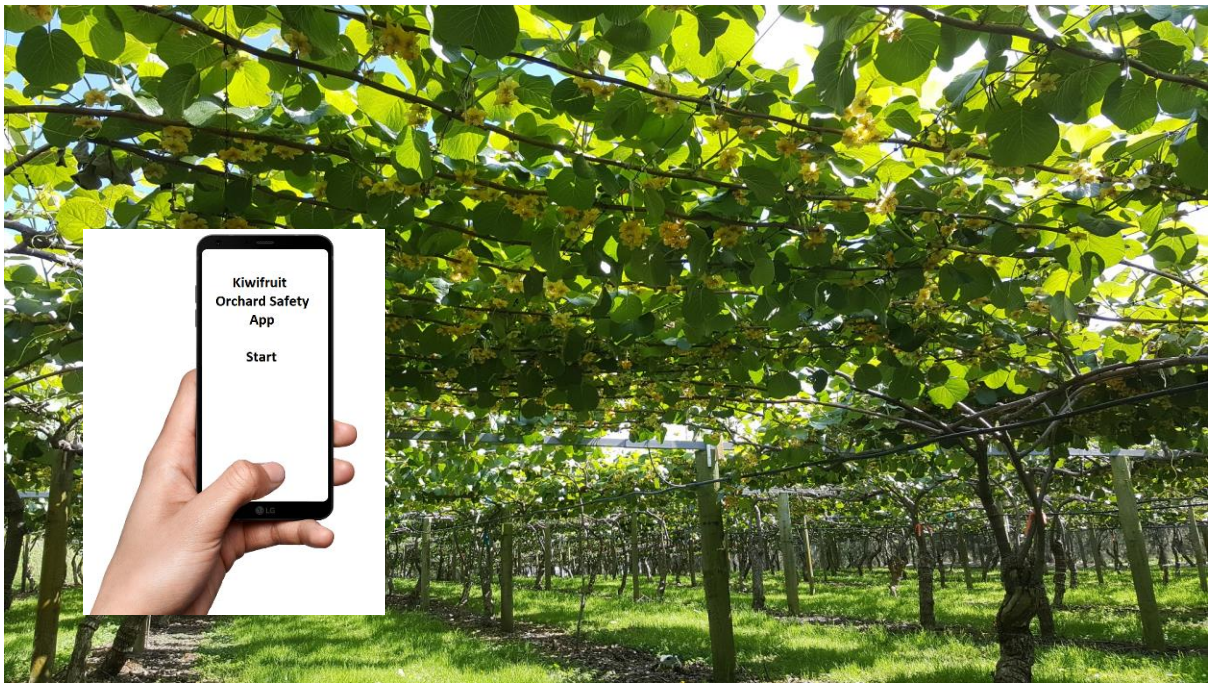
KELLOGG
Rural Leadership
PROGRAMME



Can we improve health and safety on kiwifruit orchards using software solutions?

Brad Stevens

Kellogg Rural Leadership Programme

Course 36, 2017

Table of Contents

Executive Summary

Following the introduction of the Health and Safety at Work Act 2015 (HSWA) and a fatality on a kiwifruit orchard in 2016, the New Zealand Kiwifruit industry has begun a journey on improving health and safety practices on orchard. There has recently been a proliferation of software solutions to support on-orchard health and safety. This study aims to investigate the opportunities for using software solutions on kiwifruit orchards to improve health and safety.

A literature review exploring the diffusion of innovations theory and safety culture was completed. Fifteen stakeholders from the kiwifruit industry were interviewed covering growers, contractors and packhouses to investigate the current state of health and safety in the industry and explore the industries appetite for adoption of software solutions to support health and safety. The questions investigated what was important in health and safety solutions and how software solutions were beneficial over paper systems as well as the perceived barriers to adoption.

It was found that there is an opportunity to improve health and safety on New Zealand kiwifruit orchards using software solutions. For these solutions to be adopted and the improvements realised several factors addressing culture, awareness and the solutions themselves must be considered.

This report makes five recommendations:

1. Develop case studies of short listed software solutions to increase awareness
2. Commission a specific kiwifruit industry health and safety culture campaign
3. Explore best of breed software solutions for all aspects of health and safety on orchards
4. Investigate the development of a common data sharing platform for health and safety information
5. Investigate opportunities to facilitate the enforcement of improved health and safety practices without fear of commercial implications

Acknowledgements

I wish to thank the Kellogg Programme Investing Partners for the support provided to putting on the programme:

STRATEGIC PARTNERS

PROGRAMME PARTNERS

I wish to acknowledge and thank the following people and organisations for their contribution or support for this project

Thank you to my employer Eurofins Bay of Plenty for supporting me in attending the Kellogg Rural Leadership programme.

Thank you to my family and especially my partner Caroline who saw a lot less of me whilst I attended the programme and completed this project.

Thank you to all the growers and contractors that were open with responses to my interview questions allowing me to form a data set that is representative of the industry in response to this topic.

Thank you to all those involved in running the Kellogg programme, it has been rewarding to be part of such a well-run and respected programme.

Author contact information:

Brad Stevens

Phone: +64 27 272 3425

Email: mailbradnow@gmail.com

Introduction

The New Zealand health and safety landscape has seen some significant changes following the Pike River Coal Mine Tragedy with the introduction of the Health and Safety at Work Act 2015 (HSWA). It has been recognised that New Zealand has a poor health and safety record compared with other advanced countries and the Government has set a goal to reduce serious injuries by at least 25% from the baseline by 2020 (WorkSafe, 2017).

Health and Safety is gaining an ever-increasing focus throughout work places from board rooms, CEOs and Directors through to every member of staff. There appears to be a wide range of philosophies ranging from those who are oblivious to their responsibilities to those who not only recognise responsibilities, but also believe that good health and safety practices are more productive and ultimately recognise its about staff returning home safe from work.

Health and Safety in the Agriculture sector of which Horticulture and therefore Kiwifruit is classified under has more workplace fatalities than any other sector with 119 deaths between 2011 and 2017 Year to date, of note is 34 quad bike fatalities within Agriculture over the same period (WorkSafe, 2017b).

Following the introduction of the HSWA and a fatality on a kiwifruit orchard in 2016, the New Zealand Kiwifruit industry has begun a journey on improving health and safety practices on orchard. To date this has resulted in some positive outcomes for orchard worker safety, but there appears to be significant disparity between those managing health and safety well and those who are not. Eurofins sought a list of risks from all New Zealand kiwifruit orchards prior to the 2017 harvest but on completion of harvest 45% of orchards had not provided this. As an industry with some 2,600 growers (NZKGI) there is a significant challenge to reach out to them and the associated businesses and people and lift the bar on health and safety practices. The industry is at early stages of understanding responsibilities, educating and adopting centralised systems to facilitate good health and safety practices.

The Government through WorkSafe have made available many resources to assist businesses to understand their responsibilities, and more importantly to allow them to implement safe systems of work. NZKGI, Zespri and other industry businesses have begun engaging experts to assist the kiwifruit industry to progress. There are many private companies making health and safety their business to assist businesses with adopting safe systems of work. These range from consultants to software companies with tools to facilitate the management of health and safety

New Zealand Kiwifruit growers through their marketing company Zespri have a goal to double global sales to $4.5 billion by 2025. (Zespri, 2017). People will play a key part in Zespris goal, as an industry it is critical that its workers can carry out orchard activities in a safe manner to achieve this.

New Zealand Kiwifruit Growers Incorporated (NZKGI) have recently commissioned Becca to research the various health and safety software solutions that are available and assess their suitability for the kiwifruit industry. This research will result in documenting the pros and cons of the software evaluated and explore the feasibility of an industry wide solution.

This report investigates the opportunities available to the kiwifruit industry to improve health and safety on kiwifruit orchards through the use software solutions.

Aims and objectives

The aim of this research is to identify what opportunities there are to improve health and safety on kiwifruit orchards using software solutions.

It is expected that this research will identify a number of recommendations on steps that the kiwifruit industry can take to improve health and safety on orchards using software solutions through the following objectives:

- Understand industry **perceptions** of on-orchard health and safety
- Understand how on-orchard safety is managed now and how software could improve this
- Understand the barriers to **adoption** of software solutions including **culture** and **awareness**
- Understand what growers want from health and safety solutions
- Identify the best pathways to encourage the use of software for the management of on-orchard health and safety

From this research, I hope to be able to offer the kiwifruit industry some insights into key points that it needs to consider to utilise software solutions for improved on-orchard health and safety. It is critical that the industries health and safety practices continue to evolve to keep staff safe on orchards and support the industries ongoing profitability and growth.

Literature review

As this project is based around the use of software solutions and a critical element relies on kiwifruit growers' and the wider industries' adoption of these, it is useful to explore the diffusion of innovations theory.

The diffusion of innovations theory

This is a very popular research topic that stems from the fact that It is a common problem for many individuals and organisations as to how to speed up the rate of diffusion of innovation. Rogers, E.M. (1983).

Rogers, E.M. (1983) describes four main elements in the diffusion of innovations as:

1. The innovation – an idea, practice or object perceived as new
2. Communication channels – how messages get from one individual to another
3. Time – the diffusion of an innovation takes place over a period
4. The social system – a group of people engaged in a common goal

He explains that there are five steps in the innovation decision process

1. Knowledge – where the individual is exposed to the innovations existence
2. Persuasion – where the individual forms a positive or negative view of the innovation
3. Decision – where the individual makes a choice to adopt or reject an innovation
4. Implementation – where the individual puts the innovation to use
5. Confirmation – where the individual seeks to confirm they have made the right decision but may revert if this fails.

The decision stage is a critical cross road at which point the individual decides to adopt or reject and not adopt the innovation.

He explains diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system. He then explains that innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption.

Rogers (1983) then goes on to categorize adopters based on their innovativeness:

1. Innovators (Venturesome)

This group is eager to try new ideas and they will often seek these outsides of their networks and or form innovation groups. Innovators generally are financially able to absorb losses in the event of failure and will generally be able to apply technical ability to understand. Innovators play a key role in introducing new innovations acting as a gate keeper.

2. Early Adopters (Respectable)

This group are often seen as leaders, role models and are respected in their social group with potential adopters seeking advice and information from them. This group is often seen as the group most likely to speed up the change process. The role of the early adopter is to decrease uncertainty about a new idea and convey an evaluation to their peers.

3. Early Majority (Deliberate)

This group adopt ideas just before the average member of the social group. They frequently interact with their peers but are not usually seen as leaders, they provide interconnectedness. The early majority may take some time before adopting an idea, they don't want to be the first or the last.

4. Late Majority (Sceptical)

This group adopt ideas just after the average member of a social group. It may be a financial necessity and the answer to increasing network pressures. This group is generally sceptical and wait until most of their social group have already adopted. They need convincing, pressure of peers is likely to motivate and due to scarce resources wait until most of the uncertainty is removed before they feel it is safe to adopt.

5. Laggards (Traditional)

The last group to adopt an innovation, the generally possess no opinion or leadership. This group often make decisions based on what previous generations have done. By the time that they adopt an innovation it may have already been superseded. Generally, this group is suspicious lagging behind in awareness and knowledge. Laggards resources are often limited and forces them to be cautious. Laggard is often thought of as a negative term as most non-laggards have a pro innovation bias.

