem of CPHST-PERAL arranged and hosted as the *Cactoblastis* liaison between SAGARPA and USDA, to show the representatives from Mexico the program and research they are helping to fund along the Gulf Coast. Gustavo González Villalobos and Arturo Bello from Mexico City visited the ARS Tallahassee lab, Ft. Morgan and Dauphin Island, AL, and Pensacola Beach to witness pheromone trials to see the sterile release. They visited the new Cactus moth office in Pensacola, where they met Joel Floyd, Maurice Duffel, and Ron Weeks of CPHST. Ron demonstrated the use of hand held units and GPS units in the collection of *Cactoblastis* survey data.

SURVEY: USDA-PPQ continues to conduct trapping surveys in South Carolina, Mississippi, Louisiana, and Texas. The State of Arizona is conducting trapping surveys in nurseries. Mississippi State University's Georesources Institute continues to visually check *Opuntia* for host mapping in several states including state parks in Texas.

REGULATION. The two regulatory work-plans in the APHIS Regulatory Analysis and Development staff are undergoing final review before going to the legal review by the Office of General Council. Please see previous reports for description of the work-plans.

FLORIDA NURSERYSTOCK INFESTATION: The Florida Department of Food and Consumer Services, Division of Plant Industry detected *C. cactorum* in an *Opuntia* nursery plant being sold at a larger retail outlet in Hillsborough County, FL. It was traced back to a wholesaler in Homestead, FL that received the plants from the Dominican Republic trace-forward information of the shipment lot was only distributed in Florida.

OUTREACH. An article on *Cactoblastis* and USDA's efforts appeared in the July/August issue of "The American Gardener". The PPQ office in Albuquerque gave a presentation that included *Cactoblastis* to several Southwest tribes at a meeting hosted by the Mescalero Apache Nation.

PPQ FIELD ACTIVITY: Maurice Duffel continued his TDY from the Citrus Canker program along with other program workers, Daryl Demont and Donald Smith to work with Stephen Hight in Ft. Morgan and Bon Secour making sterile releases and removing infested *Opuntia* material. In the last two weeks of the month, they removed and destroyed over 2,950 lbs. of infested host plants. They also removed egg-sticks to reduce the populations. Maurice has been working to get the office equipped with computer and telephone hook-up and purchasing furniture for the office and trailers. Craig Hinton, of the CPHST Gulfport Lab has continued to help Stephen Hight with trapping and host removal at Dauphin Island and Little Dauphin Island, Alabama.

TECHNICAL LIAISON. Stephanie Bloem collected and compiled all reports for June program activities. Report was translated to Spanish for distribution to collaborators at SAGARPA/SENASICA.

Stephen Hight, USDA-ARS-CMAVE, Tallahassee, FL
Jim Carpenter, USDA-ARS-CPMRU, Tifton, GA

STERILE INSECT TECHNIQUE (SIT) VALIDATION. The initial SIT validation experiment begun in 2005 has been completed. Final visits to the study sites at Okaloosa Island (sanitation only site) and St. George Island (control site) occurred the last week of June 2006. A manuscript will be written that summarizes this study. In general, year-long sanitation efforts (removal of infested pads and cactus moth eggsticks, larvae, and pupae) reduced the population of wild moths, but were not enough to keep the moth population from rebounding. However, sanitation coupled with the release of sterile insects substantially reduced the population of wild cactoblastis. Sterile insects released in the wild were shown to be highly competitive against wild moths. Competitiveness was evaluated for males by their recapture rate in the traps, the proportion of sterile eggsticks produced as a result of sterile males mating with wild females, and the identification of F₁ sterile adults.

An SIT verification and implementation program continued to be conducted in the area of the cactoblastis western leading edge: Dauphin Island, Little Dauphin Island, Fort Morgan (Alabama); and Pensacola Beach (Florida). Traps were serviced at all four sites at least once per week during July. The summer cactus moth flight period appeared to peak in late July, with trap catches at all sites throughout the month. Total and average monthly trap catch of wild *C. cactorum* for each site is presented in Table 1. The average number of wild moths found per trap in July is based on weekly averages over four weeks (1 - 29 July). Releases of sterile *C. cactorum* were made at all three Alabama sites (Table 2). Weekly release and recapture information at Ft. Morgan is presented in Table 3 and Figs. 1 and 2.

