Alternative Options to Fenthion and Dimethoate Education Project

Mr Richard Mulcahy
AUSVEG

Project Number: VG11031 (16/01/2012 – 01/09/2012)

VG11031

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FINAL REPORT

Project Number: VG11031

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Purpose of Report: This project was designed to better inform growers and members of the market/ trade sector of the supply chain of the issues concerning changing regulations surrounding the use of the pesticides Dimethoate and Fenthion for controlling Queensland Fruit Fly in Australian horticulture, as well as viable alternatives.

Funding: This project was funded by the National Vegetable Levy and matched governement funding.

Date of final report: 18/05/2012

Final Report: VG11031 – Alternative Options to Fenthion and Dimethoate Education Project

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Project number: VG11031
Project leader: Richard Mulcahy – AUSVEG CEO
Phone number: (03) 9822 0388
Date of Report: 18 May 2012

Project Timeline

Start: 6/1/2012
Finish: 1/9/2012

Milestone Overview

2012		
Milestone Number	**Date Due**	**Description**
101	16/1/12	Agreement signed, voluntary contributions (if required) received and IP arrangements in place Agreement signed and returned to Horticulture Australia Ltd
102	1/5/12	Market Research concluded / Report provided / Road Show to commence Market research agency concludes the research component of project. AUSVEG to report to HAL outlining the outcomes of market research analysis conducted by market research agency. An overall summary of the information gathered is to be provided to HAL. Should the project be stopped for any reason at this point, AUSVEG will provide a detailed financial reconciliation of costs incurred to this point and be reimbursed for all out of pocket expenses.
190	**1/9/12**	Final report received by Horticulture Australia Ltd All necessary reports complying with Horticulture Australia's requirements received and approved by Horticulture Australia Ltd.

CONTENTS

1. Media Summary

This project was initiated as a result of action by the Australian Pesticides and Veterinary Medicines Authority (APVMA) which is reviewing the chemicals Dimethoate and Fenthion. Both chemicals are widely used for pest control purposes in Australian horticulture, particularly to control Queensland Fruit Fly. Substantial changes in regulation are likely to have dramatic implications for Australian horticulture industry.

In response to the current APVMA reviews AUSVEG undertook this project to better educate growers on issues concerning changing regulations as well as alternative treatments to Dimethoate and Fenthion (D&F) for fruit fly. These alternative treatments were heat and low Methyl bromide fumigation, cold disinfestation, irradiation and a systems approach. The project was conducted in two stages.

Stage 1 encompassed qualitative and quantitative Market Research of consumers (February – March) to gauge their attitudes towards these alternatives, specifically, whether respondents would be happy for produce to be treated using the alternative methods.   Given that consumer opinions will undoubtedly shape, or at least influence acceptance of these alternative methods by the broader industry in the future, the market research is a necessary step in the process of establishing long-term viable solutions for the control of fruit fly.

Stage 2 was an education Road Show held between 10-27 April consisting of 13 seminars. Growers and members of the market/ trade sector of the supply chain were provided with information from scientific speakers about the D&F alternatives, and informed of the challenges and opportunities that are likely to arise from the use of these alternatives on produce. Markets and quarantine issues were also discussed. AUSVEG presented the Market Research findings on consumer attitudes.

Growers and industry representatives were appreciative of the opportunity to understand with greater clarity the issues arising from the current APVMA reviews. The scientific information regarding the various methods of fruit fly control was also absorbed well by the attendees, and understanding of these methods was enhanced.

The results of this market research and education project leaves industry better prepared for regulatory action, informed of upcoming challenges, and in an enhanced position to make judgements about the implementation of new QFF management regimes in their businesses. Nevertheless, the horticulture industry needs to be active about ongoing communication of fruit fly control regulations (as well as pesticide reform more broadly) in order for it to respond to anticipated changes.

2. Technical Summary

On 6 October 2011, the Australian Pesticides and Veterinary Medicines Authority (APVMA) issued a notice of suspension on many products containing Dimethoate due to short-term dietary risk concerns. Dimethoate is typically used in the growing regions of Queensland and Northern New South Wales as an effective method for the control/disinfestation of fruit fly.

While APVMA has indicated that their suspension is a 12-month interim regulatory action while further assessments on the chemical are made (ending 5th October 2012), it is widely anticipated that Dimethoate will be banned for many uses in Australia in the near future.

Additionally, the chemical Fenthion, which is also typically used for the control of fruit fly, is currently under review, and is widely expected to also be suspended by APVMA in 2012, and banned for most uses soon afterwards.

While a number of growers and industry participants had recently been engaged in discussions regarding effective and viable alternatives to these pesticides, growers' knowledge of these alternatives remains either limited or inaccurate. As such, it is crucial for those in the industry who are affected by fruit fly to understand alternative options to Dimethoate and Fenthion (D&F) so they may eventually be adopted.

Furthermore, it is also important to gain a better understanding of current consumer attitudes towards D&F and alternative treatment methods. Consumer opinions will undoubtedly shape, or at least influence approaches to these alternative methods. In the past, consumers have had reservations about purchasing produce that has been treated using some of the alternative treatments. These reservations need to be better understood in the contemporary context if industry is to establish long-term viable solutions for the control of fruit fly in affected regions.

AUSVEG undertook this project to better educate growers on issues concerning changing regulations as well as viable alternative treatments to Dimethoate and Fenthion (D&F) for managing fruit fly. These alternative treatments were heat and low Methyl bromide fumigation, cold disinfestation, irradiation and a systems approach. The project was conducted in two stages.

Stage 1 encompassed Market Research of consumers (February – March) which AUSVEG commissioned The Klein Partnership (TKP) to undertake. The Market Research was used to gauge consumer attitudes towards alternative treatments, specifically, whether respondents would be happy for produce to be treated using the various methods. Given that consumer opinions will undoubtedly shape, or at least influence acceptance of these alternative methods by the broader industry in the future, the market research is a necessary step in the process of establishing long-term viable solutions for the control of fruit fly.

Qualitative and quantitative Market Research was conducted. 3x 1.5 hour Focus Groups were held in Melbourne, Adelaide and Hobart, during which a moderator engaged with 7-10 hand chosen consumers. A survey questionnaire was undertaken by 917 individuals from around Australia to provide information on consumer attitudes.

The main market research findings were that knowledge of fruit fly treatment methods is low; that consumers need to be better educated about treatment methods to overcome reservations/ concerns; that although the majority of respondents wanted to support Australian farmers by purchasing Australian produce, this is not sufficient to overcome other concerns about the treatments; cold disinfestation was most appealing, as were other methods which had low residue and quality impacts; that treatments which resulted in the loss of nutritional value or exposure to toxins were major turn-offs; and that while irradiation was not the most supported treatment method, a thorough PR strategy would enable it to be more accepted by consumers.

Stage 2 was an Australia-wide education Road Show held between 10-27 April consisting of two legs encompassing 13 seminars. It was anticipated that grower education would lead to greater acceptance of the alternative fruit fly control methods, which would then be adopted into their productions.

Growers and members of the market/ trade sector of the supply chain were provided with information from scientific speakers about the APVMA review process, the alternative fruit fly treatment options, and informed of the challenges and opportunities that are likely to arise from the use of these alternatives on produce. Markets and quarantine issues were also discussed. AUSVEG presented the Market Research findings on consumer attitudes undertaken by The Klein Partnership.

Across both legs of the Road Show, presentations were well received by those who attended. Growers and industry representatives were appreciative of the opportunity to understand with greater clarity the issues arising from the current APVMA reviews. The scientific information regarding the various methods of fruit fly control was also absorbed well by the attendees, and understanding of these methods was enhanced. Furthermore, the information provided in the sessions will be used by industry to better judge which methods of treatment are suitable for their business to allow for long term viability, market access and competitiveness.

Those in attendance agreed that the horticulture industry needs to be active about the communication of fruit fly control regulations (as well as pesticide reform more broadly) which will likely have a significant impact Australia wide. Forward planning is essential.

Attendees stated that further research and development activities, as well as dialogue between growers, members of the supply chain, state primary industry body researchers, quarantine authorities and the providers of pest control technology, is needed in order to help industry respond to changes in regulation.

3. Introduction

On 6 October 2011, the Australian Pesticides and Veterinary Medicines Authority (APVMA) suspended the use of the organophosphate pesticide Dimethoate for many post harvest horticultural uses. The suspension will last for a probationary 12 month period while ongoing research is conducted into the dietary and occupational health and safety risks. This suspension was implemented after the release of the 2011 Dimethoate Residues and Dietary Risk Assessment Report (August 2011) which found that its use on some crops may lead to residue levels exceeding the recommended public health standard.[1] The APVMA is also undertaking a review of Fenthion, another organophosphate frequently used in conjunction with, or in place of Dimethoate. It is anticipated that the outcomes of both reviews will have a significant impact on pest control methods, in particular for that of Queensland Fruit Fly.

As such, this project was developed to assist growers and members of the market/ trade sector of the supply chain alike to make informed decisions about future fruit fly control methods and the direction their businesses should take to ensure continued market access both domestically and internationally.

As well as information surrounding the practical and scientific nature of alternative fruit fly control methods, it was recognised that the industry needed to be aware of consumer attitudes to fresh produce treatment methods. In Australia, limited research has previously been conducted on consumer perceptions of horticultural pest control methods. To address this gap in knowledge, AUSVEG commissioned a Market Research company to identify consumer feelings, attitudes, motivations and barriers to acceptance behind fresh produce purchasing behaviour in the context of production treatment methods.

The research was conducted in two stages; a qualitative component to unearth deeper attitudes and beliefs about fresh produce, and a quantitative survey stage in which consumer opinion was quantified in a series of pre-defined questions to understand which attitudes/concerns/barriers were most prevalent in the market.

The Klein Partnership (based in Melbourne), Jones Donald Strategy Partners (based in Sydney) and Sprout Research (based in Queensland) were approached by AUSVEG, and each submitted project

[1] Chemical Review: Dimethoate. (2011, October 12). *Australian Pesticides and Veterinary Medicines Authority*. Retrieved April 30, 2012, from http://www.apvma.gov.au/products/review/current/dimethoate.php

proposals to undertake the Market Research. After careful consideration, The Klein Partnership (TKP) was chosen to undertake the Market Research which would be conducted in two stages. The first stage, a qualitative stage, involved three focus groups which took place in Melbourne, Adelaide and Hobart in February. The second, quantitative stage, involved an online survey which was completed successfully by 907 respondents in March. The respondent answers were converted into statistic information, which then was used to form recommendations for future communications strategies between industry and consumers.

4. Materials and Methods

4.1 Market Research Objectives

To accurately gauge consumer attitudes and understanding of existing methods of fruit fly control, as well as consumer perceptions regarding the alternative methods currently available:

- Dimethoate and Fenthion
- Heat and low Methyl bromide
- Cold Disinfestation
- Irradiation
- A Systems Approach

AUSVEG engaged The Klein Partnership (TKP) to undertake the market research component of this project. This included:

4.2 Qualitative Research

3x 1.5 hour Focus Groups held in February 2012 in Melbourne, Adelaide and Hobart overseen by a moderator who engaged with 7-10 hand chosen consumers.

Respondent characteristics:

- Females.
- Main grocery buyers in the household.
- Those who make most of the decisions about what food to purchase.
- A mixed audience containing females who have children and those without children.
- 30-49 years of age.
- Those who purchase organic fruit and vegetables no more than occasionally (Those who favored organic produce were excluded due to pre-existing prejudice against chemicals and treatments).

AUSVEG has recordings of the Melbourne and Adelaide sessions. For the privacy of market research participants, these DVDs cannot be copied. TKP's Moderator's Guide and the joint AUSVEG-TKP Stimulus Material are attached (**SEE APPENDIX 1 and 2**).

4.3 Quantitative Research

Consumers undertook this survey during the period of 8 - 16 March 2012. Details of the questionnaire are attached (**SEE APPENDIX 3**).

A survey questionnaire was undertaken by 917 individuals from around Australia to provide information on consumer attitudes. 917 respondents completed the survey in its entirety, the results of which were used to form conclusions about consumer attitudes.

Survey parameters:

- 10 minute online quantitative survey using a research panel.
- Performed nationally.
- Respondents were either the main or joint grocery buyers in their household.
- They had to have bought fresh fruit or vegetables in the past month.
- They could only purchase organic fruit and vegetables occasionally, not more regularly.

5. Results

The Klein Partnership completed a PowerPoint report of the Market Research (**SEE APPENDIX 4**) and also provided AUSVEG with an abridged PowerPoint Presentation for use during the Road Show phase (**SEE APPENDIX 5**)

The key market research outcomes are as follows:

Awareness of Fruit Fly is generally low, as are the methods of control

- When educated on the issue, consumers acknowledge the need to control pests.
- Methods of control are largely unknown.

Chemical use in foods is seen as a fact of life

- There is an assumption that chemicals are involved in food production, even if specifics are not known.
- Given a choice, however, respondents would minimise chemical use – resignation is not acceptance.

Education creates discomfort

- When consumers become informed about the treatment methods, they are being asked to consider something which they don’t usually think about. This creates discomfort where before there was little.
- It appears that even a little exposure to the names and methods creates suspicion.
- It also creates a challenge in interpretation. People who claim they will not-purchase fruit/vegetables treated in a particular way is likely to be overstated.

Be targeted in provision of information

- Issues are largely around the uncertainty/lack of knowledge.
- The methods require significant explanation over and above the treatment names and short descriptions.

Names and terminology

- Scientific names and terminology scare consumers.
- If possible, the use of non-scientific names may beneficial for acceptance.

Poor nutrition and ingestion of toxins are the main issues

- Consumers’ main concerns were treatment methods which reduced nutritional value or would mean they could ingest toxins.

Empathy/sympathy for farmers is high

- 80% of respondents would purchase Australian produce because they wanted to support Australian farmers – they wanted Australia to have a viable agricultural industry.
- The majority of those surveyed were passionate about country of origin, and 67% stated they would pay more for Australian grown produce.
- Although farmer's viability may be beneficial in helping to cultivate support for the alternative treatments, it is not sufficient to overcome other concerns with the treatments.

Chemical dips and sprays were concerning

- Leveraging on this fact may be an opportunity to win support from consumers for alternative methods.
- That is moving from a 'nasty' chemical dip to something cleaner, with less residue.

Heat & Low Methyl Bromide/Fumigation

- The impacts on the ozone layer were viewed negatively.
- Otherwise this method may have applicability due to low residue or quality impacts.

Cold disinfestation was the most appealing method

- This was due to its low residue, the fact that refrigeration is a familiar concept and that the name itself is not intimidating.

Systems Approach was the next most accepted

- But there were concerns about viability for farmers around the impact on cost. It was perceived as a half-way to organic if chemicals were reduced.

Irradiation was not preferred

- However, this could be overcome through informing and educating consumers.
- There is a need to ramp-up the benefits of irradiation, namely no residue and the elimination of bacteria.
- There is benefit in reinforcing the approval of irradiation in Europe.
- The requirement to label irradiated produce is a problem as it creates suspicion. Essentially, the only method the consumer would potentially be made aware of. There is a need to be as low key as possible, if possible.
- A thorough Public Relations strategy is essential for consumer acceptance of irradiation.

6. Discussion

The two stage quantitative/qualitative approach to the market research was designed to begin from a broad base which would tease out all relevant views surrounding food treatment, before honing in on key concerns of relevance to industry. The Klein Partnership (TKP) sought to define which factors held the greatest weight for consumers when purchasing their produce.

By starting with broad open ended topics of discussion, the Focus Groups unearthed underlying beliefs regarding food treatment which inform purchasing behaviours. Nutrition, produce quality, appearance, safety, environmental impacts, industry viability and economic costs to the consumer were all discussed. Participants were allowed to make their own way to conclusions about food production before more specific stimulus material on the treatment options was used by the moderator. This approach helped establish general levels of knowledge and awareness that currently exist in the public domain which could later be juxtaposed to additional attitudes that were elicited by the stimulus material which covered less well known and understood information about fruit fly treatment methods. The moderators guide is attached (**SEE APPENDIX 1**).

The key underlying perceptions of these Focus Group discussions were then analysed and channelled into a series of predefined survey questions. The statistical results of the survey could then be used to inform industry of prevailing consumer concerns and attitudes toward farming practices in general, as well as specific fruit fly treatment methods. Again, respondents were initially questioned on their attitudes towards food production and fruit fly treatment methods with no substantiating information provided. After these views were polled, a short description of the treatment methods was provided before further questions were asked specifically on the treatments. The TKP Questionnaire is attached (**SEE APPENDIX 3**). This method enabled conclusions to be drawn concerning the direction which public debate may take should alternative pest control treatment methods become a significant public issue.

It should be noted that the systems approach alternative was not touched on in the quantitative questionnaire. This was because the vastly varied nature of systems approaches for different crops and in different regions of Australia was too complex a notion to be addressed in an online survey which was geared to take ten minutes to complete for the average participant. Moreover, informative conclusions on consumer perceptions of systems approaches could not be achieved in this setting. It was, however, recognised that a possible advantage to the consumer of some systems approach methods is a reduction in the total chemical use and/or reduced reliance on chemicals in the production process. As such, question 29 of the survey was introduced to gauge the significance of this potential benefit to the consumer (**SEE APPENDIX 3**).

The findings of the research were not altogether surprising. Respondents tended to be wary of poorly understood concepts such irradiation and technical chemical names Dimethoate, Fenthion and Methyl

Bromide. Although a small level of information about the treatments created suspicion amongst respondents, further education on the safety and effectiveness of treatment methods tended to allay primary concerns. Cold Disinfestation was the most well received treatment largely due to the familiarity of the concept of refrigeration.

When given the option to choose between treatments methods, Cold Disinfestation was the generally preferred. However an overlying feature of the entire study was that awareness and knowledge of fruit fly treatment methods is generally low and thus not normally a consideration when purchasing produce. This can be substantiated by looking at the high level of concern over commonly used chemicals when brought to the consumer's attention. When asked about chemical dips and sprays, 77% of respondents agreed or strongly agreed with the statement 'I think this might be harmful to my health'. Despite this perception, it is highly likely that all of these respondents have purchased and consumed produce treated in this manner.

It appears that, whether conscious or not, most consumers assume that when produce gets to the shop shelf it is safe to eat. Unless production methods are brought to their immediate attention, they will generally not factor this aspect into their purchasing behavior. As was made evident by many of the respondents in the Focus Groups, price is overwhelmingly the greatest consideration when purchasing groceries.

The results of the market research detail numerous issues which need to be strategically considered in regards to industry communication with the consumer. It is important, however, to keep these findings in context. The reality is that current consumer purchasing behaviour is largely unaffected by the practicalities of fruit fly management methods because the public do not have a great awareness of them. Nevertheless, the perceptions of the consumer do need to be observed should the transition to new methods of fruit fly treatment become an issue of concern for the public. Industry will need to be aware of the roots of consumer concerns and have public relations strategies in place with targeted education strategies which aim to effectively overcome misconceptions and allay any fears based on lack of understanding.

7. Information Dissemination

AUSVEG completed the Dimethoate and Fenthion Alternatives Education Road Show from 10-27 April 2012. Locations, presentation venues, key speakers and travel arrangements were finalised in late March. An overview of the Road Show is attached (**SEE APPENDIX 6**). Road Show flyer/registration forms which were e-mailed, faxed and mailed out to relevant parties (**SEE APPENDIX 7**).

The Road Show (undertaken in two legs and consisting of 13 seminars) was a series of scientifically-based education/information sessions aimed at relevant growers whose operations are affected by fruit fly. Attendees were provided with relevant information about the alternatives, and any challenges and/or opportunities that are likely to arise from using these alternatives on their produce. Markets and quarantine issues were also discussed. Information sessions were also held with relevant participants in the market/ trade sector of the supply chain.

Dr Peter Roberts from Radiation Advisory Services New Zealand (RAS NZL) discussed food irradiation technology and its potential for increased use in the Australian horticulture industry. Dr Roberts participated in all of the sessions. His presentations were well received across the meetings with participants finding the information relevant and useful. It was noted that participants in the horticulture industry generally had a poor understanding of irradiation technology and feedback from attendees after the meetings indicating that Dr Robert's presentations had helped to bridge this gap in knowledge.

AUSVEG's Hugh Gurney presented The Klein Partnership's (TKP) market research findings at the sessions held on the 10-13 April and 20-21 April, while William Churchill (AUSVEG) presented the same material at the sessions held from 23-27 April.

An abridged version of the full TKP report (**SEE APPENDIX 5**) was presented by Mr Gurney and Mr Churchill. The presentation outlined the aims and method of the market research, highlighted key findings, and proposed methods for future communication between industry and consumers.

The education Road Show was conducted in two legs, details of the sessions are outlined below.

7.1 Road Show Leg One

10th April 2012, Suppliers Meeting, Connolly WA.

- Darryl Hardie from the Department of Agriculture and Food Western Australia (DAFWA) presented on the stance taken by the APVMA on D&F. He then outlined various applicable alternatives and urged pre-emptive action by the industry to modify their pest control methods. Sections of the presentation were targeted to Western Australia's specific pest control requirements including control of Mediterranean fruit fly.
- Peter Roberts (RAS NZL) and Hugh Gurney (AUSVEG) also presented.

10th April 2012, Growers Meeting, Connolly WA.

- Darryl Hardie (DAFWA), Peter Roberts (RAS NZL) and Hugh Gurney (AUSVEG) presented.

11th April 2012, Suppliers Meeting, Adelaide SA.

- Peter Crisp from the South Australian Research and Development Institute (SARDI) attended along with Hugh Gurney (AUSVEG) and Peter Roberts (RAS NZL).
- Given a smaller audience, it was agreed that the presentations were not necessary, and a discussion took place instead.

11th April 2012, Growers Meeting, Virginia SA.

- Peter Crisp (SARDI) presented on the stance taken by the APVMA on D&F. He then outlined various applicable alternatives and urged pre-emptive action by the industry to modify their pest control methods. New baiting, trapping and systems approach tools were emphasised as the current need for fruit fly eradication in South Australia are very low. Discussion of alternatives to D&F for other pest control measures was also discussed.
- Peter Roberts (RAS NZL) and Hugh Gurney (AUSVEG) also presented.

12th April 2012, Growers Meeting, Mildura VIC.

- Jonathan Fahey from the Victorian Department of Primary Industry (VIC DPI) discussed the stance taken by the APVMA on D&F. He then discussed various alternatives to D&F and explained how to use website resources to find information on regulations and current registered pest control methods. The Public Chemical Registration Information System and Domestic Quarantine websites were particularly noted as valuable resources for growers.
- Peter Roberts (RAS NZL) and Hugh Gurney (AUSVEG) also presented.

13th April 2012, Suppliers Meeting, Melbourne VIC.

- Gary D'Arcy (VICDPI) was organised to attend or to provide a second speaker to discuss the current APVMA stance on D&F as well as alternatives. However, due to an apparent misunderstanding, there was no representative from VICDPI.
- Peter Roberts (RAS NZL) and Hugh Gurney (AUSVEG) presented.

7.2 Road Show Leg Two

20th April 2012, Growers Meeting, Darwin NT.

- Andrew Tomkins from the Northern Territory Department of Resources (NT DOR) discussed the stance taken by the APVMA on D&F. He then discussed various alternatives to D&F and included some findings from research conducted at the NT DOR.
- Peter Roberts (RAS NZL) and Hugh Gurney (AUSVEG) also presented.
- A Vietnamese interpreter was recruited (via the Northern Territory Horticulture Association) to attend the session to bridge communication barriers between Vietnamese growers.

21st April 2012, Growers Meeting, Townsville QLD.

- Peter Leach from the Queensland Department of Employment, Economic Development and Innovation (DEEDI) discussed the stance taken by the APVMA on D&F. His presentation contained a focus on the specific needs of Queensland's horticulture industry with respect to the various fruit fly control methods and the effects of the APVMA's reviews.
- Peter Roberts (RAS NZL) and Hugh Gurney (AUSVEG) also presented.
- The Townsville session was filmed by Hawkeye Digital Films. This session was chosen to be recorded because Peter Leach's presentation addressed the region which is likely to suffer the greatest impact from the APVMA's reviews. The recording included all three presentations and will be made available to the public on the AUSVEG website.

23rd April 2012, Growers Meeting, Beerwah QLD.

- Peter Leach (DEEDI), Peter Roberts (RAS NZL) and William Churchill (AUSVEG) presented.

24th April 2012, Markets Meeting, Brisbane QLD.

- A special but unscheduled D&F seminar was held at the Brisbane Markets from 9:00-10:00am.
- The meeting was arranged on the 20 April 2012 at the request of Brisbane Markets due to a growth in interest from Brisbane Markets supply chain participants.
- Peter Leach (DEEDI), Peter Roberts (RAS NZL) and William Churchill (AUSVEG) presented shortened versions of their respective presentations to workers at the Brisbane Markets. Each presentation was approximately 20 minutes in length and covered the key features of their larger presentations.

24th April 2012, Growers Meeting, Gatton QLD.

- Peter Leach (DEEDI), Peter Roberts (RAS NZL) and William Churchill (AUSVEG) presented.

Pictured: Above Left - Peter Leach (DEEDI) discussing D&F alternative options. Above Right - Peter Roberts (RAS NZL) discussing irradiation. Below: Attendees of the Gatton, QLD meeting. 24th April 2012, Gatton, QLD.

26th April 2012, Growers Meeting, Bundaberg QLD.

- Peter Leach (DEEDI), Peter Roberts (RAS NZL) and William Churchill (AUSVEG) presented.

27th April 2012, Growers Meeting, Bowen QLD.

- Peter Leach (DEEDI), Peter Roberts (RAS NZL) and William Churchill (AUSVEG) presented.

7.3 Evaluation of Road Show

Across both legs of the Road Show, presentations were well received by those who attended. Growers and industry representatives were appreciative of the opportunity to understand with greater clarity the issues arising from the current APVMA reviews. The scientific information regarding the various methods of fruit fly control was also absorbed well by the attendees and understandings of these methods were enhanced. In particular, the researchers from the various state departments presented informative talks which spoke to the requirements of their audience.

After the grower meetings, there was lively conversation on how to progress in regards to new pest management regimes. Those in attendance agreed that the horticulture industry needs to be active about the communication of fruit fly control regulations (as well as pesticide reform more broadly) as future regulations are likely to have significant impact Australia wide.

The meetings highlighted a need for a more consolidated effort in addressing this wide reaching problem of pesticide use reform. As noted by several of the state department experts on the tour, the APVMA review aims to cover an extensive list of chemicals used in the horticulture. There is concern about the industry's ability to respond to changes in regulation. Attendees stated that further research and development activities, as well as dialogue between growers, members of the supply chain, state primary industry body researchers, quarantine authorities and the providers of pest control technology, is needed in order to help industry respond to likely upcoming changes in regulation. In particular an emphasis on forward planning needs to be maintained if growers are to minimize the impact which new regulations are likely to have on their market access.

8. Recommendations

VG11031 -- Alternative Options to Fenthion and Dimethoate Education Project has enabled industry to be better prepared for regulatory action, informed of upcoming challenges, and placed it in an enhanced position to make judgements about the implementation of new fruit fly management regimes beneficial for their businesses.

Nevertheless, the horticulture industry needs to be active about ongoing communication of fruit fly control regulations (as well as pesticide reform more broadly) in order for it to respond to anticipated changes.

AUSVEG recommends that all industry engages in ongoing communication efforts in order to help industry respond to likely upcoming changes in regulation. In particular, further research and development projects should be pursued, and there needs to be avenues through which dialogue can take place between growers, members of the supply chain, state primary industry body researchers, quarantine authorities and the providers of pest control technology.

Lack of communication between industry participants is of particular concern when addressing new quarantine methods which require large centralised facilities. Post harvest facilities required for Methyl Bromide Fumigation, Heat Treatments (see Peter Leach's Presentation in **APPENDIX 5**) and Irradiation are too costly to be installed on individual farms. These facilities, although having competitive running costs, necessitate a large initial capital outlay which needs to be addressed by the industry as a whole. Although these options are potentially viable for industry, the capital required is too great for any one farm (with the exception of some larger operations) and thus collaboration is required if these alternatives are to be adopted. If these facilities are to be considered for private or government investment, a unified voice would be required to guarantee viability of such an option.

There is much uncertainty about how best to proceed for many growers who are unsure how the regulations will affect their crop protection strategies. The situation is such that many in the industry are not prepared to act or unable to act decisively to protect their market access into the future and are instead awaiting the completion of APVMA's review. When the results of the review are announced, new regulation will come into effect immediately at which point there will likely be loss of market access for interstate/international export while the industry rushes to find solutions to a problem it has not previously adequately addressed. If a smooth transition into any of the above mentioned treatments is to be achieved (or indeed, other treatment options) an increase in communication and participation from multiple sections of the supply chain will be necessary.

In preparation for likely restrictions on, or the outright banning of chemicals for fruit fly management, there also needs to be a greater emphasis on educating the public (consumers) about alternative treatments. Through enhanced knowledge of alternative treatment methods, consumers will be more willing to accept to have produce treated in new and different ways. Treatment methods need to be promoted through thorough Public Relations strategies to make them more acceptable and understood by the general public. By winning the hearts and minds of consumers, and dispelling fears associated with certain alternative treatments, industry as a whole will be able to transition to and implement alternative fruit fly treatment methods with greater ease.

9. Media Coverage

AUSVEG put out a Media Release on 27 March 2012 which advertised the Road Show (**SEE APPENDIX 8**).

Media coverage of the D&F Road Show has included (**SEE APPENDIX 9**):

- News article: "Fruit fly treatments under review" in *Sunraysia Daily* (Mildura VIC), 27 Mar 2012, p.8.

- Website article: "AUSVEG Road Show offers fruit fly treatment alternatives", Food Processing, 10 April 2012, http://www.foodprocessing.com.au/news/52375-AUSVEG-Road-Show-offers-fruit-fly-treatment-alternatives

- News article: "Catch fruit fly treatment road show in Bundaberg" in *Fraser Coast Chronicle* (Hervey Bay QLD), 12 Apr 2012, p.18.

- News article: "Catch fruit fly treatment road show in Bundaberg" in *Bundaberg Mail* (Bundaberg QLD), 12 Apr 2012, p.22.

- News article: "Dimethoate and Fenthion Registration Review" *Asian and World Foods News Letter* (Funded by Rural Industries Research and Development Corporation), Issue No. 129, Mar/Apr 2012, pp.1.

- Radio interview: Radio – 2NM, Muswellbrook hosted by Newsreader – 24 April 2012, 12:16PM

10. Bibliography

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10. Appendices

APPENDIX 1 - TKP Focus Group Moderator's Guide

APPENDIX 2 - TKP Focus Group Stimulus Material

APPENDIX 3 - TKP Questionnaire Survey

APPENDIX 4 - TKP Market Research Findings

APPENDIX 5 - Road Show Presentations

- **AUSVEG Market Research**
- **Peter Roberts (RAS NZL)**
- **Darryl Hardie (WA)**
- **Peter Crisp (SA)**
- **Peter Leach (QLD)**

APPENDIX 6 - AUSVEG Road Show Outline

APPENDIX 7 - AUSVEG Road Show Flyer/ Registration Forms

APPENDIX 8 - AUSVEG Media Release

APPENDIX 9 - News coverage of Road Show

APPENDIX 1
TKP Focus Group Moderator’s Guide

tkp
THE KLEIN PARTNERSHIP
MARKET RESEARCH CONSULTANTS

4158 – Ausveg

1. Intro — 5min
    - Introduce yourself
    - Here to talk about fresh fruit and vegetables
    - Have some ideas to share with you, ideas only at this stage

2. Purchase — 5min
    - Where buy from?
        - PROMPT supermarket, independent green-grocer, speciality supermarkets, markets, farm gate, grow your own
    - Reasons for choice

3. Food treatments / pest control — 15min
    - Awareness
    - Understanding
    - Attitudes
        - For food generally / Fruit and Veg specifically
        - Is there a difference by food types?
        - Top of mind? Do you think about it when shopping?
        - Pros / Cons
        - Health / Nutrition
        - The environment
        - Storage time
        - Taste
        - Farmers / economy
        - Appearance of product
        - Impact on where buy? Why?
        - Impact on what buy? Why?
        - Role of Organic

4. Methods of Pest Control– INTRODUCE ONE BY ONE — 40min
    - First Impressions
    - Understanding
    - Likes / Dislikes
    - Drivers / Barriers (UNPROMPTED THEN PROMPTED)
        - Health / Nutrition
        - Quality
        - Environment
        - Taste
        - Storage time
        - Appearance
    - **Propensity to purchase / not purchase food treated in this manner, Why / Why not?**
    - IRRADIATION SPECIFICALLY
        - Link to medical use, microwave ovens

    - Dips and Sprays (Fenthion / Dimethoate)
    - Fumigation (Methyl Bromide)
    - Systems Approach / Baiting & Trapping
    - Cold Disinfestations
    - Irradiation

5. Labelling Concept — 5min
    - Must be labelled
    - Would seeing the label impact intent to buy?
    - Wording options

6. Review — 10min
    - Actual impact on purchase decisions
    - Relative appeal – winners / losers
    - Key communications messages

    - Dihydrogen Monoxide / Hydrogen Hydroxide
    - Sodium Chloride

APPENDIX 2
TKP Focus Group Stimulus Material

THE KLEIN PARTNERSHIP
MARKET RESEARCH CONSULTANTS

AUSVEG STIMULUS MATERIALS

Queensland Fruit Fly

Background

- Queensland Fruit Fly are present in eastern Australia, particularly through much of Queensland and New South Wales.
- Fruit Fly has affected around 250 species of native and introduced fruits.
- Female Fruit Fly lay their eggs into healthy, ripening fruit on a fruit tree.
- Maggots hatch and begin to feed on the flesh of the fruit.
- A localized rot develops and causes the fruit to drop to the ground.

The effects of Fruit Fly

- Growers can suffer heavy losses as fruit becomes inedible
- Affected fruit cannot be sold internationally, nor can it cross into areas of Australia where Fruit Fly is under control (SA, VIC and TAS).
- The cost to Australian fruit growers is more than AUD $100 million each year, with potential to increase
- Fruit fly therefore needs to be controlled.

Fenthion / Dimethoate

- The main method of controlling fruit fly currently is with chemical pesticides.
- These are used pre-harvest (while the fruit is still growing) as a spray, and post-harvest (after it's been picked) as a dip or spray.
- The fruit tree and fruit itself are sprayed
- The current pesticides, Fenthion and Dimethoate, are being phased out for POST-harvest use (PRE-harvest use is still ok) as questions have been asked about their impact on health. The regulators are taking a very cautious approach.
- Farmers therefore need to find alternative approaches to controlling fruit fly.

Today we will be talking about some of the alternatives.
Pre-harvest, crops will still generally be sprayed – our focus today is on the post-harvest phase.

Heat and low Methyl bromide

- Methyl Bromide is an invisible and tasteless gas with insecticidal, fungicidal and herbicidal properties.
- Used post-harvest.
- Fruit is put into a temperature controlled sealed room, and exposed to the gas

Pros
- Does not affect the taste or flavour of the fruit.
- Minimal effects on the fruit's nutrition
- Leaves no residue

Cons
- Doesn't work on all fruit types
- Is damaging to the ozone layer and has therefore been phased out of all other uses. It may be phased out for agricultural use as well so might not be a long term alternative.
- If some fruit contains blemishes prior to treatment, the Methyl bromide can make them a little more visible.

<u>Cold disinfestations</u>

- Fruit is put into cold storage at temperatures between 1-3^{o}C for between 16-20 days.
- The prolonged exposure to low temperatures kills the Fruit Flies.

Pros
- Effective
- Can be carried out in transit (i.e. in trucks)

Cons
- Costly
- Time consuming (and not suitable for products with a short shelf life)
- Cold disinfestations can be damaging to some citrus and tropical fruits.
- The treatment is not suitable for airfreight. There are limitations for international export markets.

<u>Irradiation</u>

- Used post-harvest.
- Food is exposed to a source of ionising energy in order to kill or sterilise insects, bacteria, micro-organisms and other pathogens.
- There are different ways that can be used to generate the energy
  - Cobalt 60 (a type of metal which emits gamma rays)
  - X-rays
  - An electron beam
- Food never comes into direct contact with the energy source.
- When the treatment stops, the energy does not remain in the food.
- Been used overseas for years on fruit, veg, poultry, grains and herbs and so on (approved by W.H.O.)
- Used commonly to sterilise cosmetics, surgical equipment

Pros
- No change aesthetically

- Minimal impact on produce quality. Macro nutrients (fats, sugars and protein) and essential minerals are not affected.
- Food lasts longer on the shelf
- No chemical residues
- Quick

Cons

- Irradiation can reduce vitamin content in some fruit and vegetables by up to 10-20%. Losses at this level are comparable to what happens when food is cooked or under other forms of food preservation.
- Any irradiated food must be labelled as having been treated by irradiation.

Systems Approach

- This describes multiple non-chemical approaches such as:
  - Removing spoiled fruit during growing to reduce the attraction to flies
  - Pre-harvest baiting and trapping (baits that attract the flies and kill them)
  - Post-harvest inspections of produce
  - Understanding the biology of Fruit Fly. For example, in winter, the Fruit Fly's capacity for long distance flight is greatly reduced. As such, separating crops can reduce the spread of Fruit Fly. Similarly isolating orchards from towns where Fruit Fly cannot be eradicated is also useful.
  - Netting over crops
  - Moisture limitation through trickle irrigation
- Most will still involve chemical pesticides in the pre-harvest phase

Pros

- Growers are not reliant on one method of protection, particularly if one method fails.

Cons

- To meet stringent quarantine demands for interstate and international export, a Systems Approach will likely have to involve at least one of the following treatments POST-harvest: irradiation, cold disinfestations, fumigation or chemical dipping.
- Still uses chemicals in pre-harvest

<u>**IRRADIATION POINT OF SALE CARD – SAMPLE A**</u>

FRESH AUSTRALIAN MANGOES TREATED WITH IRRADIATION

Australians now have an alternative to fruit treated with chemical insecticides like Dimethoate and Methyl Bromide.

These fresh Australian mangoes have been treated with irradiation to eliminate insects and satisfy quarantine requirements to prevent the spread of insect pests, like fruit fly and mango seed weevil.

The process of irradiating these mangoes is safe and chemical-free. It involves treating the mangoes with ionising energy to eliminate insect pests while maintaining the quality of the mangoes.

This treatment option is used around the world including the United States and for all Australian mangoes sold in New Zealand. It is approved by the World Health Organisation and the Australian Government.

For more information, visit the Food Standards Australia New Zealand website (www.foodstandards.gov.au) or the Better Health Channel (www.betterhealth.vic.gov.au)

IRRADIATION POINT OF SALE CARD – SAMPLE B

FRESH AUSTRALIAN MANGOES TREATED WITH IRRADIATION - A CHEMICAL-FREE PROCESS

Australians now have an alternative to fruit treated with chemical insecticides like Dimethoate and Methyl Bromide.

These fresh Australian mangoes have been treated with irradiation to eliminate insects and satisfy biosecurity requirements to prevent the spread of insect pests, like fruit fly and mango seed weevil.

The process of irradiating these mangoes is safe and chemical-free. It involves treating the mangoes with ionising energy to eliminate insect pests while maintaining the quality of the mangoes.

This treatment option is used around the world including the United States and for all Australian mangoes sold in New Zealand. It is approved by the World Health Organisation and the Australian Government.

For more information, visit the Food Standards Australia New Zealand website (www.foodstandards.gov.au) or the Better Health Channel (www.betterhealth.vic.gov.au)

Safe and secure
for the environment

APPENDIX 3
TKP Questionnaire Survey

THE KLEIN PARTNERSHIP
MARKET RESEARCH CONSULTANTS

Questionnaire Survey
N = 900
10 min

All
SC

Q1. What is your age? OPEN

TERMINATE IF <18
Quota:

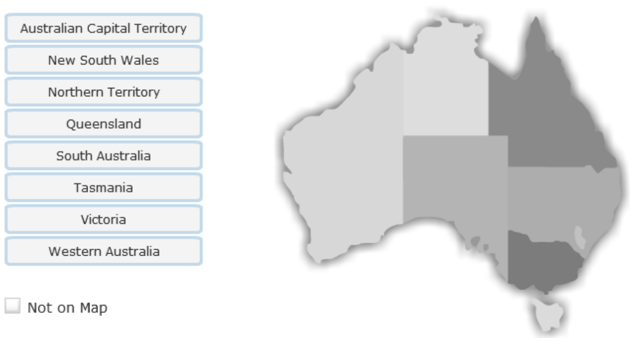
18-24	117	13%
25-34	162	18%
35-44	171	19%
45-54	162	18%
55+	288	32%
Total	**900**	**100%**

All
SC

Q2. Are you?

a. Male
b. Female

eQLocation
Where do you live?