The distribution of adopter classification has been demonstrated to closely approach normality, it is of note that the classification is not symmetrical with three categories to the left of the mean and only two to the right.

The following clearly shows the normal frequency distribution divided into the five adoption categories and the approximate percentage of each of the groups.

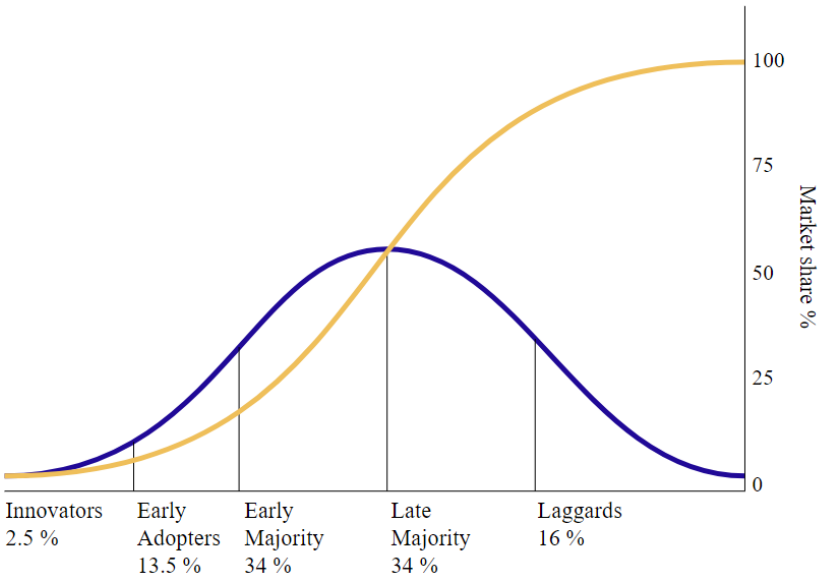


Figure 1: Adopter categorisation on the basis of innovativeness Rogers, EM (1983)

Hoffmann, V (2011) also explains that in addition to the S-shaped curve above, there is also a J-shaped curve where adoption is particularly hesitant initially and then accelerates only in the final phase.

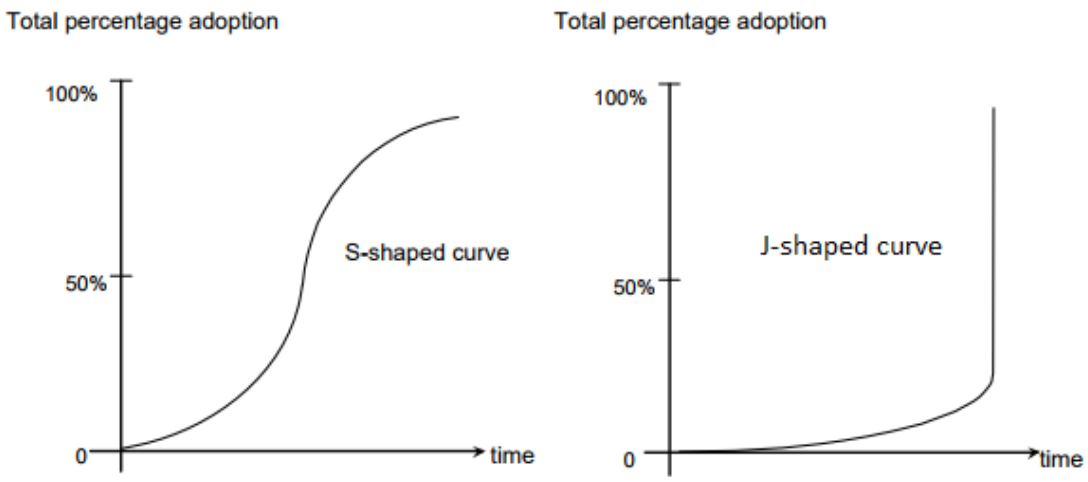


Figure 2: Two different curves of diffusion Hoffmann, V (2011)

Hoffmann describes the diffusion process as four phases

1. The innovator as “trouble maker”

In response to a problem, the innovator seeks a solution and runs the risk that they will give an innovation a go. This will have an unsettling effect creating tension leaving others questioning existing methods but often rejecting the innovation. The innovator continues to seek acceptance outside the normal group.

2. The critical phase (end or turning point)

Not all react negatively, some see themselves in a similar position to the innovator. Some identify with the innovator showing an interest and seek information. If the innovation proves successful to the innovator the risk is diminished and others will begin to try. Usually among the early adopters are influential people who can influence other groups. The innovation starts to become attractive and a critical crossroads decides if it will take off.

3. Transition to the self-sustaining process

The innovation starts to become the new norm for the future, rather than being negative it starts to be positive.

4. Final phase of the wave

Now being the new norm, we would expect accelerated diffusion, but we see adoption slow. This suggests that the innovation is not equally appropriate and advantageous for all concerned.

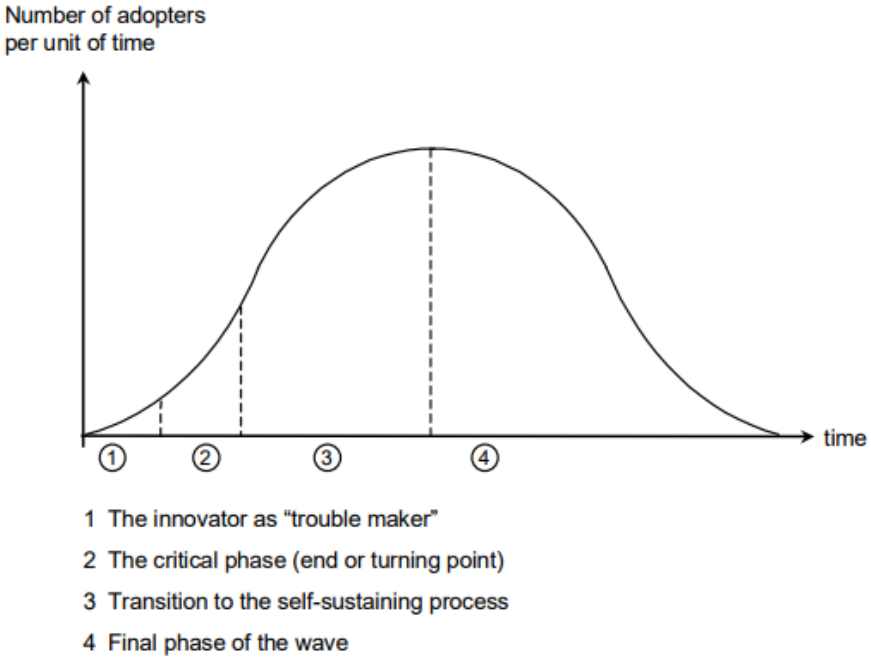


Figure 3: Phases in the diffusion process Hoffmann, V (2011)

Hoffmann, V (2011) explains that there are five variables that affect the rate of an innovations' adoption as shown in figure 4 below. He suggests that most past research has focused on the five perceived attributes of innovation.

1. Relative advantage

The degree to which an innovation is perceived to be better than what it supersedes.

2. Compatibility

The degree to which an innovation is perceived to be consistent with the existing values, past experiences and needs of potential adopters. High compatibility of an innovation is positively related to its adoption.

3. Complexity

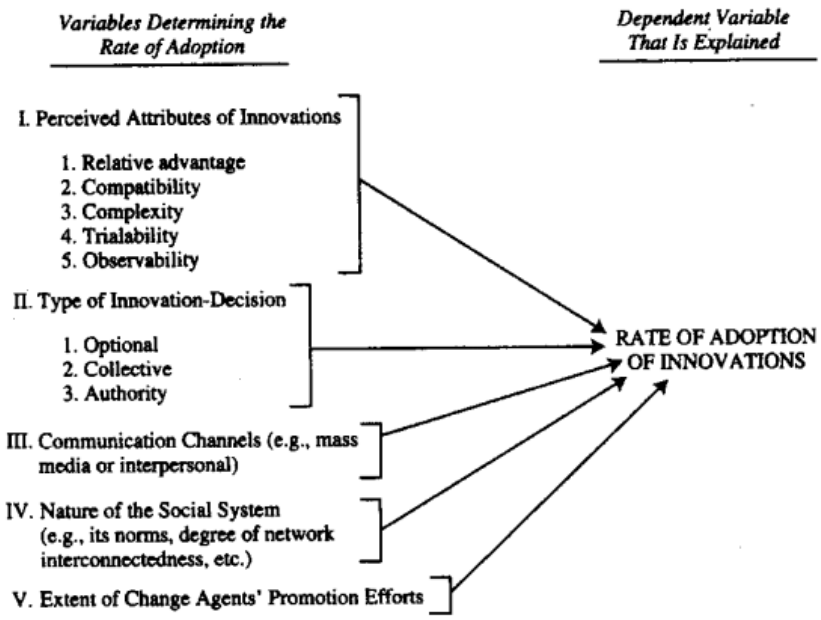
The degree to which an innovation is perceived as difficult to understand or use. High complexity will slow adoption.

4. Trialability

The degree to which an innovation can be experimented with on a limited basis. Trialability is positively related to its rate of adoption.

5. Observability

The degree to which the results of an innovation are visible to others. High observability is positively related to its rate of adoption.



The five types of variables that determine an innovation's rate of adoption have not received equal attention from diffusion scholars. The five perceived attributes of innovations have been most extensively investigated and have been found to explain about half of the variance in innovations' rates of adoption.

Figure 4: Variables determining the rate of adoption of innovations page 43 Hoffmann, V (2011)

Hoffmann, V (2011) also explains the role of change agents whose role is to influences clients' innovation decisions in a direction deemed desirable by a change agency.

Dans, E (2016) wrote a short article using Airbnb as a case study in the diffusion of innovations. In this article he explained the process by which people first hear about the service, check it out, look for recommendations, and then use it, is fast: each person that uses Airbnb tells a bunch of other people via the social networks, and so on. These are exactly the phases described by Rogers: knowledge, persuasion, decision, implementation and confirmation.

Hoffmann, V (2011) explains that farmers and researchers can collaborate over a period to result in improved outcomes. The farmers lifelong knowledge can be incorporated into formal research programmes for mutual benefit.

Safety Culture

A positive health and safety culture must go hand and hand with any software solution for it to be successful in improving health and safety.

Culture can be defined as having shared beliefs and values about what is normal, having common characteristics, practices and activities that shape and enforce actions. Nielsen (2015)

Schwartau (2012) described a safety culture as when safety is always in the back of your mind and at the front of your actions. A culture of safety has you and every employee always watching for little things that may be hazardous to yourself or someone else who comes around the workplace and may not be as familiar with the day-to-day hazards of working on and around a farm. Schwartau explains that safety culture must be lead by example and regular reinforcement.

Khan, Muhammad & Chairman. (2013) gives three stages in the development of a good safety culture.

1. Reactive: workers react to safety incidents, instead of thinking about how to prevent these.
2. Independent: once people view safety as having primary importance, then they practice safety because they want to do it, not because they are being told to do it.
3. Interdependent: every employee is looking out for others so it is the "brother's keeper" mentality.

