Joint FAO/IAEA Programme
Nuclear Techniques in Food and Agriculture

# Insect Pest Control Newsletter

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## Contents



# To Our Readers

*The state-of-the-art Mediterranean fruit fly mass-rearing and irradiation facility with the capacity of producing one billion sterile males per week, inaugurated on 29 August 2021 in Metapa de Dominguez, Chiapas, Mexico (Photo, SENASICA).*

## The International Commission on Zoological Nomenclature has Conserved Current Usage of the Generic Name *Anastrepha* Schiner, 1868 by Conditional Reversal of Precedence with Respect to *Toxotrypana* Gerstaecker, 1860

Recent morphological and molecular studies have demonstrated that two genera of *Anastrepha* Schiner, 1868 and *Toxotrypana* Gerstaecker, 1860 are synonyms. According to the rule of the International Commission on Zoological Nomenclature (ICZN), *Toxotrypana* should take precedence and to be used because it is the 'senior synonym', published in 1860 by Gerstaecker, eight years earlier than *Anastrepha* that was published by Schiner in 1868.

However, while only one species of *Toxotrypana* (*T. curvicauda*) is an agricultural pest and the multiple major pest species currently placed in *Anastrepha* have far greater impact on numerous commercial and subsistence fruit crops, if followed with ICZN rules, approx. 300 species in the genus *Anastrepha*, including several species of agricultural importance such as the South American fruit fly *A. fraterculus*, the South American cucurbit fruit fly *A. grandis*, the Mexican fruit fly *A. ludens*, the West Indian fruit fly *A. obliqua* and others should now all be referred to as *Toxotrypana* species. This would cause serious nomenclatural instability and confusion in the applied research field.

Anastrepha curvicauda *formelly known as* Toxotrypana curvicauda *(Photo: bugwood.org).*

To ensure the stability, ICZN used its plenary power to give the name *Anastrepha* Schiner, 1868, precedence over the name *Toxotrypana* Gerstaecker, 1860 whenever the two are considered synonyms (Bulletin of Zoological Nomenclature 78: Opinion 2479 (Case 3772) https://www.iczn.org/cases/resolved-opinion-issued/case/3772).

In practice, this means that nothing changes and the name of *Anastrepha* will be continually used for these species. The only change is the reference to the papaya fruit fly *T. curvicauda*. As *Toxotrypana* is now considered a synonym, reference to this species should in the future be used as *Anastrepha curvicauda*. The same applies to the other six species formerly placed in the genus *Toxotrypana*.

*Source: Marc De Meyer, Royal Museum for Central Africa (Tervuren, Belgium).*

## Fruit Fly Invasion on the Spot: The Horizon 2020 Funded FF-IPM Project Contributes to Prevention, Interception, Detection and Management of New and Emerging Fruit Flies in Europe

The risks of arrival, establishment and range expansion of exotic fruit flies are a global concern. It is expected that the threat of some of the major invasive species, such as *Ceratitis capitata*, *Bactrocera dorsalis*, and *B. zonata* may escalate in the near future because of global climate change, increased trade, and human mobility. In addition, the ban of neonicotinoids, which is one of the main control tools against fruit flies in Europe, poses an additional burden on fruit growers in Europe. To address the European needs (small size, scattered farms operated under diverse socioeconomic and regulatory frameworks), the European Union is funding a project entitled 'FF-IPM: In-silico boosted, pest prevention and off season focused IPM against new and emerging fruit flies' through the Horizon 2020 programme.

This project builds on existing knowledge to identify and fill the critical information gaps. It aims to boost regional fruit fly prevention by developing new, and also enhancing the existing interception and detection tools in order to provide new 'in-silico' assisted Integrated Pest Management (IPM) approaches that will be validated and adapted to European socioeconomic and agricultural conditions. The FF-IPM response toolbox against emerging (*C. capitata*) and new (*B. dorsalis*, *B. zonata*) fruit fly pests is reinforced by a set of novel decision support tools, dedicated and optimized to each of the target species. This is accomplished by a strong group of 21 partners from academia, research institutes and museums, businesses, and growers' organizations. FF-IPM follows a multi-actor approach, with genuine coordinated involvement of relevant actors/stakeholders, and substantive roles envisaged for them and in-built into its work plan.

