Report from the Joint FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture to CPM-16 (2022)

1. The International Atomic Energy Agency (IAEA), in partnership with the Food and Agriculture Organization of the United Nations (FAO), through their Joint FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture (Joint FAO/IAEA Centre), has been actively supporting the Secretariat of the International Plant Protection Convention (IPPC) since 2004 in the development and review of International Standards for Phytosanitary Measures (ISPMs) and its activities to improve phytosanitary capacity of IPPC Contracting Parties.

2. The Joint FAO/IAEA Centre continued to support the IPPC Secretariat in 2022.

3. In support of the *Technical Panel on Phytosanitary Treatments* (TPPT) activities, the Joint FAO/IAEA Centre provided expertise, helped review supporting data related to ISPMs, and conducted research to fulfil requirements for treatment recommendation. The following five treatments were approved at CPM-16 in 2022:

    - PT 40 (Irradiation treatment for Tortricidae on fruits) as Annex 40 to ISPM 28 (*Phytosanitary treatments for regulated pests*)
    - PT 41 (Cold treatment for *Bactrocera zonata* on *Citrus sinensis*) as Annex 41 to ISPM 28
    - PT 42 (Irradiation treatment for *Zeugodacus tau*) as Annex 42 to ISPM 28
    - PT 43 (Irradiation treatment for *Sternochetus frigidus*) as Annex 43 to ISPM 28
    - PT 44 (Vapour heat–modified atmosphere treatment for *Cydia pomonella* and *Grapholita molesta* on *Malus pumila* and *Prunus persica*) as Annex 44 to ISPM 28

4. The Joint FAO/IAEA Centre is implementing a coordinated research initiative on Novel Irradiation Technology for Phytosanitary Treatment of Food Commodities and Promotion of Trade (CRP D61026). Although there are twenty two irradiation treatments adopted as annexes to the International Standard on Phytosanitary Treatments for Regulated Pests (ISPM 28), only three are for generic treatments (ISPM28 PT7 family Tephritidae, PT39 genus Anastrepha, and very recently PT40 Tortricidae). Having more internationally accepted generic treatments, where one radiation dose is broadly applicable to a wide range of different pest species, would enhance trade in fresh commodities and support further up take of the technology. Therefore, a key research aim is to validate radiation doses proposed as generic treatments for key groups of pests. Work will also examine methods of innovating new treatments by investigating factors that might affect treatment efficacy. The first research coordination meeting was held in March 2022. Research workplans and collaborations were discussed, and collaborations agreed.

5. A Focus Group (FG) was set up by the Commission on Phytosanitary Measures (CPM) to develop a global system titled "Strengthening Pest Outbreak Alert and Response System (POARS)". The Joint FAO/IAEA Centre provided expertise to the FG. A comprehensive report was prepared and presented to the CPM Strategic Planning

Group (SPG). The aim of the global system is to empower Contracting Parties so that they are better prepared to alert about the threat or detection of an emerging pest and to be able to effectively respond. The system is designed to work in collaboration with other existing plant protection organizations at the global, regional, and national levels complementing expertise and resources. The SPG presented the recommendations of the report to the CPM-16 in April 2022. The CPM-16 agreed, as an interim measure, to establish a POARS Steering Group to work on establishing a POARS capability. A staff Member of the Joint FAO/IAEA was nominated and accepted to be part of the POARS Steering Group.

6. Two ongoing plant breeding and genetics and eight insect pest control projects of the Joint FAO/IAEA Centre were reported to the IPPC in 2022. From those, two were selected to be presented at the May 2022 IPPC Capacity Development and Implementation Committee, one on "Induced Genetic Diversity for Resistance to Fall Army Worm in Maize" targeting genetic resistance to the fall army worm in maize in Central African Republic, and the other on "Establishing the Sterile Insect Technique Methodology for the Management of the False Codling Moth, *Thaumatotibia leucotreta*, and Enhancing Integrated Pest Management Against the Peach Fruit Fly, *Bactrocera zonata*" targeting the capacity building and transfer of the sterile insect technique for those two plant pests in Israel.
7. A staff member of the FAO/IAEA Centre participated at the International Plant Health Conference held from 21-23 September in London, by making a presentation on "*Area-wide Management of Plant Pests Using the Sterile Insect Technique (SIT)*". The First International Plant Health Conference addressed new and emerging plant health challenges, including climate change impacts, the significant increase in international trade, the rapid loss of biological diversity and new pest pathways such as e-commerce by exploring more efficient national, regional and global policies, structures and mechanisms.

