Benchmarking Study to Assess Vegetable Industry Biosecurity Awareness and Preparedness

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Macquarie Franklin

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December 2013

MACQUARIE FRANKLIN
Consultants for business, agriculture and environment

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Executive summary

'Australia benefits from a relatively pest and disease free environment due to its isolation, and this status is … 'usually seen by industry to be 'very important to the continuing productivity of agricultural industries and their export' (Gilmore et al., 2009)

This project has set out to obtain a better understanding of biosecurity awareness and preparedness in the vegetable industry. The objectives of this study were to:

- establish the current level of vegetable industry biosecurity practice, awareness and preparedness in relation to invasive plant pests and disease, through the entire supply chain;
- determine reasons for the current status of biosecurity practice, awareness and preparedness; and
- provide recommendations to improve the current status of biosecurity practice, awareness and preparedness

There were two components to this project – a desktop study to review current information relevant to biosecurity in the vegetable industry, followed by a survey of industry stakeholders, throughout the supply chain. Development of the survey was informed by the desktop study.

The project is a combination of online and personal surveys that asks questions about current practices and management of biosecurity, getting a perspective from different segments of the supply chain (growers, service providers, transporters, wholesalers and retailers).

The questions were designed to elicit information about knowledge, practices, values and beliefs regarding biosecurity from respondents within each of the stakeholder groups.

Despite considerable media and industry promotion, voluntary responses to the survey were poor - the majority of responses came through the telephone interviews.

One of the main themes in respect to biosecurity practices determined from the desktop study was that of "market driven" compliance. This was reinforced by the survey with almost all growers having some form of certification, predominantly Freshcare, driven by customer requirements. Both the transport and wholesale/retail sectors also indicated high levels of certification due to market requirements and risk mitigation. The transport providers are very compliant in regions where biosecurity measures are a requirement. Only the service providers demonstrated low levels of quality assurance accreditation mainly due to much lower market requirements.

This high level of compliance to accredited schemes would therefore imply from the desktop study findings that biosecurity practices would be expected to be of a high level and indeed, production practices, such as crop pest and disease surveillance, management to prevent spread and maintaining QA programs are undertaken by most growers surveyed. However, biosecurity specific practices are much less practiced even though more than half of the growers and two thirds of the service providers indicated movement of vehicles and machinery between farms.

This gap in biosecurity practice continued to be a low priority through the wholesale and retail sectors but in the form of providing awareness material in the workplace.

The most predominant biosecurity activity undertaken by all stakeholders in the vegetable industry is surveillance. Surveillance activities for exotic plant pests are carried out by governments, industry and the wider community, they take the form of:

- Early detection – before pests become widely established
- To demonstrate the absence of a pest from the country, state or region to support access to domestic or international markets
- Following a pest incursion delimiting surveys provide information on the distribution and spread of pests
- To determine population levels to improve management decisions

Overall there is awareness amongst growers and service providers but this needs to be built on further to reduce the number that perceive biosecurity in a negative context and translate that into better levels of awareness. There is the opportunity to work closer with service providers as they clearly are a key point of reference for growers in respect to biosecurity.

The transport industry exhibited a significant disconnect in that all respondents agreed that biosecurity was important to the vegetable industry but only half indicated that they are responsible for the maintenance of biosecurity. This is particularly more relevant when viewed in the context of this was the response of those that participated in the survey which was a very low representation of the industry. The apathy to the survey and response to conduct phone interviews supports a strong case for transport being the major weakness in awareness of importance of and maintenance, of biosecurity in the vegetable industry.

Similarly the wholesale/retail sector is aware that biosecurity is important to the vegetable industry but there were still low levels of awareness of some practices and risks that pose a threat to maintaining biosecurity.

A key component of emergency plant pest preparedness is ensuring suitable and effective training for people involved in responding to emergency plant pest incursions. Effective training is the responsibility of both government and industry. PHA has a National Training Program for emergency plant pest (EPP) preparedness aimed at industry and government personnel.

The promotion of programs such as this is a high priority especially within the service provider and state government sectors as these were shown by this study to be the most important points of reference in respect to an incursion. There is opportunity to improve preparedness by leveraging off service providers as key points of reference for biosecurity practices, management and advice to the industry.

Despite a “downsizing” of many government departments, especially at state level, growers still rely on regional regulators and researchers to assist in respect to maintaining biosecurity but most of the research and extension activities are production focussed and tend to only target biosecurity “after

the fact". Maintenance of both state and federal government support is critical to biosecurity in the vegetable industry. The services provided by regulatory bodies have been shown to be respected and critical to implementing biosecurity practices and providing awareness and information to all sectors of the vegetable industry.

Plant Health Australia (PHA) has also partnered with Animal Health Australia in a joint communication and awareness campaign known as the Farm Biosecurity Program, which helps producers identify and reduce the risks posed by exotic pests and poor biosecurity practices.

The program website, www.farmbiosecurity.com.au , provides an array of information including ways in which risks to farm production can be identified and minimised through simple farm management practices.

State and territory governments, together with industry, focus on regional and farm biosecurity messages. PHA has developed a communication toolkit to help industry organisations communicate biosecurity messages to growers and encourage the uptake of practices that increase on farm biosecurity.

The Exotic Pest Hotline appears widely promoted by PHA, DAFF, DPI's and industry bodies, but is not seen as a source of reference or contact point for biosecurity issues in the vegetable industry.

The predominant theme from this study in respect to barriers to biosecurity in the vegetable industry was the cost of implementation. Cost pressures rated the most important barrier to adoption of biosecurity practices and procedures across all stakeholder groups in the survey.

The negative perceptions to biosecurity, especially to practices required, by the industry as a whole is a significant barrier. Continually the industry indicates that they understand the importance of biosecurity to the vegetable industry but the importance to their business and how it fits with the day to day operations of business is lacking and requires considerable focus for future promotion and communication.

The survey has indicated the importance of addressing "What's in it for me?" ethos that extends through the vegetable industry. Promotion and communications should attempt to address this critical question signalling to growers the benefit of biosecurity and the potential for this benefit to offset compliance costs etc, for example develop the concept of Biosecurity = Insurance.

The link between growers and service providers has been shown to be critical to implementation, maintenance and communication in respect to biosecurity in the vegetable industry.

Opportunities to increase biosecurity awareness, training and communication with regulators and the service provider sector will have a definite flow on effect to growers.

The opportunity exists to improve both the uptake and the implementation of biosecurity practices through:

- Better integration of biosecurity practices within QA programs
    - Collaboration with Freshcare, WQA etc to develop practical based biosecurity practices

    - Identify areas of that improve biosecurity practices with minimal impost on documentation
- Incentives to increase the uptake of relevant QA programs that include biosecurity practices relevant to the individual business or business sector.
- Incentives to increase the adoption of QA programs per se in the service provider sector

There is the opportunity to leverage off IPM programs and work with IPM providers and program designers to:

- Improve surveillance skills through IPM training
    - Growers
    - Service providers
    - Potential training of transport sector QA personnel
- Increase the integration of biosecurity practices in current IPM programs
- Improve awareness of potential movement of pests regionally through increased uptake of IPM within the industry
- Increase awareness of IPM management potential for incursions

Opportunities that have been identified in the survey as having the most impact to provide information for up skilling in the areas of surveillance include:

- Web based information
- Integration of information with farm Apps
- Train the trainer programs for service providers using industry bodies

Growers undertake a range of biosecurity practices on farm but were found to have a low level of implementation of biosecurity signage. There is a perception that signage is ineffective as a biosecurity control / awareness measure. In addition signage in LOTE was perceived to have little value by growers. Many workplaces have a tendency to have multiple signage relating to workplace safety, operating procedures etc. and biosecurity can be lost in a sea of signage. Biosecurity signage should be part of the operating procedures rather than distinct.

The vegetable industries reliant on seed should consider the merits of routine seed testing for seed borne pathogens in commercial lots. This would potentially also minimise the risk of seed borne infections being spread through the nursery phase of seedling propagation and supply.

Throughout the supply chain, reusable materials are utilised frequently and can cover large geographical areas due to Australia's extensively widespread geography. Improved awareness of the potential for pest and disease transmission on reusable materials and management practices for hygiene should take a national approach rather than just regional.

A national grower registration scheme would enable the collection of accurate and up-to date information about the number and location of growers of different plant species.

Such a scheme could have a potential role in improving biosecurity by:

- Providing information on the distribution of the vegetable industry to inform biosecurity planning;
- Facilitating communication to growers and service providers to increase their awareness of biosecurity needs and to increase the adoption behaviours that will mitigate the biosecurity risks; and
- Providing information on the location of vegetable properties and contact details to improve the availability to reach and communicate with growers during biosecurity responses.

1 Introduction

1.1 Background

Biosecurity presents a challenge for all agricultural industries in Australia, however there are specific characteristics of the vegetable industry that present particular challenges: The entire supply chain is relevant to biosecurity but not always wholly engaged or even aware of the risk they may pose:

- Back yard/home vegetable gardeners importing non-certified seed
- Increase in number of farmers markets as unregulated supply chain
- Many small growers from Language other than English (LOTE) backgrounds with very different cultural attitudes to biosecurity and who pose very real communication challenges
- Reliance of growers on a few large nurseries to provide planting material
- Frequent movement of live material and associated soil regionally and nationally
- Reliance on imported seed stocks

'Managing biosecurity risk lies clearly in the public sphere; that is, it depends on what people do as much as on the science of how a disease spreads. Risk management approaches therefore need to take into account the knowledge, practices and values of stakeholders. Conventional agency approaches alone, which are weighted to regulation and enforcement, are unlikely to be adequate to the task.' (Gilmore et al., 2011)

Three dimension of environmental problems (Gilmore et al., 2011):

1. The reality of what is happening on the ground
2. What people know and how they know it
3. Peoples values, attitudes and past experience

'The biosecurity measures undertaken on farms appears to depend not only on economics or feasibility, but on producers' understanding of the principles of biosecurity and their attitudes towards and motivations for undertaking or not undertaking disease prevention measures.' (Brennan & Christley, 2013)

The aims of this study were to explore understanding of vegetable industry stakeholders of biosecurity and their attitudes towards recommended biosecurity practices. The relationship between these attitudes and demographic factors were also investigated.

1.2 Study objectives

The objectives of this study were to:

- establish the current level of vegetable industry biosecurity practice, awareness and preparedness in relation to invasive plant pests and disease, through the entire supply chain;
- determine reasons for the current status of biosecurity practice, awareness and preparedness; and
- provide recommendations to improve the current status of biosecurity practice, awareness and preparedness

2 Methodology

There were two components to this project – a desktop study to review current information relevant to biosecurity in the vegetable industry, followed by a survey of industry stakeholders, throughout the supply chain. Development of the survey was informed by the desktop study.

2.1 Desktop review

A review was conducted of current (up to 5 years) information from Federal and State Government bodies, recent biosecurity reports and reviews to enable comprehensive assessment of current legislation and materials available to the vegetable industry in relation to biosecurity. The desktop study did not focus on awareness or preparedness, as this information was to be captured through the stakeholder surveys and interviews. Key industry groups across the country were also consulted to obtain further background information on biosecurity awareness and preparedness, to assist in the preparation of the stakeholder surveys. This consultation included grower representatives, transport associations and service provider organisations.

Concepts from the desktop review include the following:

- Why does the current status exist?
    - What gaps exist?
    - Why do these gaps exist?
- How has industry responded to previous projects & initiatives?

The survey development focussed on three key areas in relation to biosecurity:

- Awareness – benchmark communication flow & understanding of responsibility
- Practice (prevention) – benchmark risk mitigation activities
- Preparedness – benchmark contingency plans and response management procedures

2.2 Survey design

Four separate surveys were used to interview each of the following vegetable industry stakeholder groups:

1. Vegetable growers
2. Service providers, this included agronomists, vegetable production field officers, extension providers both private and government, seed suppliers and nursery operators
3. Transport companies

4. Vegetable wholesaler / retailers.

The survey questions were designed by Macquarie Franklin with input from AUSVEG Biosecurity advisor Dr Kevin Clayton-Greene, based on the outcomes from the desktop study. There were some questions which were consistent across the 4 stakeholder groups and others that were only asked of specific groups (e.g. producer and service providers). The questions for all 4 surveys were approved by HAL, and the grower survey questions were trialled with three vegetable growers from different areas of the country to ensure that wording, survey structure, etc. was user-friendly.

The questions were designed to elicit information about knowledge, practices, values and beliefs regarding biosecurity from respondents within each of the stakeholder groups. Respondents remained confidential, but background information relevant to how the survey was answered were obtained (e.g. name of nearest town or postcode, types of vegetable crops grown, educational background, role in the business, business structure, etc.).

The survey was distributed in two ways:

- On-line survey
- Telephone interview surveys

The online survey was created using an online survey provider, Survey Monkey.

At the commencement of the phone interview survey participants were asked “what do you first think of when you hear the word biosecurity?” The purpose of this question was to gain an understanding of growers’ understanding of, and attitude toward biosecurity in the Australian vegetable industry.

2.2.1 Survey promotion

Significant promotion of the project and the survey was undertaken.

The media campaign included the following promotion by AUSVEG:

- Article in May/June Vegetables Australia Magazine
- Paid advertisement in May/June Vegetables Australia Magazine
- Article and survey links in AUSVEG Weekly Update newsletter

The CRC for Plant Biosecurity assisted with promotion of the survey through:

- Biosecurity quarterly newsletter with story regarding the survey
- Article and survey links on website
- Article and survey links in fortnightly newsletter
- social media sites (Facebook and Twitter) to promote it further

An advertisement promoting the survey was placed in the August edition of the Good Fruit and Vegetables magazine.

National media articles were achieved in the following press and web sites

- ABC Rural country hour
- Protected Cropping Association Newsletter
- Advocate Newspaper
- Growcom publication
- Examiner
- NSW Farmers , articles and links in weekly enewsletter
- Grow SA, articles and links in In-the-Field newsletter
- Stock and Land
- Tas Country
- Veg WA, article in quarterly magazine and article and links in fortnightly enewsletter
- VGA Vic
- TIA
- Weekly Times
- Gippychat, article and link
- DPIWE Farmpoint, link on web site
- National market authority

Contacts within each of the state vegetable industry bodies were also notified about the survey by email and encouraged to promote it amongst their members.

2.2.2 Survey period

The on-line survey was open between 15 July 2013 and 6 September 2013. As an incentive to undertake the survey a $1,000 travel voucher was offered as a prize to a randomly selected respondent. Despite considerable media and industry promotion, voluntary responses to the survey were poor - the majority of responses came through the telephone interviews.

2.2.3 Interviews

An internal procedural document was drawn up by the project manager, to ensure that a standardised process was used for contacting stakeholders and conducting the interviews. While interviewers were encouraged to let interviewees speak openly and cover whatever issues they wished to raise, the interview required answers to all questions from the survey, to ensure consistency for analysis.

The target numbers for interviews were 58 growers, 26 service providers, 8 transport representatives and 8 from the wholesale/retail sector.



Vegetable Growers on contact lists that have been developed through previous survey studies of the vegetable industry were all contacted by phone and asked if they were interested in participating in the study and providing their perspective biosecurity awareness and preparedness in the vegetable industry. Service providers, transport representatives and wholesale/retail representatives were contacted directly as a result of referral from growers or as recognised entities within these stakeholder groups.

A summary of the responses to a request to participate is presented in Table 1. There was a large variation in the response of each stakeholder group. The grower response to the survey was regionally dependant and low compared to the number of levy paying growers. Service providers were the most responsive to a request for interview, whilst transport representative responses were very low (with no online respondents from this stakeholder group and phone interviews). Wholesalers and retail outlet representative's response numbers were low but the supply chain coverage was high due to responses from the 2 major supermarket chains.

Table 1: Number and location of survey participants

	Growers	Service Providers	Transport	W|Sale / Retail
NSW	1	16	2	3
VIC	13	16	2	3
QLD	16	17	2	5
SA	10	10	2	3
WA	10	8	1	2
TAS	13	14	2	3
NT	0	3	0	2
Overseas	0	5	0	0

Note: a number of stakeholders reported operating in more than one state

2.2.4 Data analysis

This report presents the findings of a detailed biosecurity survey of businesses along the vegetable supply chain over an eight week period in late July – early September 2013.

The survey collected information on five main themes:

- Biosecurity practice
- Biosecurity awareness
- Barriers to farm biosecurity adoption
- Biosecurity preparedness
- Communication and knowledge flows

A numerical summary of survey responses and related discussion is provided throughout this report.

Analysis of open ended responses involved interpretive coding of the growers' and service providers' definitions of biosecurity. Firstly, text from respondents' definitions was dissected into manageable and meaningful text segments. The main concepts from these definitions were then classified into basic themes using thematic analysis techniques (Attride-Stirling 2001). Different basic theme structures were created by repeatedly reading the responses and identifying common elements among them. Thirdly, the basic themes were then classified into organising themes relevant to the overall global biosecurity theme.

3 Results

3.1 Demographic information

Most of the grower respondents were between 25 and 54 years of age (81%), 12% of growers were aged between 55-64 years and 7% growers were over 65 years of age.

The majority of service provider respondents were within the same age bracket, 25 and 54 years of age (71%), 18% were aged between 55-64 years and 8% were over 65 years of age. No growers or service providers under the age of 25 participated.

Age demographic was not requested of the transport and wholesale/retail stakeholders.

Only one grower completing the survey nominated a language other than English as their first language. All service providers stated English as their first language.

Only 10% of growers interviewed were involved in protected cropping.

Root crops (45%), brassica (43%) and leafy vegetables (36%) were the most common vegetables produced by growers even though root crops were not targeted by the survey. Most growers listing 'other' were growing herbs (Figure 1). These 3 vegetable crops were also identified by service providers as being most commonly serviced. Service providers tended to cover a broad spectrum of vegetable crops. Leafy vegetables were predominant in both groups.

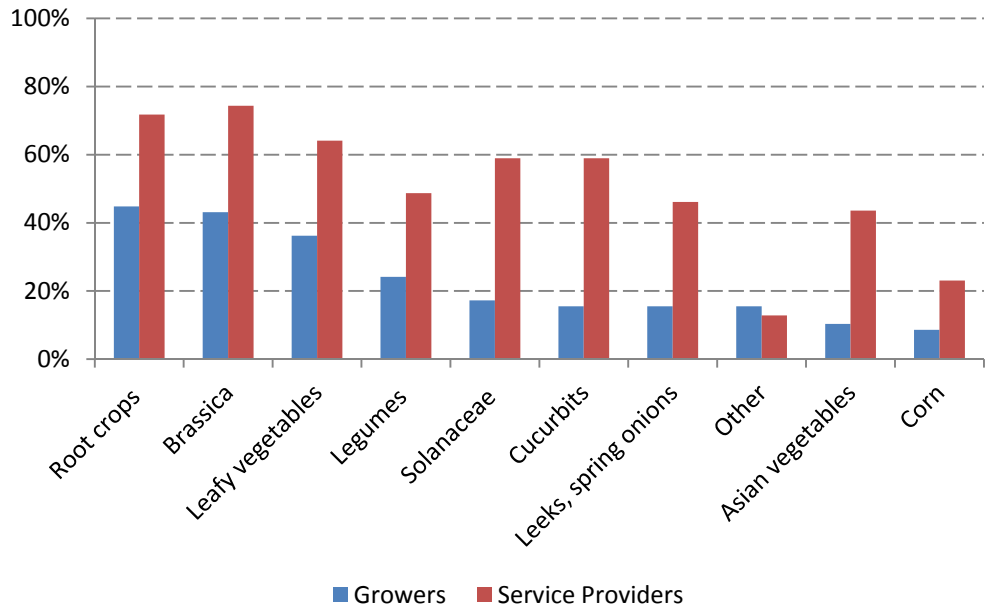

Figure 1: Key crops produced by growers and managed by service providers

The majority of growers planted between 25 hectares to 250 hectares to vegetables each year (Figure 2).

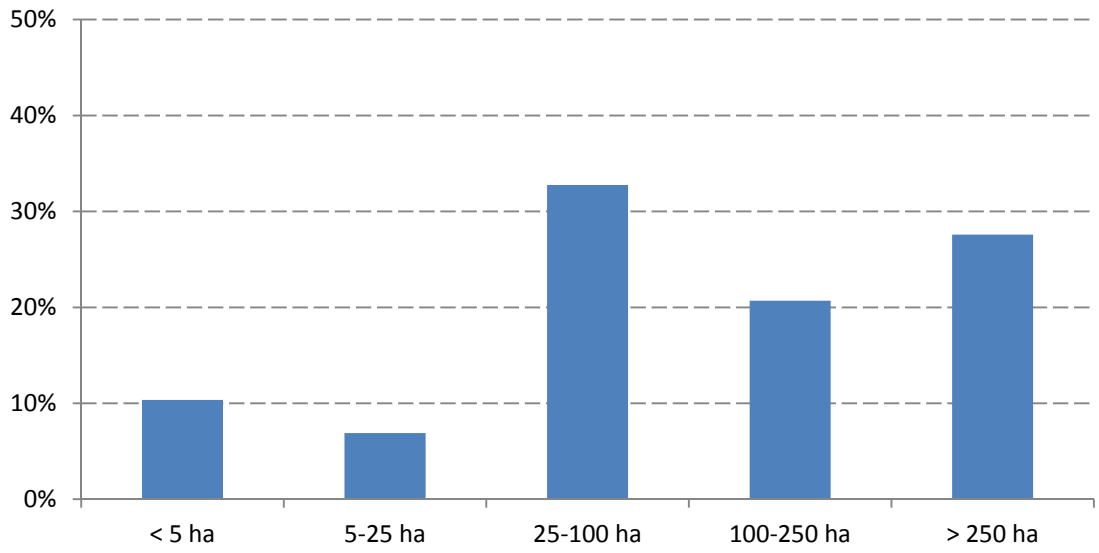

Figure 2: Number of hectares planted to vegetables each year

The majority of growers participating in the survey operated between 2 and 10 separate properties for vegetable production (59%) (Figure 3). The median number of separate properties operated for vegetable production was 3.

Figure 3: Number of separate properties operated for vegetable production by individual farm businesses

The median number of permanent staff among vegetable growers surveyed was 6 and the median number of seasonal workers was 25.

The minimum number of trucks operated by a transport provider was 12. A mean could not be determined due to some responses indicating the use of multiple trucks depending on demand.

Service providers were predominantly larger companies with greater than 50 employees reflecting the presence of multinational companies servicing agribusiness in Australia in general. The next

largest group was in the bracket of 2-10 employees representing more specialised businesses servicing the vegetable industry directly.

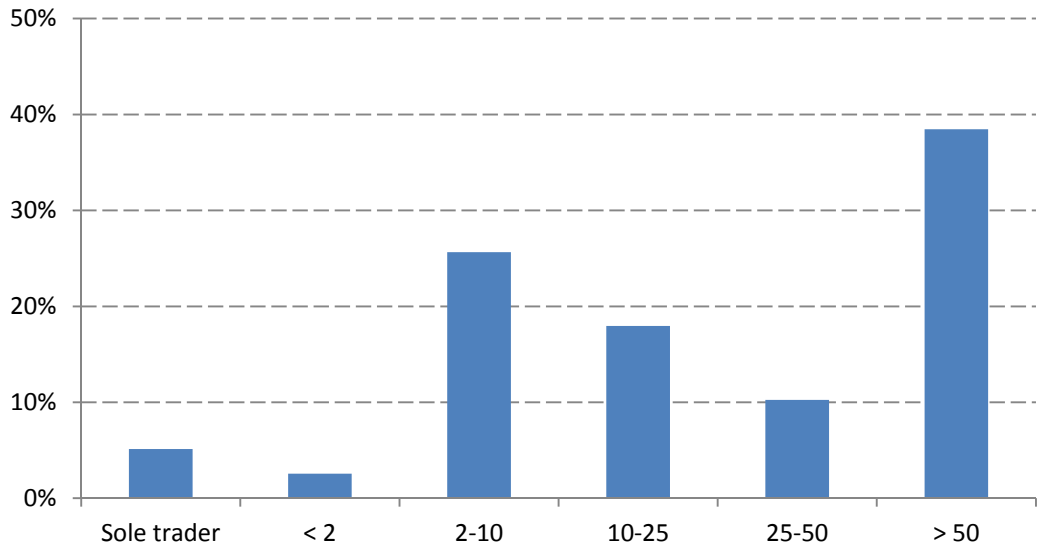

Figure 4: Number of employees reported by service providers

In respect to growers, the most common role in the business of respondents was owner / operator (45%), this was followed by supervisor / manager involved with production (41%) and owner / operator involved with supervising / managing (41%).

Some service providers surveyed undertook more than one role (Figure 5). 67% of service provider respondents were agronomists/field officers, many of whom do not specialise in vegetables. 44% were consultants to vegetable industry, and extension officers represented 13%. Sales representatives and seed supplies collectively comprised 67% of the roles of respondents.

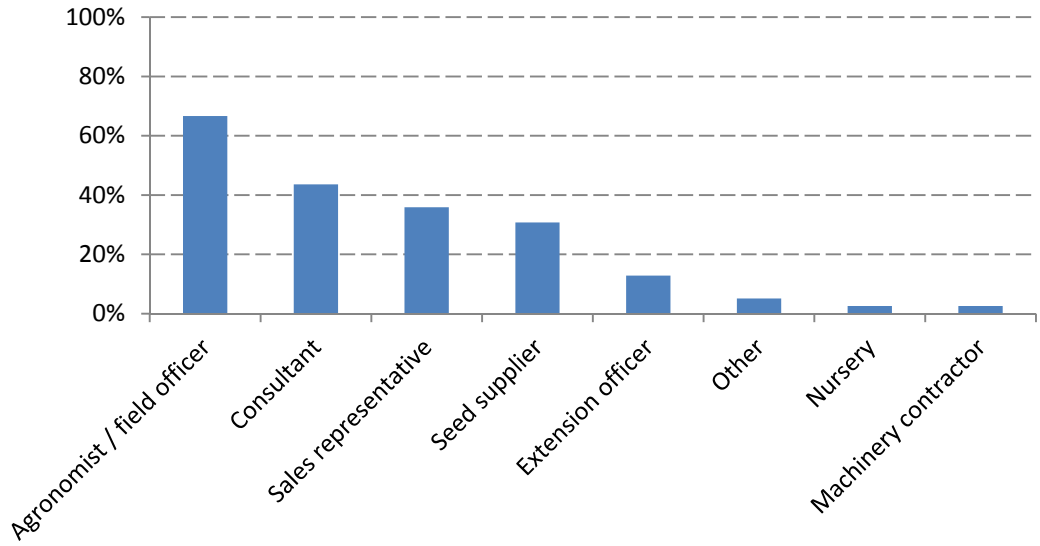

Figure 5: Role of service provider respondents

75% of transport survey respondents were management and 25% owner/operator. Half of the respondents were also undertaking vegetable growing activities whilst 25% were in retail and 25% wholesale activities.

The retailer/wholesaler survey respondents reflected a range of roles within the business with procurement, marketing, technical role and owner / operators represented in the majority with a slightly lower representation in respect to procurement and logistics. Two of the respondents represented major supermarket chains and as such indicated that they were across a range of roles (Figure 6).

The number of outlets that the wholesale / retail respondents therefore represented totalled 1506 but respondents were heavily weighted to the major supermarket chains.