This four years Project started in 2019 and has recently completed its mid-term review. In the past two years and despite COVID-19 related problems that have hampered some of the activities, it has nevertheless already achieved a number of tangible outputs. Information gaps regarding essential aspects to understand the invasive potential of the target species, such as thermal tolerance, starvation resistance or overwintering capacity were identified, and experimental tests conducted in order to provide answers.

The majority of these experiments are now finalized, and the scientific findings will be published in the near future. For innovative detection tools, the emphasis has been on the development of electronic nose for rapid interception of

infested fruits and electronic traps for a more efficient surveillance and early detection strategy.


*Demonstration of the different models of electronic traps in a recent training course organized in Naoussa, Greece by the University of Thessaly, Greece in collaboration with the Agricultural Research Organization of Israel.*

Novel diagnostic tools, both using morphological and molecular characteristics have also been developed. In addition, the efficiency of a whole set of IPM tools for off- and early season management, including entomopathogenic nematodes and fungi, and ground dwelling predators has been tested. The main emphasis in the forthcoming months will be on finalizing the above-mentioned tools and methods, and on the development and validation of a dynamic pan-European forecast toolbox allowing early alert and detection, and a decision-support toolbox for off- and on-season precision IPM.

*Source: Nikos T. Papadopoulos (University of Thessaly, Department of Agriculture Crop Production and Rural Environment, Greece) and Marc de Meyer (The Royal Museum for Central Africa, Belgium).*

## Millions of Sterile Flies Dropped from the Sky over City

The skies above metropolitan Adelaide will be filled with up to 20 million sterile fruit flies per week as the Marshall Liberal Government ramps up its spring campaign against the insidious pest. More than 600 million sterile fruit flies have been released during the extensive eradication program to date with over 160 000 homes in the outbreak and suspension areas in Adelaide.

Minister for Primary Industries and Regional Development David Basham said sterile flies are being released from a low flying plane each week between now and the end of the year. “Sterile male fruit flies seek out female fruit flies in outbreak areas, mating with them so they can’t reproduce and therefore breaking the life cycle,” Minister Basham said. “As well as from a plane, our biosecurity officers are releasing up to six million sterile fruit flies in Adelaide each week on the ground.

“We expect fruit flies in the 18 outbreak areas across South Australia to become active again as the weather warms up and the Marshall Liberal Government has been working closely with industry to prepare for our biggest fight against fruit fly.

“The Marshall Liberal Government is using every available weapon in our fight against fruit fly and Sterile Insect Technology plays a key role in our eradication program. “Fruit fly could have a devastating impact on our $1.3 billion horticulture sector vulnerable to the pest which is why we have spent almost $40 million to date to protect the hundreds of businesses and thousands of jobs in the industry across the state. “Overwhelming the wild population with our sterile flies will stop them breeding – and now is the time, before the weather really warms up and the flies become more active.

“More than 400 staff have been baiting and trapping within the fruit fly outbreak areas across the state during these cooler months and working with residents to remove fallen fruit and picking ripe fruit from trees to reduce the numbers of flies and the quantity of fresh produce available to them. “Fruit flies lay their eggs in fruit, the eggs grow into maggots that make the fruit rotten and when it falls to the ground the maggots dig into the soil to finish their life cycle, becoming flies that emerge from the ground to breed again. Enjoying delicious homegrown fruit and vegetables without maggots, and without the need for extra pesticides in your own garden, is something we cannot take for granted in South Australia.

*Source: Premier of South Australia website, 3 September 2021, by David Basham (https://www.premier.sa.gov.au/news/media-releases/news/millions-of-sterile-flies-dropped-from-the-sky-over-city).*