Advancing Australian biosecurity and trade with phytosanitary irradiation

Ben Reilly, Oct 2020

STERITECH

Protecting what matters

Who is Steritech?

Private, family owned Australian company

50 years experience in delivering irradiation services

- Operations in three states
- Four stand-alone irradiation facilities (two fresh produce capable)
- X-Ray, E-Beam and Cobalt sources
- Extensive history of compliance under numerous quarantine and quality assurance certifications

20 years of experience specializing in fresh produce treatments

- Stakeholder engagement
- Market access development
- Regulation development

Industries served

General agriculture

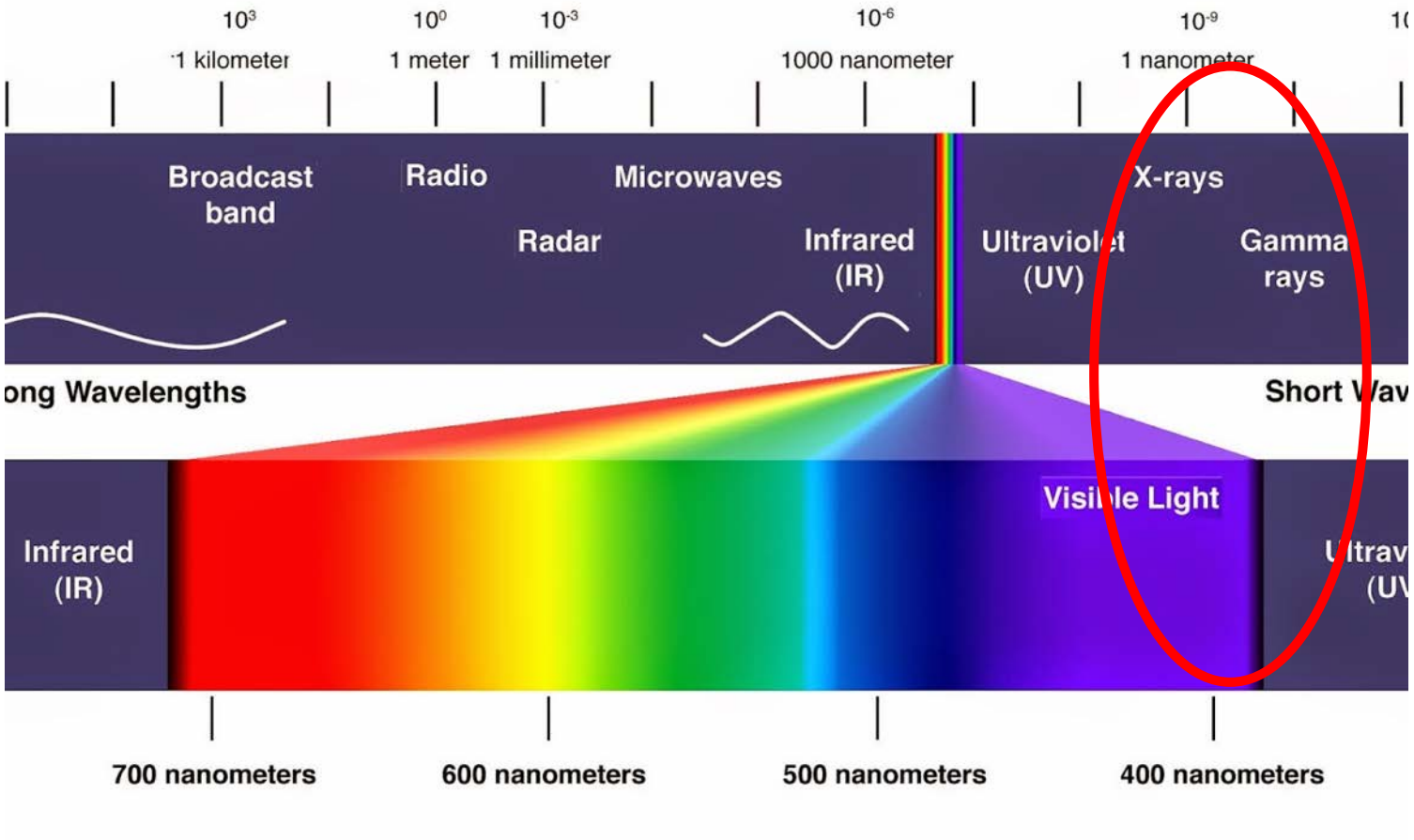
Pharmaceutical

Medical

Quarantine

Packaging

Pet products



A wave of energy like light and sound

Heat-free, chemical-free alternative

Sterilises insect pests

No withholding periods

What is phytosanitary irradiation?

