Hort Innovation

Final Report

Ensuring business continuity during biosecurity incursions – social and economic research learnings for the production nursery industry

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NY18010

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Ensuring business continuity during biosecurity incursions – social and economic research learnings for the production nursery industry (NY18010)

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Content

Summary

The intention of the Project is to assess the type of economic and social impacts that occur as a result of a biosecurity incursion on a production nursery. Biosecurity management processes should not only be about managing ecological risks and adhering to regulatory processes, but managing the social and economic impacts on a business. A biosecurity incursion in a production nursery business or region where nurseries are located can be devastating on a financial and social level for the business, the industry network and the horticulture supply chain.

During a biosecurity incursion, the Emergency Plant Pest Response Deed (EPPRD) provides the legislative and financial framework for managing specific pest and disease incursions. The EPPRD outlines how outbreaks will be managed, and how governments and industry will share the cost. Commentary on the regulatory process was outside the scope of this Project, as the Nursery Industry already allocates extensive staff and research resources to this process.

The project identified potential impacts of biosecurity incursions on industry and business continuity. These impacts are categorised as follows:

- **Operational impacts:** actions that nursery businesses are required to undertake by the authorities during an incursion response (movement restrictions, surveillance, new or additional pest control or biosecurity procedures, additional administration tasks, isolation or quarantine of stock, disposal or destruction of stock).
- **Economic impacts:** these arise from operational impacts and can include increase costs, increased workload requirements, stock destruction, restricted or reduced trade, reduced value of stock.
- **Social impacts:** four main types of social impact experienced by growers – the operational demands of managing a business during the incursion response; financial implications of the incursion for the business; conditions of high uncertainty; and difficulties in social relations with government authorities and other nursery businesses.

Identification of these general impacts enables growers, industry and government to better understand the risks, enact a range of measures to assist a speedy and safe response to the incursion and mitigate future risk.

The intended outcome for the nursery industry is to ensure there is a business continuity framework that can be applied during biosecurity incursions with social and economic research learnings informing better preparedness, response, recovery, resumption and restoration of business activities.

The framework is presented as a Decision Guide (the Guide) to prepare for continuity of operations during a biosecurity incursion. The Guide enables a nursery owner to ask specific questions of their processes, and assess their capacity to manage a disruption. The Guide applies lessons learned from the project's literature review, qualitative and quantitative research conducted by Australia's national science agency, CSIRO; and acknowledges the importance of the established industry's biosecurity program, BioSecure HACCP.

The Project findings recommend nursery businesses, industry and government adopt an attitude of preparedness as a priority activity to mitigate the risk of a biosecurity incursion. Broadening grower adoption of practices prescribed in BioSecure HACCP is recommended. Nurseries that follow the comprehensive guidelines, can meet their broader biosecurity obligations and improve their overall pest, disease and weed management systems. BioSecure HACCP is the Action Plan in a business continuity management plan.

Keywords

Production nursery industry; biosecurity; social impacts; business continuity

Introduction

The project objective is to assess the risk of biosecurity incursions to generate severe economic, social and emotional consequences on the individual nursery owner and business. Management processes should not only be about managing ecological risks and adhering to regulatory processes, but the social and economic dimensions associated with incursions. For example, financial viability of a nursery business, social and psychological impacts on owners, staff and family; and industry resilience are the subject of the project to ascertain a wholistic approach to biosecurity incursions.

The project identified potential impacts of biosecurity incursions on industry and business resilience. These impacts are categorised as follows:

- **Operational impacts:** actions that nursery businesses are required to undertake by the authorities during an incursion response (movement restrictions, surveillance, new or additional pest control or biosecurity procedures, additional administration tasks, isolation or quarantine of stock, disposal or destruction of stock).
- **Economic impacts:** these arise from operational impacts and can include increase costs, increased workload requirements, stock destruction, restricted or reduced trade, reduced value of stock.
- **Social impacts:** four main types of social impact experienced by growers – the operational demands of managing a business during the incursion response; financial implications of the incursion for the business; conditions of high uncertainty; and difficulties in social relations with government authorities and other nursery businesses.

Identification of these general impacts enables growers, industry and government to better understand the impacts, enact a range of measures to assist a speedy and safe response to the incursion and mitigate future risk. The intended outcome for the nursery industry is to ensure there is a business continuity framework that can be applied during biosecurity incursions with social and economic research learnings informing better preparedness, response, recovery, resumption and restoration of business activities.

The Project team at Nursery & Garden Industry Queensland (NGIQ) sub-contracted Australia's national science agency, CSIRO to deliver the empirical research work. Additional resources applied to this project in terms of development of the business continuity framework were delivered by the concurrently-run levy funded project led by NGIQ – NY18008 *Nursery Industry natural disaster risk mitigation and action plan*.

CSIRO performed the research component to the project with a literature review, qualitative interviews and a quantitative survey conducted for the project. Information in this report is in-part based on information from the CSIRO Final Report *Supporting production nursery businesses during a biosecurity incursion: Final Report* (Appendix 1) which should be read as part of the project Final Report.

The Decision Guide (The Guide) (Appendix 2) developed by the project provides a basic business continuity framework to the production nursery industry to aid in the preparedness of operations during a biosecurity incursion. The Guide enables a nursery owner to assess their capacity to manage a disruption to the supply of products or services due to the threat of a biosecurity incursion.

One output of the project delievered as a result of discussion amongst the project team is a List of Alternate Suppliers for inclusion in BioSecure HACCP program. This List of Alternate Suppliers was identified as a gap in industry resources, and a possible priority risk for some nurseries.

An online workshop held in October 2021, provided industry and growers with a summary of the research findings and a set of scenario exercises using priority themes from the research and based in business continuity management. The workshop can be viewed at https://youtu.be/9iQVYYviJ_k

Discussion during the online workshop included assessing the capacity for nursery businesses to 'pivot' to an alternate market or diversify to an alternate crop. This Project considers the adaptation to alternate markets or crop is not an activity that can be readily or easily undertaken, especially during a biosecurity incursion or indeed, immediately following impact. Factors restricting this pivot or diversification, may depend on one or several of the following factors:

- Crop type currently grown (e.g. citrus, ornamental)
- Penetration into new but possibly saturated markets
- Technical knowledge of growing a new, alternate crop
- Infrastructure capacity of the nursery
- Location, climate and seasonal variabilities

This project recommends any consideration by nursery operators to move to new markets or supply chains is considered within a wholistic business continuity management strategy.

Methodology

The project methodology comprised these components:

- Literature review – intention to review a broad suite of literature from academic research, industry and government sources, to identify both the broad diversity of impacts on nursery businesses and the types of supportive measures required to help businesses respond and recover.
- Empirical research (qualitative interviews and quantitative survey) into the social and economic impacts of biosecurity incursions on production nursery businesses, and potential measures to help them respond and recover.
- Development of a business continuity framework of actions (Decision Guide) that growers could take to improve their capacity to manage their preparations and response to an incursion.
- An online workshop that included a presentation by CSIRO researchers on survey and interview findings; and a scenario exercise to illustrate the scope of a continuity plan to test, assess, practice and improve response to a biosecurity incursion. The online workshop can be viewed at https://youtu.be/9iQVYYviJ_k
- A final report to summarise the research activities, findings and recommendations for growers, industry and government.

A comprehensive report of the Project methodology is provided in Appendix 1, Loechel B (2021) *Supporting production nursery businesses during a biosecurity incursion: Final Report*, pp 2 – 6.

Outputs

The project delivered the following outputs. A comprehensive report of the Project Outputs is provided in Appendix 1, Loechel B (2021) *Supporting production nursery businesses during a biosecurity incursion: Final Report*, pp 7 - 8.

- Literature review – The literature review reviews a broad suite of literature from academic research, industry and government sources, to identify both the broad diversity of impacts on nursery businesses and the types of supportive measures required to help businesses respond and recover.

  The literature review, *Supporting production nursery businesses during a biosecurity incursion: Review of social and economic impacts and business continuity*, is available on the Australian Plant Production Standard website, https://nurseryproductionfms.com.au/policy-documents/

- Social and economic research (qualitative interviews and quantitative survey) into the social and economic impacts of biosecurity incursions on production nursery businesses, and potential measures to help them respond and recover.

  The qualitative and quantitative research report, *Supporting production nursery businesses during a biosecurity incursion: Social and economic research report*, is available on the Australian Plant Production Standard website, https://nurseryproductionfms.com.au/policy-documents/

- Development of a business continuity framework of actions that growers could take to improve their capacity to manage an incursion. (Appendix 2)

- Scenario exercise workshop to test, assess, practice and improve response to a biosecurity incursion. Due to government travel restrictions across various states and territories, the project delivered the workshop as an online webinar. A copy of the online workshop can be viewed here: https://youtu.be/9iQVYYviJ_k

- Final Report summarise the research activities, findings and recommendations for growers, industry and government. Refere to Appendix 1, Loechel B (2021) Supporting production nursery businesses during a biosecurity incursion: Final report. Report prepared for the Nursery & Garden Industry Queensland (NGIQ). CSIRO, Australia

- Communications: The following communication outputs are available to levy payers and industry

  https://www.horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/ny18010/

  YourLevy@Work

  17/09/20 - http://yourlevyatwork.com.au/new-project-explores-the-impacts-of-biosecurity-incursions/

  05/02/21 - http://yourlevyatwork.com.au/preparedness-key-to-building-nursery-industry-capacity-in-biosecurity-incursions/

22/06/21 - http://yourlevyatwork.com.au/grower-survey-underway-to-gather-insights-on-biosecurity-incursions/

17/09/21 - http://yourlevyatwork.com.au/preparedness-key-to-building-nursery-industry-capacity-in-biosecurity-incursions-2/

Outcomes

The project delivered on its intended outcomes. The three end-of-project outcomes are:

1. Clear understanding of the social and economic needs of production nurseries during biosecurity incursions.
2. Industry well equipped to support business continuity (and access alternative markets where possible) during and post biosecurity incursions.
3. Increased industry resilience.

