

## ***Cactoblastis cactorum* - Report for July-Aug.-Sept. 2007**



For past reports and more information, see the PPQ Cactus Moth website at: [http://www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/cactoblastis/index.shtml](http://www.aphis.usda.gov/plant_health/plant_pest_info/cactoblastis/index.shtml)

**PLEASE NOTE: THIS IS A NEW URL FOR OUR WEBSITE, Change your bookmarks !**

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

**CHANGE IN CACTOBLASTIS LEADERSHIP:** Joel Floyd accepted a position as Domestic Diagnostics Coordinator with USDA, APHIS, PPQ National Identification Service in Riverdale, MD. The major program activities are now being handled by John Stewart, Eastern Region Program Manager in Raleigh, NC.

**INTERNATIONAL CACTOBLASTIS CACTORUM CONFERENCE:** The conference, held May 8-10<sup>th</sup> at the Desert Botanical Garden in Phoenix, Arizona has been summarized on a draft website and abstracts are being translated by Stephanie Bloem and Ek Delval from UNAM in Michoacan, Mexico.

**OUTREACH IN TEXAS:** A meeting was hosted by The Nature Conservancy in Cotulla, Texas in conjunction with the South Texas Wildlife Association. Jim Bergan facilitated the meeting with ranchers, Texas Parks and Wildlife personnel and Texas Cooperative Extension. Joel Floyd presented an overview of the problem. Also in attendance were Laura Tyler of CSU, and Barron Rector, Rangeland Specialist at Texas A&M who spoke on the outreach program, training master naturalists, volunteers and assisting in setting up sentinel sites along the Gulf Coast in Texas. Discussions included ranchers in South Texas who value prickly pear because it supports wildlife including white tail deer, quail, and javelina. The local economy finds income from hunting more important than from cattle ranching in South Texas. Northern Texas ranchers apparently have problems with an overabundance of prickly pear because of land management practices and are in need better options to control it. There was emphasis on the message that more tools are needed to solve their problem, and to educate them as to the value of prickly pear in drought years. There was discussion of the concern of unauthorized deliberate introduction of *C. cactorum* in Texas and the unintended negative consequences on habitat emphasizing that it is against federal plant pest regulations and is subject to penalties.

**ENVIRONMENTAL DOCUMENTATION:** A NEPA Categorical Exclusion was completed to cover the possibility of using herbicides for host removal and insecticides

for control on eggs and neonate larvae on top of Ft. Morgan and on Dauphin Island, Alabama.

**SURVEY:** PPQ is conducting surveys in CA, NM, TX, LA, AL, and MS. The Arizona Department of Agriculture is conducting nursery surveys using volunteers. Mississippi State University's (MSU) GeoResources Institute continues to work with various agencies and NGO's to set up sentinel sites in South Carolina and Gulf Coast areas. Dr. Richard Brown, of MSU, screened and checked traps from Arizona (44, nurseries), Texas (3, Padre Is. N.S.), New Mexico (3, Biological Park) during August and in September from Arizona (28, nurseries), Mississippi (12, Grand Bay Savannah NWR), and Texas (6, Padre Is. N.S., Galveston). All were negative for cactus moth. Visual observations were made of *Opuntia* species at four sites in Alabama (Marion and Lawrence Counties) and four sites in Mississippi (Noxubee and Lauderdale Cos.) and data entered into monitoring network, which were also negative for *C. cactorum*.

**REGULATION:** The Interim Rule for domestic regulation is still going through clearances and should be published in the coming months.

**TECHNICAL LIAISON:** Stephanie Bloem collected and compiled all reports for program activities and helped facilitate communication with SAGARPA on a number of occasions.

### **George Schneider, FDACS-DPI, Gainesville, FL**

**Accomplishments and activities.** Pupal production for this time period was 2,280 individuals. Pupae were sent to Tifton, Georgia to supplement the colony. A subset of pupae reared from eggsticks collected in south FL were eclosed at our facility to start a second generation. Rearing efficiency from three sets of colony egg sticks on artificial diet and infested on 4/17, 6/5 and 6/15 were 19.02%, 18.94% and 6.05%, respectively. However, rearing efficiency from the eggsticks collected in south FL was 62.86%. Two other sets of eggsticks were seeded on artificial diet on 7/30 and 8/31, but production numbers are still being collected. A total of 45 larval containers were set-up between 7/23 - 8/31 with eggsticks descended from the original south FL egg sticks. Several rearing improvements have been tested during the rearing of these populations. The venting of larval containers has been varied from none to well-ventilated for various instars. The use of solid lids, through at least the first four weeks after infestation, has shown some promise (shorter time interval to initial pupation and preliminary pupal rearing efficiency of 34.25%). Testing of surface sterilization of the egg sticks, wax coating of artificial diet blocks, elevated diet holding racks, and varying degrees of container sanitation at diet block replacement have been examined.