Standard Flash Australia State Question

Quota:

NSW	297	33%
VIC	225	25%
QLD	180	20%
SA	72	8%
WA	90	10%
NT	9	1%
TAS	18	2%
ACT	9	1%
Total	**900**	**100%**

Screeners

All
SC

Q3. Who buys groceries in your household?

a. Mainly you
b. You and someone else equally
c. Mainly someone else TERMINATE

All
SC

Q4. How often do you buy organic fruit or vegetables?

a. All of the time TERMINATE
b. Most of the time TERMINATE
c. Occasionally
d. Almost never
e. Never

All
SC

Q5. How often do you buy fresh fruit and vegetables?

a. More than 3 times per week
b. 1-2 times per week
c. Weekly
d. Fortnightly
e. Monthly
f. Every 1-2 months TERMINATE
g. Less than every 2 months TERMINATE

INTRO
Today we are undertaking a study to understand your views on fruit and vegetables sold in Australia.

All
SC
ROTATE ORDER

Q6. Where do you tend to buy most of your fruit and vegetables from? Please select the place you shop at most.

a. Supermarket
b. Greengrocer / Fruit and Veg Specialist
c. Market
d. Direct from the farm gate
e. Grow your own
f. Other (specify)

All
MC
DO NOT SHOW RESPONSE FROM Q6

Q7. What OTHER places do you buy fruit and vegetables in a normal month? Please select all that apply.

a. Supermarket
b. Greengrocer / Fruit and Veg Specialist
c. Market
d. Direct from the farm gate
e. Grow your own
f. Other (specify)
g. None

INFO 1

Queensland Fruit Fly are present in eastern Australia, particularly through much of Queensland and New South Wales.
Without methods to control fruit fly, crops can be unsuitable for sale due to the product spoiling. In addition, crops grown in affected regions are not allowed to be transported out of NSW or QLD into the southern states, nor can they be exported.
Without techniques to control fruit fly:

- Consumer choice may be limited, and
- Opportunities for farmers to sell their products into other markets can be restricted.

All
SC

Q8. How aware were you of this issue?

a. Not at all aware
b. Slightly aware
c. Moderately aware
d. Very aware
e. Extremely aware

All
SC

Q9. Are you aware of any methods used to control insect pests on fruit and vegetables?

f. Yes
g. No

IF YES AT Q9
OPEN
PROVIDE MULTIPLE FIELDS

Q10. Please list the methods you are aware of for controlling insect pests on fruit and vegetables.

METHOD 1
METHOD 2
METHOD 3

Q11.Please state how much you agree or disagree with the following statements:

RANDOMISE

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a. The way that insects and pests are controlled does not affect where I purchase fruit and vegetables from.	1	2	3	4	5
b. The way that insects and pests are controlled does not affect the types of fruit and vegetables I eat.	1	2	3	4	5
c. Pesticides are a fact of life.	1	2	3	4	5
d. Without pesticides, fruit and vegetables would be too expensive.	1	2	3	4	5
e. I trust the organizations responsible for food safety to make sure it's safe to eat.	1	2	3	4	5
f. I trust the organizations responsible for food safety to make sure food quality is maintained.	1	2	3	4	5
g. I purchase Australian produce because I want to support our farmers, and for Australia to have a viable agriculture industry.	1	2	3	4	5
h. I do not care whether my fruit and vegetables are imported or produced in Australia	1	2	3	4	5
i. When purchasing fruit and vegetables I'm happy to pay a little more for Australian produce.	1	2	3	4	5
j. When shopping I don't think about how fruit and vegetables have been processed.	1	2	3	4	5
k. I worry about chemicals in food	1	2	3	4	5
l. It's important that fruit fly is controlled	1	2	3	4	5

All
MC

Q12. Are you aware of any of the following as ways to control insect pests on fruit and vegetables?

	Yes	No
a. Dipping / Spraying with chemical pesticides	1	2
b. Irradiation	1	2
c. Cold disinfestations (Cold temperature pest control)	1	2
d. Fumigation	1	2

All
MC

Q13. Are any of these methods currently used in Australia to control insect pests?

	Yes	No	Don't Know
a. Dipping / Spraying with chemical pesticides	1	2	11
b. Irradiation	1	2	11
c. Cold disinfestations (Cold temperature pest control)	1	2	11
d. Fumigation	1	2	11

We are now going to explore each of these methods a little further.
Please note that all of these are established methods of controlling fruit fly.
We would also ask that when considering these options you assume there is no difference in the cost to you or the farmer.

ROTATE ORDER
INFO 2
This method is "Dips and Sprays" using chemical pesticides.

In this process the produce is either dipped into a solution of a chemical pesticide, or sprayed with it. The fruit or vegetables are not washed afterwards.

ASK ALL
GRID

Q14. Thinking about Chemical Dips and Sprays how much do you agree or disagree with the following statements?

DIPS and SPRAYS	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a. I think this might be harmful to my health	1	2	3	4	5
b. I believe the nutritional value of the food would be affected in an unacceptable manner	1	2	3	4	5
c. If it's approved to food safety standards, that's good enough for me	1	2	3	4	5
d. The name makes me uncomfortable	1	2	3	4	5
e. I think this would affect the taste	1	2	3	4	5
f. I would seek out more information before I purchased food treated in this manner	1	2	3	4	5

ASK ALL
SC

Q15. How likely would you be to purchase food treated by dips and sprays?

a. Not at all likely
b. Slightly likely
c. Moderately likely
d. Very likely
e. Completely likely

IF NOT AT ALL or SLIGHTLY LIKELY, ASK
OPEN

Q16.Why would you not purchase products treated using chemical dips and spays?

INFO 3

The next method is called "Irradiation".

Fruit and vegetables are exposed to either gamma rays, x-rays or electrons in order to kill insects, bacteria and micro-organisms.
When the treatment stops, the energy does not remain in the food.
Food treated this way lasts longer on the shelf before spoiling.
Vitamin content can be reduced around 10-15%

ASK ALL
GRID

Q17.Thinking about Irradiation, how much do you agree or disagree with the following statements?

IRRADIATION	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a. I think this might be harmful to my health	1	2	3	4	5
b. I believe the nutritional value of the food would be affected in an unacceptable manner	1	2	3	4	5
c. If it's approved to food safety standards, that's good enough for me	1	2	3	4	5
d. The name makes me uncomfortable	1	2	3	4	5
e. I think this would affect the taste	1	2	3	4	5
f. I would seek out more information before I purchased food treated in this manner	1	2	3	4	5

ASK ALL
SC

Q18.How likely would you be to purchase food treated by Irradiation?

a. Not at all likely
b. Slightly likely
c. Moderately likely
d. Very likely
e. Completely likely

IF NOT AT ALL or SLIGHTLY LIKELY, ASK
OPEN

Q19.Why would you not purchase products treated using irradiation?

INFO 4

The next method is “Cold Disinfestation”.

In this method the produce is put into cold storage at temperatures between 1-3^{o}C.
Food is left at these temperatures for between 16-20 days.
The prolonged exposure to low temperatures kills the Fruit Flies.
Not all produce treated in this method can be exported.

ASK ALL
GRID

Q20. Thinking about Cold Disinfestation, how much do you agree or disagree with the following statements?

COLD DISINFESTATION	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a. I think this might be harmful to my health	1	2	3	4	5
b. I believe the nutritional value of the food would be affected in an unacceptable manner	1	2	3	4	5
c. If it’s approved to food safety standards, that’s good enough for me	1	2	3	4	5
d. The name makes me uncomfortable	1	2	3	4	5
e. I think this would affect the taste	1	2	3	4	5
f. I would seek out more information before I purchased food treated in this manner	1	2	3	4	5

ASK ALL
SC

Q21. How likely would you be to purchase food treated by Cold Disinfestation?

a. Not at all likely
b. Slightly likely
c. Moderately likely
d. Very likely
e. Completely likely

IF NOT AT ALL or SLIGHTLY LIKELY, ASK
OPEN

Q22. Why would you not purchase products treated using Cold Disinfestation?

INFO 5

The next method is “Fumigation”.

In this method the produce is put into a temperature controlled room and exposed to an invisible and tasteless gas.
This gas has insecticidal, fungicidal and herbicidal properties and kills any insects that may be present.
The gas does not leave a residue.

If some fruit contains blemishes prior to treatment, the gas can make them a little more visible. This gas is damaging to the ozone layer and has therefore been phased out of all other uses except agriculture.

ASK ALL
GRID

Q23. Thinking about Fumigation, how much do you agree or disagree with the following statements?

FUMIGATION	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a. I think this might be harmful to my health	1	2	3	4	5
b. I believe the nutritional value of the food would be affected in an unacceptable manner	1	2	3	4	5
c. If it’s approved to food safety standards, that’s good enough for me	1	2	3	4	5
d. The name makes me uncomfortable	1	2	3	4	5
e. I think this would affect the taste	1	2	3	4	5
f. I would seek out more information before I purchased food treated in this manner	1	2	3	4	5

ASK ALL
SC

Q24. How likely would you be to purchase food treated by Fumigation?

a. Not at all likely
b. Slightly likely
c. Moderately likely
d. Very likely
e. Completely likely

IF NOT AT ALL or SLIGHTLY LIKELY, ASK
OPEN

Q25. Why would you be <INSERT RESPONSE> to purchase products treated using Fumigation?

ASK ALL
SC

Q26. Having heard about all four methods, if you had to pick ONE which would you prefer?

a. Dipping / Spraying with chemical pesticides
b. Irradiation (i.e. exposing to x-rays, gamma rays, electrons etc.)
c. Cold disinfestations (i.e. exposing to cold temperatures)
d. Fumigation (exposing to gas)
e. I would not eat food treated by any of these methods even if it meant cutting some fruits and vegetables from my diet

ASK IF SELECT a-d
MC
REMOVE OPTION FROM PREVIOUS

Q27. Are there any other methods would you also accept?

a. Dipping / Spraying with chemical pesticides
b. Irradiation
c. Cold disinfestation
d. Fumigation
e. None of these

Q28.If dipping/ spraying fruit with chemical pesticides was banned, and you had to pick ONE other method, which would you prefer?

a. Irradiation (i.e. exposing to x-rays, gamma rays, electrons etc.)
b. Cold disinfestations (i.e. exposing to cold temperatures)
c. Fumigation (exposing to gas)
d. I would not eat food treated by any of these methods even if it meant cutting some fruits and vegetables from my diet

Q29.If the use of chemicals in vegetable production was substantially reduced, but not eliminated, would you be more likely to buy it?

a. More likely
b. Less Likely
c. It makes no difference

Q30.Which state do you currently reside?

a. NSW
b. VIC
c. ACT
d. QLD
e. SA
f. WA
g. NT
h. TAS

Q31.Do you have dependent children?

a. Yes
b. No

END

APPENDIX 4
TKP Market Research Findings

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THE KLEIN PARTNERSHIP
MARKET RESEARCH CONSULTANTS

AUSVEG
Fruit Fly Study

AUSVEG

Study # 4158 – March 2012

Background

AUSVEG is the national peak industry body supporting the interests of Australian vegetable and potato growers.

Ausveg represent the interests of growers to government and assist growers by making sure the National Vegetable Levy and National Potato Levy are invested in research and development (R&D) that best meets the needs of the industry.

SITUATION

◢Two chemicals used on produce to control Queensland fruit fly are likely to be phased out of the industry, and alternative methods of protecting produce from fruit fly are under investigation.

◢Before widespread implementation there is a need to gauge consumer perceptions of a range of alternate methods.

As part of a market validation process TKP has been engaged to undertake research amongst consumers.

- **OBJECTIVES**
- **SAMPLE DETAILS**
- **PURCHASE BEHAVIOUR**
- **PEST CONTROL**
- **METHODS OF TREATMENT**
  - CHEMICAL DIPS AND SPRAYS
  - HEAT AND LOW METHYL BROMIDE
  - COLD DISINFESTATION
  - SYSTEMS APPROACH
  - IRRADIATION
- **IRRADIATION LABEL CONCEPTS**

STAGE 1 - QUALITATIVE

Objectives

The over-arching objectives of the research are to better understand customer perceptions, attitudes, barriers and concerns around the different treatment methods.

Specifically we seek to understand:

◢Consumer awareness and understanding of methods of protecting fruit and vegetables from infestation

◢Attitudes towards the current methods / chemicals

◢Attitudes towards alternative approaches

◢Drivers and barriers to adoption of each of the alternative approaches

◢Impacts on shopping behaviour and propensity to purchase

◢Key messaging that may be useful in implementation of a new approach

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Our Approach

Research was conducted in two stages utilising both QUALITATIVE and QUANTITATIVE research.

Qualitative research

- One-on-one interviews / focus groups
- Semi-structured “lines of enquiry”
- Longer interviews
- Exploratory, open discussion, not numerical ratings
- Unearth the deeper attitudes, perceptions, motivations and behaviours

Quantitative research

- Large numbers of respondents
- Structured questions
- Shorter interviews
- Pre-defined assessment criteria
- A numeric measurement. Measurement is objective and statistically valid; it’s about numbers

Our Approach

STAGE 1 – QUALITATIVE FOCUS GROUP DISCUSSIONS

An open and collaborative forum in which to explore the rational AND emotional aspects surrounding pesticides / preservatives / methods of protection from pests.

A way to explore the underlying attitudes, motivations and behaviours that apply, and give us an understanding of WHY consumers think and behave the way they do.

STAGE 2 – QUANTITATIVE CONSUMER SURVEY

Taking the learnings from the focus groups, we conduced a large scale survey to provide statistically robust measurement of key questions.

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- **OBJECTIVES**
- **SAMPLE DETAILS**
- **PURCHASE BEHAVIOUR**
- **PEST CONTROL**
- **METHODS OF TREATMENT**
  - CHEMICAL DIPS AND SPRAYS
  - HEAT AND LOW METHYL BROMIDE
  - COLD DISINFESTATION
  - SYSTEMS APPROACH
  - IRRADIATION
- **IRRADIATION LABEL CONCEPTS**

STAGE 1 - QUALITATIVE

AUSVEG

Sample Details

What?	THREE Focus Group Sessions
Who?	Main Grocery Buyers. Regularly purchase fresh fruit or vegetables, excluding regular organic buyers.
Where?	Hobart, Melbourne, Adelaide
When?	February / March 2012

Sample Details

Group Structure and Locations were as follows:

Melbourne	Adelaide	Hobart
1 Group	1 Group	1 Group

◢Groups were conducted over a period of 2 weeks, with each group running for approximately 90 minutes. Groups were moderated by Simon Edwards of TKP.

◢Respondents were:
- Females
- Main Grocery Buyer in the household
- Make most of the decisions about what food to purchase
- Mix of with / without kids
- 30-49 years of age
- Buy organic fruit and veg no more than occasionally (i.e. we excluded organic *favourers* due to pre-existing bias against chemicals and treatments)

- **OBJECTIVES**
- **SAMPLE DETAILS**
- **PURCHASE BEHAVIOUR**
- **PEST CONTROL**
- **METHODS OF TREATMENT**
  - CHEMICAL DIPS AND SPRAYS
  - HEAT AND LOW METHYL BROMIDE
  - COLD DISINFESTATION
  - SYSTEMS APPROACH
  - IRRADIATION
- **IRRADIATION LABEL CONCEPTS**

STAGE 1 - QUALITATIVE

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Purchase Behaviour

Sources of fresh fruit and vegetables were varied but consistent

- Perhaps unsurprisingly supermarkets dominate, however many occasionally use markets, greengrocers, through to 'farm gate' purchases (particularly in Hobart).
- Reasons for choice of each outlet were consistent from state to state:

Supermarket	**Convenience Price (Not quality…….)**
Market	**Fresher Buy closer to the grower Quality – lasts longer, tastes better**
Greengrocer	**More variety Specialty products Herbs Support local Pick your own, not pre-packaged**
"Farm gate"	**Cheaper Support local**

"but the quality is getting better."

AUSVEG

Purchase Behaviour

- Many also had an interest in growing their own, albeit to a limited extent.

> ***"I have a go at growing my own, but just certain things."***
> ***"We do it for the kids."***

- A few expressed discomfort with a belief that supermarkets dictate terms to farmers and squeeze them on price unfairly.

- There was general positivity towards organic product
  - Some believed that organic produce tasted better
  - Price being the same most would choose organic

- ....tempered by some minor negativity
  - It's over priced
  - It can look less appealing – 'older and more dried out'
  - More blemishes / insect bites
  - Some suspicion if it really IS organic

However, the overriding factor for almost all (and the reason they did not buy organic) was PRICE

tkp

- **OBJECTIVES**
- **SAMPLE DETAILS**
- **PURCHASE BEHAVIOUR**
- **PEST CONTROL**
- **METHODS OF TREATMENT**
  - CHEMICAL DIPS AND SPRAYS
  - HEAT AND LOW METHYL BROMIDE
  - COLD DISINFESTATION
  - SYSTEMS APPROACH
  - IRRADIATION
- **IRRADIATION LABEL CONCEPTS**

STAGE 1 - QUALITATIVE

AUSVEG

Pest Control

Unprompted thoughts

- Whilst respondents acknowledged that they rarely saw evidence of insects on fruit and vegetables they were purchasing, they did not consciously think about why this is or how it is achieved. It is not at all 'top of mind' when shopping. Pest control has:
  - Little impact on where they buy
  - Little impact on WHAT they buy

> ***"I don't think about it."***
>
> ***"I don't really care. It doesn't change what I do."***
>
> ***"What we don't know doesn't hurt us."***
>
> ***"We are busy and money conscious."***

- Methods of treatment to control pests were not immediately forthcoming.

- There was however an acceptance and assumption that chemicals and treatments are a fact of life across many different foods.
  - We note a difference amongst Hobart respondents who were conscious of protecting the perceived 'cleanness' of their produce.

  - Some consciously wash fruit and vegetables at home for this reason - especially if they had kids. Exactly what they were washing FOR was not top of mind though.

> ***"I worry a bit about the kids – but it doesn't stop me buying it!"***

tkp

Pest Control

Respondents were then read the following description of Fruit Fly

- Queensland Fruit Fly are present in eastern Australia, particularly through much of Queensland and New South Wales.
- Female Fruit Fly lay their eggs into healthy, ripening fruit on a fruit tree. Maggots hatch and begin to feed on the flesh of the fruit. A localized rot develops and causes the fruit to drop to the ground.
- Without methods to control fruit fly, crops can therefore be unsuitable for sale due to the product spoiling. In addition, crops grown in affected regions are not allowed to be transported out of NSW or QLD into the southern states, nor can they be exported.
- Therefore:
  - Consumer choice may be limited, and
  - Opportunities for farmers to sell their products into other markets can be restricted.

Prompted Thoughts on Fruit Fly

- Respondents expressed universal acceptance and desire to have fruit fly controlled:
  - From a personal perspective (the presence of insects would be an issue for most – they value having unaffected produce)
  - From the perspective of the agriculture industry

"Insects would be a bit of a turn-off."

"You don't want flies – you especially don't want larvae!"

"If the farmers didn't spray they wouldn't make money."

- Some also associated the presence of insects with food not being fresh.

- We note that many however are resigned to produce not being fresh anyway
  - Belief it's stored for extended periods of time.
  - Recognition that seasonality is less obvious – most fruits and vegetables are available all year round.
  - Fruit is seen as picked early to last longer, negatively impacting on flavour.

"I assumed it's preserved somehow."

"I hear it can be refrigerated for a long time, up to 6 months."

tkp

- **OBJECTIVES**
- **SAMPLE DETAILS**
- **PURCHASE BEHAVIOUR**
- **PEST CONTROL**
- **METHODS OF TREATMENT**
  - CHEMICAL DIPS AND SPRAYS
  - HEAT AND LOW METHYL BROMIDE
  - COLD DISINFESTATION
  - SYSTEMS APPROACH
  - IRRADIATION
- **IRRADIATION LABEL CONCEPTS**

STAGE 1 - QUALITATIVE

AUSVEG

Introduction to Methods

To gauge reactions to the different treatment methods, a description of each was read out to respondents one by one.

We explored

Understanding

First impressions

Drivers / barriers

Propensity to purchase

Chemical Dips and Sprays

Chemical Dips and Sprays

- The main method of controlling fruit fly currently is with **chemical pesticides.**
- These are used pre-harvest (while the fruit is still growing) as a spray, and post-harvest (after it's been picked) as a dip or spray.
- The fruit tree and fruit itself are sprayed
- The current pesticides, Fenthion and Dimethoate, are being phased out for POST-harvest use (PRE-harvest use is still ok) as questions have been asked about their impact on health. The regulators are taking a very cautious approach.
- Farmers therefore need to find alternative approaches to controlling fruit fly.

Chemical Dips and Sprays

- Echoing the unprompted discussion, chemical pesticides were seen as a part of life.
  - Acceptance that it makes farming viable
  - Increases yields

"A necessary evil."

"If the farmers didn't spray they wouldn't make money."

"There are more and more people to feed."

"They have to treat it with something."

- The names of two chemicals in use (Dimethoate and Fenthion) were alarming, and increased wariness.......

"That sounds harmful doesn't it."

"You assume it's a bad thing."

- ..... however whilst a minority were concerned with cumulative effects on human health, when informed that these chemicals were currently in use the assumption for most was that they must be ok.

"If it passes standards I guess it's fine."

"I've lived this long and I'm OK."

Chemical Dips and Sprays

- Spraying (particularly pre-harvest) was much more acceptable than “dipping” produce in chemicals
  - Dipping = more residue
  - More time to permeate the fruit’s skin

- Advising respondents that the industry had to look for new post-harvest treatments created suspicion. We recommend future communications not provide this detail / reasoning for looking for alternate, safer treatments.

Heat and Low Methyl Bromide

Heat and Low Methyl Bromide

- Methyl Bromide is an invisible and tasteless gas with insecticidal, fungicidal and herbicidal properties.
- Fruit is put into a temperature controlled sealed room, and exposed to the gas

Pros

- Does not affect the taste or flavour of the fruit
- Minimal effects on the fruit’s nutrition
- Leaves no residue

Cons

- Doesn’t work on all fruit types
- Is damaging to the ozone layer and has therefore been phased out of all other uses. It may be phased out for agricultural use as well so might not be a long term alternative.
- If some fruit contains blemishes prior to treatment, the Methyl bromide can make them a little more visible.

Heat and Low Methyl Bromide

- General impressions were that this was less harmful than chemical dips and sprays
  - Less residue (although some were concerned that the gas would permeate and stay in the flesh of the fruit).
  - No impact on nutrition

- Impacts on the ozone layer, and the fact Methyl Bromide had been phased out of other applications for this reason was the main (and significant) barrier to acceptance.

> ***"It sounded good until the part about damaging the ozone layer."***

  - Environmental concerns
  - Some concern that ***"if it can damage the ozone layer can it damage me?"***

- Again the chemical name 'Methyl Bromide' was alarming; 'fumigation' was significantly more acceptable terminology, albeit with associations with stronger chemicals.

> ***"Fumigation's what they do to houses isn't it?"***

Cold Disinfestation

Cold Disinfestation

- Fruit is put into cold storage at temperatures between 1-3^{o}C for between 16-20 days.
- The prolonged exposure to low temperatures kills the Fruit Flies.

Pros

- Effective
- Can be carried out in transit (i.e. in trucks)

Cons

- Costly
- Time consuming (and not suitable for products with a short shelf life)
- Cold disinfestations can be damaging to some citrus and tropical fruits.
- The treatment is not suitable for airfreight. There are limitations for international export markets.

tkp

Cold Disinfestation

- The least intimidating method
  - "Cold" is familiar
  - Sounds cleaner
  - Sound more natural
  - Sounds less harmful to health

"It sounds like snap freezing."

"That's not so scary sounding."

"So that's just like putting it in the fridge!"

- As many assume fruit is stored for long periods of time, this method seems redundant – they assume that cold storage is happening anyway.

- Negatives included belief that cold storage would reduce intensity of flavour and perhaps nutrition.

"20 days is too long."

"It's old before it gets to me."

- Overall though this was the most appealing method, and if they had a choice the focus group respondents would choose produce treated in this manner.

However……

- This depends on the consumer being aware of the method of treatment, **and they simply are not currently.**

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Systems Approach

Systems Approach

- This describes multiple non-chemical approaches such as:
  - Removing spoiled fruit during growing to reduce the attraction to flies
  - Pre-harvest baiting and trapping (baits that attract the flies and kill them)
  - Post-harvest inspections of produce
  - Understanding the biology of Fruit Fly. For example, in Winter, the Fruit Fly's capacity for long distance flight is greatly reduced. As such, separating crops can reduce the spread of Fruit Fly. Similarly isolating orchards from towns where Fruit Fly cannot be eradicated is also useful.
  - Netting over crops
  - Moisture limitation through trickle irrigation

Pros

- Growers are not reliant on one method of protection, particularly if one method fails.

Cons

- To meet stringent quarantine demands for interstate and international export, a Systems Approach will likely have to involve at least one of the following treatments POST-harvest: irradiation, cold disinfestations, fumigation or chemical dipping.
- Still uses chemicals in pre-harvest

Systems Approach

- Interestingly, responses focussed on their perceptions that this approach was time consuming and therefore expensive.
  - Impact on price to the consumer
  - Impact on the profitability for farmers

> ***"It sounds like there's a lot of labour involved. Wouldn't that push the prices up?"***
>
> ***"Can the farmer afford it?"***
>
> ***"It sounds like a small orchard, not the big factory farms we have now."***

- Restrictions on the ability to transport / export were also seen as a negative as it impacts upon the industry.
  - Respondents have GREAT sympathy for farmers (which we recommend tapping into in communications)
  - In particular there was negativity towards supermarkets for squeezing margins
  - Some made noises about willingness to pay more, however we temper this good-will with the realities of day to day life and the overarching driver of low prices outside of the focus group environment.

- Price aside it was regarded as 'good practice' and an indication that growers were taking good care of their crops.

> ***"Great for people in NSW and QLD, but not for us."***

Systems Approach

- However, if there was still be some use of chemicals anyway it seemed like a lot of effort for no gain to the consumer.
- When respondents were presented with the concept of a Systems Approach using **LESS** chemicals post-harvest, responses were positive. This seemed almost like half-way to organic.

> ***"If it uses less chemicals, and it's the same price, that's great."***
>
> ***"That one – that's the one."***

Irradiation

- Food is exposed to a source of ionising energy in order to kill or sterilise insects, bacteria, micro-organisms and other pathogens.
- There are different ways that can be used to generate the energy - Cobalt 60 (a type of metal which emits gamma rays), X-rays, an electron beam
- When the treatment stops, the energy does not remain in the food.
- Been used overseas for years on fruit, veg, poultry, grains and herbs and so on (approved by W.H.O.), and also used commonly to sterilise cosmetics, surgical equipment

Pros

- No change aesthetically
- Minimal impact on produce quality. Macro nutrients (fats, sugars and protein) and essential minerals are not affected.
- Food lasts longer on the shelf
- No chemical residues

Cons

- Can reduce vitamin content in some fruit and vegetables by up to 10-20%. Losses at this level are comparable to what happens when food is cooked or under other forms of food preservation.
- Any irradiated food must be labeled as having been treated by irradiation.

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Irradiation

- The overarching response to irradiation was **lack of understanding – it is a very unfamiliar concept.**

> ***"Waves."***
>
> ***"Zaps things."***
>
> ***"Cancer treatment."***

- **Sentiment was very mixed**, from "not sure what to think", to positive, to negative.

> ***"I feel uneasy but I don't know why."***

> ***"They have this sort of thing in all of our local hospitals."***

> ***"Yes but they all leave the room when they x-ray you."***
>
> ***"Sounds pretty hardcore."***

- **Interpretively, for irradiation to be successful would require significant investment in public education.**

- The name was somewhat of a concern but no more than for the chemical options.
  - Electrons were less alarming than x-rays or radiation

> ***"It's a scary term, but it's not always a scary thing."***

Irradiation

- Being used overseas for many years was generally a plus as it spoke to track-record of safe use, application and consumption, albeit with an interesting twist
  - Being used in Europe is generally a positive
  - Being used in the US is less so (US food and drug standards appear less respected)
  - There was also some suspicion however around it not having been heard of in Australia before. Some saw Australia as having stricter regulations than other countries and therefore wondered why Australia had not approved it before now.

> ***"Australian Standards is more compelling."***

- The elimination / eradication of microorganisms and bacteria was a positive to some, with the benefit that produce lasts longer on the shelf

> ***"It sounds like it gets the things other methods don't get."***
>
> ***"Sterilising is good."***

- ....but the widespread eradication of all living things was a source of concern for others.
  - Unnatural

> ***"Sounds like it wipes everything out – good and bad."***
>
> ***"Sterilising is bad."***
>
> ***"It sounds like McDonalds the way it lasts a long time."***

Irradiation

- The lack of chemicals / residues was a positive, however the reduction in vitamins and nutrients was a real issue.
- The trade-off presented by irradiation was seen as follows:

Chemicals + All The Vitamins **vs.** **No Chemicals + Less Vitamins**

- This choice is a hard one for respondents to make, but we believe if respondents are made aware of it, **the reduction in vitamins is almost a deal breaker.**

"If I'm buying vegies, I'm buying them for the nutrients."

- **OBJECTIVES**
- **SAMPLE DETAILS**
- **PURCHASE BEHAVIOUR**
- **PEST CONTROL**
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  - HEAT AND LOW METHYL BROMIDE
  - COLD DISINFESTATION
  - SYSTEMS APPROACH
  - IRRADIATION
- **IRRADIATION LABEL CONCEPTS**

STAGE 1 - QUALITATIVE

Respondents were presented with two labelling concepts as shown below. Differences were slight, as highlighted.

Irradiation Label Concepts

A

FRESH AUSTRALIAN MANGOES TREATED WITH IRRADIATION

Australians now have an alternative to fruit treated with chemical insecticides like Dimethoate and Methyl Bromide.

These fresh Australian mangoes have been treated with irradiation to eliminate insects and satisfy quarantine requirements to prevent the spread of insect pests, like fruit fly and mango seed weevil.

The process of irradiating these mangoes is safe and chemical-free. It involves treating the mangoes with ionising energy to eliminate insect pests while maintaining the quality of the mangoes.

This treatment option is used around the world including the United States and for all Australian mangoes sold in New Zealand. It is approved by the World Health Organisation and the Australian Government.

For more information, visit the Food Standards Australia New Zealand website (www.foodstandards.gov.au) or the Better Health Channel (www.betterhealth.vic.gov.au)

B

FRESH AUSTRALIAN MANGOES TREATED WITH IRRADIATION - A CHEMICAL-FREE PROCESS

Australians now have an alternative to fruit treated with chemical insecticides like Dimethoate and Methyl Bromide.

These fresh Australian mangoes have been treated with irradiation to eliminate insects and satisfy biosecurity requirements to prevent the spread of insect pests, like fruit fly and mango seed weevil.

The process of irradiating these mangoes is safe and chemical-free. It involves treating the mangoes with ionising energy to eliminate insect pests while maintaining the quality of the mangoes.

This treatment option is used around the world including the United States and for all Australian mangoes sold in New Zealand. It is approved by the World Health Organisation and the Australian Government.

For more information, visit the Food Standards Australia New Zealand website (www.foodstandards.gov.au) or the Better Health Channel (www.betterhealth.vic.gov.au)

Safe and secure for the environment

Irradiation

- The fact that irradiated produce has to be labelled at all made some respondents suspicious. This somewhat negates the acceptance that comes from it being 'approved' for use.

"It's creepy that it has to be labelled – why this one?"

- In terms of label content however:
  - The headline is critical – some only see themselves reading the headline
  - "Chemical-Free" is very appealing
  - "Safe & Secure" acts in concert with the headline for those who wouldn't read the 'fine' print
  - The act of education in itself is a plus but only to reduce nervousness if the consumer has already heard of irradiation
  - Concepts had a generally positive and reassuring tone, reinforced by the colour scheme that evokes sun and water

Version B was the clear winner, and in concert with a solid PR strategy we believe would alleviate some of the fears expressed during conversation.

- **SAMPLE DETAILS – QUANTITATIVE SURVEY**
- **PURCHASE BEHAVIOUR**
- **METHODS OF TREATMENT**
  - UNAIDED / AIDED
  - ATTITUDES TOWARDS FOOD TREATMENT
  - CHEMICAL DIPS AND SPRAYS
  - IRRADIATION
  - COLD DISINFESTATION
  - FUMIGATION
- **PREFERENCE AND COMPARISON**
- **RECOMMENDATIONS**

STAGE 2 - QUANTITATIVE

- Tests for statistical significance at a 95% confidence level have been conducted on particular subgroups of interest in this survey.
  - If no statistical significance has been highlighted, these are none associated with these subgroups.
  - If there is a statistically significant difference, we can be confident that this difference has not occurred by chance i.e. it reflects a genuine difference for that group compared to the population.

- In the tables and graphs;

  - Indicates a result that is significantly **higher**
  - Indicates a result that is significantly **lower**
  - Indicate a result that is not significant at 95% but is notable or of interest

- When interpreting results herein, the following margin of errors apply;

Sample size	*Margin of Error*
50	*+/- 13.9%*
100	*+/- 9.8%*
500	*+/- 4.4%*
900	*+/- 3.3%*

Sample Details

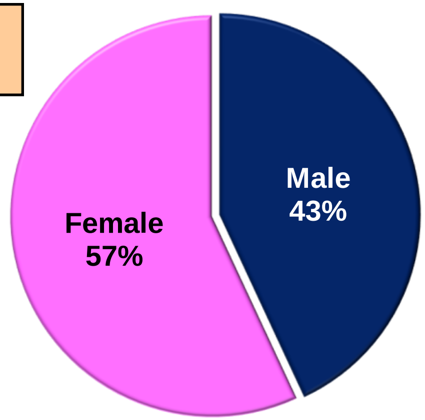
What?	10 min online quantitative survey using a research panel.
Who?	Main or joint grocery buyers in their household. Have bought fresh fruit or vegetables in the past month, and buy organic fruit and vegetables no more regularly than occasionally.
How Many?	n= 917
Where?	National
When?	8th to 16th March, 2012

Sample Details

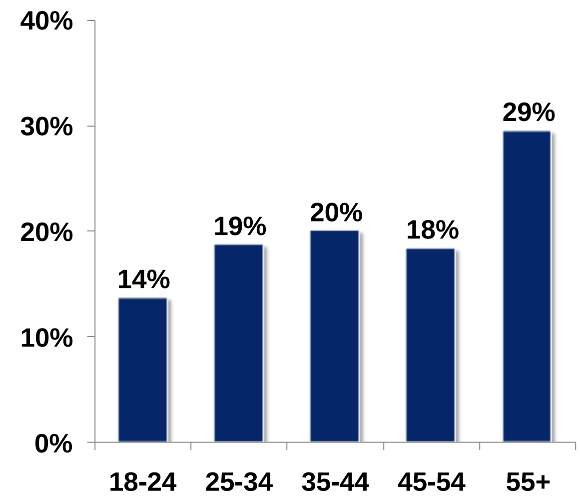
Base: 907

Gender

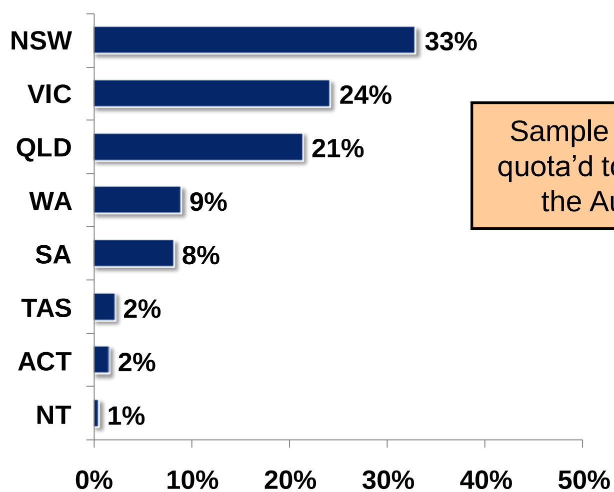
Slight female bias due to grocery buying.



Age

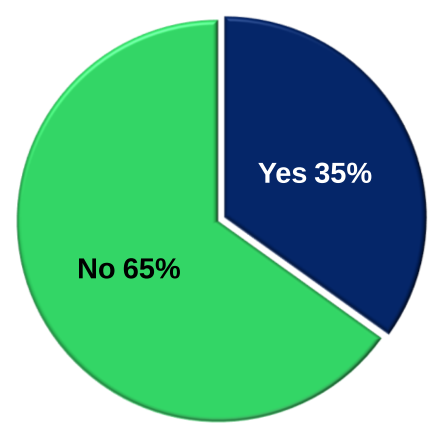


Location



Sample age and location were quota'd to be broadly in line with the Australian population.

Dependent children



tkp

- **SAMPLE DETAILS – QUANTITATIVE SURVEY**
- **PURCHASE BEHAVIOUR**
- **METHODS OF TREATMENT**
  - UNAIDED / AIDED
  - ATTITUDES TOWARDS FOOD TREATMENT
  - CHEMICAL DIPS AND SPRAYS
  - IRRADIATION
  - COLD DISINFESTATION
  - FUMIGATION
- **PREFERENCE AND COMPARISON**
- **RECOMMENDATIONS**

STAGE 2 - QUANTITATIVE

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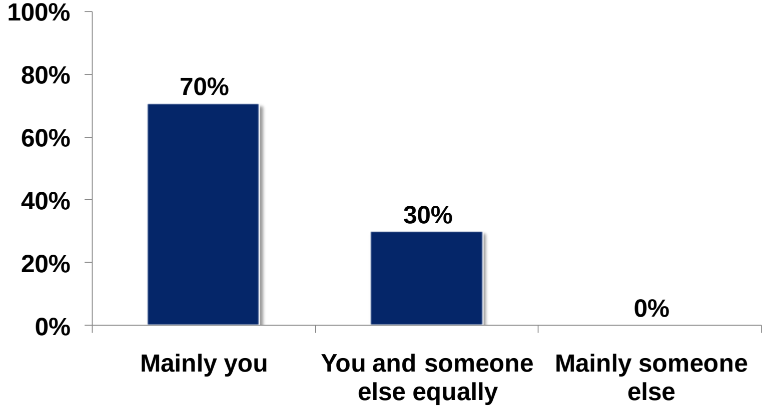
Purchase Behaviour

Base: 907

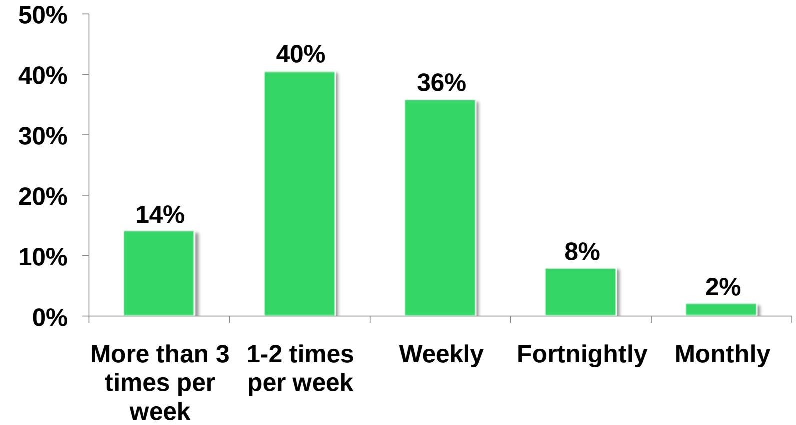
Household Grocery buyer

Q3. Who buys groceries in your household?



