



PsIP
phytosanitary
irradiation platform



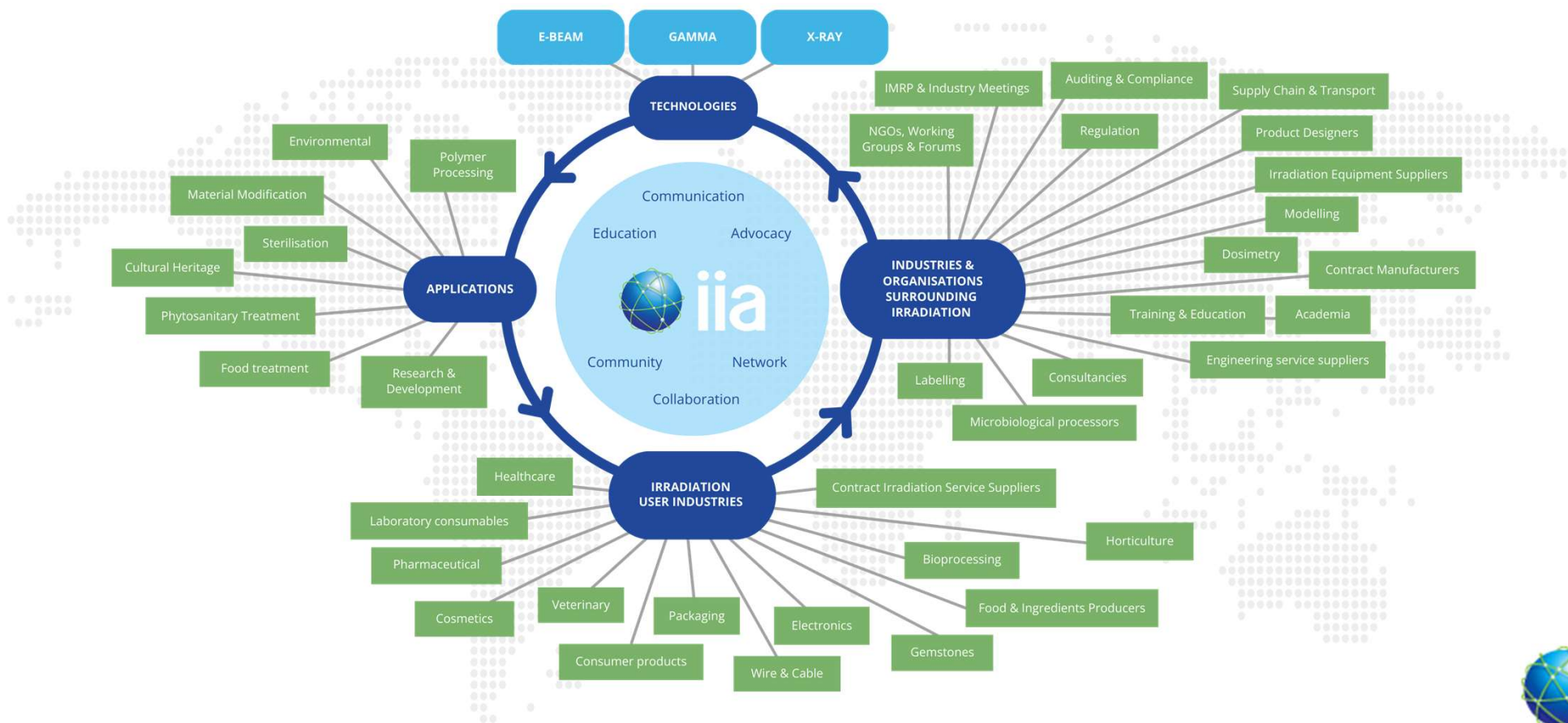
Phytosanitary Irradiation - Community Update

Paul Wynne (iia / PsIP)

CRP D61026, IAEA 12 Dec 2024



Industries and applications surrounding radiation processing



The Genesis of PsIP

To support initiatives that help to facilitate the use of phytosanitary irradiation.

- Building on the foundations of the Chapman Forum.
- Focussed specifically on Fresh Produce Phytosanitary.
- Acknowledging the progress in Australasia & the Americas.