Worksafe (2013) state that culture is key to improving health and safety in your organisation. A cultural approach doesn't replace other approaches, but underpins them and makes them more successful.

MESNZ (2017) state that staff culture is the biggest hurdle in health and safety. In an online study of 5000 industry staff, found the major issues expressed in managing and staying compliant were overwhelmingly related to staff culture. Negative older staff, lack of buy-in and "she'll be right" attitude featured at the top of the responses, followed closely by confusion about the rules and regulations.

Forté management (n.d.). state that whilst organisational culture is variable between companies, national culture is a common factor that leads to different attitudes towards risk taking, adherence to rules and procedures and the importance of safety.

They found people from different nations perceive personal risk and safety and their relationship to it differently in distinct, significant and predictable ways.

National culture is critical to filtering the messages received and their research suggests that New Zealands National culture is quite unusual and that there are a number of attributes of "Kiwis" culture that should be considered when thinking about a safety culture:

- Kiwis have a mateship culture where looking out for others is more likely to appeal than looking out for oneself
- Kiwis are comfortable with uncertainty and are generally happy to "give it a go" with little consideration of their personal risk
- Kiwis have a moderately low power distance index (PDI), this means that a high level of participation rather than direct messaging is more likely to be effective.
- Kiwis have a high level of self-reliance
- DIY is a risk factor for Kiwis, made do, give it a go and she'll be right are all likely to be a contributor to work place accidents.

In addition, Forté management suggest that people from low socioeconomic groups are likely to rely more upon instructions from superiors and feel that those superiors will ensure their safety and if something goes wrong it was unavoidable.

Forté management state that creating an umbrella "culture of safety" in the workplace has a much higher chance of success, i.e. safe practices are "how we do things around here!"

A Worksafe case study of Landcorp supports further the concept of "Mateship" and participation. Worksafe (2017c) describes the trigger for improving health and safety in this case to be the loss of a life and an outcome being the involvement of workers to seek a solution that would improve the working conditions and work life balance and ultimately improved health and safety. It is of note that this case study also identifies improved productivity as another outcome.

Twose (2016) interviewed Terry Johnson, a director of health and safety services for Simpson Grierson. Johnson stated, "My belief is there is no such thing as a health and safety culture, it's just the culture in your organisation," says Johnson. "You'll never have poor engagement or poor working relationships with your people and have a great health and safety performance - they don't match

up." This suggests that it is not health and safety culture, but more blanket culture that is critical to facilitate good health and safety.

Given that culture appears to be a key factor in improving work place health and safety it is useful to explore further some of the key points to consider when setting out to improve culture.

Martin Jenkins (2013 in their analysis of workplace health and safety culture change identified the following key points:

1. Clearly describe what good and poor workplace health and safety “looks like”
2. Invest in the strategic design of an overall programme to shift workplace health and safety outcomes
    a. Sequence and order to have the greatest impact
    b. Align incentives and support the desired behaviour
    c. Ensure the appropriate roles and responsibilities of key players
3. Work with media and advocates to change the terms of the debate
4. Coordinate and provide focus to wider community of action
5. Give people positive reasons to change (beyond compliance) using positive outcomes and not just shock messaging
6. Make good health and safety practice an attractive investment for businesses – break the perception of health and safety being negative towards productivity and profit.
7. Actively monitor and evaluate progress to inform the development of the programme and the culture change campaign – allows refinement and development over time.

Tradestaff (2017) from their research state that safety culture comes down to three key ideas:

1. Understanding – Unless the rules are understood and why they are important you cannot build a culture around following those rules.
2. Communication - Effective communication is crucial to engaging your workers in health and safety.
3. Leadership – They state that according to the WorkSafe report, it's often the boss who sets the tone of the workplace, meaning it's up to you to show that safety is important. ACC agrees, saying "Senior management must lead any effort to build a safety culture. If safety is not important to them, it won't be important to anyone."

There are numerous case studies available that tell the story of how companies have identified areas where health and safety need to be improved and made changes that have lead to change. An example of this is Blakely Pacific, Taylor, P (2016) explains that Blakely Pacific identified safety not always being considered and complacency creeping in. They began using a safety culture tree that involved employees rating safety on 12 critical areas and then working with experts to help the staff to work on improving these. The participation and the outcomes from the process have led to a clear improvement in attitudes towards safety.

Nielsen. (2015). Produced an excellent report on the health and safety attitudes and behaviours in the New Zealand workforce. This report covered a number of sectors, but focused its qualitative research on the agricultural sector. There does not appear to be a lot of research on health and safety specifically in the kiwifruit industry, the same is generally true for horticulture and most of the work is drawn from agriculture i.e. farming and applied. There is a lot of common ground between horticulture and farming and often people are both farmers and horticulturalists, it is therefore useful to explore the findings of this report to draw conclusions on how this may apply to kiwifruit orchards.

A summary of this report, with a focus on agriculture is provided below:

1. Workplace health and safety in context

Driven by pride; masculine and hierarchical; under pressure; and increasingly diverse, independent and isolated. Health and Safety is considered important but something that can get in the way of day-to-day farming. Unpredictability of agricultural work may foster a view that things are inevitable.

2. Knowledge and understanding

Attitudes and perception to risk is fluid and subjective. There can be a tendency to become complacent where a task is habitual, people are under pressure or where people become over confident. Understanding of rules and regulations is patchy.

3. Segmentation

Nielsen developed a qualitative segmentation according to attitudes and behaviour and determined 5 typologies:

1. Proactive Guardians – driven by the need to protect. They actively embrace Health and Safety and it is as important as profit. These people see its role and value in the workplace and how it contributes positively to the business. Health and Safety makes good business sense.
2. Pick and Mix Pragmatists – driven by self –reliance and self-confidence. They trust their own intuition and experience above all and take calculated risks. They value Health and Safety, but they only adhere to it when they want to and feel that if they apply common sense then Health and Safety will be taken care of. They are likely to feel that some of the rules go too far.
3. Tick the Box Immunity – driven by fear of prosecution or censure. They want to cover their tracks. They adhere to Health and Safety rules but there is no positive emotional engagement. They think only about themselves rather than the welfare of others.
4. Resisting – driven by the need for freedom. They are libertarians with a streak of anti-authority. They reject Health and Safety and they talk of the nanny/police state. For them, Health and Safety is a hindrance rather than a help. They are essentially fatalistic.
5. Hidden – driven by ignorance. They mostly are unaware of Health and Safety rules. Mostly they are young, inexperienced workers and migrants with limited or no English, typically from South-East Asia, China, South America, India and the Middle East. These people are very vulnerable.

These typologies are represented in figure 5 and further represented at a sector level in figure 6 below. In the case of agriculture, this sector can predominately be placed in Pick and Mix Pragmatists and Resisting typologies. The prevailing view that common sense is all means that farmers and farm-workers are largely a pragmatic bunch, using their own judgment to assess the need for Health and Safety in situations. The isolated nature of much of farming (no-one can see mentality), coupled with a strong streak of individualism and libertarianism means that there is a marked representation in the Resister segment.

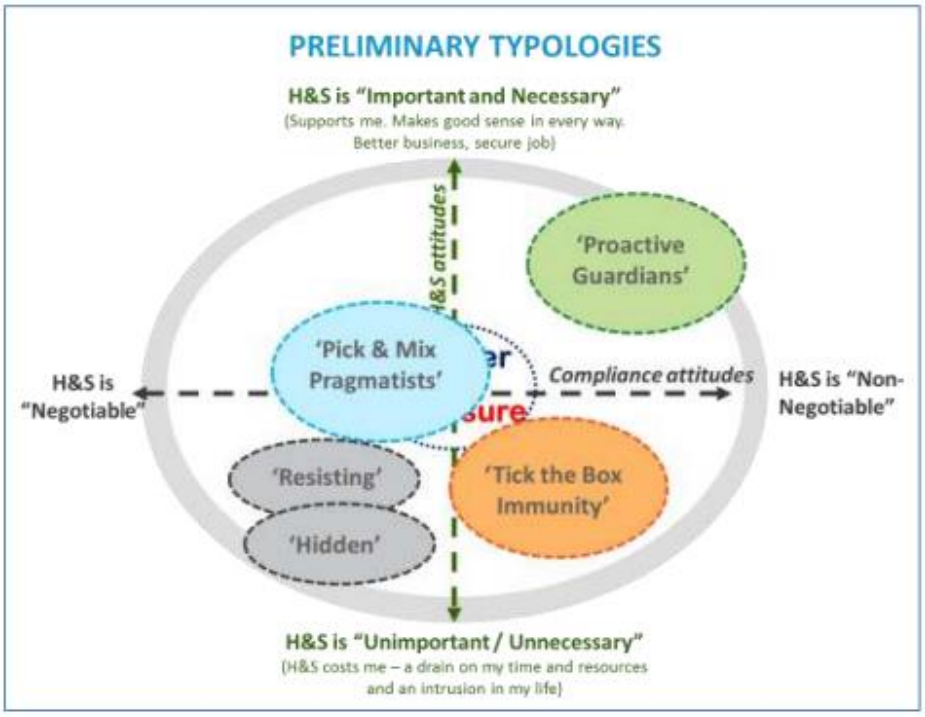


Figure 5: Health and safety typologies according to attitudes and behaviour Nielsen. (2015).

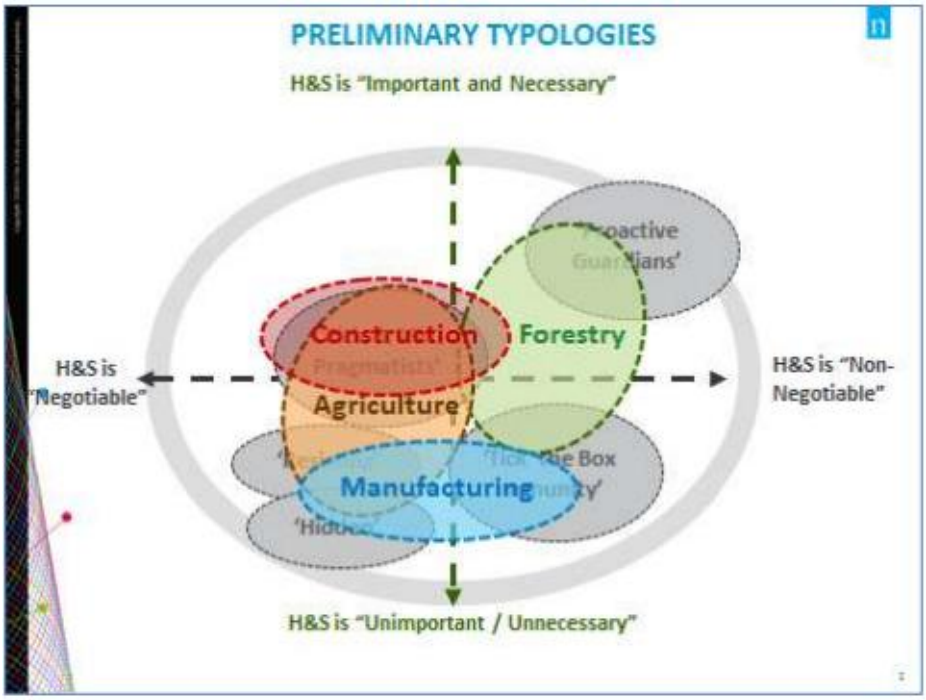


Figure 6: Sector Health and safety typologies according to attitudes and behaviour Nielsen. (2015).