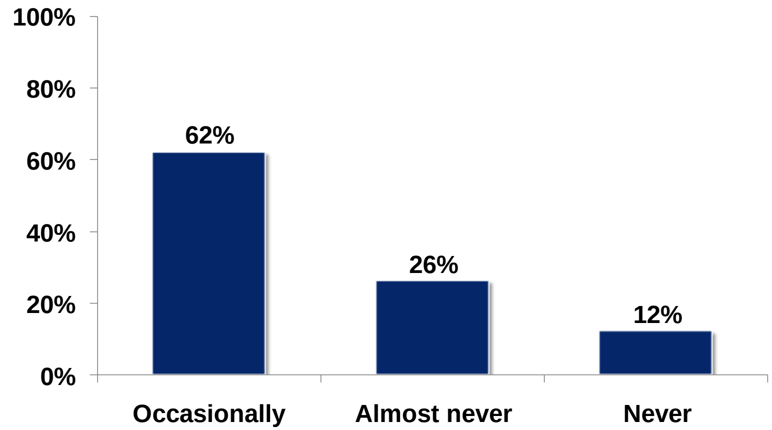
Frequency Purchased

Q5. How often do you buy fresh fruit and vegetables?



Buy Organic

Q4. How often do you buy organic fruit or vegetables?



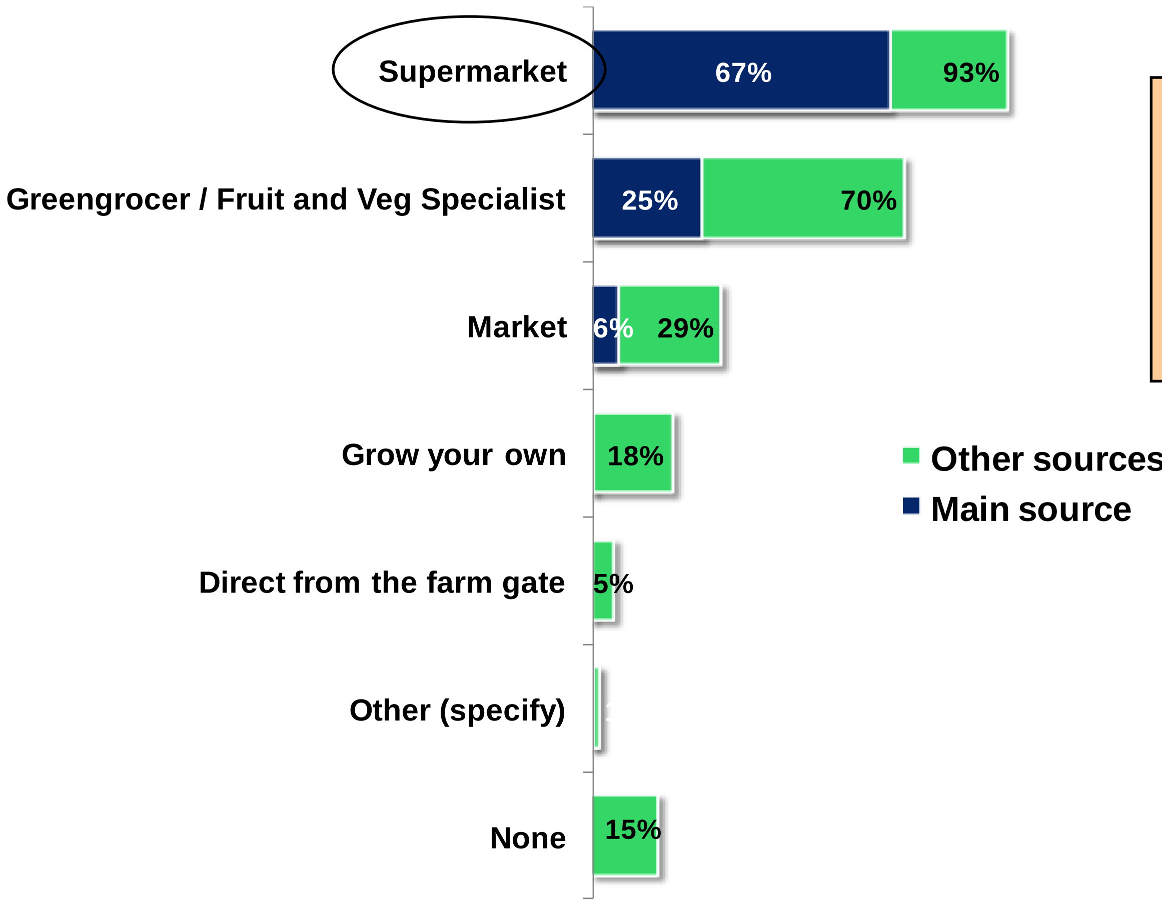
Respondents had to be main or joint grocery buyers, purchase fruit and vegetables at least monthly, and not purchase organic fruit and vegetables more than "occasionally".

Purchase behaviour
Purchase from

Q6. Where do you tend to buy most of your fruit and vegetables from?

Q7. What OTHER places do you buy fruit and vegetables in a normal month?

Base: 907



Purchases at the supermarket trump all other outlets.

Greengrocers are highly utilised as a secondary source.

In some states such as WA and ACT, Markets present more frequently as a main source.

- **SAMPLE DETAILS – QUANTITATIVE SURVEY**
- **PURCHASE BEHAVIOUR**
- **METHODS OF TREATMENT**
  - UNAIDED / AIDED
  - ATTITUDES TOWARDS FOOD TREATMENT
  - CHEMICAL DIPS AND SPRAYS
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  - COLD DISINFESTATION
  - FUMIGATION
- **PREFERENCE AND COMPARISON**
- **RECOMMENDATIONS**

STAGE 2 - QUANTITATIVE

Awareness of Treatment Methods
Introduction to Fruit Fly

Respondents were shown the following information on Fruit Fly to provide context, before being asked to provide their feedback.

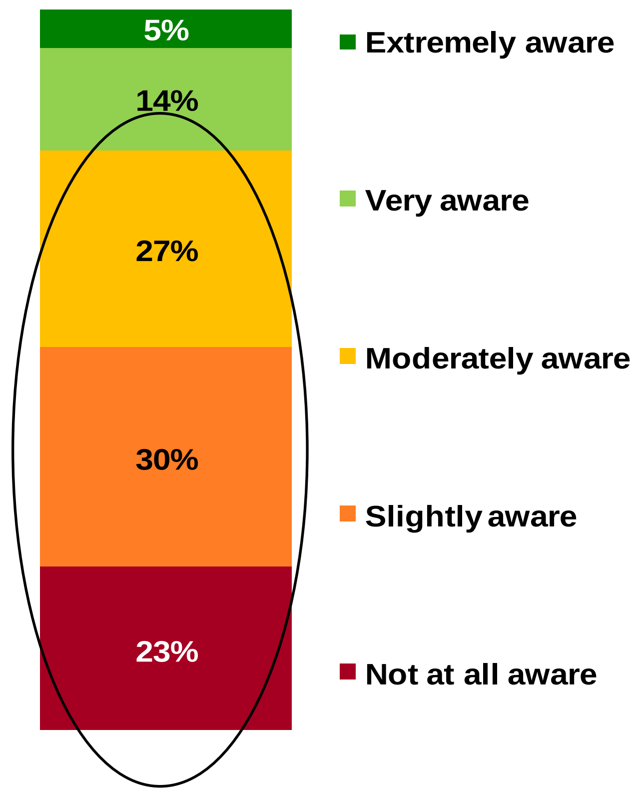
Queensland Fruit Fly are present in eastern Australia, particularly through much of Queensland and New South Wales.

Without methods to control fruit fly, crops can be unsuitable for sale due to the product spoiling. In addition, crops grown in affected regions are not allowed to be transported out of NSW or QLD into the southern states, nor can they be exported.

Without techniques to control fruit fly:

• Consumer choice may be limited, and
• Opportunities for farmers to sell their products into other markets can be restricted.

Q8 How aware were you of this issue?



Respondent awareness of the fruit fly issue appears to be low, with only one in five claiming to have strong awareness.

There were no differences by state, however older respondents were more likely to claim awareness of the issue.

Awareness of Treatment Methods
Unprompted

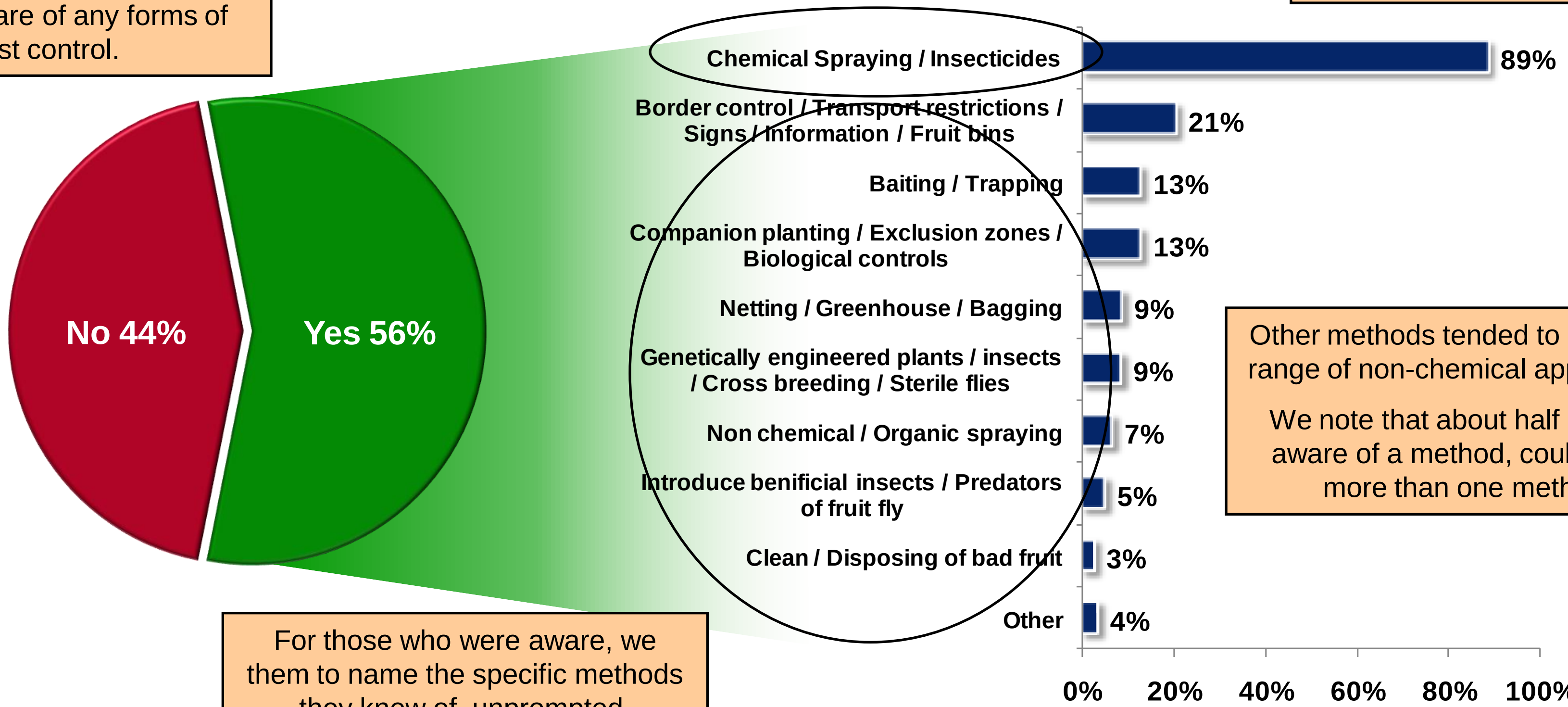
Base: 907

Q9 Are you aware of any methods used to control insect pests on fruit and vegetables?

Q10 Please list the methods you are aware of for controlling insect pests on fruit and vegetables?

Chemical sprays / insecticides dominate unaided awareness, with other methods showing significantly lower levels.

A large portion of respondents were unaware of any forms of pest control.



Other methods tended to be a wide range of non-chemical approaches.

We note that about half of those aware of a method, could name more than one method.

For those who were aware, we them to name the specific methods they knew of, unprompted.

Awareness of Treatment Methods
Prompted

Q12 Are you aware of any of the following as ways to control insect pests on fruit and vegetables?

Q13 Are any of these methods currently used in Australia to control insect pests?

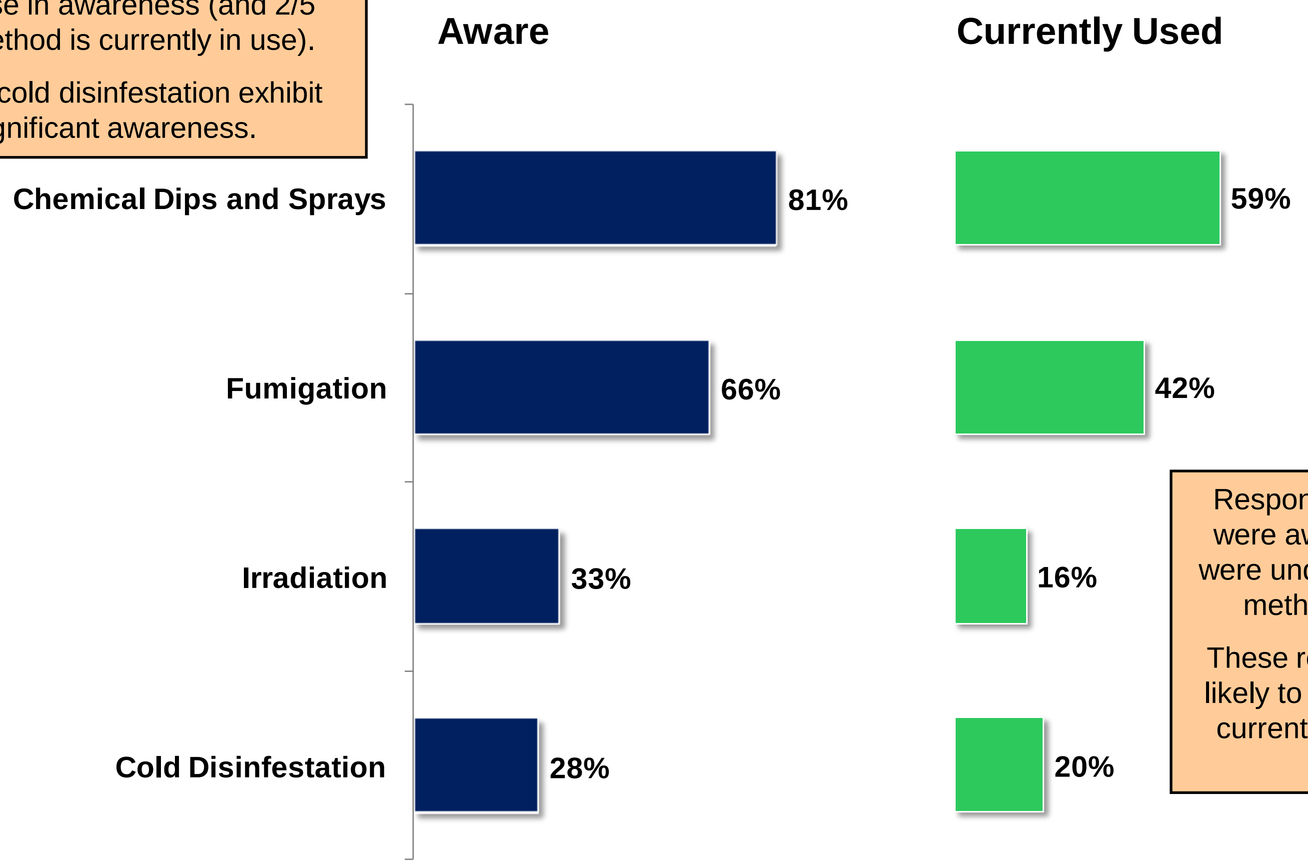
Base: 907

When respondents were presented with the names of treatment options, recognition of Chemicals / Pesticides dominated awareness.

Fumigation rose in awareness (and 2/5 believe this method is currently in use).

Irradiation and cold disinfestation exhibit low but significant awareness.

Note that awareness is claimed and may be different to understanding.



Respondents who previously stated they were aware of methods of insect control, were understandably, much more aware of methods when they were prompted.

These respondents were also much more likely to believe each of the methods were currently in use, for example, fumigation 55% vs 25%.

Attitudes towards Food Treatment

- We presented respondents with series of general attitude statements regarding fruit and vegetable treatment.

- Respondents could Strongly disagree, Disagree, Neither agree nor disagree, Agree or Strongly agree to each of the 12 statements asked.

- The questions broadly examined four themes
  - "Acceptance of the need to treat food"
  - "Trust in regulatory organisations"
  - "Impacts on Health and Nutrition"
  - "Impacts on the Australian industry"

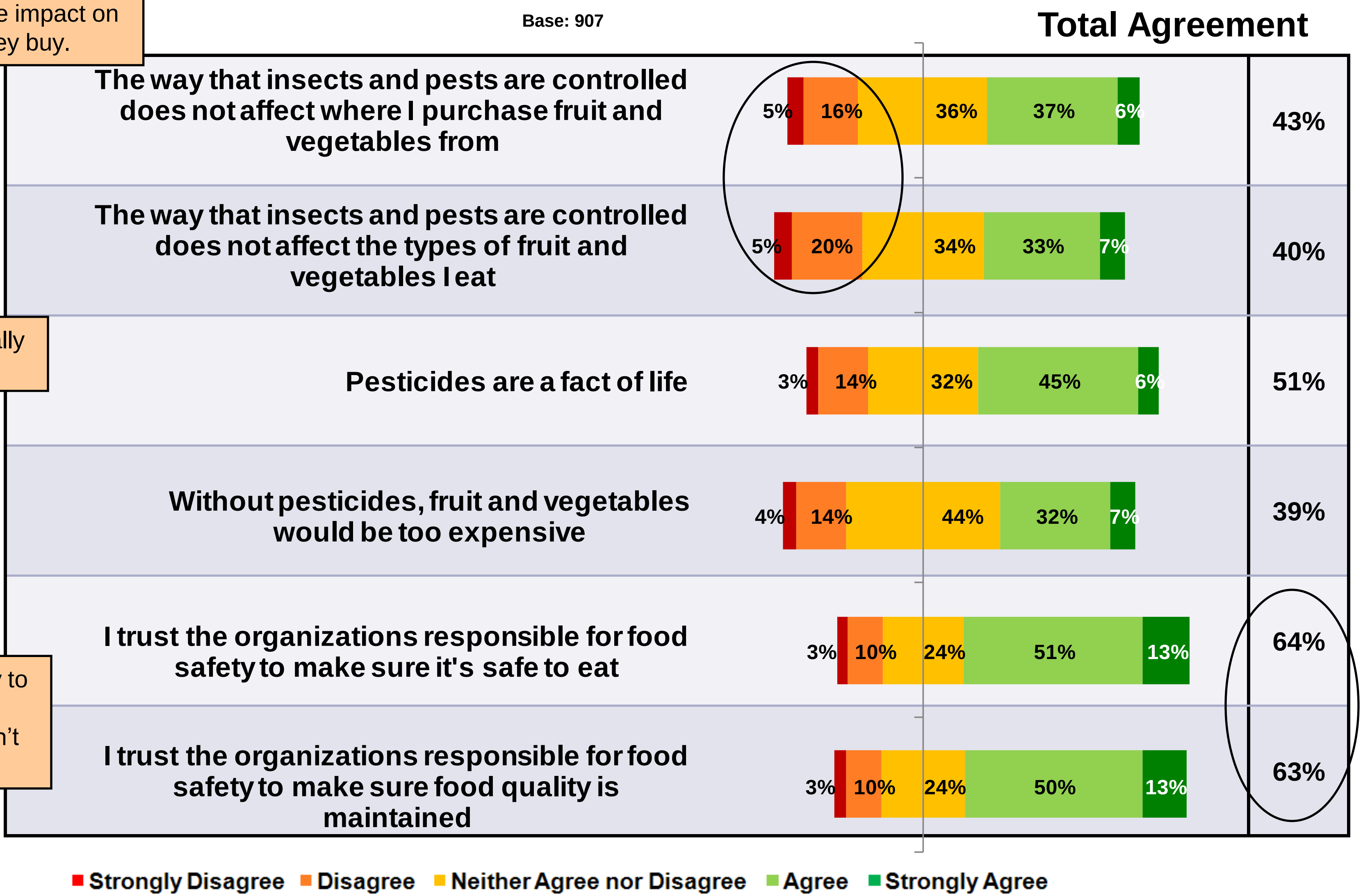
- We also asked respondents to rate attitude statements about specific treatment methods; results from these are presented later in the report.

Attitudes towards Food Treatment

About a quarter of respondents indicated that methods of treatment have some impact on what / where they buy.

Q11 Please state how much you agree or disagree with the following statements

Base: 907



Pesticides are generally part of life.

Most trust food safety to industry / govt organisations (or don't have a view)

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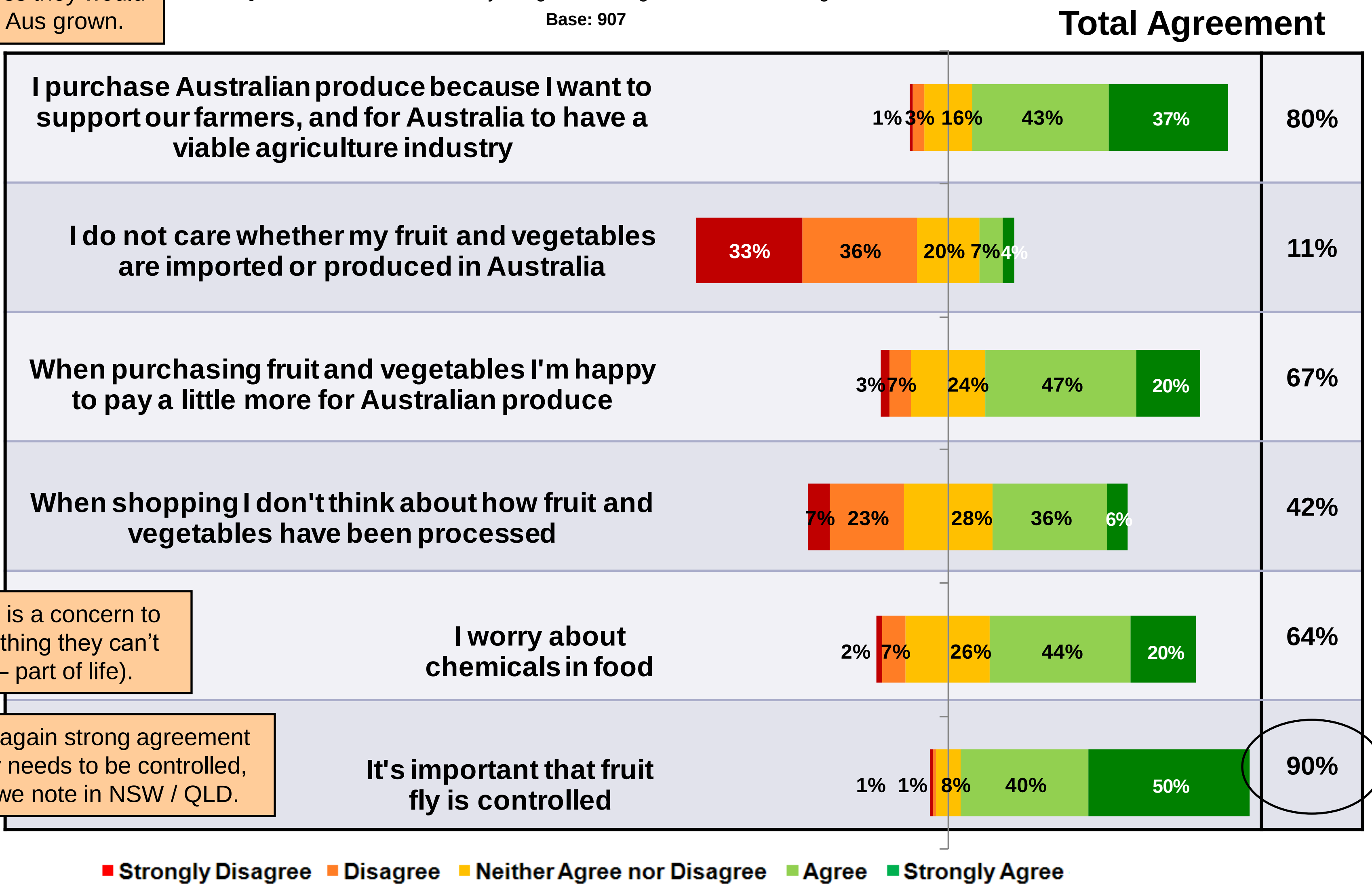
Attitudes towards Food Treatment

Respondents were passionate about the country of origin of their produce, and support Australian farmers. Some profess they would even pay more for Aus grown.

Q11 Please state how much you agree or disagree with the following statements

Base: 907



Chemicals in food is a concern to most (albeit something they can't usually impact – part of life).

There was again strong agreement that fruit fly needs to be controlled, including we note in NSW / QLD.

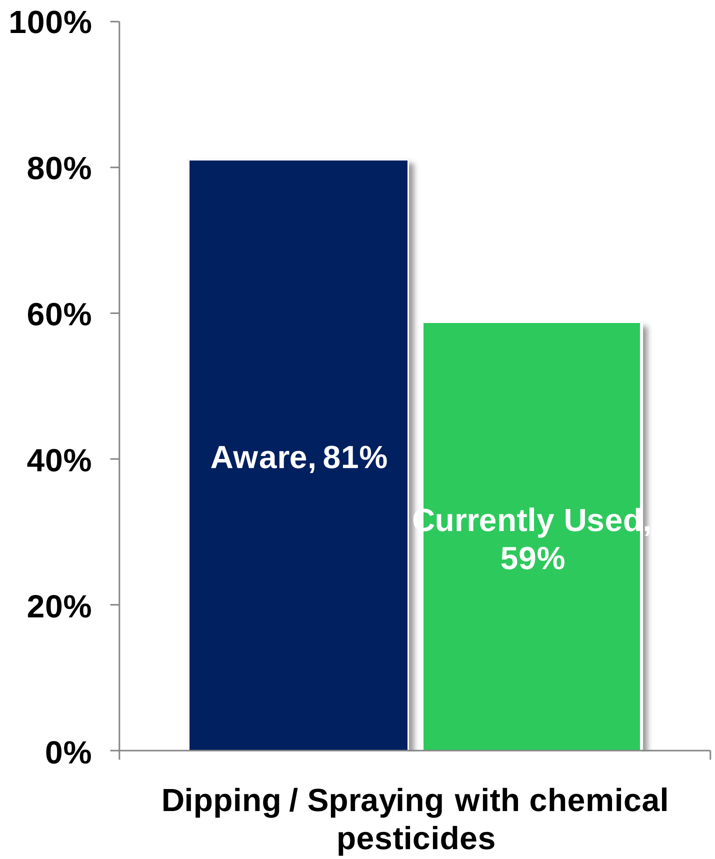
Individual Methods of Treatment

Dips & Sprays

Awareness of Treatment Methods
Dips & Sprays

Q12 Are you aware of any of the following as ways to control insect pests on fruit and vegetables?
Q13 Are any of these methods currently used in Australia to control insect pests?

Base: 907



As previously mentioned, Chemical dips and sprays have high awareness, and a majority of respondents believe it they are currently used.

Awareness of Treatment Methods

Dips & Sprays

***Respondents were shown information on a range of methods used to control insect pests on fruit and vegetables.
They were then asked their to quantify their attitudes / feelings regarding each method.**

Respondents were shown the following information before providing their feedback.

This method is “**Dips and Sprays**” using chemical pesticides.

In this process the produce is either dipped into a solution of a chemical pesticide, or sprayed with it.

The fruit or vegetables are not washed afterwards.

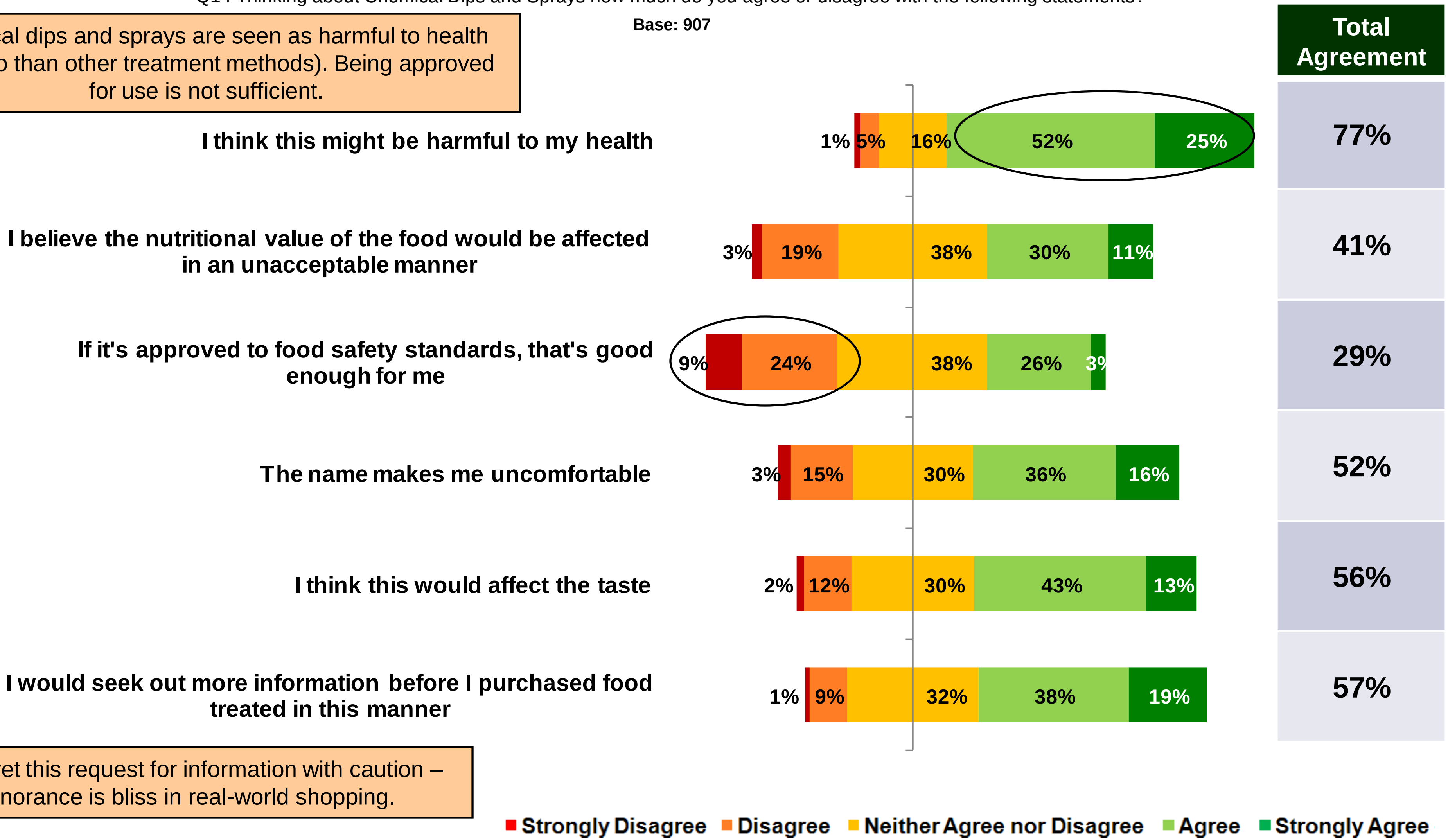
Attitude towards Treatment Methods

Dips & Sprays

Q14 Thinking about Chemical Dips and Sprays how much do you agree or disagree with the following statements?

Base: 907

Chemical dips and sprays are seen as harmful to health (more so than other treatment methods). Being approved for use is not sufficient.



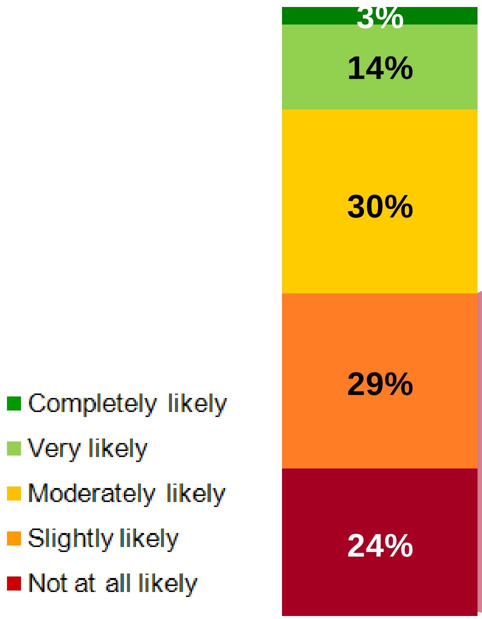
Interpret this request for information with caution – ignorance is bliss in real-world shopping.

Over half of respondents claim they would be slightly likely or not at all likely to purchase food treated with chemical dips and sprays.

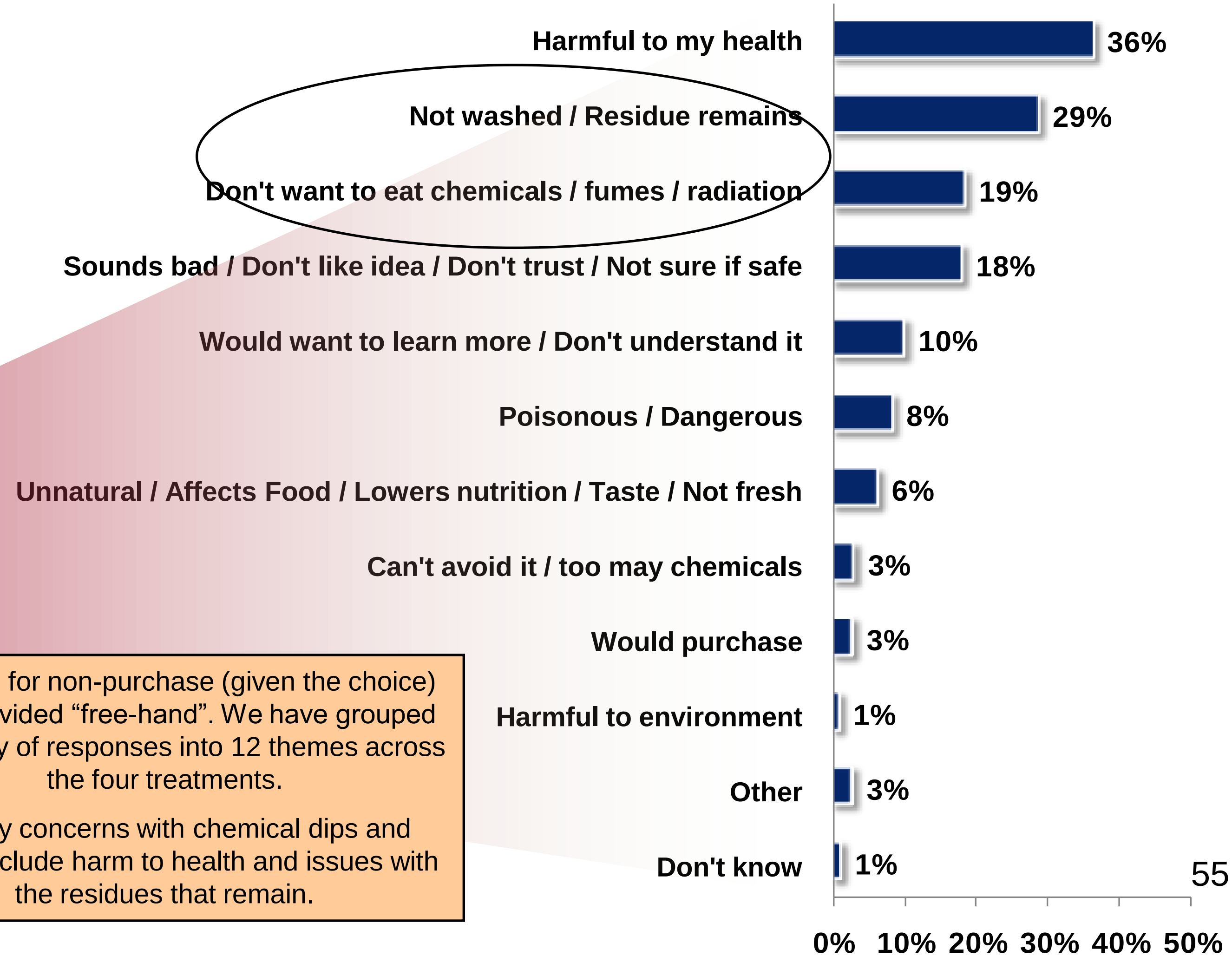
Awareness of Treatment Methods
Dips & Sprays

Base: Total 907,
Slightly or not likely to buy 486

Q15 How likely would you be to purchase food treated by dips and sprays?



Q16 Why would you not purchase products treated using chemical dips and spays?



Reasons for non-purchase (given the choice) were provided “free-hand”. We have grouped the variety of responses into 12 themes across the four treatments.

Primary concerns with chemical dips and sprays include harm to health and issues with the residues that remain.

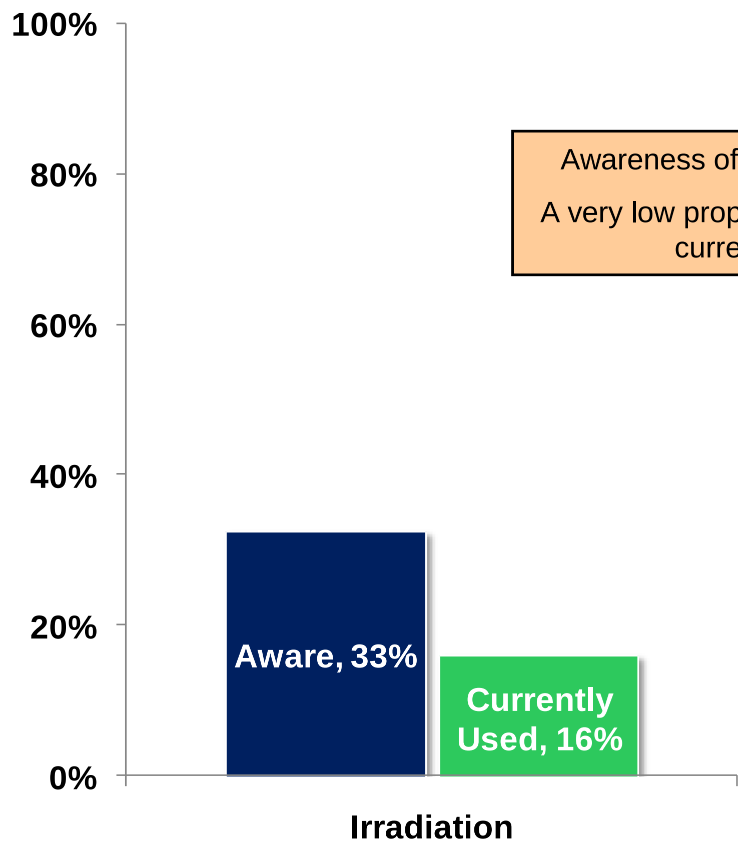
Irradiation

Awareness of Treatment Methods
Irradiation

Q12 Are you aware of any of the following as ways to control insect pests on fruit and vegetables?

Q13 Are any of these methods currently used in Australia to control insect pests?

Base: 907



Awareness of irradiation was low.

A very low proportion believed it was currently in use.

Awareness of Treatment Methods
Irradiation

The next method is called “**Irradiation**”.

Fruit and vegetables are exposed to either gamma rays, x-rays or electrons in order to kill insects, bacteria and micro-organisms.

When the treatment stops, the energy does not remain in the food.