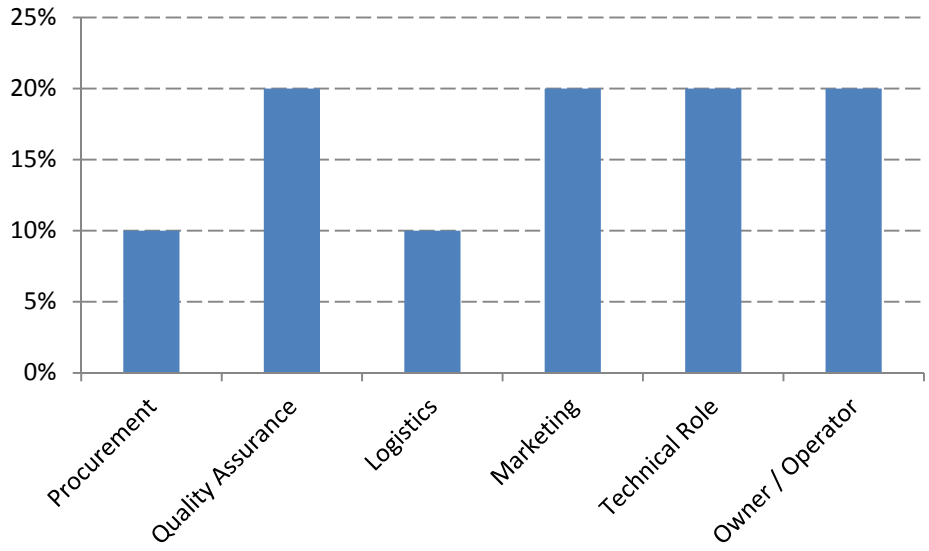

Figure 6: Role in business of wholesale/retail respondents

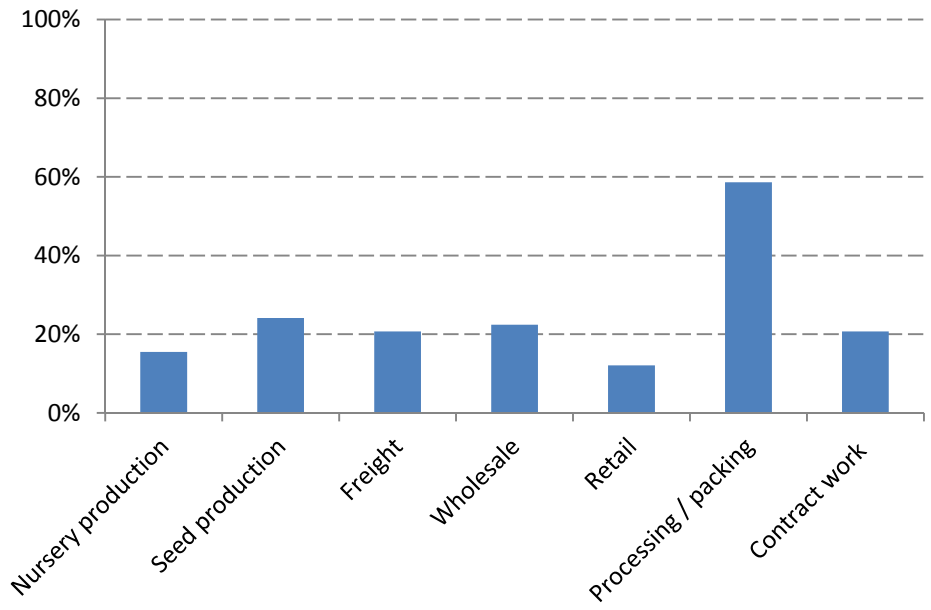

Figure 7: Additional roles to growing vegetables that growers nominated

Grower respondents undertake a range of additional roles with 59% processing and packing, 21% transporting their own produce and 34% involved in wholesale/retail (Figure 7).

3.2 Awareness

3.2.1 Purpose of Biosecurity

In response to the question "what does biosecurity mean to you?", growers and service providers overwhelmingly related the term 'biosecurity' to the concept of prevention (67% of grower's and 57% of service providers). Examples include:

- *"Preventative measures we can implement to ensure diseases do not enter Australia"*
- *"Protecting our industry from pests and disease"*
- *"Stopping disease/insects and pathogens coming in from overseas"*
- *"Protecting Australia's food chain"*
- *"Security for Australian plants and vegetables"*
- *"Stopping pests and diseases before they hit"*
- *"Pests and diseases that occur that I don't want to affect my crops"*

23% of growers defined biosecurity in terms of a goal or outcome:

- Protection 13%
- Security / Safety 11%

34% of growers defined biosecurity in terms of an action or activity:

- Stopping / keeping out 13%
- Inspection / checking 13%
- Managing / controlling 9%

68% of growers defined biosecurity within a geographical or institutional context:

- Individual 9%
- Industry 23%
- Region 13%
- Australia 30%

23% of service providers defined biosecurity in terms of a specific problem or service.

20% of service providers defined biosecurity in terms of control or containment.

Other themes emerging included:

- 21% of growers described biosecurity in relation to the on-farm management of pests and disease
- 9% of growers described biosecurity as involving pests and/or diseases, without providing any further context.
- 6% of growers provided a negative interpretation of biosecurity ("*a headache*", "*just paperwork*").
- 4% of growers said that biosecurity was not relevant to them.

Both growers and service providers nominated preventing out breaks (88% and 85% respectively) as the most important aspect of biosecurity in the vegetable industry (Figure 8)

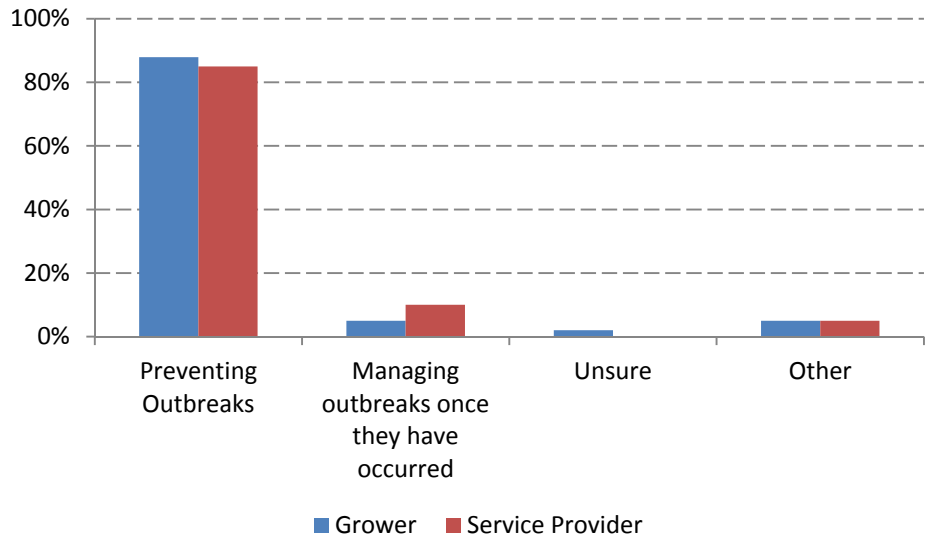

Figure 8: Rating of the purpose of biosecurity by growers and service providers

A separate question was asked of the wholesalers/retailers in relation to the relevance of biosecurity their business. 65% agreed that biosecurity added to costs in the business with 65% stating it created more paperwork and 85% extra procedures to follow. Only 15% agreed that biosecurity was not relevant to their business (Figure 9).

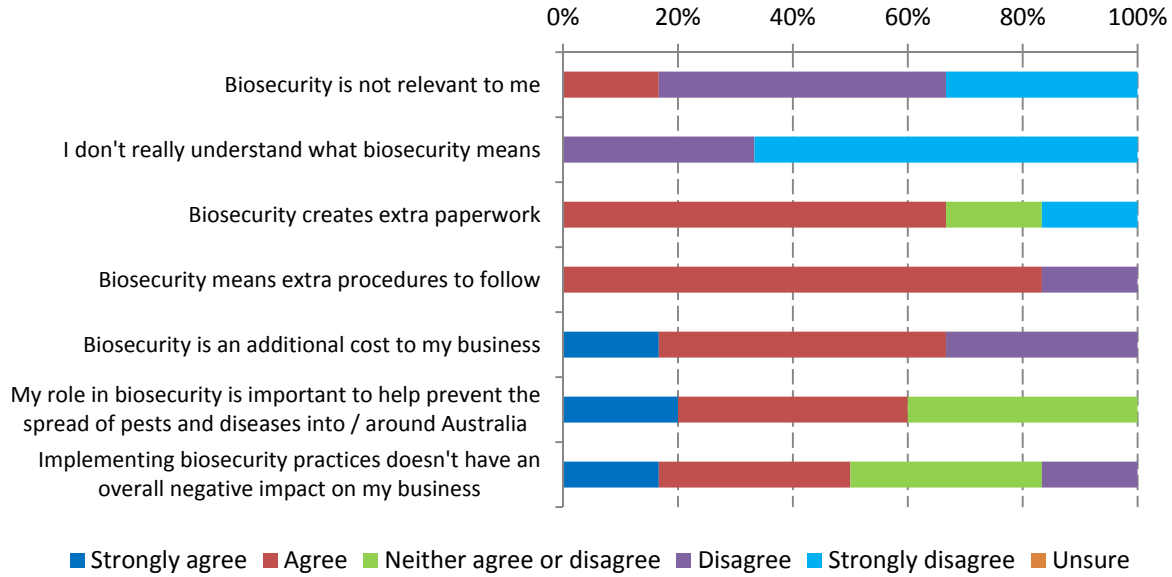

Figure 9: Summary of wholesale/retail understanding of biosecurity and how it impacts their business

In contrast to wholesale/retail, two thirds of transport respondents indicated that biosecurity was not relevant to their business (Figure 10), a third do not really know what biosecurity means, and 65% strongly agreed that biosecurity creates extra paperwork, additional procedures and additional costs.

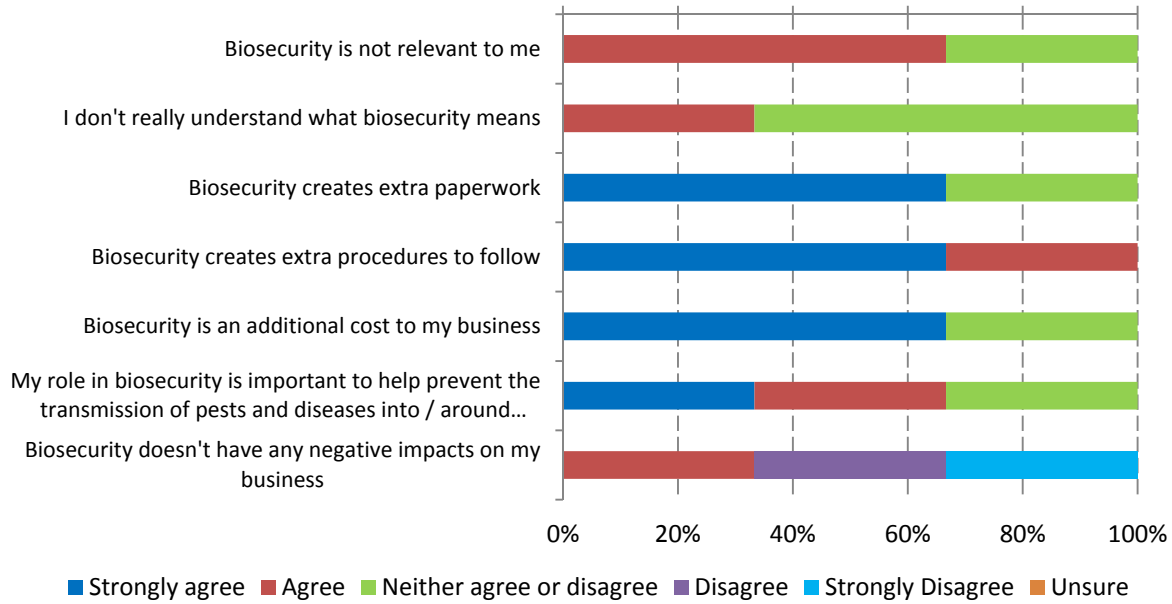

Figure 10: Summary of transport stakeholders understanding of biosecurity and how it impacts their business

3.2.2 Importance of Biosecurity

Growers' understanding on the importance of biosecurity for the vegetable industry was fairly consistent. All growers rated protecting their individual business and the Australian industry through biosecurity regulatory measures the most important aspect of biosecurity, with the majority of these growers (67% and 70%) indicating that protecting their business was the most important (Figure 11). Regulatory and market access requirements were considered to be less important by growers.

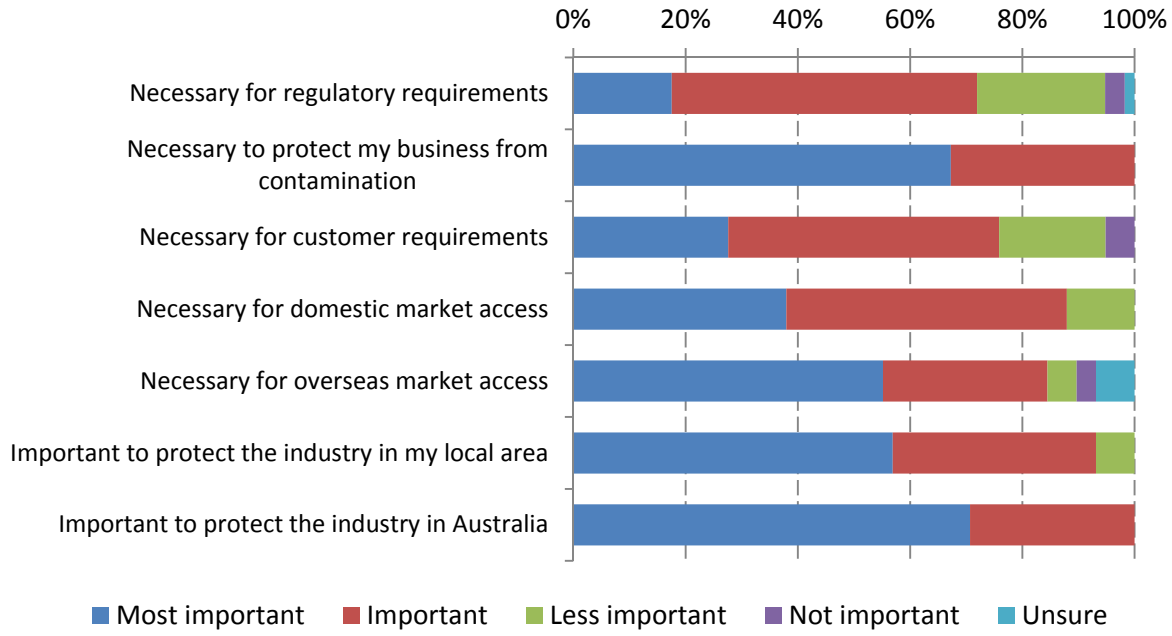

Figure 11: Grower rating of the importance of biosecurity

However, this result underrepresents true grower sentiment regarding the impact of a pest or disease incursion. A third (31%) of growers surveyed chose not to respond to the question as written and expressed their own views on the severity of the impact a pest or disease incursion could have on the vegetable industry as a whole. Some examples of this include:

- *"There may be an effect on markets but this is less important than the impact on cost of production"*
- *"Dramatic impact if there was an incursion … industry has their head in the sand very reactive instead of being proactive."*
- *"Could be devastating to all of the above obviously depends on what outbreak."*
- *"… it is very important that Australia regulates what comes into Australia, it is OK to bring things in but has to be checked."*
- *"All categories very high, protecting the borders is a huge issue."*
- *"… biggest threat we have that if we replace supply from overseas this compounds the problem and creates domestic market problems especially if people see them as better, cheaper etc.."*

- *"Increased cost of production, increase use of chemicals … sometimes control options (e.g. chemicals) might not be available."*

Growers that had experienced an incursion rated the requirement for overseas market access as a lower importance than those that had not experienced an incursion.

Service provider understanding of why biosecurity is important was similar to growers in that the main importance was protecting the industry in Australia but also just as important was the protection of local industry and the need for overseas market access (Figure 12). Not variation in the responses to these questions was seen if the service provider had or hadn't experienced an incursion.

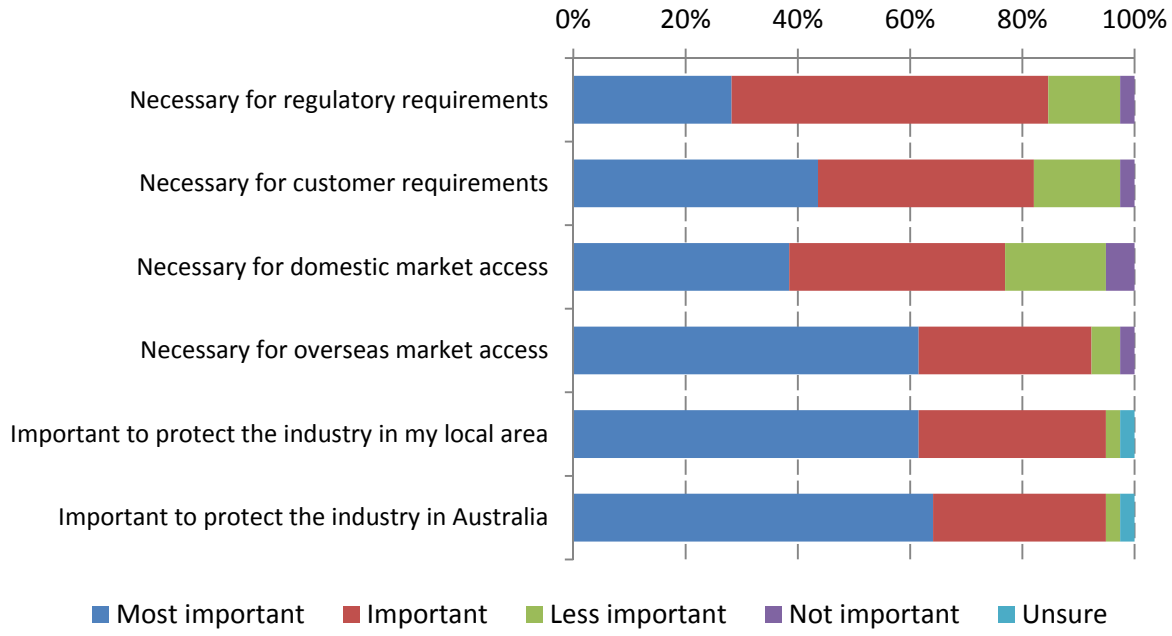

Figure 12: Service provider ranking of the importance of biosecurity

Wholesalers and retailers indicated that biosecurity is important for the industry both nationally and locally but rated the requirement for regulatory and customer requirements the least (Figure 13).

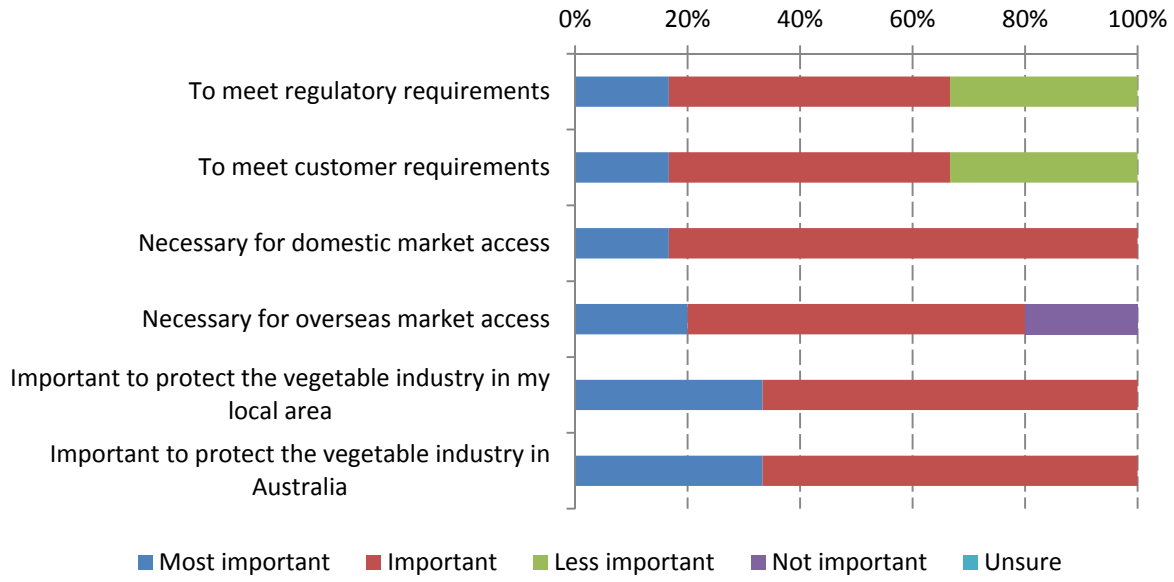

Figure 13: Wholesale/retail respondents ranking of the importance of biosecurity

The transport sector focus was predominantly on meeting regulatory requirements and 50% believed that biosecurity was not important, but interestingly 100% of transport respondents stated that biosecurity is important to protect the vegetable industry in Australia (Figure 14).

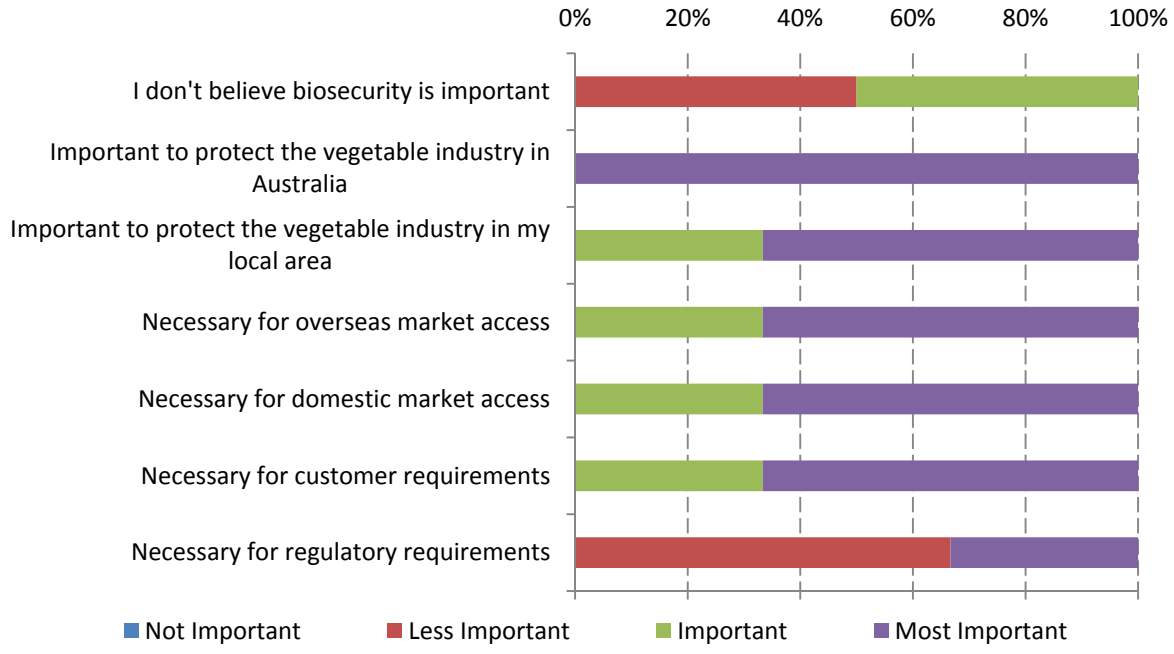

Figure 14: Transport respondents ranking of the importance of biosecurity

3.2.3 Impact of an incursion

Grower responses to the potential impact of a hypothetical incursion revealed that an increased cost of production is perceived to be the biggest potential impact followed by opportunity for overseas products to supply the Australian domestic market (Figure 15)

- Increased cost of production (80%)
- Overseas imports permitted to meet market demand (78%)
- Loss of overseas markets due to biosecurity / quarantine restrictions (76%)

Service providers rated loss of overseas markets followed by increased opportunity for overseas imports as the two highest impacts from a potential incursion (Figure 16).

The least important impact perceived by growers and service providers was loss of local market image. In contrast the wholesale/retail sector rated loss of overseas markets due to image as the most important impact (Figure 17).

There was no or little variation in how the impacts of an incursion were rated by growers, based on whether they had actually experienced an incursion or not.

Service providers that had experienced an incursion rated loss of local markets, image and loss of growing regions higher than those who had not experienced an incursion.