4. Communications

Nielsen found significant sector differences but found several common themes:

- Visual and face to face more effective
- The use of technology is becoming more common and should be considered
- Authentic work stories are a main learning tool
- Workers pay attention to experienced "wise men" in their sector

- Entertainment or emotive material will be more effective
- A focus on the positive
- Challenge complacency
- Freedom to do what I love

5. Perceptions of Worksafe NZ

Awareness of Worksafe NZ was poor. There was a view that Worksafe should be a trusted expert advisor rather than the policeman.

Methodology

Initially it was envisaged that this project would be much broader investigating all aspects of on orchard health and safety, for this reason much of the initial literature review was looking at health and safety in the wider context.

After some time, it became clear that the project needed to be more focused, this lead to the project being focused on the use of software solutions to improve kiwifruit on-orchard health and safety.

The literature review then became focused on the extensive work of Rogers on the diffusion of innovations theory as well as exploring the effect of safety culture.

A series of interview questions were formed that were aimed at understanding perceptions of the current state of health and safety on kiwifruit orchards and the industries appetite for the adoption of software solutions to support improved on-orchard health and safety. The intention was not to identify a single software solution for industry use, but more to understand how health and safety is managed now and how software could help improve this. The questions also explored what growers felt was important in a health and safety solution, including exploring the perceived benefits of a software solution over paper based systems and the barriers to adoption.

Interviewees were selected from the researchers own industry networks with some additional assistance from Nikki Johnson, CEO of NZKGI. In total 15 people were interviewed, this represented a large cross section of industry that operate on orchard including 14 growers, 8 contractors and 9 involved with packhouses; several of the interviewee's operated across all 3 of these groups. 14 of the interviewees operated across multiple orchards and 5 were already using a software solution to manage on-orchard health and safety to various extents in their business.

Interviewees were given a brief introduction to the project and interviewed either by phone (6) or in person (8), one was done via email due to the interviewees time restrictions. On average interviews took approximately 1 hour. Results were summarised into a table and from this the high-level trends were identified and summarised.

No.	Owner / Grower?	Contractor?	Packhouse?	Existing App / Software?	Work across multiple orchards?	Young (<40)	Interview In Person?
1	Y	Y		Y	Y	Y	Y
2	Y	Y			Y		Y
3		Y	Y		Y	Y	Y
4	Y		Y		Y		Y
5	Y			Y	Y		
6	Y	Y			Y		
7	Y		Y	Y	Y		
8	Y						
9	Y				Y	Y	
10	Y		Y		Y	Y	Y
11	Y		Y		Y	Y	Y
12	Y	Y	Y		Y		Y
13	Y	Y	Y		Y		
14	Y	Y	Y	Y	Y		Y
15	Y	Y	Y	Y	Y	Y	N
Totals	**14**	**8**	**9**	**5**	**14**	**6**	**8**
%	**93%**	**53%**	**60%**	**33%**	**93%**	**40%**	**53%**

Figure 7: Interviewee backgrounds and attributes

Analysis and results

On completion of interview questions all results were summarised into an Excel sheet and the common themes identified from responses, these are summarised below.

Orchard / Business Overview

1. *How would you describe health and safety for your orchard / business? (set the scene – relativity)*

This was deliberately a very broad and open question to allow a high-level understanding of the interviewees perception and approach to health and safety. There were three key themes that came through, the priority of these varied greatly between responses. Keeping people safe was a key priority, identifying and mitigating risks and finally compliance. It appears that people generally grapple with which is more important to them, the fundamental keeping people safe or meeting compliance requirements to ensure that they are protected should an incident occur.

2. *What do you perceive the biggest health and safety risks are for your orchard / business? (perception)*

Overwhelmingly, machinery was identified as the number one risk by 12 of 15 responses. Rabbit holes, wires, people and chemicals were identified by several responses. In general interviewees felt that the orchard environment was low risk. There appeared to be a higher perception of risk at harvest time albeit there were also several comments that postharvest operations had some good systems in place.

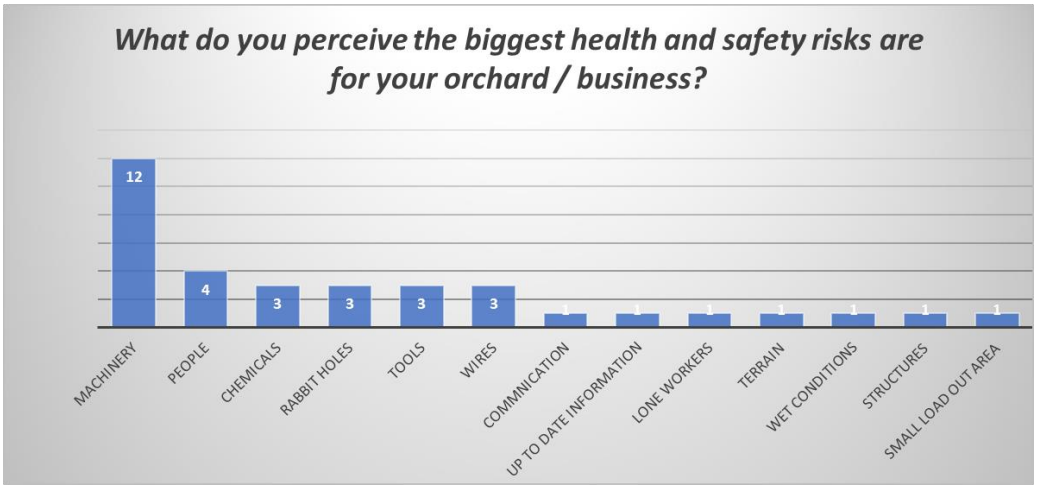


Figure 8: What do you perceive the biggest health and safety risks are for your orchard / business?

3. *What are the biggest problems for you managing on orchard H&S and why?*

There were a wide range of perspectives with the most common themes being buy in and time to implement and administer. Many contractors and Packhouse operators felt that it was difficult to get growers to buy into improved health and safety suggestions due to the competitive nature of their business and a fear that growers may change providers if something was pushed on them. There was a concern that many people were not taking health and safety seriously and that ensuring that processes were followed was a challenge.

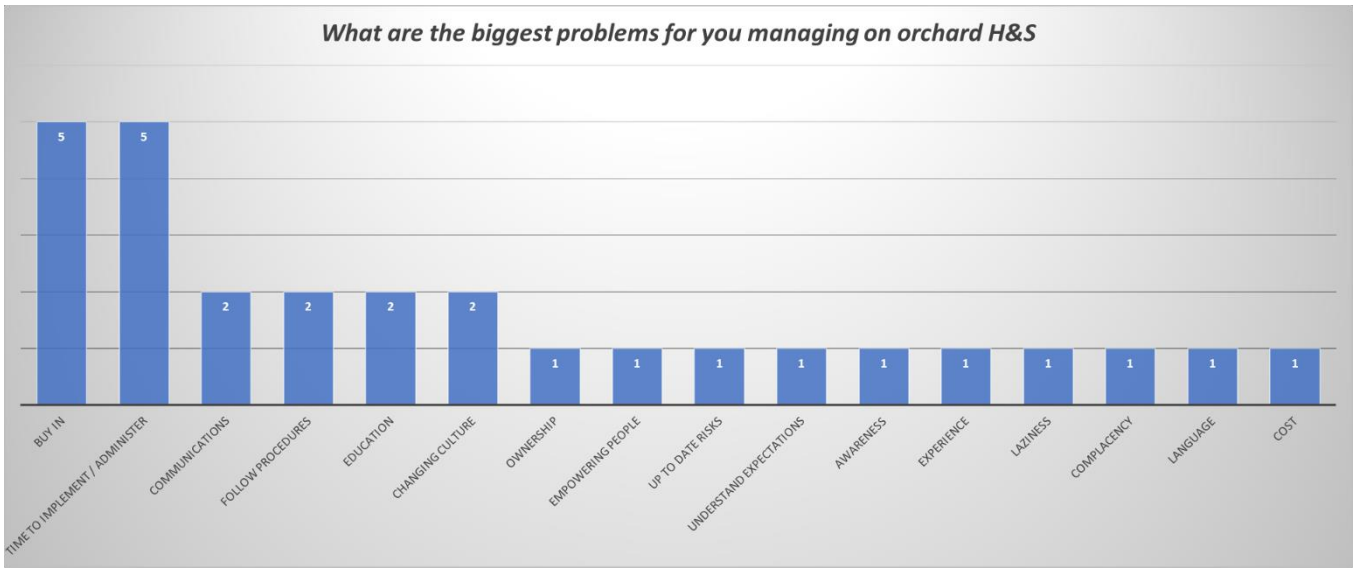


Figure 9: What are the biggest problems for you managing on orchard H&S

4. *If we classify adoption into groups from innovator, early adopters, early majority, late majority through to laggards, how would you describe your orchard / business and why?*

This question was to understand the make-up of the interviewees to see if there was any difference between the views of the different adoption groups. Most interviewees classified themselves being innovators or being early adopters (67%). When asked why they classify themselves into these categories early adopters and innovators gave reasons such as “Always strive to be at the front”, “proactive” and “Don’t hesitate to give it a go”.

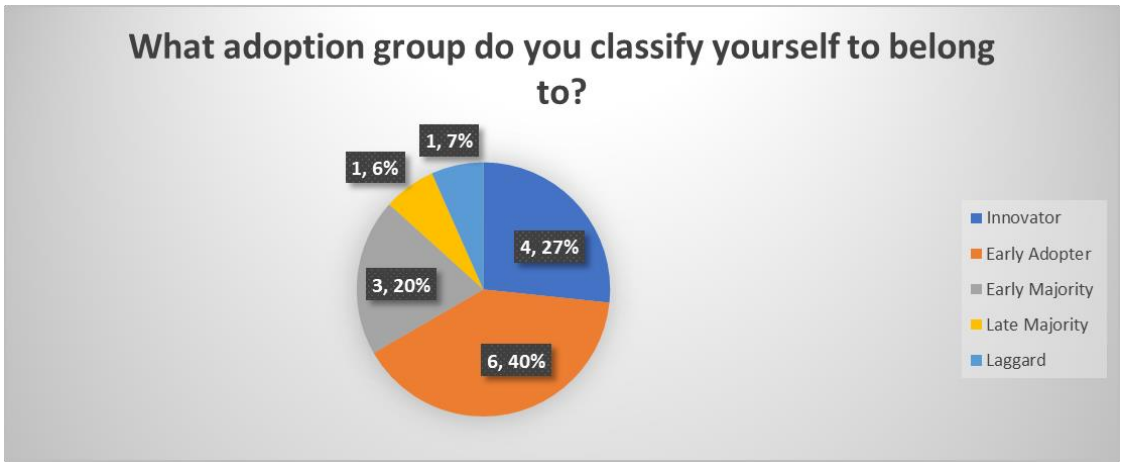


Figure 10: What adoption group do you classify yourself to belong to?