1. **Understanding of the Social and Economic Needs of Production Nurseries during biosecurity incursions.** The project conducted empirical research investigation with both qualitative and quantitative methods employed to identify impacts and potential supportive measures. The qualitative, semi-structured interviews were conducted with a range of stakeholders (n=31) who had been directly involved with a biosecurity incursion within the nursery industry. The aim of this research was to gain a broad range of perspectives on the impacts arising from a biosecurity incursion and potential measures to support nursery businesses manage future incursions. One outcome of the interviews was for the project to identify the types of impact:

   - **Operational impacts:** actions that nursery businesses are required to undertake by the authorities during an incursion response (movement restrictions, surveillance, new or additional pest control or biosecurity procedures, additional administration tasks, isolation or quarantine of stock, disposal or destruction of stock).
   - **Economic impacts:** these arise from operational impacts and can include increase costs, increased workload requirements, stock destruction, restricted or reduced trade, reduced value of stock.
   - **Social impacts:** four main types of social impact experienced by growers – the operational demands of managing a business during the incursion response; financial implications of the incursion for the business; conditions of high uncertainty; and difficulties in social relations with government authorities and other nursery businesses.

   Of note, the research identified a significant stressor for growers is the issue of uncertainty about the incursion and its implications:

   > Uncertainty in the early stages of an incursion is generally unavoidable, due to the many initial unknowns, even among experts, about the pest type, origin and spread. Nevertheless, the issue does point to the need for strong communication between authorities, industry bodies and growers to, as quickly as possible, provide clear and up-to-date information to growers, to help dispel uncertainties and support practical action at the farm-level.
   > (Loechel, B. and Hobman, E.V. (2021) *Supporting production nursery businesses during a biosecurity incursion: Social and Economic Report*, p 30).

Identification of these three general impacts enables growers, industry and government to understand the social and economic impacts, enact a range of measures to assist a speedy and safe response to the incursion; and mitigate future risk by promoting preparedness as a priority activity.

2. **Industry well equipped to support business continuity (and access alternative markets where possible) during and post biosecurity incursions.** The project reviewed the industry capacity to manage a biosecurity incursion and ensure continuity of trade.

The project defined the intent of a business continuity management plan as to help identify priority risks, prepare for disruption, mitigate operational impacts and downtime; and support social and economic recovery from the disruption to the supply of products or services.

The Decision Guide (The Guide) (Appendix 2) developed by the project provides an overlay of a business continuity framework to the production nursery industry to aid in the continuity of operations during a biosecurity incursion. The Decision Guide enables a nursery owner to assess their capacity to manage a disruption to the supply of products or services due to the threat of a biosecurity incursion.

The Guide applies lessons learned from the project's literature review, qualitative and quantitative research conducted by Australia's national science agency, CSIRO; and acknowledges the importance of the established industry's biosecurity program, BioSecure HACCP.

Investigations to develop this Guide for the project has revealed no need to reinvent a management action plan, because BioSecure HACCP provides this in its comprehensive set of protocols and procedures that provides growers with methods to manage both the endemic common pests confronted daily as well as confirming freedom of quarantine pests or the early detection of exotic plant pests.

Importantly, the project research identified diversification or access into alternate markets during an incursion is extremely difficult or impractical, due to a range of factors often outside the control of the grower. Discussion during the online workshop https://youtu.be/9iQVYYviJ_k and with the Greenlife Industry Australia team, indicate capacity to "pivot" to an alternate market or diversify to an alternate crop is not an activity as easy as it may seem. Factors restricting this pivot or diversification, depend on the crop, market and technical capacity of the nursery. For example, shifting from supply to the landscape market into an already "full" or saturated retail market may not be easy or consistent.

3. **Increased industry resilience.** The project encourages a more general uptake by growers of the industry program, BioSecure HACCP. Under the delivery of Greenlife Industry Australia (GIA), the industry has established BioSecure HACCP as the on-farm Biosecurity Program for management of biosecurity incursions.

BioSecure HACCP is designed to assist growers in determining their current and future pest, disease and weed risks, as well as guide their businesses in the implementation of management

strategies at critical control points. (*Managing Biosecurity*, BioSecure HACCP: Guidelines for Managing Biosecurity in Nursery Production 4th Edition, page 8).

Therefore, the production nursery industry is well equipped with a rigorous system that aims to identify internal and external biosecurity threats to the integrity of a nursery's biosecurity preparedness.

The project recommends more research and development be conducted to ensure continuity of supply chain for industry, but at a grower level, adoption of a business continuity management plan to enable whole-of-business risks, threats be identified, preparedness activities managed and embedded within the business and production processes.

Monitoring and evaluation

The project delivered required outputs and its intention to assess the type of economic and social impacts that occur as a result of a biosecurity incursion on a production nursery. The project delivered on its intended intermediate and end-of-project outcomes.

The project acknowledges the research contribution by Australia's national science agency, CSIRO. Regular updates and meetings were held between NGIQ project leader and CSIRO research personnel, to deliver the following outputs:

- Literature review
- Empirical research (qualitative interviews and quantitative survey)
- A business continuity framework of actions (Decision Guide)
- An online workshop - update on research findings and scenario exercises to illustrate scope of a continuity plan
- A final report to summarise the research activities, findings and recommendations for growers, industry and government

Regular meetings and updates were provided to GIA, in particular, the National Biosecurity Manager, to ensure research questions and interviews were relevant. Findings of the survey and interviews were shared with GIA and together, content for the online workshop was planned. Identification of a need for an additional template, List of Alternate Suppliers, was a result of this discussion.

Communication activity with nursery operators was delivered through project updates and calls to industry for participation in the interviews, survey and to promote the online workshop. Communications activity with stakeholders includes:

https://www.horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/ny18010/

YourLevy@Work

17/09/20 - http://yourlevyatwork.com.au/new-project-explores-the-impacts-of-biosecurity-incursions/

05/02/21 - http://yourlevyatwork.com.au/preparedness-key-to-building-nursery-industry-capacity-in-biosecurity-incursions/

22/06/21 - http://yourlevyatwork.com.au/grower-survey-underway-to-gather-insights-on-biosecurity-incursions/

17/09/21 - http://yourlevyatwork.com.au/preparedness-key-to-building-nursery-industry-capacity-in-biosecurity-incursions-2/

Key evaluation questions considered at commencement have been fulfilled.

To what extent has the project identified the social and economic impacts of a biosecurity incursion?	This was achieved through the main research outputs: literature review, survey and interviews with stakeholders. The Final Report outcomes and recommendations are derived from identification of the social and economic impacts.
To what extent has the project improved awareness of business continuity management plans to levy payers?	Awareness of business continuity management plans has improved amongst key stakeholders, including industry groups and levy payers.
To what extent were priority stakeholders engaged in the project outputs?	Levy payers were involved in the survey and interviews; industry and government agencies were engaged in each stage of project delivery.
Have regular project updates been provided through linkage with the industry communication project?	This was achieved through YourLevy@Work, Hort Innovation and GIA enewsletters.

Recommendations

Priority themes emerged from the research findings and development of the Decision Guide to form the Recommendations.

The CSIRO Final Report for this project, Loechel B (2021) *Supporting production nursery businesses during a biosecurity incursion: Final Report* (Appendix 1), p 12 provides a comprehensive list of Recommendations for Growers, Industry and Government and should be read in conjunction with this Report.

Priority themes emerge from the Project which provide the following recommendation:

Preparedness is a priority activity to ensure business continuity.
Nursery operators, industry and government have a shared responsibility to focus on preparation activities and improve system-level incursion preparedness. The Executive Summary of the CSIRO Final Report states the nursery industry has:

> …conducted a range of programs and projects over the past decade or so to improve grower biosecurity *preparedness*. However, there remained a need to better understand the range of impacts and supportive measures required to assist growers to *respond and recover* from biosecurity incursions. (p iii)

Recommendation #1. The project recommends growers adopt the practices of BioSecure HACCP as their primary means for preparing for and managing a biosecurity incursion. Nurseries that follow the comprehensive guidelines can meet their broader biosecurity obligations and improve their overall pest, disease and weed management systems. BioSecure HACCP is the Action Plan in a business continuity management plan.

Recommendation # 2. The Project recommends growers utilise the resource, *Production Nursery Business Continuity and Preparation Decision Guide during a biosecurity incursion*. (Appendix 2) and practice scenario exercises (aided by the Decision Guide) to ensure that they have thought through likely impacts and therefore what they need to do to be prepared.

