

Technology Transfer for Mass Rearing Operations of *Cactoblastis cactorum*
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The Florida Department of Agriculture and Consumer Services, Division of Plant Industry (FDACS-DPI) is a regulatory agency which works to detect intercept and control plant and honey bee pests and diseases that threaten Florida's native plants and agricultural resources. The FDACS-DPI is a logical choice for the mass rearing operations of the cactus moth. Currently, the Methods Bureau is involved in several insect biological control programs which operate under cooperative agreements with the USDA-APHIS, including; Imported Fire Ant / phorid flies, Tropical Soda Apple / leaf-eating beetle, Pink Hibiscus Mealybug / parasites and predators, Mediterranean Fruit Fly Sterile Insect Technique (SIT) Program and more recently, the Cactus Moth SIT Program. Most of these programs are in operation and maintained on the main DPI campus in Gainesville, Florida. Facilities include a 15,000 square foot building dedicated to multiple insect mass rearing programs, a linear accelerator for irradiation of commodities, twenty-three full time employees assigned to distinct program areas, a technique development laboratory, a microbiology laboratory, as well as on-site entomologists, plant pathologists and other support staff.

The overall goal for the mass rearing of cactus moths is the production of a large number of moths to be used in a SIT program in order to establish a barrier and prevent the spread of this insect into the southwestern United States and Mexico. Standard Operating Procedures (SOP) for rearing the cactus moth have been developed by Dr. Jim Carpenter, USDA-ARS in Tifton, Georgia, and serve as an important technology transfer tool. The objectives for DPI in 2006-2008 are to gain experience with the mass rearing and handling of all life stages of the insect in both cactus pads (cladodes) and artificial diet. The infrastructures necessary to mass rear the cactus moth through its life cycle have been identified and the building and establishment of such structures is currently underway.

Florida Accelerator Services and Technology (F.A.S.T.) is the name for the irradiation facility that houses the linear accelerator, utilizing an electron beam, which is certified to the National Bureau of Standards specifications for low dose applications. Experimental trials of different irradiation doses were tested to identify the correct dosage for the adult cactus moth to ensure F₁ sterility. A target dose of 200 Gy was calibrated and radiation biology results verified the accelerator provides the appropriate biological responses as compared to the Co-60 source irradiator currently used in Tifton, Georgia.

Production of the insects will be based on and depend on their biological potential in addition to the facility rearing capacity. Quantitative and qualitative measurements will be tracked and recorded for the colony. Qualitative measurements include pupal and adult weights, number of eggs per stick, percent pupal eclosion, and percent egg hatch. Quantitative measurements include the number of egg sticks, pupae and adults produced as well as the total number of adults irradiated, shipped and released per week.

For the cactus moth mass rearing program, emphasis will be placed on the use of the SOP as a living document with continuous process improvement and standardization. Also, disease management will be a focal point, in which a high degree of sanitation for containers, equipment and rearing chambers will be employed and specific work pathways followed to minimize contamination.