

Australia export programmes for irradiated fresh produce to New Zealand

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Purpose of review: The pre-export application of agreed phytosanitary measures for economically important species of fruit flies (eg, *Bactrocera tryoni* – Queensland fruit fly) and other high risk pests are a critical aspect of New Zealand's biosecurity requirements. There are a number of successfully implemented treatments allowing for the commercial trade of fresh produce from Australia to New Zealand. The "tool box" of agreed measures include the application of post-harvest treatments such as heat treatments, cold disinfestation, chemical dips/sprays and methyl bromide fumigation. Other non-treatment options include sourcing products from recognised pest free areas (PFAs), the use of systems approaches and recognised non-host status. Over recent years, there has been a need to revise the commercial application for several of the historically recognised treatment options. In particular, the effective banning of dimethoate as an accepted post-harvest treatment option for several products required the development and implementation of new alternatives to facilitate the long-standing market access for important commodities such as mangoes, tomatoes and capsicums. The application of irradiation technology in this instance has successfully fulfilled an important technological and trade need. Furthermore, irradiation has also facilitated the market access for new commodities, such as lychees, and paved the way for the implementation of long-term and sustainable export-import programmes.

Findings: A significant volume of irradiated mangoes, lychees, tomatoes and capsicums are now purchased by consumers in New Zealand. It is very clear that not only does irradiation fulfil a technological need but it also fulfils a consumer need by making quality produce available at competitive prices. Consequently, a significant proportion of the New Zealand public will consistently buy irradiated fresh produce when it is available to them.

Directions for future research: The recent approval by FSANZ for the irradiation of a range of new commodities will open up further opportunities for both new market access (eg, for cherries and other stone fruit) and also provide a commercially viable treatment alternative for products with existing market access to New Zealand (eg, grapes). Since the commercial application of irradiation treatments has now been in place for more than a decade, trust and confidence in the technical effectiveness of the treatment has improved as well as consumer acceptance. Significant investments in associated infra-structure requirements directly relevant to the fresh produce supply-chain (eg, maintaining the cold-chain before, during and after treatment) has also sent positive signals that irradiation is a sustainable and long-term option amongst the current toolbox of treatment options. Governments and regulators must now build on the existing science-based approvals and take a more pragmatic stand to ensure that the regulatory frameworks and approval processes are less obstructive and time consuming so that consumers can exercise their free choice of buying or not buying a wider range of irradiated produce.

Keywords: market access; supply-chain; irradiation; consumer choice

Introduction

The early history relating to the application of irradiation treatment in New Zealand dates back to the effective banning of the technology by the Lange government in the mid-late 1980s. Amongst other things, the government enacted nuclear-free legislation which had a direct impact on the use of irradiation for food processing or phytosanitary treatment purposes by way of effectively banning the sale of irradiated foods in New Zealand.

This review examines the cases of successfully developing irradiation treatments for fresh produce through a change management process involving government policy, legislative frameworks, biosecurity market access and food safety regulatory processes through to commercial implementation and

active trade. It considers the reasons for, and implications of, the use of irradiation treatment in the fresh produce export-import industry and the flow-on benefits.

Irradiated fresh produce in New Zealand: regulatory frameworks

In order to sell a food in New Zealand that has been irradiated, or a food that contains irradiated ingredients, permission must be granted for that food to be irradiated in the Australian and New Zealand Food Standards Code (viz. Standard 1.5.3 Irradiation of Food) [1]. The food must also meet the labelling requirements of the Standard. Food Standards Australia New Zealand (FSANZ) is the independent statutory agency that is responsible for approving products under the Standard 1.5.3. For imported fresh produce that is permitted to be irradiated

Figure 1: Australia export volumes of irradiated fruits and vegetables from 2004 to 2015.