Recommendation #3. The project identified a need to further investigate supply chain (upstream and downstream) vulnerabilities for growers and the industry. For example, the impact of compromised or infected plant source materials and the availability through alternate suppliers. The project produced a List of Alternate Suppliers template, but recommends more research and development be conducted to ensure continuity of supply chain to industry.

Communication is critical to a timely response and return to trade.
The empirical research provided evidence of significant institutional learnings across the industry over time, with generally greater satisfaction expressed about the management of more recent incursions than with earlier ones. The interviews identified supportive actions that could be taken in the event of an incursion is the rapid provision of useful and clear information, specifically relevant to the incursion. Uncertainty and the unknown timeframe of an incursion in

some cases, led to undue stress and dissatisfaction with authorities' management of an incursion. Equally important is recognition for nursery operators to provide data in a timely manner to authorities, and therefore have ready access to business records relevant to the incursion, to aid traceability of stock.

> **Recommendation #4:** Industry and government to improve communications with growers, and enact the rapid provision of useful and clear information specifically relevant to the incursion, to help dispel uncertainty and support practical action by growers to help achieve a faster return to trade.

> **Recommendation #5:** Nursery operators to ensure business records and stock traceability data is readily accessible in the event of an incursion. This might require an upgrade or improvement of data systems within the nursery business. Nurseries should subscribe to relevant industry newsletters and Biosecurity Alerts to ensure regular updates, news and alerts are received by the nursery business.

Capacity is limited to enable nurseries to 'pivot' to alternate markets.
During the online workshop, discussion included assessing the capacity for nursery businesses to 'pivot' to an alternate market or diversify to an alternate crop. Factors restricting this pivot or diversification, may depend on one or several of the following factors:

- Plant stock type currently grown (eg. citrus, ornamental)
- Capacity to penetrate into new, yet possibly saturated, markets
- Limited technical knowledge of growing a new, alternate crop
- Limited or specific infrastructure capacity of the nursery
- Location, climate and seasonal variabilities

Consider, for example, shifting from supplying the landscape market to an already 'full' or saturated retail market may not be easy or provide consistent revenue. The social network stigma of a biosecurity incursion identified by this project within the nursery industry, may be acerbated if a grower decides to pivot into another grower's market. While open market competition is generally healthy, new players penetrating into an existing market, may need to undercut competitor's price points or flood the market with poor quality stock to gain access. Neither option is favourable to the growers or industry reputation.

> **Recommendation # 6:** This Project considers the adaptation to alternate markets or crop is not an activity that can be readily or easily undertaken, especially during a biosecurity incursion or indeed, immediately following impact, and recommends any change to markets or crop be considered as part of a broader business continuity management plan.

The CSIRO Final Report for this project, Loechel B (2021) *Supporting production nursery businesses during a biosecurity incursion: Final Report* (Appendix 1), p 12 provides a comprehensive list of Recommendations for Growers, Industry and Government and should be read in conjunction with this Report.

Refereed scientific publications

Loechel B (2020) Supporting production nursery businesses during a biosecurity incursion: Review of social and economic impacts and business continuity. CSIRO, Australia.

Loechel B and Hobman EV (2021) Supporting production nursery businesses during a biosecurity incursion: Social and economic research report. Report prepared for the Nursery & Garden Industry Queensland (NGIQ). CSIRO, Australia.

Loechel B (2021) Supporting production nursery businesses during a biosecurity incursion: Final report. Report prepared for the Nursery & Garden Industry Queensland (NGIQ). CSIRO, Australia

Project Reports are available on the NGIQ website - https://www.ngiq.asn.au/resources/technical-information/biosecurity-pest-disease/?skw=&orderby=date&order=desc

References

Loechel B (2021) Supporting production nursery businesses during a biosecurity incursion: Final report. Report prepared for the Nursery & Garden Industry Queensland (NGIQ). CSIRO, Australia

Intellectual property, commercialisation and confidentiality

No project IP, project outputs, commercialisation or confidentiality issues to report.

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The Project acknowledges the work conducted by Australia's national science agency, CSIRO, and their researchers, Barton Loechel and Elizabeth Hobman.

Information in this report is in-part based on information from the CSIRO Final Report *Supporting production nursery businesses during a biosecurity incursion: Final Report*.

The project acknowledges the contribution by Greenlife Industry Australia, levy payers, industry and government agencies to the project research.

Appendices

Appendix 1 – Loechel B (2021) *Supporting production nursery businesses during a biosecurity incursion: Final Report*. Report prepared for the Nursery & Garden Industry Queensland (NGIQ). CSIRO, Australia.

Appendix 2 – *Production Nursery Business Continuity & Preparation Decision Guide during a biosecurity incursion.*

Australia's National
Science Agency

Supporting production nursery businesses during a biosecurity incursion: Final Report

Milestone 190

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Important disclaimer

Contents

Tables

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This report forms Milestone 190 of the project, NY18010 *Ensuring Business Continuity during biosecurity incursions: Social and Economic research learnings for the Production Nursery Industry*, led by the Nursery & Garden Industry Queensland (NGIQ). The project is funded by Hort Innovation, using the Nursery Industry research and development levy and contributions from the Australian Government. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture.

The author thanks reviewers who have provided helpful comments to improve this report, including fellow CSIRO research scientists Elizabeth Hobman, Kerry Collins, and Anthea Coggan, and Kerry Battersby, Nursery & Garden Industry Queensland.

Keywords

Production nursery industry, biosecurity, social impacts, business continuity

Executive summary

The production nursery industry is a significant sector of the broader Australian horticulture industry, being extremely diverse and highly integrated into many other horticultural industry supply chains. Thus, the incursion of an emergency or high priority plant pest in a production nursery business can have devastating consequences, both financial and personal, for many businesses, communities, and regions.

The nursery industry, via Greenlife Industries Australia (formerly Nursery Garden Industry Australia (NGIA)) has conducted a range of programs and projects over the past decade or so to improve grower biosecurity *preparedness*. However, there remained a need to better understand the range of impacts and supportive measures required to assist growers to *respond and recover* from biosecurity incursions.

This project, *Ensuring Business Continuity during biosecurity incursions: Social and Economic research learnings for the Production Nursery Industry* (NY18010), presented an opportunity to investigate the social and economic impacts of biosecurity incursions and the supportive measures and actions required for growers to effectively manage an incursion.

The overall project objective was to develop a framework of supportive measures to assist individuals and businesses in the production nursery industry to cope with and recover from a biosecurity incursion event.

The project comprised three main research components (and corresponding outputs):

- Literature review (Milestone 103)
- Empirical research (qualitative interviews and quantitative survey) into the social and economic impacts of biosecurity incursions on production nursery businesses, and potential measures to help them respond and recover (Milestone 104)
- Development of a business continuity framework of actions that growers could take to improve their capacity to manage an incursion (Milestone 105).

Links to all research outputs are provided in section 3 ‘Outputs’ in this report.

Overall, the project delivered a suite of research products and an actionable tool, that integrates with prior research and capacity building tools produced by industry, notably the BioSecure HACCP program, to deliver a simple and practical Decision Guide for growers.

1 Introduction

The production nursery industry is a significant sector of the broader Australian horticulture industry, being extremely diverse and highly integrated into many other horticultural industry supply chains. The incursion of an emergency or high priority plant pest in a production nursery business can have devastating consequences, both financial and personal, for business owners and staff. Further, the production nursery industry typically sits at the beginning of many horticultural supply chains, and impacts can flow through to other businesses and people in many industries, communities, and regions. While high-level economic impact studies can calculate the overall impact of biological incursions at a broad, industry-wide scale, for industries to recover requires the recovery of many individual businesses. Further, while economic and financial factors are clearly of central importance to business recovery and ongoing viability, the more profound impacts of a biosecurity incursion can be the social, emotional, and psychological wellbeing of the people involved (Maclean et al., 2018; Mankad & Curnock, 2018; Mankad et al., 2019).

The production nursery industry has initiated a range of programs and projects over the past decade or so to improve general grower biosecurity preparedness (Loechel et al., 2018; Nursery & Garden Industry Queensland, 2015; Plant Health Australia, 2013). However, there remained a need to better understand the range of impacts and supportive measures required to assist growers to respond to and recover from incursions. This project therefore sought to identify both social and economic factors impacting production nursery businesses during an incursion, as well as the supportive measures required to assist businesses to respond and recover. The project outputs, particularly the framework of supportive measures, or 'business continuity framework', will help businesses to identify priority risks, prepare for disruption, minimise operational impacts and downtime; and thereby support social and economic recovery from the disruption to the supply of products or services.

1.1 Background

This is the Final Report of the project NY18010 *Ensuring Business Continuity during biosecurity incursions: Social and Economic research learnings for the Production Nursery Industry.* The overall project objective was to develop a framework of supportive measures to assist individuals and businesses in the production nursery industry to cope with, and recover from, a biosecurity incursion event. This report collates the findings of the following individual research components: literature review (Loechel, 2020; Milestone 103); qualitative and quantitative research on the main social and economic impacts of a biosecurity incursion on production nursery businesses, and potential corresponding support measures (Loechel & Hobman, 2021; Milestone 104); and subsequent development of the business continuity framework, in the form of a Decision Guide for nursery owners, to help them better manage a biosecurity incursion (*Production Nursery Business Continuity & Preparation Decision Guide during a biosecurity incursion;* Milestone 105; delivered by NGIQ and supported by CSIRO).