Information Hub on the PsIP website

Trade

- + 'Phytosanitary irradiation: Building stronger pathways for domestic and international trade' Project report out of Australia
 - + PI Mexico 2017-2021
 - + PI Australia 2005-2020
 - + PI Mexico 2020
 - + Vietnam- USA trade 2020

[View All](#)

Standards

- + ISPM standards – Update May 2023
- + Approval of irradiation facilities
 - + ISO Standard

[View All](#)

Regulations

- + US regulations for phytosanitary irradiation
- + Australian regulations for phytosanitary irradiation

[View All](#)

Databases

- + International Database on Commodity Tolerance
- + International Database on Insect Disinfestation and Sterilization

[View All](#)

Irradiation Facilities

- + Low Energy in-line X-ray for PI
- + Optimizing the location of a PI facility
- + New Zealand – Phytosanitary X-ray facility
- + Specification X-ray system for SIT
- + Irradiation Facilities

[View All](#)

Advocacy

- + Revision of maximum X-ray energy limit – update May 2023
- + Proposed revision to maximum dose

Books

- + Irradiation for Quality Improvement, Microbial Safety and Phytosanitation of Fresh Produce
- + Pest Management in Postharvest Storage : Novel Techniques
- + Phytosanitary Measures
- + Market Access of Fresh Horticultural Produce
- + Quality Improvement, Microbial Safety & Phytosanitation of Fresh Produce

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Research

- + Species sensitivity distributions
- + Phytosanitary Irradiation of the cocoa mealybug (*P. lilacinus*)
- + IAEA CRP D61026 on PI Treatments – Report 1st Coordination Meeting
- + Irradiation of slug hosting parasitic nematodes
- + New IAEA Coordinated Research Project on PI Treatments – Update Oct 6, 2021

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Other resources

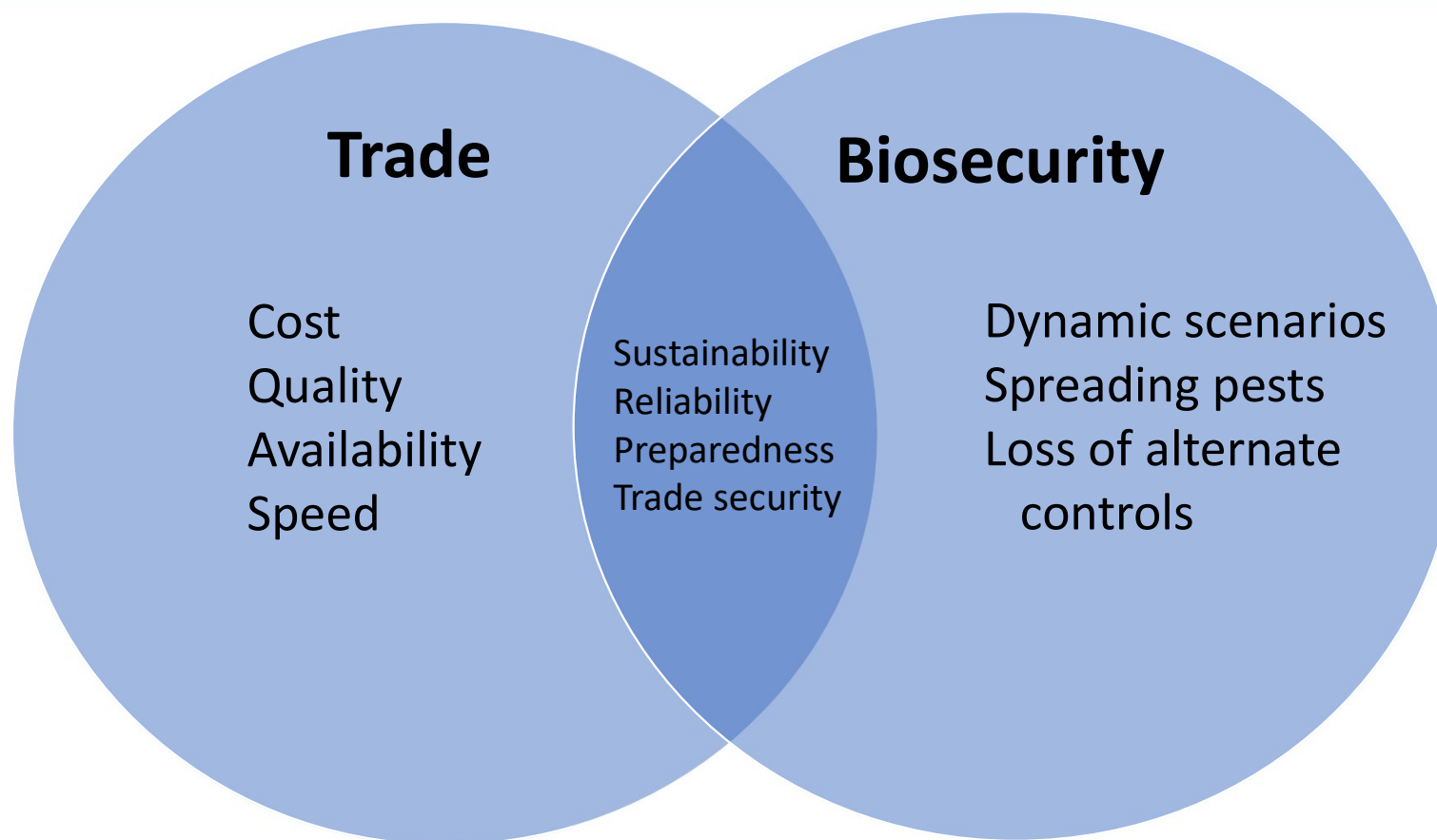
- + 'Comprehensive Generic Doses for Phytosanitary Irradiation' Webinar Recording
- + 'Fruit Quality: Phytosanitary Irradiation vs Conventional Post Harvest Treatments' PsIP Webinar Recording
- + 'Effects of Phytosanitary Irradiation on Fresh Produce Quality' PsIP Webinar Recording
- + 'USDA APHIS PPQ Programs: Strong Roots and Still Growing' PsIP Webinar Recording
- + 'Phytosanitary irradiation – An Australian Perspective' PsIP Webinar Recording