Regulation and approval

Food Standards

FSANZ: 26 crops approved, remainder pending

Biosecurity

State Government: ICA-55 for interstate shipments

Federal Government: Export protocols to 6 markets

Internationally

Codex Alimentarius, ISPM 18, ISPM 28 …WHO, FAO, USDA, FDA

Why are end-point-treatments needed?

Food is often transported between states and countries:

- food security
- year-round access
- healthy consumer choices

Biosecurity risks (pests, diseases etc) can hitchhike on food shipments.

Shipments with a biosecurity risk must be treated to prevent the spread of pests.

Irradiation is a modern treatment with benefits for the environment, consumer and grower.

Significant for fruit fly control

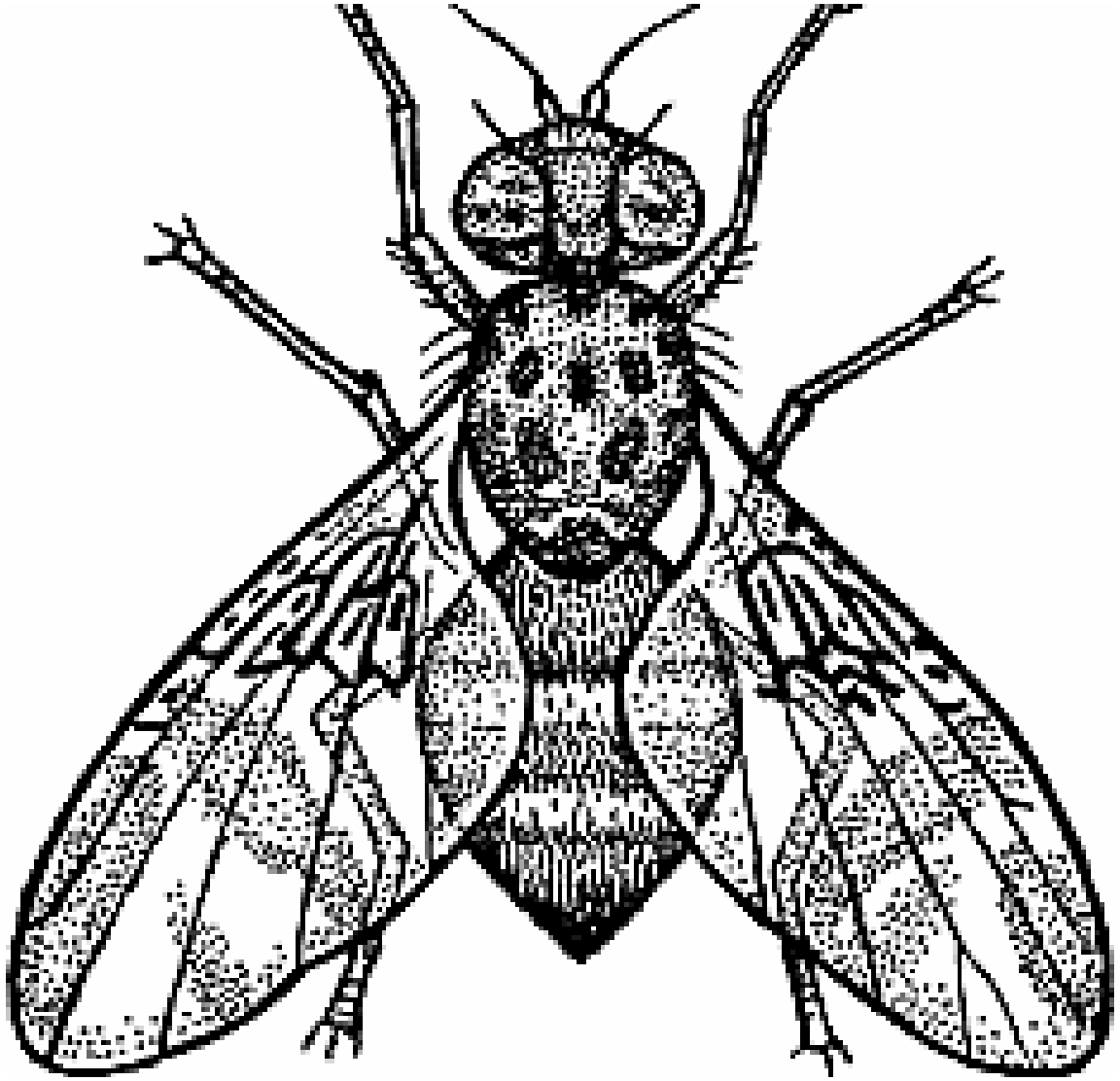
Irradiation has two widely recognised generic treatments:

150Gy – all fruit fly

400Gy – all insects

Australia is broken into three regions for fruit fly: East, West, Fruit Fly Free

Irradiation is the only treatment that has a generic treatment with efficacy data for all fruit fly and all fruit.



Simplicity of ICA-55

There are over 30 different ICA's for fruit fly control

Almost all of these have some form of limitation (crop, region, season)

In recent years there have been numerous high-profile fruit fly incursions and treatment failures.

ICA-55 (irradiation) is a single solution for all fruit fly host commodity shipments with no failed treatments identified in 15 years of use in Australia

Importance of domestic biosecurity

Protect Australian farmers and reduces need for sprays

Demonstrates capability to trade partners

Domestic system is the foundation for export protocols

Loss of PFA’s and East-West would result in loss of market access for many industries

Development in Australia

Australia is a global leader

Infrastructure

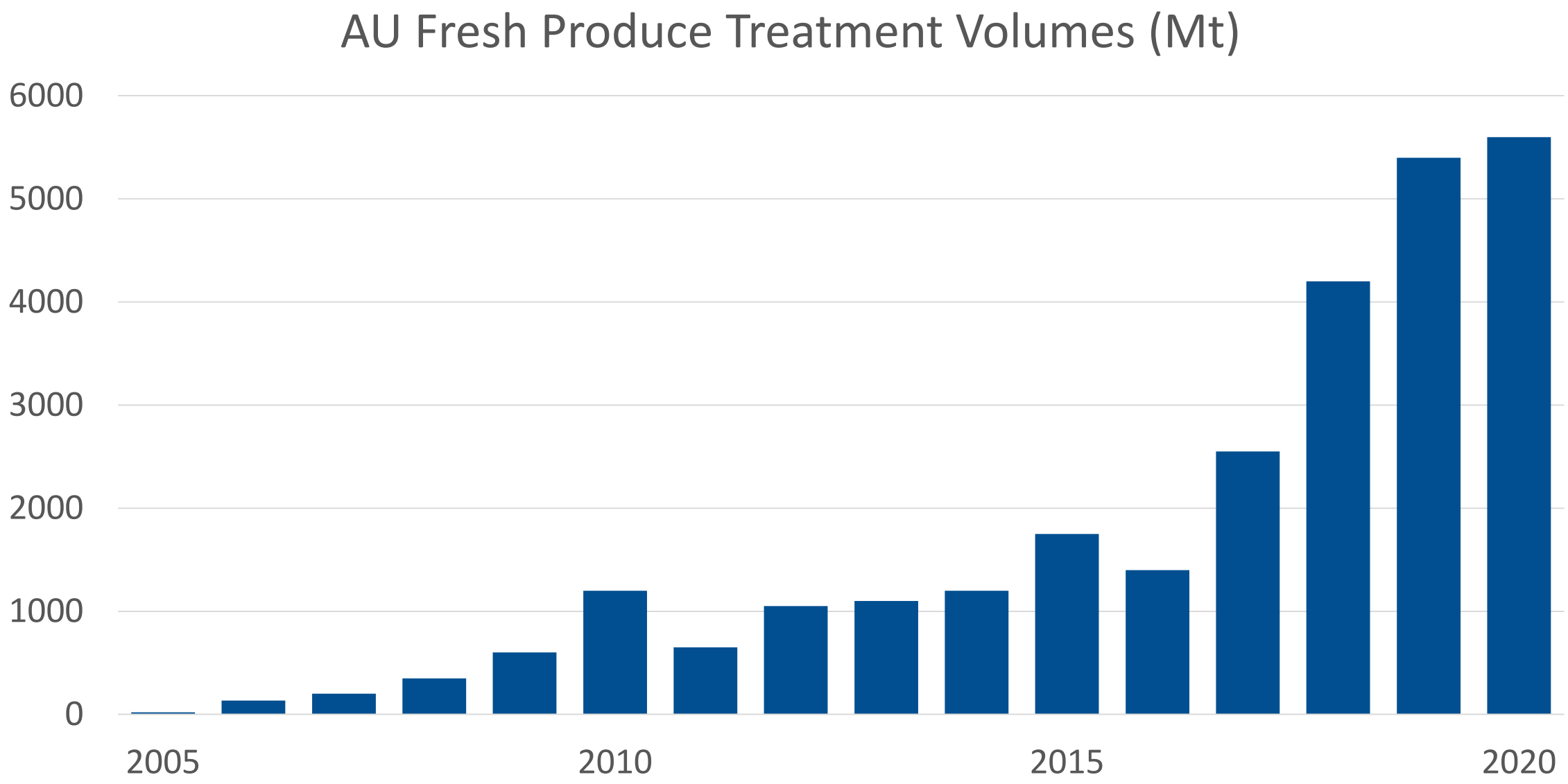
- 2004 First whole pallet, fresh produce facility
- 2020 First whole pallet, X-Ray/E-beam fresh produce facility