5. *When thinking specifically about on orchard, on a scale of 1-10 how would you rate health and safety for your orchard / business? Why?*

Responses ranged from 4-9 with an average rating of 7. Without exception all responses acknowledged that they still had some work to do. Most Interviewees felt that they were making a genuine effort and that health and safety had become more of a priority recently.

6. *When thinking specifically about on orchard, on a scale of 1-10 how would you rate health and safety for the kiwifruit industry (specifically on orchard)? Why?*

Responses ranged from 1-7 with an average rating of 5. All Interviewees identified themselves as having better health and safety systems in their own orchard / business than that of the general industry. Some common themes were that "growers have not got to grips with this yet" and that the industry has seen some recent improvements. There is also a view that growers are too reliant on post-harvest and that we have some challenges with the older generation of kiwifruit growers breaking away from the "She'll be right" mentality.

Technology Solutions

7. *Is your health and safety system paper based or electronic? What is the primary reason for this?*

10/15 responses did not use electronic systems at all for managing their health and safety. Those that did use electronic systems only used them for components of their system and were supplemented by paper, there was also a view that paper would always remain in some form. Many responses stated that the main reason for lack of adoption was that they had not found a suitable system or a lack of awareness of the software solutions available.

8. *Do you think growers / contractors are aware of the electronic solutions available? What is the best way to make growers aware of these?*

10/15 responses said they felt that growers were not aware of the software solutions available, there was no clear link between those that already had software solutions and awareness. There was a clear view that KGI and Postharvest were the best avenues to improve awareness of software solutions to growers.

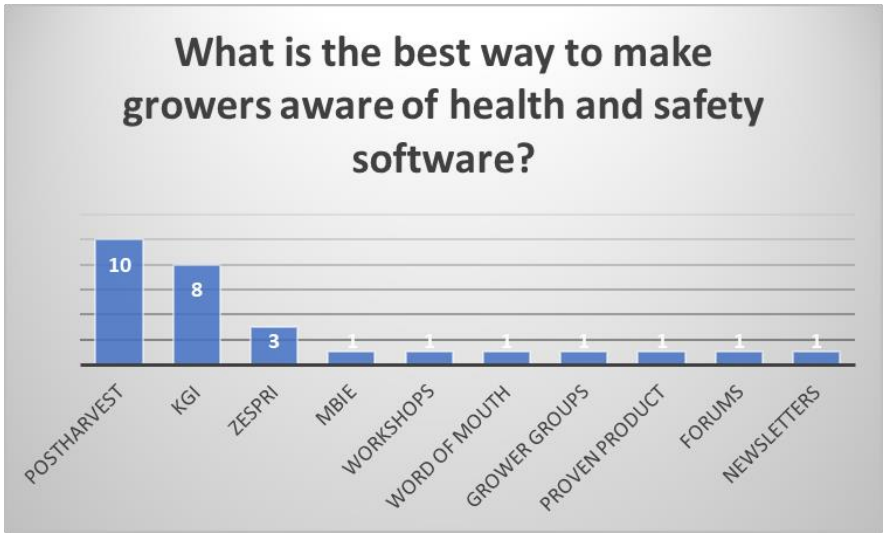


Figure 11: What is the best way to make growers aware of health and safety software?

9. *What do you consider the most important aspects of a H&S system for your orchard / business (generic)?*

This question resulted in a range of answers but the most important was that it was easy to use. Identifying and communicating risks was important as was meeting compliance requirements.

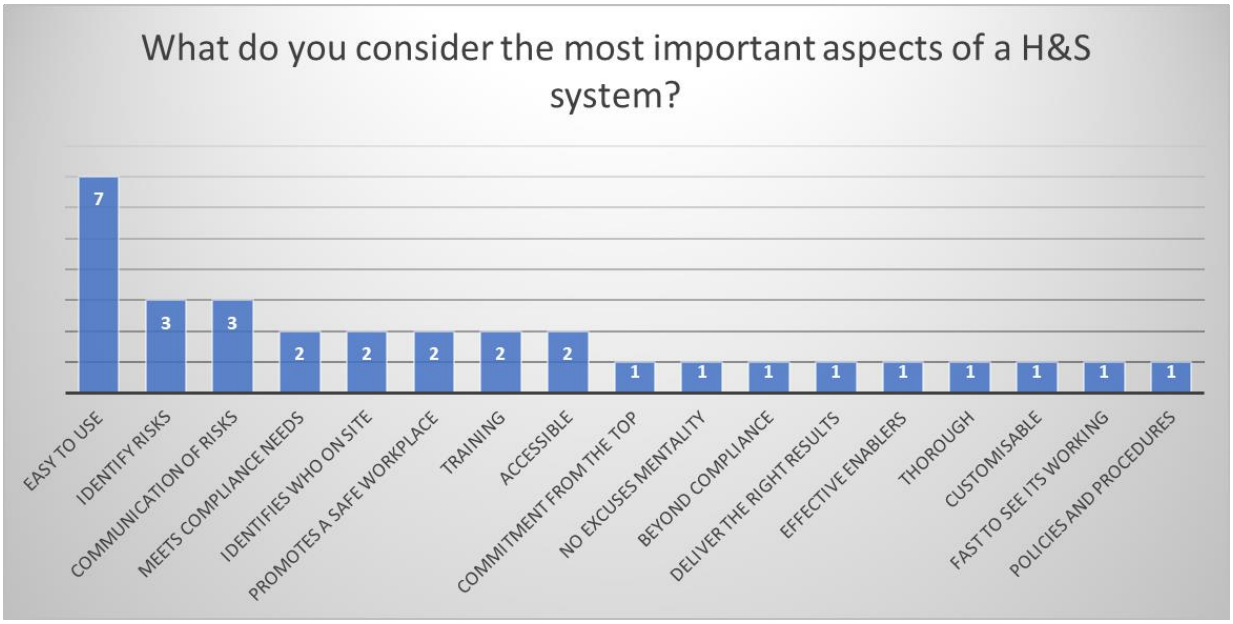


Figure 12: What do you consider the most important aspects of a H&S system?

10. *What do you think the most important features / benefits are of an (electronic) health and safety system over paper based systems? What would or did motivate you to adopt a technology solution for your orchard / business?*

Interviewees believe that electronic systems are more accessible to those that need access. There is a view that this accessibility will lead to improved reporting and compliance and that live data will allow features such as notification of entry and exit to assist with on-orchard health and safety.

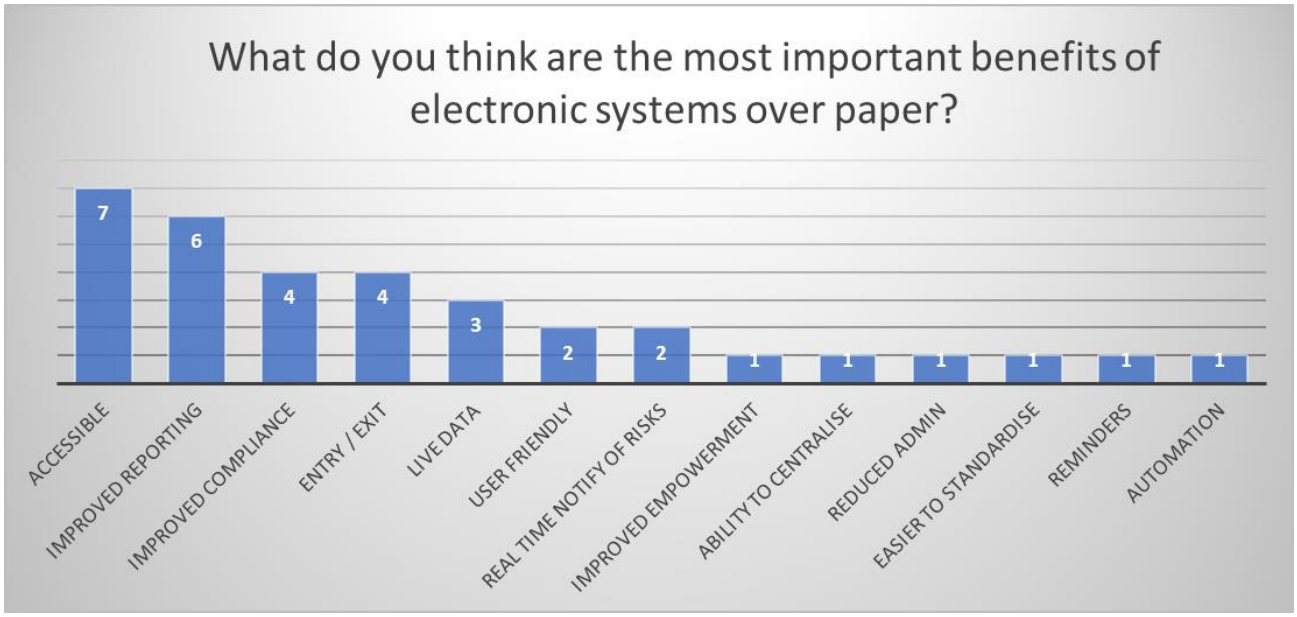


Figure 13: What do you think the most important features / benefits are of an (electronic) health and safety system over paper based systems?

11. *What do you see as the main barriers to electronic systems for the management of H&S for your orchard / business?*

Interviewees see the average age of growers in the industry as the most significant barrier, this is closely followed by the "she'll be right" culture and technical ability (often attributed to age also). Cell phone coverage is also considered a barrier albeit many technology solutions claim to have online / offline capability.

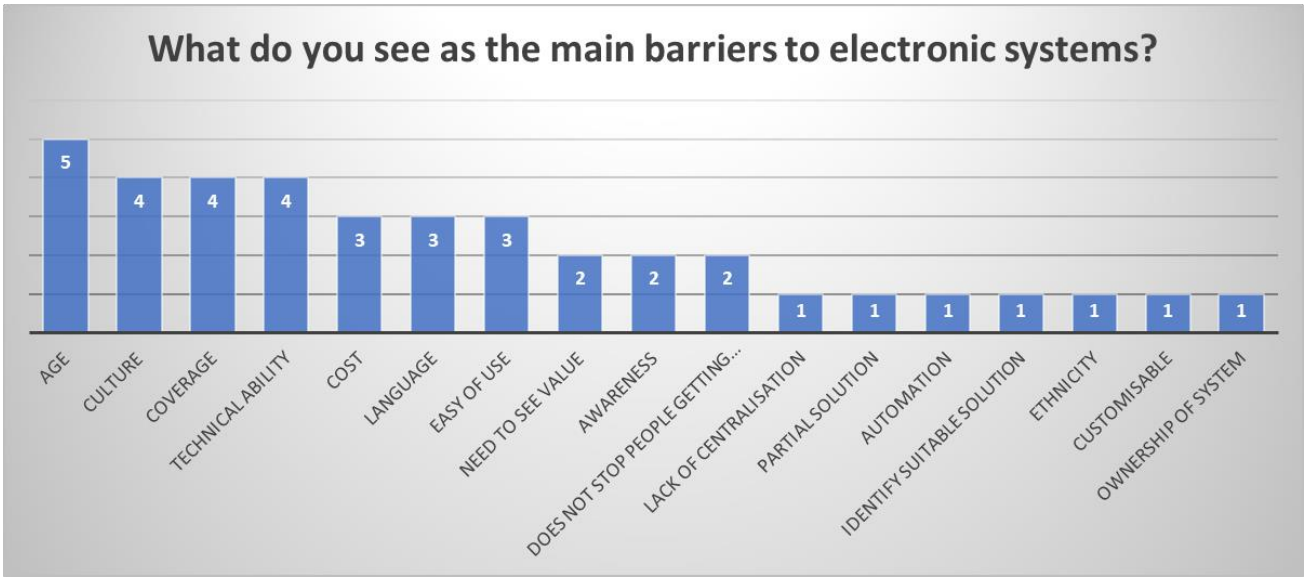


Figure 14: *What do you see as the main barriers to electronic systems for the management of H&S for your orchard / business?*

12. *Would you be supportive of a centralised industry health and safety solution or do you believe this should be up to orchardists / businesses to choose as they see fit? Why?*

Except for only one response who did not have a view, all interviewees could see the benefits of a centralised solution and were supportive of this. There was a common view that this would make it easier for all and many identified that it would reduce duplication. One interviewee who has built their own electronic system went as far as saying that they would ditch their own system if the right industry solution was available and this benefited the industry.

