Hort Innovation

Final Report

National Nursery Industry Biosecurity Program

Project leader:

John McDonald

Delivery partner:

Greenlife Industry Australia Ltd

Project code:

NY15004

Project:

National Nursery Industry Biosecurity Program (NY15004)

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Level 7
141 Walker Street
North Sydney NSW 2060

Telephone: (02) 8295 2300

www.horticulture.com.au

Content

Summary

The strategic objectives of the National Nursery Industry Biosecurity Program have been to ensure production nurseries in Australia are aware of and prepared for incursions of exotic plant pests and have effective market access mechanisms in place to maintain business functionality. These have been achieved through a dedicated project team undertaking:

- industry wide communication across aspects of both on and off-farm plant protection and biosecurity issues that impact the grower including both endemic and emergency plant pest management;
- appropriate activities to ensure that industry meets its obligations under the Emergency Plant Pest Response Deed (EPPRD) through committee level representation and input into the ongoing development of EPPRD support resources including Issues Resolution Groups, Working Groups and PlantPlan;
- development of an industry on-farm plant protection and biosecurity program (BioSecure HACCP) as a national market access instrument that supports production nurseries in meeting intra and interstate quarantine entry conditions and electronic certification; and
- industry access to appropriate pesticides (insecticides, fungicides, herbicides, etc) to manage plant pests across cropping systems through the pesticide minor use program.

The project has built upon the existing key programs, towards which industry has previously invested significant levy funds, under the Nursery Production Farm Management System (now the Australian Plant Production Standard (APPS)) to support an industry managed domestic biosecurity market access system. The primary on-farm programs that have formed a major component of the project have been the NIASA BMP and BioSecure HACCP programs that have had success in achieving interstate market access with national committee oversight.

As a result of this dedicated biosecurity program the industry has achieved a unique status as the only non-government operator of an approved plant protection and biosecurity program as a market access scheme in Australia. Furthermore, BioSecure HACCP is the only e-Certification system for the verification of plant consignments having met the interstate quarantine movement conditions operating within Australia's domestic quarantine system. With these advances in 'Regtech' the BioSecure HACCP program offers great opportunity for further co-regulatory alignments across the domestic and international plant biosecurity system through the provision of efficient administration, real-time traceability and flexible auditing processes.

The project has also underpinned the activities required to service the industry obligations under the EPPRD and through this provided a voice in contributing towards the management and/or eradication of more than 150 plant pest identifications under the EPPRD including cost sharing in the eradication of brown marmorated stink bug, banana freckle, tomato potato psyllid and citrus canker. As an Affected Industry Party in these incursions, and represented by Greenlife Industry Australia as the industry's signatory to the EPPRD, production nurseries that sustained financial losses under these Response Plans were entitled to seek and receive 'Owner Reimbursement Costs (ORCs)' with this project team assisting businesses in the process of applying for ORCs and successfully receiving the appropriate compensation.

Over 1000 activities have been conducted by the project team throughout the life of the project to support these key strategic objectives including attending related meetings, undertaking communication activities and grower engagement, producing technical papers, resource development and industry representation. The project also facilitated and drove leveraged RD&E investment from stakeholders exceeding $2.4 million over the project life addressing activities such as biosecurity training in northern Australia, telling the story of biosecurity champions, building a virtual reality training module, benefit/cost analysis of crop monitoring, digital recording functionality, pest identification platform and remote digital monitoring of on-farm activities.

Keywords

Nursery production; Australian Plant Production Standard; NIASA; BioSecure HACCP; Australia; best management practice; quality; accreditation; nursery production resources; plant protection; biosecurity; minor use permits; pesticides.

Introduction

Across Australia the nursery production sector is engaged in multiple supply channels from the supply of ornamental plants to retailers, advanced trees for urban planting and fruit, vegetable and forestry starter plants for commercial horticulture production.

The total exposure to pest, disease and weed pressures is diverse and constant due to the nature of most businesses cropping all year round and despatching to markets across all Australian jurisdictions. The Australian nursery industry, across all supply channels, has a crop base in excess of 30,000 species/cultivars with all the associated pest and disease issues creating a major risk to plant production systems. Managing these pest and disease risks, and the potential biosecurity pathways, is a major process within production nurseries requiring a specific robust guidance document to allow for the implementation of a structured plant protection system. Building and extending the BioSecure HACCP program has provided resources for industry adoption and implementation supported by technical advances e.g., portable digital platforms, and in-field data capture making such a program efficient to operate and valuable to the knowledge based decision making processes.