Protocols and use

- Import
- Export
- Domestic

Australian protocols

Domestic	
ICA-55	26 crops (alternative to fumigation, dips, sprays)
	summer fruit, berries, cherries, grapes, mangos, tomatoes etc
Export	
New Zealand	mango, grape, lychee, tomato, capsicum
USA	mango, lychee
Vietnam	grape, cherry, citrus
Thailand	persimmons
Indonesia	20+ crops
Malaysia	mango


AU Fresh Produce Treatment Volumes (Mt)
6000
5000
4000
3000
2000
1000
0
2005
2010
2015
2020

Comparison of end-point-treatments

	Fumigation	Dip/spray	Cold treatment	VHT	Irradiation
Cold chain friendly and flexible	✗	✓	✗	✗	✓
Generic insect / crop efficacy	✗	✗	✗	✗	✓
Rapid (12hrs)	✓	✓	✗	✓	✓
High capacity	✓	✓	✓	✗	✓
Chemical free, environmentally friendly	✗	✗	✓	✓	✓

Highest confidence

Extreme process control

- Fewer significant variables
- Automated process
- Dose-mapping qualification
- Product security
- Many layers of additional margin built in

If a sterile, live larvae is found

- Document checks
- Labelling check & DNA test

Melbourne Merrifield X-Ray facility

Nationally significant asset

Source converts electricity into X-Rays

Central to 50% of Australia’s produce movements

Stand alone, double door biosecurity facility

Treatment process

Product arrives and undergoes QC and QA check

Pallets loaded onto a conveyor

Conveyor carries product past the source

Treatment takes approximately 1hr, in refrigerated environment

Electronic records track the pallet from receiving to dispatch

Automated scanners match the product ID to a treatment record

Dosimetry confirms treatment success prior to dispatch

3x temp zones pre & post treatment

Refrigerated conveyor carries pallets through treatment for unbroken cold chain

Refrigerated loading docks

What have the challenges been?