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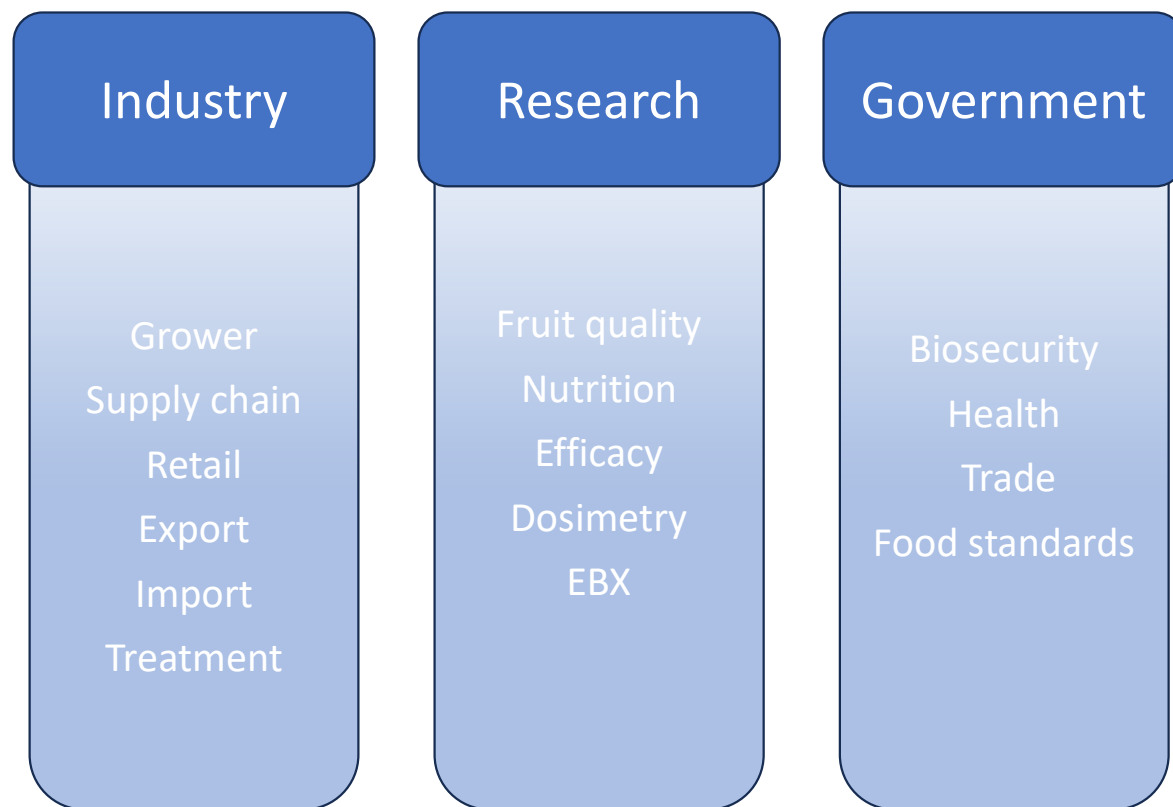
Recent PsIP Webinars:

- ***Phytosanitary Challenges & Opportunities*** – Yves Henon (iia Board Member and Subject Matter Expert)
- ***Effects of Phytosanitary Irradiation on Fresh Produce Quality*** – Dr John Golding (Research Scientist NSW Australia)
- ***Fruit Quality Irradiation v Conventional Treatments*** – Professor Anuradha Prakash (Chapman university USA)
- ***Comprehensive Generic Doses for Phytosanitary Irradiation*** – Dr Peter Follett (Research Entomologist USDA)
- ***USDA APHIS PPQ Programs*** – Laura Jeffers (Senior Risk Manager Pest Exclusion and Import Programs USDA APHIS, USA)
- ***Phytosanitary Irradiation an Australian Perspective*** – Sally Ormiston (Assistant Director Biosecurity Department of Agriculture, Fisheries and Forestry – Australia).

Drivers of Phytosanitary Irradiation



Understanding Stakeholder Groups

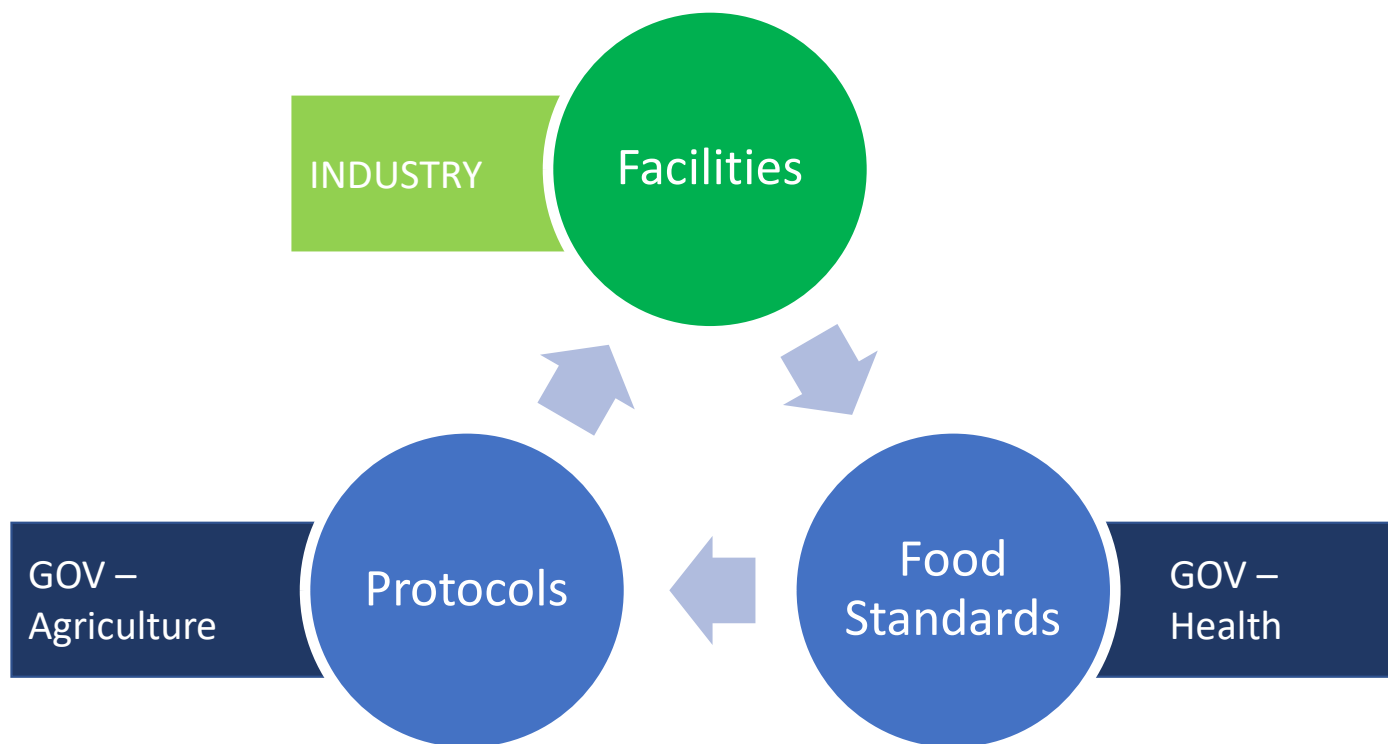


Every Stakeholder brings a unique perspective

Collaboration between stakeholders is essential if we are to unlock potential

Regional differences multiply the complexity.