Australia had been exposed to higher risk entry pathways for emergency plant pests (pests of biosecurity concern) due to major increases in travel and trade combined with a changing climate, have contributed to the introduction of 300 exotic detections since the commencement of the project in November 2015.

The National Nursery Industry Biosecurity Program was developed to provide growers with a well-structured industry specific, on-farm plant protection and biosecurity program that will maintain or improve productivity, profitability and the overall sustainability of the business through:

- improved pest, disease and weed management, reducing crop losses and operational costs due to a structured pest management system and resources;
- provision for knowledge-based decision making leading to operational efficiency gains in labour allocation (e.g., reduced pesticide application) and cropping inputs (e.g., pesticides) through the application of on-farm biosecurity procedures;
- access to a secure data storage and retrieval system reducing administration costs through efficient data management;
- flexible market access through self-certification allowing businesses to meet client demands 24/7;
- reduced market access costs through self-certification and electronic documentation systems;
- a faster return to market access after an emergency plant pest impact due to operating under a creditable biosecurity system; and
- confidence of the supply chain due to recognition of skilled staff and a professional business managing biosecurity risks.

On a higher level the project was designed to deliver critical decision-making into forums whose deliberations intimately impact growers in areas such as national biosecurity R&D, legislation, surveillance, response and cost reimbursement. The project was also required to profile the biosecurity issues of concern to nursery production and allow the industry to be a part of the decision-making process that has the industry's interests as a priority.

Importantly, it was designed to benefit growers caught up in an emergency response actions by providing support personnel on-hand to guide regulators and provide input into appropriate response strategies and cost reimbursement mechanisms.

Finally, the project aimed to raise overall biosecurity awareness across the industry which has national social, environmental and economic benefits including contribution to national pest surveillance, early detection and reporting of exotic plant pests and greater opportunities to economically eradicate emergency plant pests.

Methodology

Overarching framework

The project was built upon the existing key programs, which industry has previously invested significant levy funds towards, under the Nursery Production FMS (now the Australian Plant Production Standard (APPS)) to support an industry managed domestic biosecurity market access system. The primary on-farm program that will form a major component of the project was BioSecure HACCP, a program that has had initial trial success (interstate market access) when tested between Queensland and Victoria under the guidance of Biosecurity Queensland and Biosecurity Victoria with national committee oversight.

The project methodology included areas as detailed below:

1. Transition Program

Initially the project required re-alignment of the APPS to fit the new research and development agenda of Hort Innovation including designing a national approach to administering the APPS (self-funding). The APPS includes three separate programs (NIASA Best Management Practice, EcoHort environmental and natural resource management system and BioSecure HACCP plant protection and biosecurity system) with NIASA a mandatory pre-requisite to achieving BioSecure HACCP certification hence the need to transition the APPS into a system that met Hort Innovation levy investment criteria administratively and operationally. During the first six months of the project the transition program assessed all BioSecure HACCP resources to ensure they aligned to the new administration program including the electronic software platforms Audit Management System (AMS) and the National Audit Portal (NAP) which are essential to the integrity of the on-farm program and national market access under BioSecure HACCP.

Guidance documents such as the NIASA and BioSecure HACCP Manuals, Governance and Administration Framework, Terms and Conditions were reviewed by the project team and adjusted as required. The national biosecurity training portal was also reviewed and adjusted to meet the administration requirements of the new project. All documents were re-printed (electronic format) for distribution as required including the BioSecure HACCP Manual uploaded to the APPS online resource portal.

During the initial 6-month period the project team also surveyed growers currently involved in the APPS across Australia assessing their interest in adopting BioSecure HACCP. This information established the key contact list of growers for the project to engage with and begin planning for on-farm implementation plus guide the construction of market access resources required (e.g., Entry Conditions Compliance Procedures (ECCP) and training portal information).

The industry appointed a National Biosecurity Manager to oversee the transition program and build the project team in consultation with Hort Innovation and Nursery & Garden Industry Australia (NGIA) – now Greenlife Industry Australia (GIA). Furthermore, the transition period was to be used to position/identify the project team, FTE and consultants, across appropriate locations to service the project outcomes.

At the completion of the 6-month Transition Program the project team assessed the feedback from growers to guide the development of annual workplans and resource deployment. The project team further assessed projected budget forecasts, for accuracy and alignment to grower locations and adjusted with Hort Innovation accordingly.

While the primary focus of the Transition Program was realigning BioSecure HACCP and the APPS, the project was engaging in activities described below under Industry Biosecurity Preparedness and Improved Biosecurity Awareness. This was demonstrated through meeting industry obligations under the EPPRD, participating in related industry to build upon R&D projects such as NY15002 and initiating the development and distribution of biosecurity extension materials.