Table 1. Wild *Cactoblastis cactorum* (Cc) caught in traps during July 2006 (1 – 29 July).

Location	Dauphin Is.,	Little Dauphin	Ft. Morgan,	Pensacola
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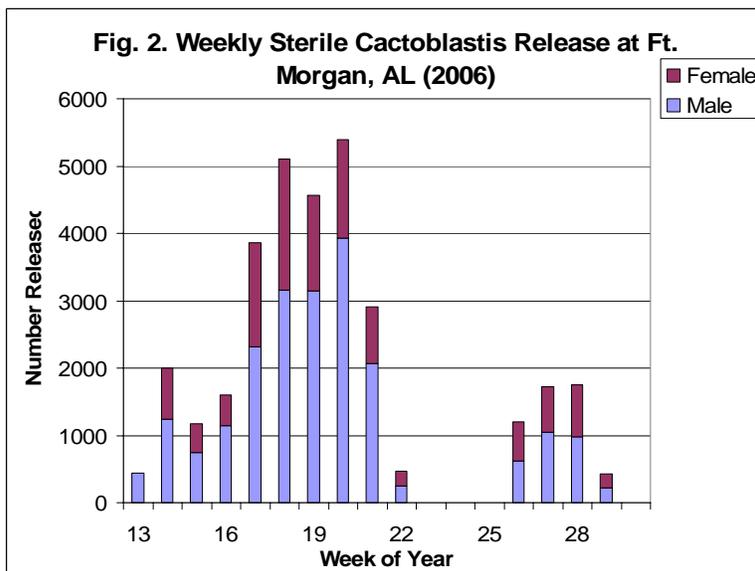
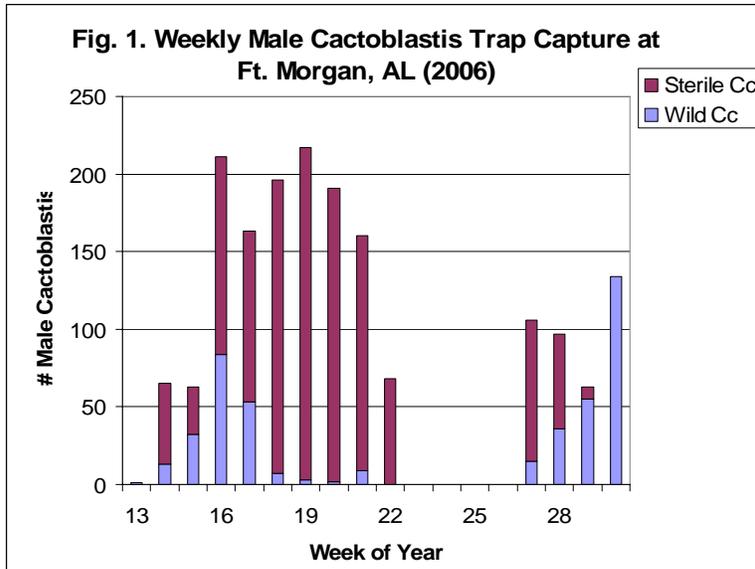
	AL	Is., AL	AL	Beach, FL
# Traps	53	5	16	70
# Wild Cc	17	29	240	2243
Avg. # Wild Cc/Trap	0.1	1.4	3.8	8.0

Table 2. July release totals of sterile *Cactoblastis cactorum* made at three Alabama sites.

LOCATION	NUMBER OF STERILE Cc RELEASED		
	♂	♀	TOTAL
Ft. Morgan, AL	2239	1668	3907
Little Dauphin Island, AL	1502	1206	2708
Dauphin Island, AL	1087	924	2011

Table 3. Weekly male *Cactoblastis cactorum* (Cc) trap capture, number of male and female sterile moths released, and percent sterile males released that were recaptured at Ft. Morgan, AL, February-July 2006.