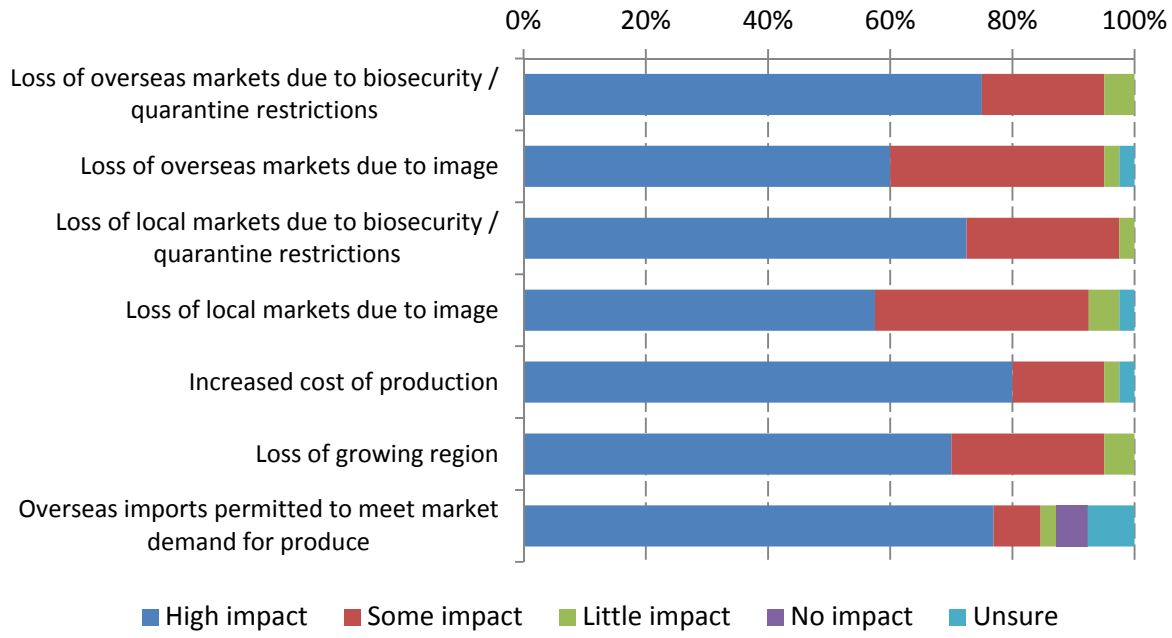

Figure 15: Grower perception of impact of potential incursion

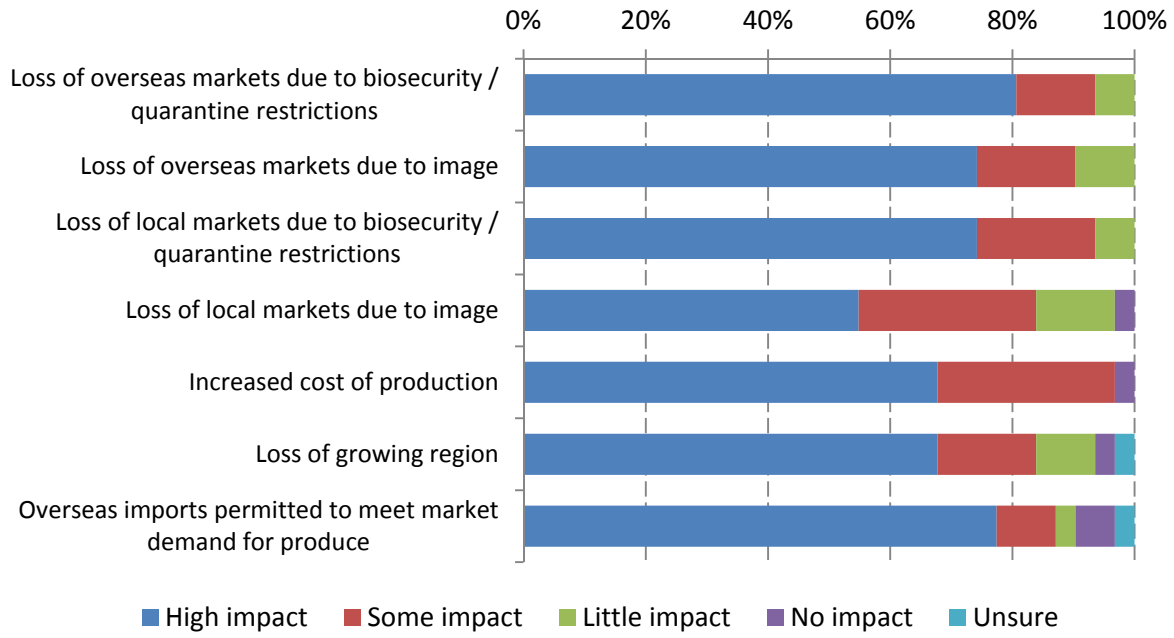

Figure 16: Service Provider perception of impact of potential incursion

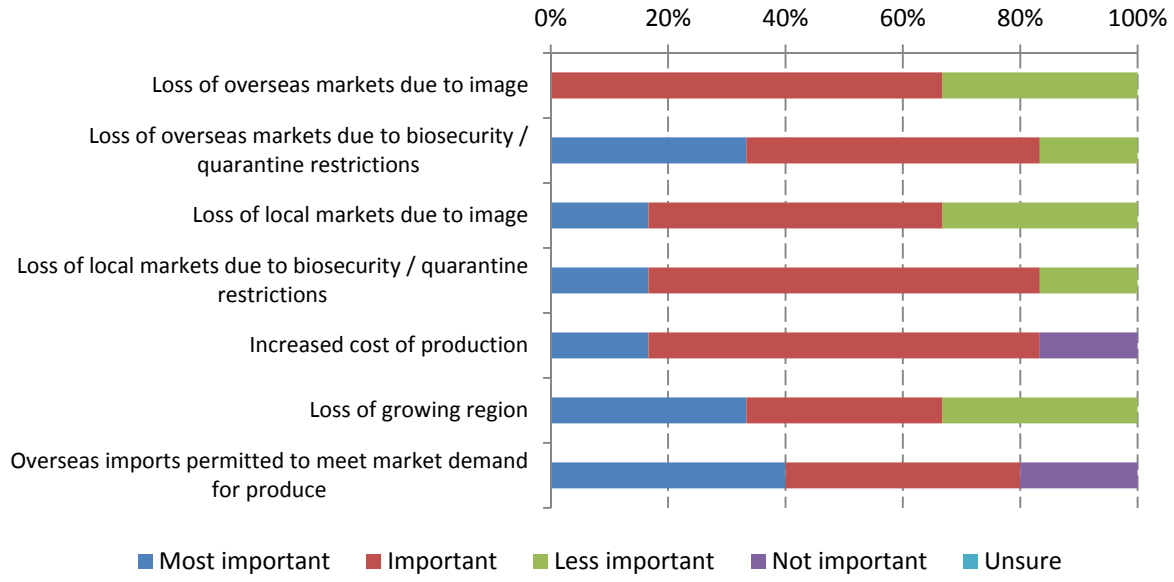

Figure 17: Wholesale/retail perception of impact of potential incursion

3.2.4 Risks

The majority of growers perceived inputs such as seed (81%), nursery stock (59%), reusable materials (76%) and contractors and machinery moving between sites as posing the main biosecurity risk for their business. Management practices of neighbours were also considered high risk to moderate risk by the majority (69%) of growers (Figure 18).

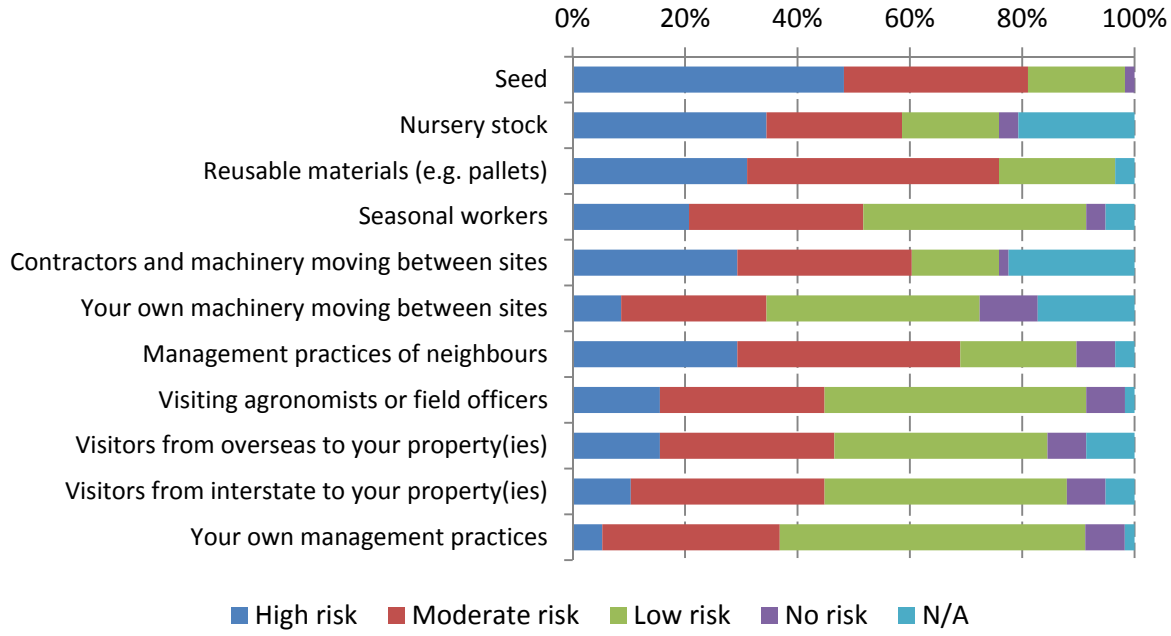

Figure 18: The main biosecurity risks identified by growers

The majority of service providers perceived their activities around the transfer of plant and soil material on clothes or shoes (77%), dirty machinery, equipment or vehicles moving between sites (67%) as important or most important biosecurity risks for the vegetable industry (Figure 19).

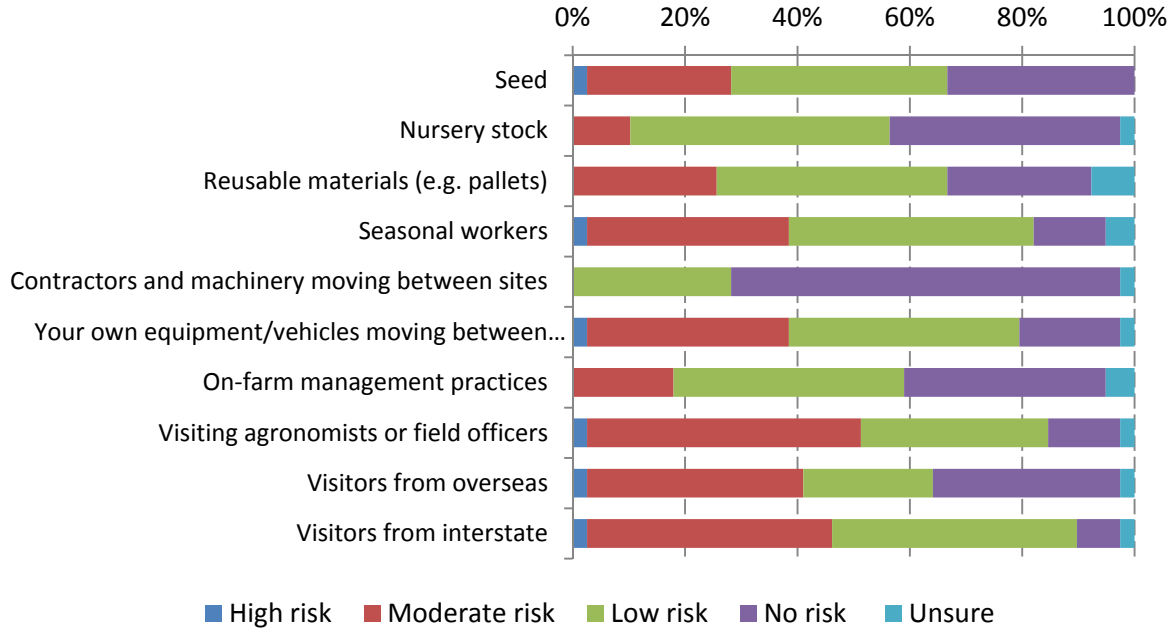

Figure 19: The main biosecurity risks to industry identified by service providers

Wholesalers / retailers believe they pose to risks to vegetable industry biosecurity mainly through the inability to recognise and diagnose potential problems (80%) (Figure 20).

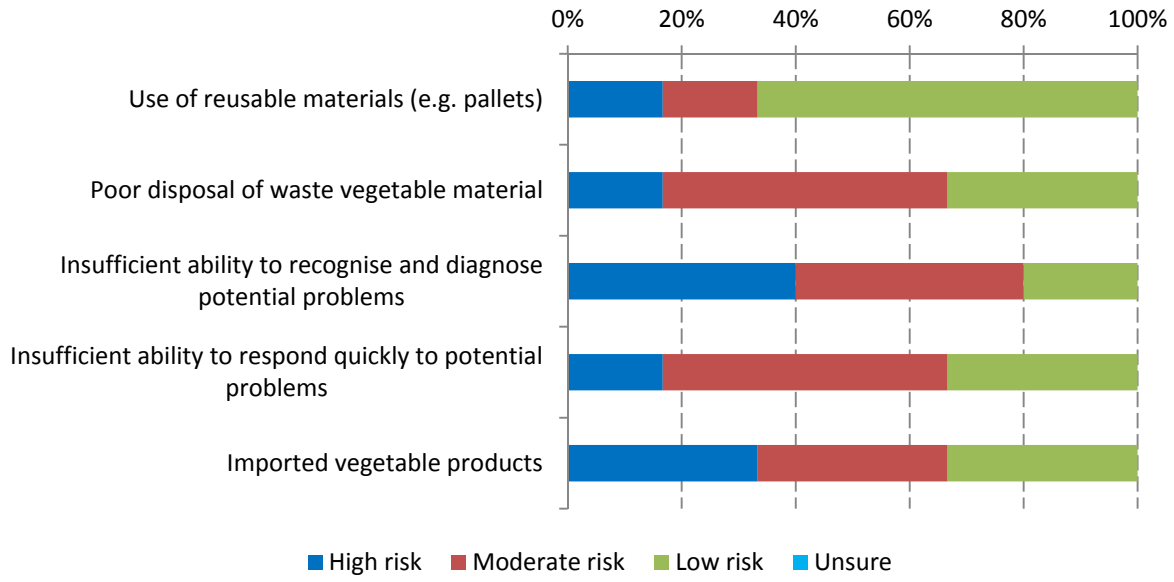

Figure 20: Biosecurity risks that the wholesale and retail sectors believe they pose to the vegetable industry

3.2.5 Previous incursion experience

Around a third of growers interviewed (29%) reported experiencing a biosecurity incursion. The majority of these indicated that the event had increased their cost of production. Some examples include:

- *"… unable to send produce to some markets due to Lettuce Aphid and had to use extra chemical control on their crops which was an increase in cost to the business."*
- *"Fire ants were found 5 km from property … unsure of what is going to happen due to the lack of communication … if the area is declared then it will require washing everything down/checking everything."*
- *"… asparagus rust 10 years ago … DPI did research work to formulate ways to combat the problem … didn't affect the business greatly besides production cost going up slightly."*
- *"Beetle in seed imported from Asia … seed was isolated from the rest of the seed and the shipment was sprayed."*
- *"Bacterial … disease first asked a neighbour and he did not know what it was so he asked an agronomist, they identified but there was no remedy and a loss in production. They cannot grow the same crop in that soil."*
- *"White rot … not sure how it came in … pickers or machinery? On all occasions where found they removed the soil up to 12inches. It impacted their business by increasing cost of production and decreasing yield. "*
- *"… carrot virus …asked agronomist, who didn't know … approached DPI to test, which confirmed it was a virus. Don't know how it arrived, but it is transmitted by insects (but not sure which one/s) … was a problem for 3 years then just disappeared … spray to control insects and prevent the virus …crop completely unsaleable …massive increase in cost of production."*

Around two thirds of service providers and similar number of wholesale/retail respondents indicated they had experienced a biosecurity incursion. Of those service providers who had experienced a biosecurity incursion a third were involved in the provision of advice on pest / disease management. Other impacts of biosecurity incursions reported by service providers included following stricter hygiene protocols (26%), an increase in business (21%) and other service providers that experienced a loss of business (11%).

Examples include:

- *"Lettuce aphid … growers had to get permits for selling interstate, involved with program to control the pest."*
- *"White blister on brassica's looked internationally for products which worked on that disease, implemented trials to test products and recommended these to growers."*
- *"Lettuce aphid worked on it after it was found in certain areas, by looking at weed and other hosts to try and work out how it was moving."*
- *"Lettuce aphid found during routine scouting by agronomists. Specimens sent to DPI for identification … of product restricted … containment processes implemented"*
- *"Lettuce aphid found through crop scouting … additional control methods for the specific farm and had no major impact other than control measures became common practice within his business and with the farmers he dealt with."*

30% of Wholesale/retail indicated that they had not experienced an incursion. For those that had experienced an incursion, 20% indicated they experienced an interruption to supply and similar numbers indicated that the incursion created extra paperwork and supply was maintained by sourcing product from elsewhere in Australia. But only 10% indicated that this damaged the industries reputation. No overseas product was sourced as a result of an incursion.

Only half of the transport respondents indicated having experienced an incursion, 25% indicated extra demands as a result and they believed that it damaged the vegetable industry's reputation.

3.3 Biosecurity Practice

3.3.1 Plant health certification

All stakeholders were asked what degree of plant health certification/quality assurance is required for their business to operate.

Half of the growers, wholesalers and retailers responded that they require plant health certification to operate within areas with biosecurity requirements. In contrast, only 15% of service providers required certification to operate with 64% of service providers not requiring any certification requirements to operate (Figure 21).

A small majority of growers reported supplying regions within Australia which have biosecurity requirements / restrictions (52%).A similar number reported supplying regions within Australia

where no biosecurity requirements / restrictions exist. A smaller number of growers (12%) reported supplying international clients who required plant health or quarantine certificates.

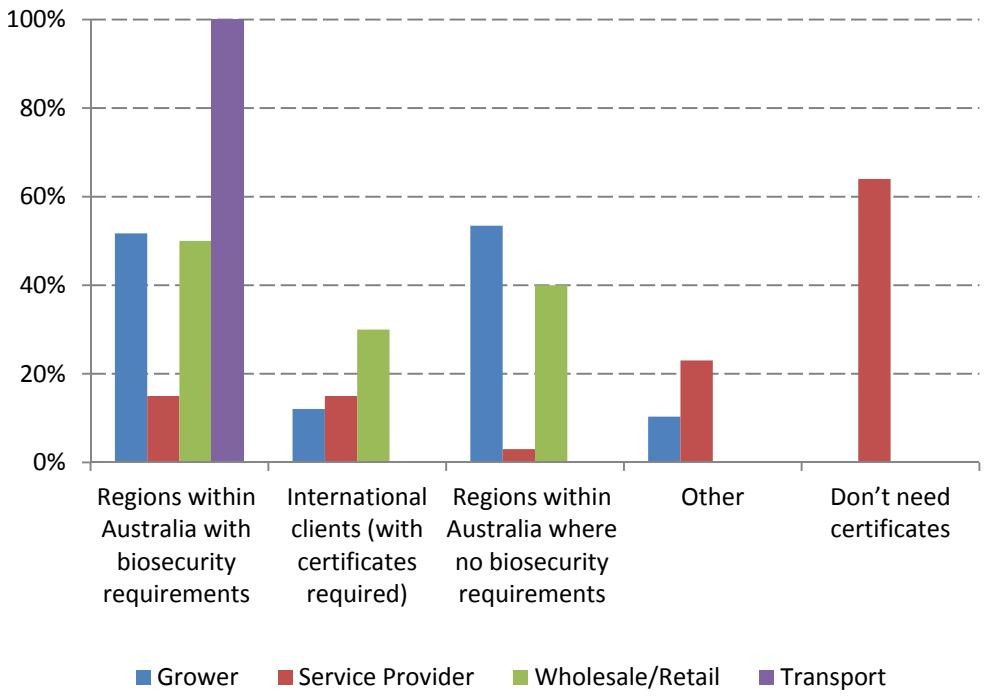

Figure 21: Plant health or certification requirements and their impact on business

Maintaining an accredited quality assured scheme was also a commonly reported biosecurity practice by growers (90%), transport (75%) and all wholesale/retail respondents had some form of quality assurance scheme (Figure 22).

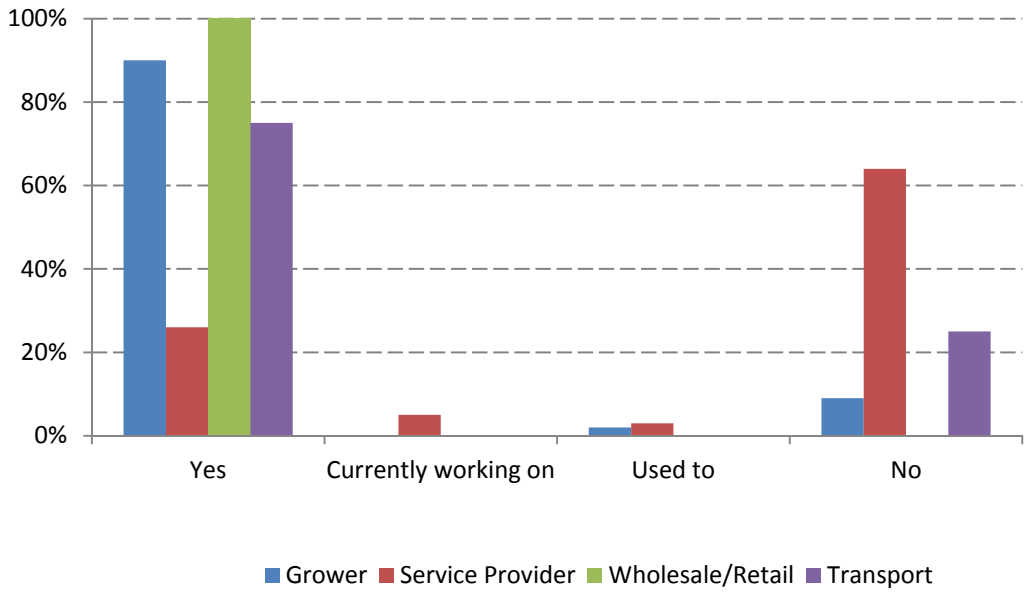

Figure 22: Levels of quality assurance implementation by stakeholders

Around a quarter (26%) of service providers indicated they maintain an Accredited Quality Assured scheme, 64% did not and 5% were currently working towards being accredited.

The most commonly reported quality assurance scheme for growers was Fresh Care, grower interview responses suggested this practice was due to customer demand and biosecurity was only one component motivating this practice (Figure 23).

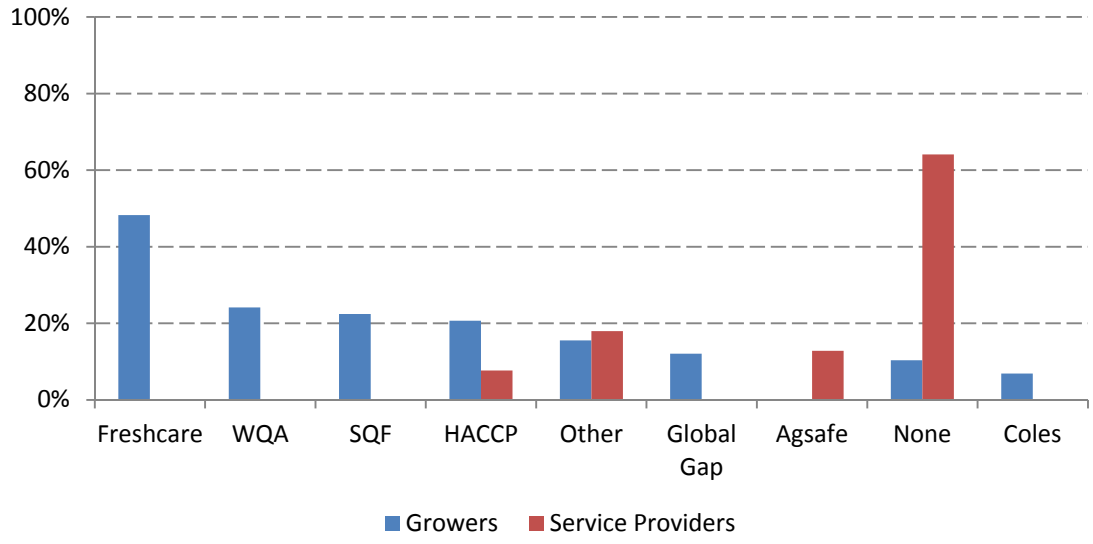

Figure 23: Grower and service provider accredited quality assurance schemes

3.3.2 Movement of vehicles and personnel

Around 70% of growers reported using vehicles, equipment or machinery on multiple properties and the same number of service providers indicated that their job frequently involved moving equipment or vehicles between different properties. A further 18% of service providers indicated their job involved infrequently moving equipment or vehicles between different properties (Figure 24).

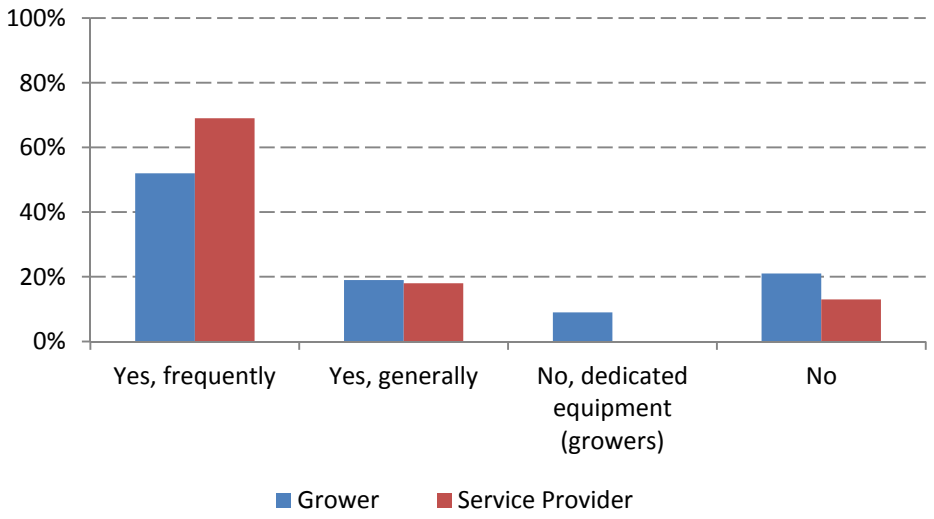

Figure 24: Movement of vehicles and machinery of growers and service providers

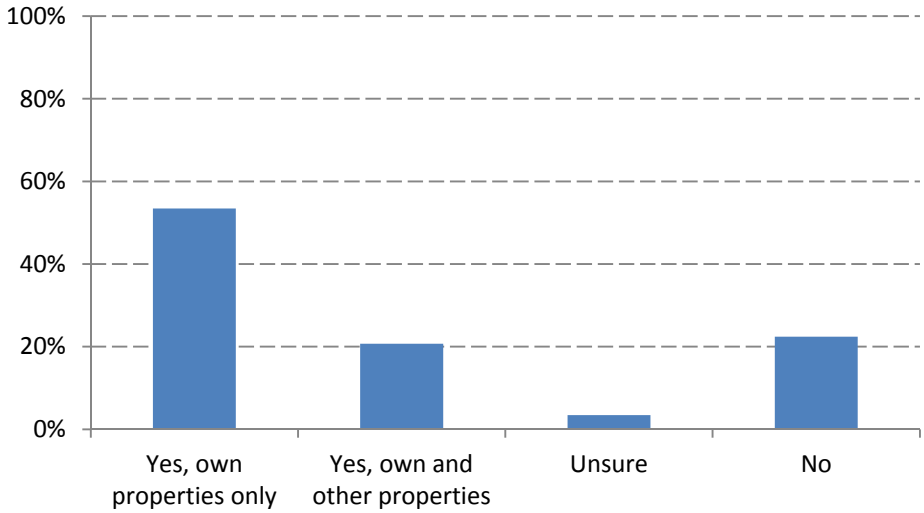

Figure 25: Movement of workers between grower properties

A combined 74% of growers indicated that they have workers move either between their own and other properties, only 22% had dedicated workers on farm that were not transient (Figure 25).

3.3.3 Biosecurity practices implemented

The biosecurity practice most commonly indicated to be standard practice for growers (Figure 26), service providers (Figure 27) and wholesale/retail respondents (Figure 28) was pest / disease surveillance within crop/produce, 100% of growers and wholesale/retail and 84% of service providers.

The next most common practice for growers was managing plant pests to prevent spread (97%).

Maintaining an accredited quality assured scheme was also a commonly reported biosecurity practice by growers (90%) whilst 75% of service providers indicated that they adhered to some form of program on farm. 85% of wholesale/retail respondents indicated purchasing from reputable suppliers is standard practice.

Other biosecurity measures used as standard practice by a majority of growers included purchasing planting material from a reputable supplier (91%) and checking planting material for evidence of plant pests or unusual symptoms (84%).

Using signage to communicate on-farm biosecurity issues were less commonly practiced among the growers surveyed with only 45% of growers displaying biosecurity signs at farm entrances, visitor parking areas or wash down facilities at least some of the time. This practice was also the least important for service providers within their own businesses. Over 70% of growers never display biosecurity signs in different languages for the workforce.

Over half the growers interviewed (57%) had procedures to ensure employee and visitor footwear was free from soil and plant material before entering or leaving the farm. However, only 36% of growers had special procedures for visitors and staff who have recently arrived from overseas. This may be due to a reliance on Australian Quarantine regulations which are perceived as adequate (Section 3.6.1). This may also be due to the number of overseas visitors and frequency of visits that some growers accommodate may be very low and hence perceive this risk as low.