Season	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Mangoes (NZ/USA/Malaysia)	19	129	201	346	585	1095	620	918	1018	866	1480
Tomatoes (NZ)										413	430
Capsicums (NZ)										58	28
Lychees (NZ)		5	10	20	57	110	15	132	76	29	34
Papayas (NZ)			12	1						22	
Plums (Indonesia)											2
Table grapes (Indonesia)											28
TOTALS	19	134	223	367	642	1205	635	1050	1094	1388	2002

under Standard 1.5.3, there must also be a corresponding import health standard (IHS) in place that prescribes the necessary biosecurity (viz. phytosanitary) measures required for the effective management of regulated pests associated with each commodity. The Ministry for Primary Industries (MPI) is responsible for the development of biosecurity import health standards in accordance with the provisions of the Biosecurity Act 1993. Amongst other things, the principles and standards developed under the auspices of the International Plant Protection Convention [2, 3, 4] underpin the development of IHSs by MPI. The development of the International Standard for Phytosanitary Measures - ISPM No. 18 (2003) (Guidelines for the use of irradiation as a phytosanitary measure) was important in terms of the timing of the Australia mango IHS development process. The technical and operational aspects contained in ISPM No. 18 acted as guidance for decision-makers associated with the mango IHS development, assisted with public consultation and finally commercial implementation. As ISPM No. 18 was further developed, the application of specific doses for high risk pests (eg, Queensland fruit flies) and “generic” doses for other pests has also evolved from the international standard setting process and considered in more recently developed country-commodity IHSs.

Both the food safety and biosecurity approval processes are subject to applications and approvals on a case-by-case basis. In practice, dual applications and approvals are necessary to reach the desired end-point of active commodity trade. The biosecurity and food safety approval processes are both underpinned by the need for science-based assessments, including taking into consideration the recommendations and guidelines of the recognized international bodies for food (viz. Codex) and the international trade in plant products (viz. the International Plant Protection Commission, IPPC).

Mango case study

The main interest in food irradiation in Australia and New Zealand is as a phytosanitary treatment to ensure that viable insect

pests (eg, fruit flies) are effectively managed on the host commodity concerned. In the case of mangoes, the banning of ethylene dibromide (EDB) in 1994 removed the only recognised fruit fly treatment option at that time. Other options such as dimethoate dip or heat treatment had unproven efficacy and/or significant limitations in terms of commercial practicality due to phytotoxicity and product quality issues.

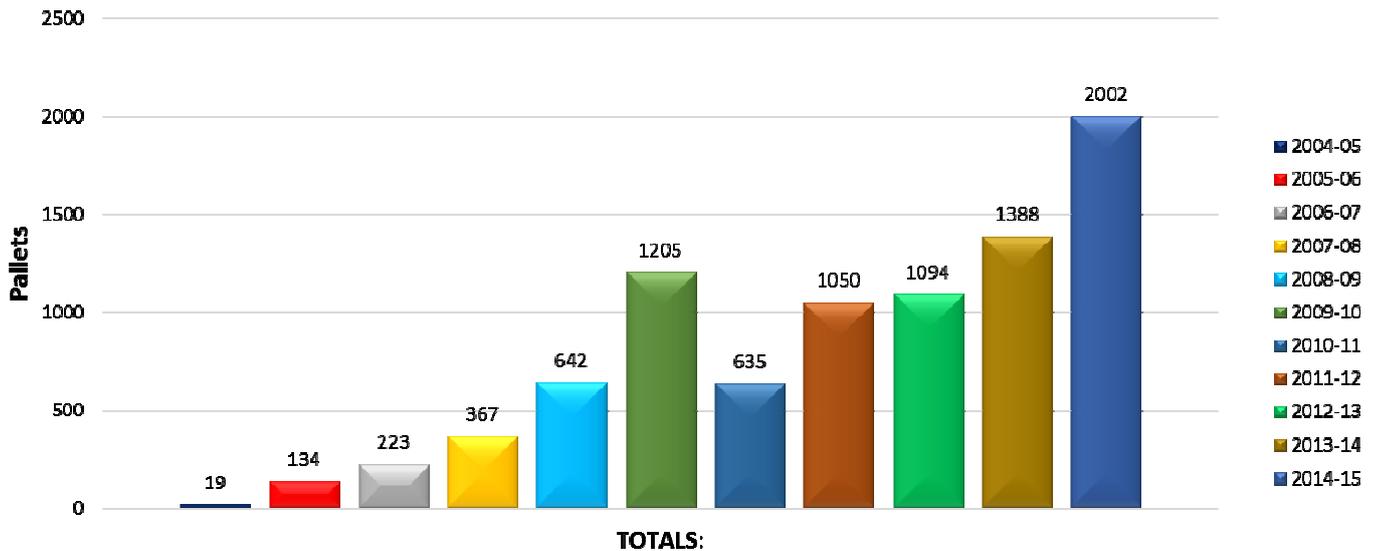
In 2003, FSANZ approved nine tropical fruits (including mangoes) that could be irradiated up to 1 kGy for phytosanitary purposes. The FSANZ approval for mangoes paved the way for an associated import health standard (IHS) to be developed using irradiation as an agreed treatment for fruit flies and other regulated pests of concern for New Zealand. Following the prerequisite technical import risk analysis (IRA) work, the Australian mango IHS was issued in 2004. Irradiated mangoes have been regularly imported into New Zealand since 2004 with a gradual increase in volumes since trade first commenced (Fig. 1, 2). Australian mangoes are marketed as premium products and sell alongside mangoes imported from other countries such as Mexico, Peru and Ecuador that have been treated with other phytosanitary treatments such as hot water dip or vapour heat.