Food treated this way lasts longer on the shelf before spoiling.
Vitamin content can be reduced around 10-15%

Attitude towards Treatment Methods
Irradiation

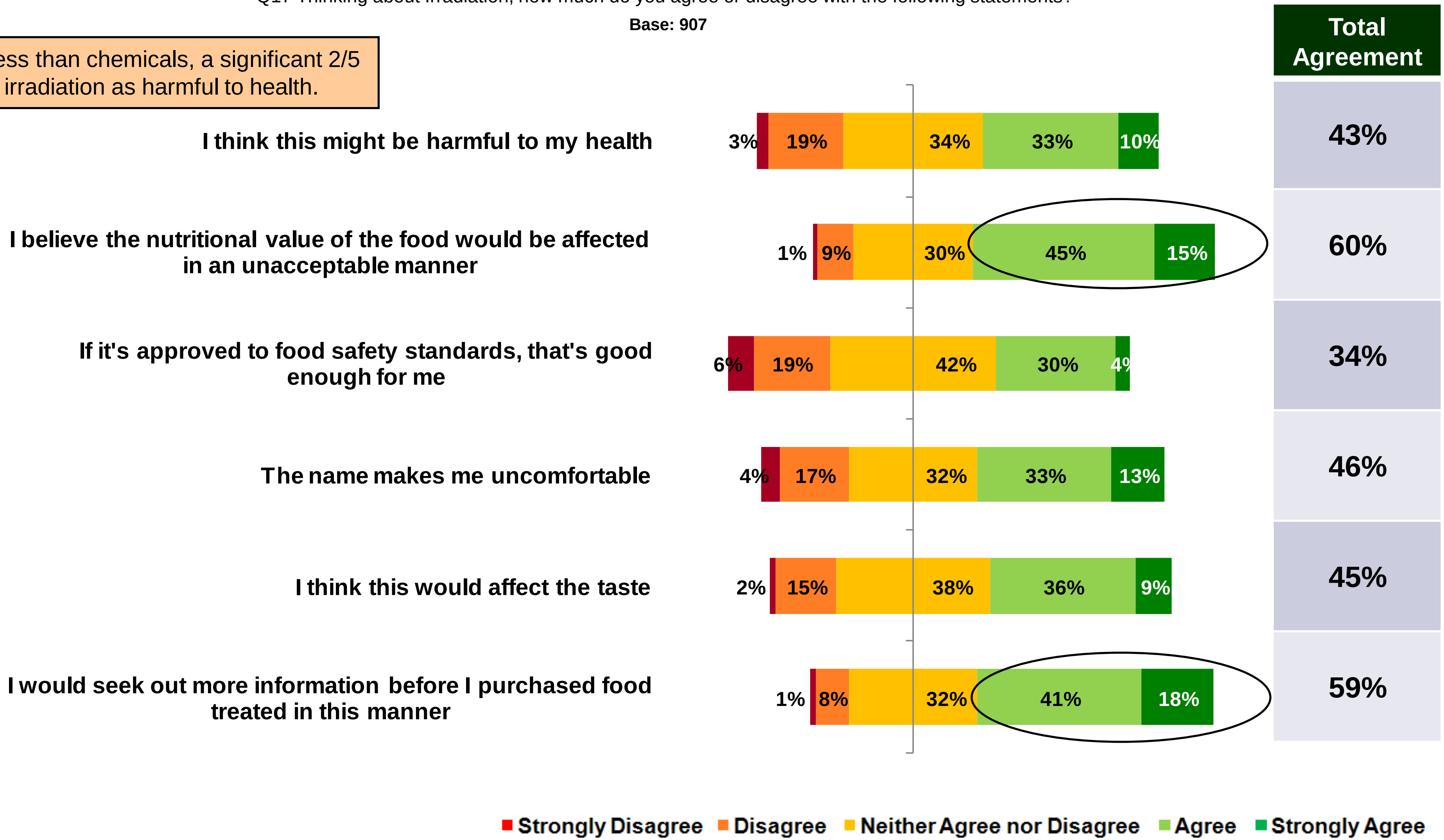
Many respondents believed the nutritional value of the food could be affected in an unacceptable manner.

(Note we did inform them that there would be **some** impact on nutrition in the introduction).

Q17 Thinking about Irradiation, how much do you agree or disagree with the following statements?

Base: 907

Whilst less than chemicals, a significant 2/5 see irradiation as harmful to health.



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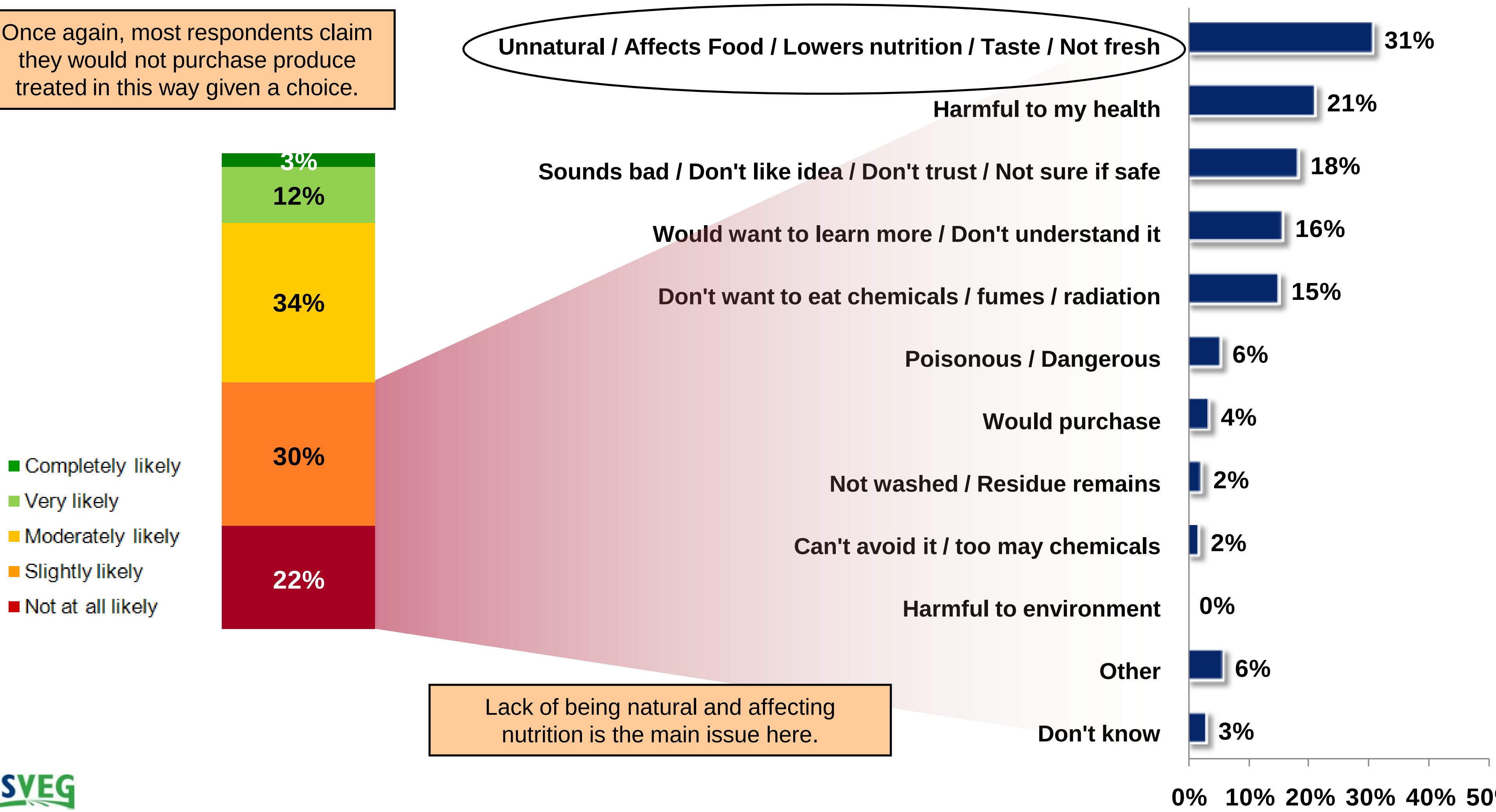
Awareness of Treatment Methods
Irradiation

Q18 How likely would you be to purchase food treated by Irradiation?

Base: Total 907, Slightly or not likely to buy 472

Q19 Why would you not purchase products treated using irradiation?

Once again, most respondents claim they would not purchase produce treated in this way given a choice.



Lack of being natural and affecting nutrition is the main issue here.

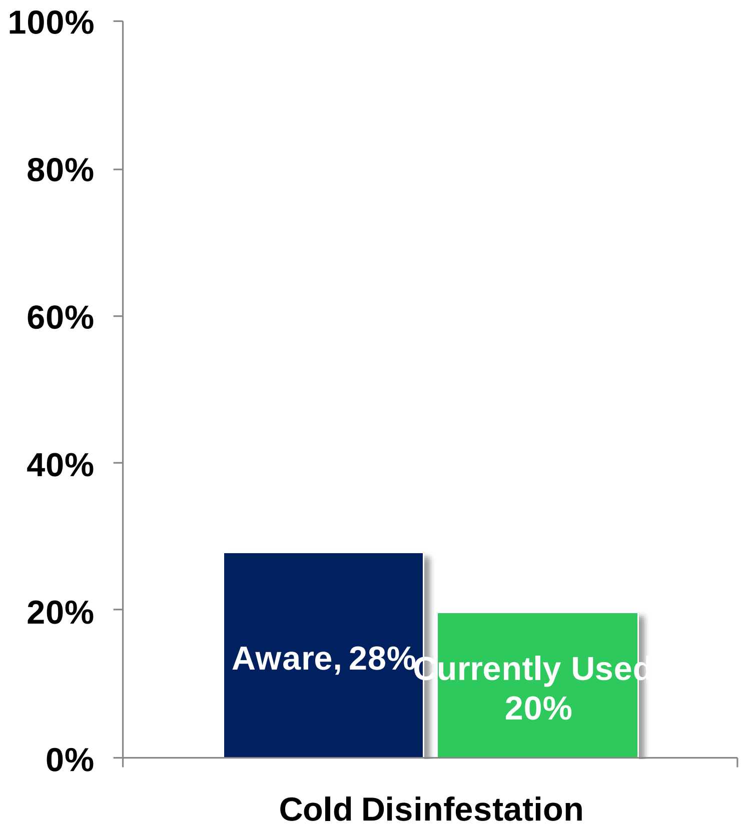
Cold Disinfestation

Awareness of Treatment Methods
Cold disinfestation

Q12 Are you aware of any of the following as ways to control insect pests on fruit and vegetables?

Q13 Are any of these methods currently used in Australia to control insect pests?

Base: 907



Low awareness of cold disinfestation.

The next method is “**Cold Disinfestation**”.

In this method the produce is put into cold storage at temperatures between 1-3^{0}C.
Food is left at these temperatures for between 16-20 days.
The prolonged exposure to low temperatures kills the Fruit Flies.

Not all produce treated in this method can be exported.

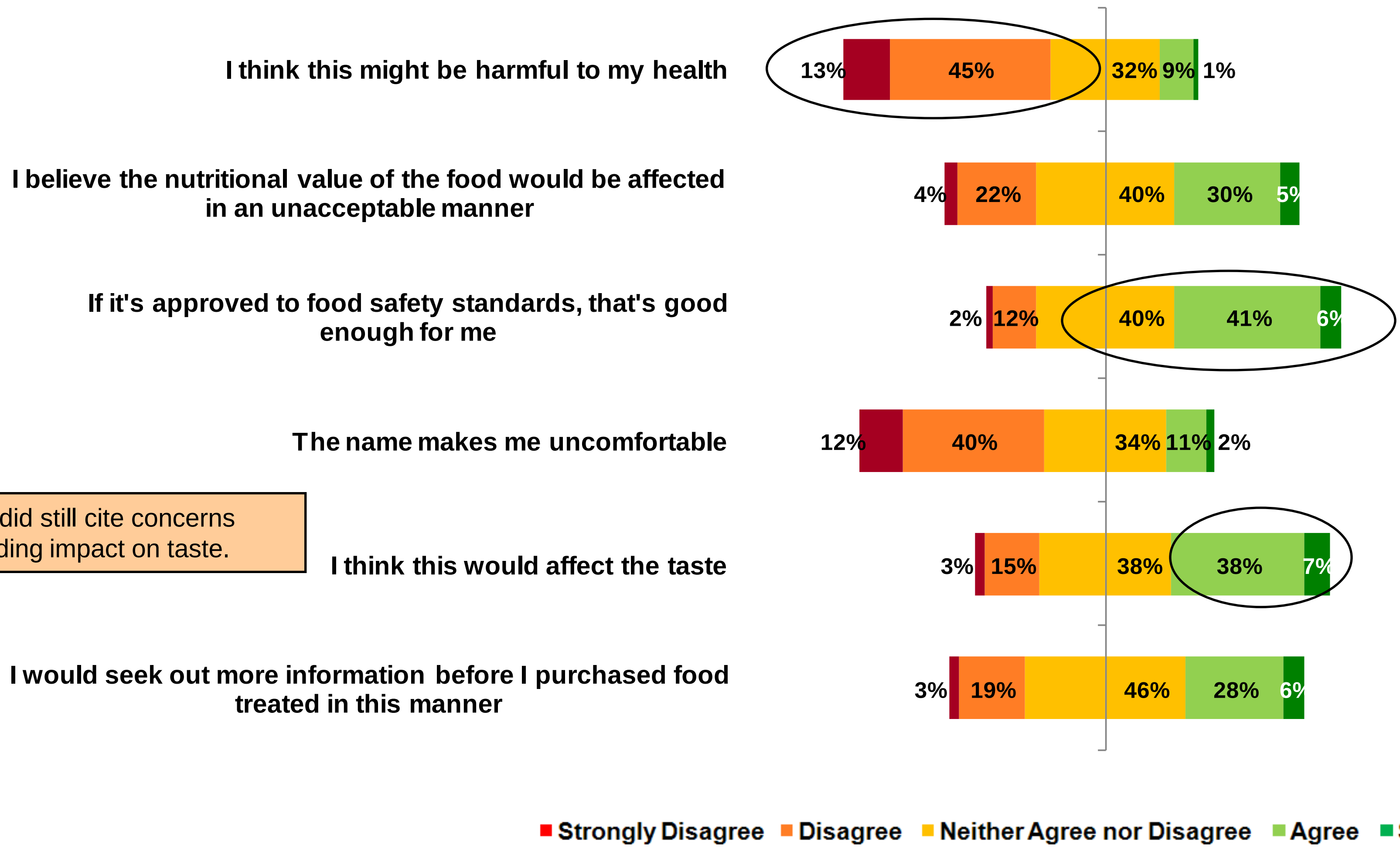
The most positively regarded overall.

Seen as the least harmful to health, having the least uncomfortable sounding name, and the lowest levels of claimed information requirements.

Attitude towards Treatment Methods
Cold Disinfestation

Q20 Thinking about Cold Disinfestation, how much do you agree or disagree with the following statements?

Base: 907



Total Agreement
10%
35%
47%
13%
45%
34%

Many did still cite concerns regarding impact on taste.

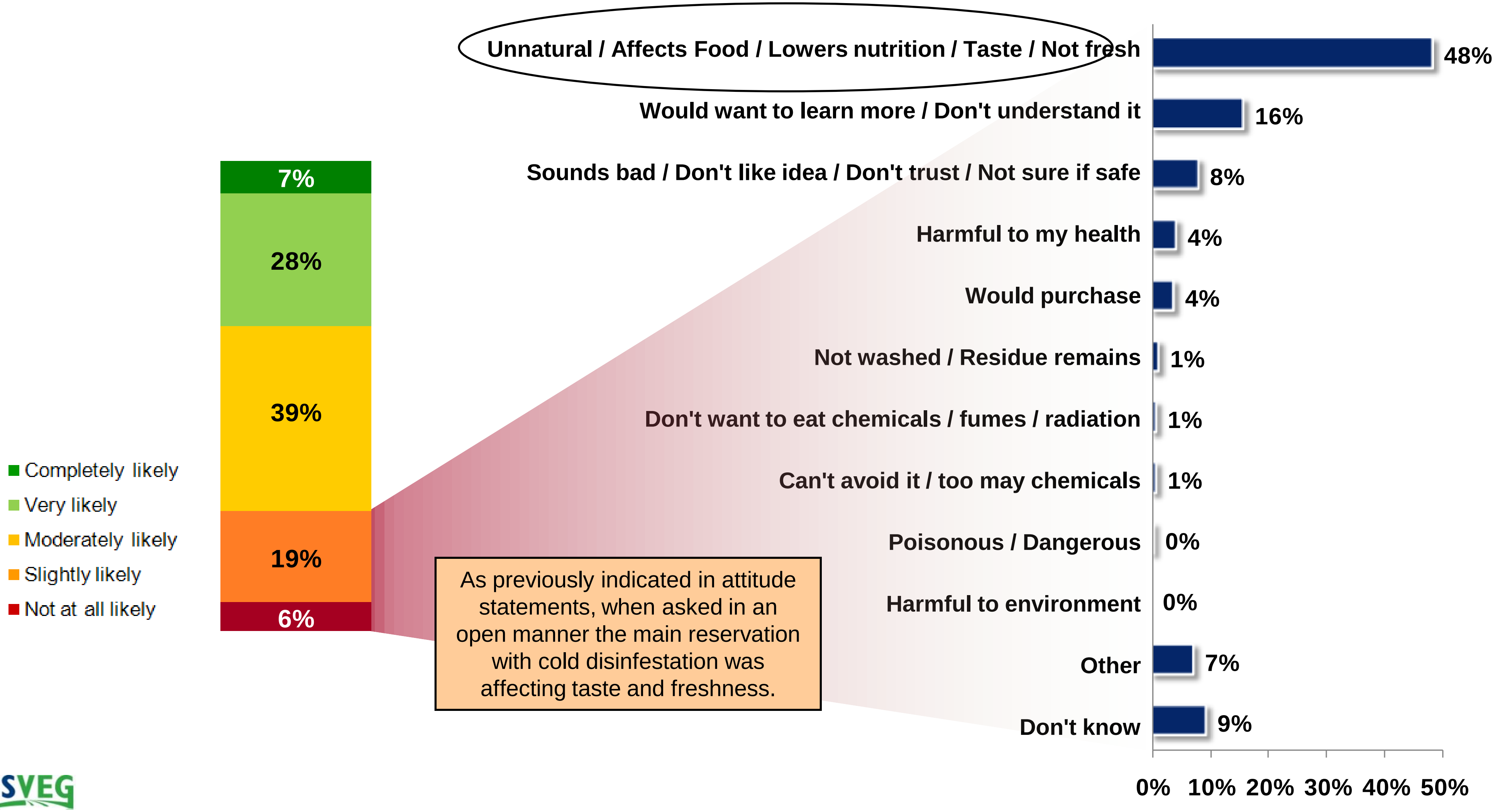
Awareness of Treatment Methods
Cold Disinfestation

Respondents appeared more favourable to purchasing food treated by cold disinfestation compared to other methods.

Q21 How likely would you be to purchase food treated by Cold Disinfestation?

Base: Total 907, Slightly or not likely to buy 234

Q22 Why would you not purchase products treated using Cold Disinfestation?



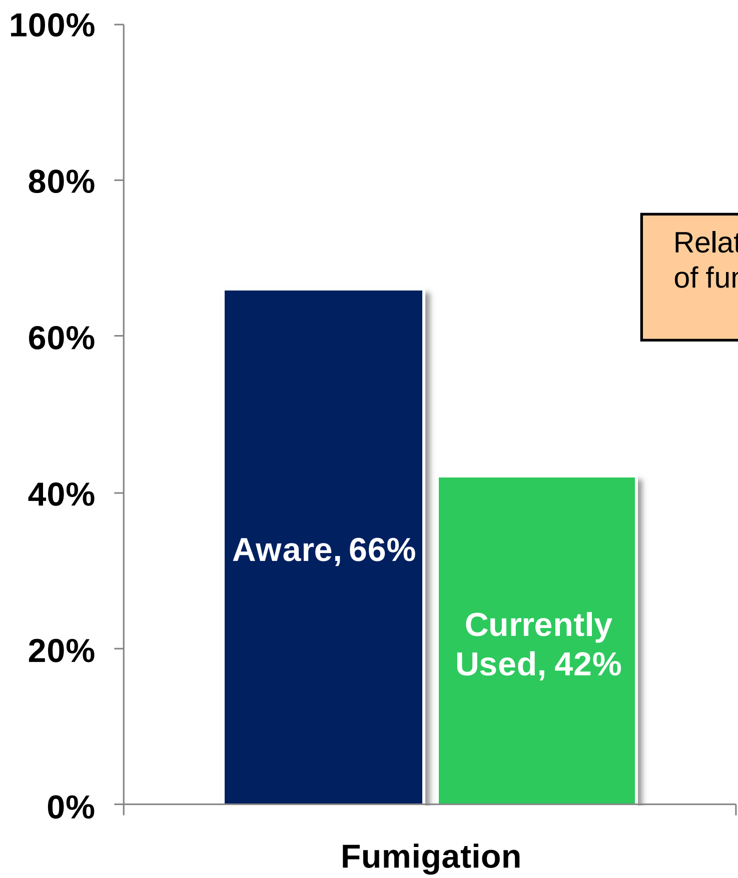
As previously indicated in attitude statements, when asked in an open manner the main reservation with cold disinfestation was affecting taste and freshness.

Fumigation

Awareness of Treatment Methods
Fumigation

Q12 Are you aware of any of the following as ways to control insect pests on fruit and vegetables?
Q13 Are any of these methods currently used in Australia to control insect pests?

Base: 907



Relatively strong awareness of fumigation compared with other methods.

The next method is “**Fumigation**”.

In this method the produce is put into a temperature controlled room and exposed to an invisible and tasteless gas.
This gas has insecticidal, fungicidal and herbicidal properties and kills any insects that may be present.

The gas does not leave a residue.
If some fruit contains blemishes prior to treatment, the gas can make them a little more visible.

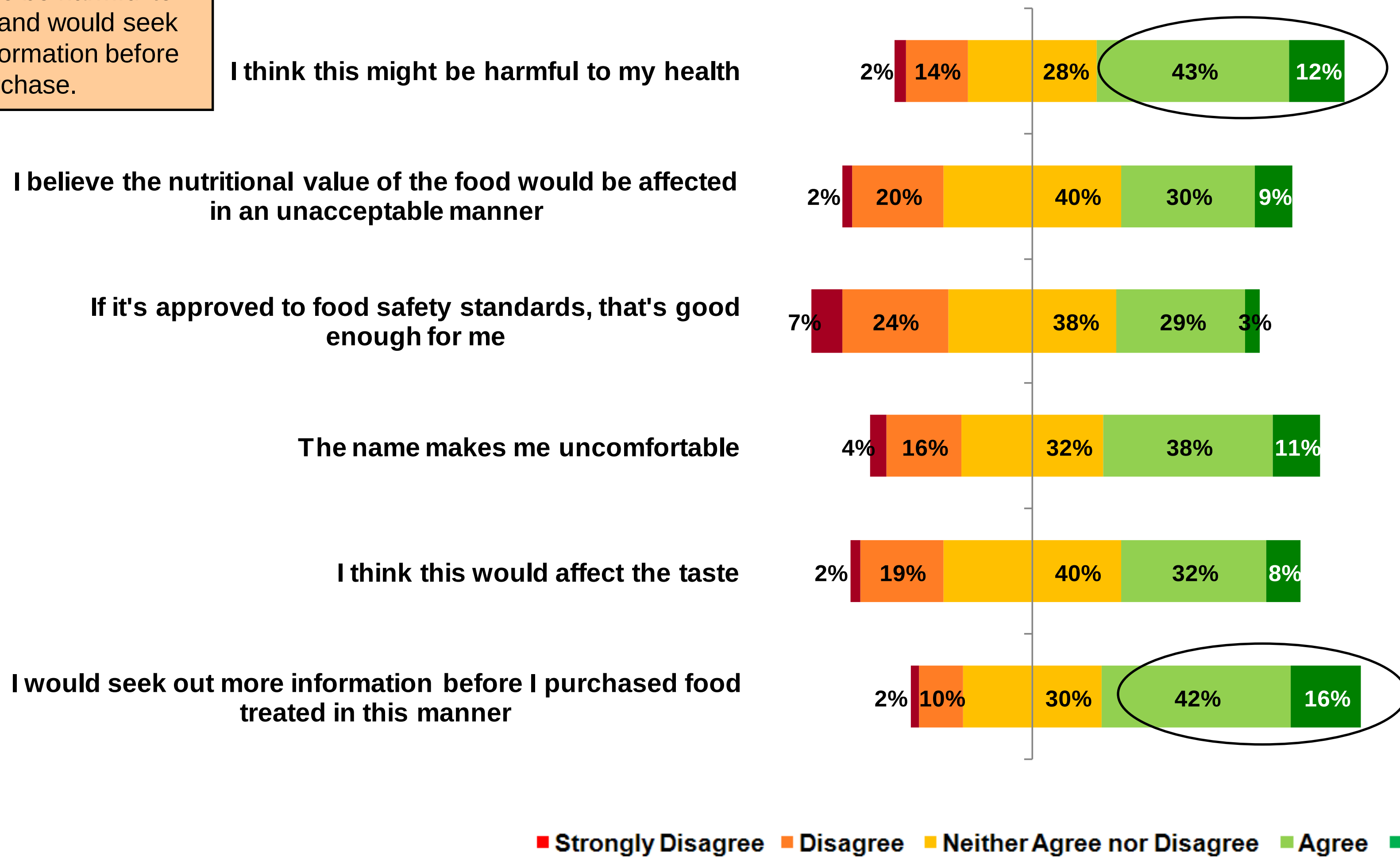
This gas is damaging to the ozone layer and has therefore been phased out of all other uses except agriculture.

Attitude towards Treatment Methods
Fumigation

Again, a high proportion of respondents believe fumigation to be harmful to their health and would seek out more information before purchase.

Q23 Thinking about Fumigation, how much do you agree or disagree with the following statements?

Base: 907



Total Agreement
55%
39%
32%
49%
40%
58%

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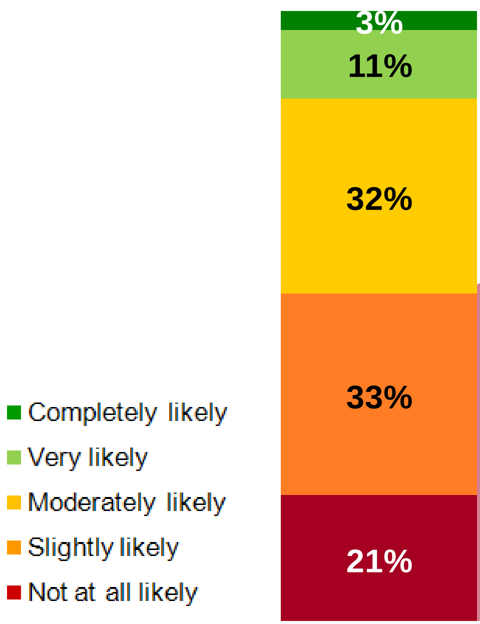
Awareness of Treatment Methods
Fumigation

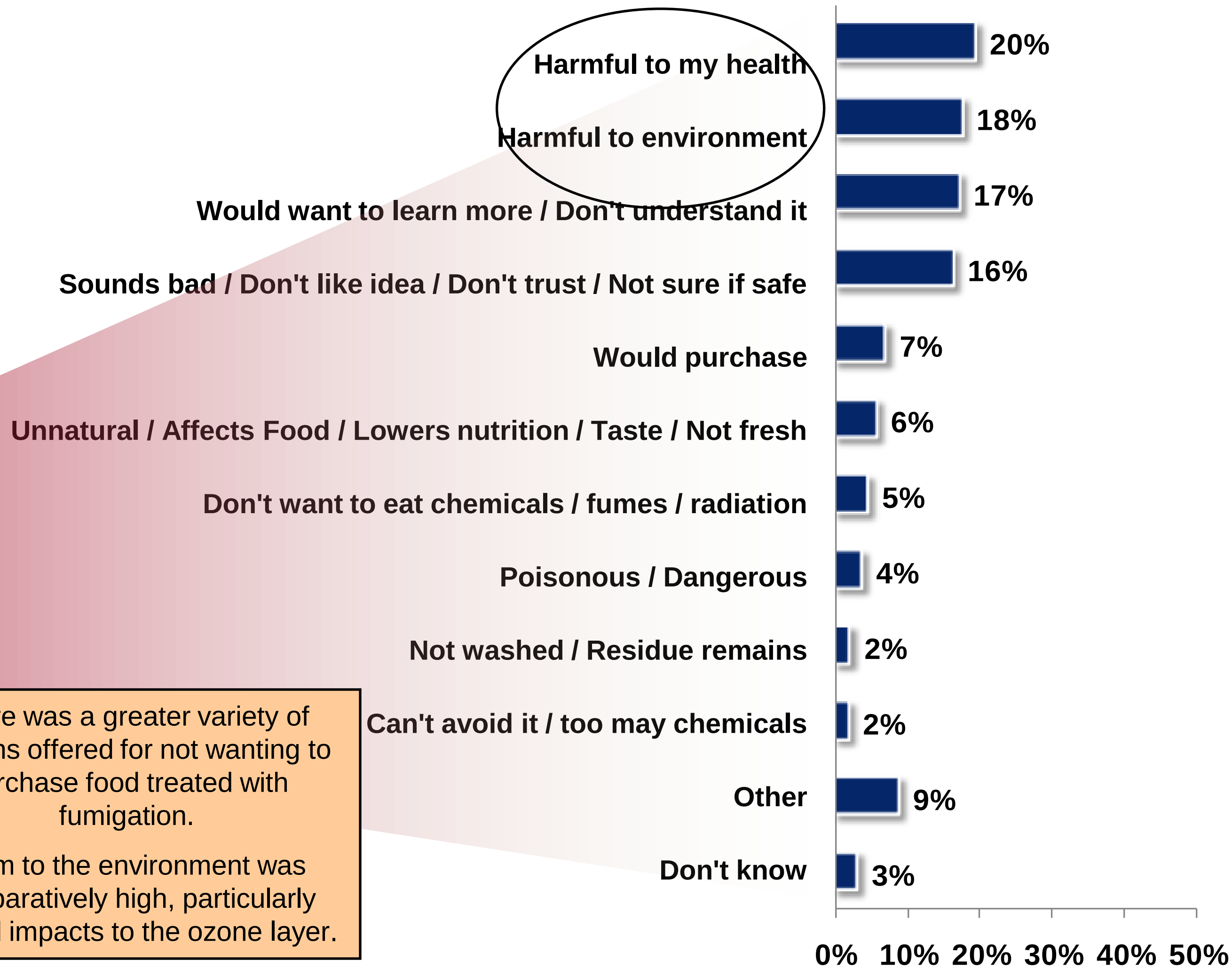
Q24 How likely would you be to purchase food treated by Fumigation?

Base: Total 907,
Slightly or not likely to buy 492

Q25 Why would you not purchase products treated using Fumigation?

Similar story here, with very few respondents being very or completely likely to purchase given a choice.





There was a greater variety of reasons offered for not wanting to purchase food treated with fumigation.

Harm to the environment was comparatively high, particularly around impacts to the ozone layer.

- **SAMPLE DETAILS – QUANTITATIVE SURVEY**
- **PURCHASE BEHAVIOUR**
- **METHODS OF TREATMENT**
  - UNAIDED / AIDED
  - ATTITUDES TOWARDS FOOD TREATMENT
  - CHEMICAL DIPS AND SPRAYS
  - IRRADIATION
  - COLD DISINFESTATION
  - FUMIGATION
- **PREFERENCE AND COMPARISON**
- **RECOMMENDATIONS**

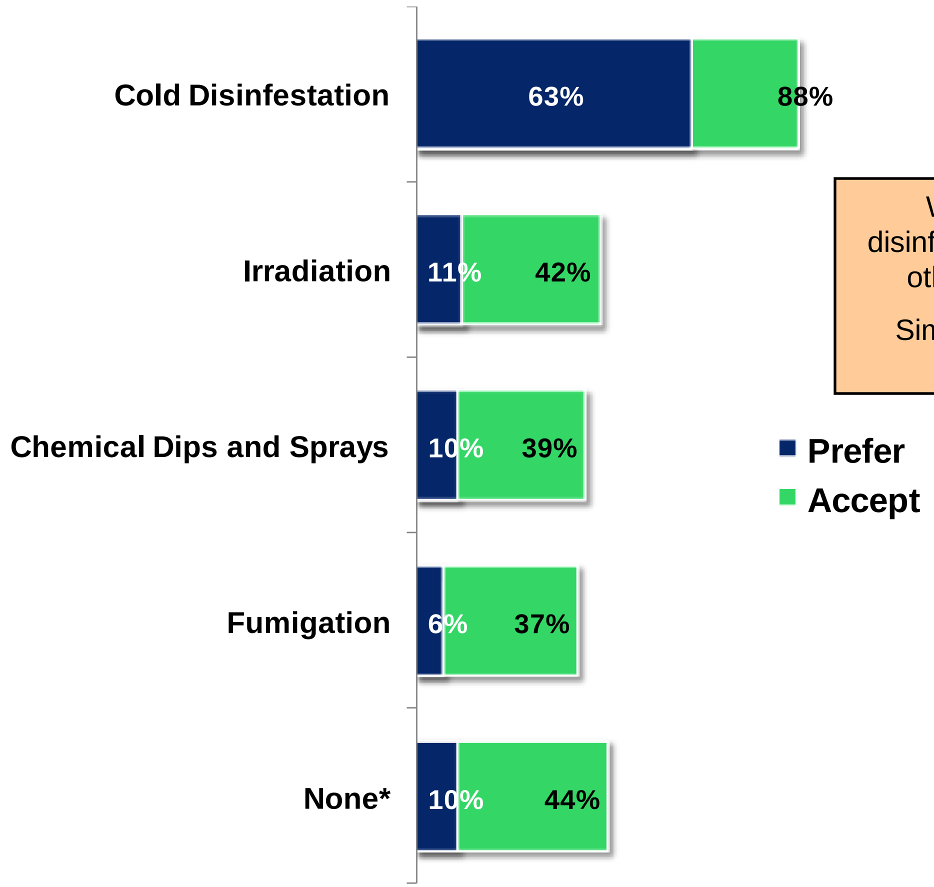
STAGE 2 - QUANTITATIVE

Preferred Methods

Q26 Having heard about all four methods, if you had to pick ONE which would you prefer?

Q27 Are there any other methods would you also accept?

Base: 907



When asked for a preference, cold disinfestation was the clear winner, with the other methods being about the same.

Similar patterns for all other acceptable methods.

***I would not eat food treated by any of these methods even if it meant cutting some fruits and vegetables from my diet**

Preferred Methods

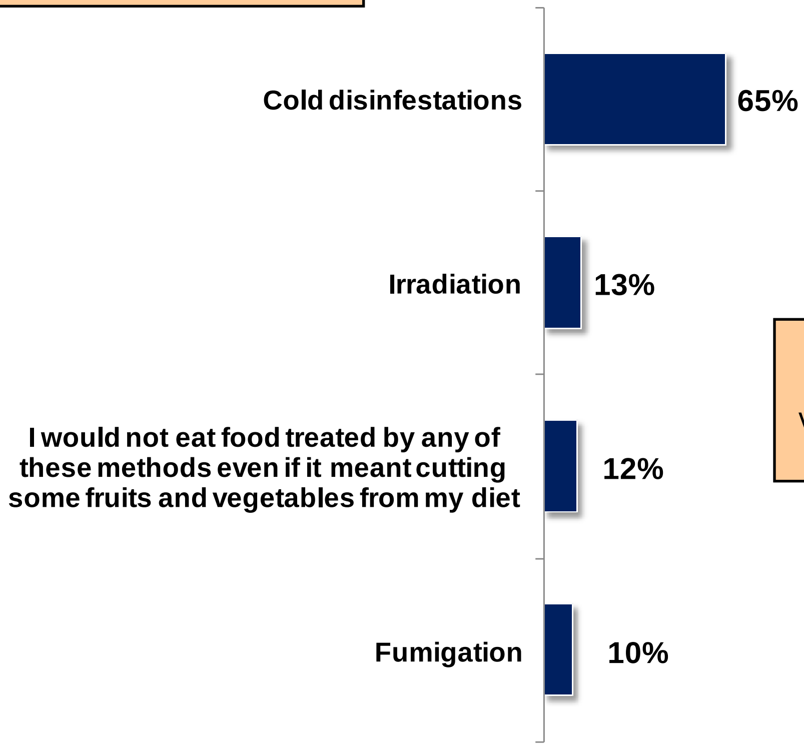
Q28 If dipping/ spraying fruit with chemical pesticides was banned, and you had to pick ONE other method, which would you prefer?

Q29 If the use of chemicals in vegetable production was substantially reduced, but not eliminated, would you be more likely to buy it?

Base: 907

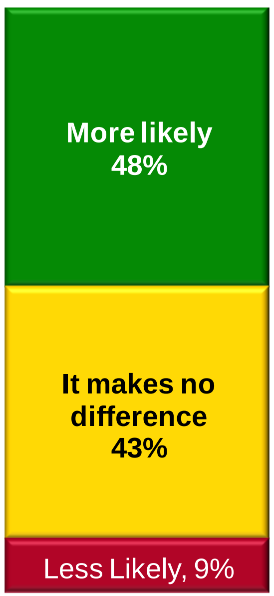
Again, cold disinfestation is the clear preference from the perspective of the consumer.

Other Preferred Method



Most respondents claim they would be more likely to buy vegetables if chemical use was reduced.

Likelihood to buy if Chemicals Reduced



Attitude Towards Treatment Methods

Q14, 17, 20, 23 Thinking about xxxx how much do you agree or disagree with the following statements?

Base: 907

Here we look at a comparison between the four methods previously presented.

Chemical dips and sprays appear to exhibit the highest level of concern re harm to health. Irradiation and fumigation are middle of the pack with their own strengths and weaknesses. Cold disinfestion appears to be of least concern to respondents.

% Agree or Strongly Agree

	Chemical Dips and Sprays	Irradiation	Cold Disinfestation	Fumigation
I think this might be harmful to my health	77%	44%	11%	55%
I believe the nutritional value of the food would be affected in an unacceptable manner	41%	60%	35%	38%
If it's approved to food safety standards, that's good enough for me	29%	33%	47%	32%
The name makes me uncomfortable	52%	46%	14%	48%
I think this would affect the taste	56%	45%	45%	40%
I would seek out more information before I purchased food treated in this manner	57%	59%	34%	58%

Likelihood to Purchase

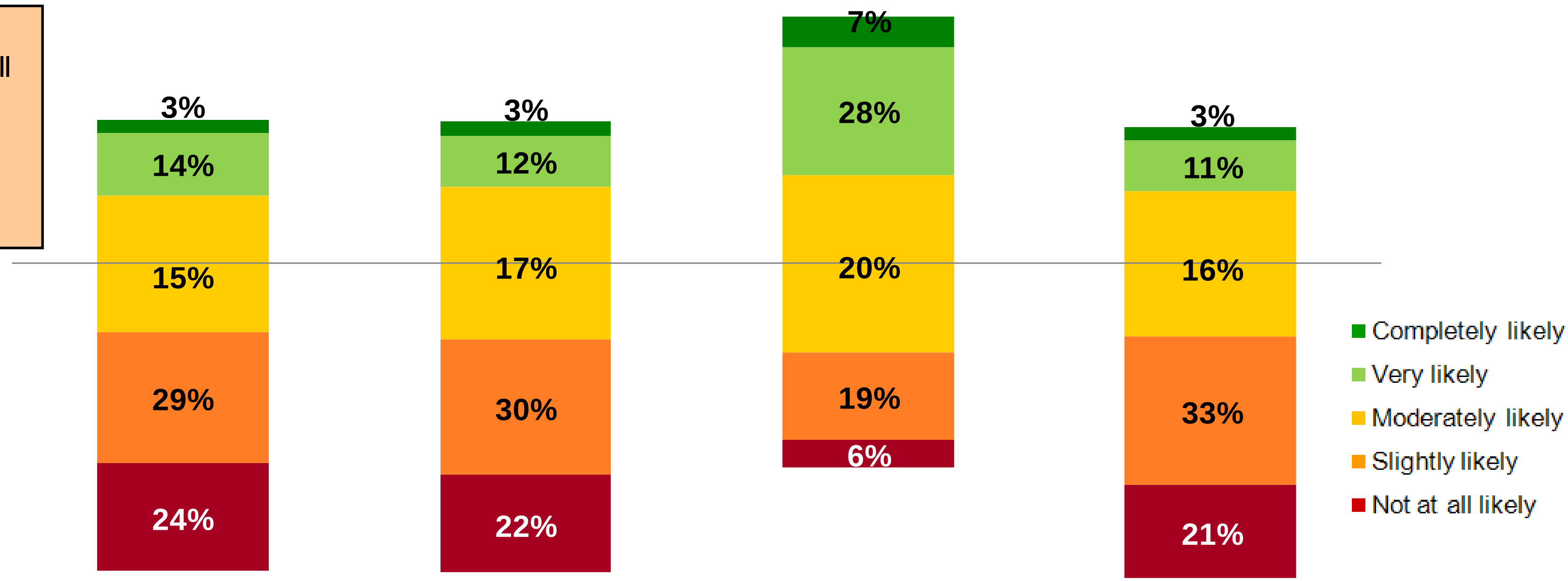
Q15, Q18, Q21, Q24 How likely would you be to purchase food treated by xxxx?

