



PHYTOSANITARY IRRADIATION IN INTERNATIONAL TRADE

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Council on
Ionizing Radiation
Measurements &
Standards

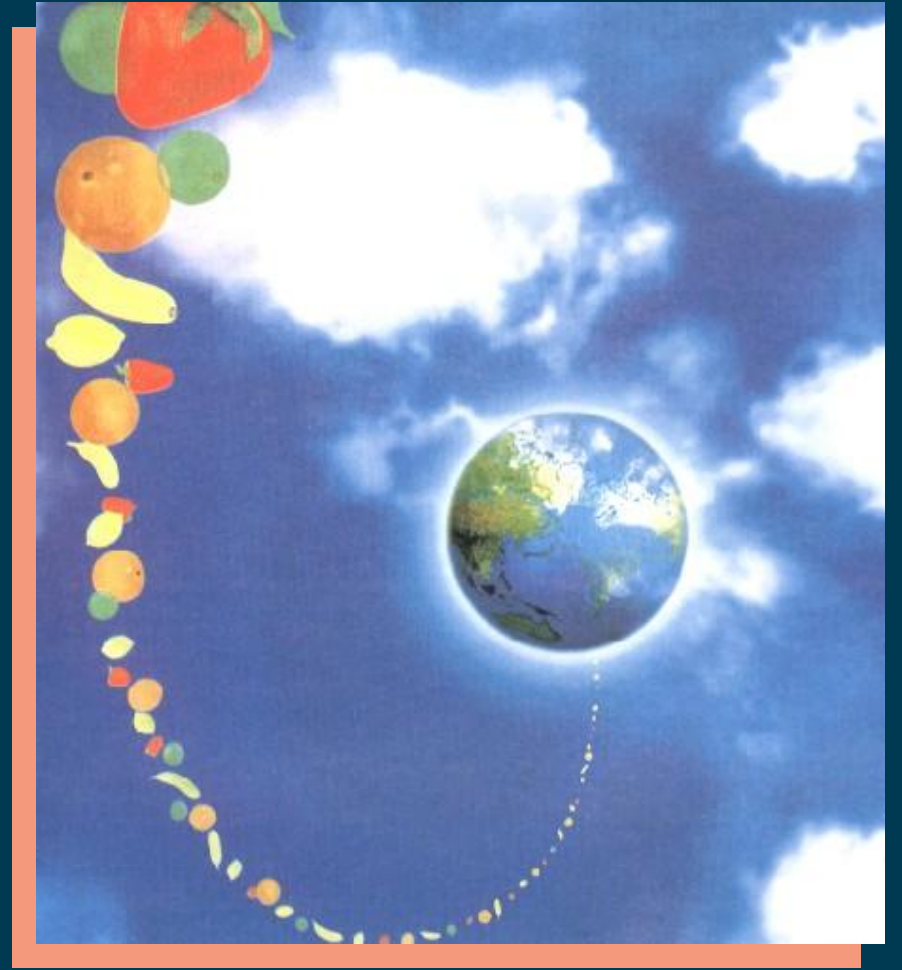
CIRMS 2026 — Need

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Progress in **international trade of irradiated plant products** is currently blocked because we lack **regulatory frameworks, public acceptance, and private investment**, which prevents **policy and market development**.

TRADE

- ❖ Trade of horticultural products represents one of the main contributors to the economies of any country
- ❖ All countries use phytosanitary measures to manage the risk of pest introduction associated with trade in plant products



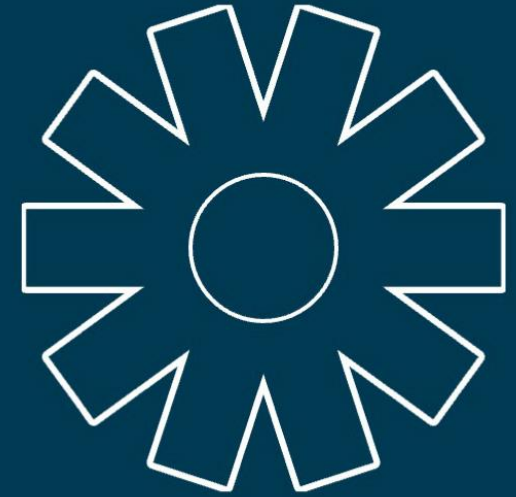


PHYTOSANITARY IRRADIATION

**HAS DEVELOPED A CENTRAL ROLE
AMONG CURRENT PHYTOSANITARY
RISK MANAGEMENT STRATEGIES IN
THE UNITED STATES AND MANY OTHER
COUNTRIES**