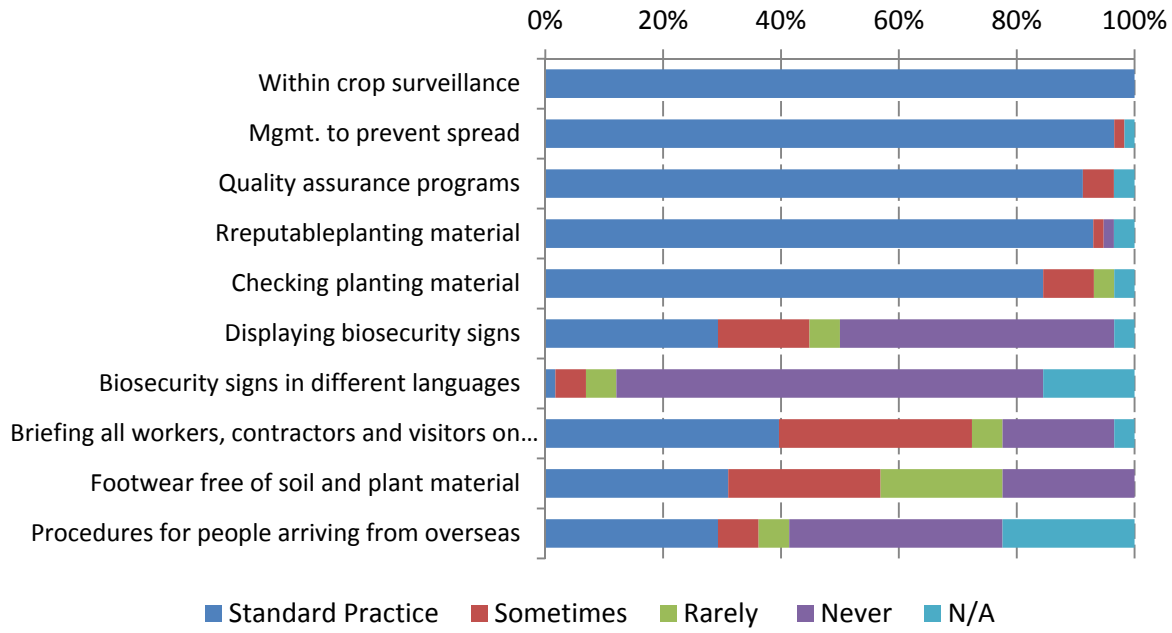

Figure 26: Biosecurity practices implemented by growers

When the grower response to practices implemented were further examined by segregating the responses for those that had experienced an incursion, only the practices of ensuring footwear free of soil and plant material and procedures for people arriving from overseas increased in the level of standard practice carried out compared to those that had not experienced an incursion. All other levels of standard practice remained the same or similar.

The majority of service providers indicated that they personally undertake all the biosecurity practices listed in the questionnaire as standard practice. The biosecurity practice most commonly indicated to be standard practice was pest / disease surveillance within crop (82%), the next most common practice was following biosecurity procedures on farms worked on (77%). The service providers that had experienced an incursion focussed more on checking plant material certification (increased from 15 % for those that had not experienced an incursion to 50% for those that had), checking plant material (increased from 32% to 65%) and were more likely to follow any special procedures (increased from 50% to 80%). The only standard procedure that decreased in the level of standard practice was that of displaying biosecurity signs, only 10% indicated this as standard practice for those that had experienced an incursion compared to 28% for the service providers who

had not.

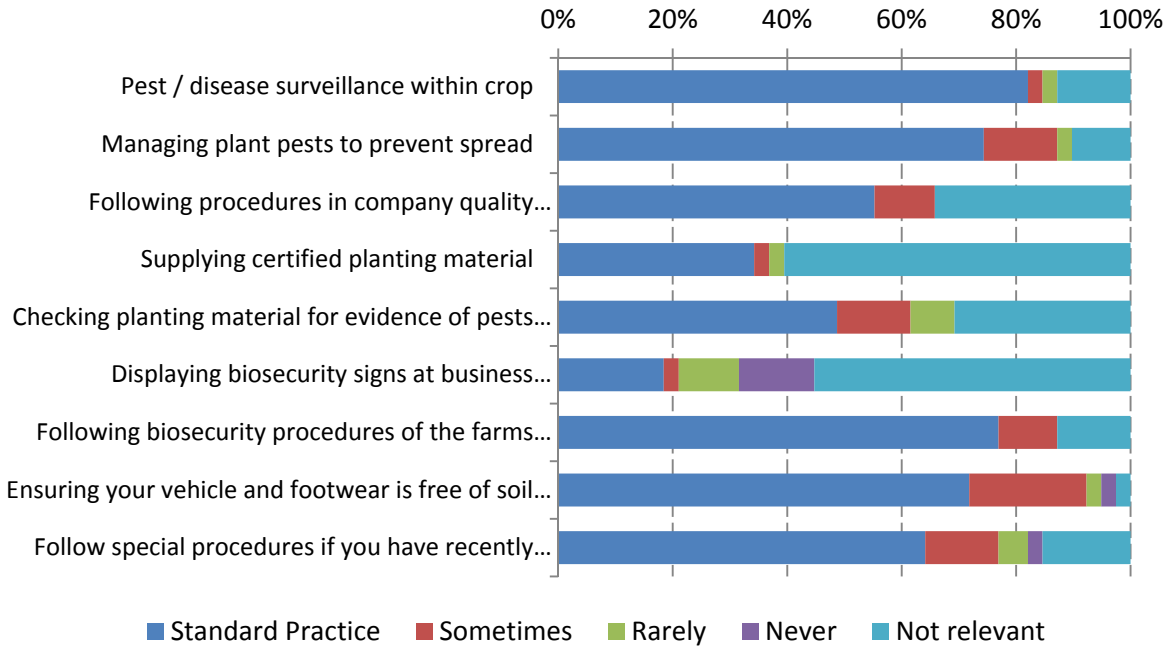

Figure 27: Biosecurity practices implemented by service providers

Service providers were also asked to rate on-farm biosecurity (Figure 27) practices as to whether they thought the practices were worthwhile growers implementing. The largest variance between what was indicated as standard practice and what is perceived as worthwhile practices was the purchasing of plant material from a reputable (certified) supplier (35% standard practice compared to 85% worthwhile) and checking plant material for evidence of pests (50% standard practice compared to 85% worthwhile).

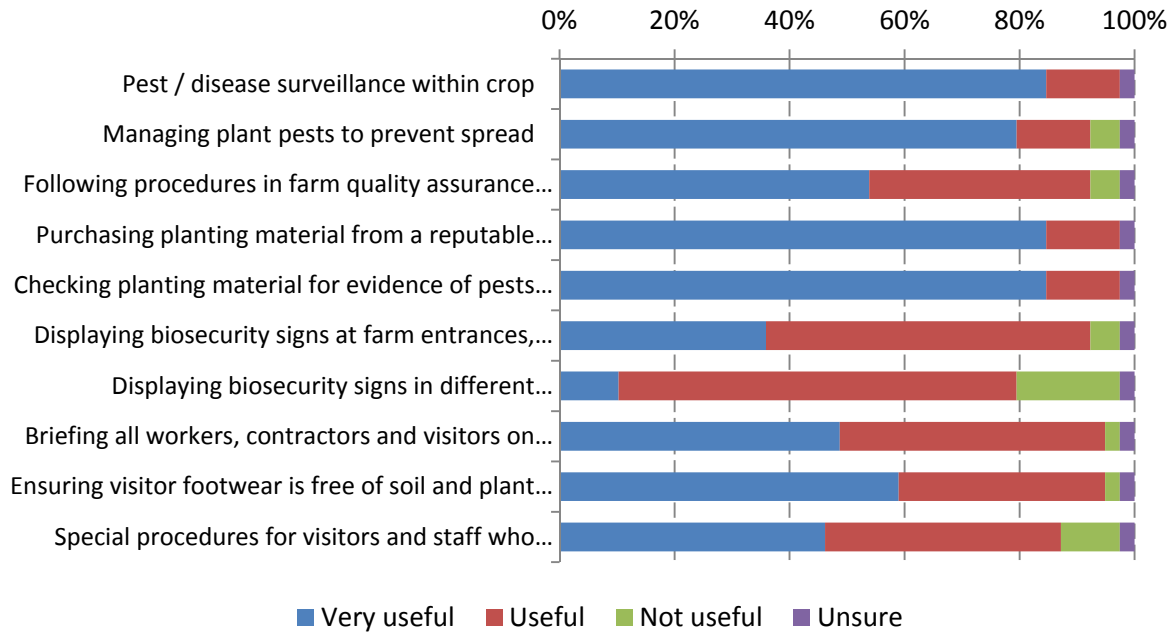

Figure 28: Service provider ranking of on-farm biosecurity practices as to what growers should be implementing

Wholesale/retail respondents indicated all practices asked are commonly standard practice other than the displaying of biosecurity awareness material in the workplace (Figure 29).

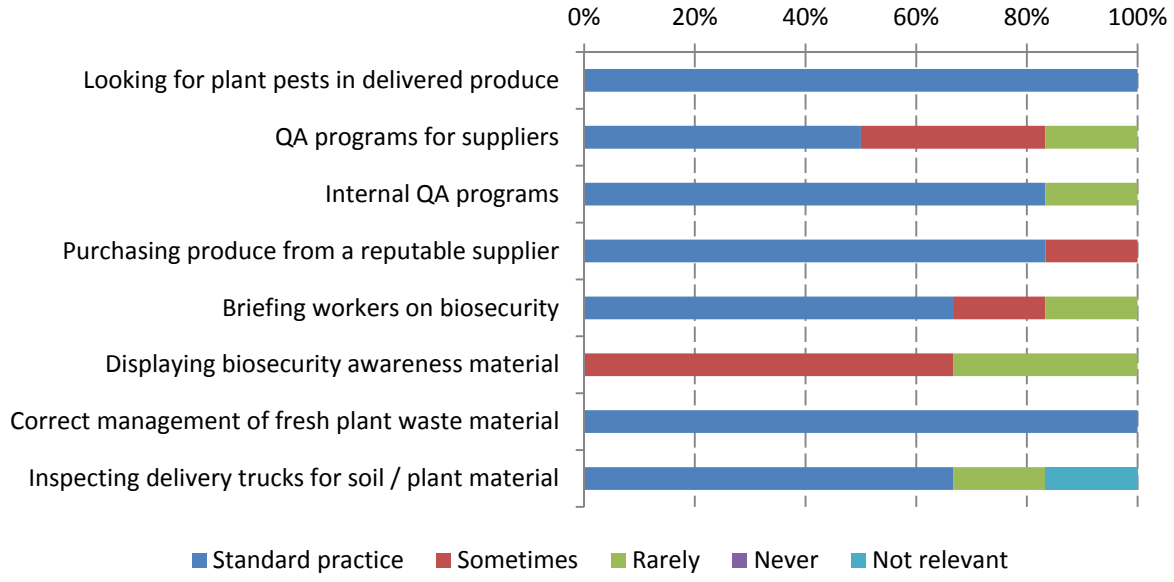

Figure 29: Biosecurity practices implemented by wholesale/retail stakeholders

30% of transport respondents indicated that all activities listed were standard practice and all respondents indicated that keeping a log of vehicle movements, quality assurance programs and correct management of waste material was standard practice (Figure 30).

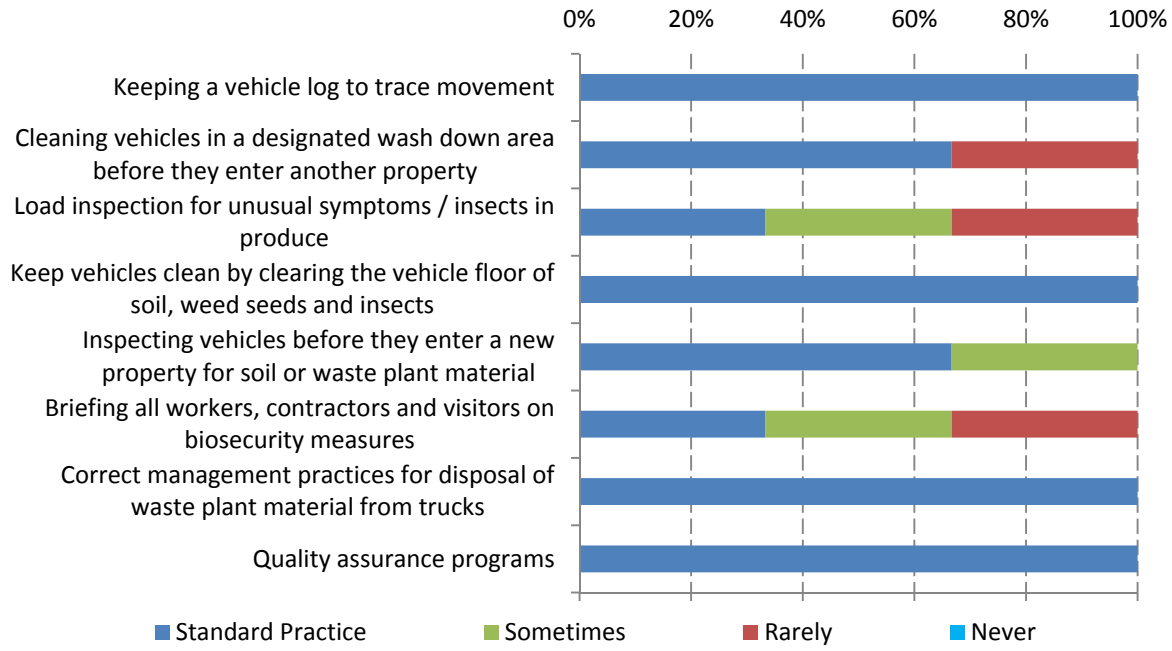

Figure 30: Biosecurity practices implemented by transporters

3.4 Barriers

Growers were asked to nominate the key factors that limit their business from adopting best practice farm biosecurity. A majority of growers (55%) reported cost pressures as being important as a factor limiting them from adopting best practice farm biosecurity (Figure 31).

Almost 20% of growers reported poor duty of care by contractors as a most important factor preventing their business from adopting best practice farm biosecurity. Staffing issues including language barriers (75%) and the transient nature of seasonal labour (68%) were most commonly reported as being less important, not important or not relevant.

Issues around the experience to recognise and diagnose potential problems (55%) and not sharing / providing relevant information to growers (47%) were ranked most important or important by a

majority of growers.

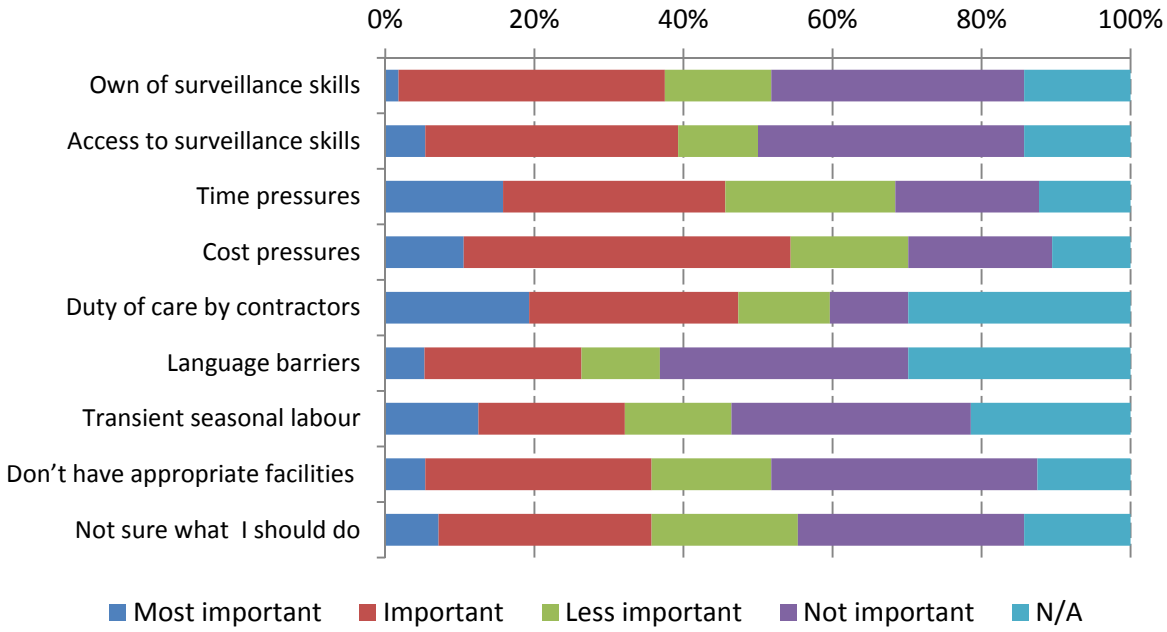

Figure 31: Factors limiting growers from adopting best practice farm biosecurity

Service providers were asked to nominate the importance of 11 factors potentially limiting them from adopting best practice biosecurity. The majority of service providers found most of these factors less important or not important (Figure 32). A majority of services providers indicated that poor duty of care by others in the industry as being important or most important as a factor limiting them from adopting best practice farm biosecurity (58%) and half of the service providers indicated poor duty of care by growers as limiting adoption of best practice.

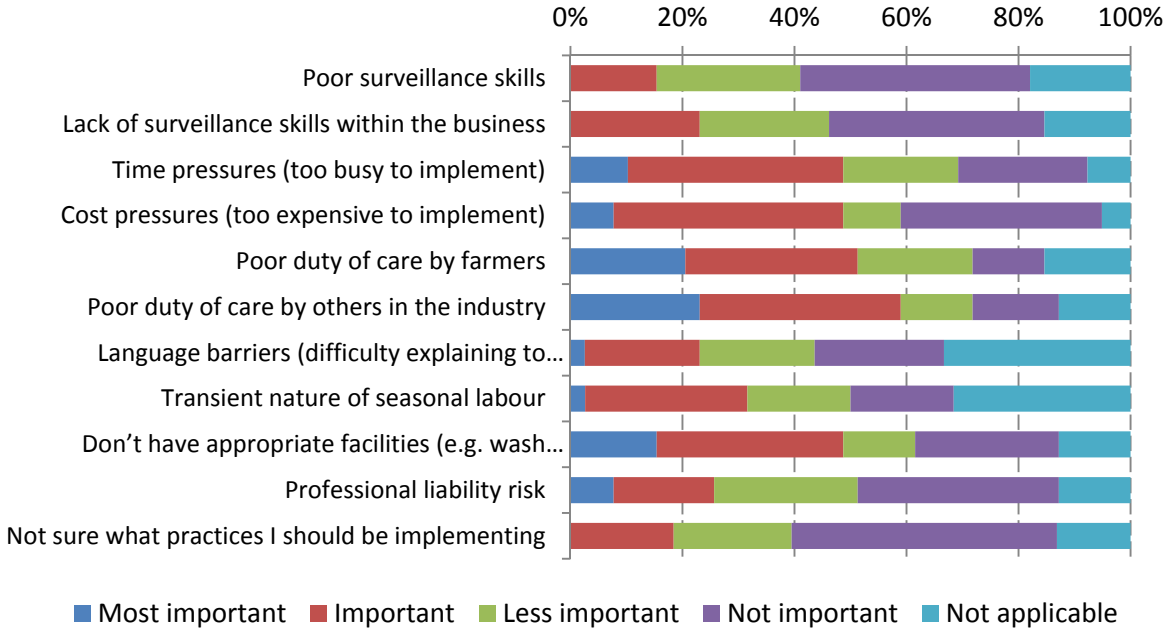

Figure 32: Factors limiting service providers from adopting best practice biosecurity

The majority of wholesalers/ retailers indicated that biosecurity was predominantly the growers' responsibility, not relevant to their business and quarantine services are sufficient to manage biosecurity. They do recognise that they are limited in their business by lack of diagnostic skills (Figure 33).

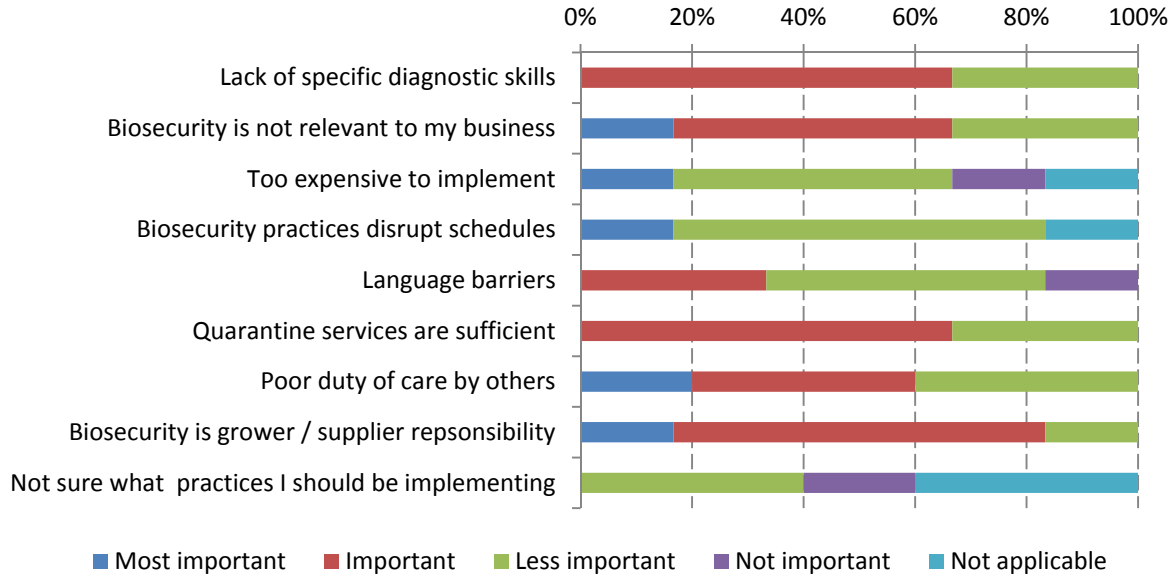

Figure 33: Factors limiting implementation of best practice biosecurity by wholesalers/retailers

All respondents from the transport sector indicated that biosecurity practices interrupt their schedules and the majority believe that biosecurity practices are too expensive to implement whilst being unsure of what practices to implement. Language barriers were deemed to be the least restriction (Figure 34).

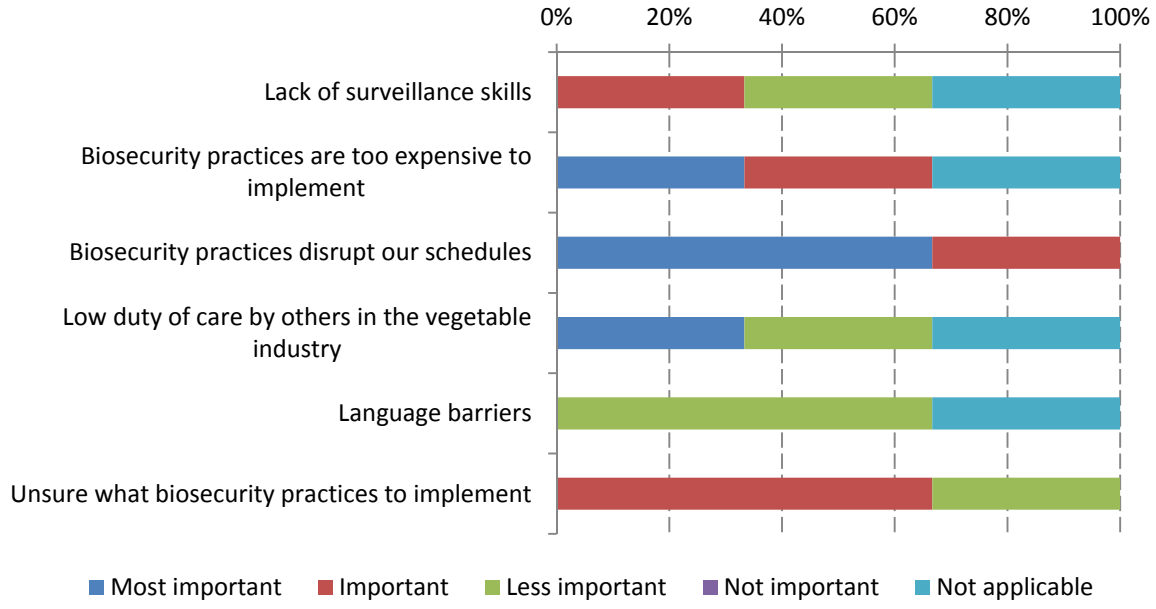

Figure 34: Factors limiting implementing best practice biosecurity measures by transporters

3.5 Preparedness

3.5.1 Incursion response

When asked about what is usually done when an unusual plant pest, weed or disease is found the majority of growers indicated they would contact an agronomist or field officer (79%) and isolate the area (52%). The service providers indicated that they would contact the relevant state government agency (64%) followed by consulting a colleague (46%). Wholesalers/retailers main response was to isolate the product and implement their biosecurity plan (50%) followed by contacting quarantine (30%) whilst transport respondents main action was to let the consignee know (50%).

Other common management measures by growers included contacting state government agencies (36%) and asking neighbours for advice (21%), implementing a full trace back (31%) and implementing a biosecurity plan (17%). Of the service providers 8% indicated that they would contact the exotic pest hotline for advice but only 1 grower indicated that they would use this hotline. No wholesale/retail or transport respondents indicated they would utilise the exotic pest hotline. Contacting the peak industry body (AUSVEG) rated relatively low in response to an incursion.

The response data was reviewed to examine variations in response based on whether the grower or service provider had experienced an incursion. Having experienced an incursion, growers were more likely to contact an agronomist or field officer, isolate the area, contact state government agency and implement a trace back. They did not indicate they would dial the exotic plant pest hotline (Figure 35).