Base: 907

	Chemical Dips and Sprays	Irradiation	Cold Disinfestation	Fumigation
% Completely / Very Likely	17%	15%	35%	14%

The approval of cold disinfestation translates well into likelihood to purchase.

The other three showed similar levels of purchase likelihood.



Using another perspective, Cold Disinfestation has relatively few rejecters.

tkp

This table looks at the open responses as to why respondents would not purchase normalised to that percentages would apply across the **entire** sample; **these results would generalise to attitudes in the population.**

Reasons For Not Purchasing

Q16, 19, 22, 25 Why would you not purchase products treated using xxx? - Coded

Base: 907

	Chemical Dips and Sprays	Irradiation	Cold Disinfestation	Fumigation
Unnatural / Affects Food / Lowers nutritional value / Taste / Not fresh	3%	16%	12%	3%
Harmful to my health	19%	11%	1%	10%
Sounds bad / Don't like the idea / Don't trust it / Not sure if safe	10%	9%	2%	9%
Would want to learn more / Don't understand it	5%	8%	4%	9%
Don't want to eat chemicals / fumes / radiation	10%	8%	0%	3%
Not washed / Residue remains	15%	1%	0%	1%
Would purchase	2%	2%	1%	4%
Poisonous / Dangerous	4%	3%	0%	2%
Can't avoid it / too may chemicals	2%	1%	0%	1%
Harmful to environment	1%	0%	0%	9%
Other	2%	3%	2%	5%
Don't know	1%	2%	2%	2%

There appears to be a base of people who would not buy simply because they don't know enough and or don't trust the method.

Harm to health was dominated by chemical use (linked to residues we believe), although about 10% claim they would reject irradiation and fumigation due to health concerns.

Irradiation and cold disinfestation were perceived to impact food quality and nutrition.

Fumigation stands alone as being potentially harmful to the environment (ozone).

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- **SAMPLE DETAILS – QUANTITATIVE SURVEY**
- **PURCHASE BEHAVIOUR**
- **METHODS OF TREATMENT**
  - UNAIDED / AIDED
  - ATTITUDES TOWARDS FOOD TREATMENT
  - CHEMICAL DIPS AND SPRAYS
  - IRRADIATION
  - COLD DISINFESTATION
  - FUMIGATION
- **PREFERENCE AND COMPARISON**
- **RECOMMENDATIONS**

STAGE 2 - QUANTITATIVE

◢ ***Awareness of Fruit Fly is generally low, as are methods of control***

– When educated on the issue, consumers acknowledge the need to control pests.

– How to do this is largely unknown.

◢ ***Chemical use in foods is seen as a fact of life***

– There is an assumption that chemicals are involved in food production even if specifics are not known.

– Note however that given a choice respondents would minimise chemical use – **resignation is not acceptance.**

◢ ***Education creates discomfort***

– When presenting consumers with treatment methods they are asked to think about something that most DON'T usually think about. This creates discomfort where before there was little.

– It appears that a little exposure to the names and methods creates suspicion.

– It also creates a challenge in interpretation, for example claimed non-purchase is likely to be overstated.

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Recommendations

- ***Be targeted in provision of information***
  - Issues are largely around the uncertainty / lack of knowledge
  - The methods require significant explanation over and above the names / short descriptions.
- ***Names and terminology***
  - Scientific names and terminology are scary
  - If possible, non-scientific names may therefore be beneficial
- ***Poor nutrition and ingestion of toxins are the main issues***
- ***Empathy / Sympathy for farmers is high***
  - Helping their viability may be a secondary benefit in communications (but not sufficient to overcome the major concerns)
- ***Chemical dips and sprays were concerning***
  - Leveraging this could be a plus in changing methods
  - Move from a ‘nasty’ chemical dip to something cleaner, with less residue etc..

Recommendations

- ***Cold Disinfestation was the most appealing method***
  - Low residue
  - Refrigeration is a familiar concept
  - The name itself is not intimidating

- ***Systems Approach was the next most accepted***
  - Albeit with concerns about viability for farmers around the impact on cost
  - A half-way to organic if chemical use was reduced

- ***Irradiation was not preferred***
  - However we believe this could be overcome somewhat through informing and educating
  - Ramp up the benefits of no residue and elimination of bacteria
  - Ramp up the approval in Europe
  - The requirement to label is a problem – creates suspicion and is essentially the only method the consumer would potentially be made aware of. Be as low key as possible, IF possible.
  - We sense a thorough PR strategy is essential

Recommendations

- ***Heat & Low Methyl Bromide / Fumigation***
  - The impacts on the ozone layer are seen as a step backwards
  - Otherwise this method may have applicability due to low residue or quality impacts

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THE KLEIN PARTNERSHIP

MARKET RESEARCH CONSULTANTS

APPENDIX 5
Road Show Presentations

AUSVEG Market Research

Peter Roberts (RAS NZL)

Darryl Hardie (WA)

Peter Crisp (SA)

Peter Leach (QLD)

AUSVEG Presentation
Alternatives to Dimethoate and Fenthion

Study # 4158 – March 2012

Background and Objectives: "To better understand customer perceptions".

SITUATION

- Two chemicals used on produce to control Queensland fruit fly are likely to be phased out of the industry. Alternative methods of protecting produce from fruit fly are under investigation.
- Before widespread implementation, there is a need to gauge consumer perceptions of a range of alternate methods.

The over-arching objectives of the research are to better understand customer perceptions, attitudes, barriers and concerns around the different treatment methods.

Specifically we seek to understand:

- Awareness and understanding of methods of protecting fruit and vegetables from infestation
- Attitudes towards the current and alternative methods / chemicals
- Drivers and barriers to adoption of each of the alternative approaches
- Key messaging that may be useful in implementation of a new approach

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Research program: Explore the issues then quantify

STAGE 1 – EXPLORE → **STAGE 2 – QUANTIFY**

Stage 1 – Explore

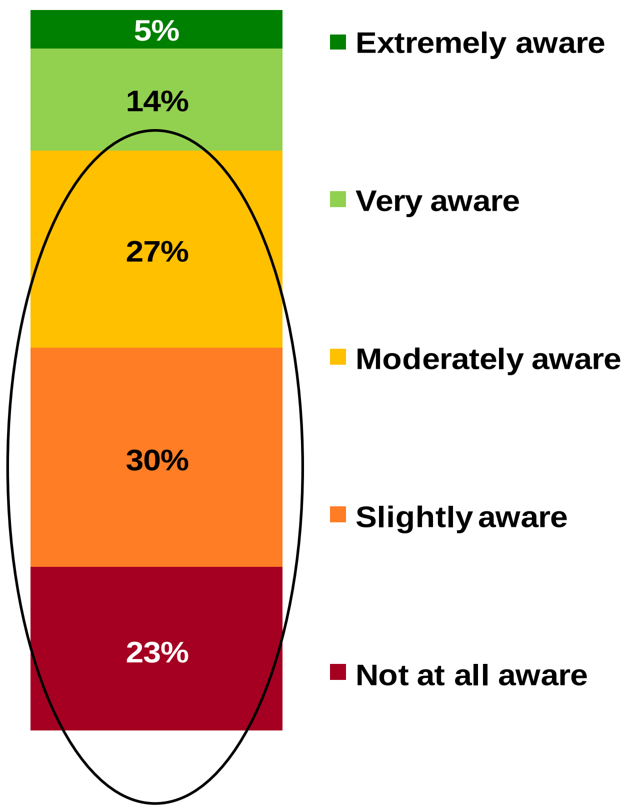
- THREE focus groups.
- Melbourne, Adelaide, Hobart
- Semi-structured “lines of enquiry”
- Longer interviews
- Unearth the deeper attitudes, perceptions, motivations and behaviours
- Main Grocery Buyers

Stage 2 – Quantify

- 917 respondents
- Structured questions
- Shorter interviews
- Pre-defined assessment criteria
- A numeric measurement. Measurement is objective and statistically valid.
- Main or Joint Grocery Buyers, do not regularly buy organic.

Awareness of pest issue is low.
Universal acceptance of the need to control Fruit Fly.

How aware were you of this issue? [Fruit flies]



> ***"I don't think about it."***

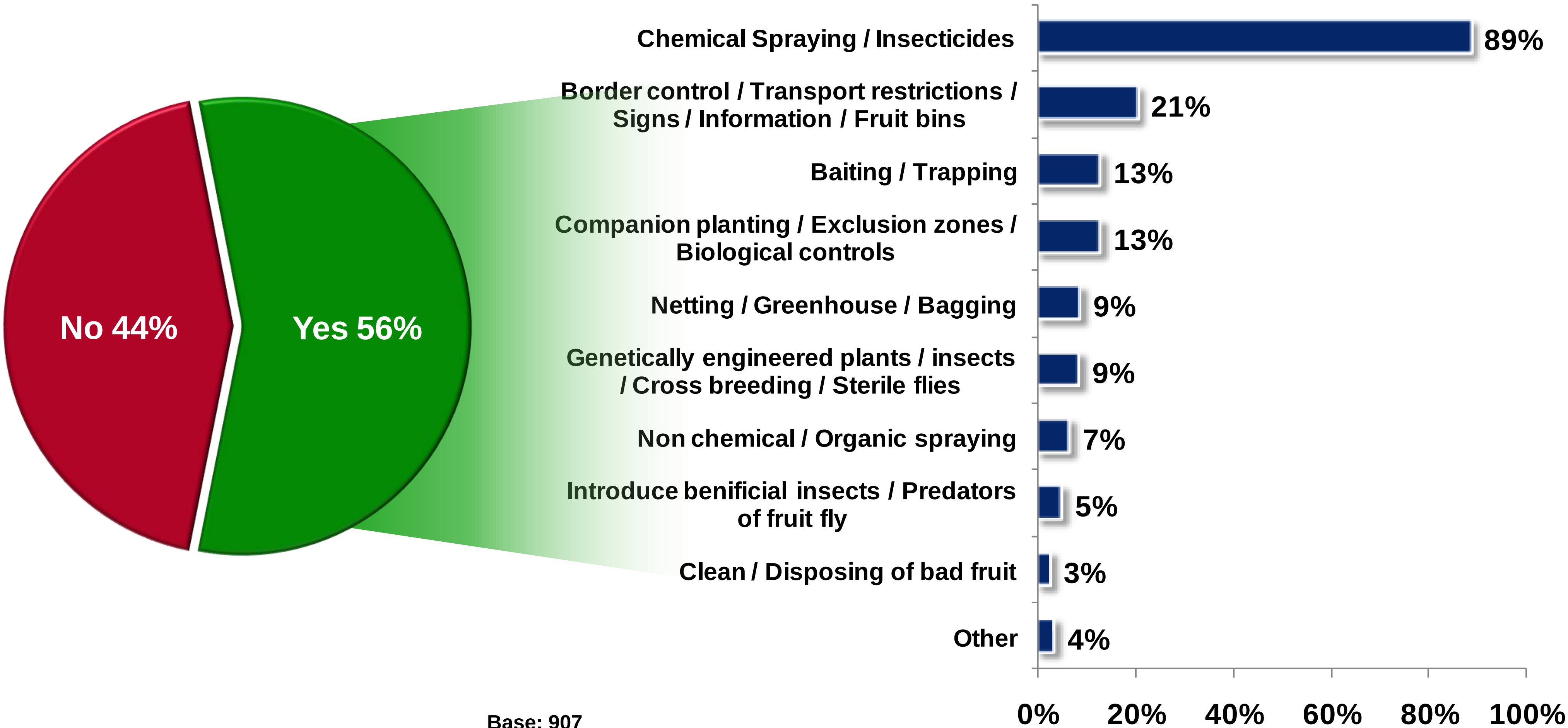
> ***"If the farmers didn't spray they wouldn't make money."***

> ***"I worry a bit about the kids – but it doesn't stop me buying it!"***

Awareness of pest control methods is low. Those aware, know of chemicals.

Are you aware of any methods used to control insect pests on fruit and vegetables?

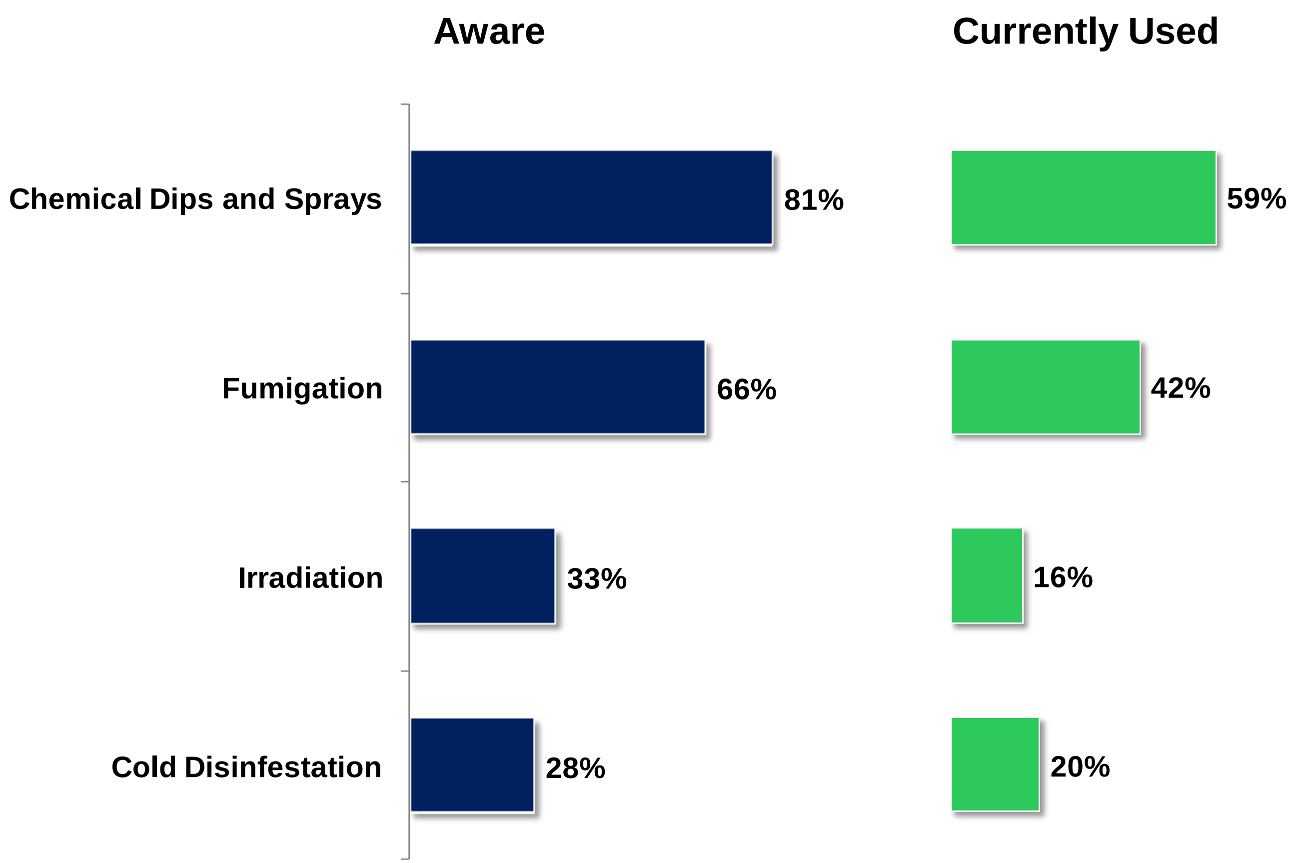
Please list the methods you are aware of for controlling insect pests on fruit and vegetables?



Most have heard of chemicals and fumigation. Most think they are being used.

Are you aware of any of the following as ways to control insect pests on fruit and vegetables?

Are any of these methods currently used in Australia to control insect pests?



Base: 907

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Chemical dips and sprays

- Chemical pesticides were accepted – makes farming viable and increases yields.
- Naming chemicals (Dimethoate and Fenthion) was alarming, and increased wariness.
- When informed that these chemicals were currently in use, the assumption for most was that they must be ok.
- Spraying was much more acceptable than "dipping" produce in chemicals. Dipping = more residue
- Advising respondents that the industry had to look for new post-harvest treatments created suspicion.

"They have to treat it with something."

"That sounds harmful doesn't it."

"If it passes standards I guess it's fine."

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Fumigation – Heat and low methyl bromide

- General impressions were that this was less harmful than chemical dips and sprays; Less residue, No impact on nutrition.
- Impacts on the ozone layer, and the fact Methyl Bromide had been phased out of other applications were the main (and significant) barriers to acceptance.
- Again the chemical name ‘Methyl Bromide’ was alarming; ‘fumigation’ was significantly more acceptable terminology, albeit with associations with stronger chemicals.

“Fumigation’s what they do to houses isn’t it?”

“It sounded good until the part about damaging the ozone layer.”

“If it can damage the ozone layer can it damage me?”

Cold disinfestation

- The least intimidating method; “Cold” is familiar. It sounds clean, natural and less harmful to health.
- As many assume fruit is stored for long periods of time, this method seems redundant – they assume that cold storage is happening anyway.
- Negatives included belief that cold storage would reduce intensity of flavour and perhaps nutrition.
- Overall, this was the most appealing method. If the respondents had a choice, they would choose produce treated in this manner.

However...... This depends on the consumer being aware of the method of treatment, **and they simply are not currently.**

“That’s not so scary sounding.”

“So that’s just like putting it in the fridge!”

“20 days is too long before it gets to me.”

Systems approach

- Interestingly, responses focussed on their perceptions that this approach was time consuming and therefore expensive.
- Price aside, it was regarded as 'good practice' and an indication that growers were taking good care of their crops.
- However, it was acknowledged that a Systems approach could still use chemicals. Respondents considered that it involved a lot of effort for no gain to the consumer.
- When respondents were presented with the concept of a Systems Approach using **LESS** chemicals post-harvest, responses were positive. This seemed almost like half-way to organic.

"It sounds like there's a lot of labour involved. Wouldn't that push the prices up?"

"Can the farmer afford it?"

"If it uses less chemicals, and it's the same price, that's great."

Irradiation

- The overarching response to irradiation was **lack of understanding.**
- **Sentiment was very mixed**, from "not sure what to think", to positive, to negative.
- **Interpretively, for irradiation to be successful, it would require significant investment in public education.**
- The name was a concern, but no more than the chemical options.
- Being used overseas for many years was generally a positive, as it spoke to track-record of safe use.
- The elimination / eradication of microorganisms and bacteria was a positive to some, with the benefit that produce lasts longer on the shelf.
- The lack of chemicals / residues was a positive, however the **reduction in vitamins and nutrients was a real issue**.

"Sounds pretty hardcore."

"It's a scary term, but it's not always a scary thing."

"Sounds like it wipes everything out – good and bad."

"If I'm buying vegies, I'm buying them for the nutrients."

Fruit fly should be controlled for Aus industry. Most trust industry to maintain quality / safety.

Please state how much you agree or disagree with the following statements

Respondents were passionate about the country of origin of their produce, and support Australian farmers. Some profess they would even pay more for Australian grown produce.

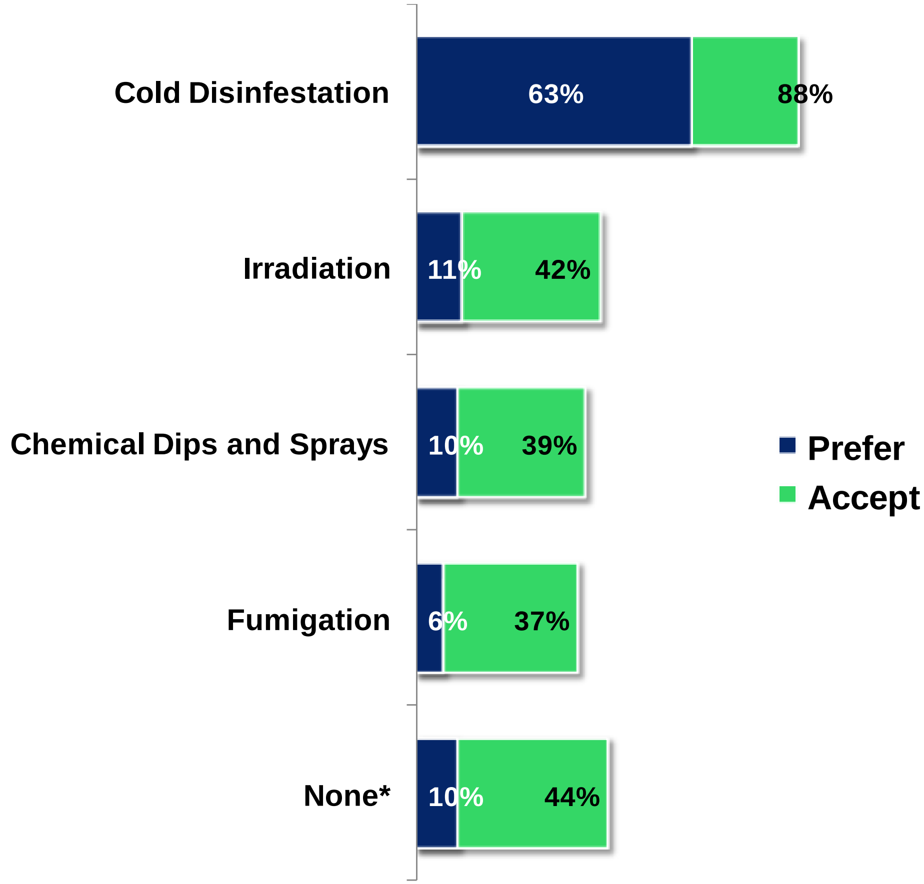
% who agree with statement

90%	It's important that fruit fly is controlled
80%	I purchase Australian produce because I want to support our farmers, and for Australia to have a viable industry
67%	When purchasing fruit and vegetables, I'm happy to pay a little more for Australian produce
64%	I worry about chemicals in food
64%	I trust the organisations responsible for food safety to make sure it's safe to eat
63%	I trust the organisations responsible for food safety to make sure food quality is maintained
51%	Pesticides are a fact of life
43%	The way that insects and pests are controlled does not affect where I purchase fruit and vegetables from
42%	When shopping I don't think about how fruit and vegetables have been processed
40%	The way that insects and pests are controlled does not affect the types of fruit and vegetables I eat
38%	Without pesticides, fruit and vegetables would be too expensive
11%	I do not care whether my fruit and vegetables are imported or produced in Australia

Base: 907

Cold disinfestation is strongly preferred

Having heard about all four methods, if you had to pick ONE which would you prefer?
Are there any other methods would you also accept?



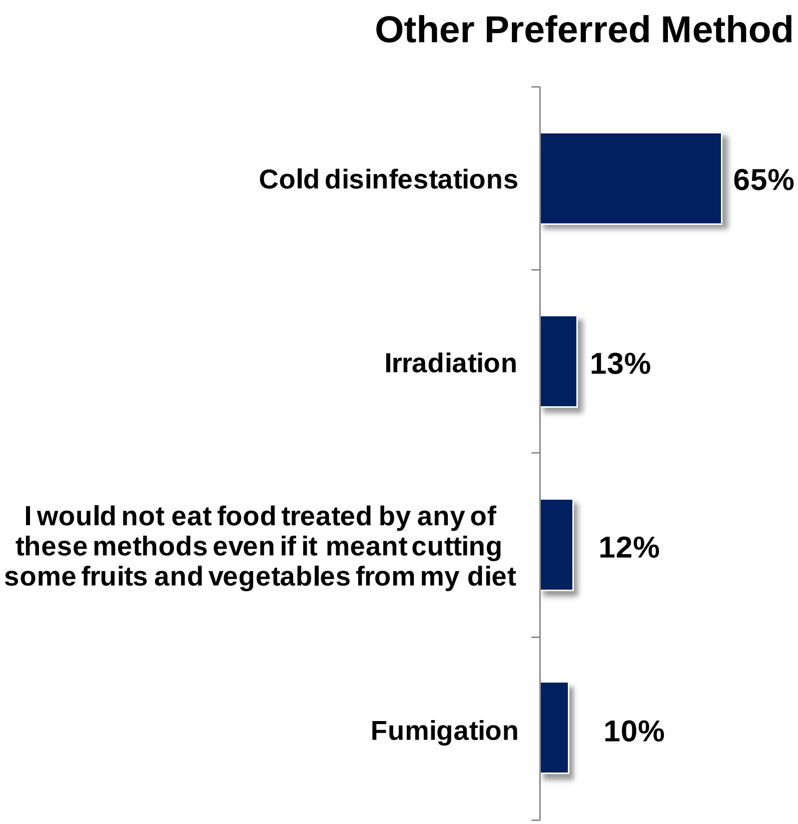
Base: 907

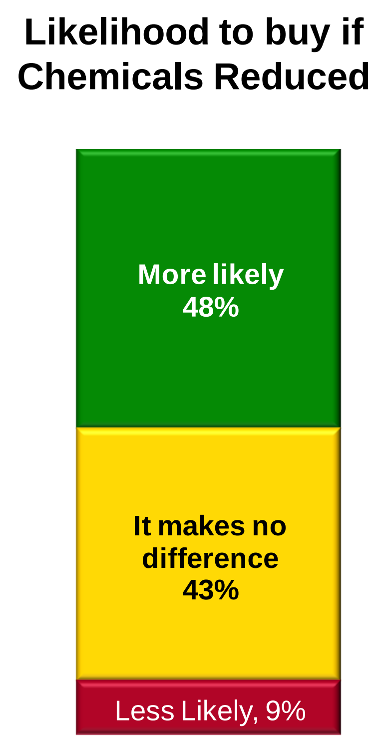
***I would not eat food treated by any of these methods even if it meant cutting some fruits and vegetables from my diet**

Claim to buy more if chemical use is reduced.

If dipping/ spraying fruit with chemical pesticides was banned, and you had to pick ONE other method, which would you prefer?

If the use of chemicals in vegetable production was substantially reduced, but not eliminated, would you be more likely to buy it?





Base: 907

tkp

Concern with all methods.
Most comfortable with cold disinfestation.

How much do you agree or disagree with the following statements?

Here we look at a comparison between four methods previously presented.

Base: 907

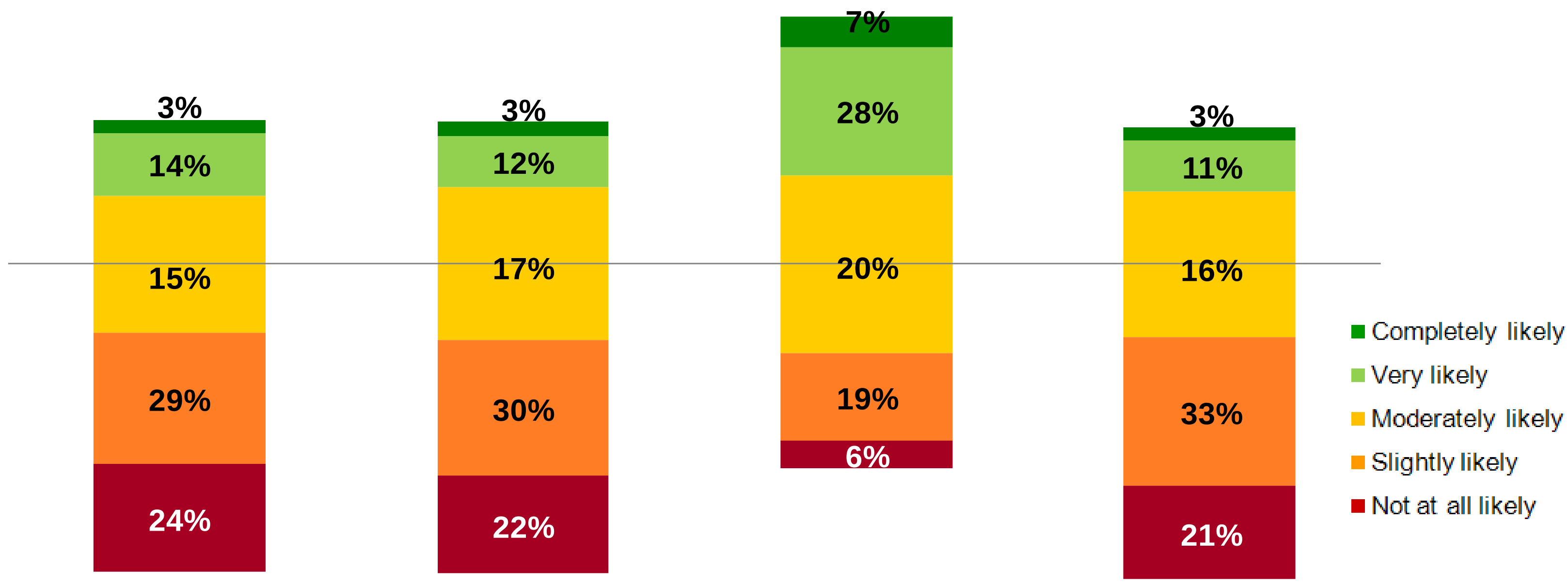
% Agree or Strongly Agree

	Chemical Dips and Sprays	Irradiation	Cold Disinfestation	Fumigation
I think this might be harmful to my health	77%	44%	11%	55%
I believe the nutritional value of the food would be affected in an unacceptable manner	41%	60%	35%	38%
If it's approved to food safety standards, that's good enough for me	29%	33%	47%	32%
The name makes me uncomfortable	52%	46%	14%	48%
I think this would affect the taste	56%	45%	45%	40%
I would seek out more information before I purchased food treated in this manner	57%	59%	34%	58%

Most likely to purchase cold disinfestation. Other methods similar likelihood.

How likely would you be to purchase food treated by…….

% Completely / Very Likely	17%	15%	35%	14%
	Chemical Dips and Sprays	Irradiation	Cold Disinfestation	Fumigation



Base: 907

tkp

Reasons for not purchasing differ according to specific method.

Why would you not purchase products treated using ………?

	Chemical Dips and Sprays	Irradiation	Cold Disinfestation	Fumigation
Unnatural / Affects Food / Lowers nutritional value / Taste / Not fresh	3%	16%	12%	3%
Harmful to my health	19%	11%	1%	10%
Sounds bad / Don't like the idea / Don't trust it / Not sure if safe	10%	9%	2%	9%
Would want to learn more / Don't understand it	5%	8%	4%	9%
Don't want to eat chemicals / fumes / radiation	10%	8%	0%	3%
Not washed / Residue remains	15%	1%	0%	1%
Would purchase	2%	2%	1%	4%
Poisonous / Dangerous	4%	3%	0%	2%
Can't avoid it / too may chemicals	2%	1%	0%	1%
Harmful to environment	1%	0%	0%	9%
Other	2%	3%	2%	5%
Don't know	1%	2%	2%	2%

Main issues, as the Australian public see it;

- **Don't know enough**
- **Harm to health**
- **Nutrition/taste**

Base: 907

AUSVEG

Recommendations

- ***Awareness of Fruit Fly is generally low, as are methods of control***
  - When educated on the issue, consumers acknowledge the need to control pests.
  - Methods of control are largely unknown.

- ***Chemical use in foods is seen as a fact of life***
  - There is an assumption that chemicals are involved in food production, even if specifics are not known.
  - Note however, that given a choice, respondents would minimise chemical use – **resignation is not acceptance.**

- ***Education creates discomfort***
  - When consumers are provided with information about treatment methods, they are being asked to consider something which they DON'T usually think about. This creates discomfort where before there was little.
  - It appears that a little exposure to the names and methods creates suspicion.
  - It also creates a challenge in interpretation. For example, people who claim they will not-purchase fruit/ vegetables treated in a particular way is likely to be overstated.

- ***Be targeted in provision of information***
  - Issues are largely around the uncertainty / lack of knowledge.
  - The methods require significant explanation over and above the names / short descriptions.

Recommendations

- ***Names and terminology***
  - Scientific names and terminology are scary.
  - If possible, non-scientific names may therefore be beneficial.

- ***Poor nutrition and ingestion of toxins are the main issues***

- ***Empathy / Sympathy for farmers is high***
  - Helping farmer's viability may be a secondary benefit in communications (but not sufficient to overcome the major concerns).

- ***Chemical dips and sprays were concerning***
  - Leveraging this could be a plus in changing methods.
  - Move from a 'nasty' chemical dip to something cleaner, with less residue etc..

- ***Heat & Low Methyl Bromide / Fumigation***
  - The impacts on the ozone layer are seen as a step backwards.
  - Otherwise this method may have applicability due to low residue or quality impacts.

Recommendations

- ***Cold Disinfestation was the most appealing method***
  - Low residue.
  - Refrigeration is a familiar concept.
  - The name itself is not intimidating.

- ***Systems Approach was the next most accepted***
  - Albeit with concerns about viability for farmers around the impact on cost.
  - A half-way to organic if chemicals were reduced.

- ***Irradiation was not preferred***
  - However, this could be overcome through informing and educating consumers.
  - There is a need to ramp up the benefits of no residue and elimination of bacteria.
  - There is benefit in reinforcing the approval of irradiation in Europe.
  - The requirement to label is a problem – creates suspicion. Essentially, the only method the consumer would potentially be made aware of. There is a need to be as low key as possible, IF possible.
  - A thorough PR strategy is essential.

Irradiation: An Effective, Sustainable Phytosanitary Treatment Option for Australian Growers

AUSVEG Roadshow
April 2012

Peter B Roberts

Radiation Advisory Services
Lower Hutt, New Zealand

This presentation will discuss -

- What is food irradiation?
- Regulations and protocols that are in place to allow irradiation of food in Australia/NZ.
- The effectiveness of irradiation on insect pests.
- Quality of produce after irradiation.
- The advantages of irradiation.

- Existing phytosanitary uses of irradiation for trade in fresh produce.
- Irradiation processing in Australia
- Some important issues
  - Sterility *vs* Mortality
  - Labelling
  - Consumer responses
  - Costs
- *The Future and Some Conclusions*

What is Food Irradiation?

Food irradiation

- Deliberately exposes food to radiation energy.

- Examples of radiation are UV and visible light, radio-waves, microwaves, X-rays and gamma rays. They differ only in their energy level and, therefore, in the effects they produce.

Food Irradiation

- It uses high-energy radiation from gamma-rays, x-rays or an electron beam.
  - Gamma rays are produced by a radioactive isotope, usually cobalt-60.
  - An electron beam is produced by an electrical machine (an accelerator). Electrons can be converted into X-rays.
    - No radiation is produced while the accelerator is switched off.
- Gamma and x-rays are very penetrating (pallet-sized loads).
- Electrons penetrate packages a few centimetres thick.

The Process

Hint – think microwaves

Food

Ionising Radiation

Radiation Source

Cobalt-60

Electron beam
≤ 5MeV

X-ray
≤ 10 MeV

The food is carried through the radiation beam on a conveyer

Key Facts

- Irradiation with the approved radiation sources *cannot* make food radioactive.

- A non-chemical, physical process (heating, cooling, drying, canning and pasteurization are other physical processes).

- The energy absorbed in the food brings about changes in the chemicals present in the food or its contaminants.

- The “amount” of energy absorbed by the food is the DOSE. Dose is measured in Gray (Gy).
  - 1 Gy = 1 Joule absorbed per kg food. 1 kGy = 1000 Gy

The Chemical Changes

- All food processing technologies cause some change to the food.
- At low doses, there may be useful effects to inhibit sprouting of tubers, and on the ripening and maturation rate of fruits.
- At higher doses, changes to the DNA of living cells can cause sterility or death.
- Like all processing technologies, some changes to food ‘structure’ and its constituents can occur
  - Irradiation is practical when benefits occur at lower doses than detrimental effects

Regulations and Protocols

ICA-55

- Interstate Certification Assurance National Protocol (ICA-55)
  - A protocol for the use of irradiation as a phytosanitary treatment for fresh fruits and vegetables within Australia
- ICA-55 applies to any fresh produce approved for irradiation by Food Standards Australia New Zealand (FSANZ)

- **ICA-55 sets minimum doses that guarantee the non-viability of insect species for quarantine purposes (sterility) irrespective of the host produce.**
  - **150 Gy for fruit flies of the family *Tephriditae.***
  - **300 Gy for mango seed weevil.**
  - **400 Gy for all other pests of the class *Insecta,* except pupae and adults of the order *Lepidoptera* .**

1 Gy = 1 Gray = 1 Joule of energy absorbed per kg food.
1 kGy = 1000 Gy

FSANZ Standard 1.5.3

This Standard governs the use of irradiation for foods for human consumption in Australia and New Zealand.

Approvals are given following an application on a case-by-case basis.

Applications must demonstrate a technical need and treatment efficacy.

FSANZ Approvals

Breadfruit, carambola, custard apple, longan, lychee, mango, mangosteen, papaya, rambutan.

Persimmons also approved, not yet gazetted.

Maximum dose is 1000 Gy (1kGy)








Potential FSANZ approvals

QLD government and industry joint projects

- **Tomatoes, capsicums -** ***application submitted***

- **Strawberry, zuccini, nectarine, rock melon, honeydew melon, table grape, cherry, peach, plum, apple –** ***data acquisition stage***

FSANZ Approvals

- FSANZ has also approved the irradiation of herbs, spices and herbal infusions
- These approvals are for higher doses for decontamination purposes

International Approvals - Health

- 23 countries have approved irradiation up to 1 kGy for ***all*** fruit and vegetables.
- 12 countries have approved irradiation up to 1 kGy for ***specified*** fruits and vegetables.
  - Australia/NZ (through FSANZ 1.5.3) are in this group.
- 28 countries have approved irradiation as a disinfestation treatment
  - 7 other approvals are for delay of ripening, control of maturation rate or inhibition of sprouting.

Is Irradiated Food Safe to Eat?

YES

- The evidence is overwhelmingly that irradiated food is toxicologically safe, and presents no special nutritional or microbiological problems.

- Approximately 60 countries have approved at least one use of food irradiation.

- Codex Alimentarius issued a General Standard for Irradiated Food (1983, revised 2003).
  - Any food irradiated up to an overall average dose of 10 kGy is safe and wholesome.
    - Note phytosanitary use has a maximum dose of 1 kGy

An Effective Phytosanitary Treatment?

Yes

An Agreed Protocol for Irradiation as a Phytosanitary Treatment?

- The effectiveness of irradiation as a phytosanitary treatment is well established.
- There are international guidelines and standards on the treatment.
- These standards are based on a minimum dose to the insect that guarantees that *any* insect on *any* host produce that does not die within a short time after treatment will be sterile or unable to develop into an adult capable of reproducing.

International Plant Protection Convention (IPPC)

- IPPC is the global authority on plant protection and quarantine standards. Its standards and guidelines are recognized by the World Trade Organization (WTO).
- IPPC has issued Guidelines for the Use of Irradiation as a Phytosanitary Treatment.
- Recommends that 150 Gy be regarded as the generic dose to ensure 'sterility' of all Tephritid fruit fly on all hosts.
- The USDA-APHIS accepts 400 Gy as a generic dose to deal with all insect species (except Lepidoptera) on all hosts.

- **ICA-55 is based on the ICCP recommendations and the research which is the basis for USDA recommended generic minimum dose.**

Quality of Irradiated Produce

At doses below 1 kGy -

- The effect on the sensory qualities and appearance of most fruits and vegetables is minimal.
  - An exception is avocado and, possibly, other fruits with a high unsaturated fat content (such as custard apple).
- Given proper handling within the supply chain from harvest to retail, product quality is usually higher than competing options such as MeBr or heat-based treatments.

At doses below 1 kGy -

- There is no effect on protein, carbohydrate, minerals, total fat and dietary fibre.
- Some vitamins are radiation resistant and some are sensitive.
- Below 1 kGy, the effect on total vitamin content is insignificant. The effect on any individual vitamin is less (probably much less) than 10%.
  - Any losses are less than other treatments such as heating, freezing, canning and storage.

Irradiation Advantages

Irradiation Advantages

- It is a broad spectrum treatment (all insects, all host produce).
- Accepted in all States and Territories.
- The process leaves no toxic chemical residues.
- It is a cold treatment
  - This can produce a better product than treatments involving heating the fruit, which have to allow for extra ripening due to the treatment.
- It is penetrating (treatment in the final package; sterilizes insects throughout the fruit; fruit size and shape are unimportant).