Beginning in mid-August, larval samples have been provided to Dr. Drion Boucias at the for pathogen evaluation. Six out of seven sample batches have tested positive for *Nosema* or a possibly linked vesicle. Testing will continue to try and cull infected stock and evaluate whether the unknown vesicle is a precursor to active *Nosema* infections.

The adult colony environmental chamber is close to being operational. Lights and scale collection systems have been installed; humidification system still needs to be purchased and installed. The first of two large larval development chambers has been assembled. All shelving for use in these chambers has been assembled. Procurement of the new guide assembly for the linear accelerator is underway and quotes are being obtained for the placement of the eclosion and knock-down environmental chambers which will be situated adjacent to the warehouse behind the BCRF.

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

**SIT VALIDATION/VERIFICATION.** Traps were serviced during the July-September at all 4 study sites (Pensacola Beach, FL, Ft. Morgan, AL, Dauphin Island, AL, and Little Dauphin Island, AL) (see Table 1). A few moth captures were made at Dauphin and Little Dauphin Islands. Two infested plants were found on Dauphin Island; one in July and one in September. Infested plants and adjacent plants were removed. The infested July plant had late instar larvae but the September plant had newly hatched eggsticks. Sterile insect releases were made in the areas with infested plants throughout July and August. A small infested plant with only six larvae was found on Little Dauphin Island in September and removed. This plant was likely a hold-over from infested plants found and removed in June.

Captured males were likely a mixture of local infestations and fly-over re-infestations from Ft. Morgan (~3 miles away). Sterile males released at Ft. Morgan have been found in Dauphin Island traps during previous flight periods. The spring flight period ended in late May (Pensacola Beach) to early June (Ft. Morgan). The summer flight period began about one month later; late June at Pensacola Beach and early July at Ft. Morgan. Twice weekly releases of sterile *C. cactorum* were made at both Ft. Morgan and Little Dauphin Island over a 7 week period (beginning of April through 3<sup>rd</sup> week of May) (Table 2a and 2b). Weekly recapture information at Ft. Morgan is presented in Table 3 and Figs. 1 and 2. Sanitation efforts were conducted on Dauphin and Little Dauphin Islands during this period. Nearly 15 tons of cactus pads were hand removed, primarily from Little Dauphin Island. Material removed consisted of pads and plants damaged by weather, excess pads from sentinel plants, and host plant reduction. However, several infested pads were also removed from Little Dauphin Island.

Table 1. Wild *Cactoblastis cactorum* (Cc) caught in traps during July, August, and September 2007.

JULY				
Location	Dauphin Is., AL	Little Dauphin Is., AL	Ft. Morgan, AL	Pensacola Beach, FL
# Traps	53	16	16	70
# Wild Cc/Month	6	1	293	835
Weekly Avg. # Wild Cc/Trap	0.03	0.02	5.7	3.0

AUGUST				
# Wild Cc/Month	3	2	151	181
Weekly Avg. # Wild Cc/Trap	0.01	0.02	1.9	0.5
SEPTEMBER				
# Wild Cc/Month	5	0	176	144
Weekly Avg. # Wild Cc/Trap	0.02	0	1.8	0.5

Table 2. Release totals of sterile *Cactoblastis cactorum* made at three Alabama sites during July, August, and September 2007.