13. *Do you consider it important to have a single comprehensive H&S system or is it ok to utilise many components / systems? E.g. some systems are good at managing inductions but not so good at managing training.*

There was a strong preference (73%) to utilise the best systems available for each of the health and safety components. Whilst interviewees would rather a single comprehensive system, they would sacrifice this over adopting best of breed systems. A small group (20%) felt that so long as a single comprehensive system met minimum compliance needs and "did the job" that they were happy with this and didn't need to have the best available, one interviewee did not have a view.

14. *Do you consider you would or do have buy in for use of an electronic health and safety solution from your staff and or contractors? Why?*

There was a view that buy in was or would be achieved but not without some work (87%). Some comments included that contractors would be more difficult and that owners / leaders would need to enforce coupled with selling the reasons for implementation. The remaining 13% felt that there would be some rebellion and contractors tended to be lax.

15. *Do you consider an electronic H&S system would or does improve the management of an up to date risk register? Why?*

A little over half (60%) of responses believed that an electronic health and safety system would improve the management of an up to date health and safety system. These people tended to see this as one of the primary reasons for adopting an electronic H&S system and felt that being able to capture risks on the orchard as they happened would we a significant improvement. The remainder (40%) did not consider that an electronic system would improve the status quo. This ranged from a feeling that they were so small that they were intimately aware anyway to concerns around adoption and a reliance on people to follow the process being little different to now.

16. *Do you consider an electronic health and safety system has or would reduce the time taken administering health and safety? Why?*

67% of interviewees believed that it would reduce H&S administration, 27% did not and 7% did not have a view. Several common trends included a view that there was little time spent on administering health and safety now, so any reductions were not significant, this was further expanded on by a number that stated that electronic H&S systems would support them doing it properly or better so admin would be the same or more.

17. *How do you feel an electronic health and safety solution has or could help with managing and interacting with visitors and or contractors?*

For many of the interviewees this was a primary driver for electronic H&S systems. There was often an acknowledgement that contractors and visitors have gone under the radar with poor communication and there was an awareness that this was an area that needed to be improved. In all cases those that had an electronic system stated that this had improved this area of H&S in their business.

18. *Do you consider that an electronic health and safety system would improve or has improved health and safety for your orchard / business? Why?*

A little over half (60%) felt that electronic H&S systems would or have improved health and safety on their orchard / business. Key reasons that they attributed this to were an improved awareness and simply lifting the bar. The remainder (40%) felt that electronic systems had little effect due to the experience of their staff, electronic systems being no more than a tool and factors such as culture and compliance being the drivers rather than electronic systems.

19. *How much would you be prepared to pay per year for an electronic health and safety solution?*

Most Interviewees found it very difficult to answer this based on a lack of knowledge of what systems are out there and therefore a lack of knowledge of what the systems could do and therefore their value. A number would need to do a cost benefit analysis, others were prepared to state a few hundred per annum, a few thousand per annum or even 5-10 thousand per annum, this varied greatly depending on scale of the business.

Discussion

The aim of this study was to identify what opportunities there are to improve health and safety on kiwifruit orchards using software solutions. A key element of this research was to explore the industries' attitude to health and safety and its readiness to utilise software solutions.

The New Zealand kiwifruit industry health and safety status is well aligned with that of the New Zealand farming industry and in fact many players are involved in both these industries. This alignment stems from the underlying national culture where "kiwis" perception of risk and safety originates. The "she'll be right" and "give it a go" attitudes are still at play in the industry, this is supported both in the literature and in the interviews conducted.

It appears that the industry is at a cross roads as to the acceptance that the industries health and safety practices must improve. When interviewees were asked to describe health and safety for their orchard / business they often grappled with whether the priority was to keep people safe or to meet compliance requirements.

Nielsen (2015). categorised agriculture as predominately "pick and mix pragmatists" and "resisting" typologies, this is also true of the kiwifruit industry, however there is absolutely a group of "tick the box immunity" that are fearful of prosecution.

The kiwifruit industry does not perceive itself as a high-risk industry, whilst interviewees could identify several risks, other than machinery they generally struggled to identify risks. Equally whilst they acknowledged room for improvement, they generally rated their health and safety practices highly based on a genuine effort. Most interviewees rated their industry colleagues as generally having poorer practices than themselves. This is probably fair given that approximately two thirds of interviewees considered themselves to be innovators or early adopters and on reflection this group are likely to represent the leaders of the industry better than the industry on average.

It is of concern that several contractors and packhouse operators felt that they could not push growers too hard to improve health and safety issues identified due to the competitive nature of the industry. This clearly demonstrates that the industry health and safety culture has some way to go.

When exploring the barriers to adoption of health and safety systems, and in particular electronic health and safety systems, buy in, age and culture were key challenges that interviewees raised. A number of interviewees suggested that younger people in the industry were more aware of health and safety expectations and ways to manage health and safety. This again aligns with the inherent "kiwi culture" but suggests that through the legislation, education and over time the culture is changing. It appears that contractors and the growers themselves are more challenging to get buy in from than staff. It appears that it is the growers themselves that need to be focused on to achieve buy in, once this is achieved the culture change can be lead from the top.

Based on the literature there will need to be a focus on the five perceived attributes of innovation. Potential adopters need to be convinced that software solutions will make their life easier and give them peace of mind. They need to have a positive experience and need the product to be dumbed down to its simplest level, they need to be able to give it a go and find ways that it can work for them and finally they need to get positive feedback from all stakeholders

Throughout the interview process many of the interviewees commented that they had seen recent health and safety improvements in the industry. Based on the interviews it appears that this is driven by both the changes to legislation (fear of prosecution) and the changes introduced to the industry as

a result of the industry fatality in 2016. This also suggests that there is a captive audience ready to adopt health and safety software solutions if they are fit for purpose.

Two thirds of interviewees did not use software solutions for managing their health and safety, furthermore no interviewees had a fully electronic solution. They stated the reason for their paper based systems was largely due to a lack of awareness or being unable to identify a suitable system that met their needs. It appears that we are only just moving into the critical phase where the early adopters are starting to see the fruits of the innovators.

Interviewees felt that the best way to make the wider industry aware of health and safety software solutions was through NZKGI and post-harvest although there was some concern about the reliance of growers on post-harvest facilities. The work that NZKGI is doing with Becca to identify a method to evaluate health and safety software solutions and evaluate existing solutions using this will be invaluable. However, the literature suggests that in addition it is critical that there is work done in parallel to support building a positive health and safety culture in the New Zealand kiwifruit industry. No solution will be successful in the absence of a positive culture. This work will need to be lead from industry groups such as Zespri and NZKGI and will need to be well structured and multifaceted to be most effective.

Interviewees are clear that any health and safety system must be easy to use. They expect it to identify and communicate risks and they expect it to meet their compliance requirements. When they think about the benefits of an electronic solution over a paper based system, they see accessibility as the overarching benefit and believe that this will lead to improved reporting and compliance and see live data will assist with this. There are relatively few in the industry using software solutions for health and safety again supporting that we are only just starting to move into early adopters. Several interviewees were working very closely with the developers of solutions to further develop the solutions to meet their needs and had negotiated a “deal”, this supports the research that says that farmers and researchers can collaborate over time for improved outcomes.

There is strong support for a centralised industry health and safety solution. Interviewees are looking for a means by which all stakeholders can share health and safety information as required rather than adopt a single solution. There is a view that no single solution can meet everyone’s needs, and stakeholders should be free to choose, but that sharing would reduce duplication and result in better safety outcomes.

Interviewees accept that having a single solution that meets all their health and safety needs is difficult. They are happy to utilise multiple systems, even paper to get the best of breed for each component of their health and safety system.

It appears that software health and safety solutions will facilitate an improvement in up to date risk registers and the management of contractors and visitors though to achieve this it is critical that a safety culture is in place. Risk registers have typically been either a set and forget or an annual task and visitors and contractors have often gone under the radar. These two attributes of a health and safety system are perceived to be key advantages of software solutions where these are actioned in near real time and prompted on orchard.

Whilst interviewees are split in their views on the ability of a health and safety software solution to improve health and safety, this was considered in tandem with other factors such as experience and culture. If these are put to the side or addressed in parallel, software solutions will facilitate an improvement in on-orchard health and safety. All interviewees that were already using a software solution to manage some part of their health and safety said that it had improved health and safety.

Given the lack of awareness of health and safety software solutions it is also difficult for those that have not been exposed to their capabilities to fully understand how these can facilitate outcomes that are different to the status quo.

Cost of the system was considered as a barrier to adoption, but this was not a primary driver. There are mixed views on how much interviewees would be prepared to pay for a system, with many needing to do a cost benefit. The literature states a case for positive business case and interviewees supported this work. Systems need to be cost effective, but cost can be balanced against ease of use, meeting compliance and even considered an insurance policy.

Conclusions

There is an opportunity for the New Zealand kiwifruit industry to improve health and safety on orchards using software solutions.