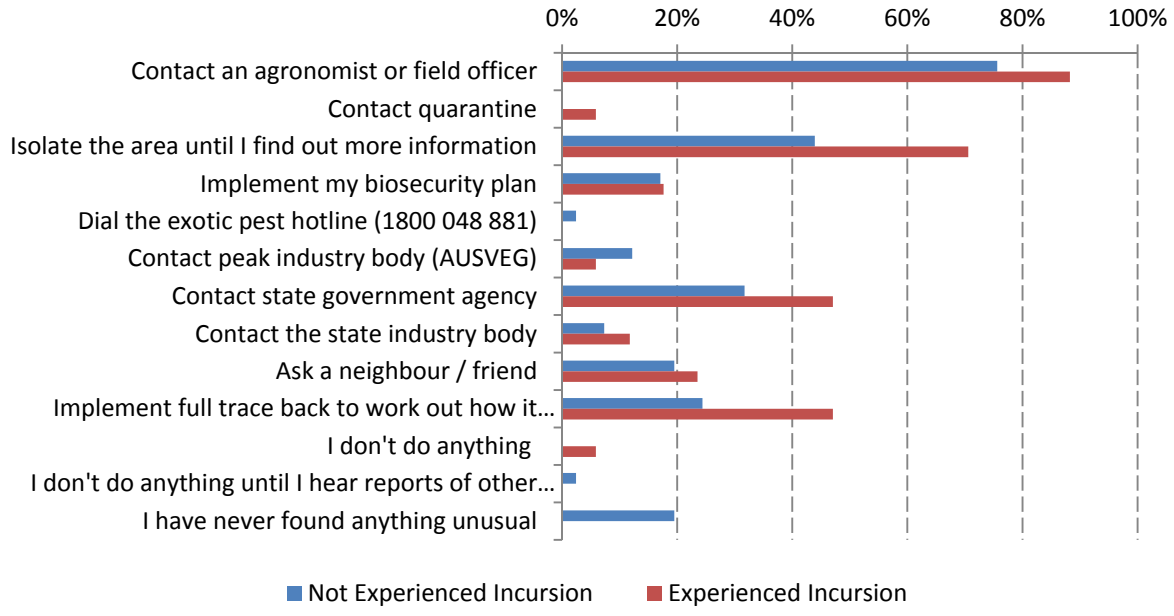

Figure 35: Incursion response differences based on previous incursion experience for growers

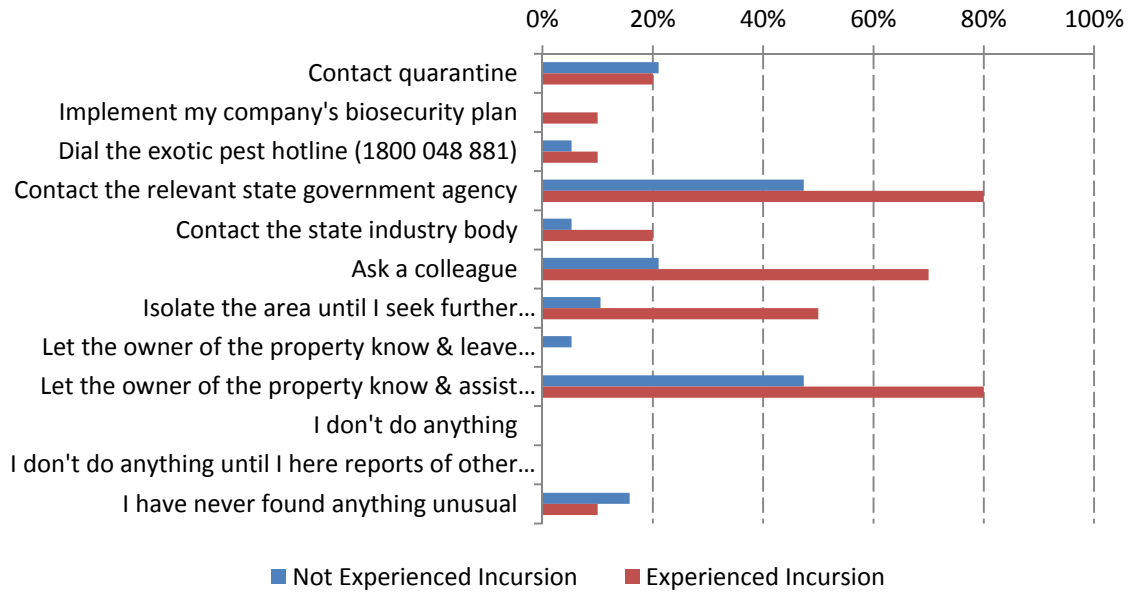

Figure 36: Incursion response differences based on previous incursion experience for service providers

Service providers that have experienced an incursion are more likely to contact a relevant state government agency, consult a colleague, seek further information and let the property owner know and assist them in dealing with it (Figure 36).

3.5.2 Rating stakeholders

When asked about other stakeholders along the supply chain most vegetable growers rated the biosecurity practice of nursery / seed suppliers (75%), other vegetable growers (63%) and field officers / agronomists (75%) as good or very good. Around a third of growers surveyed believe transport companies (28%) and vegetable retailers / wholesalers (31%) address biosecurity poorly (Figure 37).

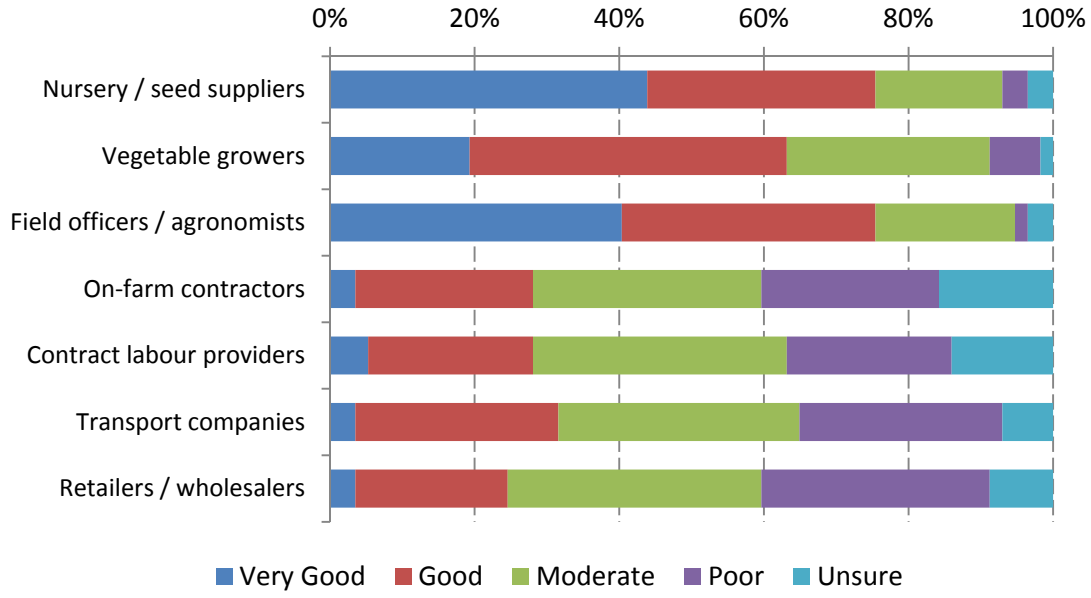

Figure 37: How growers rate themselves and other stakeholders in the vegetable industry in respect to biosecurity

Growers that have experienced an incursion rated themselves less favourably and indicated an even lower opinion of on-farm contractors and contract labour hire.

When service providers were asked about other organisations along the supply chain most service providers rated the biosecurity practices of nursery / seed suppliers (77%) and field officers/ agronomists (72%) as good or very good. Around a third of service providers (33%) believe on-farm contractors address biosecurity poorly (Figure 38).

Service providers that have experienced an incursion rated themselves higher than those that had not experienced an incursion but rated nursery/seed suppliers less favourably.

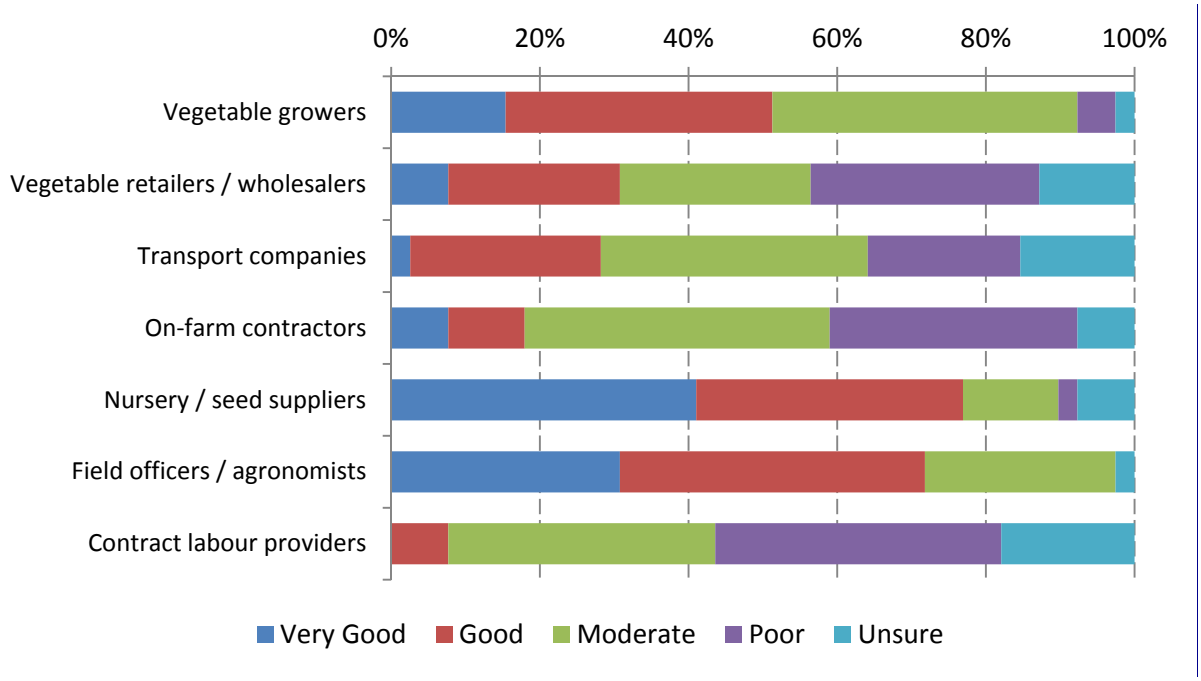

Figure 38: How service providers rate themselves and other stakeholders in the vegetable industry in respect to biosecurity

Wholesaler and retailer rated growers highly followed by their own sector, but rated contract labour hire the lowest with no response greater than moderate (Figure 39).

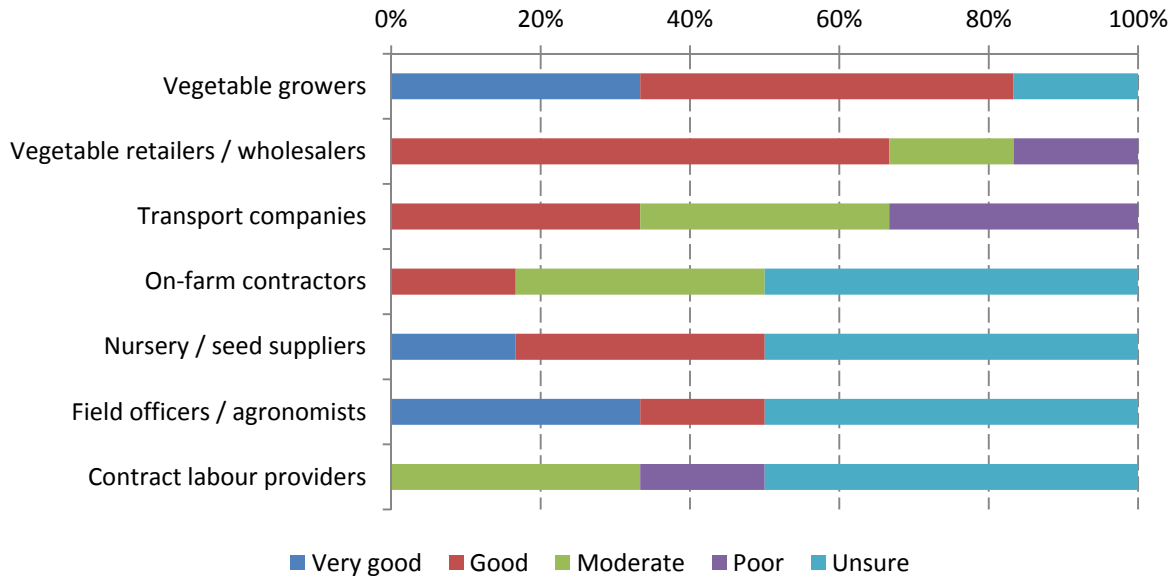

Figure 39: How wholesale/retail sector rates other stakeholders in the vegetable industry in respect to biosecurity

Transport sector opinions were high of all other sectors, the lowest being contract labour hire and on farm contractors (Figure 40).

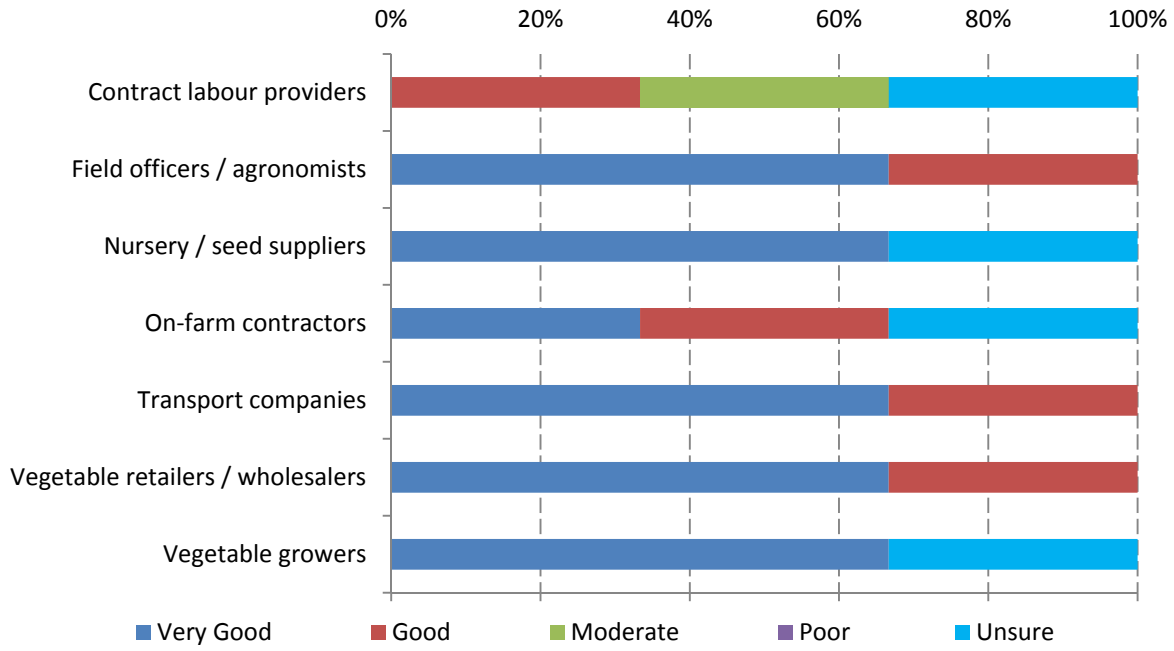

Figure 40: How transport sector rates other stakeholders in the vegetable industry in respect to biosecurity

3.6 Communication/Knowledge

3.6.1 Organisations

A summary from the desktop study of government biosecurity initiatives and projects is presented in in Appendix A.

The most important source of information about biosecurity as nominated by growers from a list was consultants/ advisors / agronomists, with 88% indicating this source as important or most important. 79% of growers nominated AUSVEG as a most important or important source of information about biosecurity (Figure 41).

The majority of growers surveyed nominated all groups on the list (except the Federal Government (DAFF)) as important or a most important source of information about biosecurity in the vegetable industry.

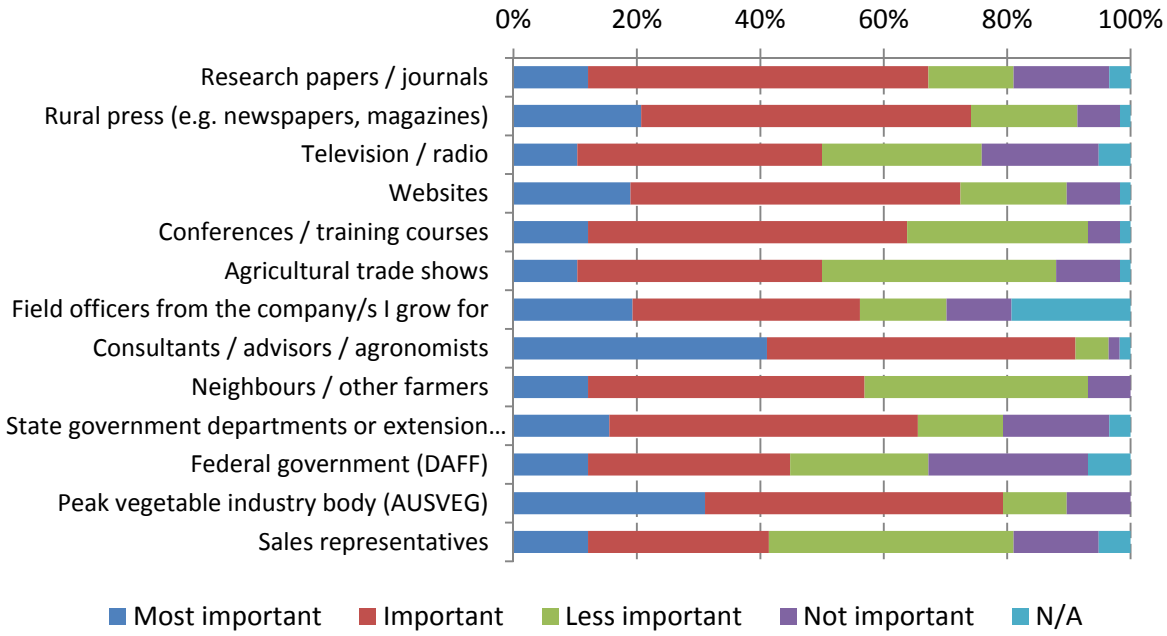

Figure 41: Grower ratings for information sources.

Vegetable growers on the whole nominated themselves as the group that plays the most important role for biosecurity in the vegetable industry, with 90% of growers surveyed indicated this group as most important or important. The next most important organisation was quarantine services (88%) followed by state industry bodies and the peak industry body at 78% (Figure 42).

The least important role in respect to biosecurity perceived by growers was that of Universities/specialist agricultural colleges.

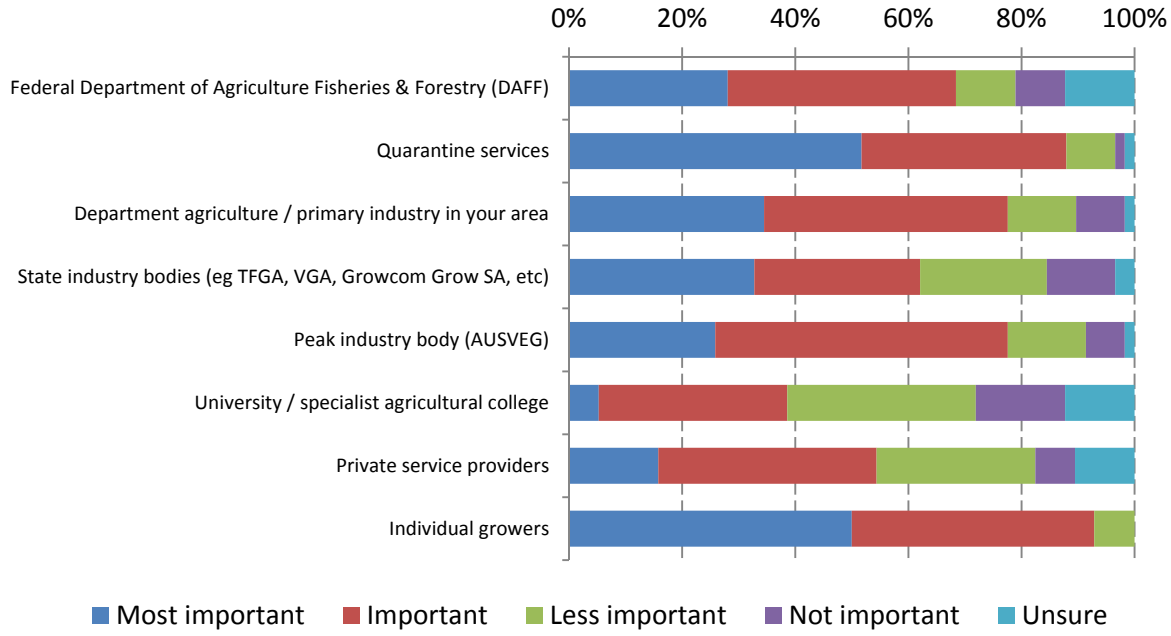

Figure 42: Grower rating of the role that organisations play in biosecurity

The most important source of information about biosecurity as nominated by service providers was other consultants/ advisors / agronomists, with 87% indicating this source as important or most important. Websites, conferences/training courses and colleagues all rated at 84% importance whilst 79% of service providers nominated AUSVEG as a most important or important source of information about biosecurity. Television/radio and agricultural trade shows were the least important role in respect to biosecurity (Figure 43).

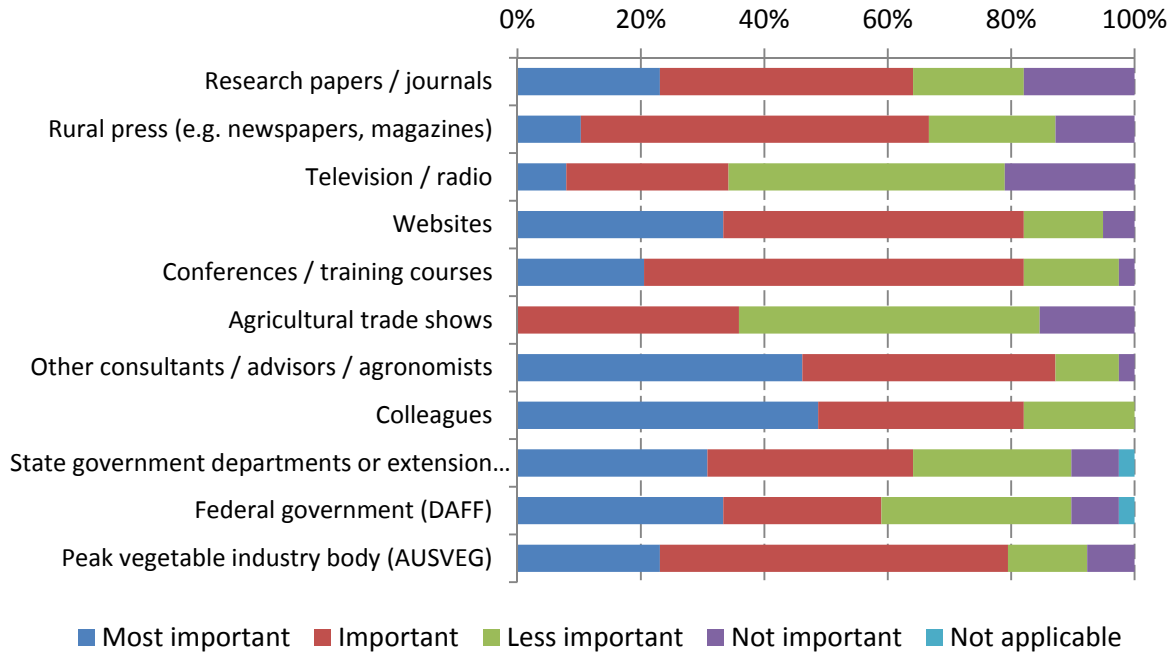

Figure 43: Service provider ratings for information sources

Almost all service providers nominated quarantine services as the group that play the most important role for biosecurity in the vegetable industry, with 97% of service providers indicating this group as most important or important (Figure 44). Service providers recognised growers as the next most important role (90%), followed by DAFF (82%) and the peak industry body (78%).

Similarly to the growers, the service providers rated Universities/ specialist agricultural colleges as having the least important role in biosecurity.

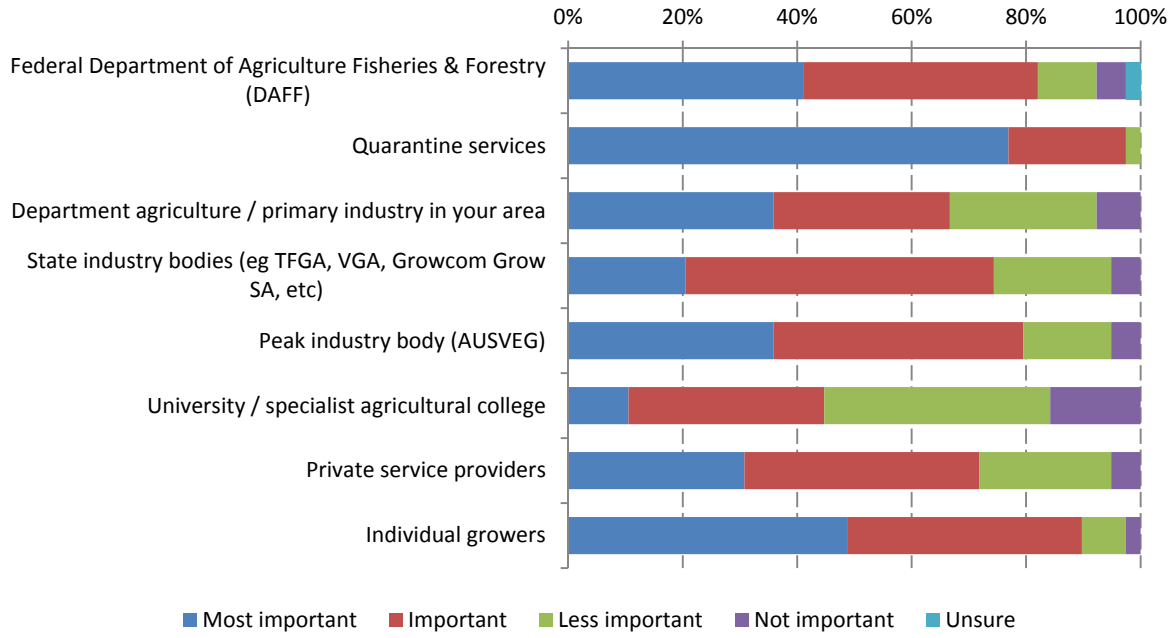

Figure 44: Service provider rating of the role that organisations play in biosecurity.

All of the wholesale/retail respondents indicated that state government bodies were the primary source of information in regards to biosecurity followed by DAFF at 84%, journals/industry press and consultants/advisors 66% and then the peak industry body (50%) (Figure 45).

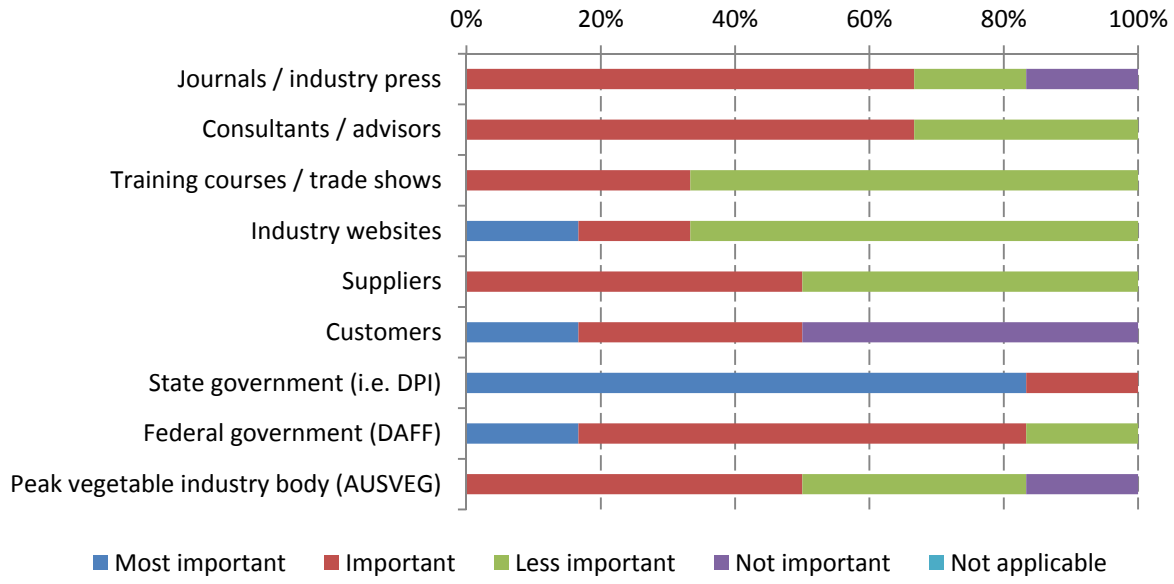

Figure 45: Wholesale/retail ratings for information sources

Transport sector rated the most important sources of information as state quarantine, their customers followed by DAFF and state government departments. AUSVEG rated less important than trade press/journals and trade shows/training courses (Figure 46).