2. BioSecure HACCP as a National Market Access System

This project (NY15004) was developed to drive national industry adoption and government recognition of BioSecure HACCP over a three (3) year trial period progressing to a commercially sustainable entity within a further two years (2) for a project total of five (5) years. The project engaged supply chain stakeholders, through industry

structures and national forums e.g., Plant Health Australia (PHA), to support BioSecure HACCP and to consider adopting key services such as electronic certification in other areas of horticulture.

BioSecure HACCP is the principal program designed for on-farm implementation at a grower level to manage pest, disease and weed threats across nursery cropping systems through a detailed program of site surveillance, crop monitoring and consignment inspection driving management decisions. The program was supported by a clear and documented set of guidelines, operating procedures and document management processes for growers to utilise within their production systems. The program offered a web based Audit Management System (AMS) for document (records) storage and management capacity that allows growers to systematically upload on-farm biosecurity records for secure storage and recall. The AMS provides growers with a client database capability that is aligned to the electronic certification system providing key administrative efficiencies.

The project team offered growers national access to BioSecure HACCP Certification through a formal process of compliance against the guidelines which further led to adoption of appropriate ECCP for specific intra and interstate market access. The project provided some on-farm advice to growers implementing BioSecure HACCP, and relevant ECCP, through specialist officers and/or consultants as appropriate with remote assistance provided via email, web-based content and hardcopy support documents such as the BioSecure HACCP manual. Compliance auditing (twice per annum) was undertaken by members of the project team, or by approved consultants, of those businesses operating under BioSecure HACCP to evaluate their businesses against the criteria set out in the BioSecure HACCP Manual, ECCP and Terms and Conditions.

Industry as a whole was engaged and informed through various communication channels on biosecurity activities and the availability of resources including workshops, webinars and electronic communication – email, blog, website, etc. Factsheets, biosecurity plans, manuals, videos, etc. were to be made available for industry to access across the industry communication platforms as soon as they become available.

The project provided capacity and resources towards the national negotiation for the recognition and adoption of BioSecure HACCP by each individual Australian state and territory biosecurity agency. This was achieved at both a collective and individual level utilising the Sub-committee on Domestic Quarantine & Market Access (SDQMA) and one on one negotiation with State Department of Agriculture jurisdictions. Upon a jurisdiction adopting BioSecure HACCP further work by the project in the development of ECCP for all pests of quarantine concern, relative to that jurisdiction, was drafted for acceptance across jurisdictions negotiated by the project team. Where required the project provided biosecurity staff of participating jurisdictions with specialised training in the application of BioSecure HACCP, ECCP, etc. and in the operation of the AMS.

The project undertook to ensure all supporting information, guidelines and resources of the APPS, critical to the operation of BioSecure HACCP were maintained through annual reviews and ongoing assessment throughout the project. Where required updates, upgrades or additions were developed, tested and implemented as identified including electronic documentation, information assets such as training courses, videos, etc. and web-based platforms such as the AMS and National Audit Portal (NAP).

Based on industry Best Management Practice (BMP) participation levels within the project Queensland, New South Wales, Victoria and Western Australia provided the highest level of grower participation followed by South Australia, Tasmania and Northern Territory. Therefore, the project based key staff on the east coast to provide the capacity to service the larger numbers of growers (QLD, NSW, VIC, TAS and SA) and a project officer servicing NT and WA.

Project consultants were initially considered on an ‘as needs basis’ to provide grower technical support and to undertake program compliance audits across regions if required and economical to do so. Specific detail was provided at the end of the 6-month transition program (annual workplan) once the initial grower engagement numbers and locations were confirmed hence engagement of project officers rather than consultants.

The overall strategy for BioSecure HACCP was to transition to a self-funding entity by November 2020 based on adoption of a commercialisation plan developed by November 2018. The project set in place a national recognition for BioSecure HACCP as a market access instrument and develop all key background documents and support tools in Years 1 through 3 and transition to a self-supporting structure through Years 4 and 5 culminating in a standalone entity post November 2020.

3. Industry Biosecurity Preparedness

The EPPRD is the key platform for ensuring industry biosecurity preparedness is met through participation in national meetings, forums and projects. The EPPRD, a legally binding document, imposes significant obligations upon the 42 signatories (Government and Industry) with industry required to provide representatives to key committees, participate in the continual development of further the underpinning guidance documents e.g., PlantPlan and contributing to key issues requiring stakeholder input through resolution groups. Furthermore, there are key areas that the signatory to the EPPRD must provide support to during an incursion response through to the eradication and stand-down or transition to management including industry wide communication, industry liaison, assessing owner reimbursement costs and response debriefing.