2 Methodology

The project methodology compromised three main components, reflecting the three major research components of the project: literature review, qualitative and quantitative research, and development of the business continuity framework.

2.1 Literature review

The review consulted a broad range of publicly available sources, from Australia and overseas, that provided information on the social and economic impacts of biosecurity incursions in the production nursery industry. Information sources included industry and government publications, and articles published in academic journals and conference proceedings.

The review began with an overview of the production nursery industry and its efforts to improve biosecurity preparedness, drawing primarily on a recent study of related issues by Loechel et al. (2018). The review then turned to an exploration of the many and diverse types of impacts of biosecurity incursions on growers and their businesses. To provide context, an overview was first provided of a typical biosecurity response, as outlined in the formal guidelines for an emergency plant pest incursion (PLANTPLAN; Plant Health Australia, 2019). This information about procedures for a regulated response provided useful insights into potential impacts on nursery business operations. The review then described findings (albeit from a limited pool of available research) on estimated economic impacts on nursery businesses and industry. A broader range of social research literature allowed description of the various social and psychological/emotional impacts of a biosecurity incursion on growers and their communities. The review of social and economic impacts was then followed by a corresponding focus on research on the types of supportive measures and actions that could be taken to assist efforts to prepare for, manage, and recover from, a biosecurity incursion. This was complemented by an overview of the types of supportive material and tools currently available to production nursery businesses and the plant industries more generally.

A key component of any approach seeking to support recovery efforts, is a focus on what measures businesses themselves can take to be better prepared. For this reason, the review also included a focus on Business Continuity Management (BCM), a comprehensive and well-established system that assists businesses to plan for, manage and recover from severely disruptive events. The review explored the potential for BCM to be applied to biosecurity management by businesses, to better enable continuity of trade during and after an incursion.

2.2 Social and economic research

The second research component of the project comprised of an empirical research investigation, with both qualitative and quantitative methods employed to identify impacts and potential supportive measures. The detailed methodology is provided in the report for this component (Loechel & Hobman, 2021) with a summary only provided here.

2.2.1 Ethics and Privacy

The research methodology was approved by CSIRO's Social Science Human Research Ethics Committee in accordance with the National Statement on Ethical Conduct in Human Research 2007 (Updated 2018) and by CSIRO's Privacy unit in accordance with the Privacy Act 1988 (Cth).

2.2.2 Qualitative interviews

First, qualitative, semi-structured interviews were conducted with a range of stakeholders (n=31) who had been directly involved with a biosecurity incursion in Australia related to the production nursery industry. The aim was to gain a broad range of perspectives on the impacts arising from a biosecurity incursion and potential measures to support nursery businesses to manage an incursion.

Case-study incursions

A number of Emergency Plant Pest (EPP) biosecurity incursions known to have occurred over the past decade and having significantly affected production nursery businesses, were identified to form the focus of the research interviews: myrtle rust (2010), banana freckle (2013), cucumber green mottle mosaic virus (CGMMV; 2014), tomato potato psyllid (TPP; 2017), and citrus canker (2018).

Participant recruitment

A total of 31 interview participants were recruited, comprising of four main categories of participants:

- production nursery business managers ('growers') known to have been affected (directly and/or indirectly) by one of the focal biosecurity incursions (n=9, representing 8 separate businesses as one interview included 2 interviewees)
- government biosecurity managers and scientists involved in incursion responses (n=14)
- production nursery industry personnel who were involved in assisting a response (n=4)
- downstream supply-chain industry personnel (i.e., from industries that included customer businesses of affected production nursery businesses (n=4)).

Interview participants were drawn from all the states and territories. Refer to Table 1 for a breakdown of participants by stakeholder type and jurisdiction.

Interview conduct

Interviews were conducted over the period February to May 2021 and were undertaken primarily by telephone. Interviews took 54 minutes on average and all were audio-recorded and transcribed for analysis.

Broadly speaking, the interview questions sought information on the following two topics:

- Impacts experienced by nursery businesses during a biosecurity incursion (operational, economic, and social), including their duration and severity
- Measures that could be taken by various relevant parties (businesses, nursery industry associations, government, and other biosecurity-related organisations) to reduce the

impacts of a biosecurity incursion on nursery businesses and to support nursery business owners and staff to manage and recover from an incursion.

Table 1. Interviewee recruitment numbers

STAKEHOLDER TYPE	NO.	JURISDICTIONS	NOTES
Growers	9	QLD, NSW, WA, NT	Representing 8 businesses
Nursery industry association	4	National, NSW, WA	
Government – national plant biosecurity management	3	National	Includes government-industry partnership organisation (PHA)
Government – state & territory:	11	QLD, NSW, VIC, TAS, SA, WA, NT	
biosecurity management	8		Main role type, includes some with scientific role
scientific & diagnostic	3		Main role type, includes some with management role
Government - total	14		
Supply chain industry/customers	4	National	
Total	**31**		

Data analysis

Interview transcriptions were entered into Nvivo qualitative analysis software (Nvivo Plus; QSR International Pty Ltd. Version 12) for coding of the main themes based on the key questions of interest, with the main theme points then summarised and organized accordingly.

2.2.3 Quantitative survey

Findings from the interviews were used to guide development of a quantitative survey of production nursery businesses. The survey was undertaken to gain a greater range of input specifically from growers, notably relating to the following areas: their awareness of, and experience with, biosecurity incursions, particularly the different types and degree of severity of social and economic impacts; perceptions about potential future incursions; and suggestions for ways that production nursery businesses could be best supported during an incursion.

A telephone survey was administered to 80 production nurseries in Australia, from Tuesday 6th July, 2021 to Tuesday 13th July, 2021. Five hundred and sixteen production nurseries were telephoned, and of these, 61 did not answer and 7 phone numbers were disconnected. Of the calls that were successful (in terms of either reaching a person or answering machine, n=448), 80 agreed to participate in the survey (17.9% response rate). This appears a reasonable response rate to this type of survey in Australia (Bednall et al., 2013).

The survey was conducted by a third-party agency (KG2) on behalf of CSIRO. The publicly available Nursery Industry Trade Register comprising 528 production nurseries served as the sampling frame.

Participants were asked about their experiences with biosecurity incursions, which were defined in the survey as a situation where an emergency plant pest or disease has been detected, and in some way has impacted their business – either directly or indirectly.

Participants in the qualitative and quantitative studies were not in any way linked, with two separate recruitment processes undertaken completely independently of one another, and the survey responses being anonymous to the researchers.

2.3 Scenario exercise

Following completion of the social and economic research component, an online webinar was held to present the findings to growers and other stakeholders and to encourage thinking through actions required in potential incursion scenarios. The webinar was hosted by NGIQ on 15 October 2021, using the Zoom platform and facilitated by the NGIQ project manager, and comprised of four main components:

1. Introduction covering project rationale, objectives and methodology
2. Presentation of the social and economic research findings by the CSIRO researchers
3. A series of scenario exercises, where the audience was encouraged to consider sets of questions for three distinct scenarios
   - Scenario #1: Uncertainty and unknown impacts of a local biosecurity incursion
   - Scenario #2: Supply chain interruption
   - Scenario #3: Reputational damage to the business due to an incursion
4. Panel discussions for each scenario (including the GIA Biosecurity Manager, CSIRO researchers, and questions from the audience via webinar 'chat' function)

The scenario question sets were developed by the project team based on the findings of the social and economic research study.

A range of industry and government stakeholders attended the webinar which allowed comment or questions via the 'chat' function.

2.4 Business continuity framework development

The third and final research component of the project saw development of a framework of supportive measures to aid planning and decision-making by production nursery businesses in the event of a biosecurity incursion. The framework development process was led by NGIQ and supported by the CSIRO research team, the Greenlife Industries Australia (GIA) Biosecurity Manager, and business consultancy firm TCB Solutions.

Information derived from the social and economic research components, the scenario exercise, and follow-up discussions between NGIQ, GIA and TCB Solutions, informed development of a Decision Guide for growers: *Production Nursery Business Continuity & Preparation Decision Guide during a biosecurity incursion*. Development of the Decision Guide was also informed by experience gained through a related project *Nursery industry natural disaster risk mitigation and recovery plan* (NY18008). Discussion of these various project learnings resolved that any business continuity framework needed to be simple to understand, easy to use, and aligned with other

business improvement tools already in use in the nursery industry. Thus, the Decision Guide is based on simple decision trees utilised in other products provided through the nursery industry's Australian Plant Protection Standard (APPS) and incorporates the BioSecure HACCP program as central to biosecurity planning.

3 Outputs

The project produced three primary outputs: literature review (Milestone 103); report on social and economic research findings (Milestone 104); and a business continuity framework in the form of a Decision Guide for growers (Milestone 105).

3.1 Literature review

3.1.1 Accessibility

The literature review, *Supporting production nursery businesses during a biosecurity incursion: Review of social and economic impacts and business continuity*, is available via the GIA, Australian Plant Protection Standard (APPS) website https://nurseryproductionfms.com.au/policy-documents/.

3.1.2 Summary findings

Refer to Appendix A.

3.2 Social and economic research report

3.2.1 Accessibility

The qualitative and quantitative research report, *Supporting production nursery businesses during a biosecurity incursion: Social and economic research report*, is also available via the GIA, APPS website https://nurseryproductionfms.com.au/policy-documents/.