Three “Hard” Barriers to Trade



These barriers prevent trade. Development must happen in parallel.



Food Standards

Enable the the treatment technology to be applied

Ensure it is safe, fit for purpose

Determines important variables and requirements

Science based

Usually an independent government Authority



Protocols

OFFICIAL

AGRICULTURE VICTORIA

ICA-55: Irradiation Treatment

REVISION REGISTER

Date of issue	Amendment details
22/08/2019	Version 1.0: New Procedure
31/12/2020	Version 1.1: update procedure to new format; addition of the Act to references (3)
05/10/2022	Version 1.2: update of reference (3) change name of PSW-02 to SOP, update of host product list to include cut flowers, change of produce to product, add definition for Serpentine leafminer and definition of pupata intensity.

OFFICIAL

Enable the routine movement of product.
Relies on science and statistics.
Usually has an operational work plan.
Specific to a crop and region, historically.
Requires auditing and routine inspection.
May require stakeholders to be certified.
Governments must have overarching systems.

Facilities

Facility Operators - experts in irradiation who need to deliver:

- Operational biosecurity
- Local approvals to operate & licencing
- Design of a fit for purpose facility (design, dosimetry, cold chain)
- Meet commercially viable expectations



Investment challenges.

Food Standards

What is the regional authority?

Does it have a standard?

How are they developed?

Is CODEX an accepted solution for your region?

Does your standard harmonise with export markets?

Protocols

Do you have irradiation protocols?

What pests are you targeting?

Does your biosecurity authority have irradiation experts?

How does your region develop market access protocols?

Facilities

What licences are required?

What trade opportunities will a facility service?

What source is most suited?

Where would it be located?

Who are the stakeholders?

The world needs more and better phytosanitary measures



Massive yet grossly underestimated global costs of invasive insects

Corey J. A. Bradshaw , Boris Leroy, Céline Bellard, David Roiz, Céline Albert, Alice Fournier, Morgane Barbet-Massin, Jean-Michel Salles, Frédéric Simard & Franck Courchamp 

Nature Communications 7, Article number: 12986 (2016) | [Download Citation](#) 

...invasive insects cost a minimum of 70 billion USD per year globally, while associated health costs exceed 6.9 billion USD per year...

*...two main phenomena leading to an increased frequency of introductions and potentially expanding distributions of the costliest insect invaders: **international trade and global warming.***