Irradiation Advantages

- It is rapid (approximately 1 hour treatment, total turnaround about 2 hours).
- Treated produce can be released into trade immediately.
- It is simple, depending only on conveyer speed and source power to set the dose. It is insensitive to temperature, humidity, pressure, etc.
- It is cost competitive with other alternatives to insecticide treatments.

Existing Uses of Food Irradiation

- The major use of irradiation (~50%) is for the decontamination of herbs and spices.
  - 70,000 tons (~ 1/3) of herbs and spices used in the US are irradiated.
  - Considerable volumes of herbs and spices are traded internationally but the amount is uncertain.
- The total amount of food irradiated globally is approaching 1 million tonnes p.a.
- Most is for use in the country in which it is irradiated.
  - herbs & spices; chicken; dried fish; grains; garlic, potatoes, onions; dry, pre-cut fruits and vegetables.

Trade in Irradiated Fruits

- In 2004, New Zealand became the first country to accept and import irradiated fruit from another country (mango in 2004, lychee followed in 2007).
- Before shipments proceeded Biosecurity NZ -
  - checked that mango irradiation was permitted under FSANZ Standard 1.5.3.
  - completed a thorough pest risk assessment and a study of management options for the pest of concern, with irradiation as the primary option.
  - issued an Import Health Standard under MAFBNZ standard 152.02 (Biosecurity Act 1993).

Trade in Irradiated Fruits

- The USA established trade between Hawaii and the continental USA in papaya from 1995 and later in sweet potato and a few other fruits.
  - Today about 4,500 tons of irradiated fruit is traded between Hawaii and the mainland.
  - Irradiated Florida fruits are sent to other States.
- More recently (2007 onwards) the USA has imported several types of irradiated fruit from Mexico, India, Thailand and Vietnam.
  - Agreement is in place for imports from Pakistan, Malaysia, Ghana and South Africa.

- Small volumes of irradiated mangoes have been sent from Australia to Malaysia. Thailand has also shown interest in irradiated fruit.
- Discussions are underway to allow Australian mango and lychee to be imported into the US after irradiation treatment.
- USDA inspection of Steritech's Narangba plant has been undertaken. The idea is to gain US acceptance of Steritech staff as accredited agents of AQIS for phytosanitary certification purposes.

Irradiated for Export to NZ (tonnes)

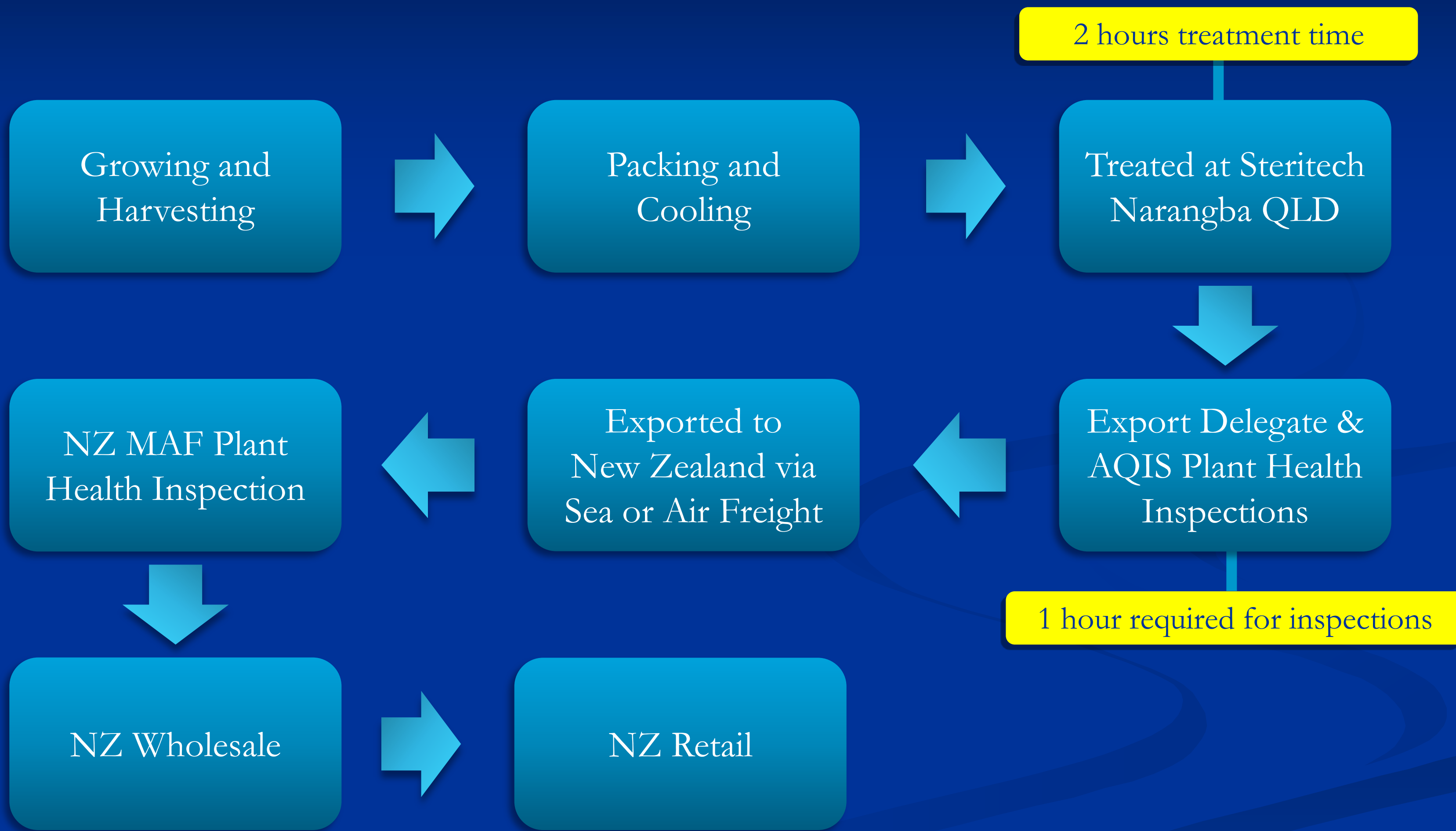
Season	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11*	2011-12
Mango	19	129	201	346	585	1,095	620	918
Papaya	-	-	12	1	-	-	-	
Lychee	-	5	10	20	57	110	15	32
TOTAL	19	134	223	367	642	1205	635	950

* Season 2010-11 was adversely affected by severe weather conditions which dramatically reduced crop volumes

Irradiated Imports into US (tons)

Country	*Fruit*	*2008*	*2009*	*2010*
India	Mango	275	130	195
Thailand	Longan (mainly)	1700	1890	1800
Vietnam	Dragonfruit	0	100	850
Mexico	Guava	257	3521	9121
	Grapefruit	0	67	101
	Mango	0	0	239
	Sweet Lime	0	0	600
	Manzano Pepper	0	0	257
	Total	2232	5708	13,163

Export Market Access (New Zealand): Irradiation and the supply chain



Steritech has accredited Export Delegation from AQIS and is authorised to perform onsite Plant Health Inspections

Inter-state Trade in Australia

- ICA-55 provides a protocol for irradiation to be used to meet quarantine requirements for fresh produce crossing state and territory boundaries
- Preliminary trials have been carried out in late 2011 sending irradiated Queensland mangoes to Melbourne and Tasmania.
- The irradiated fruit was sold successfully at 5 retail outlets in Melbourne and several shops in Hobart, including Salamanca markets.

Irradiation Processing in Australia

Irradiation

- Irradiation processing of non-food items has been carried out for over 50 years.
  - The process is well understood and controlled.
- The major uses of irradiation are for non-food applications.
  - to sterilise medical products.
    - over 50% of single-use medical products are irradiated.
  - to sterilize pharmaceutical & cosmetic products, and items needing a decontamination or biosecurity treatment such as plant materials, soil-bearing items.
  - to cross-link polymers.

Steritech

- The leading sterilisation company in the Asia-Pacific region using irradiation, ETO and heat treatments.
- Australia’s only contract irradiation service for almost 40 years.
- Facilities in Melbourne, Sydney and Brisbane (Narangba).
- The Brisbane plant is capable and licensed to provide phytosanitary treatments of fresh produce.
  - It has irradiated mango, lychee and papaya for export to NZ, commencing in the 2004/05 mango season.

Steritech

- Steritech helps industries make their products safer, manage pests and meet regulatory requirements, including:
  - Medical equipment, pharmaceutical goods and cosmetics.
  - Agricultural products (e.g. animal feed and grain).
  - Packaging (e.g. milk powder bags, wine casks, corks, etc.).
  - Beehives (eliminates larvae that cause AFB & EFB disease): Archival materials (eliminates moulds).
  - Quarantine (e.g. goods seized by customs).
  - Herbs, spices and herbal teas.
  - Mango, papaya, lychee for export.

Food Irradiation – A Simple Process

- A non-chemical, physical process.
- Controlled only by the speed of the conveyor and the "power" of the radiation source.
- Gamma and x-rays are very penetrating (pallet-sized loads).
- Electrons penetrate packages a few centimetres thick.

Non- phytosanitary applications

- Improving food safety (above 1 kGy) -
  - Food free of disease-causing pathogens, such as *E Coli* 0157:H7: campylobacter, salmonella, listeria.
  - US approval for iceberg lettuce and spinach .
- Reducing food wastage/extend shelf-life -
  - Inhibit sprouting, control maturation, reduce storage decay -
    - Used for garlic (China), potatoes (Japan), onions.
    - Used for strawberries (France, US) to prevent fungal rot (> 1 kGy).
    - Proposed but little used for mango, papaya, banana.
    - Potential use (e.g., table grapes) when the 1 hour treatment can replace long-treatment time options such as cold or controlled atmosphere storage.

Some Issues

Sterility *vs* Mortality

- Irradiation below 1 kGy guarantees insect ***sterility.***
- Occasionally, live insects are found in irradiated shipments. This delayed clearance of some early shipments to NZ.
- MAF NZ has a procedure for any live insects -
  - The insect is identified.
  - If the dose on the phytosanitary certificate is sufficient for sterilisation of the identified insect (refer to a MAF Biosecurity table or the import health standard) then the shipment is cleared for import.
- The issue is not proving to be a practical barrier in NZ or the US -
  - Biosecurity NZ and USDA-APHIS remain positive about the irradiation option.

Supply Chain Conditions

- Nearly all fruit maintain market quality.
  - Avocado and, possibly, custard apple are exceptions.
- Quality after irradiation is usually superior to other options being considered to replace dimethoate and fenthion.

- *Good control of temperature and storage time within the supply chain is essential.*

Labelling Requirements

- FSANZ Standard 1.5.3 requires that irradiated foods be labeled in order to ensure consumers retain their right-to-choose
- Foods that are chemically treated do not have to be labelled
  - However, labeling of irradiated foods has disarmed much of the criticism of the process.

FRESH AUSTRALIAN MANGOES TREATED WITH IRRADIATION - A CHEMICAL-FREE PROCESS

Australians now have an alternative to fruit treated with chemical insecticides like Dimethoate and Methyl Bromide.

These fresh Australian mangoes have been treated with irradiation to eliminate insects and satisfy biosecurity requirements to prevent the spread of insect pests, like fruit fly and mango seed weevil.

The process of irradiating these mangoes is safe and chemical-free. It involves treating the mangoes with ionising energy to eliminate insect pests while maintaining the quality of the mangoes.

This treatment option is used around the world including the United States and for all Australian mangoes sold in New Zealand. It is approved by the World Health Organisation and the Australian Government.

For more information, visit the Food Standards Australia New Zealand website (www.foodstandards.gov.au) or the Better Health Channel (www.betterhealth.vic.gov.au)

Safe and secure for the environment

The Consumer Issue

- When irradiated mangoes were first introduced into NZ, there was a flurry of protest in cyberspace from ‘anti-irradiation’ activists and supporters of minimal processing of food.
- This resulted in minor negative publicity in mainstream media.
- The negative publicity soon evaporated.
- Irradiated Australian mangoes are now sold, at a premium, in major supermarkets with volumes increasing.
  - Accounts for greatest percent increase in QLD mango exports.

- The consumer reaction in NZ is typical of wherever irradiated food has been introduced.
- Most consumers will purchase and re-purchase high quality irradiated foods.
  - Retailers have been a greater barrier to irradiation because of their assumption of a consumer backlash.
- Some consumers (15 - 20%?) may never purchase irradiated foods for a variety of reasons

Australia/NZ Consumer Surveys

- Only limited information is available. For example, Gamble *et al* (2002).
- New market research has just been completed.
  - A HAL/AUSVEG initiative

Costs

- Treatment costs currently 5 to 7 cents/kg.
  - Expected to decrease as volumes increase.
- Likely capital investment in new plant, A$10+ million.
- In 2006/07 QLD tomato and capsicum production value approached A$300 million, of which approximately 70% went to Qfly – free markets.
- Tomato and capsicum exports to NZ were valued at A$11 million p.a.
  - Dimethoate suspension has closed these markets in NZ.

The Future

New Zealand

- Mango and lychee have led the way and volumes imported are growing steadily.
- Certification systems are in place to allow the expansion of imports from countries with a strong national plant protection organisation.
- The recent experience has been positive from quarantine officials, importers and retailers.

New Zealand

- Trade is likely to grow, but probably quite slowly on a produce-by-produce and country–by-country basis.
- There are more opportunities for Australian exports in tropical fruits, tomatoes, capsicums, zuccini, table grapes, *etc.*
- The NZ Fresh Produce Importers Association is supportive of irradiation.

Australia

- An Interstate Certification Assurance protocol for irradiation as a phytosanitary measure has been approved (ICA-55).
- This allows irradiation to be used as a replacement for insecticide treatments such as dimethoate and fenthion.
- A pilot study of irradiated mangoes shipped from Queensland and sold in Tasmania and Melbourne was successful.

Other Export Opportunities

In 2009-10, irradiated mangoes to NZ were 25% of total mango exports.

- **Irradiated mangoes are already being shipped to Malaysia.**
- **Talks are underway with authorities in the USA and Thailand to permit shipments of selected irradiated fruits.**
- **Many Asian and South American countries have health regulations permitting irradiation of fresh fruits and vegetables.**

Other Export Opportunities

- Irradiation is an option to meet phytosanitary issues facing the export of Australian fruits and vegetables.
- It is also an option for new markets when irradiation can be used to increase the effective shelf-life of produce (e.g., table grapes and strawberries).

CONCLUSIONS

Conclusions (1)

1. Irradiation is a practical, efficient and effective phytosanitary treatment of fresh fruit and vegetables.

2. Presently over 13,000 tonnes of irradiated fruits are imported annually into New Zealand and the USA.

3. Irradiated fruit has sold well at retail for several years. Actual retail experience shows that consumer resistance has been overestimated in many surveys and trade articles.

4. The controversy previously associated with irradiation is now much reduced, and there is increased consumer acceptance. This is thanks to -
    4. Labelling, consumer concerns about chemical residues, likely use of accelerator sources in the future.

Conclusions (2)

5. Trade in irradiated fresh produce has grown steadily and is set to expand further.

6. 28 countries have approved irradiation of fresh fruits and vegetables for disinfestation purposes and at least 8 countries are involved in trade.

7. ***Irradiation can decrease reliance on post-harvest treatments with toxic insecticides and chemical fumigation.***

Thank You

For a copy of the presentation or further technical information contact

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For advice on commercial matters or trials contact

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Department of Agriculture and Food

GOVERNMENT OF WESTERN AUSTRALIA

Alternatives to Dimethoate & Fenthion Education Road Show

Darryl Hardie
DAFWA rep on DFRCC

Department of Agriculture and Food

GOVERNMENT OF WESTERN AUSTRALIA

Talking Points

- Background on D&F
- Cold Disinfestation
- Methyl Bromide
- Baiting & Trapping
- Systems approach

Dimethoate & Fenthion

- The bad news is that dimethoate has already been restricted, especially on edible peel product.
- The good news is that you will have fenthion for a few more months?

What the APVMA has said!

What is Dimethoate?

- An Organophosphorus (OP) insecticide used to control insect pests
- Very important for QFF control and included in Interstate Certification Assurances as well as quarantine requirements for trade
- Labels allow use on a wide range of fruits and vegetables for many pests including Med Fly
- Can be used in a home garden setting as well as in commercial horticulture and broadacre cropping

Legislative Criteria

- Can only register or continue to register a product if
  - is not an undue hazard to people (handling or exposed to residues)
  - does not have an unintended harmful effect on plants, animals or the environment
  - does not unduly prejudice trade
  - is shown to be effective

Criteria are defined in legislation (Agvet Code Act)

Progress of the Review

- Published the Human Health Assessment – Toxicology Report in January 2011
- New health standards recommended for short-term and life-time exposures (ADI & ARfD)
- New standards in line with those in EU, USA, WHO

Country	ADI (mg/kg bw/day)	ARfD (mg/kg bw)
EU 2007	0.001	0.01
US EPA 2006	0.002	0.02
WHO 2003	0.002	0.02
Australia 2010	0.001	0.02

- Expect to finalise review findings in 2012 following OH&S component report

Residues And Dietary Risk Assessment

- A residues and dietary risk assessment is required to set Maximum Residue Limits in food crops
- Residues data provided to the review from chemical manufacturer and HAL
- Over 100 studies, reviewed and assessed between 2009 and up until June 2011
- Agree with FSANZ on dietary risk assessment approach and food consumption figures

Dietary Exposure Assessment

Chronic exposure – lifetime exposure to that chemical from residues in food, corresponding to ADI (acceptable daily intake)

- food consumption data for general population

Acute exposure – short term exposure (24 hour period) to the chemical from residues in food, corresponding to acute reference dose (ARfD)

- food consumption data for various age groups and general population

How Large are High Consumer Portions?

- Children, 5 years (24 hours or 1 meal)
  - Apple – about 2
  - Banana – about 2½
  - Mango – about ½
  - Rockmelon – about 0.4
  - Tomato – about 1.3 or 10 small cherry toms
  - Strawberries – about 10

Dietary Exposure Assessment

- Once dietary exposure threshold is exceeded, uses must be modified or removed
- Product labels varied and new instructions issued
- Assess and register alternatives or replacements while reviews are ongoing

Outcomes of August 2011 Report

- Estimated exceedances above ARfD for children (2 to 6 years) for various crops – for example
  - grapes 30× (pre); apples 5× (pre); cherries 3× (pre); peaches 14× (pre); nectarines 5× (pre); **tomatoes 4× (pre); cucumbers 3.5× (post)**
  - More details in report

- Below the ARfD and acceptable for
  - tropical fruit with inedible peel such as bananas, mango, avocado, custard apples, pineapple
  - citrus fruits, **peppers (cover spray only)**
  - **peas and beans**, cereal grains, oilseeds, pulses

What Does This Mean?

- This means that the new health standard, the acute reference dose, provides a trigger for action based on estimated dietary exposures for children

- The margins of safety that are put in place to protect consumers have been reduced

- Some regulatory action is required to either modify, restrict or remove uses

- Other regulators internationally take action based on dietary risk

Department of Agriculture and Food
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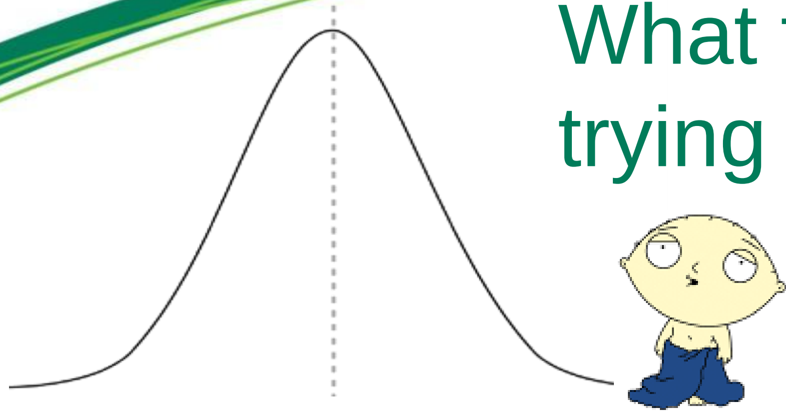
What the APVMA was trying to say!



Increasing susceptibility to dimethoate →

←Increasing fruit intake with (ARfD)

Department of Agriculture and Food

GOVERNMENT OF WESTERN AUSTRALIA

http://www.apvma.gov.au/products/review/current/dimethoate_a_z.php

Australian Government
Australian Pesticides and Veterinary Medicines Authority

- About the APVMA
- Consultation and Collaboration
- News, Media and Events
- Publications and Guidelines
- Product Registration
- Permits
- Manufacture, Trade and Supply
- Registered Products, Active Constituents and Chemical Reviews
  - Registered Chemical Products (PUBCRIS)
  - Chemical Review Program

You are here: Home > Registered Products and Reviews > Chemical Review Program > Suspended and allowed uses following 2011 Dietary Risk Assessment of dimethoate

Suspended and allowed uses following 2011 Dietary Risk Assessment of dimethoate

Note: Individual crops are listed where possible, however crop groups are also listed where they appear on the label.

Related information

- Download the list of suspended uses (PDF, 303kb) | (DOC, 564kb)
- View the new instructions for use: PER13155 and PER13156

Suspended uses | Continue to be allowed

Suspended dimethoate uses

Suspended uses (dimethoate)

- Brussels sprouts
- Cabbage (except specified drumhead varieties)
- Capsicum post harvest
- Cole crops (other than broccoli, drumhead cabbages and cauliflower)
- Cucumber
- Cucurbits (except melons, watermelons and zucchini)
- Egg plants
- Fruiting vegetables, other (except capsicum, tomatoes for processing and sweet corn)
- Gourd – bitter
- Kohlrabi
- Leafy vegetables
- Lettuce
- Loofa – smooth
- Root and tuber vegetables (except beetroot, carrot, parsnips, potatoes and sweet potatoes, radish and turnip)
- Silverbeet
- Stalk and stem vegetables except asparagus, celery, globe artichoke and rhubarb)
- Tomatoes (except tomatoes for processing only)

Suspended uses (Medfly issues)

- Capsicum post harvest
- Fruiting vegetables, other (except capsicum, tomatoes for processing and sweet corn)
- Tomatoes (except tomatoes for processing only)

Current uses (fenthion)

- Capsicums
- Capsicums - Post-harvest
- Chillis - Post-harvest
- Cucurbits - Post-harvest
- Egg plant
- Loofahs - Smooth - Post-harvest
- Tomatoes
- Tomatoes - Post-harvest
- Vegetables - Fruiting - Post-harvest

Trichlorfon

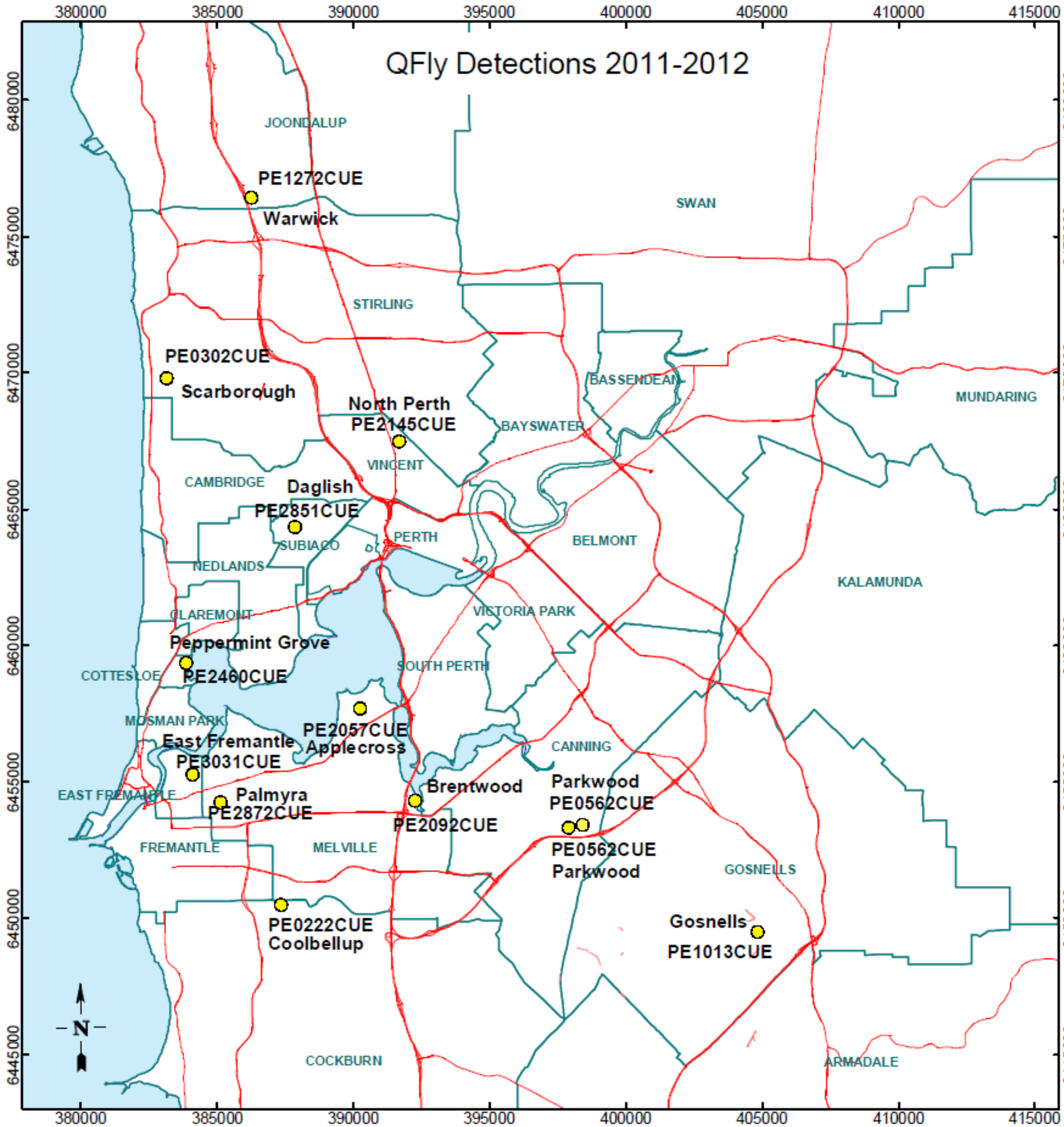
- Trichlorfon has been nominated for review because of environmental, human health and residue concerns

- Permit 12486 for berry fruit has 14 WHP rather than label 2 day WHP.

Department of Agriculture and Food

GOVERNMENT OF WESTERN AUSTRALIA

The Qfly diversion!



ICA 1 & 2 (edible peel?)

Ref No. & Title	Pests[1]	Host[2]	State/Territory Accepted[3]	Documents & Status				
				Protocol (Version, Date & State)	HACCP Plan (Version, Date & State)	Operational Procedure		
						State/Territory in effect[4]	Issue & Revision	Issue Date
ICA-01 Dipping with Dimethoate or Fenthion	Fruit Fly (Qld, banana and Mediterranean fruit fly)	Fruit Fly host fresh fruits and vegetables as listed in the procedure.	QLD NSW VIC SA WA TAS NT	Version: Issue date:	Version: Issue date:	QLD	Issue: Third Revision: 2	21/12/99
						NSW	Issue: Version: 4	14/09/11
						VIC	Issue: Sixth Revision: 3	24/10/11
						NT	Issue: Revision: 9	08/11/11
						SA	Issue: First Revision: 3	01/05/05
						WA	Issue: Version: 7	06/08/04

Cold Disinfestation

- Not really applicable in domestic situation

  - ➢length of treatment (16 days?)
  - ➢suitability of produce
  - ➢cost ($3 - 5 carton)

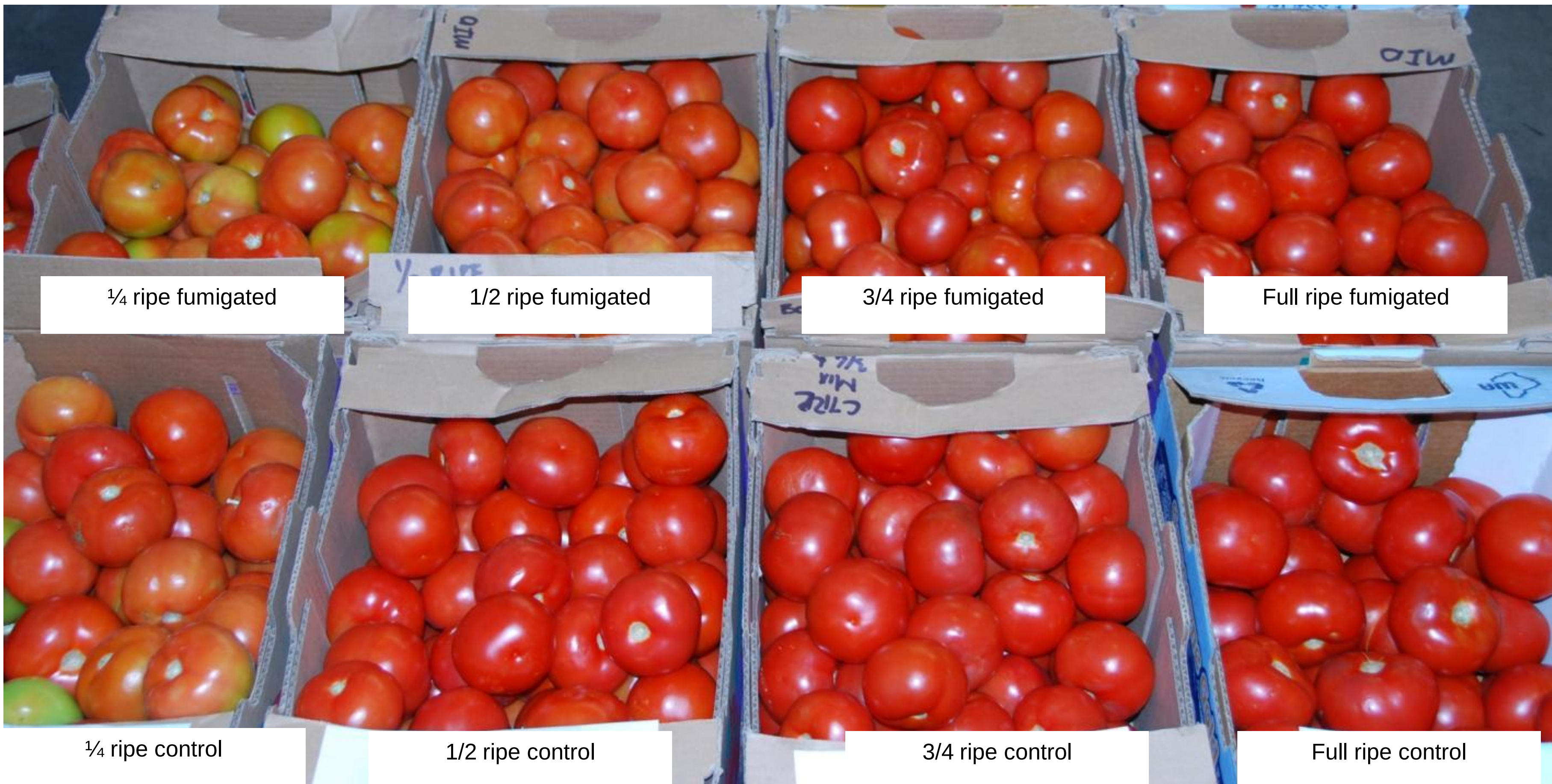
MeBr fumigation of Tomatoes

- ICA-04 allows access to all states for fruit fumigated by methyl bromide, but was not favoured by growers, market agents and packers
- Any physical damage may be highlighted by fumigation and it is important that fruit to be fumigated is of high quality.
- It also showed that fruit with a larger calyx after the long period of storage was not in as good condition as fruit with a smaller, less prominent calyx.
- Most importantly, the demonstration showed that when done correctly, fruit quality and colour is maintained, fruit is suitable for sale, and meets market access requirements for all states.
- ICA-26 updated to allows Pre-harvest Treatment and Post Harvest Inspection of Tomatoes, Capsicums, Chillies and Eggplant to include Medfly. This modified protocol has been accepted by Victoria and South Australia and will be included as approved ICAs for those states very soon.
- ICA-27 being modified to include Medfly. This allows fruit picked at a mature green stage to be sent without a post harvest inspection as in ICA-26.
- **MeBr longterm use.**

GOVERNMENT OF WESTERN AUSTRALIA

Department of Agriculture and Food

Comparison of fumigated and control tomatoes after 17 days storage (14 days at 9°C and three days at ambient temperature) (ICA-04)



Tomatoes con’t

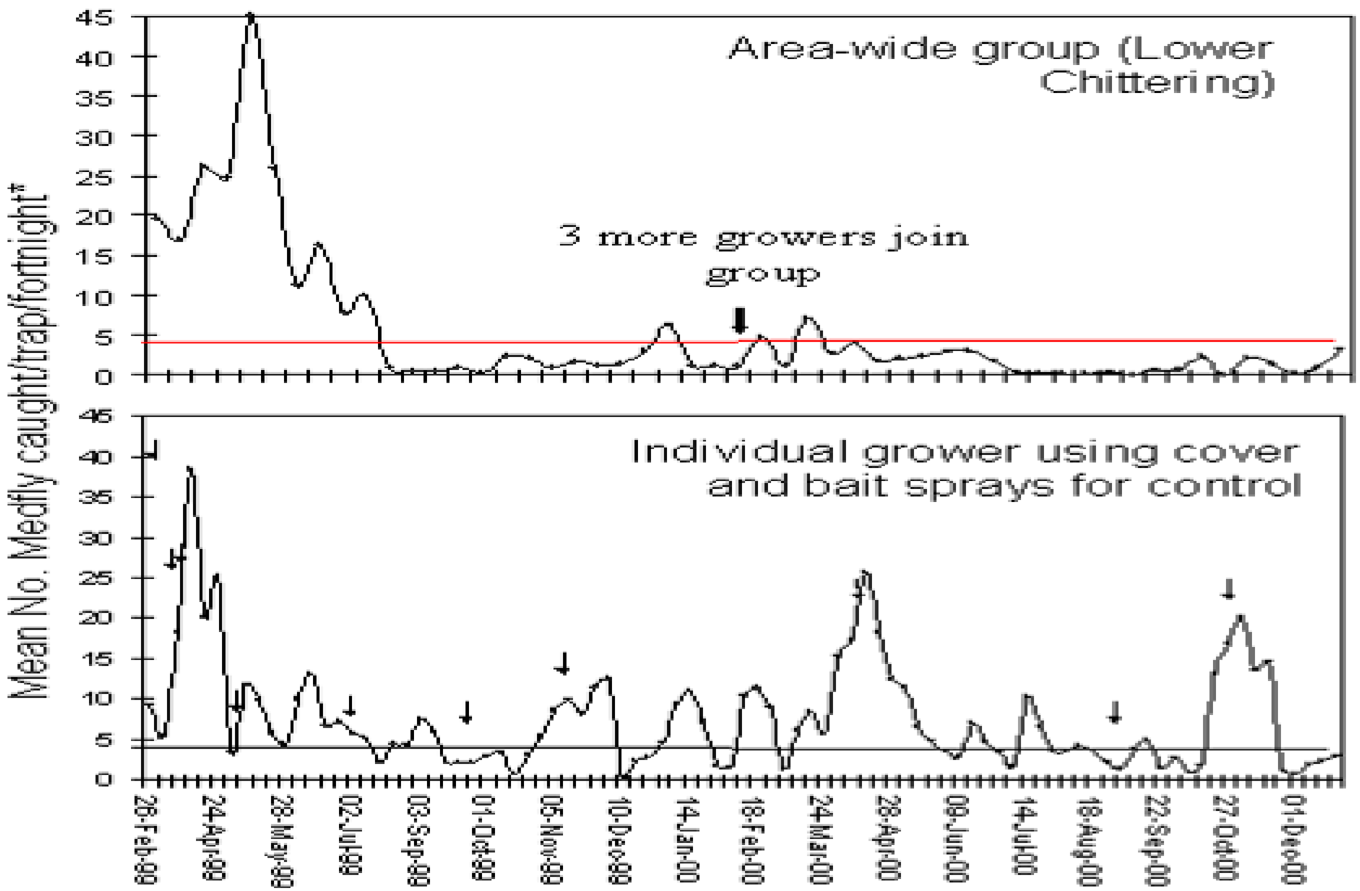
Ref No. & Title	Pests[1]	Host[2]	State/Territory Accepted[3]	Documents & Status				
				Protocol (Version, Date & State)	HACCP Plan (Version, Date & State)	Operational Procedure		
						State/Territory in effect[4]	Issue & Revision	Issue Date
ICA-26 Pre-harvest Treatment and Post Harvest Inspection of Tomatoes, Capsicums, Chillies and Eggplant	Fruit Fly (Qld & Mediterranean fruit fly)	Tomatoes, Capsicums, Chillies & Eggplant	QLD (not Med Fruit Fly) NSW (not Med Fruit Fly) SA VIC NT (not Med Fruit Fly)	Version: 5.0 Issue date: 08/08/11 (WA)	Version: 5 Issue date: 27/10/10 (QLD)	QLD	Issue: Fourth Revision: 0	18/01/11
						NSW (not for eggplant)	Issue: Version: 3	28/05/04
						VIC	Issue: Version: 5.2	15/11/11
						NT	Issue: Revision: Second	06/09/11
						WA	Issue: Version: 1.0	15/09/11
ICA-27 Mature Green Condition of Tomatoes	Qld Fruit Fly	Tomatoes	QLD VIC NT	Version: Issue date:	Version: Issue date:	QLD	Issue: First Revision: 0	18/02/99
						VIC	Issue: Version: 1.0	26/05/11

Baiting

Baiting is a AWM solution for the community

Area-wide baiting

The average numbers of Medfly caught/trap on properties in an area-wide group (top) vs a single orchard (bottom). The horizontal line indicates the threshold at which baiting needs to be carried out.



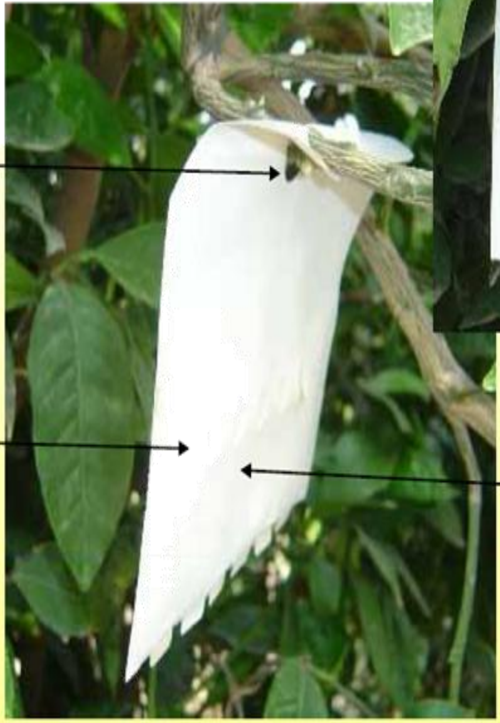
Trapping

Device design

Device consists of laminated plastic/paper device with built in hanger coated with insecticide on the outside and able to contain USDA attractant formulations inside

Built in hanger system – fold over clip system.

Insecticide on surface of device.



Attractants incorporated inside device. Device acts a control release mechanism

Systems approaches

- The integration of different risk management measures, at least two of which act independently, and which cumulatively achieve the appropriate level of protection against regulated pests [ISPM 14:2002; revised ICPM, 2005]

- ISPM 14 - The use of integrated measures in a systems approach for pest risk management.