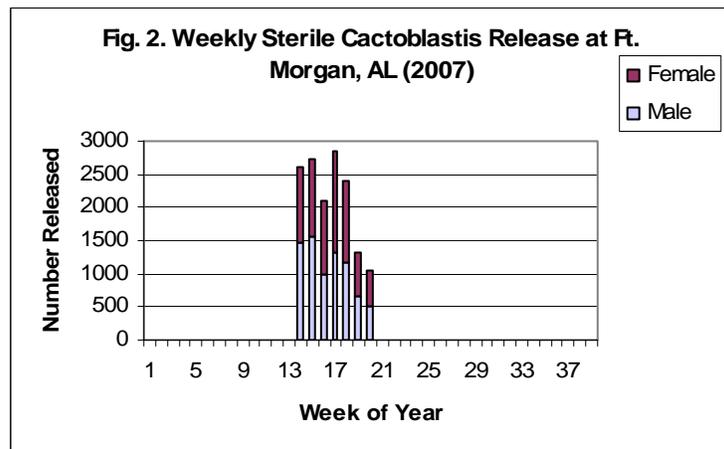
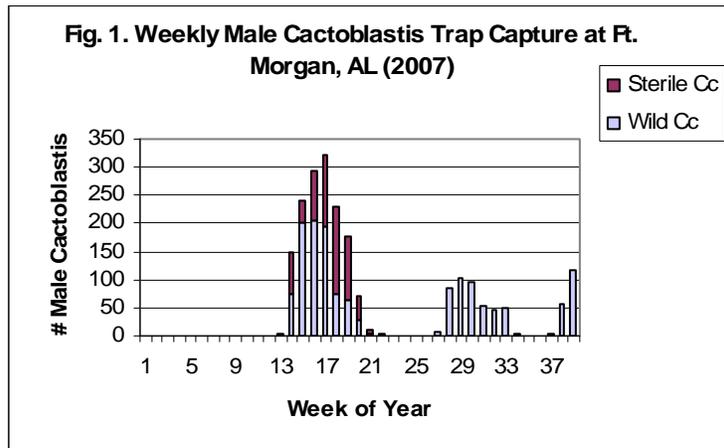
LOCATION	NUMBER OF STERILE Cc RELEASED		
	♂	♀	TOTAL
JULY			
Ft. Morgan, AL	0	0	0
Little Dauphin Island, AL	0	0	0
Dauphin Island, AL	4,220	4,316	8,536
AUGUST			
Ft. Morgan, AL	0	0	0
Little Dauphin Island, AL	0	0	0
Dauphin Island, AL	4,559	2,323	6,882
SEPTEMBER			
Ft. Morgan, AL	0	0	0
Little Dauphin Island, AL	0	0	0
Dauphin Island, AL	0	0	0

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, 2007.

MONTH	WEEK OF YEAR	Cc CAPTURED		STERILE Cc RELEASED		% STERILE Cc RECAPTURED
		WILD ♂ Cc	STERILE ♂ Cc	♂	♀	
July	27	7	0	0	0	--
July	28	86	0	0	0	--
July	29	104	0	0	0	--
July	30	96	0	0	0	--
August	31	52	1**	0	0	--
August	32	47	0	0	0	--
August	33	49	2**	0	0	--
August	34	2	0	0	0	--
August	35	1	0	0	0	--
September	36	0	0	0	0	--
September	37	4	0	0	0	--
September	38	57	0	0	0	--
September	39	115	0	0	0	--

\* Sterile males captured during these weeks included in previous week of sterile release.

\*\* Sterile males released on Dauphin Island.



**S. Dorn, M. Sarvary, ETH, Zurich, Switzerland**

Research was completed and two manuscripts have been written and submitted for publication.

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

**Accomplishments and activities.** Low amounts of pheromone have been obtained in GC/MS analysis to date, compromising the ability to identify additional bioactive pheromone components. Pupae from wild cactus moth were collected by S. Hight and shipped to Miami to allow comparisons with results from colony cactus moth females. From July to September, five shipments of colony cactus moth female pupae were received from Tifton (J. Carpenter). Total number of colony females received and eclosion (percent) were: 11 July - 500 females (29% eclosed), 14 Aug - 500 females (12% eclosed), 28 Aug - 100 females (eclosion not quantified), 19 Sept - 100 females (36% eclosed), 25 Sept - 103 females (eclosion ongoing). Three shipments of wild cactus moth pupae were received from Tallahassee (S. Hight). Total number of wild

pupae received and eclosion (percent) were: 12 July – 672 females (79% eclosion), 808 males (73% eclosion); 13 July – 329 females (83% eclosion), 436 males (75% eclosion); 27 Sept – 100 wild females (eclosion ongoing)

**Chemical analysis.** We continued to use pheromone biosynthesis-activating neuropeptide (PBAN) to enhance pheromone production. During July and September, there were 17 GS/MS runs in total. Samples were obtained from wild females on 17 July (15 PBAN-enhanced glands and 15 KCl-sham treated control glands). Amounts of pheromone continued to be low, so 1) modifications to the gland extract collection protocol were evaluated and 2) comparisons of PBAN-enhanced extracts and extracts from naturally calling females were made. Samples were obtained from 15 PBAN-treated, 15 KCl-sham treated controls, and 15 calling females on July 19 and on July 20 (all wild females). A new shipment of PBAN was obtained from P. Teal (ARS, Gainesville) on Sept. 6. Additional gland extracts were obtained from colony females on 27 Sept (12 PBAN-enhanced glands and 12 KCl-sham treated control glands). These results will be compared to parallel tests with wild females that are ongoing and will be presented in the next report.