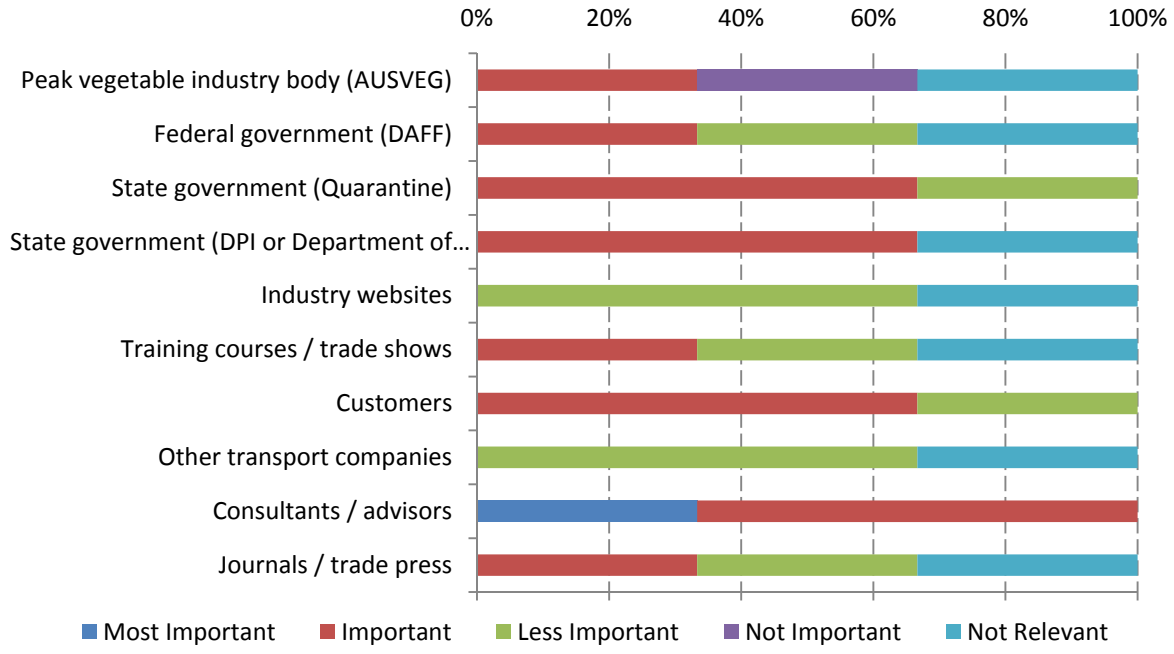

Figure 46: Transport sector information source rating

3.7 Open questions

Responses to the question "Do you think enough support is provided to implement biosecurity?"

The majority of growers surveyed (52%) do not think enough support is provided to the vegetable industry to implement biosecurity. General themes from respondents:

- email is the best way to receive this information
- unable to read all the large volume of information received
- benchmarking industry standards for growers from AUSVEG; step-by-step guidelines; year-to-year goals to slowly implement
- crop specific articles on biosecurity
- More awareness of the potential disaster which could occur if an outbreak wasn't contained: the impact on people's business financially
- More department extension officers, more local people on the ground
- Additional training
- More information on how to deal with possible issues & information on potential threats
- Information needs to be made more readily available
- Books to identify pests & diseases
- More information would be good to fill in missing gaps
- Better communication

38% of service providers do not think enough support is provided to the vegetable industry to implement biosecurity. The respondent's general themes:

- More consultation with consultants and landholders
- System where they contact people on the ground
- Better systems for keeping track of potential issues before they arrive
- Need to change grower culture … they see it as being not their problem and someone else will fix it
- Awareness is the key and any activities that increase awareness would be good
- Grower registration
- Better communication via emails and articles in papers
- Not enough funding
- More research needed
- We need better communication
- A register that you could sign up to receive information
- More information needs to be provided and made more available
- More money put into it

50% of wholesale/retail respondents do not think enough support is provided to the vegetable industry to implement biosecurity. The respondent's general themes:

- QA systems at DC level for supermarkets provide for a high level of inspections that should assist in detection, implementation of biosecurity processes
- Significant impost with paperwork to maintain systems
- Investment in training is undertaken by the supermarkets
- Transport have a low duty of care in respect to biosecurity

Transport respondents thought that enough support is provided to the vegetable industry to implement biosecurity. The respondent's general themes:

- "*Not sure what our responsibility is."*
- *"Our customers really only want to make sure we transport at the correct temperature"*

Common themes from general comments

- Need for improved import standards / labelling laws / level playing field / ban on fresh produce imports
    - "*Biosecurity not that high on the agenda for my business … need more customs checking internationally"*
    - *"labelling laws in Australia … to ambiguous to be of any great value to producers"*
    - *"Imports from overseas don't have the same requirements"*
    - *"Federal government should stop imports."*
    - *"Biosecurity of imported produce needs to be much better … government needs to get act together."*
    - *"Biggest concern is growers from overseas not being in the same QA programs that Australian growers are so more likely to have problems come in."*
    - *"Australian government is not really aware of how dire the consequences of an incursion would be and give way for free trade."*
    - *"Current policy of the importation of fruit and vegetables will eventually decimate our vegetable production."*
    - *"with a huge increase in importation from overseas … it is only a matter of time before we experience a huge outbreak … education of all stakeholders is perhaps our best option."*
    - *"Imported product should be grown to same standards and clearly labelled. Need stricter quarantine on imported products to stop pests and diseases entering country."*

- Effectiveness of current quarantine system
    - *"AQIS need to consult better with industry before making changes and after see how changes are going … need to be more knowledgeable/experienced … need to speed up testing of seed and decrease costs of testing"*
    - *"A practical common sense approach by quarantine staff is needed"*
    - *"Disappointed in the quarantine system as they keep letting things in"*
    - *"Government processes are poor and letting Australian industry down."*

  - *"Legislation is based on a 1950's based extension model (government based), this is now severely under resourced and consequently the emphasis has been shifted onto industry groups"*

- Need for improved government consultation with industry about regulations
  - *"Forewarning on any new rules and regulations that may be implemented with regard to biosecurity so that growers can plan ahead if the changes are going to affect them."*
  - *"State government agencies don't have the same objectives as people on the ground."*
  - *"Government implement without consultation or share information with people on the ground … it works the other way as well … would like to see this improved so better decisions are made."*
  - *"Very difficult to stay in business and keep doing right things (lots of red tape)."*
  - *"I doubt that many people deny the importance, but there is a lot of assumption that government agencies are looking after it."*
  - *"DAFF are not helping industry bring useful tools from overseas (eg insects for IPM)"*

- Need for a grower registration system
  - *"Need to know where different crops are grown and who's growing them"*
  - *"Registration of Australian growers … impossible to have good biosecurity planning if you don't have this."*

- Pros and cons of QA systems / biosecurity plans
  - "*Can't afford to implement but can't afford not to implement"*
  - "*QA has improved biosecurity, it has been positive for the business because everyone is accountable, but is challenging for medium-sized business, as can't afford a fulltime QA/OH&S person."*
  - *"QA is a massive cost to growers which isn't passed on."*
  - *"Would clean whole industry up if QA required for all produce by all retailers/wholesalers. Would results in more professional efficient growers and get rid of back yarders. Would be a selling point for retailers – they can guarantee the quality and safety of the produce."*

- Need for a code of conduct / industry standard
  - *"I would like a standard practice or code but no regulation"*
  - *"Tend to only focus on it when there is an issue and I think the potential code of practice would be good but please no regulation."*

- Other
  - *"People tend to focus on the 'big picture' and don't realise that incursions at a local scale can be/have more of an impact than at the national scale."*

- *"At the end of the day if one of the 100 seasonal workers does not care about quarantine such as washing his boots then it is unrealistic to implement all of the procedures."*
- *"Signs on gates from local department, please respect farm biosecurity and call this number … no one calls."*
- *"Never really worried about biosecurity … biosecurity does add more costs."*
- *"Awareness and action are different things … setting up and preparing for a threat is not happening. Most people are not prepared."*
- *"Biosecurity is an area that if you want to know something – information is easy to source."*
- *"The vegetable industry is so diverse … it only takes one person in the area to not cooperate and everyone's efforts can be in vain."*
- *"major issues with LOTE growers - they don't value on-farm cleanliness even though they do understand"*

4 Discussion

In this section survey results are discussed in conjunction with the findings from the desktop review.

4.1 Practices

One of the main themes in respect to biosecurity practices determined from the desktop study was that of "market driven" compliance.

'If your farm, seed or transplant provider maintains a Quality Assured scheme such as ISO 9000, SQF 2000, NIASA, Freshcare or Woolworths Quality Assurance Scheme, it is likely that some fundamental techniques of biosecurity best practice are already being applied.' Farm Biosecurity Manual for the Northern Adelaide Plains vegetable growers.

This is indeed the case with almost all growers having some form of certification, predominantly Freshcare, driven by customer requirements. Both the transport and wholesale/retail sectors also indicated high levels of certification due to market requirements and risk mitigation. The transport providers are very compliant in regions where biosecurity measures are a requirement. Only the service providers demonstrated low levels of quality assurance accreditation mainly due to much lower market requirements.

This high level of compliance to accredited schemes would therefore imply from the desktop study findings that biosecurity practices would be expected to be of a high level and indeed, production practices, such as crop pest and disease surveillance, management to prevent spread and maintaining QA programs are undertaken by most growers surveyed. However, biosecurity specific practices such as footwear hygiene, procedures for visitors, signage are much less practiced even though more than half of the growers and two thirds of the service providers indicated movement of vehicles and machinery between farms.

The recommended biosecurity practice, biosecurity signage in the workplace, was the practice area most lacking. A major gap in the practices of growers and service providers is due to the lack of perceived benefit of biosecurity signage. This is emphasised by the decrease in standard practice of utilising signage by growers that had experienced an incursion indicating that signage is seen as having a low success rate in respect to awareness and prevention of potential incursion. This was further highlighted by less than 10% of growers only sometimes having LOTE signage in the workplace.

This gap in biosecurity practice continued to be a low priority through the wholesale and retail sectors but in the form of providing awareness material in the workplace, not just signage.

Visitor hygiene practices, possibly linked to insufficient signage instruction, were also deemed to be lacking as a practices across the industry. Those growers that had experienced an incursion become more diligent and increased visitor hygiene activities as a result.

The vegetable industries reliance on seed material was highlighted by the service providers, as was the supply of planting stock from nurseries as a risk to vegetable industry biosecurity. The industry

should consider the merits of routine seed testing for seed borne pathogens in commercial lots and certification systems for seedlings that include pathogen testing.

The most predominant activity undertaken by all stakeholders in the vegetable industry is surveillance. Surveillance activities for exotic plant pests are carried out by governments, industry and the wider community, they take the form of:

- Early detection – before pests become widely established
- To demonstrate the absence of a pest from the country, state or region to support access to domestic or international markets
- Following a pest incursion delimiting surveys provide information on the distribution and spread of pests
- To determine population levels to improve management decisions

Australia uses a mix of targeted and passive surveillance:

• The targeted surveillance programs are predominantly pest specific and the National Biosecurity Plan status report provides details of such programs undertaken across Australia in 2011.

• Passive surveillance programs work through raising awareness of specific pests to growers and the wider community and rely on these stakeholders looking for pests during their day-to-day activities.

Insufficient surveillance skills and cost pressures to undertake effectively are raised throughout the supply chain of the vegetable industry.

Previous studies have identified a significant biosecurity gap that exists with the limited level of formal on-farm surveillance, and support systems to motivate and support it. 'Self-surveys' are important components of best management practices, preparedness and incursion management programmes.

From this study, the transport sector also recognised that surveillance in the form of load inspections for unusual pests, plants or diseased material is a significant gap in biosecurity practices but the sector struggles with how to address in respect to training, resources and cost of implementation.

4.2 Awareness

The predominant theme of the surveys in respect to biosecurity awareness was the concept of prevention. All sectors surveyed indicated understanding of the requirement for biosecurity but have negative perceptions in regard to biosecurity adding costs to their business, creating additional paperwork and extra procedures within the day to day operations. It is concerning that a collective 10% of growers had a negative interpretation or said biosecurity was not relevant to them, this represents a significant risk to the industry as a whole.

Overall there is awareness amongst growers and service providers but this needs to be built on further to reduce the number that perceive biosecurity in a negative context and translate that into better levels of awareness. There is the opportunity to work closer with service providers as they clearly are a key point of reference for growers in respect to biosecurity.

The transport industry exhibited a significant disconnect in that all respondents agreed that biosecurity was important to the vegetable industry but only half indicated that they are responsible for the maintenance of biosecurity. This is particularly more relevant when viewed in the context of this was the response of those that participated in the survey which was a very low representation of the industry. The apathy to the survey and response to conduct phone interviews supports a strong case for transport being the major weakness in awareness of importance of and maintenance, of biosecurity in the vegetable industry.

Similarly the wholesale/retail sector is aware that biosecurity is important to the vegetable industry but there were still low levels of awareness of some practices and risks that pose a threat to maintaining biosecurity.

Awareness of biosecurity risks by contractors of their activities is paramount with growers but is not perceived as a significant risk by the service providers (contractors included) themselves. There appears to be a major diversion in the perceptions of how contractors view their awareness of biosecurity and what the growers believe is required of contractors to maintain biosecurity in the industry. Growers indicated it is paramount that contractors are aware of the biosecurity risks associated with their activities. However, service providers (contractors included) did not perceive their activity as posing a significant risk.

Previous studies have determined that for growers to conduct important early detection roles in biosecurity management, growers and the community need heightened awareness of the importance of biosecurity; their shared responsibilities; roles and responsibilities of others; education and training on threats; the process for reporting; incentives to report; and their potential for 'ownership' of protection measures. The outputs and comments from the open-ended questions support these findings along with the necessity for a national registration process across the industry that enables coordination of these roles and provision of material to develop awareness in the industry not just growers alone. Service providers are an important resource, as well as risk in to the industry, and should be integrated into such a register.

4.3 Preparedness

Pre-border or offshore activities are undertaken by a range of organisations, but with the Australian Government taking primary responsibility. A role performed by DAFF Biosecurity – border compliance (formerly AQIS).

Australia has a range of activities in place aimed at limiting the impact of a pest should it be detected within Australia. Post-border activities range from planning and preparedness through to everyday pest management operations.

Preparedness activities include:

- Agreed and implemented biosecurity plans for plant production industries
- Industry targeted measures to raise awareness of plant pest risk
- Internationally recognised surveillance systems capable of early detection and demonstrating area freedom

There are also a range of activities aimed at minimising the impact of Australia's endemic pests:

- Domestic quarantine restricts the movement of high risk plants, plant products, people or equipment,
- Domestic quarantine restrictions operate under state and territory legislation
- The interstate certification scheme is used to govern the movement of plant products under state and territory import regulations:
    - Plant Health Certificate – issued by government
    - Plant Health Assurance Certificate – issued by approved businesses

Industry biosecurity planning provides a mechanism for plant production industries, in collaboration with governments and other relevant stakeholders to identify and prioritise plant pest threats that could have a significant impact on their crops. Industry biosecurity plans are reviewed and updated every three to four years. The most recent being Vegetable Industry Biosecurity Plan (Version 2.0 – 2011)

Previous studies on the vegetable industries preparedness in respect to biosecurity identified the following gaps:

- the crucial role of early detection is not understood
- surveillance through the supply chain is lacking
- enhanced surveillance through passive inclusion in existing programs and IPM practices
- practices often considered too costly to implement
- insufficient incentives to implement biosecurity practices

A key component of emergency plant pest preparedness is ensuring suitable and effective training for people involved in responding to emergency plant pest incursions. Effective training is the responsibility of both government and industry. PHA has a National Training Program for emergency plant pest (EPP) preparedness aimed at industry and government personnel.

The promotion of programs such as this is a high priority especially within the service provider and state government sectors as these were shown by this study to be the most important points of

reference in respect to an incursion. There is opportunity to improve preparedness by leveraging off service providers as key points of reference for biosecurity practices, management and advice to the industry.

Despite a "downsizing" of many government departments, especially at state level, growers still rely on regional regulators and researchers to assist in respect to maintaining biosecurity but most of the research and extension activities are production focussed and tend to only target biosecurity "after the fact".

PHA has developed PLANTPLAN, a set of national incursion response guidelines for the plant sector, detailing the procedures required and the roles and responsibilities of all parties involved in an incursion response.

In the event of a pest incursion affecting the vegetable industry, AUSVEG will be the key industry contact point and will have responsibility for relevant industry communication and media relations. PLANTPLAN indicates that growers and industry representatives will be informed by the appropriate agriculture department and through national grower bodies (AUSVEG) and grower networks. The use of brochures, web pages, newsletters, fax sheets and regional meetings will inform growers, pickers and handlers of the quarantine requirements and provide information to assist in the early detection of new outbreaks.

4.4 Communication and information sources

Communication and collaboration with grower groups is an important aspect of the protection of Australia's plant biosecurity system. Effective communication of key biosecurity issues enhances the establishment of practices that minimise the impact of exotic plant pests and facilitate early detection.

PHA, in partnership with plant production industries and governments, has released a number of farm biosecurity manuals. These manuals are specifically tailored for growers and consultants, outlining simple and effective measures that can be incorporated into day-to-day operations that will improve biosecurity and help protect their industry from new and invasive pests.

The biosecurity manuals currently developed by PHA include:

- Biosecurity Induction Manual for Bundaberg Horticultural Farms (Version 1.0)
- Farm Biosecurity Manual for the Northern Adelaide Plains Vegetable Growers (Version 1.0)

More needs to be done to educate growers as to the general applicability of the principles contained in these manuals. Feedback from growers during interviews indicated that region specific tile(s) of the document was the reason some growers had not read or thought applicable.

PHA has also partnered with Animal Health Australia in a joint communication and awareness campaign known as the Farm Biosecurity Program, which helps producers identify and reduce the risks posed by exotic pests and poor biosecurity practices.

The program website, www.farmbiosecurity.com.au , provides an array of information including ways in which risks to farm production can be identified and minimised through simple farm management practices.

State and territory governments, together with industry, focus on regional and farm biosecurity messages. PHA has developed a communication toolkit to help industry organisations communicate biosecurity messages to growers and encourage the uptake of practices that increase on farm biosecurity.

The Exotic Pest Hotline appears widely promoted by PHA, DAFF, DPI's and industry bodies, but is not seen as a source of reference or contact point for biosecurity issues in the vegetable industry. If this service is to be better utilised a more targeted approach to promotion within the vegetable industry is required. Television and radio were also shown to be a poor source of communication in the industry and any promotion should be web based to maximise effect. There exists the opportunity for more App (Application software) based methods of communicating, informing and reporting that could be integrated with a national registration process.

Previous research has found that 'agencies with the highest interest in biosecurity outcomes did not enjoy high levels of trust and so were not seen by the landholders as having high levels of influence', (Gilmore et al., 2011). The study findings appear to support this finding with agronomists and consultants rating as the most important source of information whereas the national regulatory body DAFF was not seem as an important resource.

4.5 Barriers

The predominant theme from this study in respect to barriers to biosecurity in the vegetable industry was the cost of implementation. This is well summarised by the comment *"Can't afford to implement but can't afford not to implement".* Cost pressures rated the most important barrier to adoption of biosecurity practices and procedures across all stakeholder groups in the survey. It is important that vegetable growers and service providers are provided with the incentives to adopt biosecurity plans to undertake routine surveillance on-farm, as part of their crop, farm, and enterprise management and advice.

A further challenge is how to change the perception of transport sector that biosecurity measures are not just a cost and disruption to schedules.

Biosecurity threats pose significant potential costs through lost productivity, loss of markets and increased input and compliance costs but this is generally not quantified or well understood until after an incursion has been experienced.

Other barriers to adoption and implementation determined by this study were:

- Language barriers
- Transient labour
- Duty of care by contractors

There are significant limitations in the vegetable industry in respect to human resources and appropriate skill sets. The requirements need to be reviewed especially where specialist services and highly trained personnel are best placed to provide their service, and mentoring opportunities. This was shown to be the case throughout the supply chain in the vegetable industry.

The negative perceptions to biosecurity, especially to practices required, by the industry as a whole is a significant barrier. Continually the industry indicates that they understand the importance of biosecurity to the vegetable industry but the importance to their business and how it fits with the day to day operations of business is lacking and requires considerable focus for future promotion and communication.

5 Recommendations

5.1 Negativity to biosecurity practices

One of the strongest themes in respect to biosecurity by the vegetable industry is the cost of compliance; this is, not unexpectedly, widespread throughout the vegetable supply chain. Regulatory frameworks and the processes that are presently used should always be reviewed to assist in streamlining and simplifying processes to reduce the negativity to compliance. Focus should be on:

- How to make the cost of compliance seem a benefit or extract a benefit from.
- Minimising paperwork/documentation.
- Resources to improve skill sets.
- Where possible adopt a more practical based approach.
- Integrate biosecurity measures with other procedures where possible, this is discussed further below.

The survey has indicated the importance of addressing "What's in it for me?" ethos that extends through the vegetable industry. Promotion and communications should attempt to address this critical question signalling to growers the benefit of biosecurity and the potential for this benefit to offset compliance costs etc, for example develop the concept of Biosecurity = Insurance.

5.2 Awareness development with service providers

The link between growers and service providers has been shown to be critical to implementation, maintenance and communication in respect to biosecurity in the vegetable industry.

Opportunities to increase biosecurity awareness, training and communication with regulators and the service provider sector will have a definite flow on effect to growers. This is one area that Ausveg could undertake a key role in to coordinate programs that not only service the grower base but integrate with service providers. This would potentially be through targeting the individual sectors of the service industry such as Australian Institute of Agricultural Science and Technology, Agricultural Institute of Australia, Seed Industry Association, Nursery and Garden Industry association etc. and through directly targeting the larger agronomy service provider firms.

5.3 Biosecurity practices and QA programs

The survey identified that many of the practices undertaken in respect to biosecurity in the vegetable industry are due to the requirements of various QA programs that are undertaken to meet market requirements and food safety guidelines.

The opportunity exists to improve both the uptake and the implementation of biosecurity practices through:

- Better integration of biosecurity practices within QA programs
    - Collaboration with Freshcare, WQA etc to develop practical based biosecurity practices
    - Identify areas of that improve biosecurity practices with minimal impost on documentation
- Incentives to increase the uptake of relevant QA programs that include biosecurity practices relevant to the individual business or business sector.
- Incentives to increase the adoption of QA programs *per se* in the service provider sector

5.4 Biosecurity practices and IPM

Surveillance undertaken during implementation of IPM programs was seen as a practical method of improving biosecurity practices and potentially awareness.

There is the opportunity to leverage off IPM programs and work with IPM providers and program designers to:

- Improve surveillance skills through IPM training
    - Growers
    - Service providers
    - Potential training of transport sector QA personnel
- Increase the integration of biosecurity practices in current IPM programs eg. Glove box guides, calendars etc.
- Improve awareness of potential movement of pests regionally through increased uptake of IPM within the industry
- Increase awareness of IPM management potential for incursions



5.5 Surveillance training

One of the key limiting factors throughout the vegetable industry supply chain is that of resources to undertake biosecurity related surveillance and the skills of those undertaking the surveillance. This is seen as a weakness by growers, to a certain extent service providers, especially in the transport

sector. Whilst training for QA personnel is seen as well undertaken by the supermarkets, it is still a weakness in the wholesale/retail area especially in respect to identification of pests and disease.

There is also link between the cost of training and undertaking surveillance that is limiting levels of surveillance in the vegetable industry.

Opportunities that have been identified in the survey as having the most impact to provide information for up skilling in the areas of surveillance include:

- Web based information
    - Should be highly visual practical based and limited in technical content and reduced wordiness
    - Ability to be filtered easily by crop or market sector
- Integration of information with farm Apps
    - Standalone vegetable industry specific App as a resource (examples exist in other commodities and industries)
    - Integration of current farm management Apps to provide link to vegetable industry specific App and/or web based resources – hotlinks for biosecurity queries
- Train the trainer programs for service providers using industry bodies such as Australian Institute of Agricultural Science and Technology, Agricultural Institute of Australia, Seed Industry Association, Nursery and Garden Industry association etc.

5.6 On-farm activities

Growers undertake a range of biosecurity practices on farm but were found to have a low level of implementation of biosecurity signage. There is a perception that signage is ineffective as a biosecurity control / awareness measure. In addition signage in LOTE was perceived to have little value by growers. Many workplaces have a tendency to have multiple signage relating to workplace safety, operating procedures etc. and biosecurity can be lost in a sea of signage. Biosecurity signage should be part of the operating procedures rather than distinct.

The relevance of signage and a review of its approach and format are warranted to improve the usage and impact on awareness of biosecurity within the workplace and regional significance.

Another biosecurity practice that was found to be a low priority on farm was that of hygiene controls with visitors and especially overseas visitors.

Awareness of risks and integration of hygiene for biosecurity within food safety hygiene regimes is the simplest way of improving practices. Service provider education and stewardship training is required to improve the practices of contractors in particular. Contractor codes of conduct could be targeted to improve awareness that flows through to improved practices.

5.7 Plant material certification

The importance of pest and disease free planting material is paramount to the maintenance of pest and disease free regions in Australia in respect to vegetable production.

The vegetable industries reliant on seed should consider the merits of routine seed testing for seed borne pathogens in commercial lots. This would potentially also minimise the risk of seed borne infections being spread through the nursery phase of seedling propagation and supply.

5.8 Supply chain specific issues

Load inspections through the distribution chain were determined to be a weakness in biosecurity practice and as a result the awareness of the requirement to undertake and the potential risks of not inspecting frequently and appropriately are not understood. This also extents to the integrity of loads as well and the sealing of produce to minimise biosecurity risk. Focus is required on how to improve the process of load inspections in respect to frequency and diligence by the transport sector without any significant impost in respect to documentation and procedures.

Throughout the supply chain, reusable materials are utilised frequently and can cover large geographical areas due to Australia's extensively widespread geography. Improved awareness of the potential for pest and disease transmission on reusable materials and management practices for hygiene should take a national approach rather than just regional.

5.9 National registration program

An interesting observation that emerged from the interviews which also supported previous studies is the need for a national registration program of some description for the vegetable industry. There is a requirement for a coordinated approach that is a register not only of growers but also service providers. This registration program can also provide a conduit for information to the transport and wholesale/retail sectors.

A national grower registration scheme would enable the collection of accurate and up-to date information about the number and location of growers of different plant species.

Such a scheme could have a potential role in improving biosecurity by:

- Providing information on the distribution of the vegetable industry to inform biosecurity planning;
- Facilitating communication to growers and service providers to increase their awareness of biosecurity needs and to increase the adoption behaviours that will mitigate the biosecurity risks; and
- Providing information on the location of vegetable properties and contact details to improve the availability to reach and communicate with growers during biosecurity responses.

A national biosecurity register was considered to have the greatest potential for the vegetable industry in the immediate future.