Systems approaches

Ref No. & Title	Pests[1]	Host[2]	State/Territory Accepted[3]	Documents & Status				
				Protocol (Version, Date & State)	HACCP Plan (Version, Date & State)	Operational Procedure		
						State/Territory in effect[4]	Issue & Revision	Issue Date
ICA-56 Emergency Pre-harvest Baiting & Inspection Protocol for Pest Free Areas	Fruit Fly (Queensland & Mediterranean fruit fly)	Fruit Fly host fresh fruits and vegetables	NSW VIC SA NT	Version: 1.0 Issue Date: 07/03/11 (SA & VIC)	Version: 1.0 Issue Date: 07/03/11 (SA & VIC)	NSW	Issue: Revision: 1.0	07/04/11
						VIC	Issue: Version: 1.1	05/04/11

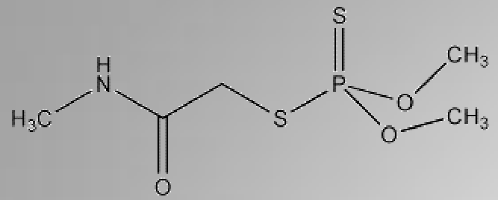
Department of
Agriculture and Food

GOVERNMENT OF
WESTERN AUSTRALIA

Acknowledgements

- Dr Francis De Lima
- Dr Sonya Broughton
- Mr Rohan Prince
- Mr Graeme Lukeis
- Ms Simone Tuten
- Mr Grant Jackson

The End –Questions please

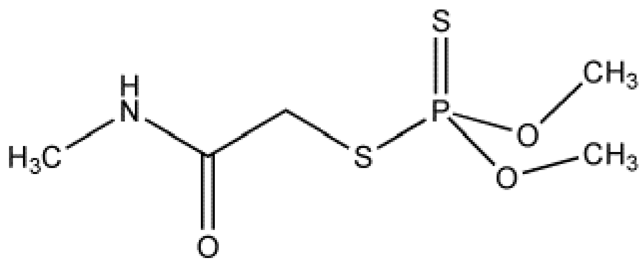


DIMETHOATE AND FENTHION

P. Crisp
SARDI Entomology

AUSVEG – 11 April 2012

DIMETHOATE



- Organophosphate
- Acetylcholinesterase
  - Interrupts insect central nervous system
- Introduced in 1950's
- Fruit fly, aphids, thrips, mites, grasshoppers jassids, Rutherglen bug, psyllids (>80 species)
- Stone fruit, pome fruit, citrus, vegetables, berries, mangos, grapes, passionfruit .....(>200 use patterns)

DIMETHOATE - REVIEW

- Under review in USA
- Limited pre-harvest uses in some European countries
- 6th November 2011 APVMA restricted it's uses
  - E.G. Post harvest on edible skin fruit
- Main concern that it is used on many products and there is risk of multiple exposures.

SUSPENDED USES (DIMETHOATE)

- Brussels sprouts
- Cabbage (except specified drumhead varieties)
- Capsicum post harvest
- Cole crops (other than broccoli, drumhead cabbages and cauliflower)
- Cucumber
- Cucurbits (except melons, watermelons and zucchini)
- Egg plants
- Fruiting vegetables, other (except capsicum, tomatoes for processing and sweet corn)
- Gourd – bitter
- Kohlrabi
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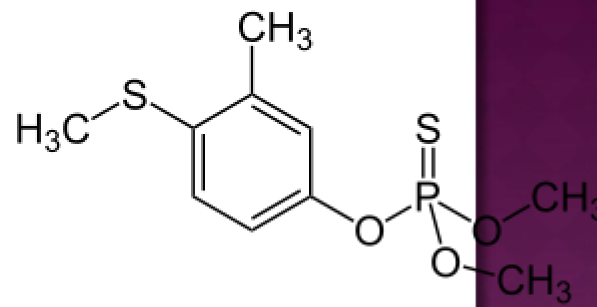
Darryl Hardie
DAFWA rep on DFRCC

FENTHION



- Organophosphate
  - Insecticide, acaracide and avicide
  - Cholinesterase inhibiter
- Citrus, stone fruit, vegetables, pome fruit, tropical fruit....
- Fruit Fly, Grasshopper, Rutherglen bug, various moths, spiders, ants, fleas.....

FENTHION - REVIEW

- Under review – expect 2012 report
- Expect changes to patterns of use
- Not applied directly to food crops in USA or Europe
- Concern that it is used on many products and there is risk of multiple exposures.

RESIDUES AND DIETARY RISK ASSESSMENT

- A residues and dietary risk assessment is required to set Maximum Residue Limits in food crops
- Residues data provided to the review from chemical manufacturer and HAL
- Over 100 studies, reviewed and assessed between 2009 and up until June 2011
- Agree with FSANZ on dietary risk assessment approach and food consumption figures

DIETARY EXPOSURE ASSESSMENT

Chronic exposure – lifetime exposure to that chemical from residues in food, corresponding to ADI (acceptable daily intake)

- food consumption data for general population

Acute exposure – short term exposure (24 hour period) to the chemical from residues in food, corresponding to acute reference dose (ARfD)

- food consumption data for various age groups and general population

HOW LARGE ARE HIGH CONSUMER PORTIONS?

- Children, 5 years (24 hours or 1 meal)
  - Apple – about 2
  - Banana – about 2½
  - Mango – about ½
  - Rockmelon – about 0.4
  - Tomato – about 1.3 or 10 small cherry toms
  - Strawberries – about 10

DIETARY EXPOSURE ASSESSMENT

- Once dietary exposure threshold is exceeded, uses must be modified or removed
- Product labels varied and new instructions issued
- Assess and register alternatives or replacements while reviews are ongoing

OUTCOMES OF AUGUST 2011 REPORT

- Estimated exceedances above ARfD for children (2 to 6 years) for various crops – for example
  - grapes 30× (pre); apples 5× (pre); cherries 3× (pre); peaches 14× (pre); nectarines 5× (pre); tomatoes 4× (pre); cucumbers 3.5× (post)
  - More details in report

- Below the ARfD and acceptable for
  - tropical fruit with inedible peel such as bananas, mango, avocado, custard apples, pineapple
  - citrus fruits, peppers (cover spray only)
  - peas and beans, cereal grains, oilseeds, pulses

WHAT DOES THIS MEAN?

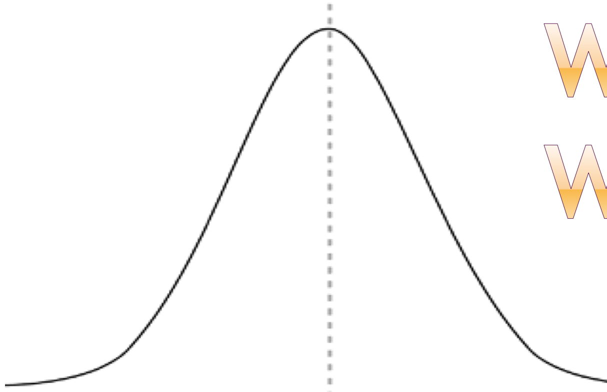
- This means that the new health standard, the acute reference dose, provides a trigger for action based on estimated dietary exposures for children

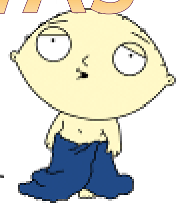
- The margins of safety that are put in place to protect consumers have been reduced

- Some regulatory action is required to either modify, restrict or remove uses

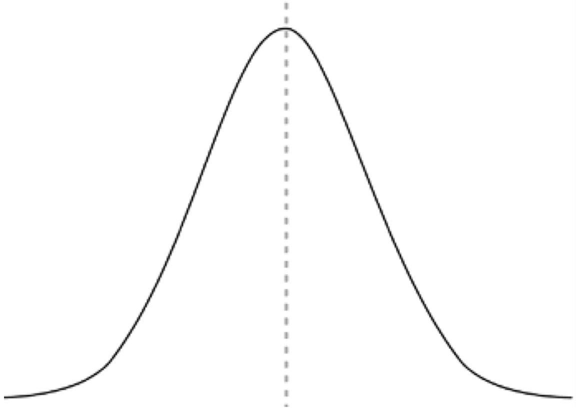
- Other regulators internationally take action based on dietary risk

WHAT THE APVMA WAS TRYING TO SAY!



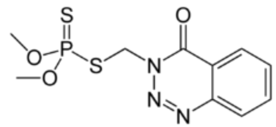
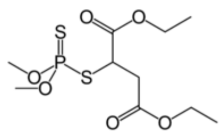
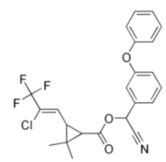
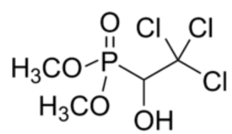
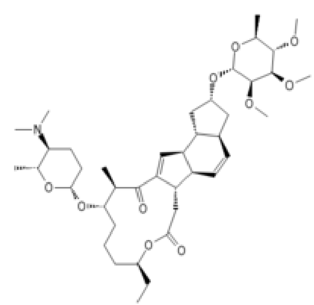
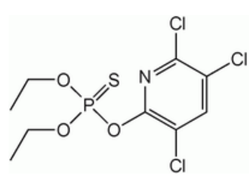


Increasing susceptibility to dimethoate →



←Increasing fruit intake with (ARfD)

CHEMICAL ALTERNATIVES

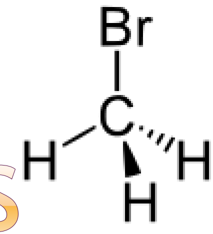
- Azinfos-methyl 
- Maldison 
- Lambda-cyhalothrin 
- Trichlorfon 
- Spinetoram 
- Chlorpyrifos 

COLD DISINFESTATION

- Not really applicable in domestic situation
    - length of treatment (16 days?)
    - suitability of produce
    - cost ($3 - 5 carton)

Darryl Hardie
DAFWA rep on DFRCC

MEBR FUMIGATION OF TOMATOES



•ICA-04 allows access to all states for fruit fumigated by methyl bromide, not favoured by growers, market agents and packers

•Any physical damage may be highlighted by fumigation

  •important that fruit to be fumigated is of high quality.

•Fruit with a larger calyx after the long period of storage was not in as good condition as fruit with a smaller, less prominent calyx.

•When done correctly, fruit quality and colour is maintained

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•**MeBr longterm use.**

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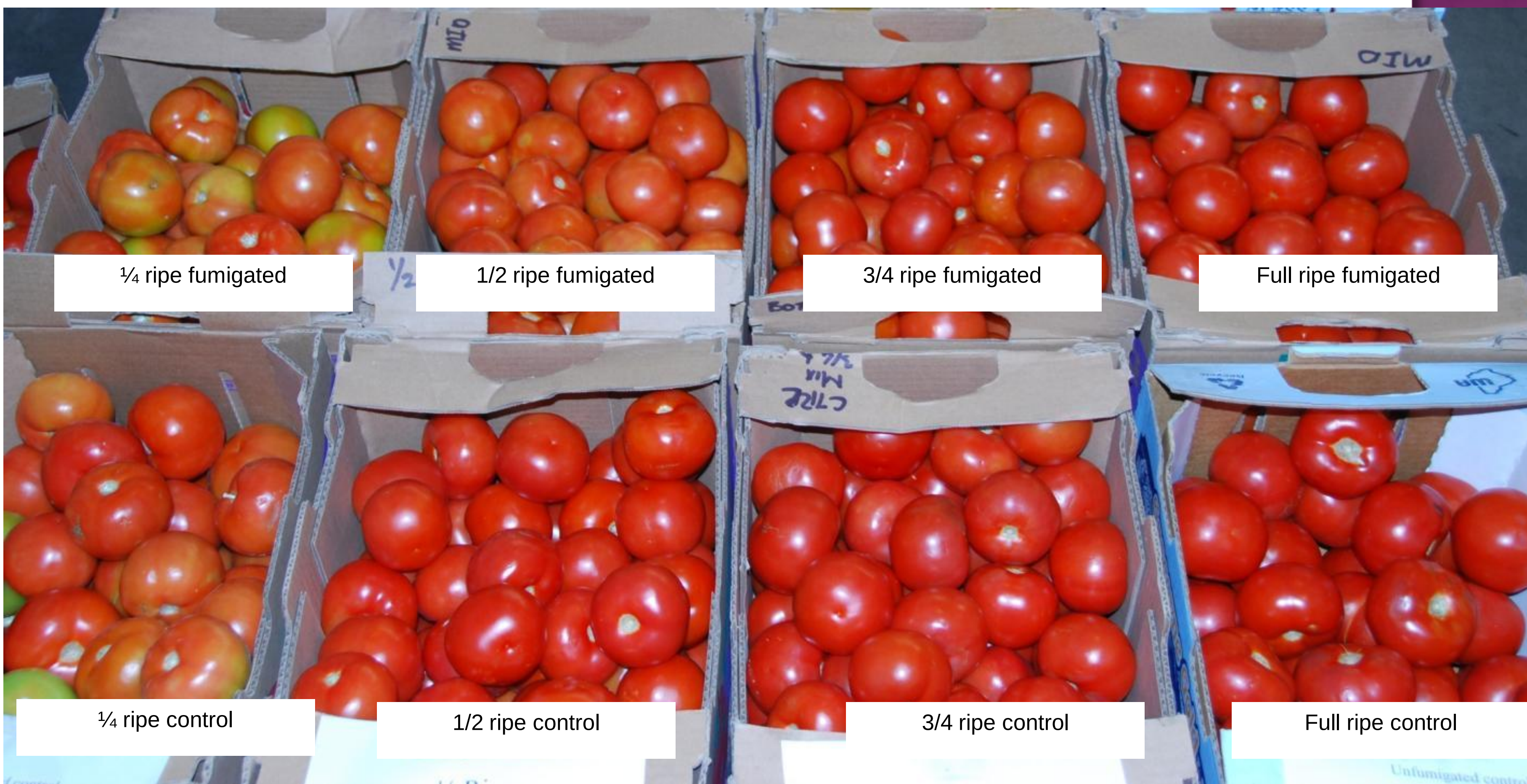
COMPARISON OF FUMIGATED AND CONTROL TOMATOES AFTER 17 DAYS STORAGE (14 DAYS AT 9°C AND THREE DAYS AT AMBIENT TEMPERATURE) (ICA-04)



TOMATOES CON'T

Ref No. & Title	Pests[1]	Host[2]	State/Territory Accepted[3]	Documents & Status				
				Protocol (Version, Date & State)	HACCP Plan (Version, Date & State)	Operational Procedure		
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						NSW (not for eggplant)	Issue: Version: 3	28/05/04
						VIC	Issue: Version: 5.2	15/11/11
						NT	Issue: Revision: Second	06/09/11
						WA	Issue: Version: 1.0	15/09/11
ICA-27 Mature Green Condition of Tomatoes	Qld Fruit Fly	Tomatoes	QLD VIC NT	Version: Issue date:	Version: Issue date:	QLD	Issue: First Revision: 0	18/02/99
						VIC	Issue: Version: 1.0	26/05/11

SYSTEMS APPROACH FIELD OPTIONS

- Baiting
- Biological control
- Cover sprays – other insecticides, oils or kaolin
- Cultural techniques
- Hygiene
- Mating disruption
- Netting/barriers
- Sterile insect technique
- Varietal differences

BAITING AND TRAPPING

- Lure and kill
  - Male annihilation technique (MAT)
  - Naturalure (protein lure plus toxicant) (registered organic)
  - Cera-trap (lure and drown)
  - SPLAT (chemical lure plus toxicant)
- Lure and Sterilise
  - Adress system
    - Bait plus lufenuron

MALE ANNIHILATION TECHNIQUE

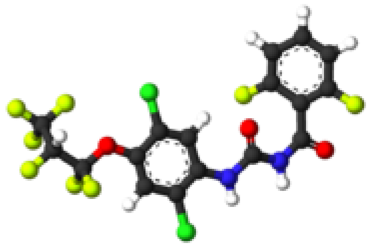
- Canite blocks
  - Attractant
  - Toxicant (maldison)
  - Nailed to trees or posts
- Labour intensive
  - Placement and replacement of blocks
  - Treating blocks
    - Risk of exposure to toxicant

BAITS - LURE AND KILL

- Protein (Fruit Fly)
  - Naturalure – Protein bait plus Spinosad
  - Amulet Gel - Protein gel plus fipronil
- Pheromone (Lepidoptera)
  - Pheromone attractant plus toxicant
- Can be applied as a spray or bait
- Minimal handling
- If used as bait spots – no contact with fruit
  - Residue issues minimised

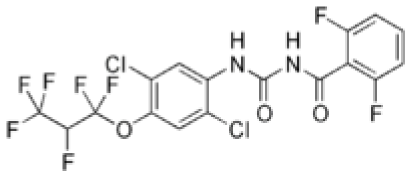
BAITS – MASS TRAPPING

- Lure and Drown
  - Liquid trap
  - Protein lure
  - No Toxicant
  - E.G. Ceratrap
- Trap and kill
  - Trap with lure (often chemical attractant)
  - Toxicant (E.G. Dichlorvos)
- Labour intensive
  - Placing and replacing traps
  - Product cost



LURE AND STERILISE

- Uses an open “trap”
- Attractant – protein, chemical or pheromone
- Chemosterilant
  - Lufenuron



- Insect contacts the bait and becomes sterile
- Can be used for Lepidoptera, Western Flowers thrips and flies

SPLAT

- Specialised Pheromone and Lure Application Technology
- Can carry a range of different lures, pheromones and toxicants
  - LBAM pheromone for mating disruption
  - Capilure and spinetoram for Medfly lure and kill
  - Protein and lufenuron for
- Inert carrier that can be mixed to order
- Can be applied mechanically
- Not on fruit so no residue issues (600 ml h/a)
- Persistent
- Possible to stack some combinations

STERILE INSECT TECHNOLOGY (SIT)

- Insects are reared in culture
- Able to separate male and female pupae
  - Colour
  - Heat treatment – female pupae killed
- Pupae sterilised by irradiated (130 gy)
  - 6 gy in one day is fatal to humans
- Sterile flies are released and mate with wild females
- Eggs laid by the female are sterile

STERILE MALE RELEASE

- Higher to ratio of sterile to wild the more effective it is
- Ideal in urban and environmentally sensitive areas
- Best when combined with other techniques
- Used widely in Europe, North Africa and USA.
  - Guatemala (USDA) facility produces 3 billion sterile flies per week and is currently being expanded
  - Used for fruit fly areas as control measure
  - Released in California as preventative measure

SYSTEMS APPROACH POST HARVEST

- Fumigation
  - Methyl bromide
  - Ethyl formate
  - Ethyl dinitrile
- Cold disinfestation
- Dips – oils, waxes or toxicant
- Irradiation
- Modified atmosphere

IRRADIATION

- Low acceptance in Australia
- Electron, x-ray or gamma ray
- Can kill bacteria, viruses, fungi and insects
- Accepted in some markets
  - Mangos exported to NZ
  - Spices
- Can improve shelf life of some crops
- Doses required to kill some insects may damage some crops

MODIFIED ATMOSPHERE

- Low oxygen atmosphere
- Elevated CO_2
- Often used in association with low temperatures

EXAMPLE SYSTEM
WESTERN FLOWER THRIPS

- Structure
  - Thrips excluding mesh
- Planting
  - Clean seedlings
  - Resistant varieties/crop where possible
- Hygiene
  - Removal of diseased plants
  - Care with entry
- Biological controls
  - Orius and predatory mites
- Targeted use of pesticide
  - Based on careful crop monitoring
  - Where possible soft on beneficial insects

EXAMPLE SYSTEM FRUIT FLY

- Physical barriers
  - Mesh barrier
- Planting
  - Less favoured varieties/crops
  - Early yielding varieties
- Baiting and trapping
  - Maintain traps for monitoring populations
  - Establish baiting program as required
- Harvest
  - Quality control systems
- Post harvest
  - Quality control systems
  - Post harvest treatment

SUMMARY

- Loss of Dimethoate and Fenthion for some crops will present challenges
- Alternative options exist and more are going to become available

AUSVEG

Dimethoate and Fenthion Forum– Alternative Options for Market Access

(April 2012)

Peter Leach

A/Program Manager Plant Biosecurity and Product Integrity

Biosecurity Queensland

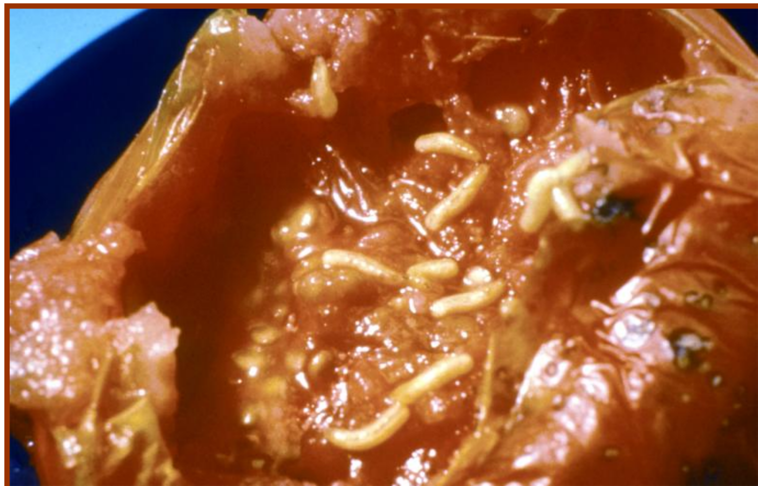
Queensland Government

Why is fruit fly a problem for Australia?

- We have over 300 species of fruit fly in Australia (mainly in Northern Australia) and the vast majority are not a problem for home gardeners and commercial producers
- Most species of fruit fly attack non-commercial native fruit
- One native fruit fly species that is a severe pest is Queensland fruit fly (*Bactrocera tryoni*)
- Queensland fruit fly is a problem for both home gardeners and commercial producers

Why is fruit fly a problem for Australia?

- Over 240 types of fruit and vegetables are recorded as being hosts to fruit fly.
- The risk of Queensland fruit fly attacking a crop will depend on if it is a good host, a poor host or a conditional non-host and the number of fruit fly in your region.
- An example of a good host is stone fruit, they can be attacked from early fruit formation through to harvest.
- An example of a conditional non-host is banana, if it is ripe it is a good host, but if harvested green it is not a host.



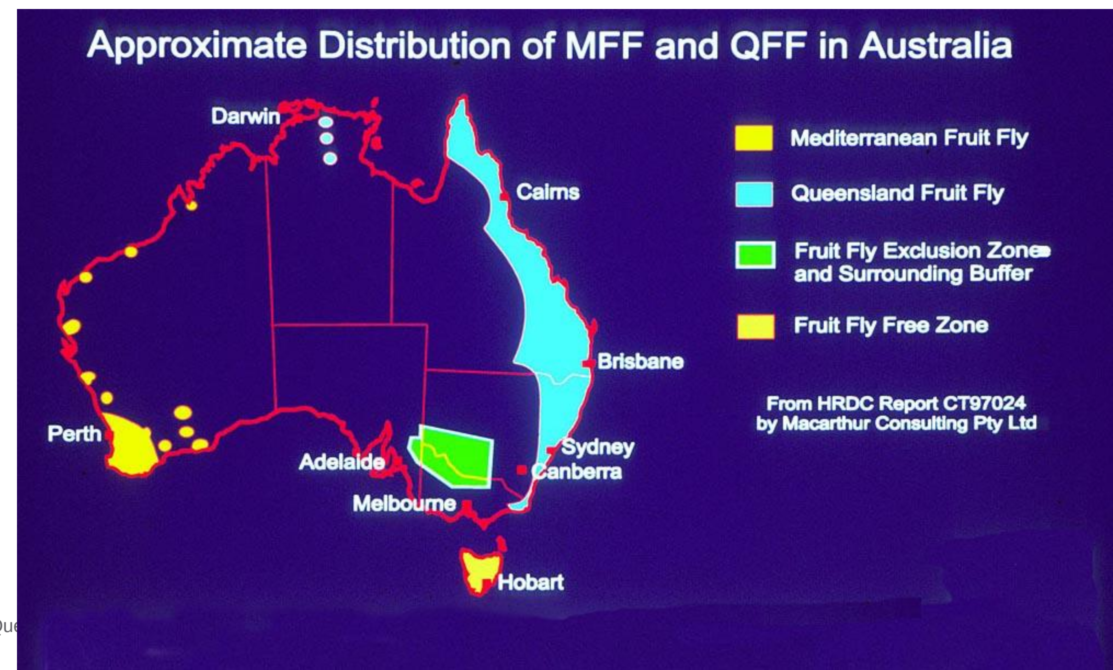
Why is fruit fly a problem for Australia?

- The population of fruit fly/risk of attack will vary dramatically within Queensland depending where it is grown and what time of year the fruit is harvested.
- Some areas within Queensland have low populations of fruit fly at some times of the year (winter) but there are no areas in Queensland that are considered free of fruit fly
- The largest populations of Queensland fruit fly are almost always close to urban populations.

Why do Queensland Growers Need to Treat for Fruit Fly?

- Because some areas of Australia do not have fruit fly and they want to keep it that way.

- Restrictions on Queensland growers is set by each of the states and territories in Australia (e.g. Victoria or Tasmania).



The role of the Queensland Government

- The Queensland Government does not set the treatment conditions but does provide and accreditation scheme (ICA) for growers and undertakes co-funded research with industry to develop new treatments

- Markets such as Brisbane, Sydney and Newcastle are in endemic fruit fly areas and Queensland growers can access these markets without the need to treat for fruit fly

What is an acceptable level of infestation?

- For backyard growers it is any level of infestation they find acceptable
- For commercial growers it is **“no viable insects”** in fruit they export to areas of Australia that are fruit fly free (or have species we don’t have e.g. WA has Medfly but not Q‘fly)
- No viable insects is a regulatory requirement to meet entry conditions for areas that are fruit fly free
- It is also a requirement for major supermarkets
- So even if growers are not sending to markets with restrictions they may still need to make sure there are **“no viable insects”** in consignments

The APVMA Review of Dimethoate

- There are over 500 businesses accredited under the ICA scheme in Queensland
- As a result of the APVMA review on dimethoate some of Queensland major industries can no longer use dimethoate as a postharvest treatment and have had to find alternative treatments: capsicum, tomato, eggplant, stonefruit, pome fruit, tropical and sub-tropical fruit with edible peel
- Systems approach protocols have also been affected and permits for alternative chemicals have been obtained to maintain access to interstate markets.

Insecticide Treatments

Over 30 crops **may** retain the postharvest use of Dimethoate

- Abiu
- Avocado
- Banana
- Banana Passionfruit (dip only)
- Cactus Fruit *(Pitaya, Dragon Fruit, Prickly pear)*
- Cherimoya
- Chilli
- Citrus (including grapefruit, lemon, lime, mandarin, pomelo, orange, tangelo)
- Custard apple
- Durian
- Feijoa *(Pineapple guava)*
- Granadilla (*Grandadilla*)
- Guava (inedible peel varieties only)
- Kiwifruit (*Chinese gooseberry*) (inedible peel varieties only
- Litchi *(Lychee)*
- Mango
- Mangostan (*Mangosteen*)
- Pawpaw (excluding defective flower end-type)
- Passionfruit
- Persimmon (inedible peel varieties only)
- Pomegranate
- Rambutan
- Rollinia (*Biriba*)
- Sapodilla (*Chicosapote, Chico*)
- Sapote, White (*Casimiroa*)
- Sentol (*Santol*)
- Soursop (*Guanabana*)
- Star Apple (*Caimito*)
- Sugar Apple (*Sweetsop, Squamosa*)
- Tamarillo
- Wax Jambus *(Java apple)*

Over 100 Crops can currently use Fenthion

(Date of release of the APVMA review findings is uncertain)

APVMA still reviewing WPHS

Insecticide Treatments

Some crops need to complete residue studies

Over 30 crops **may** retain the postharvest use of Dimethoate

- Abiu
- Avocado
- Banana
- Banana Passionfruit (dip only)
- Cactus Fruit *(Pitaya, Dragon Fruit, Prickly pear)*
- Cherimoya
- Chilli
- Citrus (including grapefruit, lemon, lime, mandarin, pomelo, orange, tangelo)
- Custard apple
- Durian
- Feijoa *(Pineapple guava)*
- Granadilla (*Grandadilla*)
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Over 100 Crops can currently use Fenthion

(Date of release of the APVMA review findings is uncertain)

Insecticide Treatments

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- Feijoa *(Pineapple guava)*
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- Soursop (*Guanabana*)
- Star Apple (*Caimito*)
- Sugar Apple (*Sweetsop, Squamosa*)
- Tamarillo
- Wax Jambus *(Java apple)*

Many crops don't use dimethoate for market access

Over 100 Crops can currently use Fenthion

(Date of release of the APVMA review findings is uncertain)

Alternative Options for Market Access

- Heat Treatment
  - Vapour Heat Treatment
  - High Temperature Forced Air
  - Hot Water Dipping
- Cold Treatment
- Fumigants- Methyl bromide
- Insecticides
  - Field sprays with other chemicals
  - Postharvest treatment with other chemicals?
- Systems Approaches
- Non Host Status or conditional non-host status
- Area Freedom/Pest Free Places of Production
- Irradiation

Which technology should you use?

The technology that meets your trading partners requirements, maintains product quality and is the most economical.

CONDITIONAL NON-HOST STATUS (various ICA's)

- Achachairú
- Banana
- Black Sapote
- Durian
- Jaboticaba
- Jackfruit
- Lime (Tahitian)
- Longan
- Lychee
- Mangosteen
- Papaya
- Passionfruit
- Pomegranate
- Rambutan

- 15 crops have approval to use conditional non-host status
- But it is not accepted by all jurisdictions
- Can be variety specific
- Avocado (Hass and Lamb Hass) has just been approved
- The host status of tomato and mango is being reviewed.

IRRADIATION
ICA-55

- **FSANZ approved crops**
- Breadfruit
- Carambola
- Custard apple
- Longan
- Litchi *(Lychee)*
- Mango
- Mangost*een*
- Papaya
- Rambutan

Accepted by all states and territories

- Uses a generic treatment for all fruit fly species

Irradiation Activities

- **Research projects have been completed on:**
- Tomato
- Capsicum
- Zucchini
- Honey Dew Melon
- Rockmelon
- Nectarine
- Strawberry
- Cherry
- Apricot
- Plum
- Peach
- Table Grape
- Apple

- **Food Standards Australia New Zealand requires nutritional studies to be conducted**
  - Full Nutrition panel (Water, Energy, Protein (Nitrogen), Total lipid (fat) (Palmitic acid, Malic Acid), Carbohydrate, Total dietary fibre, Ash, Total Sugars (fructose, glucose, sucrose).
  - Ascorbic Acid (Vitamin C)
  - Carotene (beta carotene)

Fruit quality assessments have also been undertaken for use by industry

Irradiation Activities

- FSANZ has approved the use of irradiation on persimmon but has not yet been officially gazetted.
- Submissions for tomato and capsicum have been submitted to FSANZ and submissions on the other crops listed are being developed
- If the submissions are successful it will be at least 9-12 months until irradiation could be used for interstate access for these crops

Systems Approaches

- **PRE-HARVEST TREATMENT AND INSPECTION**
- Capsicum
- Chilli
- Citrus
- Custard Apple
- Eggplant
- Grape
- Mango
- Stonefruit
- Strawberry
- Tomato

Nine out of the ten commodities still rely on the use of chemical cover sprays and have been affected by the APVMA review.

The biggest problems are:

- The lack of harmonisation amongst jurisdictions
- They are more expensive and complicated
- They are not as robust as single point end point treatments (two weeks of rain can knock out a protocol)

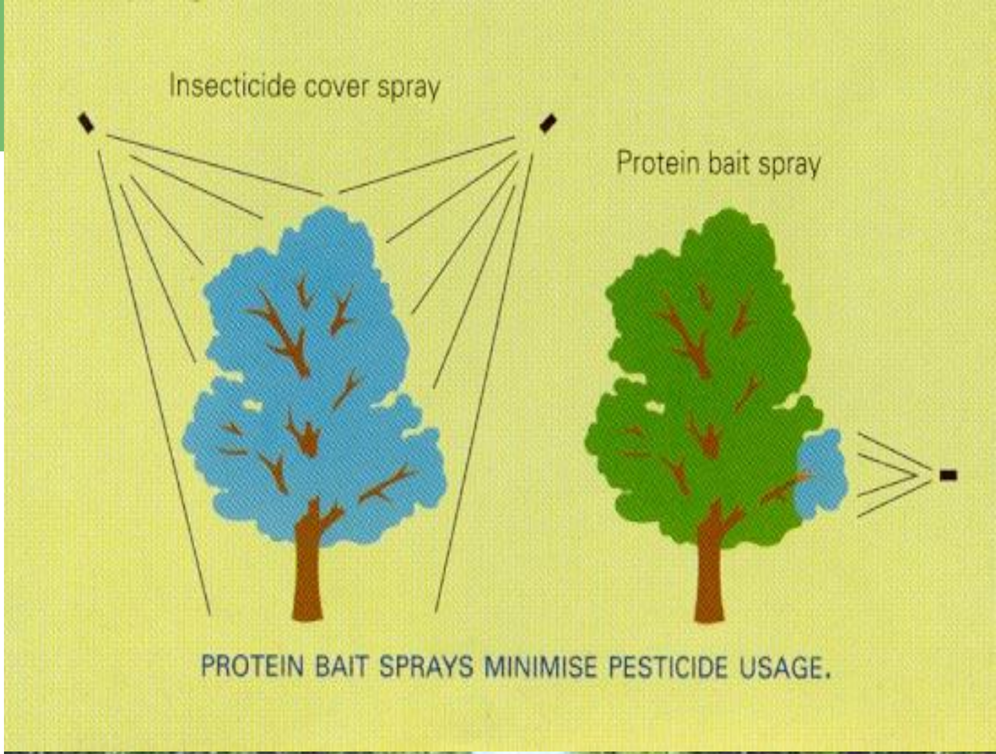
Chemical Control

Cover sprays with insecticides

- Effective and costly
- Kill eggs and larvae in the fruit
- Possible residue problems
- Detrimental to beneficial insects
- Incompatible with IPM
- Long with-holding period
- Consumer resistance
- Potential environmental issues

Bait Sprays

- Foliar spot spray
- Protein + insecticide
- Targets females (need protein for egg development) but kills males as well



Bait Sprays

- **Advantages**
  - Reduce insecticide
  - Reduce cost
  - Compatible with IPM – not detrimental to parasitoids & predators for other insect pests
  - Consumer preference – minimal residues
  - Environmental benefits

- **Disadvantages**
  - May not be effective on highly susceptible crops or under high fruit fly pressure
  - Most effective if applied area wide
  - Not systemic, must be reapplied regularly and after rain

Cold Treatment (ICA – 07)

- Currently approved on the domestic market for all crops
- But the treatment takes approximately two weeks at (1^0C) and is not considered a viable option for most industries.
- Queensland is undertaking research on higher temperatures (3^0C) and shorter time periods.
- If successful it may lead to greater adoption of the technology but it is expected that the major use of cold treatments will be for international exports.

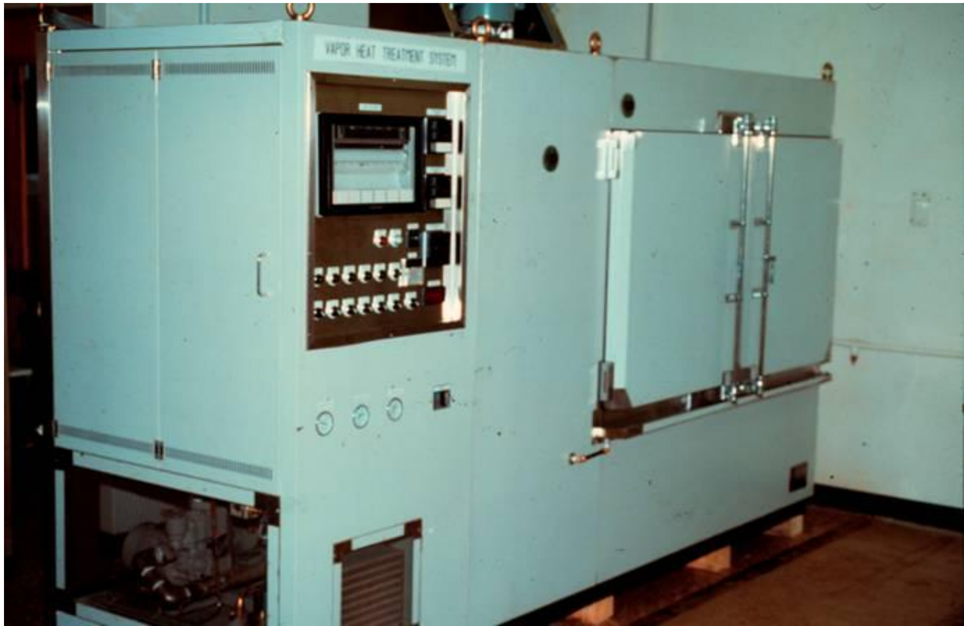
Area Freedom

- Currently there are no areas of Queensland that are considered to be fruit fly free
- But, concepts such as Pest Free Places of Production are being investigated around Australia (e.g. Secure Glasshouses- Guyra Tomatoes)
- Research in Queensland has looked at protective netting but it has not been approved for interstate access
- May have some impact on pollination and fruit quality (these can be overcome with R&D)
- Will require heavy initial investment but would allow production without the need for cover sprays for fruit fly
- Concept has been approved internationally but economics will determine if it is viable option for Queensland producers

Heat Treatments

- **Domestically**
  - VHT (vapour heat treatment) and HWD (hot water dipping) are approved for treatment of fruit fly in mango
  - HTFA (high temperature forced air) is approved for papaya

    (Approved during PFF campaign and has never been used. ICA would need to be updated)



Heat Treatments

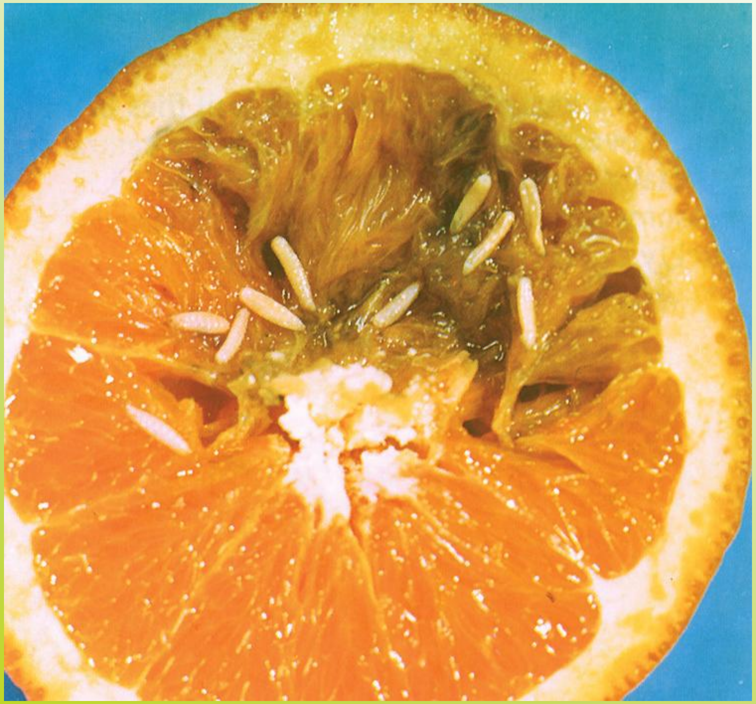
- **Internationally**
  - VHT is approved for mangoes to Japan, Korea and China
  - The fruit fly treatment is identical for all three countries but approvals vary dramatically.

    (Korea and China have restrictions against mango seed weevil but no restrictions on varieties. Japan is not concerned about MSW but does have restrictions on varieties)
  - Use of AQIS approved treatment facilities for treatment for the domestic market may require approval of our trading partners

Heat Treatments

- Research has been completed on VHT of tomatoes, rock melon, honeydew melon, zucchini and scaloppini with positive results recorded
- Extensive research has been undertaken on capsicum and cucumber but treatments required to control fruit fly resulted in severe damage
- Research has been completed to Asia Pacific Plant Protection Commission standards (regional standard)
- Results are applicable to both international and domestic markets
- But no protocols have been negotiated for market access

    (Why would you use VHT when cheaper alternatives such as chemical postharvest treatments were available?)



