

release 1 million flies is US\$ 85. RC plane under the Sao Francisco Valley is a good option, at low cost and very reliable operation, releasing the sterile flies at low altitude and low speed, causing less damage to the flies.

Esterilidad Inducida en Machos y Hembras de *Anastrepha fraterculus* (Wiedemann) - Perú

Mónica Alburqueque Quiroz, Rafael Guillén Encinas

Servicio Nacional de Sanidad Agraria - SENASA, Av. La Molina 1915, Lima-12, Perú.
malburqueque@senasa.gob.pe, rguillen@senasa.gob.pe

Se efectuó una serie de experimentos con el fin de determinar niveles de esterilidad en machos y hembras aplicando dosis de radiación gamma de 30, 40, 50, 60, 70 y 80 Gy hasta determinar la dosis apropiada que asegure completa esterilidad, comprobándola con el seguimiento de fertilidad de sus progenies. Se irradiaron pupas de 60, 48 y 24 horas antes de la emergencia de la colonia de crianza artificial de Perú (origen Piura 2000, Lima 2002 e Ica 2004), cruzando 25 parejas de adultos irradiados con no irradiados del sexo opuesto, colocados en envases plásticos con panel de oviposición, agua y alimento. El fotoperiodo fue de 10 horas luz y 14 oscuridad a 26.0 °C y 60% HR. Los huevos colectados se alinearon en superficies humedecidas y se colocaron a 28 °C y 80% HR, a los dos días se transfirieron a dieta larvaria. Se realizaron lecturas de huevos eclosionados y los adultos obtenidos como resultado se cruzaron con moscas no irradiadas del sexo opuesto midiendo la fertilidad de la progenie reproduciéndola hasta estado adulto. Se logró determinar que a partir de 50 Gy se obtiene esterilidad completa en hembras expuestas en estado de pupa a 60, 48 y 24 horas antes de la emergencia. Asimismo se determinó que 70 Gy es la dosis para inducir esterilidad completa en machos de pupas irradiadas a 60 y 48 horas antes de la emergencia, así como la dosis 80 Gy en pupas irradiadas a 24 horas antes de la emergencia, ya que las progenies de estos individuos no son capaces de progresar a la siguiente generación, dosis recomendables a aplicar para realizar las pruebas de competitividad de cópula y su posterior aplicación e implementación de la TIE de esta especie de mosca de la fruta en el Perú.

Aerial Release of Sterile Flies Using Radio-Controlled Aircraft

Ítala Damasceno¹, Paulo C. Cavalcanti¹, Deise Campos¹, Kandice Andrade¹, Meire Castro¹, Rodrigo Viana¹, Jair F. Virginio¹, Nuno Brancos¹, Beatriz J. Paranhos², A. Malavasi¹

¹Medfly Rearing Facility, Juazeiro, Bahia, Brazil, malavasi@moscamed.org.br; ²EMBRAPA, CPTSA, Petrolina, Pernambuco, Brazil

Sterile Mediterranean fruit flies, *Ceratitidis capitata*, were released over commercial 9.2 hectares mango field using a radio-controlled aircraft 2.00 meters long, 3.60 m wingspan equipped with a 50 cc gas engine in Sao Francisco Valley, State of Pernambuco, Brazil. The objective was to evaluate the use of RC aircraft as releasing method and determine the distribution pattern, recapture rate and survivorship in the field. Flies 3-4 days old were knock down at -4°C for 15 minutes in the laboratory and brought to the release point in ice cooler with dry ice 20 min driving. Three releases of approximately 60,000 sterile males were carried out at 50 to 100 meters altitude and 50-60 km speed in one single line through middle of the mango orchard with green fruit. After releases, 64 Jackson traps baited with trimedlure were installed in days 0, 1, 2, 4, 8 and 16 and exposed for 2, 4, 6, 8, 8 and 8 hours, respectively. Spatial and temporal dispersal pattern of the released males were

according decay models. The dispersion was not uniform and varied in each release. Recapture rate ranged from 0.83 to 2.28%. The highest capture in day one after release and flies were found until the 16th day. The data suggest that RC aircraft should be a good inexpensive alternative for aerial release when compare with conventional airplane, take in consideration, release altitude, aircraft speed during releases and flight precision over the target area.

Low-Cost Isotope Marking Method for the Mediterranean Fruit Fly *Ceratitis capitata* Wied (Diptera: Tephritidae)

Rebecca Hood-Nowotny¹, Carlos Caceres^{1,2}, Islam Amirul¹, Alan Robinson¹

¹International Atomic Energy Agency (IAEA), Agency's Laboratories Seibersdorf, A-2444 Seibersdorf, Austria; ²Current address: USDA, APHIS, 12 Av. 4-65 Zona 10, Guatemala City, Guatemala. 01010. carlos.e.caceres@usda.aphis.gov

A simple method of marking of Mediterranean fruit flies *Ceratitis capitata* (Wiedemann) using stable isotopes is described. This species is an economically important pest in agriculture and has a major impact on agricultural trade. It is a target species of many successful area-wide integrated pest management (AW-IPM) programmes using the Sterile Insect Technique (SIT). Programme monitoring in the field relies on being able to accurately differentiate released sterile insects from wild insects so that estimates can be made of the ratio of sterile males to wild males. Typically, released flies are marked with fluorescent dust 100 % reliable. All known species of fruit fly feed on C3 plants in the wild which have a carbon isotope signature of around -28‰ on an internationally recognised scale. However, almost all mass rearing facilities use cane sugar in the larval and adult diet which is a C4 sugar sources (with a signal of around -11‰) and this could provide a an easy signature to differentiate released flies from wild flies. To test this approach, samples of flies from several operational field programmes from the field and the facility were analysed. It was clearly demonstrated that using C4 sugar in the larval rearing diet was an effective and economic way of intrinsically labelling Mediterranean fruit flies and it was possible to distinguish mass reared from wild populations with greater than 95% confidence. The C4 marker was detectable and distinguishable from wild populations up to twelve days after "release". This technique could be extending to any other SIT programs for other fruit flies species that use similar rearing protocol than Medfly.

Male Mating Competitiveness and Sterility Induction into Cohorts of Wild *Anastrepha ludens* (Diptera: Tephritidae) by Mass Reared Flies Irradiated at Different Doses

Juan Rull¹, José Arredondo², Santiago Morató¹, Gloria Ruiz¹

¹Instituto de Ecología, A.C., Apartado Postal 63, C.P. 91000 Xalapa, Veracruz; ²Subdirección de Desarrollo de Métodos, Programa Moscafrut SAGARPA-IICA, Central Poniente No. 5, 37000 Tapachula, Chiapas, México.

In several tephritid species females are more radiosensitive than males, in order to achieve 100% sterility of both males and females in bisexual strains released as part of Sterile Insect Technique programmes, high doses of irradiation have to be applied. Substantially lower doses are sufficient to