3.2.2 Summary findings

Refer to Appendix B.

3.3 Business continuity framework

3.3.1 Scenario workshop

The scenario exercise via webinar provided three main contributions to aid development of the business continuity framework: a) presentation of summary findings from the qualitative and quantitative social research component, b) presentation of three scenario exercises to guide participants through planning and managing biosecurity incursions, and c) opportunity for panel discussion on each of the scenarios.

Accessibility

A recording of the online scenario workshop is available on the GIA YouTube Channel https://youtu.be/9iQVYYviJ_k

3.3.2 Decision Guide

Accessibility

The business continuity framework, in the form of a Decision Guide, *Production Nursery Business Continuity & Preparation Decision Guide during a biosecurity incursion*, is yet to be made accessible, however it is expected this will occur at or near the completion date of this project (December 2021), via the GIA website.

Summary

The Decision Guide incorporates the industry's established biosecurity program, BioSecure HACCP, and is presented in three phases:

1. Preparation Decision Guide
2. Incursion Impact Decision Guide
3. Recovery and Review Decision Guide.

Each phase of the Decision Guide follows the basic framework already established by the Australian Plant Protection Standard (APPS) in delivering best management practices to the nursery industry. That is, each Guide presents a series of questions via decision-trees, which lead the nursery owner to prepare, deal with and recover from a biosecurity incursion and promote continuous improvement in production and business continuity management.

Decision-trees are used in other APPS products, such as Ecohort and BioSecure HACCP, as they provide a simple and relatively quick risk assessment through a 'where you are at' analysis. They additionally provide the grower with direction on next steps in their efforts for continuous improvement, for whichever process or risk they are seeking to improve. The Decision Guide therefore provides a simple and familiar approach to assist growers to make nursery business improvements. Importantly, the Decision Guide acknowledges the centrality of the established industry biosecurity program, BioSecure HACCP, to any industry program or action plan to assist growers to improve biosecurity preparation and management.

4 Outcomes

The project has provided a range of information, from a wide-ranging and in-depth review of the literature, to findings from empirical research with growers, industry and government stakeholders, to a practical decision-making tool for growers that integrates with the production nursery industry's signature biosecurity program, BioSecure HACCP. These information products build on previous work investigating how production nursery growers can be better prepared for a biosecurity incursion (Loechel et al., 2018), to provide a strong knowledge foundation for the industry going forward, as well as providing a practical decision-making tool to help growers prepare for and manage an incursion.

5 Recommendations

5.1 For growers:

- Growers to prioritise being prepared for the event of a biosecurity incursion.
- Growers to utilise the *Production Nursery Business Continuity & Preparation Decision Guide during a biosecurity incursion*, including, importantly, adopting BioSecure HACCP as their primary means for preparing for and managing a biosecurity incursion.
- Growers to undertake their own biosecurity incursion scenario exercises (aided by the Decision Guide) to ensure that they have thought through likely impacts and therefore what they need to do to be prepared.
    - Importantly, as diversifying into different markets during an incursion is extremely difficult or impractical, growers need to consider how they would access alternative income streams and/or sources of credit if the incursion is prolonged.
- Growers to ensure they are regularly updated on important industry news and alerts, by subscribing to relevant industry newsletters and Biosecurity Alerts, and membership of their relevant production nursery industry association.
- Growers to maintain regular communication with industry personnel, including advising them when they are affected by a biosecurity incursion.
- Growers to ensure they can readily access business records that are relevant to a biosecurity investigation, to provide key data to authorities in the event of an incursion.
- Growers to proactively foster relationships with key industry and government personnel, and other growers, who may have expert knowledge and/or experience with biosecurity management, to provide helpful information in the event of an incursion.
- Growers, all along the supply chain, to prepare for unknown and uncertain impacts, for example by identifying alternative suppliers.

5.2 For industry and government

- Industry and government to be well prepared for an incursion, including:
    - strengthening relationships and communication channels with one another and growers
    - supporting grower preparedness through capacity building
    - adopting formal mechanisms to learn from past incursions, notably from the experience of a broad spectrum of relevant players
    - contingency planning and scenario exercises

    - developing and improving plans, systems, and resources to support rapid action in future incursions.

- Industry and government to prioritise communication helpful to growers as early as possible in an incursion, providing relevant and actionable information on the nature of the incursion and actions that growers can take to improve incursion management and assist a rapid return to trade.
- Government to take an inclusive approach to biosecurity incursion management, engaging proactively with industry to determine practical steps forward to assist growers and industry groups to contribute to incursion management.
    - Government to include grower information and business data in incursion monitoring and management, notably where this information can be provided via robust monitoring and business records-management systems.
- Government to prioritise evidence- and risk-based approaches to decision-making about allowing businesses to return to trade, whether fully or partially.
- Government to work with industry to improve system-level incursion preparedness, notably in terms of developing biosecurity standards and protocols that facilitate rapid resumption of trade.
- Government and industry to continue exploring more expansive compensation mechanisms than the current Owner Reimbursement Costs (ORC) scheme.
- Government and industry to provide strong and proactive leadership in combatting misinformed views that result in blaming, stigma and ostracism of growers impacted by a biosecurity incursion.

5.2.1 Implementation of the business continuity framework:

- Industry to promote the Decision Guide to growers, through the various communication channels and technical officers of the national body, GIA, and in consultation with the state-based nursery industry bodies.
- Industry and government to promote the Decision Guide through the various capacity building events and projects they conduct for production nursery growers, such as *Resourcing, supporting, and assessing biosecurity in nursery production* (NY20000).

Appendix A Literature review summary findings

The literature review identified three main types of impacts on production nursery businesses from a biosecurity incursion:

1. Impacts on farm or nursery operations, deriving both from the pest itself and the efforts to control it.
2. Economic and financial impacts on individual businesses, and to the broader industry. These flow from the nature of the impacts on nursery business operations, the related capacity of nursery businesses to produce and deliver products, and to the protective actions taken by customers, markets and jurisdictions.
3. Social impacts on growers, including both negative and positive effects; notably, personal psychological/emotional impacts, and consequences to social relations with other growers and related businesses in the industry, and within the local community.

The review identified the following key elements of support mechanisms suggested by the literature:

- Strong and early biosecurity preparedness measures that build grower capacity to deal with an incursion.
- A broad view by biosecurity response management, inclusive of contextual factors at a range of scales.
- Inclusive, planned and proactive stakeholder engagement.
- Decision-making that is methodical, participatory, transparent and holistic.
- Flexibility and responsiveness of the management approach.
- Anticipation of resistance and conflict, awareness of their benefits and risks, and proactively implementing mechanisms that help manage them.
- Programs and forums that support growers to build and share their knowledge and skills, and to develop greater connectedness and trust.
- Provision of practical information and assistance related to the broad range of supportive measures and resources that may be required by businesses.
- Approaches that are future oriented, building the capacity of growers to deal with the longer-term demands of a biological incursion.
- Communication that is early, frequent, clear, up-to-date, and informative; and, communication framings that focus on positive actions.
- Formal evaluation of the management approaches and measures taken.

The review also investigated the potential contribution of the Business Continuity Management (BCM) approach to building the resilience of businesses to a biosecurity incursion, and found that:

- BCM has a primary focus on helping businesses to navigate severely disruptive events to minimise interruption to trade, while building broader disaster management and business resilience characteristics.
- BCM additionally includes a focus on integrating the various external aspects of a disruptive event, which in the case of a biosecurity incursion would include: the formal biosecurity management system, interactions with relevant stakeholders, and considerations of flow-on effects, to and from, supply chains, environment and community.
- This holistic approach positions BCM as well suited to supporting management of biosecurity incursions growers and industry.

Appendix B Summary of findings from the social and economic research component

A. Social and economic impacts

- The quantitative survey found that 40% (n=32) of participants had been impacted, directly or indirectly, by a biosecurity incursion. Around half of these (n=17) had been impacted by one incursion, while the remainder had been affected by two or more incursions.
- Around half of the survey participants (n=44, 55%) reported that they were not aware of any other production nurseries being impacted by a biosecurity incursion in the last 5 years.
- Operational impacts: because many of the economic impacts arise as a result of actions that nursery business are required by the authorities to undertake during an incursion response, these actions were categorised and listed as 'operational impacts'. They provide necessary context to many of the economic and social impacts and to corresponding improvements or supportive actions.
  - The main operational impact categories identified were, as follows:
    - movement restrictions (specific to host plants or more general to all plant materials, people, vehicles, etc)
    - surveillance – increased monitoring, inspection, recording of information, and reporting to authorities
    - new or additional pest control procedures – mainly in the form of chemical sprays, but also installation of netting, weed control, etc
    - new or additional biosecurity procedures – e.g., plant hygiene, nursery operational hygiene, visitor management
    - additional administration requirements – e.g., generating, compiling and provisioning records and compliance documentation to authorities and/or customers
    - isolation, quarantine and/or partitioning of plant stock
    - disposal and/or destruction of plant stock and other infested materials.
  - The quantitative survey also revealed that some business experienced direct impacts such as a restriction or requirement placed upon them by government authorities (n=23 of 32 affected by an incursion); and/or indirect impacts such as flow-on effects from restrictions/requirements placed on another business (n=14 of 32 affected).
  - Quarantine orders appeared to be less prevalent among those affected (n=4 of 32 affected), as compared to the imposition of a geographic biosecurity zone (n=15 of 32 affected) or other restriction or requirement imposed (e.g., site inspection, request for records) (n=17 of 32 affected). In addition to government, customers also were identified as another originator of certain restrictions or requirements (n=7 of 32 affected)