PHYTOSANITARY IRRADIATION

- ❖ A contemporary pest risk management measure; first used in 1986
- ❖ Irradiation has many characteristics that make it unique among phytosanitary treatment methods

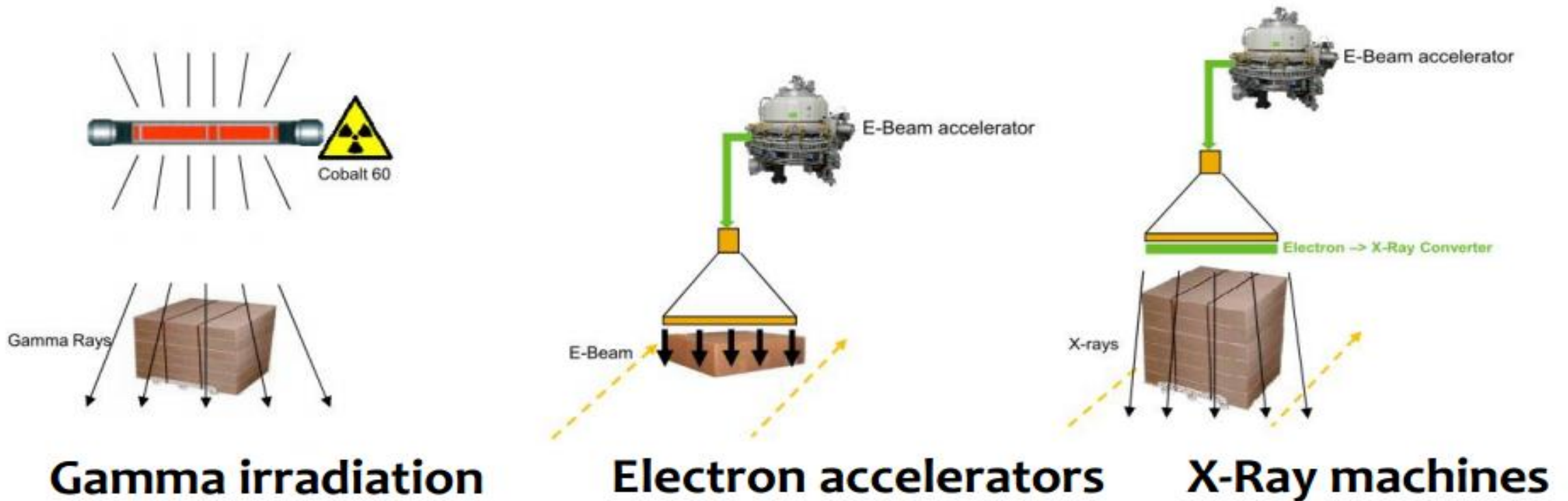


RANGE OF RESPONSES

- Mortality
- Sterility or limited fertility
- Limited development
- Non-emergence
- Devitalization (of seed)
- Inactivation (of microorganisms)
- Sprout inhibition



RANGE OF APPLICATION TECHNOLOGIES



IMPROVES COMMODITIES

- Many products (but not all) are improved by irradiation treatment
- Increase quality and shelf life