For such solutions to be effective the following points should be considered:

- No software solution will be effective without a positive health and safety culture being developed in parallel to eliminate culture as a barrier to adoption and the solutions ongoing success
- The inherent national (kiwi) culture, albeit changing slowly, is not conducive to a positive health and safety culture, culture change must be lead from the top
- Early adopters need to be supported through the critical phase
- Awareness and understanding of solutions available is poor, solutions need to be promoted
- Stakeholders need to see a positive business case
- Solutions must be fit for purpose, a common reason for lack of adoption was lack of a suitable solution
- Solutions must be easy to use, accessibility is key
- There is strong support for a centralised industry health and safety solution, common data rather than a single system
- Solutions don't have to do it all, they must be good at the components that they offer
- Risk registers and contractor / visitor management seen as key features
- Most of industry are unaware of existing software solutions capability
- Cost is not a primary driver but will be considered later in the evaluation process

Recommendations

1. On completion of NZKGI commissioned work evaluating existing software solutions build case studies to showcase the best of the solutions available in collaboration with early adopters
    a. These case studies should be promoted in industry publications and events to increase awareness
    b. Case studies must promote a positive business case demonstrating value
    c. Consolidate a list of features of software solutions and publish in layman's terms to educate industry on the benefits
2. Commission a specific kiwifruit industry health and safety culture campaign, it is critical that culture is developed in parallel with the development and recommendation of software solutions
3. Explore best of breed software solutions for all aspects of health and safety on orchards, don't be limited to comprehensive health and safety software solutions – one size does not fit all
4. Investigate how a common data sharing platform could be developed to facilitate sharing of health and safety information between systems and stakeholders within the industry
5. Investigate other opportunities beyond culture change that could help to facilitate packhouses and contractors to push growers to implement improved health and safety practices without fear of commercial implications

References

Dans, E (2016). Airbnb: a case study in diffusion of innovations https://medium.com/enrique-dans/airbnb-a-case-study-in-diffusion-of-innovations-99b22444f276

Forté Management (n.d.) The influence of national culture on safety practices in the New Zealand context http://www.forte-management.co.nz/resource/detail/136

Hoffmann, V (ed.) (2011). Knowledge and Innovation Management. Module Reader. Hohenheim University. https://www.researchgate.net/publication/225616414

Khan, Muhammad & , Chairman. (2013). Developing a Safety Culture in Developing Countries https://www.researchgate.net/publication/276488208_Developing_a_Safety_Culture_in_Developing_Countries

Maintenance Engineering Society (MESNZ) (2017). Staff Culture The Biggest Hurdle in Health and Safety http://www.scoop.co.nz/stories/BU1706/S00069/staff-culture-the-biggest-hurdle-in-health-and-safety.htm

Nielsen. (2015). Health and safety attitudes and behaviours in the New Zealand workforce: A study of workers and employers. 2014 Qualitative Research. Agriculture report. (A report to WorkSafe New Zealand). Wellington, New Zealand: Author. https://www.worksafe.govt.nz/worksafe/research/research-reports/reports/attitudes-and-behaviours-survey-qualitative-agriculture-report.pdf

NZKGI http://nzkgi.org.nz/

Rogers, E.M. (1983). Diffusion of innovations (3rd ed.). New York: Free Press of Glencoe. pp 453

Schwartau, C (2012). Create a culture of safety on your farm http://www.extension.umn.edu/agriculture/dairy/farm-life/create-a-culture-of-safety-on-your-farm/

Taylor, P (2016). Growing a safety culture: How improving attitudes to safety helped Blakey Pacific boost productivity and reduce injuries http://safetree.nz/wp-content/uploads/2016/08/How-Blakely-Pacific-is-growing-its-safety-culture.pdf

Tradestaff (2017). How can New Zealand improve safety culture on building sites? https://www.tradestaff.co.nz/blog/employer-faqs/how-can-new-zealand-improve-safety-culture-on-building-sites/

Twose, H (2016). Creating a safety culture in the workplace http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=11611370

Worksafe, (2013). People come first: Building a strong health and safety culture in New Zealand mines, quarries and tunnels.

WorkSafe, (2017). Progress towards the 2020 target.
http://www.worksafe.govt.nz/worksafe/research/health-and-safety-data/towards-2020/towards-2020-factsheet.pdf

WorkSafe, (2017b). Workplace fatalities by industry.
http://www.worksafe.govt.nz/worksafe/research/health-and-safety-data/workplace-fatalities/workplace-fatalities-by-industry

Worksafe, (2017c). Empowering people to make a difference
http://www.worksafe.govt.nz/worksafe/hswa/tools-and-resources/case-studies/sweetwater-station-empowering-people

Zespri, (2017). Zespri Annual-Report 2016/17.
http://www.zespri.com/ZespriInvestorPublications/Annual-Report-2016-17.pdf

Appendices

a.) Interview questions

Orchard / Business Overview

1. How would you describe health and safety for your orchard / business? (set the scene – relativity)
2. What do you perceive the biggest health and safety risks are for your orchard / business? (perception)
3. What are the biggest problems for you managing on orchard H&S and why?
4. If we classify adoption into groups from innovator, early adopters, early majority, late majority through to laggards, how would you describe your orchard / business and why?
5. When thinking specifically about on orchard, on a scale of 1-10 how would you rate health and safety for your orchard / business? Why?
6. When thinking specifically about on orchard, on a scale of 1-10 how would you rate health and safety for the kiwifruit industry (specifically on orchard)? Why?

Technology Solutions

7. Is your health and safety system paper based or electronic? What is the primary reason for this?
8. Do you think growers / contractors are aware of the electronic solutions available? What is the best way to make growers aware of these?
9. What do you consider the most important aspects of a H&S system for your orchard / business (generic)?
10. What do you think the most important features / benefits are of an (electronic) health and safety system over paper based systems? What would or did motivate you to adopt a technology solution for your orchard / business?
11. What do you see as the main barriers to electronic systems for the management of H&S for your orchard / business?
12. Would you be supportive of a centralised industry health and safety solution or do you believe this should be up to orchardists / businesses to choose as they see fit? Why?
13. Do you consider it important to have a single comprehensive H&S system or is it ok to utilise many components / systems? E.g. some systems are good at managing inductions but not so good at managing training.
14. Do you consider you would or do have buy in for use of an electronic health and safety solution from your staff and or contractors? Why?
15. Do you consider an electronic H&S system would or does improve the management of an up to date risk register? Why?
16. Do you consider an electronic health and safety system has or would reduce the time taken administering health and safety? Why?
17. How do you feel an electronic health and safety solution has or could help with managing and interacting with visitors and or contractors?
18. Do you consider that an electronic health and safety system would improve or has improved health and safety for your orchard / business? Why?
19. How much would you be prepared to pay per year for an electronic health and safety solution?

b.) Summary of Individual Results

No.	Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	How would you describe health and safety for your orchard / business? (set the scene – relativity)	Do well, bread and butter v good, 2 serious harm, strong vision, 40-50% culture, Cant insult common sense, engage vs fear	Offload to orchard management company, some involvement in culture	Work in progress, Genuine effort, more focus during harvest, lack of communications, act as Orchard project managers	Acknowledge risks, policies need to be in place to mitigate	Try to have under control, note hazards, take seriously primarily due to consequences, equally don't want accidents	Right to go home safe, manage to avoid exposure, minimise risks, remove ideal	#1 on mgmt. meetings, all stepped up, equally don't see as high risk	Scared based on hearing about other situations, Fearful of consequences if not done right, good to have awareness	No injuries, prevent better than cure	Important, don't want injuries, awareness important, make environment safe but people should be competent, acknowledge risks	Orchards should be safe to work in, Cover yourself, believe proactive, identify, minimise and fix risks.	Keep staff safe, quality of life, people need to think for themselves, experience important	Part of business, committed, compliance cost, worker welfare a primary goal	Keep people safe, safe no risk environment, act when things go wrong	Work in progress, still a lot to do re adoption of new systems.
2	What do you perceive the biggest health and safety risks are for your orchard / business? (perception)	Machinery, Chemicals	Communication, Machinery, updates	Machinery, lone workers	Machinery, People under pressure, Poor training	Machinery, Rabbit holes	Machinery, Chemicals, tools	Machinery, Rabbit holes	Machinery, Wire, Chemical	Machinery, Wire	Machinery, Terrain, Wet conditions	Wires and structures, small load out area	Rabbit holes, tools	Machinery, tools	People & machinery	Untrained staff. Building a culture.
3	What is the biggest problem for you managing on orchard H&S and why?	Ownership, empowering people, desire buy in for productivity and wellbeing, not just growing fruit, compliance the easy part,.	Obtaining up to date hazards, lack of communications	Understanding expectations,	Individuals adhering to instructions, stop short cuts	Administration, time constraints	Follow processes, ensuring awareness, leading by example	People not taking seriously enough, people at different levels, education, changing culture	Time and effort involved in thorough training and monitoring	Information flow, evidence of engagement, discipline to follow-up, staff inexperience or lack of life experience.	Complacency, laziness, getting people to take seriously	Cost, Time	Time, reliance on staff to advise of issues	Administration, nature of workforce, staff turnover, language, people not embracing	Change - moving from old style minimalistic to risk analysis	Staff uptake, think its more forms to do
4	If we classify adoption into groups from innovator, early adopters, early majority, late majority through to laggards, how would you describe your orchard / business and why?	Innovator	Laggard	Late Majority	Innovator	Innovator	Early Adopter	Early Majority	Early Adopter	Early Adopter	Early Adopter	Early Majority	Early Adopter	Early Majority	Innovator	Early Adaptor
4a	If we classify adoption into groups from innovator, early adopters, early majority, late majority through to laggards, how would you describe your orchard / business and why?	Innovator - people getting excited about this and want to take it further.	Laggard - some awareness but haven't taken on	Late Majority - Above average but happy to be a follower, don't want to be a pioneer	Innovator - always at forefront, raise issues at board table, see issues before others	Innovator - Hear about and don't hesitate to give it a go. Anything to make life easier.	Early adopter - think proactively, look to grow using new tech and methods	Early majority - proactive, many systems in place a long time	Early adopter - like to be looking for the next thing	Early adopter	Early adopter - currently assessing best fit system	Early majority - some apprehensive	Early adopters - see good ideas from partners	Early majority - on board	Always strive to be at the front	Practices started changing well before legislation, trying to simplify

No.	Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
5	When thinking specifically about on orchard, on a scale of 1-10 how would you rate health and safety for your orchard / business? Why?	6	8	7	9	7.5	4	7	9	7	6	7	8	7	8	8
5a	Why?	In good position to progress and understand, good idea of where going.	Use the right equipment and PPE, retain experience, looking after staff	Several investigations / audits where worksafe happy, records sufficient, genuine effort.	Always front of mind, actively seeking risks and addressing them	Generally good, some complacency from owners	Need to do better, written communications good, exposure to hort NZ conference identified further work, more than just staff, equipment used in wrong way.	Still reinforcing, changed a lot in last few months.	Can always do better, owner awareness is right up there.	Can't backup with excellent data, constant role, hard to gauge if haven't talked	Need to ensure all fully aware, particularly contractors	Acknowledge that there is some work to do, just need to make the time to action.	Have had no problems, perceive relatively static and low risk	Acknowledge some work to do but perceive that mostly in order	Need to improve communications, and ensure procedures followed	Always room for improvement
6	When thinking specifically about on orchard, on a scale of 1-10 how would you rate health and safety for the kiwifruit industry (specifically on orchard)?	4	3	3	6	5	1	6	7	5	4	6	5	6	4	6
6a	Why?	Many not actively engaged, well behind by comparison	Industry not to grips with needs, fought against, too hard basket, lack of up to date info, few proactive operators	Well behind packhouses where there is a dedicated resource, challenges with adoption	Focus is there, Negative grumbles, generational challenges	Many don't think its their responsibility, too much reliance on post harvest	Common sense rules mentality, often have to help orchardists or see non existent, generational changes	Global gap and Grasp has facilitated a lot of progress	Focus needs to be higher	recent improvements, but still some way to go	See a lot of orchards and a lot appear to have very little in place	Getting there, good grower responses at field day, 90% no sign in, contractors dragging the chain	Should be aware of liability, not as good as packhouses, reasonably on board	Can see some good operators but many well behind them	4 is probably generous, fail to face reality, growers get away with too much partially due to commercials	Pretty robust, easy and non complicated
7	Is your health and safety system paper based or electronic?	Electronic	Paper	Paper	Paper	Electronic	Paper	Electronic	Paper	Paper	Paper	Paper	Paper	Paper	Electronic	Electronic
7a	Is your health and safety system paper based or electronic? What is the primary reason for this?	To get better info, easier to manage compliance, improved awareness and accountability	Haven't found a good fit system, lack of standard	Packages too generic, haven't found good fit, perceive cheaper	Haven't found the right fit yet	Awareness of who on orchard and when, always need paper as a backup so paper hybrid, proof is key	Haven't seen the ideal system, need to have a solid paper based system first	All encompassing, smart, visual, operating in lots of places so easier to coordinate	Not aware of electronic systems, very close working in the small business	Haven't found a suitable system, trailing own adoption of OneNote	Haven't found the right system, don't want to back a looser	Time to implement, poor experience with an app, identifying suitable system	Not aware of electronic systems, will it make a difference	Only just becoming aware of electronic systems	Know who on orchard, why and where, keep in safe areas, right info	Hybrid in effect, some prefer paper, for easy access, haven't quick got tech or systems to adopt fully.