GIA is the industry member of PHA and the signatory to the EPPRD and as such has the responsibility to ensure all obligations are met on behalf of the nursery production industry. This project required a significant input from GIA and required access to GIA resources including databases for national engagement and industry communication channels as well as key software platforms developed to support the APPS.

This project provided industry representation on both the EPPRD National Management Group (NMG) and the Consultative Committee on Emergency Plant Pests (CCEPP) convened upon the detection of an emergency plant pest. These committees are responsible for determining the national status of a new emergency plant pest incursion (e.g., cost beneficial and technically feasible to eradicate) and approving the cost associated with implementing an eradication program (Response Plan) and the allocation of owner reimbursement costs. As an affected party the industry must be in position to contribute to the deliberations of these committees to ensure growers are represented and their key concerns/interests addressed e.g., market access.

Note: Over the 5 years prior to the project commencing there were more than 300 emergency plant pest notifications considered by CCEPP (Source: Plant Health Australia, August 2015). Nursery production is involved in the majority of these considerations.

Enhancing industry biosecurity preparedness under the project was also achieved through establishing direct links to relevant industry projects (e.g., NY15002), national initiatives such as the Plant Biosecurity CRC and involvement with Plant Health Australia (PHA) and the federal Department of Agriculture, Water and the Environment (DAWE) through the Office of the Chief Plant Protection Officer. The National Biosecurity Manager (NBM) and NGIA CEO provided project oversight and industry advice to the QDAF project NY15002 – 'Building the resilience and on-farm biosecurity capacity of the Australian production nursery industry' project as Steering Committee members and as participants in the planning and execution of emergency plant pest incursion exercises. The NBM also provided direction and advice (targeted pests) towards the development of key outputs from the project including pest contingency plans, pest management plans, pest factsheets and pesticide minor use permits.

The NBM participated on relevant PHA instigated Issue Resolution Groups (IRG), Working Groups, Incursion Exercises, etc. that were convened to test and address additions, changes or deletions in key areas such as PlantPlan and the EPPRD as well as contributing to the knowledge bank for incursion management. Further contributions by the NBM were made by participating in DAWE working groups e.g., Vegetable Leaf Miner Working Group, to ensure industry actively contributes to managing pests of national concern.

The NBM worked with appropriate PHA staff to update the Industry Biosecurity Statement, Industry Biosecurity Manual and the Industry Biosecurity Plan with the aim to have all documents completed by the end of Year 5 of the project and new versions released to industry. Participating with the Plant Biosecurity CRC provides opportunities to contribute to national R&D direction and investment relevant to nursery production plus it offers an opportunity to engage with key biosecurity stakeholders on the issues affecting industry and define potential solutions.

4. Improving Biosecurity Awareness

Improving biosecurity awareness across the Australian nursery production industry was achieved through a structured engagement and communication process including industry pest management webinars/workshops, information resources (e.g., pest management plans, factsheets) being made available through electronic platforms and through the utilisation of hardcopy communication tools and project officers at industry trade events. The project profiled industry resources, issues and solutions utilising traditional media channels as well as in higher level activities with key industry groups, governments and Hort Innovation.

The project accessed all relevant materials generated from industry focused R,D & E projects, plus from other relevant stakeholders, and developed targeted extension resources including technical papers e.g., Nursery

Papers, for industry use plus on-farm guides such as pest management plans to improve biosecurity at a grower level. Key pest management resources e.g., Pest ID Tool, BioSecure HACCP, and the Biosecurity Manual were managed, updated and promoted to industry across various media to drive a higher level of awareness and on-farm risk management.

Communicating the resource development, availability and topical biosecurity issues to industry formed a significant component of delivering on improving industry biosecurity awareness. The Technical Support Officer took charge of organising, preparing and providing relevant material for national communication via industry communication channels including state bodies, national electronic systems and independent journals. The project developed a documented Stakeholder Engagement Plan during the Transition Program phase in the initial 6-month period.

Mainstream media outlets were provided with appropriate media releases addressing components of the project deemed to have a broad relevance in ensuring key achievements were made across the biosecurity continuum.

The project also undertook to measure and evaluate the uptake and awareness of project outputs through an early-term review by July 2017 (internal via consultant) and a formal mid-term review by November 2018 (external through Hort Innovation).