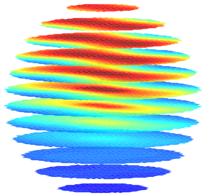
Microwave disinfestation of fruits

Mala Gamage *et al.* – CSIRO-FNS

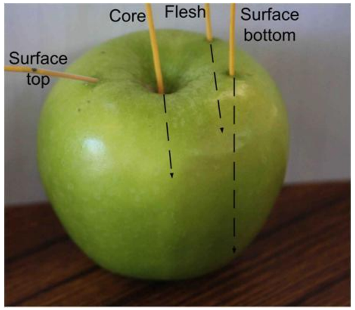
David Williams – DPIV
&
Peter Leach - DEEDI

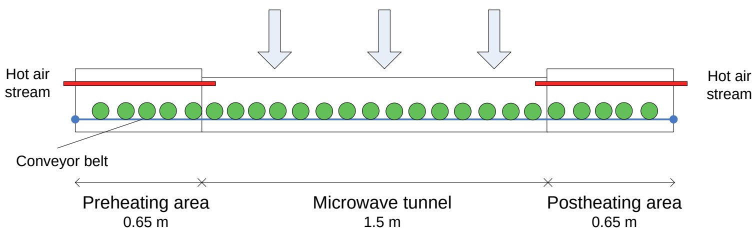
Horticulture Showcase, DPIV 5 July 2011

Microwave (MW) heating of fruit

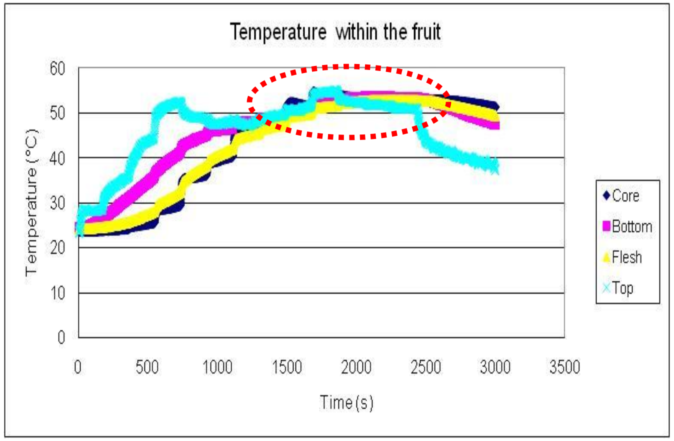


MW
Volumetric heating





Pentagonal
MW + hot air tunnel
for
continuous treatment of fruit



Conclusions / Future work

Conclusions

- Microwave/hot air heating - high potential →
  - Use can be extended to many crops,
  - Short treatment time,
  - Less energy consumption than VHT,
  - Free of chemical residues,
  - Suitable for small and large pack houses.

- Fruit quality was not affected by MW treatment .

Future work

- Target crops - Mango, Apple, Tomato?
- Insects – FF, Codling moth , other pests (Mango Weevil)
- Large scale disinfestation & quality trials
- Collaborations – DPIV & DEEDI
- Funding – Horticultural Industries & HAL

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Email: enquiries@csiro.au Web: www.csiro.au

CSIRO

Market Access Options - Tomato

Western Aust	South Australia	Tasmania	Victoria
Melon Thrips: 1. Inspection 2. MT free area 3. Fumigation 4. MTF-04	**Melon Thrips:** 1. Inspection 2. MT free area 3. Fumigation 4. MTF-04	**Melon Thrips:** No Quarantine entry condition	**Melon Thrips:** No Quarantine entry condition
Q Fruit Fly: 1. Dip or flood spray fenthion 2. Fumigation 3. Cold treatment	**Q Fruit Fly:** 1. Dip or flood spray fenthion 2. Fumigation 3. Pre-harvest treat and post harvest inspection	**Q Fruit Fly:** 1. Dip or flood spray fenthion 2. Fumigation 3. Mature green 4. Cold treatment	**Q Fruit Fly:** 1. Dip or flood spray fenthion 2. Fumigation 3. Pre-harvest treat and post harvest inspection 4. Mature green 5. Cold treatment

Market Access Options – Tomato - If fenthion use is restricted

Western Aust	South Australia	Tasmania	Victoria
Q Fruit Fly: 1. Dip or flood spray fenthion **2. Fumigation** 3. Cold treatment	Q Fruit Fly: 1. Dip or flood spray fenthion **2. Fumigation** **3. Pre-harvest treat and post harvest inspection**	Q Fruit Fly: 1. Dip or flood spray fenthion **2. Fumigation** **3. Mature green** 4. Cold treatment	Q Fruit Fly: 1. Dip or flood spray fenthion **2. Fumigation** **3. Pre-harvest treat and post harvest inspection** **4. Mature green** 5. Cold treatment

Market Access Options - Capsicum

Western Aust	South Australia	Tasmania	Victoria
Melon Thrips: 1. Inspection 2. MT free area 3. Fumigation	**Melon Thrips:** 1. Inspection 2. MT free area 3. Fumigation	**Melon Thrips:** No Quarantine entry condition	**Melon Thrips:** No Quarantine entry condition
Q Fruit Fly: 1. Flood spray fenthion 2. Fumigation 3. Cold treatment	**Q Fruit Fly:** 1. Flood spray fenthion 2. Fumigation 3. Pre-harvest treat and post harvest inspection	**Q Fruit Fly:** 1. Flood spray fenthion 2. Fumigation 3. Cold treatment	**Q Fruit Fly:** 1. Flood spray fenthion 2. Fumigation 3. Pre-harvest treat and post harvest inspection 4. Cold treatment

Market Access Options - Capsicum - If fenthion use is restricted

Western Aust	South Australia	Tasmania	Victoria
Q Fruit Fly: 1. Flood spray fenthion **2. Fumigation** 3. Cold treatment	**Q Fruit Fly:** 1. Flood spray fenthion **2. Fumigation** **3. Pre-harvest treat and post harvest inspection**	**Q Fruit Fly:** 1. Flood spray fenthion **2. Fumigation** 3. Cold treatment	**Q Fruit Fly:** 1. Flood spray fenthion **2. Fumigation** **3. Pre-harvest treat and post harvest inspection** 4. Cold treatment

Market Access Options - Chilli

Western Aust	South Australia	Tasmania	Victoria
Melon Thrips: 1. Inspection 2. MT free area 3. Fumigation	**Melon Thrips:** 1. Inspection 2. MT free area 3. Fumigation	**Melon Thrips:** No Quarantine entry condition	**Melon Thrips:** No Quarantine entry condition
Q Fruit Fly: 1. Flood spray dimethoate or fenthion 2. Fumigation 3. Cold treatment	**Q Fruit Fly:** 1. Flood spray dimethoate or fenthion 2. Fumigation 3. Pre-harvest treat and post harvest inspection	**Q Fruit Fly:** 1. Flood spray dimethoate 2. Fumigation 3. Cold treatment	**Q Fruit Fly:** 1. Flood spray dimethoate or fenthion 2. Fumigation 3. Pre-harvest treat and post harvest inspection 4. Cold treatment

Market Access Options - Chilli - If fenthion use is restricted

Western Aust	South Australia	Tasmania	Victoria
Q Fruit Fly: **1. Flood spray dimethoate** or fenthion **2. Fumigation** 3. Cold treatment	Q Fruit Fly: **1. Flood spray dimethoate** or fenthion **2. Fumigation** **3. Pre-harvest treat and post harvest inspection**	Q Fruit Fly: **1. Flood spray dimethoate** **2. Fumigation** 3. Cold treatment	Q Fruit Fly: **1. Flood spray dimethoate** or fenthion **2. Fumigation** **3. Pre-harvest treat and post harvest inspection** 4. Cold treatment

Market Access Options - Eggplant

Western Aust	South Australia	Tasmania	Victoria
Melon Thrips: 1. Inspection 2. MT free area 3. Fumigation	**Melon Thrips:** 1. Inspection 2. MT free area 3. Fumigation	**Melon Thrips:** No Quarantine entry condition	**Melon Thrips:** No Quarantine entry condition
Q Fruit Fly: 1. Dip or flood spray fenthion 2. Fumigation 3. Cold treatment	**Q Fruit Fly:** 1. Dip or flood spray fenthion 2. Fumigation 3. Pre-harvest treat and post harvest inspection	**Q Fruit Fly:** 1. Fumigation 2. Cold treatment	**Q Fruit Fly:** 1. Dip or flood spray fenthion 2. Fumigation 3. Pre-harvest treat and post harvest inspection 4. Cold treatment

Market Access Options - Eggplant - If fenthion use is restricted

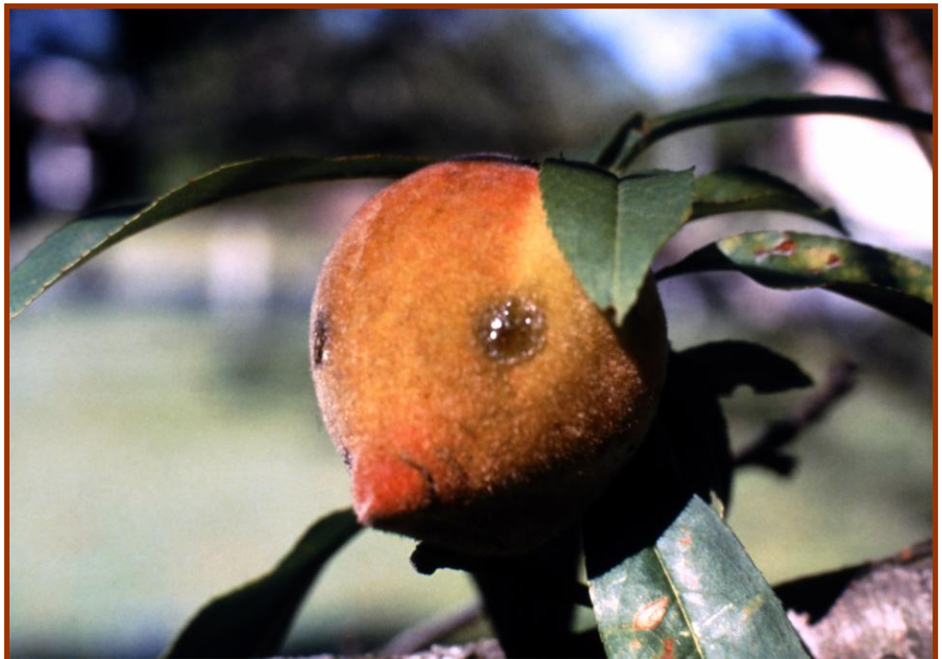
Western Aust	South Australia	Tasmania	Victoria
Q Fruit Fly: 1. Dip or flood spray fenthion **2. Fumigation** 3. Cold treatment	**Q Fruit Fly:** 1. Dip or flood spray fenthion **2. Fumigation** **3. Pre-harvest treat and post harvest inspection**	**Q Fruit Fly:** **1. Fumigation** 2. Cold treatment	**Q Fruit Fly:** 1. Dip or flood spray fenthion **2. Fumigation** **3. Pre-harvest treat and post harvest inspection** 4. Cold treatment

Methyl Bromide (ICA – 04)

- Currently approved on the domestic market for all crops
- Is the only treatment option for some markets (especially Tasmania)
- Is being considered as an emergency measure for tomato and capsicum which both lost access when postharvest use of dimethoate was withdrawn

Methyl Bromide

- Under the Montréal protocol many non-quarantine uses are being phased out
- But quarantine use is exempt from the phase out until alternative treatments are developed
- Progress on developing alternatives has been slow to date



Methyl Bromide

- The major reason for the phase out of methyl bromide is that it is a an ozone depleter (WPHS is also a concern)
- Recapture technology has been developed and commercially adopted in some countries which reduces the impact of methyl bromide on the environment
- Recapture technology has received environmental awards in Australia and the US.

Methyl Bromide

- Predicted rises in **cost** and decreased product **availability** were another two issues predicted to impact on the viability of methyl bromide.
- To date there has been no significant change for either issue.

Methyl Bromide

- Generally regarded by industry as damaging to most commodities

- Q: Is this true or is it because supply chain management is poor?

- Q: Has treatment in the past always been “Best practice”

    (the days of treating under tarps with no temperature control are probably limited if this technology is to be a remain a viable option)

- Q: Does adopting best practice mean a change to the current supply chain

    (Could larger producers treat on farm prior to product being cooled down)

    (Is it the methyl bromide treatment or the “break” in supply chain that causes a reduction in shelf life)

    (Would the use of facilities with forced air cooling/heating improve product quality)

Methyl Bromide- R&D

- Research on the use of lower doses for longer time periods is currently being investigated in tomatoes and capsicum
- Funding provided by HAL, Biosecurity Australia and Brisbane based exporters
- Lower doses for longer time periods is expected to help maintain fruit quality

Conclusions- General

- Queensland industries will retain access to major markets such as Brisbane and Sydney without the need to treat for fruit fly
(for small industries this is a viable option)

- Some commodities will retain the use of dimethoate and some industries have substituted fenthion for dimethoate (timing of the release of preliminary results of APVMA review of fenthion is unknown)

- Some commodities have alternatives such as conditional non-host status, systems approaches, fumigation, irradiation or cold treatment.

- Some markets are going to be lost until alternatives are developed and negotiated.

Current Domestic Use of Alternative FF Treatments

Option	Approved by all States and Territories	Approved for all fruit fly species	Approved for control of pests other than fruit fly	Treatment Facility	Current Industry Adoption
HWD	No	No	No	On farm	Nil
VHT	No	No	No	Centralised	Nil
Cold	**Yes**	No	No	On farm	Nil
Host Status	No	No	N/A	On farm	High
Systems Approach	No	No	**Yes**	On farm	Expanding
Methyl bromide	**Yes**	No	**Yes**	On large farms	Currently low
Irradiation	**Yes**	**Yes**	**Yes**	Centralised	Very low

Overall Conclusion

Which technology should you use?

The technology that meets your trading partners requirements,

maintains product quality

and is the most economical.

APPENDIX 6
AUSVEG Road Show Outline

Date	Day	Location	Meetings	Venue	Speaker 1 (D&F and Alternatives)	Speaker 2 (Irradiation)	Speaker 3 (Market Research)
First Leg							
10-Apr	**Tuesday**	**Perth**	Suppliers 12:00	Joondalup Resort	Darryl Hardie (DAFWA)	Peter Roberts (RAS NZL)	Hugh Gurney (AUSVEG)
			Growers 18:00	Joondalup Resort	Darryl Hardie (DAFWA)	Peter Roberts (RAS NZL)	Hugh Gurney (AUSVEG)
11-Apr	**Wednesday**	**Adelaide**	Suppliers 13:30	Arkaba Hotel	Peter Crisp (SARDI)	Peter Roberts (RAS NZL)	Hugh Gurney (AUSVEG)
			Growers 18:00	Grow SA Virginia	Peter Crisp (SARDI)	Peter Roberts (RAS NZL)	Hugh Gurney (AUSVEG)
12-Apr	**Thursday**	**Mildura**	Growers 18:00	Mercure Hotel Mildura	Jonathan Fahey (VIC DPI)	Peter Roberts (RAS NZL)	Hugh Gurney (AUSVEG)
13-Apr	**Friday**	**Melbourne**	Suppliers 14:00	Amora Hotel	Gary D'Arcy (VIC DPI)	Peter Roberts (RAS NZL)	Hugh Gurney (AUSVEG)
Second Leg							
20-Apr	**Friday**	**Darwin**	Growers 18:00	Vibe Hotel	Andrew Tomkins (DoR)	Peter Roberts (RAS NZL)	Hugh Gurney (AUSVEG)
21-Apr	**Saturday**	**Townsville**	Growers 15:30	Townsville RSL	Peter Leach (DEEDI)	Peter Roberts (RAS NZL)	Hugh Gurney (AUSVEG)
23-Apr	**Monday**	**Caboolture**	Growers 18:00	Beerwah Golf Club	Peter Leach (DEEDI)	Peter Roberts (RAS NZL)	William Churchill (AUSVEG)
24-Apr	**Tuesday**	**Brisbane**	Suppliers 9:00	Brisbane Markets	Peter Leach (DEEDI)	Peter Roberts (RAS NZL)	William Churchill (AUSVEG)
		Gatton	Growers 18:00	Royal Gatton Hotel	Peter Leach (DEEDI)	Peter Roberts (RAS NZL)	William Churchill (AUSVEG)
26-Apr	**Thursday**	**Bundaberg**	Growers 18:00	Bundaberg Enterprise Centre	Peter Leach (DEEDI)	Peter Roberts (RAS NZL)	William Churchill (AUSVEG)
27-Apr	**Friday**	**Bowen**	Growers 18:00	Bowen RSL	Peter Leach (DEEDI)	Peter Roberts (RAS NZL)	William Churchill (AUSVEG)

APPENDIX 7
AUSVEG Road Show Flyer/ Registration Forms

Alternatives to Dimethoate and Fenthion

Education Road Show

The fruit fly treatments Dimethoate and Fenthion (D&F) are currently under review by the Australian Pesticides and Veterinary Medicines Authority (APVMA) and it is anticipated that both chemicals will be banned for use in Australia.

AUSVEG will be undertaking a series of seminars as part of a road show to educate growers and suppliers on alternatives to D&F, including methyl bromide fumigation, cold disinfestation, baiting and trapping, irradiation and a systems approach. Leading scientists will discuss the advantages and disadvantages of these alternative treatments.

Additionally, findings on recent market research activities which have been undertaken by AUSVEG will also be presented. These findings illuminate consumer attitudes towards the various D&F alternatives, and will allow growers to make informed decisions about the available alternatives.

Following the presentations, growers will have the opportunity to speak directly with the presenters informally over complimentary refreshments and finger food.

Road Show Leg One

CONNOLLY WA: ☐ Tuesday 10th April: 6:00pm - 9:00pm.
Venue: Joondalup Resort Country Club Boulevard, Connolly, WA.
Speakers: Darryl Hardie (DAFWA), Peter Roberts (RAS NZL), Hugh Gurney (AUSVEG)

VIRGINIA SA: ☐ Wednesday 11th April: 6:00pm - 9:00pm.
Venue: Growers SA HQ, Old Port Wakefield Rd, Virginia, SA.
Speakers: Peter Crisp (SARDI), Peter Roberts (RAS NZL), Hugh Gurney (AUSVEG)

MILDURA VIC: ☐ Thursday 12th April: 6:00pm - 9:00pm.
Venue: Mercure Hotel, 120 Eighth St, Mildura, VIC.
Speakers: Jonathan Fahey (VICDPI), Peter Roberts (RAS NZL), Hugh Gurney (AUSVEG)

Road Show Leg Two

DARWIN NT: ☐ Friday 20th April: 6:00pm - 9:00pm.
Venue: Vibe Hotel, 7 Kitchener Drive, Darwin City Waterfront, NT.
Speakers: Andrew Tomkins (DoR), Peter Roberts (RAS NZL), Hugh Gurney (AUSVEG)

TOWNSVILLE QLD: ☐ Saturday 21st April: 3:30pm - 6:30pm.
Venue: Townsville RSL, 139 Charters Towers Rd, Hermit Park, Townsville, QLD.
Speakers: Peter Leach (DEEDI), Peter Roberts (RAS NZL), William Churchill (AUSVEG)

BEERWAH QLD: ☐ Monday 23rd April: 6:00pm - 9:00pm.
Venue: Beerwah Golf Club, 24 Biondi Crescent, Beerwah, QLD.
Speakers: Peter Leach (DEEDI), Peter Roberts (RAS NZL), William Churchill (AUSVEG)

GATTON QLD: ☐ Tuesday 24th April: 6:00pm - 9:00pm.
Venue: Royal Gatton Hotel, 2 Railway St, Gatton, QLD.
Speakers: Peter Leach (DEEDI), Peter Roberts (RAS NZL), William Churchill (AUSVEG)

BUNDABERG QLD: ☐ Thursday 26th April: 6:00pm - 9:00pm.
Venue: Bundaberg Enterprise Centre, Tantitha St, Cnr of Quay & Tantitha, Bundaberg, QLD.
Speakers: Peter Leach (DEEDI), Peter Roberts (RAS NZL), William Churchill (AUSVEG)

BOWEN QLD: ☐ Friday 27th April: 6:00pm - 9:00pm.
Venue: Bowen RSL, 38 Williams St, Bowen QLD.
Speakers: Peter Leach (DEEDI), Peter Roberts (RAS NZL), William Churchill (AUSVEG)

To RSVP

To attend one of the road show sessions, please tick the appropriate box next to your preferred session and fill out your personal details in the space below. To RSVP please fax your completed form to AUSVEG on (03) 9822 0688 or email us your contact details and the event you wish to attend to info@ausveg.com.au. Alternatively, please call AUSVEG on (03) 9822 0388 to register by phone.

Name ______________________

Address ______________________

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Phone Number ______________________

Fax Number ______________________

Email Address ______________________

HAL Horticulture Australia

AUSVEG

RAS NZL - Radiation Advisory Services, New Zealand; DAFWA - Department of Agriculture and Food Western Australia; SARDI - South Australian Research and Development Institute; VICDPI - Victorian Department of Primary Industries; DoR - Northern Territory Department of Resources; DEEDI - Queensland Department of Employment, Economic Development and Innovation.

Alternatives to Dimethoate and Fenthion

Education Road Show

The fruit fly treatments Dimethoate and Fenthion (D&F) are currently under review by the Australian Pesticides and Veterinary Medicines Authority (APVMA) and it is anticipated that both chemicals will be banned for use in Australia.

AUSVEG will be undertaking a series of seminars as part of a road show to educate growers and suppliers on alternatives to D&F, including methyl bromide fumigation, cold disinfestation, baiting and trapping, irradiation and a systems approach. Leading scientists will discuss the advantages and disadvantages of these alternative treatments.

Additionally, findings on recent market research activities which have been undertaken by AUSVEG will also be presented. These findings illuminate consumer attitudes towards the various D&F alternatives, and will allow growers to make informed decisions about the available alternatives.

Following the presentations, growers will have the opportunity to speak directly with the presenters informally over complimentary refreshments and finger food.

To RSVP

To attend one of the road show sessions, please tick the appropriate box next to your preferred session and fill out your personal details in the space below. To RSVP please fax your completed form to AUSVEG on (03) 9822 0688 or email us your contact details and the event you wish to attend to info@ausveg.com.au.
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Name ______________________

Address ______________________

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Phone Number ______________________

Fax Number ______________________

Email Address ______________________

Road Show Leg One

CONNOLLY WA: ☐ Tuesday 10th April: 12:00pm - 3:00pm.
Venue: Joondalup Resort Country Club Boulevard, Connolly, WA.
Speakers: Darryl Hardie (DAFWA), Peter Roberts (RAS NZL), Hugh Gurney (AUSVEG)

FULLARTON SA: ☐ Wednesday 11th April: 1:30pm - 4:30pm.
Venue: Arkaba Hotel, 150 Glen Osmond rd, Fullarton, SA.
Speakers: Peter Crisp (SARDI), Peter Roberts (RAS NZL), Hugh Gurney (AUSVEG)

RICHMOND VIC: ☐ Friday 13th April: 2:00pm - 5:00pm.
Venue: Amora Hotel, 649 Bridge rd, Richmond, VIC.
Speakers: Gary D'Arcy (VICDPI), Peter Roberts (RAS NZL), Hugh Gurney (AUSVEG)

HAL Horticulture Australia

AUSVEG

RAS NZL - Radiation Advisory Services, New Zealand; DAFWA - Department of Agriculture and Food Western Australia; SARDI - South Australian Research and Development Institute; VICDPI - Victorian Department of Primary Industries.

Các biện pháp thay thế khác cho Dimethoate và Fenthion

Thuyết Trình Giáo Dục Lưu Động

HAL
Horticulture Australia

AUSVEG

Thuốc điều trị ruồi trái cây Dimethoate và Fenthion (D&F) hiện đang được Cơ Quan Dược Phẩm Trừ Sâu và Thú Y Úc (Australian Pesticides and Veterinary Medicines Authority) (APVMA) tái xét và theo dự liệu, cả hai loại hóa chất này sẽ bị cấm sử dụng ở Úc.

AUSVEG sẽ thực hiện một loạt các buổi hội thảo chuyên đề trong khuôn khổ chương trình hướng dẫn lưu động nhằm giáo dục các nhà trồng trọt và nhà cung cấp về các biện pháp thay thế khác cho D&F, bao gồm khói say methyl, phương pháp diệt trùng lạnh, nhử mồi và giăng bẫy, rọi tia sáng và phương pháp hệ thống. Các nhà khoa học hàng đầu sẽ thảo luận về những điểm thuận lợi và bất lợi của các biện pháp điều trị thay thế này.

Ngoài ra, kết quả của các hoạt động nghiên cứu thị trường gần đây do AUSVEG tiến hành cũng sẽ được trình bày. Các kết quả này sẽ giải thích về thái độ của khách hàng đối với nhiều biện pháp thay thế D&F khác nhau đồng thời cho phép các nhà trồng trọt đưa ra các quyết định về những biện pháp thay thế hiện có sẵn sau khi đã được giải thích tường tận.

Sau các buổi thuyết trình, các nhà trồng trọt sẽ có cơ hội nói chuyện trực tiếp một cách thân mật với nhân viên thuyết trình qua bữa ăn nhẹ và giải khát miễn phí.

Thuyết Trình Lưu Động Giai Đoạn 2

DARWIN NT: ☐ Thứ Sáu ngày 20 tháng 04: 6g chiều – 9g tối.

Địa điểm: Vibe Hotel, 7 Kitchener Drive, Darwin City Waterfront, NT.

Các diễn giả: Andrew Tomkins (DoR), Peter Roberts (RAS NZL), William Churchill (AUSVEG)

Muốn phúc đáp

Muốn tham dự buổi thuyết trình này, xin điền các chi tiết cá nhân của quý vị vào chỗ trống dưới đây. Muốn phúc đáp, xin fax mẫu đơn đã điền đầy đủ của quý vị tới AUSVEG qua số (03) 9822 0688 hoặc gởi email các chi tiết liên lạc của quý vị tới chúng tôi tại info@ausveg.com.au. Một cách khác, xin gọi cho AUSVEG qua số (03) 9822 0388 để ghi danh qua điện thoại.

Họ Tên ______________________________

Địa Chỉ ______________________________

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Số Điện Thoại ______________________________

Số Fax ______________________________

Địa Chỉ Email ______________________________

DoR – Bộ Tài Nguyên Bắc Lãnh (Northern Territory Department of Resources); RAS NZL – Dịch Vụ Tư Vấn Phóng Xạ, Tân Tây Lan.

APPENDIX 8
AUSVEG Media Release

AUSVEG

Media Release

5 April 2012 **For immediate release**

Alternative weaponry in the fight against fruit fly

An upcoming educational road show will showcase alternative treatments for fruit fly - one of the most destructive and disruptive pests faced by the horticulture industry – to growers all over Australia.

Fruit fly costs Australian growers more than $100 million each year and affects approximately 250 fruits and vegetables.

“The purpose of these seminars is to better educate our nation’s growers about alternative fruit fly treatments so they can continue providing Australian families with high quality, nutritious produce,” said AUSVEG Communications Officer Hugh Gurney.

AUSVEG is the National Peak Industry Body for Australia’s 9,000 vegetable and potato growers.

Two of the traditional treatments for fruit fly, Dimethoate and Fenthion (D&F) may not be permitted for certain usages in the near future. The Agricultural Pesticides and Veterinary Medicines Authority (AVPMA) has restricted certain usages for Dimethoate and is reviewing Fenthion.

“These seminars, which will take place in key regions of the country, will educate growers on alternative treatments for fruit fly, namely fumigation, cold disinfestation, irradiation and a systems approach,” said Mr Gurney.

“Leading scientists and industry specialists will discuss the advantages and disadvantages of alternative treatments and growers will have an opportunity to speak directly with the presenters informally following the presentations,” said Mr Gurney.

As part of the seminars, findings on recent market research commissioned by AUSVEG will also be presented.

“The market research findings will highlight consumer attitudes towards the various alternative treatments. Armed with this knowledge, growers will be able to make informed decisions about the most appropriate method for them,” said Mr Gurney.

“We appreciate it is a busy time of year for growers, so we have scheduled the majority of the seminars for the evening, from 6pm to 9pm, which will include finger food and refreshments,” said Mr Gurney.

The road show will visit Western Australia, South Australia, Victoria and Northern Territory before visiting a number of areas in Queensland.

For more information on locations and dates, or to register for these seminars, please go to the events section of the AUSVEG website at www.ausveg.com.au/events/general.htm or contact AUSVEG on (03) 9822 0388.

This project has been funded by HAL using the National Vegetable Levy and matched funds from the Australian Government.

MEDIA CONTACT: Hugh Gurney – Communications Officer, AUSVEG
Phone: (03) 9822 0388, Mobile: 0410 047 432, Email: hugh.gurney@ausveg.com.au

APPENDIX 9
News coverage of Road Show

Sunraysia Daily (Mildura), Mildura VIC
27 Mar 2012

General News, page 8 - 296.89 cm²
Regional - circulation 7,496 (MTWTFS-)

ID 139314987 BRIEF AUSVEG INDEX 1.1

New ways to control wasps

Board looks for chemical alternatives

MURRAY Valley Citrus Board grower levies are funding a search for chemical alternatives to manage the incursion of citrus gall wasp (CGW) in the Sunraysia district.

CGW populations in Queensland and coastal NSW are kept below damaging levels by its natural enemies, in particular two parasitic wasp species.

The board funded the release of millions of these parasitic wasp species as a long term management option for CGW.

However, these natural enemies are at their early establishment stage and, while numbers are increasing, they are not high enough to effectively control sever infestations of CGW.

Currently, methidathion is the only chemical registered and it does not always provide satisfactory control of CGW.

Dr Jianhua Mo from NSW Department of Primary Industries is trialling alternative chemical options for citrus growers in the Murray Valley.

Confidor Guard, petroleum spray oil (PSO) and an unregistered product (Product X) are being tested.

Results from the 2010/11 trial have shown that a single application of Confidor Guard, applied as a soil drench in late October, reduced the number of large galls in May the following year by about 60 per cent.

Similar reductions were achieved by three applications of PSO.

However, Supracide and Product X failed to provide significant control of CGW.

Confidor Guard has a broad spectrum of activity, which makes it toxic to CGW parasites, so it is best used where the parasitic wasps are absent.

PSO only repels adults CGW from laying eggs in citrus shoots and has no direct adverse effects of parasitic wasps.

Product X has shown some efficacy against CGW in a separate trial.

Its unsatisfactory performance in this study may have been due to application timing.

To confirm the performance of the test chemicals, another trial has been started and data from this trial will be collected in May 2012.

Full results will be published when the trial is completed.

This project is funded by HAL using voluntary contributions from MVCB levies with matched funds from the Federal Government.

Fruit fly treatments under review

THE fruit fly treatments dimethoate and fenthion are currently under review by the Australian Pesticides and Beterinary Medicines Authority (APVMA) and it is anticipated that both chemicals with be banned for use in Australia.

AUSVEG will undertake a series of seminars as part of a road show to educate growers and suppliers on alternatives to dimethoate and fenthion, including methyl bromide fumigation, cold disinfestation, baiting and trapping, irradiation and a systems approach.

Leading scientists will discuss the advantages and disadvantages of these alternative treatments.

Following the presentations, growers will have the opportunity to speak directly with the presenters informally over complimentary refreshments and finger food.

The Mildura seminar will be held on Thursday, April 12, at the Mildura Grand Hotel from 6pm.

For more information and to RSVP phone AUSVEG on (03) 9822 0388.

Water trade suspended

NSW Water has announced the suspension of water allocation trade from the NSW Murray and Lower Darling Rivers into South Australia from April 1 to June 30, 2012.

Suspension of trade was necessary to minimise a reduction in water availability for NSW licensed general security water users in the coming 2012/13 season.

Victoria has also suspended trade from NSW to Victoria to protect next season's allocations to Victorian water entitlement holders.

News - Mail (Bundaberg), Bundaberg QLD
12 Apr 2012

General News, page 22 - 120.00 cm²
Regional - circulation 10,514 (MTWTFS-)

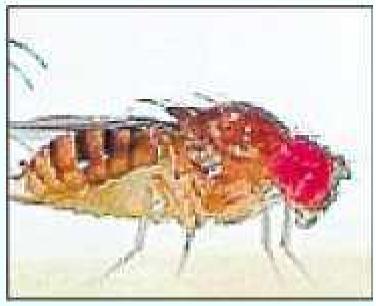
ID 141495291 BRIEF AUSVEG INDEX 1

Catch fruit fly treatment roadshow in Bundaberg

AN EDUCATIONAL roadshow will showcase alternative treatments for fruit fly, as traditional treatments dimethoate and fenthion may be placed on the banned or restricted list. The roadshow will come to Bundaberg and will be run by peak grower body Ausveg, which said fruit flys cost Australian growers more than $100 million each year and affected about 250 varieties of fruits and vegetables.

"The purpose of these seminars is to better educate our nation's growers about alternative fruit fly treatments so they can continue providing Australian families with high quality, nutritious produce," Ausveg communications officer Hugh Gurney said.

"The seminars ... will educate growers on alternative treatments for fruit fly, namely fumigation, cold disinfestation, irradiation and a systems approach. Leading scientists and industry specialists will discuss the advantages and disadvantages of alternative treatments and growers will have an opportunity to speak directly with the presenters informally, following the presentations."



Mr Gurney said as part of the seminars, findings on recent market research commissioned by Ausveg would also be presented.

"The market research findings will highlight consumer attitudes towards the various alternative treatments. Armed with this knowledge, growers will be able to make informed decisions about the most appropriate method for them."

The Bundaberg workshop will be held on April 26, 6-9pm at the Bundaberg Enterprise Centre.

For details phone Ausveg on (03) 9822 0388.


Catch fruit fly treatment roadshow in Bundaberg

Meeting hot over quotas

ATTEND AGROTREND FOR YOUR CHANCE TO WIN!

Fraser Coast Chronicle (Maryborough), Hervey Bay QLD
12 Apr 2012

General News, page 18 - 120.38 cm²
Regional - circulation 8,823 (MTWTFS-)

ID 141486859 BRIEF AUSVEG INDEX 1

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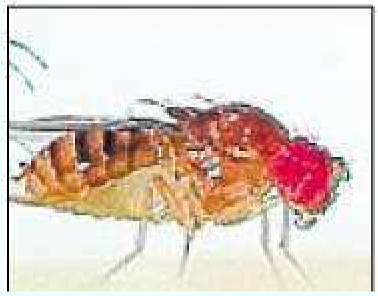

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"The market research findings will highlight consumer attitudes towards the various alternative treatments. Armed with this knowledge, growers will be able to make informed decisions about the most appropriate method for them."

The Bundaberg workshop will be held on April 26, 6-9pm at the Bundaberg Enterprise Centre.

For details phone Ausveg on (03) 9822 0388.

Media Monitors
STAY CONNECTED

Radio: 2NM, Muswellbrook hosted by Newsreader – 24 April 2012, 12:16PM

Southern Cross Rural News - ID: W00048414375

Dozens of Queensland fruit and vegetable producers looking to combat fruit fly have met in Brisbane. Hugh Gurney, AUSVEG, says the problem is costly and needs to be solved.

Interviewee: Hugh Gurney, AUSVEG

Audiences include 20 stations.

Issue No. 129 Mar/ Apr 2012

ASIAN and WORLD FOODS NEWSLETTER

Dimethoate and Fenthion Registration Review

The Australian Pesticide and Veterinary Medicines Authority (APVMA) is reviewing the registration of the insecticides dimethoate (contained in products such as Rogor™) and fenthion (contained in products such as Lebaycid™). New scientific studies provided to the APVMA's review suggested that children's exposure to dimethoate from residues in treated produce could be above the health standard. In August 2011 the APVMA published the residues report for dimethoate. Based on the findings in this report, the APVMA took regulatory action to suspend many uses of dimethoate.

Export market access for fruit fly host horticultural commodities (including tomatoes, capsicum, zucchinis) to New Zealand has been lost temporarily until research and negotiation on alternative quarantine treatments to replace dimethoate is completed.

It is highly likely that the APVMA will take regulatory action on fenthion in 2012. The extent of this future regulatory action is not known. The uses for fenthion are not as broad ranging as for dimethoate, but all near-harvest and post-harvest uses of fenthion in some crops may be restricted. However, further restrictions than this may be possible.

Producers that currently use fenthion for the in-field or quarantine control of fruit fly should consider what they need to do to implement alternative forms of fruit fly control.

Alternative methods to control fruit fly include:

- Chemicals - The APVMA has issued several new permits for chemicals to control fruit fly in certain crops. The APVMA's website has the most up-to-date details of these new permits:

(www.apvma.gov. au/products/review/current/dimethoate_alternatives.php)

- Irradiation - Irradiation is an approved post-harvest phytosanitary treatment for fruit fly. Irradiation of a commodity must be approved through the Food Standards Australia New Zealand (FSANZ) process before its use

- Systems approaches - Systems approaches integrate several types of fruit fly management (including at least two that work in different ways) to achieve the appropriate level of protection. Systems approaches recognise good agricultural practice as contributing to the phytosanitary status of a commodity for trade. Examples include the use of in-crop cover sprays coupled with post-harvest inspection or seasonal freedom from fruit fly coupled with in-field trapping.

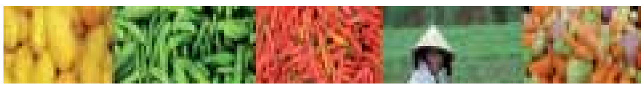
For further details:
http://www.dqmawg.org.au/go/dqmawg/issues-and-decisions/apvma-reviews-of-dimethoate-and-fenthion.

AUSVEG will be undertaking a series of seminars aimed at educating growers and suppliers on alternatives to fruit fly treatments Dimethoate and Fenthion (D&F). The roadshow comes in anticipation of a ban of the chemicals in Australia, following a review by the Australian Pesticides and Veterinary Medicines Authority (APVMA).

The road show will highlight alternative treatments available to industry, such methyl bromide fumigation, cold disinfestation, baiting and trapping, irradiation and a systems approach. Leading scientists will discuss the advantages and disadvantages of these alternatives.

Findings of recent market research undertaken by AUSVEG will also be presented. These findings reveal consumer attitudes towards the various D&F alternatives, and will enable growers to make informed decisions about available fruit fly treatments.

The event will also provide opportunities for growers to speak directly with researchers over complimentary refreshments and finger food. For information on venues, dates and registration please visit http://ausveg.com.au/events/general.htm



Pomegranate; commercial and economic aspects for Australia

Pomegranate (*Punica granatum*) has been cultivated in the Middle-East since ancient times. Historical evidence has revealed that its primary site of cultivation was in

Iran - the largest pomegranate producer in the world.

Popular as a fresh and processed fruit, studies have shown that the pomegranate contains bioactive phytochemicals that can be useful in combatting serious diseases such as high blood pressure, diabetes, and cancers. Consumer awareness of these findings has increased recently, leading to increased pomegranate consumption and cultivation throughout the world. It is predicted that over the next few years, pomegranate consumption will continue to rise.

Over 90 per cent of pomegranate production occurs in the northern hemisphere in Iran, India and the USA. In recent years, due to its nutritional and pharmaceutical value, pomegranate cultivation has grown in other parts of the world, including Chile, Argentina, South Africa and Australia in the southern hemisphere.

The pomegranate has shown adaptability to a wide range of soils and climatic conditions. It bears fruit sooner than most other fruit crops, and can produce between 25-30t/ha from the third year of production. With yields of 50t/ha in later years, pomegranate produces higher returns for farmers and industries than many other fruit crops.

Pomegranates are also frequently processed to make juice, seed oil, herbal tea, dietary supplements, cosmeceutical and pharmaceutical products. Based on our suitable climatic conditions and soil types, as well as our worldwide reputation as a high quality food producer, Australia is well positioned to become a leading producer in the southern hemisphere.

In order to extend pomegranate cultivation in Australia, researchers have accessed several pomegranate varieties with unique and desirable characteristics from Iran. Those varieties are being assessed for performance and suitability at a number of experimental sites in New South Wales, Victoria and South Australia.

Currently pomegranate fresh fruits and beverages have a high demand around the world. However, there is a huge potential for bioactive compounds in pomegranate fruit, aril, peel and seed to be used in functional food, cosmeceutical, nutraceutical, and phytoceutical industries.

For further information: Dr Mohammad E. Hassani, **University of Sydney NSW Australia**, mohammad.hassani@sydney.edu.au

Scoping Study for Development of Cultural, African Produce in Australia.

A scoping study being conducted by the Victorian Department of Primary Industries (DPI) is assessing potential opportunities for the access, production and marketing of traditional African food products. The study is jointly funded by RIRDC and Vic DPI.

The study comes as a result of being approached by representatives of the African community to consider how access to their traditional cultural foods can be improved. People of African heritage living in Australia face challenges every day in accessing their customary food commodities, with only limited availability of locally grown products or high priced imports available for a number of their staple foods.

The scoping will evaluate potential crops, opportunities for production, determine the priorities and potential market opportunities as a basis for the development of a larger project.

The study will also identify priority crops for industry, and associated agronomic needs.

For further information: Harold Adem harold.adem@dpi.vic.gov.au

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Email: joslyn.vandermoolen@rirdc.gov.au

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Australian Government
Rural Industries Research and Development Corporation