- Economic impacts: the interview findings suggested economic impacts generally arose from the operational impacts, notably from movement restrictions that restricted trade, destruction of plant stock, new or enhanced pest control regimes (e.g., chemical sprays, netting) and, in a few cases, major reconfiguration of the nursery system or facilities to prevent infestations.
  - These findings were supported by the survey of growers, where the most common impacts reported included:
    - Increased costs (n=15, 47%)
    - Increased workload requirements (n=13, 41%)
    - Stock losses (destruction) (n=12, 38%)
    - Restricted or reduced trade (n=13, 41%)
    - Stock losses (reduced value) (n=9, 28%).
  - In terms of costs and financial impacts, the survey results showed that:
    - On average, participants spent $15,623 in managing the incursion. However, the distribution was positively skewed; with six participants (19%) not spending any money on managing the incursion and around one-third (n=11, 32%) spending less than $10,000.
    - On average, participants destroyed or disposed of $97,842 worth of plant-related stock and equipment. Again, the distribution was positively skewed; with 14 participants (44%) not losing any stock or equipment at all.
    - It was estimated that the average annual income lost was 4.6%.
  - In addition to these quantifiable financial impacts, one-quarter of these survey participants (n=8, 25%) reported that they lost customers or markets because of the incursion.
  - In terms of the duration of impacts, survey participants reported greatly varying time lengths, ranging from as little as “up to a fortnight” up to “longer than 20 years”. Around one-third (n=10, 31%) indicated that their business was still “moderately” to “greatly” affected by the incursion.
  - Restriction or reduction in trade tended to either occur within one’s state/territory (n=10 of 13 affected), and/or with another state/territory (n=10 of 13 affected), which is consistent with the fact that the greatest proportion of plant and stock movement (in terms of sales and purchase) tends to occur within one’s state.
  - A minority of survey participants (n=2, 18.2%) experienced a period time where they were unable to sell any product.
- Social impacts
  - The interview study revealed four main types of social impacts experienced by growers:
    - the operational demands of managing the business during an incursion response
    - the financial implications of the incursion for the business
    - conditions of high uncertainty, which exacerbated both 1 and 2, and
    - difficulties arising in social relations with other parties, notably government authorities and other nursery businesses (but also the nursery industry bodies in a minority of cases).

– Interview results suggested that the severity of social impacts was related to the severity of economic impacts, which was strongly related to the duration of time over which trade was impaired and the extent of that impairment, and to conditions of high uncertainty surrounding the incursion.

– Interviews also showed that stress associated with difficulties in relationships with other nursery businesses (and to a lesser extent nursery industry bodies) was related to perceptions of being unfairly blamed for the incursion, with a resulting sense of stigma and ostracism from industry peers.

– Results from the quantitative survey revealed that:

  - Stress reactions varied. A quarter (n=8, 25%) of impacted growers experienced "moderate" to "overwhelming" financial stress during the incursion, while the remainder reported "no" or "a little" financial stress (n=24, 75%).
  - In terms of perceived stress, 17 (n=53%) rated the incursion experience as "moderately" to "extremely" stressful. However, most participants indicated that they felt able to cope. Additionally, the majority of participants reported that their business' reputation, and relationships with other nurseries and customers remained unchanged.
  - In a hypothetical example presented to all survey participants, the majority (n=71, 89%) felt "moderately" to "very" confident that they could continue to trade through a biosecurity incursion. However, more than half (n=52, 65%) recognised that whether they could continue to trade through an incursion was largely outside of their personal control.
  - When asked, in an open-ended question, what caused the greatest stress during the incursion, participants mainly commented on the uncertainty and unknown element of being impacted (i.e., Where did the disease come from? What is it? How long will it last?).

B. Supportive actions

- Supportive actions were identified for each of the major parties in an incursion – the production nursery business, industry representative bodies, and government authorities. Interviews showed that, while in many cases the responsible party(s) for certain actions is reasonably clear, in other cases views differed over the sharing of responsibilities, with the sharing of many responsibilities an ongoing conversation between industry and government.

  – Actions that production nursery businesses could take to mitigate the impacts of an incursion were reasonably clear: the main theme from interviews was 'preparedness'. This referred to being prepared in terms of biosecurity generally (to reduce the risk of an incursion), but also being prepared specifically for the eventuality of an incursion affecting the business at some point in the future.

    - Biosecurity preparedness at the farm-level was seen to start with the basics of biosecurity planning and practice – having a biosecurity plan and undertaking good biosecurity practices as standard business operations.
    - Planning specifically for the potential eventuality of an incursion was seen as having done some planning for an incursion, that is, business 'contingency

planning' in terms of mapping a range of potential scenarios and planning for them. The main suggestions were for business diversification and contract design and management.

- At a broader level, preparedness for an incursion was seen as part of a mature, professional approach to business management, that included business risk management and business continuity planning.
- With regards to the survey results on what nurseries could do themselves to prepare and respond to an incursion, participants felt that they could:
    - Be aware of, and perform, biosecurity best practices in their nursery
    - Keep staff educated, informed, and well trained
    - Adhere to industry standards and government regulations
    - Access expertise through their networks
- Most participants (n=48, 73%) also placed a "moderate" to "high" priority on developing a biosecurity plan in case an incursion occurs.
- When presented with a list of potential supports, survey participants showed:
    - the most interest in accessing experts who can provide useful information and assistance on biosecurity-related matters,
    - moderate interest in receiving information and/or training on how to manage their business through an incursion,
    - slight interest in insurance cover and access to information on managing personal and social challenges.

– Areas where government authorities and industry representative bodies could support growers, from interview results:

- providing information and tools to raise awareness and build capacity for both general biosecurity awareness and good practice, and for on-farm incursion management
- with regards to preparedness for an incursion, supporting nursery business management improvements, particularly around scenario planning, business diversification and contract design and management
- in the event of an incursion, rapid provision of useful and clear information specifically relevant to the incursion, to help dispel uncertainty and support practical action by growers to help achieve a faster return to trade
- inclusion of grower information in the response decision-making process
- as rapid return to trade was generally seen as the most effective and sustainable way to minimise the economic impacts of an incursion, suggestion to facilitate this included:
    - rapidly deployment of evidence- and risk-based approaches that could enable either partial or full return to trade
    - system-level incursion preparedness in terms of the development of biosecurity standards and protocols that could facilitate quicker resumption of trade.

    - consideration/investigation of a more expansive compensation mechanism than the current Owner Reimbursement Costs (ORC) scheme
    - in the context of blaming, stigma and ostracism by industry peers, strong leadership by government authorities and industry bodies to show empathy and support may be helpful in blunting peer and community accusations and ultimately fostering a more a supportive environment.

– Survey participants reported higher levels of satisfaction with support received from family and/or friends, the nursery industry association, and other nursery businesses.

– Satisfaction with support from government agencies and biosecurity officers was more variable and hovered around the mid-point of the scale.

– Participants' rating of collective efficacy was variable, which suggests that people differed in their experiences of various groups (businesses, government, industry people) working together to address the problems associated with the incursion.

– With regards to the survey findings about what else government and industry could do, in open-ended comments, participants felt that government could help nurseries in managing biosecurity incursions by:
    - Improving and streamlining their communications
    - Consulting more with industry
    - Providing more financial and technical support
    - Acting more quickly and efficiently.

– Similarly, in open-ended comments, participants felt that the nursery industry associations could help nurseries by:
    - Maintaining their dissemination of up-to-date information
    - Continuing their current efforts
    - Providing expert advice and support to members.

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Nursery & Garden Industry Queensland

Production Nursery Business Continuity & Preparation Decision Guide during a biosecurity incursion

Introduction

The Decision Guide provides an overlay of a business continuity framework to the production nursery industry to aid in the continuity of operations during a biosecurity incursion.

The intent of a business continuity management plan is to help identify priority risks, prepare for disruption, minimise operational impacts and downtime; and support social and economic recovery from the disruption to the supply of products or services.

The project NY18010 *Ensuring Business Continuity during biosecurity incursions; Social and Economic research learnings for the Production Nursery Industry*, has developed the Decision Guide for a nursery owner to assess their capacity to manage a disruption to the supply of products or services due to the threat of a biosecurity incursion.

The Decision Guide on the following pages applies lessons learned from the project's literature review, qualitative and quantitative research conducted by Australia's national science agency, CSIRO; and acknowledges the importance of the established industry's biosecurity program, BioSecure HACCP.

BioSecure HACCP

The Australian production nursery industry, under the delivery of Greenlife Industry Australia (GIA), has established Biosecure HACCP as the on-farm Biosecurity Program for management of biosecurity incursions.

Biosecure HACCP is the industry specific biosecurity program designed to assist growers in determining their current and future pest, disease and weed risks, as well as guide their businesses in the implementation of management strategies at critical control points. (*Managing Biosecurity*, BioSecure HACCP: Guidelines for Managing Biosecurity in Nursery Production 4th Edition, page 8).