No.	Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
8	Do you think growers / contractors are aware of the electronic solutions available? What is the best way to make growers aware of these?	No	No	No	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	Yes
8a	Comments?	KGI doing a good job, individuals have to want to engage, Generational change will occur	Will need to filter down	Not actively searching	Younger age group are, corporatisation and directors liability driving change, owner operators struggle with changes and are unwilling. Automation critical.	Joe Bloggs doesn't put enough importance on H&S, legal changes came so fast - trying to catch up, scaring the best way, need good examples, age a barrier, postharvest have enough to do.	No comment	KGI the quickest pathway	No comment	Engaged growers know - would say 70% are engaged	Industry accident a wake up call, not my problem mentality, wait till told or have to, not proactive, reliance on postharvest and Zespri, even accidents don't always drive change, definitely improving	Many don't care or appreciate it could make things easier	No comment	Needs to be pushed down from industry	More and more taking up, open to fit for purpose product, currently slow uptake	As a packhouse / management company we are pretty good at pushing out to growers
8b	What is the best way to make growers aware of these?	KGI, postharvest	Postharvest, MBIE, forums, newsletters	KGI	Proven products that have as much automation as possible	Scaring growers is the best vehicle, post harvest can help	Zespri & Packhouse field days, KGI	KGI	Word of mouth, Packhouse or grower groups	Postharvest, KGI	Postharvest, Zespri	KGI, Zespri	Packhouse	Workshops, Packhouses, KGI, Zespri	KGI	Packhouse
9	What do you consider the most important aspects of a H&S system for your orchard / business (generic)?	Commitment from the top, no excuses mentality, identify risks, training	Communication of risks, beyond compliance	Accessible to all, meets compliance needs	Clear identification and mitigation of risks	Open and knows where to go if something goes wrong	All encompassing, who onsite and where, communicates risks	Deliver the right results, effective enablers	Thorough, make sure people understand it	Easy to use, customisable	Easy to use, fast, easy to see its working	Records or entry / exit, policies and procedures to protect, risk ID an d minimisation processes	Easy to use - promotes a safe workplace	Promotes worker welfare, meets compliance needs	Clear procedures well understood, good communications	Simple, less is more, accident reporting and staff training records
10	What do you think the most important features / benefits are of an (electronic) health and safety system over paper based systems? What would or did motivate you to adopt a technology solution for your orchard / business?	User friendly, accessible, more effective reporting and compliance, greater empowerment	Live info - risks and knowing who's there, data consistent and up to date	Accessibility, ability to centralise	Notify entry and exit of orchard, real time notify of hazards	Accessibility, notification of entry / exit	Better records	Smart, coordinated, visual, assists with multiple orchards	Availability, good records, reduction in paper work	Accessibility, cant loose it, better reporting, reminders	Accessibility, things don't go missing	Easier to standardise, auto notify entry / exit, reminders, automation	Not able to comment	Accessibility	Live, ease of use, current	Instant notification, contractor management, instant capture

No.	Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
11	What do you see as the main barriers to electronic systems for the management of H&S for your orchard / business?	Same as any other system, lack of engagement, culture, people need to see value - awareness is key	Central data source	Coverage, only a partial solution	Cost, connectivity and automation - but ultimately cant put a cost on it	Age and technical ability	Finding the right one, don't see tech as a barrier, never completely replace paper	Lack of awareness, learning, implement across, age, language, ethnicity	Simplicity of use, coverage	Cost / ROI, not quite capture the way you want, doesn't stop people getting hurt	Coverage, tech ability, age and education, language.	Age, lack of technical knowledge, coverage, reluctance to use	Cost, will it make a difference, lack of knowledge	Tech knowledge, language, age, clear instructions / understanding	Grower buy in, participation, understanding, can make a difference, easy and convenient	Someone else owning them, there is a role for packhouse or industry to make their own
12	Would you be supportive of a centralised industry health and safety solution?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	?	Yes	Yes	Yes
12a	Would you be supportive of a centralised industry health and safety solution or do you believe this should be up to orchardists / businesses to choose as they see fit? Why?	Great think top have common systems, only as good as those that engage, enormous value in having systems linked to each other	Access to single data source, but still multiple products. Will likely lower cost and assist operators on multiple sites	Removes duplication	Best thing that could happen, better accessibility and also assurance to the market	Industry input required, don't want to recreate	Support central repository rather than single system	Absolutely for wider industry benefit	Integrated approach benefits all	must be simple for end users, standard data and sharing will benefit	Still needs to accommodate different needs	Easier for all	Depends how hard it is to use	All of industry benefit	Look at benefits to wider industry, would even ditch own system	Remove duplication, facilitate ownership
13	Do you consider it important to have a single comprehensive H&S system or is it ok to utilise many components / systems? E.g. some systems are good at managing inductions but not so good at managing training.	Rather one system, but have multiple for best of breed, customisable important - everyone wants something a little unique.	No - pick and choose best pieces doesn't matter how as long as its done	Prefer single but expect will require multiple for some time	No - pick best elements	Prefer one, but not worried about adopting multiple to get best result	Multiple components fine	Best of each	Take the best, e.g. induction more important than training	Prefer single but take best available to get the outcome	Want to be compliant, prefer single so long as compliant	Prefer single system so long as meeting compliance requirements	No view	Comprehensive, perfection not all, needs to allow humans to fix as required	Probably have a hybrid for some time, take the best components	There is on one size fits all system, can compare with Global gap
14	Do you consider you would or do have buy in for use of an electronic health and safety solution from your staff and or contractors? Why?	Come a long way, a long way to go, no complaints from contractors, still working on making it a habit	Some challenges depending on how easy to use but will ultimately get used to it	Most growers don't care, initial push back then become part of business, staff easier to get buy n via contracts - not so easy for growers who will move to next contractor	Yes - will make contractual and auditable and lead culture	Believe so, important to prove it works first.	Yes no issue	Been good, see as positive	Don't see as an issue, particularly if it conforms to an industry standard	Yes, safety conscious any way, its part of regular conversations	Hard like any system not used to, external pretty lax, will need to be more forceful	Staff ok, contractors may be a bit harder but industry wide would help	Need to see value, will rebel on mandatory of value not proven	Yes - small scale, not a hard ask	Yes no issue	Staff easier than contractors, need to write into contracts to enforce

No.	Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
15	Do you consider an electronic H&S system would or does improve the management of an up to date risk register? Why?	Absolutely	Yes - this is one of perceived key benefits	No - its just a framework comes down to buy in, this is evolving	Yes - allows to be captured in the workplace and keep on top of it	Yes - paper flys around and gets out of date	No - not visible, need to be intelligent as well as proactive	Yes definitely, live check ins	No albeit accessibility better	Yes but no better, don't know the level to store data	No - still reliant on people, it is more instant	Yes - field based capture will facilitate this	No - not convinced on adoption	Currently infrequent, this would improve and share the load	Yes - this is a key driver it keeps things up to date	Yes - centralises and reduces effort
16	Do you consider an electronic health and safety system has or would reduce the time taken administering health and safety? Why?	Better utilisation rather than less admin, manage engagement and escalations more effectively, empower, segregate duties, accountability.	No really, not a lot of time currently spent	May be a little but mostly just more accessible	Yes becomes real-time and part of doing business	Yes once setup	Yes - similar experience with in orchard recording for payroll	Yes	Yes this is my expectation	Yes, don't spend enough time now, evidence most powerful	Yes	Yes albeit not onerous now	Depends on what it does	Yes less time and paper work	No - its more that we will be doing it properly	Yes beyond setup
17	How do you feel an electronic health and safety solution has or could help with managing and interacting with visitors and or contractors?	Early days, further work to do with random vs approved contractors, way more effective, still refining	It will assist with communication, this is generally poor now	Can see potential but see sign in books fail safe - keep it simple	This is a key driver absolutely	Yes, have seen improvement for those using app	Yes - allows upload of contractor H&S plans	Yes, also allows to be viewed retrospectively	Yes	Yes	Yes - visibility and awareness improved	Yes	Not focused on this, don't perceive it will help significantly.	Yes - this is mostly under the radar	Yes - this was a key driver in electronic system	Yes- reduces time spent on this, contractors starting to buy in
18	Do you consider that an electronic health and safety system would improve or has improved health and safety for your orchard / business? Why?	Yes	No - used to orchards, experienced operators, appropriate machinery	No - just a tool, Culture is the key thing that needs to change	Yes - partly as younger generation embrace and take rest along the journey	Yes - lifted the bar re hazards	Yes if all encompassing but must capture good data	Yes, will improve awareness	Yes certain aspects could help understanding and awareness	Limited, more compliance driven but does improve awareness	No - there may be some absorption by osmosis but incremental	No - more about compliance	No - Time spent, what's different, data overload, wont do it.	Yes raises awareness, filters down, feels staff safer. Better awareness, reporting and risks addressed.	Yes - its improved the little things e.g. know others working in the same space	Yes, staff happy, still some paper systems in parallel
19	How much would you be prepared to pay per year for an electronic health and safety solution?	Currently circa $400/ month + some significant development. Not seen as a barrier. Cost is secondary.	5-10k / annum	could be 15-20k but needs to be exceptional.	400-600/h.a, see as another compliance cost but also assurance to the market.	Currently paying $10/month, it does need to be inexpensive	Cost benefit, pay what you have to pay	Work in progress - working closely with developer, cost benefit based	1k p.a crazy, a few hundred p.a ok	Cost benefit, compares with accounts package value vs "insurance" risk	$300-400 per year seems reasonable, will pay more to give freedom	Have to do something, could save a lot, $400-600 p.a seems reasonable	Cost benefit	Need to know what we get, do cost benefit analysis	Under 5k p.a	No comment