Complexity and speed of regulation development (local and foreign)

- Food standards regulations
- Biosecurity legislation
- Alignment with foreign regulations

Lack of treatment facilities globally

Extra labelling requirements (vs. no label for chemical treatments)

Perceived barriers - commercial success and practical engagement have disproven these

FAQ’s

Q. Does it damage the nutrition?

A. No, thorough FSANZ reviews found no significant impact on nutrition, with any measured variation comparable to what is naturally found within fruit and other widely established handling practices.

Q. Will all my food be irradiated?

A. No, end-point-treatments are only ever used when there is a specific need. There are many existing treatments, of which phytosanitary irradiation is just one.

FAQ’s

Q. What are the benefits for consumers?

A. Consumers gain improved access to a greater range of fresh produce, often fresher and delivered in a more sustainable way that avoids fumigants and chemical dips.

Q. What are the benefits for farmers?

A. Irradiation is extremely reliable, helping protect local growers from foreign pests and disease. For growers using the treatment to reach market it is often the preferred treatment as it does not damage the fruit quality or shelf life.

FAQ’s

Q. What are the benefits for retailers?

A. The treatment is extremely reliable. Alternate treatments often fail which result in significant food waste and empty shelves. This increases the cost of supplying fresh food.

A grower and exporter perspective on phytosanitary irradiation

About Marto’s Mangoes

Family business

Growing mangos in Bowen for 30 years

Market and export our own fruit

Investing in new technology for quality

- on farm ripening
- new packing line

About Australian mango exports

Markets:

New Zealand, USA, Malaysia

Japan, China, Korea

Hong Kong, Singapore, UAE, Canada

Domestic / Interstate

Treatment/s:

Irradiation

Vapor Heat Treatment (VHT)

Non-protocol

Fumigation, Dimethoate, Irradiation

Trade Challenges:

- Cost, quality and capacity of VHT protocols
- Treating all current and future pest scenarios
- Complexity of different protocol requirements

AUSTRALIAN MANGOES

Marto’s Mangoes experience

Many years experience exporting to New Zealand, using irradiation

Treatment benefits:

- Quality and cold chain
- Capacity
- Reliability
- Works on all insects
- Environmentally friendly
- Support and collaboration with Steritech

Industry results with New Zealand

Australia’s largest protocol market for mangoes

- >1500 pallets per year
- >2.5 million mangoes
- 100% treated with irradiation

Consumer preference for Australian grown mangoes

- Flavour
- Shelf life
- Appearance

5 consecutive years of trade growth

Importance of irradiation to industry

Grow Asia exports

Simplify biosecurity requirements on growers

Avoid fumigation failures / recalls

Protect Australian growers from imported pests

Australia grows some of the world's best mangoes. Without effective protocols we cannot reach our export potential though.

A Tasmanian retail perspective on fruit fly treatments

Kemuel Wood

October 2020

Who are we?

Family owned independent retailer

Operating as Bay of Fires IGA, this store has

served the the community for 15 years

Tasmanian IGA Retailer of the year: 2013, 2014, 2016

Experience in wholesale produce supply before joining IGA is a critical part of our store performing over 42% in fresh.

Challenges of retailing in Tasmanian

Almost all fruit shipped to Tasmania requires a fruit fly fumigation.

Fumigation damages product quality and sometimes fails, causing recalls. The most recent example of this occurring 3 weeks ago.

Maintaining regular supply of quality fresh produce is challenging. Fruit which heated to in excess of 20 degrees then fully wrapped in plastic whilst at that temp. has fruit breaking down in a matter of hours & days, not weeks

Tasmanian consumers deserve choice and quality produce.

Fumigated mangoes in Tasmania often suffer skin blemish and softening issues

Irradiation trial

2018 mango trial using irradiation

- Quality was excellent
- Retention samples lasted much longer
- Sales were very strong over 5500 in 2 weeks
- Customer feedback focused on fruit quality
- No consumer questions about labelling

In 2018 there was no facility in Melbourne and this exercise took significant planning.

The new facility in Melbourne will allow convenient access to treatment for supplying Tasmania.