Therefore, the production nursery industry is well equipped with a rigorous system that aims to identify internal and external biosecurity threats to the integrity of a nursery's biosecurity preparedness.

Investigations to develop this Framework for the project has revealed no need to reinvent a management action plan, because BioSecure HACCP provides this in its comprehensive set of protocols and procedures that provides growers with methods to manage both the endemic common pests confronted daily as well as confirming freedom of quarantine pests or the early detection of exotic plant pests.

As stated on the Australian Plant Production Standard website (APPS - https://nurseryproductionfms.com.au/) , BioSecure HACCP on-farm system content includes:

Identification of pathways for plant pests	Control points within the cropping system
High health procedures to reducing risks	Recording process for managing risks
Electronic document management	Traceability processes in place

Nurseries that follow the comprehensive guidelines, can meet their broader biosecurity obligations and improve their overall pest, disease and weed management systems. Biosecure HACCP is the Action Plan in a business continuity management plan.

During a biosecurity incursion, the Emergency Plant Pest Response Deed (EPPRD) provides the legislative and financial framework for managing specific pest and disease incursions. The EPPRD outlines how outbreaks will be managed, and how governments and industry will share the cost.

Robust internal management of nursery operational data and the tracing of stock can make the incursion impact somewhat and readily assist authorities in working with the nursery business to determine Owner Reimbursement Costs (ORC).

Encouraging continuous improvement

The project has applied the key findings from the *Supporting production nursery businesses during a biosecurity incursion; Social and economic research report* (The Report) to compile this Decision Guide.

Actions that production nursery businesses could take to mitigate the impacts of an incursion were reasonably clear: the main theme from interviews was 'preparedness'. This referred to being prepared in terms of biosecurity generally (to reduce the risk of an incursion), but also being prepared specifically for the eventuality of an incursion affecting the business at some point in the future. (*Executive Summary*, p ix)

At a broader level, preparedness for an incursion was seen as part of a mature, professional approach to business management, that included business risk management and business continuity planning. (*Executive Summary*, p x)

With regards to the survey results on what nurseries could do themselves to prepare and respond to an incursion, participants felt that they could:

- Be aware of, and perform, biosecurity best practices in their nursery
- Keep staff educated, informed, and well trained
- Adhere to industry standards and government regulations
- Access expertise through their networks (*Executive Summary*, p x)

Specific activities for preparedness are described on pp 13 – 14 of the Report –

> Biosecurity preparedness at the farm-level was seen to start with the basics of biosecurity planning and practice – having a biosecurity plan and undertaking good biosecurity practices as standard business operations. This began with biosecurity awareness and education of management and staff, and extended to the practices of biosecurity: ensuring propagation material was clean (whether seeds, tissue, cuttings, seedlings, etc.), strong surveillance regimes (systems of monitoring, inspection and record-keeping), actions to prevent infection (visitor management, operational hygiene, partitioned or zoned production arrangements, physical barriers e.g., netting), and rapid reporting of suspect pests and symptoms.

Based on the Report findings and discussions held during the project online workshop (available on the GIA YouTube Channel https://youtu.be/9iQVYYviJ_k) the Decision Guide is presented in three phases:

1. Preparation Decision Guide
2. Incursion Impact Decision Guide
3. Recovery and Review Decision Guide

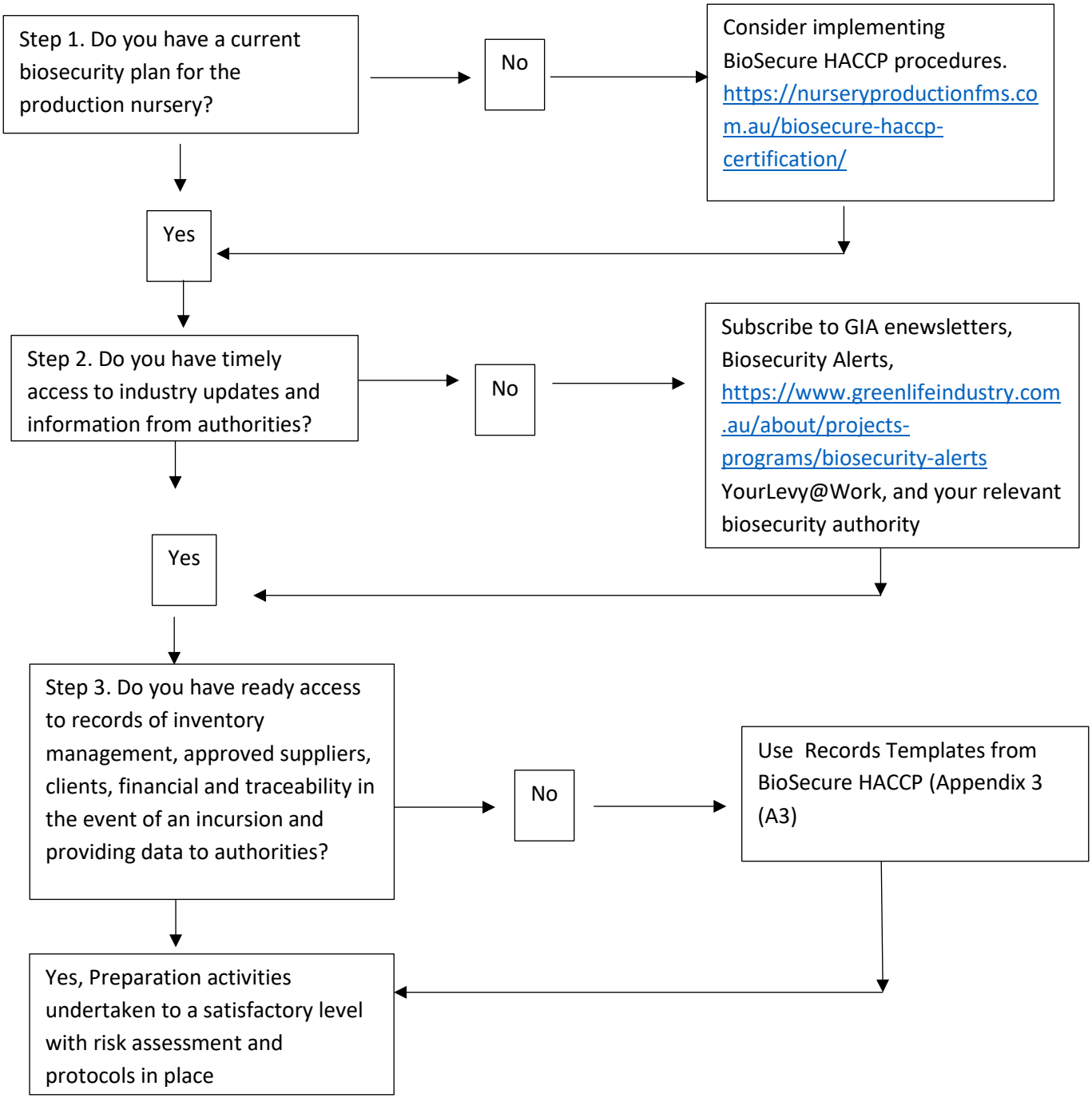
Each phase is of the Decision Guide follow the basic framework already established by the Australian Plant Protection Standard (APPS) in delivering best management practices to the nursery industry. That is, each Guide presents a series of questions which lead the nursery owner to prepare, deal with and recover from a biosecurity incursion and promote continuous improvement in production and business continuity management.

The Decision Guide is currently being assessed by the GIA biosecurity team to assess its functionality and application within the broader industry response to biosecurity incursions.

Decision Guide #1 - Preparation

PREPARATION	○ Recognising priority risks and assessing impact to plant stock, supply chain and business ○ Preparation Action Plan ○ Stay up to date with information and alerts from industry / authorities ○ Communication to priority contacts – staff, suppliers, clients, external and industry contacts

