

## RESEARCH IN PHYTOSANITARY IRRADIATION: THE ROLE OF THE INTERNATIONAL ATOMIC ENERGY AGENCY AND THE JOINT FAO/IAEA DIVISION

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Being uniquely positioned with experts from both the radiation processing community and specialists in insect pest control, the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture has supported research, education and cooperation in the use of ionizing radiation as a phytosanitary treatment since 1981. The International Consultative Group on Food Irradiation (ICGFI) established in 1984 under the aegis of IAEA, FAO and WHO and of which the Joint FAO/IAEA Division was the Secretariat was the first group to formalize a recommendation for a generic treatment. In 1986, based on irradiation data for many tephritid fruit fly species and a limited number of other insect pests, they proposed a dose of 150 Gy for fruit flies and 300 Gy for other insects. The Food and Environmental Protection Sub-programme has implemented four coordinated research projects in the area of phytosanitary irradiation (PI). These projects permitted an extensive exchange of views on the findings especially as they related to methodologies for insect rearing and infestation of test commodities, evaluation of treatment effects, control of the irradiation process and dosimetry methods, and significance of the measures and criteria used to establish treatment efficacy for the recommended dose. These projects thus established the basis for developing national and international standards on the use of irradiation as a phytosanitary treatment such as the International Standard for Phytosanitary Measures (ISPM) Guidelines for the Use of Irradiation as a Phytosanitary Measure (ISPM 18) approved in 2003 by the International Plant Protection Convention (IPPC) and the adoption of 15 internationally accepted irradiation treatments under the Standard on Phytosanitary Treatments for Regulated Pests (ISPM 28).

The latest CRP spanned from 2009 to 2014 and involved scientists institutions in 15 countries collaborating in a programme to develop generic dose treatments applicable to a broad range of insects by research on important pests in international trade. Thirty-eight different pest species were studied in this latest research effort and thirteen studies were fully validated using very large numbers of insects in confirmatory tests, to establish treatment efficacy at levels of phytosanitary security commonly used internationally. Several generic and species specific treatments have been developed. For example, research carried out in Vietnam has led to a new treatment at a minimum dose of 231 Gy for three mealy bugs (Pseudococcidae): *Dysmicoccus neobrevipes*, *Planococcus lilacinus* and *Planococcus minor* approved by the Technical Panel on Phytosanitary Treatment (TPPT) of the IPPC in March 2015 (annex 19 of ISPM 28). More proposals will be submitted for consideration as international standards at the next IPPC call for treatment proposals

A new CRP starting in 2016 on novel approaches to food irradiation using electron beam and X ray will also include some research on phytosanitary irradiation for species of interest in the Middle East.

Finally the Technical Department of the IAEA is supporting Member States in Latin America and the Caribbean to create the conditions to use phytosanitary irradiation, not only with the already established technique of gamma irradiation but also including the use of electron beam and X ray.