8. In terms of development of technical materials to support the implementation of the ISPMs, upon the request of FAO Members and IAEA Member States the following materials were produced in 2022:

    - *FAO/IAEA. (2022). Guidelines for Mass-Rearing and Irradiation of Drosophila suzukii for Sterile Insect Technique Application, version 1.0, Robin Guilhot, Gustavo Taret, Keke Gembinsky and Carlos Cáceres (eds.), Vienna, Austria. 29 pp. (https://www.iaea.org/sites/default/files/massrearing-and-irradiation-swd.pdf).*

    - *FAO/IAEA. (2022). International Guideline for Transboundary Shipments of Irradiated Sterile Insects. Vienna, Austria. 38 pp. (https://www.iaea.org/sites/default/files/2022.transboundary_shipments_of_sterile_insects.pdf).*

    - *FAO/IAEA. (2022). General Guidelines to Facilitate the Opening of International Markets for Fruits and Vegetables that are Fruit Fly Hosts Based on International Standards for Phytosanitary Measures. Vienna, Austria. (https://doi.org/10.4060/cc0361en).*

    - *FAO/IAEA/USDA. (2022). Manual de Control de Calidad del Producto en la Cría masiva y Liberación de Moscas de la Fruta Estériles. Traducción de la Versión*

7.0 de 2019. Viena, Austria, 149 pp. (https://www.iaea.org/sites/default/files/qcv7-en-espanol.pdf).

- *FAO/IAEA. (2022). Dosimetry for SIT: Standard Operating Procedures for Gafchromic™ Film Dosimetry System for Gamma Radiation v. 1.0, Andrew Parker, Kishor Mehta and Yeudiel GómezSimuta (eds.), Vienna, Austria. 40 pp. (https://www.iaea.org/sites/default/files/gamma-sop-en-excel-embedded.pdf).*
- *FAO/IAEA. (2022). Dosimetría para la TIE: Procedimiento Operativo Estandar para el sistema de dosiemetría de películas Gafchromic™ para Radiación Gamma v. 1.0, Andrew Parker, Kishor Mehta y Yeudiel Gómez-Simuta (eds.), Viena, Austria. 46 pp. (https://www.iaea.org/sites/default/files/22/03/gamma-sop-es-excel-embedded.pdf).*
- *FAO/IAEA. (2022). Dosimetry for SIT: Standard Operating Procedures for Gafchromic™ Film Dosimetry System for Low Energy X Radiation v. 1.0, Andrew Parker, Kishor Mehta and Yeudiel Gómez-Simuta (eds.), Vienna, Austria. 42 pp. (https://www.iaea.org/sites/default/files/x-ray-sop-en-excel-embedded.pdf)*
- *FAO/IAEA. (2022). Dosimetría para la TIE: Procedimiento Operativo Estándar para el sistema de dosimetría de película Gafchromic™ para Radiación X de Baja Energía v. 1.0, Andrew Parker, Kishor Mehta and Yeudiel Gómez-Simuta (eds.), Viena, Austria. 51 pp. (https://www.iaea.org/sites/default/files/22/03/x-ray-sop-es-excel-embedded.pdf).*
- *FAO/IAEA. (2022) Efficient Screening Techniques to Identify Mutants with TR4 Resistance in Banana. Jankowicz-Cieslak and Ingelbrecht (eds.), Springer ISBN 978-3-662-64915-2 (*https://link.springer.com/book/10.1007/978-3-662-64915-2*).*

9. In terms of capacity building, the Joint FAO/IAEA Centre has devoted part of its technical assistance to regulatory aspects and facilitating the implementation of the ISPMs in developing countries through regional workshops and technical meetings. In 2022, seven FAO/IAEA training events (courses and workshops) were held, addressing the following topics:

    - *FAO/IAEA Regional Training Course on Mutation Breeding and Efficiency Enhancing Techniques for Resistance to Banana Fusarium Wilt Race TR4 in Latin America, 14-25 February 2022, Seibersdorf, Austria.*
    - *FAO/IAEA Regional Training Course on Pest Risk Analysis. 23–29 March 2022 (virtual).*
    - *FAO/IAEA First Coordination Meting on Validating the Sterile Insect Technique for the Control of the South American Fruit Fly. 23–25 May 2022 (virtual).*
    - *FAO/IAEA National Training Course on Mutation Breeding in Maize and Developing Resistance to the Fall Army Worm, 9-12 August 2022, Bangui, Central African Republic.*
    - *FAO/IAEA Regional Training Course on Identification of the South American Fruit Fly (Anastrepha fraterculus) Morphotypes, Management of the Genetic Sexing Strain Colonies, and Artificial Rearing. 5–9 September 2022, Seibersdorf, Austria.*

- *FAO/IAEA Regional Training Course on Detection and Diagnosis of Fusarium Tropical Race 4 (Foc TR4), 10-14 October 2022, Mexico City, Mexico.*
- *FAO/IAEA Training Course on Codling Moth IPM Integrating SIT. 10–19 October 2022 (virtual).*