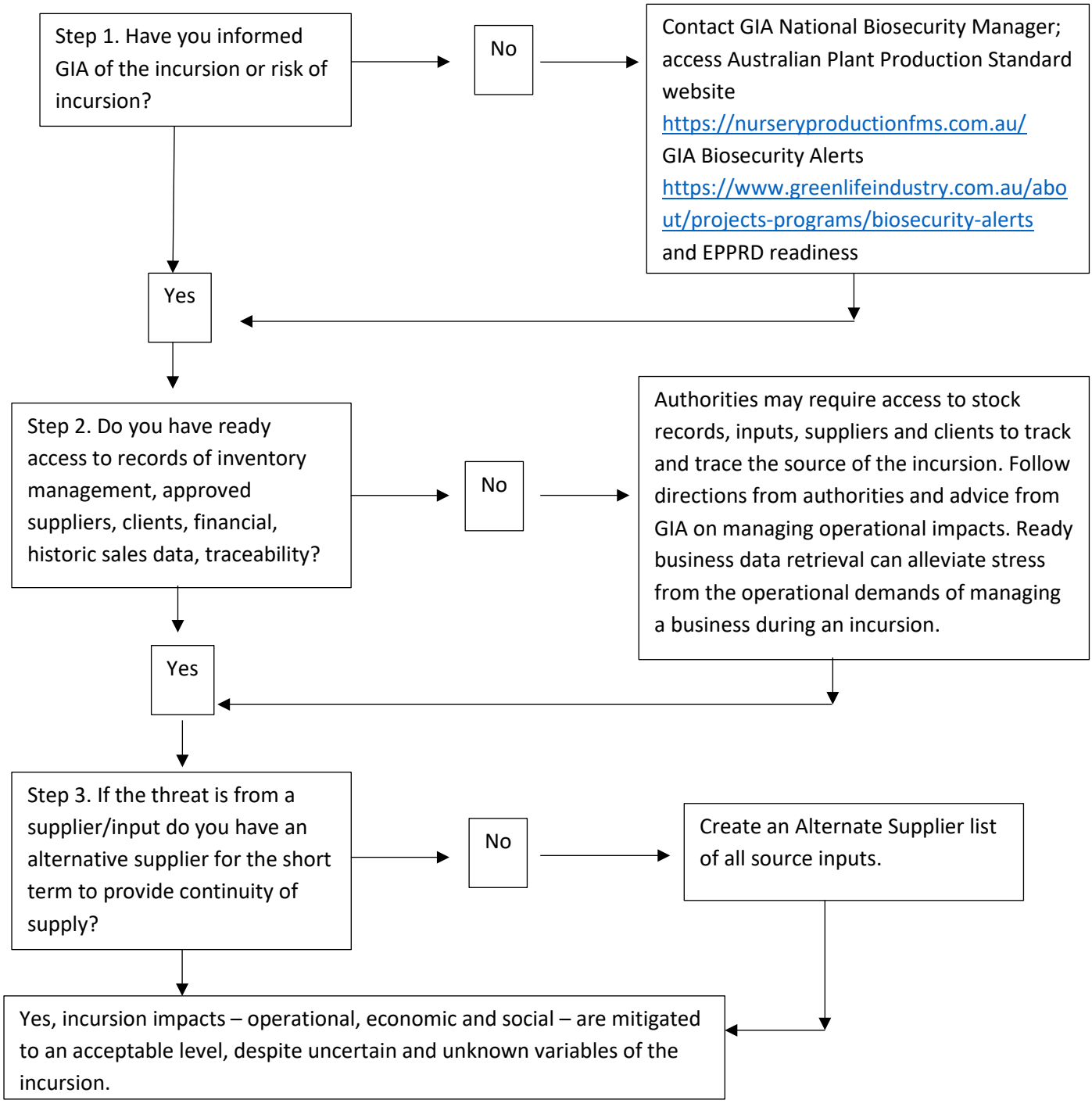
Preparation Decision Guide



Decision Guide #2 – Incursion Impacts

INCURSION IMPACTS	○ **Operational impacts - movement restrictions, surveillance, new or additional pest control or biosecurity procedures, additional administration tasks, isolation or quarantine of stock, disposal or destruction of stock** ○ **Economic impacts – tend to arise from operational impacts. Increased costs, increased workload requirements, stock destruction, restricted or reduced trade, or reduced value of stock** ○ **Social impacts - stress arising from the operational demands of managing a business during the incursion response; financial implications of the incursion for the business; conditions of high uncertainty; difficulties in social relations with government authorities; and reputation with clients and other nursery businesses**

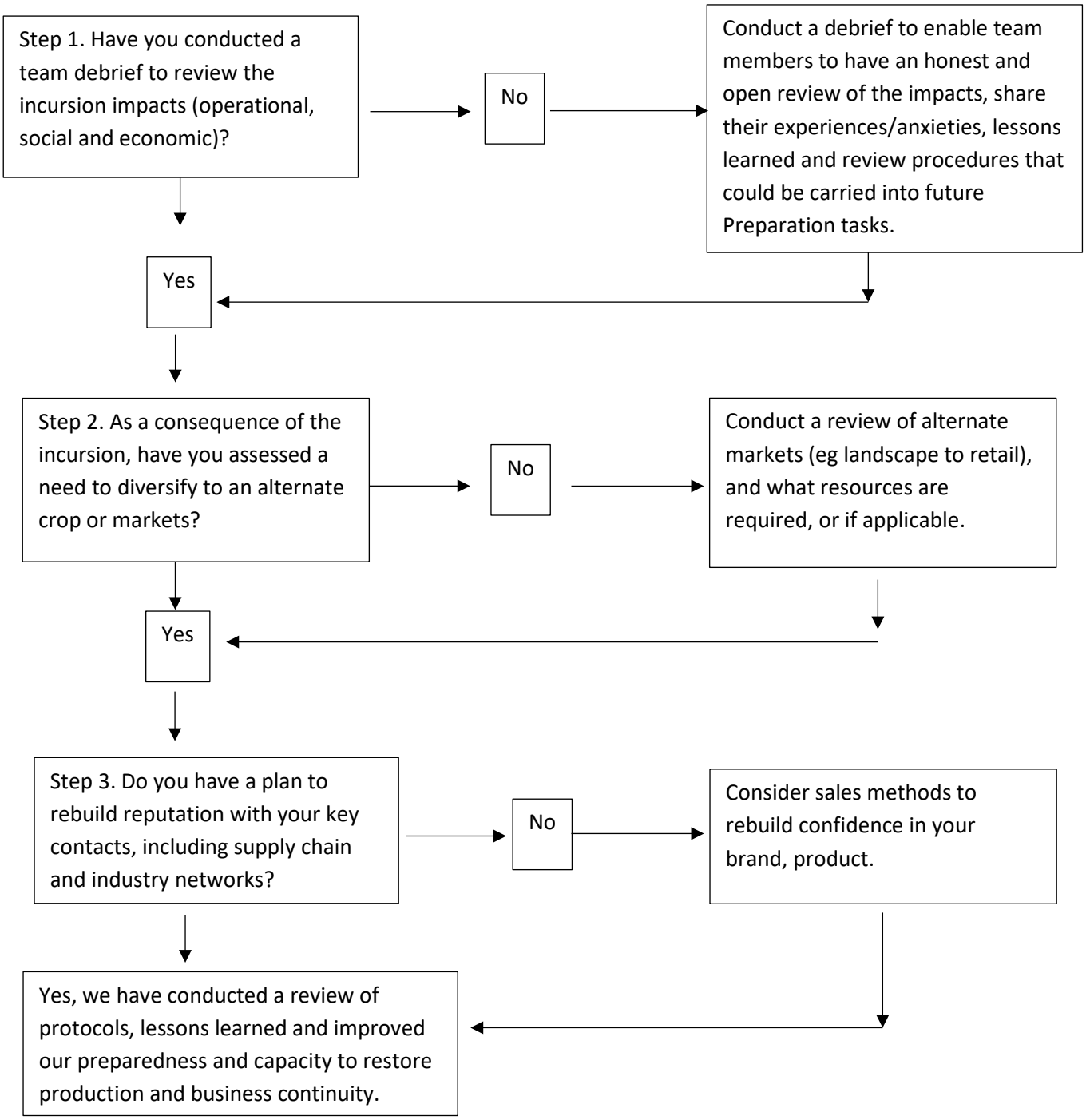
Incursion Impacts Decision Guide



Decision Guide #3 – Recovery & Review

RECOVERY & REVIEW	○ **Assess capacity to change practices to minimise operational impacts; review lessons learned from incursion impacts** ○ **Rebuild markets to restore economic recovery** ○ **Restore / assess supply chain** ○ **Restore reputation with key contacts** ○ **Review Preparation Decision Guide in light of lessons learned**

Recovery & Review Decision Guide



Summary

This Decision Guide encourages nursery operators to undertake risk assessment, review of practices, and continuous improvement as each stage of a biosecurity incursion:

1. Preparedness
2. Incursion Impact
3. Recovery and Review

The Decision Guide sets up basic priority questions at each stage; with an intention to identify weaknesses or vulnerabilities in the business or nursery production processes. Overall, the Decision Guide acknowledges comprehensive resources already exist for nursery operators to access to effectively prepare for and manage an incursion, in the format of BioSecure HACCP and the various communication Alerts distributed by industry.

The Decision Guide encourages good biosecurity practices, as expressed in the project's findings on interviews and survey conducted with growers:

> Good biosecurity practices were seen not only as a means of reducing the risk that an incursion would occur, but also as assisting a rapid response by authorities when one did occur. In particular, good record-keeping in relation to the purchase and sale of plant material, was singled out as important for the tracing and tracking of infected plant stock. At a broader level, the ability to provide evidence of good biosecurity practices through an accreditation or certification scheme, was seen as having potential to provide a higher level of assurance to government authorities and industry, and thereby facilitate quicker return to trade. (pp 13 – 14)

References & Links:

BioSecure HACCP: Guidelines for Managing Biosecurity in Nursery Production 4th Edition, https://nurseryproductionfms.com.au/biosecure-haccp-certification/

Project Reports:

Loechel B and Hobman EV (2021) Supporting production nursery businesses during a biosecurity incursion: Social and economic research report. Report prepared for the Nursery & Garden Industry Queensland (NGIQ). CSIRO, Australia.

Loechel B (2020) Supporting production nursery businesses during a biosecurity incursion: Review of social and economic impacts and business continuity. CSIRO, Australia.

Project Reports are available on the NGIQ website - https://www.ngiq.asn.au/resources/technical-information/biosecurity-pest-disease/?skw=&orderby=date&order=desc

Online Webinar: https://youtu.be/9iQVYYviJ_k

Hort Innovation Strategic levy investment | NURSERY FUND

This project has been funded by Hort Innovation using the nursery research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit horticulture.com.au