MONTH	WEEK OF YEAR	Cc CAPTURED		STERILE Cc RELEASED		% STERILE ♂ Cc RECAPTURED
		WILD ♂ Cc	STERILE ♂ Cc	♂	♀	
February	8	0	--	--	--	--
March	12	0	--	--	--	--
March	13	1	0	443	0	--
April	14	13	52	1236	758	3.1
April	15	32	31	747	422	4.2
April	16	84	127	1144	456	11.1
April	17	52	110	2312	1547	1.5
May	18	7	189	3163	1942	6.0
May	19	3	214	3139	1433	6.8
May	20	2	189	3925	1475	4.8
May	21	9	151	2073	836	7.3
June	22	0	68	245	226	27.8
June	23	0	0	0	0	0
June	24	0	0	0	0	0
June	25	0	0	0	0	0
June	26	0	0	616	578	0
July	27	15	91	1044	680	5.5
July	28	36	61	975	782	6.3
July	29	55	8	220	206	3.6
July	30	134	0	0	0	0



ECOLOGICAL AND QUALITY CONTROL FIELD STUDIES

Field Trial of Experimental Pheromone Blends. A field trial was conducted in Pensacola Beach comparing different blends of the experimental cactus moth lure. Three new formulations were tested against the currently used standard lure and against newly emerged, virgin, female *C. cactorum*. The experiment began 7 July and concluded 4 weeks later (4 August).

Flight Periods and Degree-Day Model. Weekly-collected trap bottoms sent by collaborators from the 5 sites were scored, analysis updated, and outcomes forwarded back to collaborators. In general, the summer flight period began mid-June for south Florida, early July for north Florida and coastal Georgia, and mid-July for coastal South Carolina.

Dispersal Studies (collaboration with Prof. Silvia Dorn). Hosted a one week visit by Dr. Mark Sarvary (post-doctoral student with Prof. Dorn) from 10-14 July. Dr. Sarvary gained experience and competence with aspects of *C. cactorum* biology in the laboratory (sexing pupae and adults, identifying mating status of males and females), obtained a tour of the Tifton rearing effort, and assisted with field studies (servicing traps, conducting sanitation efforts, releasing sterile insects).

COLONY MAINTENANCE, BUILD-UP AND MASS-REARING. Cladode Rearing: 154,000 eggs were collected and 108,800 larvae were set up during July for rearing *C. cactorum* on cladodes. Approximately 64,790 pupae were collected and 400 were shipped to cooperators in Zurich for flightability studies during July.

Artificial Diet Rearing: A *Cactoblastis cactorum* rearing workshop was held in Tifton, GA, 18-19 July 2006, during which time invited scientists specializing in insect pathology, insect diet development, insect mass rearing and insect genetics reviewed the work progress of the *C. cactorum* mass rearing project, and provided ideas and recommendations for future research and operational improvements to meet the challenges encountered in mass rearing *C. cactorum*. Workshop participants included invited specialists, and scientists from USDA-APHIS, Florida Department of Plant Industry, and USDA-ARS. The *C. cactorum* research team currently is working to evaluate and adapt suggestions and ideas generated during the workshop. In addition, future collaborations with Allen C. Cohen, Director, Insect Diet & Rearing Research, LLC, and with other USDA-ARS scientists are under development to address some of the identified research priorities.

Silvia Dorn, ETH, Zurich, Switzerland

DISPERSAL STUDIES

Dr. Mark Sarvary has started to work in the laboratory of Prof. Silvia Dorn at ETH Zurich on June 15, 2006. He holds a PhD Degree from Cornell University, Ithaca, NY. He has studied Zoology and Ecology as well as Agricultural Economics in Godollo, Hungary.