- A biosecurity register is a register for particular crop/risk or to improve response capability to a pest incursion
- Such a register needs to be crop based to allow for quick filtering of information to avoid information over load
- Such a register could incorporate Apps functionality as suggested above and the App provided free as an incentive upon registration for example.

The reality of a grower registration scheme:

- The ability to communicate rapidly will only be of benefit if there is some action growers can take to prevent the spread of the disease or to eradicate it.
- Even if it were possible to notify all commercial growers about a potential plant pest, their willingness to take action to prevent or eradicate that plant pest will depend on the potential for the plant pest to adversely affect their business.
- If the cost of prevention or eradiation is greater than the cost to the business, then they are unlikely to take any action. This is where grower understanding of EPPRD is important.

AUSVEG is the most appropriate body as the national communications co-ordinator with various and multiple state and regional organisations listed as points of contact in the event of a pest incursion emergency response.

5.10 Government support

Maintenance of both state and federal government support is critical to biosecurity in the vegetable industry. The services provided by regulatory bodies have been shown to be respected and critical to implementing biosecurity practices and providing awareness and information to all sectors of the vegetable industry.

The recent trend has been to encourage industry bodies to undertake greater roles with biosecurity in their respective sectors as government resources have decreased. There is still a major requirement for government resources and industry bodies should assist with the regulatory process, not be expected to undertake.

6 Bibliography

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- Biosecurity Induction Manual for Bundaberg Horticultural Farms, Version 1.0, produced by Plant Health Australia & Bundaberg Fruit and Vegetable Growers, 2010
- Gilmour, Beilin and Sysak 2009 'Using stakeholder mapping and analysis with a mental models approach for biosecurity risk communication with peri-urban communities', ACERA Project No. 08/01, Australian Centre of Excellence for Risk Analysis
- Gilmour, Beilin and Sysak 2011 'Biosecurity risk and peri-urban landholders – using a stakeholder consultative approach to build a risk communication strategy, Journal of Risk Research, Vol 14, No 3, pp. 281-295
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- Brennan and Christley 2012 'Biosecurity on Cattle Farms: A study in North-West England', PLoS ONE open access, Vol 7, Iss 1

The following were sources reviewed as part of survey question development:

- On-farm hygiene and sanitation for greenhouse horticulture, NSW Industry & Investment, PrimeFact 1005, April 2010
- Farm Hygiene for Vegetable Crops, Department of Agriculture, Fisheries & Forestry, Queensland Government, viewed online – www.daff.qld.gov.au/26_19736.htm
- Producer guide to the National Farm-Level Biosecurity Standard for Potato Growers – A guide to developing your farm biosecurity plan, Canadian Food Inspection Agency, 2013

The following sources were consulted for the desktop research report
(*in general order of relative importance*):

- Industry Biosecurity Plan for the Vegetable Industry, Version 2.0, April 2011, Plant Health Australia
- National Plant Biosecurity Status Report 2011 Plant Health Australia, Canberra ACT
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- Scholefield Robinson Horticultural Services 2008 'Vegetable biosecurity & quarantine gap analysis', HAL project number: VG07087
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- Biosecurity Strategies and other material Government websites listed in the draft desktop r/v

- Abdalla, Millist, Buetre & Bowen 2012 Benefit-cost analysis of the National Fruit Fly Strategy Action Plan, ABARES, Canberra ACT
- Kruger, Thompson, Clarke, Stenekes & Carr 2009 Engaging in Biosecurity: Gap Analysis, ABARES, Canberra ACT
- Maller, Kancans & Carr 2007 Biosecurity and Small Landholders in Peri-Urban Australia, ABARES, Canberra ACT
- Beare, Elliston, Abdalla & Davidson 2005 Improving plant biosecurity systems – a cost-benefit framework for assessing incursion management decisions, ABARES, Canberra ACT
- GROWCOM 2008 Submission to the Quarantine and Biosecurity Review Panel on the Quarantine and Biosecurity Review Issues Paper

Data analysis methodology

- Attride-Stirling, J. 2001 'Thematic networks: an analytical tool for qualitative research', Qualitative Research, vol. 1(3), pp385-405

Appendix A: Government biosecurity initiatives & projects

Commonwealth

DAFF website provides on-farm biosecurity information that is relevant to hobby farmers through to large-scale producers. It provides a simple explanation of what biosecurity is, and how to keep weeds, pests and diseases off farming properties.

- Biosecurity videos on the DAFF YouTube channel
    - On-farm biosecurity
    - Animal biosecurity
    - Plant biosecurity
    - Small farm biosecurity
    - Equipment biosecurity
    - Biosecurity for travelling farm workers

Farm Biosecurity Program – a joint initiative of Animal Health Australia & PHA this website hosts information to help producers understand disease, pest and weed risks, what they can do to reduce those risks, and how to go about it. It provides materials to help producers implement good biosecurity on their property, including:

- Biosecurity record templates
- Disease, pest and weed information
- Links to useful websites
- Biosecurity related news and events
- Industry specific online resources (**including the vegetable industry)**
- Pulls together information from a range of other sources e.g. Farm Biosecurity Manuals specific to the vegetable industry have been developed (discussed above)

New South Wales

- NSW draft biosecurity strategy is being finalised in early 2013
- No specific mention of the vegetable sector in the draft strategy document
- Deals with the management of risks from pests, weeds and diseases
- The draft strategy outlines the roles and responsibilities of the government and non-government sectors, and community across the entire biosecurity spectrum.
- The NSW government will help industries and the community to manage biosecurity risks by:
    - Building awareness about biosecurity
    - Leading and coordinating prevention, preparedness, responses and recovery programs for outbreaks for significant emergency pests, weeds and diseases.
    - Helping to develop non-regulatory quality assurance and interstate certificate agreements that support market access arrangements
    - Protecting and managing natural areas, including national parks, through weed management and feral animal control
    - Coordinating diagnostic, surveillance, tracing and monitoring systems

    - Conducting research in priority biosecurity areas.
- The draft biosecurity strategy recognises the responsibility of industry as:
    - Identifying an managing biosecurity risks that may threaten their or other businesses
    - Working with government and other stakeholders to develop and implement policies and strategies that will protect Australiana and NSW's biosecurity status
    - Educating their members about their roles and obligations
    - Being vigilant by keeping a watchful eye out for unfamiliar pests, weeds and diseases
    - Reporting biosecurity risks
    - Participating in responses to biosecurity incursions
    - Complying with regulations, especially in relation to record-keeping and reporting biosecurity incidents
    - Participating in the development and implementation of industry standards, guidelines and codes of practices
    - Participating in the development of response agreements, cost-sharing arrangements and allocation of resources where appropriate.
- The NSW government has established telephone hotlines and web-based systems for reporting suspected pests, weeds and diseases.
- The Elizabeth Macarthur Agricultural Institute at Camden is part of a national network of diagnostic facilities and is recognised for its world class research into the development and delivery of improved diagnostics.
- The draft biosecurity strategy recognises that plant disease surveillance in NSW has largely been reactive and has lacked an emphasis on active surveillance to detect new incursions & that the current system needs to be reviewed.
- The draft biosecurity strategy recognises that systems with similar aims as the livestock industry NLIS need to be developed for the plant-based industries.

- **Factsheet**s
    - – Vehicle biosecurity kit for plant industries (an effective tool to help minimise the risk of spreading unwanted weeds, pests and diseases between farms or regions)
    - a step by step guide to vehicle wash down
- Vegetable diseases, pests and disorders section of website:
    - Pests
    - Diseases and disorders
    - IPM

Victoria

- No specific mention of the vegetable sector in the strategy document
- The Victorian Government's biosecurity approach is encapsulated in a vision of collaboration between government, industry and the community. This vision is articulated through six themes:
    - Developing partnerships
    - Strengthening the coverage
    - Making sound decision and investments
    - Building the biosecurity skill base and systems

  - Smarter surveillance
  - Responding to incursions
- A Biosecurity implementation plan 2010 to 2013 was developed to deliver on this vision. Relevant points in the plan include:
  - Delivery of awareness programs such as the 'Services and Information to Small Landholder' program.
  - Inspection, treatment and plant health certification provided on a fee-for-service basis to growers, packers, exporters, wholesalers and nurseries.
  - Permits and certificates are issued to control movement and validate the status of produce and machinery into and out of areas such as the Sunraysia pest free area, various phylloxera exclusion and infested zones and potato cyst nematode control and protection districts.
  - Promotion of state and national biosecurity standards and practices.
  - Working with PHA and industry to improve threat prevention and on-farm biosecurity program delivery to the plant sector.
  - Government laboratories provide research, development and diagnostic testing support for plant species to enable effective and prompt emergency plant pest response, as well as cost-effective management of endemic disease.
  - Government has developed response systems and procedures; built capacity and capability through the training of agency and industry participants; and targeted specific diseases that are identified through risk analysis.
  - Plans were in place to work with local industry leaders and PHA to deliver preparedness and training programs to meet the requirements of national response agreements.
- While sectors such as the animal industries and fisheries licensing already have well-developed information management systems, less well developed systems are in use in other areas of primary industries. Different systems are in place to serve specific purposes and technical needs within government; these systems have been developed independently, so they are not uniform, consistent or compatible, and they do not deliver all that is required for managing the current range of biosecurity activities or sectors.

Information available online – Pests, Diseases & Weeds section of website:

- Plant Diseases/Vegetables
  - Guide to recognise and manage some of the many diseases of vegetables
- Weeds
  - A-Z of weeds
  - Invasive plant classifications
  - Invasive plant management
  - Weed spotters
- Pest insects & mites
  - A range of pest specific fact sheets

Queensland

- No specific mention of the vegetable sector in the strategy document
- Plant health, pest and disease section of website contains:
    - An A-Z listing of significant plant pest
- Social media presence – Facebook, Twitter & YouTube channel
    - E.g. 'Weed out of seeds – how to clean down'
    - Mostly related to animal industries

Tasmania

- No specific mention of the vegetable sector in the biosecurity strategy document
- Outcome 8 - emergency preparedness & response
    - 8.11 develop stakeholder specific best practice guidelines for weed prevention
- Outcome 9 – partnerships
    - Identify possible working partnerships that enhance efficiency and delivery of biosecurity requirements in Tasmania
- Outcome 10 – training & education
    - Establish training and education programs for industry partners and other relevant stakeholders
- Outcome 11 – communication
    - Develop and implement a biosecurity communications program specifically designed to raise the awareness of the Tasmanian community as to the importance of biosecurity and its maintenance

South Australia

- Biosecurity SA Plant Health consists of Plant Health Operations and the Plant Health Policy Unit, providing the vehicle for managing plant biosecurity in South Australia.
- Biosecurity SA Plant Health consisting of Fruit Fly Operations and State Quarantine Services, provide the following services:
    - inspection of horticultural produce and other host materials by Plant Health Inspectors
    - monitoring the state-wide fruit fly trapping grid
    - incident response and eradication
    - plant health certification and market access support
    - accreditation of export compliance arrangements
    - roadblock management, quarantine bins, pits and signage
    - quarantine and area freedom surveys
    - field inspections
    - auditing of accredited compliance arrangements
    - development and maintenance of standards
    - compliance and investigations
    - awareness and education including Hotline number for reporting suspected pest sightings
- Biosecurity SA Plant Health Program works with several state and national peak bodies to develop and implement plant health policy and standards.

Western Australia

Specific information packages have been developed regarding farm biosecurity and related activities that involve a high volume of people and vehicle turnover:

- Farm biosecurity plan (designed for grain growers)
- Biosecurity guidelines for contractors working on agricultural properties
- Biosecurity information for contractors

The plant industries in Western Australia have developed industry specific biosecurity plans under the HortGuard® and GrainGuard initiatives. The Guard industry initiatives focus on the following areas:

- Threat identification and risk assessment: A primary task of the HortGuard® and GrainGuard biosecurity groups is to identify key threats, both established and exotic, and assess the potential impact on the local horticultural and grain industries.
- Border quarantine: Improved threat identification and communication under HortGuard® and GrainGuard will assist AQIS and the Department of Agriculture and Food to ensure that entry into Western Australia of horticultural pests, weeds and diseases is minimised.
- Surveillance network: The Department of Agriculture and Food's established surveillance network is being expanded throughout the agricultural community to assist with identifying new or unusual weeds, pests and diseases. Growers, agribusiness representatives and the Department's field staff are being encouraged to use identification sample kits to send unfamiliar samples to the Department of Agriculture and Food's plant laboratories to enable early investigation and implementation of effective responses.
- Emergency response: The Department of Agriculture and Food has endorsed the detailed procedures developed in Plant Health Australia's national incident response document called PlantPlan. This document details how an exotic pest incursion is to be managed. Contingency plans are being developed for each major industry threat in the biosecurity planning process with specialist training enabling regional taskforces to effectively respond in an emergency.
- Containment, eradication and management: Recommendations are made for improved control and eradication activities for pests, diseases and weeds. Priority is given to those threats with a high rate of risk to industry and government. Recovery services such as counselling and providers of financial advice are also listed.
- Research and Development: Identifying and prioritising relevant biosecurity research areas for the horticultural and grain industries that encourage national development and integration of biosecurity-based research.
- Communication: Implementing a communication plan for the growth and protection of the horticultural and grain industries. The Guards approach to industry biosecurity planning has been adopted nationally by Plant Health Australia since it was established in 2001.

Appendix B: Copy of Stakeholder Surveys

HAL Biosecurity Survey - Transport

Vegetable Industry Biosecurity Survey - Transport

This survey is being conducted by Macquarie Franklin on behalf of Horticulture Australia Limited (HAL). It is part of a HAL funded project, which aims to find out more about the level of awareness of biosecurity within the vegetable industry across Australia. This will better inform future investment in biosecurity research and extension programs. The information that is produced as a result of the survey will be available as a final report downloadable from the HAL website.

If you wish to be in the running **to win a $1000 travel voucher** please provide your name and contact details when asked at the end of the survey. Responses from the survey will not be linked to individuals and reports from Macquarie Franklin to HAL will not include information that could be used to identify individual respondents.

The survey will take 10 minutes to complete and closes on Wednesday 14 August 2013

The contact person at HAL regarding the survey is:

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HAL Biosecurity Survey - Transport

***1. What is your role in the business? (select all the options that apply to you)**

- [ ] Manager
- [ ] Logistics
- [ ] Driver
- [ ] Owner / Operator
- [ ] Other (please specify)

2. How many fresh food freight trucks does your business, or the business you work for, operate?

3. In addition to transport, does your business undertake any of the following activities? (select all the options that apply to you)

- [ ] Vegetable growing
- [ ] Wholesale
- [ ] Retail
- [ ] Other (activity within the vegetable industry)

(please specify)

4. What states do you (personally) operate in? (select all the options that apply to you)

- [ ] NSW
- [ ] VIC
- [ ] QLD
- [ ] SA
- [ ] WA
- [ ] TAS
- [ ] NT
- [ ] Internationally

(please specify which countries)

5. Are Plant Health or Quarantine certificates required for any produce that you transport? (select all the options that apply to you)

- [ ] Produce from within Australia where biosecurity requirements / restrictions exist
- [ ] Imports from overseas
- [ ] Imports from within Australia where no biosecurity requirements / restrictions exist
- [ ] Other

(please specify)

6. Do you maintain an Accredited Quality Assured scheme? (select the option that best applies to you)

- ◯ Yes
- ◯ Currently working towards
- ◯ Used to have
- ◯ No

7. If you do have, or have ever had, an Accredited Quality Assured scheme, please list the scheme/s.

8. As a person involved in the transport industry, what does biosecurity mean to you? (rate each of the statements below on how much you agree or disagree with them)

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree	Unsure
Biosecurity is not relevant to me	◯	◯	◯	◯	◯	◯
I don't really understand what biosecurity means	◯	◯	◯	◯	◯	◯
Biosecurity creates extra paperwork	◯	◯	◯	◯	◯	◯
Biosecurity creates extra procedures to follow	◯	◯	◯	◯	◯	◯
Biosecurity is an additional cost to my business	◯	◯	◯	◯	◯	◯
My role in biosecurity is important to help prevent the transmission of pests and diseases into / around Australia	◯	◯	◯	◯	◯	◯
Biosecurity doesn't have any negative impacts on my business	◯	◯	◯	◯	◯	◯

9. Please rate how well you believe the following stakeholders in the vegetable industry address biosecurity.

	Poor	Moderate	Good	Very good	Unsure
Vegetable growers	◯	◯	◯	◯	◯
Vegetable retailers / wholesalers	◯	◯	◯	◯	◯
Transport companies	◯	◯	◯	◯	◯
On-farm contractors	◯	◯	◯	◯	◯
Nursery / seed suppliers	◯	◯	◯	◯	◯
Field officers / agronomists	◯	◯	◯	◯	◯
Contract labour providers	◯	◯	◯	◯	◯

10. What practices does your business implement to reduce the biosecurity risk to the vegetable industry? (rate all the options listed below depending on how frequently you do them)

	Never	Rarely	Sometimes	Standard practice	Not relevant
Quality assurance programs	◯	◯	◯	◯	◯
Correct management practices for disposal of waste plant material from trucks	◯	◯	◯	◯	◯
Briefing all workers, contractors and visitors on biosecurity measures	◯	◯	◯	◯	◯
Inspecting vehicles before they enter a new property for soil or waste plant material	◯	◯	◯	◯	◯
Keep vehicles clean by clearing the vehicle floor of soil, weed seeds and insects	◯	◯	◯	◯	◯
Load inspection for unusual symptoms / insects in produce	◯	◯	◯	◯	◯
Cleaning vehicles in a designated wash down area before they enter another property	◯	◯	◯	◯	◯
Keeping a vehicle log to trace movement	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

HAL Biosecurity Survey - Transport

11. What is limiting your business from implementing best practice biosecurity measures? (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most important	Not applicable
Lack of surveillance skills	◯	◯	◯	◯	◯
Biosecurity practices are too expensive to implement	◯	◯	◯	◯	◯
Biosecurity practices disrupt our schedules	◯	◯	◯	◯	◯
Low duty of care by others in the vegetable industry	◯	◯	◯	◯	◯
Language barriers	◯	◯	◯	◯	◯
Unsure what biosecurity practices to implement	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

12. When you find something unusual in a vegetable consignment, what do you usually do? (select the options that typically apply to you)

- ☐ Implement my company's biosecurity plan
- ☐ Contact quarantine
- ☐ Isolate the consignment until I find out more
- ☐ Dial the exotic pest hotline (1800 048 881)
- ☐ Contact the peak industry body (AUSVEG)
- ☐ I don't do anything, as I have concerns about the consequences of reporting it
- ☐ I don't do anything until I hear about reports of other detections
- ☐ I contact the grower where the produce came from
- ☐ Other

(please specify)

HAL Biosecurity Survey - Transport

13. Why do you think biosecurity is important to the vegetable industry? (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most important	Unsure
Necessary for regulatory requirements	◯	◯	◯	◯	◯
Necessary for customer requirements	◯	◯	◯	◯	◯
Necessary for domestic market access	◯	◯	◯	◯	◯
Necessary for overseas market access	◯	◯	◯	◯	◯
Important to protect the vegetable industry in my local area	◯	◯	◯	◯	◯
Important to protect the vegetable industry in Australia	◯	◯	◯	◯	◯
I don't believe biosecurity is important	◯	◯	◯	◯	◯
Unsure	◯	◯	◯	◯	◯

Other (please specify)

14. Which of the following do you think are the key risks that the transport sector poses to biosecurity in the vegetable industry? (rate all the options listed below, from least important to most important)

	No risk	Low risk	Moderate risk	High risk	Unsure
Reusable materials (e.g. pallets)	◯	◯	◯	◯	◯
Transfer of plant or soil material in or on trucks	◯	◯	◯	◯	◯
Inappropriate disposal of waste plant material	◯	◯	◯	◯	◯
Insufficient ability to recognise and diagnose pests / diseases / problems	◯	◯	◯	◯	◯
Produce/load not inspected by drivers	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

15. If you have experienced a biosecurity incursion, how did it impact your business? (select all options that apply to you)

- [ ] I have not experienced an incursion
- [ ] It damaged our image / reputation
- [ ] Decreased business as less produce being transported
- [ ] Changed routes (collection / destination) that produce was being transported
- [ ] Changed cartage arrangements
- [ ] Created extra demands (e.g. increased paperwork, wash down procedures, etc)
- [ ] Other

(please specify)

16. Where do you get information about biosecurity from? (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most important	Not relevant
Journals / trade press	◯	◯	◯	◯	◯
Consultants / advisors	◯	◯	◯	◯	◯
Other transport companies	◯	◯	◯	◯	◯
Customers	◯	◯	◯	◯	◯
Training courses / trade shows	◯	◯	◯	◯	◯
Industry websites	◯	◯	◯	◯	◯
State government (DPI or Department of Agriculture)	◯	◯	◯	◯	◯
State government (Quarantine)	◯	◯	◯	◯	◯
Federal government (DAFF)	◯	◯	◯	◯	◯
Peak vegetable industry body (AUSVEG)	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

17. Do you think enough support is provided to the transport industry to implement biosecurity?

◯ Yes

◯ No

◯ Maybe

If you answered No or Maybe, what additional support or information would you like to see provided?

18. Are there any other comments that you would like to make about biosecurity in the vegetable industry?

19. If you would like to be in the running to win a $1,000 travel voucher, please include your name and contact phone number.

Name:

Phone Number:

Thank you for completing this survey, your input is greatly valued.

HAL Biosecurity Survey - Service Providers

Vegetable Industry Biosecurity Survey - Service Providers

This survey is being conducted by Macquarie Franklin on behalf of Horticulture Australia Limited (HAL). It is part of a HAL funded project, which aims to find out more about the level of awareness of biosecurity within the vegetable industry across Australia. This will better inform future investment in biosecurity research and extension programs. The information that is produced as a result of the survey will be available as a final report downloadable from the HAL website.

If you wish to be in the running **to win a $1000 travel voucher** please provide your name and contact details when asked at the end of the survey. Responses from the survey will not be linked to individuals and reports from Macquarie Franklin to HAL will not include information that could be used to identify individual respondents.

The survey will take 10 - 15 minutes to complete and closes on Wednesday 14 August 2013

The contact person at HAL regarding the survey is:

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HAL Biosecurity Survey - Service Providers

***1. What services do you (personally) provide? (select all the options that apply to you)**

- [ ] Agronomist / field officer
- [ ] Seed supplier
- [ ] Nursery
- [ ] Sales representative (e.g. chemical, fertiliser, irrigation, etc)
- [ ] Contractor (machinery-based)
- [ ] Consultant
- [ ] Extension officer
- [ ] Contract labour provider
- [ ] Other (please specify)

2. What is your age?

- ◯ 15-24
- ◯ 25-54
- ◯ 55-64
- ◯ 65 and over

3. How many employees does your business, or the business you work for, employ? (select the option that best applies to you)

- ◯ Sole trader
- ◯ < 2
- ◯ 2-10
- ◯ 10-25
- ◯ 25-50
- ◯ > 50

4. Is English your first language?

- ◯ Yes
- ◯ No (please specify)

5. Which states do you (personally) operate in? (select all options that apply to you)

- [ ] NSW
- [ ] VIC
- [ ] QLD
- [ ] SA
- [ ] WA
- [ ] TAS
- [ ] NT
- [ ] Internationally

(please specify countries)

6. Do you maintain an Accredited Quality Assured scheme? (select the option that best applies to you)

- ◯ Yes
- ◯ Currently working towards
- ◯ Used to have one
- ◯ No

7. If you do have or have ever had an Accredited Quality Assured scheme, please list the scheme/s.

8. What vegetable crops do you (personally) work with? (select all the options that apply to you)

- [ ] Leafy vegetables
- [ ] Cucurbits
- [ ] Corn
- [ ] Asian vegetables
- [ ] Leeks, spring onions
- [ ] Brassica (e.g. cauliflower, cabbage)
- [ ] Root crops(e.g. carrots, parsnips)
- [ ] Legumes (e.g. peas, beans)
- [ ] Solanaceae (e.g. capsicum, chillies)
- [ ] Other

(please specify)

9. As part of your job, do you move equipment or vehicles between different properties? (select the option that best applies to you)

- ◯ Yes, frequently
- ◯ Yes, but infrequently
- ◯ No, not at all

10. Do you need Plant Health or Quarantine certificates for any activities you do? (select all the options that apply to you)

- [ ] Supply of products to regions within Australia
- [ ] We supply products to regions within Australia where no plant health / quarantine certificates are required
- [ ] We deal with international clients (importing)
- [ ] We deal with international clients (exporting)
- [ ] We don't need certificates for any activities we do
- [ ] Other

(please specify)

11. In your opinion, what is the most important aspect of biosecurity in the vegetable industry? (select the option that best applies to you)

- ◯ Preventing outbreaks
- ◯ Managing outbreaks once they have occurred
- ◯ Unsure
- ◯ Other

(please specify)

12. What risk do you think your activities pose to biosecurity in the vegetable industry? (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most important	Not applicable
Supply of seed	◯	◯	◯	◯	◯
Supply of nursery stock	◯	◯	◯	◯	◯
Reusable materials (e.g. pallets, trays)	◯	◯	◯	◯	◯
Dirty machinery, equipment or vehicles moving between sites	◯	◯	◯	◯	◯
Providing contract labour that moves between properties	◯	◯	◯	◯	◯
Transfer of plant or soil material on clothes or shoes	◯	◯	◯	◯	◯
Insufficient experience to recognise and diagnose potential problems	◯	◯	◯	◯	◯
Not sharing / providing relevant information to growers	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

13. What actions do you (personally) take to reduce the biosecurity risk to the vegetable industry? (rate all the options listed below depending on how frequently you do them)

	Never	Rarely	Sometimes	Standard practice	Not relevant
Pest / disease surveillance within crop	◯	◯	◯	◯	◯
Managing plant pests to prevent spread	◯	◯	◯	◯	◯
Following procedures in company quality assurance programs	◯	◯	◯	◯	◯
Supplying certified planting material	◯	◯	◯	◯	◯
Checking planting material for evidence of pests or unusual symptoms	◯	◯	◯	◯	◯
Displaying biosecurity signs at business entrances, visitor parking areas, wash down facilities	◯	◯	◯	◯	◯
Following biosecurity procedures of the farms where you work	◯	◯	◯	◯	◯
Ensuring your vehicle and footwear is free of soil and plant material before entering or leaving properties	◯	◯	◯	◯	◯
Follow special procedures if you have recently returned from overseas	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

14. What is currently limiting you from adopting best practice biosecurity? (rate all the options listed below, from least important to most important)

	Not important	Less Important	Important	Most Important	Not applicable
Poor surveillance skills	◯	◯	◯	◯	◯
Lack of surveillance skills within the business	◯	◯	◯	◯	◯
Time pressures (too busy to implement)	◯	◯	◯	◯	◯
Cost pressures (too expensive to implement)	◯	◯	◯	◯	◯
Poor duty of care by farmers	◯	◯	◯	◯	◯
Poor duty of care by others in the industry	◯	◯	◯	◯	◯
Language barriers (difficulty explaining to workforce)	◯	◯	◯	◯	◯
Transient nature of seasonal labour	◯	◯	◯	◯	◯
Don't have appropriate facilities (e.g. wash down areas/equipment)	◯	◯	◯	◯	◯
Professional liability risk	◯	◯	◯	◯	◯
Not sure what practices I should be implementing	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