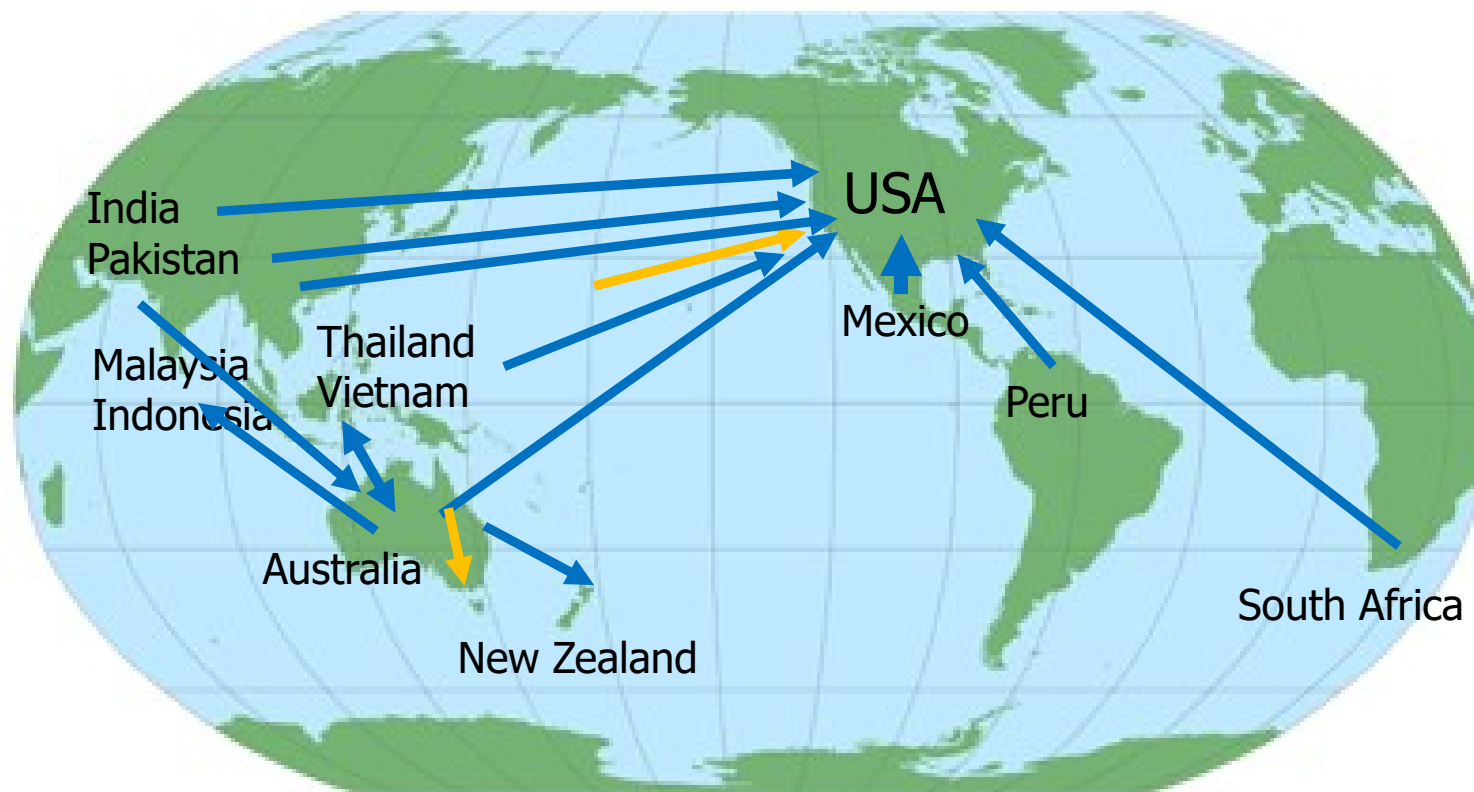
CONFIDENCE IN EFFICACY OF PHYTOSANITARY IRRADIATION



<p>SOUNDNESS OF RESEARCH SUPPORTING MINIMUM DOSE</p>	<p>CONFIDENCE THAT THE IRRADIATION PROCESS WILL ACHIEVE THAT MINIMUM DOSE</p>	<p>PHYTOSANITARY SAFEGUARDING OF PRODUCT AFTER IRRADIATION</p>
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Trade of produce irradiated for phytosanitary purpose

→ International → Domestic



Global volume 2022 ~ 60,000 tons (estimate). USA main importer

Distractions – “Soft” Barriers

- Soft barriers do not completely block trade but may slow the flow.
- Soft barriers distract and disrupt effective development efforts.
- Historic Example: Consumer Resistance & Labelling
- Organic products and the term ‘additive’



Proudly leading
sustainable biosecurity

This store and the many farmers that supply it are committed to providing fresher more sustainable produce choices.

As part of this commitment, X-ray and gamma ray is used as biosecurity control, replacing older chemical, heat and fumigant-based treatments.

Irradiated produce not yet accepted in some major markets

Japan
South Korea
Taiwan

China ?