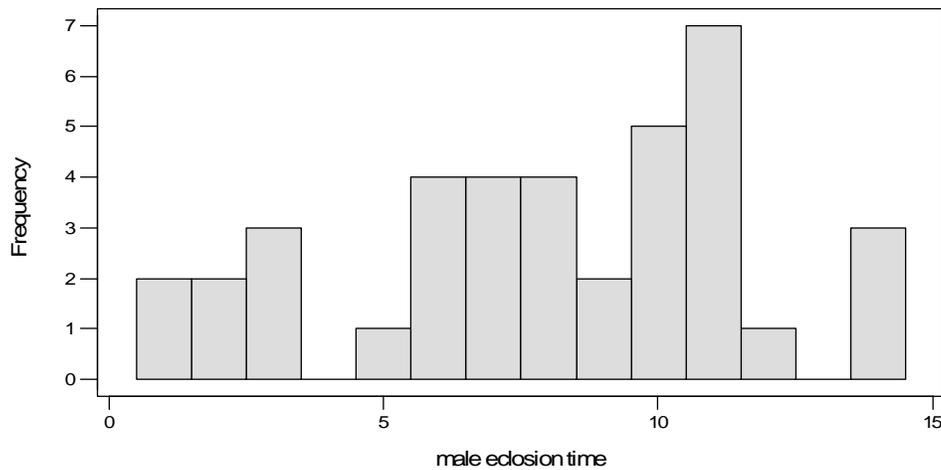
Mark Sarvary started to calibrate the equipment. The first shipment of 200 *Cactoblastis* pupae from Tifton, Georgia, arrived on June 19, the second one of 200 on June 27, by DHL. None of the pupae had emerged upon arrival. Emergence record will be sent to USDA Tifton in due time. Quality of shipped moths: about 25% of moths qualify for flight bioassays due to wing damage during eclosion. Changes applied to the rearing technique is expected to increase this percentage.

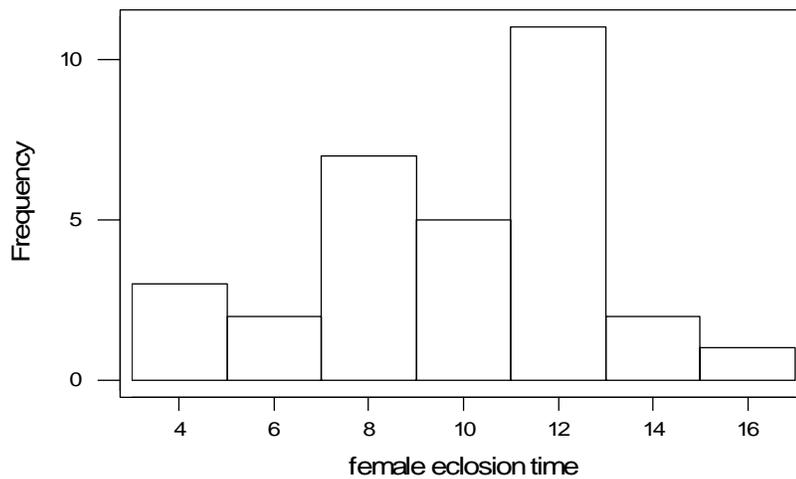
Table 1. Quantitative categorization of the first two shipments of *Cactoblastis cactorum*: eclosion time measured from arrival.

	Mean eclosion time (days after arrival)	Peak eclosion (days after arrival)	Number of live pupae arrived from GA on June 19 th and on June 27 th .	Number of moths eclosed by July 5 th .	Crumpled wings	Dead on day 0	Moth used for testing
Total	8.5	11	391	198	82	15	101
Males	7.9	11	196	101	34	14	53
Females	9.32	12	195	97	48	1	48

Figure 1. Temporal distribution of emergence of shipped moths in days after transfer to a climate chamber (26 C°, 70% Rh, 12L:12D)

Histogram of male eclosion time





R. Heath, N. Epsky, USDA-ARS-SHRS Laboratory, Miami, Florida
PHEROMONE STUDIES

ACCOMPLISHMENTS AND ACTIVITIES. One set of gland extracts was obtained, which consisted of 21 glands. There were ten gas chromatography-mass spec (GC-MS) analyses were conducted. No shipments of cactus moth pupae were received from Tifton, GA.

Technical problems. GC-MS analyses were limited because of problems encountered with debris from the gland extracts that required GC-MS shut-down, cleaning and tuning. We have purchased equipment to facilitate removing debris from the gland extract samples and are in the process of baking out the GC-MS before analyses can be conducted again.