Summary of mango retail experience

There is now sufficient experience, covering a decade of active trade, to show that when labelled irradiated mangoes are offered for retail sale, consumers will purchase and re-purchase them. This shows that irradiated produce can be marketed profitably, without risk to reputation and against lower priced products in the same category. Similar consumer acceptance has been gained for mangoes (and other products) in other countries, including those with well-informed consumers similar to New Zealand (eg, USA).

Though vocal in the media at times, lobbyist opposition seems to have had little impact on most consumers who tend to make informed decisions on the basis of what they see in front of them, product quality, eating experience and price.

Figure 2: Growth in Australian irradiated fresh produce volumes. (Note: the 2010-11 growing season was adversely affected by severe weather conditions (cyclones) in parts of Queensland).



Future directions

The increasing scope of regulatory approvals for irradiated fresh fruit and vegetables should contribute to the wider availability of more product lines to the New Zealand consumer. The mango experience has established a successful foundation for the commercial application of irradiation for the Australia-New Zealand fresh produce trade. The trade in lychees, tomatoes and capsicums has also been recently facilitated by the use of irradiation filling a technological treatment and market need [5]. Several other commodities have also now been approved for irradiation treatment through the FSANZ approval process (Fig 1). This will lead to market access opportunities for new products (eg, stone fruit) as well as adding irradiation as a viable post-harvest treatment option for products with existing market access (eg, grapes). Australia has begun exporting irradiated fruit to other countries, including mangos to the USA. In order to maximise the trade benefits for irradiated fresh produce into the future, there needs to further work in the following areas:

- Simplifying the labelling requirements for irradiated produce in line with the recommendations of the “Blewett Report” in 2011 [6].
- Reduce the cost, complexity and timelines associated with the FSANZ approval process by accepting the approval of the commodity class Fresh Fruits and Vegetables under a single generic approval under Standard 1.5.3.
- Reduce the cost, complexity and timelines associated with the commercial application of irradiation as an agreed phy-

tosanitary treatment with better use of the IPPC principle of “Equivalence” (viz. Importing contracting parties should recognize alternative phytosanitary measures proposed by exporting contracting parties as equivalent when those measures are demonstrated to achieve the appropriate level of protection determined by the importing contracting party).

- Continued consumer education on the benefits of irradiation as a safe and effective treatment alternative for fresh fruits and vegetables.

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