15. Why do you think biosecurity is important to the vegetable industry? (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most Important	Unsure
Necessary for regulatory requirements	◯	◯	◯	◯	◯
Necessary for customer requirements	◯	◯	◯	◯	◯
Necessary for domestic market access	◯	◯	◯	◯	◯
Necessary for overseas market access	◯	◯	◯	◯	◯
Important to protect the industry in my local area	◯	◯	◯	◯	◯
Important to protect the industry in Australia	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

16. Please rate how well you believe the following stakeholders in the vegetable industry address biosecurity.

	Poor	Moderate	Good	Very good	Unsure
Vegetable growers	◯	◯	◯	◯	◯
Vegetable retailers / wholesalers	◯	◯	◯	◯	◯
Transport companies	◯	◯	◯	◯	◯
On-farm contractors	◯	◯	◯	◯	◯
Nursery / seed suppliers	◯	◯	◯	◯	◯
Field officers / agronomists	◯	◯	◯	◯	◯
Contract labour providers	◯	◯	◯	◯	◯

17. What impact do you think a pest or disease incursion could have on the vegetable industry as a whole? (rate all the options listed below)

	No impact	Little impact	Some impact	High impact	Unsure
Loss of overseas markets due to biosecurity / quarantine restrictions	◯	◯	◯	◯	◯
Loss of overseas markets due to image	◯	◯	◯	◯	◯
Loss of local markets due to biosecurity / quarantine restrictions	◯	◯	◯	◯	◯
Loss of local markets due to image	◯	◯	◯	◯	◯
Increased cost of production	◯	◯	◯	◯	◯
Loss of growing region	◯	◯	◯	◯	◯
Overseas imports permitted to meet market demand for produce	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

18. Of the following organisations which do you think play the most important role for biosecurity in the vegetable industry (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most important	Unsure
Federal Department of Agriculture Fisheries & Forestry (DAFF)	◯	◯	◯	◯	◯
Quarantine services	◯	◯	◯	◯	◯
Department agriculture / primary industry in your area	◯	◯	◯	◯	◯
State industry bodies (eg TFGA, VGA, Growcom Grow SA, etc)	◯	◯	◯	◯	◯
Peak industry body (AUSVEG)	◯	◯	◯	◯	◯
University / specialist agricultural college	◯	◯	◯	◯	◯
Private service providers	◯	◯	◯	◯	◯
Individual growers	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

19. If you, or a client, have experienced a biosecurity incursion, how did it impact your business? (select all the options that apply to you)

- [ ] I have not experienced an incursion
- [ ] I provided advice on pest/disease management
- [ ] I was aware of the incursion but not directly involved
- [ ] The incursion resulted in loss of business
- [ ] The incursion resulted in an increase in business
- [ ] There were stricter hygiene protocols that I had to follow

Other (please specify)

20. When you find an unusual plant pest, weed or disease in a crop or area where you are working, what do you usually do? (select the options that typically apply to you)

- [ ] Contact quarantine
- [ ] Implement my company's biosecurity plan
- [ ] Dial the exotic pest hotline (1800 048 881)
- [ ] Contact the relevant state government agency (DPI, Department Agriculture)
- [ ] Contact the state industry body
- [ ] Ask a colleague
- [ ] Isolate the area until I seek further advice/assistance
- [ ] Let the owner of the property know & leave them to deal with it
- [ ] Let the owner of the property know & assist them to deal with it
- [ ] I don't do anything as I am concerned about the consequences of reporting it
- [ ] I don't do anything until I here reports of other detections
- [ ] I have never found anything unusual

(please specify)

21. Which of the following do you think are the key biosecurity risks for the vegetable industry? (rate all the options listed below, from lowest risk to highest)

	No risk	Low risk	Moderate risk	High risk	Unsure
Seed	◯	◯	◯	◯	◯
Nursery stock	◯	◯	◯	◯	◯
Reusable materials (e.g. pallets)	◯	◯	◯	◯	◯
Seasonal workers	◯	◯	◯	◯	◯
Contractors and machinery moving between sites	◯	◯	◯	◯	◯
Your own equipment/vehicles moving between sites	◯	◯	◯	◯	◯
On-farm management practices	◯	◯	◯	◯	◯
Visiting agronomists or field officers	◯	◯	◯	◯	◯
Visitors from overseas	◯	◯	◯	◯	◯
Visitors from interstate	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

22. Rate the following practices in terms of whether you think they are worthwhile farm biosecurity practices or not.

	Not useful	Useful	Very useful	Unsure
Pest / disease surveillance within crop	◯	◯	◯	◯
Managing plant pests to prevent spread	◯	◯	◯	◯
Following procedures in farm quality assurance programs	◯	◯	◯	◯
Purchasing planting material from a reputable supplier	◯	◯	◯	◯
Checking planting material for evidence of pests or unusual symptoms	◯	◯	◯	◯
Displaying biosecurity signs at farm entrances, visitor parking areas, washdown facilities	◯	◯	◯	◯
Displaying biosecurity signs in different languages for the workforce	◯	◯	◯	◯
Briefing all workers, contractors and visitors on farm biosecurity measures	◯	◯	◯	◯
Ensuring visitor footwear is free of soil and plant material before entering or leaving farms	◯	◯	◯	◯
Special procedures for visitors and staff who have recently arrived from overseas	◯	◯	◯	◯
Other	◯	◯	◯	◯

(please specify)

23. Where do you get information about biosecurity from? (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most important	Not applicable
Research papers / journals	◯	◯	◯	◯	◯
Rural press (e.g. newspapers, magazines)	◯	◯	◯	◯	◯
Television / radio	◯	◯	◯	◯	◯
Websites	◯	◯	◯	◯	◯
Conferences / training courses	◯	◯	◯	◯	◯
Agricultural trade shows	◯	◯	◯	◯	◯
Other consultants / advisors / agronomists	◯	◯	◯	◯	◯
Colleagues	◯	◯	◯	◯	◯
State government departments or extension officers	◯	◯	◯	◯	◯
Federal government (DAFF)	◯	◯	◯	◯	◯
Peak vegetable industry body (AUSVEG)	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

24. If you have ever encountered a pest, weed or disease new to Australia / your area please explain briefly what the pest was, how it was found and dealt with, and how it impacted your business.

25. Do you think enough support is provided to vegetable industry service providers about biosecurity?

- ◯ Yes
- ◯ No
- ◯ Maybe

If you answered No or Maybe, what additional support or information would you like to see provided?

26. Are there any other comments that you would like to make about biosecurity in the vegetable industry?

27. If you would like to be in the running to win a $1,000 travel voucher, please include your name and contact phone number.

Name:

ZIP/Postal Code:

Phone Number:

Thank you for completing this survey, your input is greatly valued.

HAL Biosecurity Retail Survey

Vegetable Industry Biosecurity Survey - Retail / Wholesale

This survey is being conducted by Macquarie Franklin on behalf of Horticulture Australia Limited (HAL). It is part of a HAL funded project, which aims to find out more about the level of awareness of biosecurity within the vegetable industry across Australia. This will better inform future investment in biosecurity research and extension programs. The information that is produced as a result of the survey will be available as a final report downloadable from the HAL website.

If you wish to be in the running **to win a $1000 travel voucher** please provide your name and contact details when asked at the end of the survey. Responses from the survey will not be linked to individuals and reports from Macquarie Franklin to HAL will not include information that could be used to identify individual respondents.

The survey will take 10 minutes to complete and closes on Wednesday 14 August 2013

The contact person at HAL regarding the survey is:

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HAL Biosecurity Retail Survey

***1. What is your role in the business? (select all the options that apply to you)**

- [ ] Procurement
- [ ] Quality Assurance
- [ ] Logistics
- [ ] Marketing
- [ ] Technical Role
- [ ] Owner / Operator
- [ ] Other (please specify)

2. How many outlets does your business have?

3. Does your business operate in wholesale or retail markets? (select the option that most applies to you)

- ◯ Wholesale
- ◯ Retail
- ◯ Both

4. What states does your business operate in? (select all the options that apply to you)

- [ ] NSW
- [ ] VIC
- [ ] QLD
- [ ] SA
- [ ] WA
- [ ] TAS
- [ ] NT
- [ ] Internationally

(please specify which countries)

5. Do you maintain an Accredited Quality Assured scheme? (select the option that best applies to you)

- ◯ Yes
- ◯ Currently working towards
- ◯ Used to have
- ◯ No

6. If you do have or have ever had an Accredited Quality Assured scheme, please name the scheme/s.

7. Does your business purchase vegetables from suppliers? (select all options that apply to you)

- ☐ From regions throughout Australia with plant health / quarantine certificates
- ☐ From regions throughout Australia with no plant health / quarantine certificates
- ☐ From the local area with plant health / quarantine certificates
- ☐ From the local area with no plant health / quarantine certificates
- ☐ From international suppliers
- ☐ No fresh vegetables are purchased by my business
- ☐ Other

(please specify)

8. As a person involved in the retail industry, what does biosecurity mean to you? (rate each of the statements below on how much you agree or disagree with them)

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree	Unsure
Biosecurity is not relevant to me	◯	◯	◯	◯	◯	◯
I don't really understand what biosecurity means	◯	◯	◯	◯	◯	◯
Biosecurity creates extra paperwork	◯	◯	◯	◯	◯	◯
Biosecurity means extra procedures to follow	◯	◯	◯	◯	◯	◯
Biosecurity is an additional cost to my business	◯	◯	◯	◯	◯	◯
My role in biosecurity is important to help prevent the spread of pests and diseases into / around Australia	◯	◯	◯	◯	◯	◯
Implementing biosecurity practices doesn't have an overall negative impact on my business	◯	◯	◯	◯	◯	◯

9. Why do you think biosecurity is important to the vegetable industry? (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most important	Unsure
To meet regulatory requirements	◯	◯	◯	◯	◯
To meet customer requirements	◯	◯	◯	◯	◯
Necessary for domestic market access	◯	◯	◯	◯	◯
Necessary for overseas market access	◯	◯	◯	◯	◯
Important to protect the vegetable industry in my local area	◯	◯	◯	◯	◯
Important to protect the vegetable industry in Australia	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

10. What impact do you think a pest or disease incursion could have on the vegetable industry as a whole? (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most important	Unsure
Loss of overseas markets due to image	◯	◯	◯	◯	◯
Loss of overseas markets due to biosecurity / quarantine restrictions	◯	◯	◯	◯	◯
Loss of local markets due to image	◯	◯	◯	◯	◯
Loss of local markets due to biosecurity / quarantine restrictions	◯	◯	◯	◯	◯
Increased cost of production	◯	◯	◯	◯	◯
Loss of growing region	◯	◯	◯	◯	◯
Overseas imports permitted to meet market demand for produce	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

11. Which of the following are the key biosecurity risks that you think retailers / wholesalers pose to the vegetable industry? (rate all the options listed below, from lowest risk to highest)

	Low risk	Moderate risk	High risk	Unsure
Use of reusable materials (e.g. pallets)	◯	◯	◯	◯
Poor disposal of waste vegetable material	◯	◯	◯	◯
Insufficient ability to recognise and diagnose potential problems	◯	◯	◯	◯
Insufficient ability to respond quickly to potential problems	◯	◯	◯	◯
Imported vegetable products	◯	◯	◯	◯
Other	◯	◯	◯	◯

(please specify)

12. When you or a customer find an unusual plant pest / disease in your produce, what do you usually do? (select the options that typically apply to you)

- [ ] Contact quarantine
- [ ] Implement my company's biosecurity plan
- [ ] Dial the exotic pest hotline (1800 048 881)
- [ ] Contact peak vegetable industry body (AUSVEG)
- [ ] Isolate the suspect produce until I found out more
- [ ] I wouldn't do anything, as I would be concerned about the consequences of reporting it
- [ ] Contact the supplier of the produce
- [ ] Implement full trace back
- [ ] I have never had this happen to me
- [ ] Other

(please specify)

13. If you have experienced a biosecurity incursion, how did it impact your business? (select all the options that apply to you)

- [ ] Have not experienced an incursion
- [ ] There was an interruption to supply
- [ ] We sourced the product from elsewhere (within Australia) to maintain supply
- [ ] We sourced the product from elsewhere (outside Australia) to maintain supply
- [ ] It damaged our image / reputation
- [ ] Created extra demands (e.g. increased paperwork, handling procedures, etc)
- [ ] Other

(please specify)

14. What biosecurity practices does your business implement? (rate all the options listed below depending on how frequently you do them)

	Never	Rarely	Sometimes	Standard practice	Not relevant
Looking for plant pests in produce delivered to your operations	◯	◯	◯	◯	◯
QA programs for suppliers	◯	◯	◯	◯	◯
Internal QA programs	◯	◯	◯	◯	◯
Purchasing produce from a reputable supplier	◯	◯	◯	◯	◯
Briefing workers on biosecurity	◯	◯	◯	◯	◯
Displaying biosecurity awareness material in staff rooms, trimming and packing areas	◯	◯	◯	◯	◯
Correct management of fresh plant waste material	◯	◯	◯	◯	◯
Inspecting delivery trucks for soil / plant material	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

15. What is limiting implementation of best practice biosecurity in your business? (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most important	Not applicable
Lack of specific diagnostic skills	◯	◯	◯	◯	◯
Biosecurity is not relevant to my business	◯	◯	◯	◯	◯
Biosecurity practices are too expensive to implement	◯	◯	◯	◯	◯
Biosecurity practices disrupt schedules	◯	◯	◯	◯	◯
Language barriers	◯	◯	◯	◯	◯
Quarantine provides sufficient biosecurity protection	◯	◯	◯	◯	◯
Poor duty of care by others in the vegetable industry	◯	◯	◯	◯	◯
Biosecurity is grower / supplier repsonsibility	◯	◯	◯	◯	◯
I am not sure what biosecurity practices I should be implementing	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

16. Please rate how well you believe the following stakeholders in the vegetable industry address biosecurity.

	Poor	Moderate	Good	Very good	Unsure
Vegetable growers	◯	◯	◯	◯	◯
Vegetable retailers / wholesalers	◯	◯	◯	◯	◯
Transport companies	◯	◯	◯	◯	◯
On-farm contractors	◯	◯	◯	◯	◯
Nursery / seed suppliers	◯	◯	◯	◯	◯
Field officers / agronomists	◯	◯	◯	◯	◯
Contract labour providers	◯	◯	◯	◯	◯

17. Where do you get information about biosecurity from? (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most important	Not applicable
Journals / industry press	◯	◯	◯	◯	◯
Consultants / advisors	◯	◯	◯	◯	◯
Training courses / trade shows	◯	◯	◯	◯	◯
Industry websites	◯	◯	◯	◯	◯
Suppliers	◯	◯	◯	◯	◯
Customers	◯	◯	◯	◯	◯
State government (Department Primary Industry / Agriculture)	◯	◯	◯	◯	◯
Federal government (DAFF)	◯	◯	◯	◯	◯
Peak vegetable industry body (AUSVEG)	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

18. Do you think enough support is provided to your industry to implement biosecurity?

- ◯ Yes
- ◯ No
- ◯ Maybe

If you answered No or Maybe, what additional support or information would you like to see provided?

19. Are there any other comments that you would like to make about biosecurity in the vegetable industry?

20. If you would like to be in the running to win a $1,000 travel voucher, please include your name and contact phone number.

Name:

Phone Number:

Thank you for completing this survey, your input is greatly valued.

HAL Biosecurity Survey - Grower

Vegetable Industry Biosecurity Survey - Growers

This survey is being conducted by Macquarie Franklin on behalf of Horticulture Australia Limited (HAL). It is part of a HAL funded project, which aims to find out more about the level of awareness of biosecurity within the vegetable industry across Australia. This will better inform future investment in biosecurity research and extension programs. The information that is produced as a result of the survey will be available as a final report downloadable from the HAL website.

If you wish to be in the running **to win a $1000 travel voucher** please provide your name and contact details when asked at the end of the survey. Responses from the survey will not be linked to individuals and reports from Macquarie Franklin to HAL will not include information that could be used to identify individual respondents.

The survey will take about 15 minutes to complete and closes on Wednesday 14 August 2013

The contact person at HAL regarding the survey is:

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HAL Biosecurity Survey - Grower

*1. What is your role in the business? (select all the options that apply to you)

- [ ] Production
- [ ] Quality Assurance
- [ ] Logistics
- [ ] Marketing
- [ ] Processing / packaging
- [ ] Supervisor / manager
- [ ] Technical advisor
- [ ] Owner / Operator
- [ ] Other (please specify)

2. What is your age?

- ◯ 15-24
- ◯ 25-54
- ◯ 55-64
- ◯ 65 and over

3. Is English your first language?

- ◯ Yes
- ◯ No (please specify)

4. Other than vegetable production, what additional activities does your business undertake? (select all the options that apply to you)

- [ ] Nursery production
- [ ] Seed production
- [ ] Freight
- [ ] Wholesale
- [ ] Retail
- [ ] Processing / packing
- [ ] Contract work (e.g. ground prep, planting, harvesting, spraying, etc)
- [ ] Other (please specify)

5. How many separate properties does the business operate for vegetable production?

6. In which states does the business grow vegetables? (select all the options that apply to you)

- [ ] NSW
- [ ] VIC
- [ ] QLD
- [ ] SA
- [ ] WA
- [ ] TAS
- [ ] NT
- [ ] Internationally

(please specify which countries)

7. What type of production system does the business operate? (select all the options that apply to you)

- [ ] Outdoor cropping
- [ ] Protected cropping

8. What vegetables are grown by the business? (select all the options that apply to you)

- [ ] Leafy vegetables
- [ ] Cucurbits
- [ ] Corn
- [ ] Asian vegetables
- [ ] Leeks, spring onions
- [ ] Brassica (e.g. cauliflower, cabbage)
- [ ] Root crops (e.g. carrots, parsnips)
- [ ] Legumes (e.g. peas, beans)
- [ ] Solanaceae (e.g. capsicum, chillies)
- [ ] Other (please specify)

9. On average, how many hectares of land are planted to vegetables each year by the business? (select the option that best applies to you)

- ◯ < 5 ha
- ◯ 5-25 ha
- ◯ 25-100 ha
- ◯ 100-250 ha
- ◯ > 250 ha

10. Do you need Plant Health or Quarantine certificates for any produce you supply? (select all the options that apply to you)

- [ ] We supply regions within Australia which do have biosecurity requirements / restrictions
- [ ] International clients (with certificates required)
- [ ] We supply to regions within Australia where no biosecurity requirements / restrictions exist
- [ ] Other

(please specify)

11. Do you maintain an Accredited Quality Assured scheme? (select the option that best applies to you)

- ◯ Yes
- ◯ Currently working towards
- ◯ Used to have one
- ◯ No

12. If you do have or have ever had an Accredited Quality Assured scheme, please list the scheme/s.

13. Are vehicles, equipment or machinery used on one property also used on other properties? (select the option that best applies to you)

- ◯ Yes, only properties operated by the business
- ◯ Yes, properties operated by the business and other properties (includes use of contractors and their equipment)
- ◯ No, equipment is dedicated to each property
- ◯ No, we have only one property

14. How many staff does the business employ?

Number of permanent staff

Typical number of seasonal workers

15. Do workers move between sites? (select the option that best applies to you)

- ◯ Yes, only properties operated by the business
- ◯ Yes, properties operated by the business and other properties
- ◯ Unsure
- ◯ No

16. In your opinion, what is the most important aspect of biosecurity in the vegetable industry? (select the option that best applies to you)

- ◯ Preventing outbreaks
- ◯ Managing outbreaks once they have occurred
- ◯ Unsure
- ◯ Other

(please specify)

17. What on-farm biosecurity practices does your business implement? (rate all the options listed below depending on how frequently you do them)

	Never	Rarely	Sometimes	Standard practice	Not relevant
Pest / disease surveillance within crop	◯	◯	◯	◯	◯
Managing plant pests to prevent spread	◯	◯	◯	◯	◯
Following procedures in farm quality assurance programs	◯	◯	◯	◯	◯
Purchasing planting material from a reputable supplier	◯	◯	◯	◯	◯
Checking planting material for evidence of pests or unusual symptoms	◯	◯	◯	◯	◯
Displaying biosecurity signs at farm entrances, visitor parking areas, washdown facilities	◯	◯	◯	◯	◯
Displaying biosecurity signs in different languages for the workforce	◯	◯	◯	◯	◯
Briefing all workers, contractors and visitors on your farm biosecurity measures	◯	◯	◯	◯	◯
Ensuring employee and visitor footwear is free of soil and plant material before entering or leaving the farm	◯	◯	◯	◯	◯
Special procedures for visitors and staff who have recently arrived from overseas	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

18. What is currently limiting your business from adopting best practice farm biosecurity? (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most important	Not relevant
Lack of surveillance skills within the business	◯	◯	◯	◯	◯
Lack of access to surveillance skills from external providers	◯	◯	◯	◯	◯
Time pressures (too busy to implement)	◯	◯	◯	◯	◯
Cost pressures (too expensive to implement)	◯	◯	◯	◯	◯
Poor duty of care by contractors	◯	◯	◯	◯	◯
Language barriers (difficulty explaining to workforce)	◯	◯	◯	◯	◯
Transient nature of seasonal labour	◯	◯	◯	◯	◯
Don't have appropriate facilities (e.g. wash down areas/equipment)	◯	◯	◯	◯	◯
Not sure what practices I should be implementing	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

19. When you find an unusual plant pest, weed or disease in one of your crops, what do you normally do? (select the option/s that you would usually do)

- [ ] Contact an agronomist or field officer
- [ ] Contact quarantine
- [ ] Isolate the area until I find out more information
- [ ] Implement my biosecurity plan
- [ ] Dial the exotic pest hotline (1800 048 881)
- [ ] Contact peak industry body (AUSVEG)
- [ ] Contact state government agency (Department Primary Industry / Agriculture)
- [ ] Contact the state industry body
- [ ] Ask a neighbour / friend
- [ ] Implement full trace back to work out how it arrived
- [ ] I don't do anything as I was concerned about the consequences of reporting it
- [ ] I don't do anything until I hear reports of other detections
- [ ] I have never found anything unusual
- [ ] Other

(please specify)

20. Why do you think biosecurity is important to the vegetable industry? (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most important	Unsure
Necessary for regulatory requirements	◯	◯	◯	◯	◯
Necessary to protect my business from contamination	◯	◯	◯	◯	◯
Necessary for customer requirements	◯	◯	◯	◯	◯
Necessary for domestic market access	◯	◯	◯	◯	◯
Necessary for overseas market access	◯	◯	◯	◯	◯
Important to protect the industry in my local area	◯	◯	◯	◯	◯
Important to protect the industry in Australia	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

21. Please rate how well you believe the following stakeholders in the vegetable industry address biosecurity

	Poor	Moderate	Good	Very good	Unsure
Vegetable growers	◯	◯	◯	◯	◯
Vegetable retailers / wholesalers	◯	◯	◯	◯	◯
Transport companies	◯	◯	◯	◯	◯
On-farm contractors	◯	◯	◯	◯	◯
Nursery / seed suppliers	◯	◯	◯	◯	◯
Field officers / agronomists	◯	◯	◯	◯	◯
Contract labour providers	◯	◯	◯	◯	◯

22. What impact do you think a pest or disease incursion could have on the vegetable industry as a whole? (rate all the options listed below)

	No impact	Little impact	Some impact	High impact	Unsure
Loss of overseas markets due to biosecurity / quarantine restrictions	◯	◯	◯	◯	◯
Loss of overseas markets due to image	◯	◯	◯	◯	◯
Loss of local markets due to biosecurity / quarantine restrictions	◯	◯	◯	◯	◯
Loss of local markets due to image	◯	◯	◯	◯	◯
Increased cost of production	◯	◯	◯	◯	◯
Loss of growing region	◯	◯	◯	◯	◯
Overseas imports permitted to meet market demand for produce	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

23. Of the following organisations which do you think play the most important role for biosecurity in the vegetable industry (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most important	Unsure
Federal Department of Agriculture Fisheries & Forestry (DAFF)	◯	◯	◯	◯	◯
Quarantine services	◯	◯	◯	◯	◯
Department agriculture / primary industry in your area	◯	◯	◯	◯	◯
State industry bodies (eg TFGA, VGA, Growcom Grow SA, etc)	◯	◯	◯	◯	◯
Peak industry body (AUSVEG)	◯	◯	◯	◯	◯
University / specialist agricultural college	◯	◯	◯	◯	◯
Private service providers	◯	◯	◯	◯	◯
Individual growers	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

24. Which of the following do you think pose the main biosecurity risks for your business? (rate all the options listed below, from least important to most important)

	No risk	Low risk	Moderate risk	High risk	Not relevant
Seed	◯	◯	◯	◯	◯
Nursery stock	◯	◯	◯	◯	◯
Reusable materials (e.g. pallets)	◯	◯	◯	◯	◯
Seasonal workers	◯	◯	◯	◯	◯
Contractors and machinery moving between sites	◯	◯	◯	◯	◯
Your own machinery moving between sites	◯	◯	◯	◯	◯
Management practices of neighbours	◯	◯	◯	◯	◯
Visiting agronomists or field officers	◯	◯	◯	◯	◯
Visitors from overseas to your property(ies)	◯	◯	◯	◯	◯
Visitors from interstate to your property(ies)	◯	◯	◯	◯	◯
Your own management practices	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

25. If you have experienced a biosecurity incursion, how did it most impact your business? (select all the options that apply to you)

- [ ] I have not experienced an incursion
- [ ] Increased my cost of production long-term
- [ ] I was unable to supply / sell any produce from the affected property / packing shed
- [ ] My products were withdrawn from sale in wholesale / retail markets (brand damage)
- [ ] I lost market access and following the incursion had to find new markets / buyers
- [ ] Affected crops were destroyed (no compensation)
- [ ] Other

(please specify)

26. Where do you get information about biosecurity from? (rate all the options listed below, from least important to most important)

	Not important	Less important	Important	Most important	Not applicable
Research papers / journals	◯	◯	◯	◯	◯
Rural press (e.g. newspapers, magazines)	◯	◯	◯	◯	◯
Television / radio	◯	◯	◯	◯	◯
Websites	◯	◯	◯	◯	◯
Conferences / training courses	◯	◯	◯	◯	◯
Agricultural trade shows	◯	◯	◯	◯	◯
Field officers from the company/s I grow for	◯	◯	◯	◯	◯
Consultants / advisors / agronomists	◯	◯	◯	◯	◯
Neighbours / other farmers	◯	◯	◯	◯	◯
State government departments or extension officers	◯	◯	◯	◯	◯
Federal government (DAFF)	◯	◯	◯	◯	◯
Peak vegetable industry body (AUSVEG)	◯	◯	◯	◯	◯
Sales representatives	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯

(please specify)

27. If you have ever encountered a pest, weed or disease new to Australia or your area please explain briefly what the pest was, how it was found and dealt with, and how it impacted your business.

28. Do you think enough support is provided to growers to implement biosecurity?

- ◯ Yes
- ◯ No
- ◯ Maybe

If you answered No or Maybe, what additional support or information would you like to see provided?

29. Are there any other comments that you would like to make about biosecurity in the vegetable industry?

30. If you would like to be in the running to win a $1,000 travel voucher, please include your name and contact phone number.

Name:

ZIP/Postal Code:

Phone Number:

Thank you for completing this survey, your input is greatly valued.