Papaya

Cherry

Mango

Figs

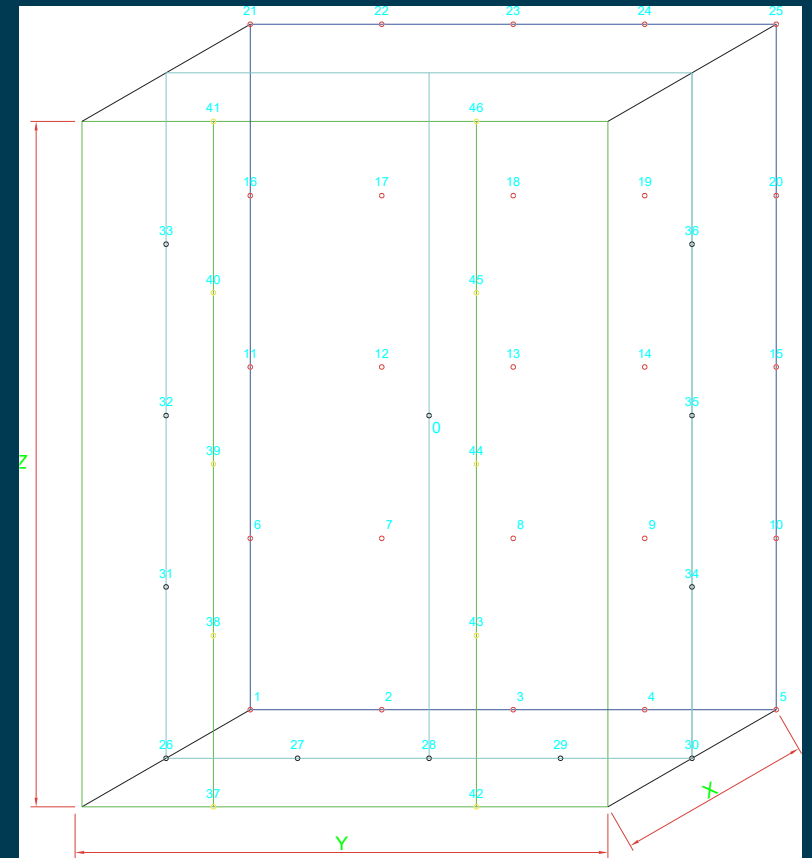


ACCEPTANCE OF LIVE PESTS

- Mortality is not required to achieve quarantine security (sterility is sufficient)
- Must have confidence in the dose and application because treated pests remain alive
- Focus on the integrity of the treatment and inability of pests to establish
- Requires a change in inspector's mindset

ABSORBED DOSE

- Efficacy measured by dose absorbed by the pest that achieves the desired response
- Application achieves the minimum dose at every point in the load
- Dose is the same for the same pest in every commodity
- No need for research on doses for every commodity or regulatory approvals for every commodity



GENERIC DOSE

- Research demonstrates the effectiveness of one dose for groups of pests; for example:
 - ✓ **150 Gy** for all fruit flies
 - ✓ **400 Gy** for all insects except lepidopteran pupae/adults
- Generic doses for regulatory applications are globally approved by the International Plant Protection Convention (IPPC)



OPPORTUNITY!!!

Every commodity that is affected by a pest which has either a specific dose or generic dose is eligible for irradiation as a phytosanitary measure if...

the commodity can tolerate the dose.

MANGO

PEACH

RADIOPHYLICS IN COMMERCE

Grape

SWEET LIME

GUAVA

DRAGON FRUIT

POMEGRANATE

RAMBUTAN

PAPAYA

LONGAN

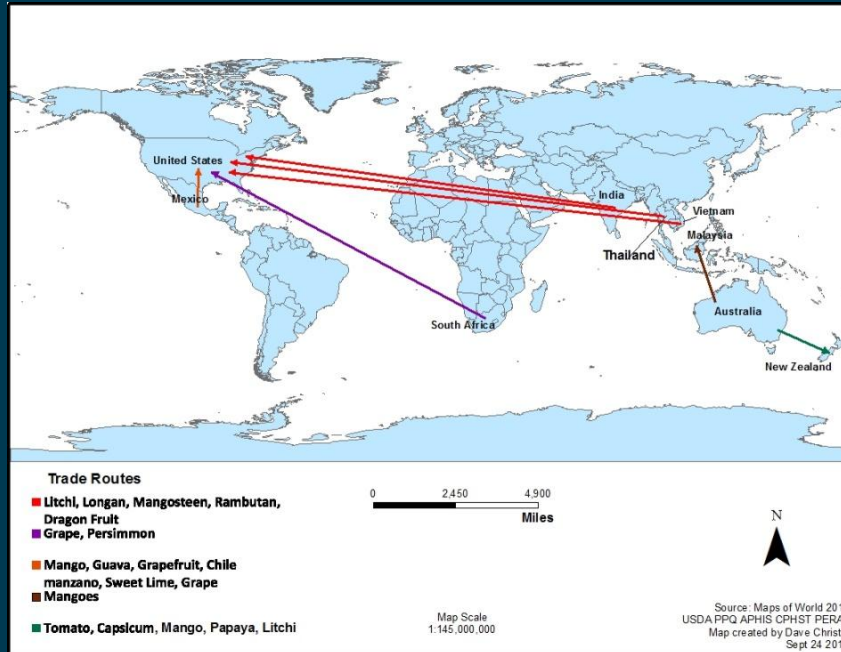
MANZANO

MANGOSTEEN

PEPPER

PERSIMMON

FIG



RADIOSENSITIVE

Fruit: citrus, orange, pomelo
chabacano, cherimoya, nispero,
maracuya, pear, pineapple, plum,
tangelo, annonas, black plum ...