European Union





Active international cooperation to develop new generic doses



Will broaden the scope of applications

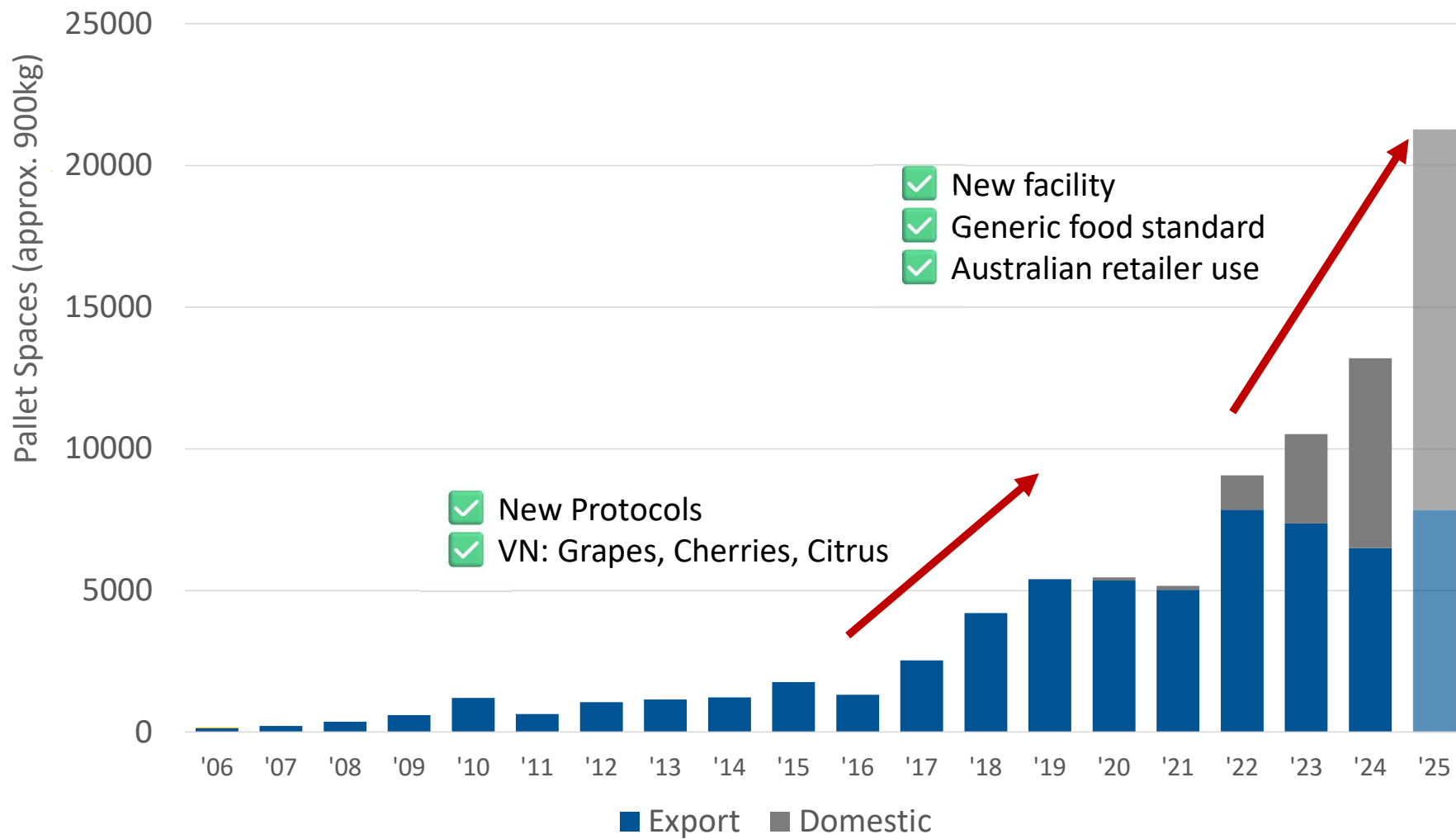
CRP 2nd RCM D61026 Novel Irradiation Technology for Phytosanitary Treatment of Food Commodities and Promotion of Trade

Will make practical application easier

Technical Cooperation Project RLA1021 Started in 2022

Strengthening Capacities and Promoting New Trends Related to Irradiation Technologies for Quarantine Purposes (ARCAL CLXXXI)
Argentina Brazil Chile Colombia Costa Rica Cuba Dominican Republic Ecuador El Salvador Honduras Mexico Panama Paraguay Peru Uruguay




Australian Irradiated Produce Volumes





PoID
ph
irr



-  Two-way trade
-  One-way trade
-  Domestic trade

Summary

- There is clear evidence of significant growth albeit from a low base
- Policy alignment would greatly support commercial growth
- The importance of Standards, Protocols and Facilities
- Generic doses would greatly support the use of phytosanitary irradiation
- Success stories in Mexico, Australia, Vietnam should be shared
- There is an opportunity to inform NPPO's over the 'efficacy' of irradiation
- We are now in a dynamic phase of evolution requiring fast responses
- PsIP, and IFIS, have an important role to play