February 2018 trial

Pros and Cons

Advantages:

- Better quality and extended shelf life due to less invasive treatments
- Greater consumer choice and availability
- Chemical-free
- Better protection for local growers with zero chance of fumo failure

Challenges:

- Educating the consumer. What % of our customers even know what current requirements are and what happens when a live lava is found in a piece of fruit even though it will be sterile.

Australian Government
Department of Agriculture, Water and the Environment

Overview of international acceptance of phytosanitary irradiation

James Fell

26 October 2020

An attractive emerging export pathway

- Countries impose phytosanitary requirements
- Role of government in negotiating phytosanitary access
- Agreements between governments are required for agrifood trade to occur
- Around 36 existing treatment pathways on a country-commodity basis
- Irradiation: increasing acceptance as an important pathway

International Plant Protection Convention

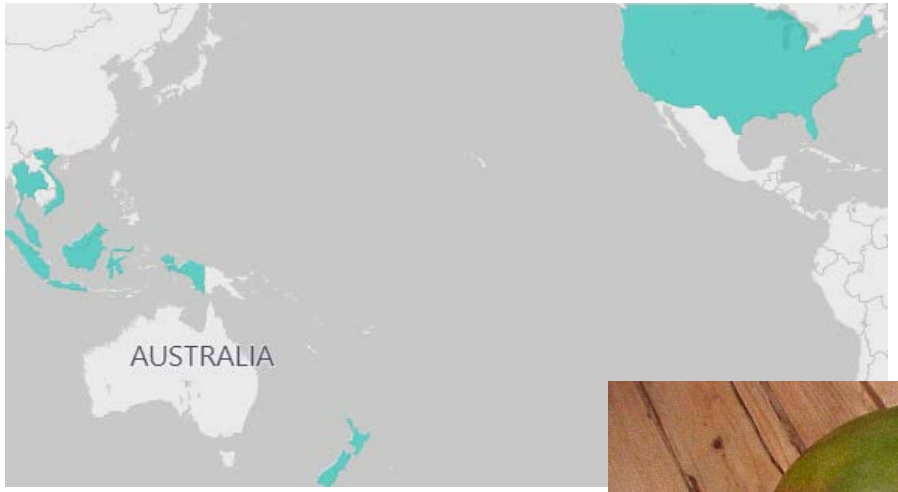
CODEX ALIMENTARIUS
INTERNATIONAL FOOD STANDARDS
Food and Agriculture Organization of the United Nations
World Health Organization

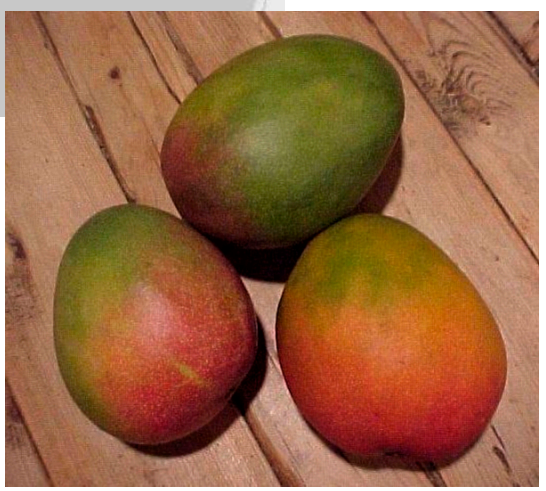
WORLD TRADE ORGANIZATION

Irradiation for Australian exports

- Indonesia
- New Zealand
- Vietnam
- US
- Thailand
- Malaysia
- Cook Islands

- Many commodities such as mangoes, lychees, cherries and more





Irradiation: used globally

- Irradiation as a food treatment has been around for decades
- 60+ countries allow consumption of irradiated produce, including SE & NE Asia, EU, US and India
- Numerous countries have irradiation export pathways:
  - Thailand, Vietnam, US, India, Mexico, Australia and more
- Some countries allow it domestically, but not for imports

Source: IAEA

International promotion of treatment pathways

- Promoting expanded international acceptance
- Capacity building
- Collaboration with Australian industry
- Chapman Conference
- ASEAN phytosanitary treatments workshop