Flowers: Chrysanthemum, Rose,
Callalily, Antherium, Sweet pea, Iris

Total volume of irradiated fruit exported from Mexico to the US in tons/yr

year	Volumen (ton)
2008	265 (guayaba)
2009	3564 (guayaba)
2010	5912
2011	5636
2012	8178
2013	9240
2014	10030
2015	11713
2016	14991
2017	15000
2018	17000
2019	20034
2020- 2024≥	35034



PI FACILITIES IN MEXICO

- Agroindustrial **e-beam** plant in Aguacalientes
- Benebion **cobalt 60** plant in San Luis Potosi





PI USE IN THE WORLD



- **Irradiation treatment is greatly underutilized and is the phytosanitary treatment with greatest potential to increase fresh commodity trade**
- 60 countries have a regulatory framework that makes provision for the consumption and commerce of irradiated food but only 15 have established trade using PI treatments for fresh commodities
- Most countries have established commerce in irradiated food but principally dried food, condiments, spices and herbs
- Most countries have at least one facility, but they are multi-use or exclusively to sterilize medical supplies

POLICY AND MARKET DEVELOPMENT

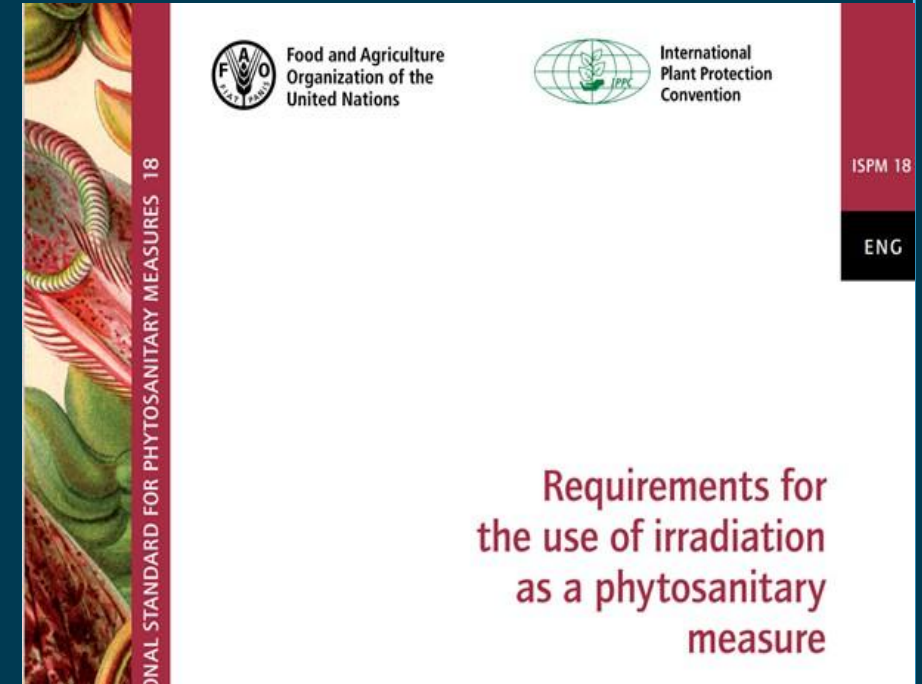
The path to development and implementation of PI technology requires:

- Commercial interest, market demand or potential
- Political will for multi-authority collaboration; government, academia and private
- Business plans to justify investment
- Education of stakeholders and the public
- Understanding international obligations and standards

HARMONIZATION HELPS!!!

Elements that facilitate harmonization

1. Technical justification (scientific evidence demonstrating risk)
2. Effectiveness in providing an appropriate level of protection (based on research)
3. Operational feasibility and cost effectiveness
 - **ISPM #18 Guidelines for the use of irradiation as a phytosanitary treatment**
 - **ISPM #28 Phytosanitary treatment for regulated pests** (currently 16 internationally agreed PI treatments)



FROM THE CROP TO THE TABLE

The ability to benefit economically from marketing irradiated products depends on countries having a reasonable and predictable regulatory framework based on multilateral harmonization



THANK YOU

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