



Improving Industry Competitiveness

Nuclear Science and Technology Working for You

Radiation Processing Through Gamma and Electron Beam Irradiation

Philippine Nuclear Research Institute's Multipurpose Gamma Irradiation Facility has demonstrated many of the applications of radiation processing using gamma-rays and has been regularly serving clients from the food, medical products, cosmetics, packaging and pharmaceutical industries.

The facility irradiates various products such as spices, dehydrated vegetables, herbal products

and cosmetic raw materials/accessories for decontamination or reduction of microbial load; medical products (such as gloves and syringes), pharmaceuticals, packaging materials, tissue grafts and Bio-N substrate for sterilization. It can also be used for sprout inhibition of agricultural crops such as onions and garlic, quarantine treatment of fruit and vegetables and to eliminate pathogens in food and food products.



Multipurpose Gamma Irradiation Facility

The 2.5 MeV electron beam (EB) irradiation facility is the first of its kind in the country intended for full-scale research and development and semicommercial EB services. The PNRI Electron Beam Irradiation Facility can be used in the degradation of carrageenan for the production of plant growth promoter (PGP), radiation grafting, radiation sterilization of medical devices and irradiation of food such



Electron Beam Irradiation Facility

as beef patties. It can also be used in improving the quality of wires and cable insulation through crosslinking and can also be used for surface curing. The E-Beam Facility has received funding from the International Atomic Energy Agency (IAEA), the Philippine government, and the United States and Japanese governments under the Peaceful Utilization Initiative (PUI).

Establishment of Quarantine Treatment Dose for Mango Pulp Weevil in Philippine Super Mango



Extraction of mango pulp weevils inside infested mangoes



Researchers attached dosimeters on the mangoes to determine the radiation dose absorbed

Quarantine pests such as the mango pulp weevil *Sternochetus frigidus* (Fabr.) prevent Philippine mango exports from entering international markets such as the United States and other countries with strict quarantine regulations. The wasted potential aggravates the economic woes of the local mango growers and exporters who contribute a substantial share of the Philippines' total agricultural exports.

The quarantine treatment has been approved by the United States Department of Agriculture

- Animal and Plant Health Inspection Service - Center for Plant Health Science and Technology, with the Final Rule already published in the United States Federal Register.

Based on PNRI's research studies, a minimum radiation dose of 165 Gy is enough to make the adult mango weevil sterile, providing sufficient quarantine security for the Philippine Super Mango.