Outputs

A detailed account of outputs delivered by the project have been provided through regular project milestone reports. The following provides a 'snapshot' of activities conducted throughout the life of the project that provide insight to the project's outputs in meeting its strategic objectives.

1. Industry wide communication across aspects of both on and off-farm biosecurity issues that impact the grower including both endemic and emergency plant pest management.

Annual Technical Papers

Annual Nursery Industry Biosecurity Program technical papers have been edited and formatted to fit the industry standard hardcopy template for a 'Nursery Paper' and published in HortJournal as well as the GIA website and the GIA APPS website. A summary of annual technical papers delivered by required milestone date is provided below as Table 1 noting the project exceeded anticipated deliverables by more than 2 to 1. An example (The Arrival of Fall Armyworm (Spodoptera frugiperda): An emergency plant pest incursion) is provided here - https://www.greenlifeindustry.com.au/Attachment?Action=Download&Attachment_id=2248.

Table 1- Annual Technical Papers Delivered

Title	Milestone Date
BioSecure HACCP meeting growers Biosecurity Obligation	30/05/2016
Minor Use Permit Pesticide Program	30/11/2016
Nursery Industry Biosecurity Program	31/05/2017
Xylella fastidiosa Nursery Paper	30/11/2017
Integrated Pest Management (IPM)	31/05/2018
Effective Use of Sticky Traps Nursery Paper	30/11/2018
Integrated Pest Management (IPM) Nursery Paper	30/11/2018
Pest ID Tool	31/05/2019
Neonicotinoid Insecticides – No replacements but there are alternatives, was published as a Nursery Papers through Hort Journal	30/11/2019
International Year of Plant Health	30/11/2019
Specifying Tree Stock for Success	30/11/2019
The Arrival of Fall Armyworm (*Spodoptera frugiperda*): An emergency plant pest incursion	26/05/2020
Managing a Plant Virus in Nursery Production	18/12/2020

BioSecure HACCP awareness material developed and distributed

The project has raised overall biosecurity awareness across the industry which has national social, environmental and economic benefits. This includes a contribution to national pest surveillance, early detection and reporting of exotic plant pests and greater opportunities to economically eradicate emergency plant pests. A summary of awareness materials is included as Table 2.

Table 2 - BioSecure HACCP awareness material developed and distributed

Title	Milestone Date
BioSecure HACCP Nursery Paper	30/05/2016
Linkedin Page set up	30/05/2016
BioSecure HACCP (APPS) website established	30/05/2016
Case Study – Protea Flora Nursery	30/11/2016
Case study - Pohlmans	31/05/2017
Case study - Scotsburn Nursery	31/05/2017
Case Study - Greenfingers Potting Mix	30/11/2017
Case Study - The Plantsmith	30/11/2017
Case Study – Humphris Nursery	30/11/2017
Case Study – Mansfields Nursery	30/05/2017
ABC Radio program exposure (Country Hour)	31/05/2017
South Australian Biosecurity Teleconference (ECCPs)	31/05/2017
New South Wales Biosecurity Teleconference (ECCPs)	31/05/2017
South Australian Biosecurity Teleconference (ECCPs)	31/05/2017
BioSecure HACCP Forum Geelong Victoria	31/05/2017
New South Wales Biosecurity Teleconference (ECCPs)	31/05/2017
Sub-committee on Domestic Quarantine & market Access meeting	31/05/2017
Biosecurity Queensland legislation implementation meeting	31/05/2017
Media Release - Nursery industry's John McDonald honoured with national biosecurity award	31/05/2018
Media Release - Nurseries urged to remain vigilant after citrus canker found in Northern Territory	31/05/2018
Media release International Year of Plant Health	31/05/2019
Biosecurity advice BMSB	31/05/2019
Biosecurity advice Citrus Canker	31/05/2019
Biosecurity Queensland & Victoria National Audit Planning Meeting	31/05/2019
Biosecurity NSW Legislative Approval Meeting	31/05/2019
Biosecurity Queensland & Victoria National Audit Planning Meeting	31/05/2019
Nursery Tree Stock Standard Workshop (Caboolture)	31/05/2019
Hort Innovation Nursery Export Project Meeting (Teleconference)	31/05/2019
Hort Innovation Smartfarming Project Meeting (Teleconference)	31/05/2019
Hort Innovation/QDAF Nursery Export Project Meeting	31/05/2019
BioSecure HACCP Grower Forum Adelaide	31/05/2019
International Plant Propagators Society Conference	31/05/2019
Case Study – Eyles Citrus	30/11/2019
Updated all APPS program information on AMS and FMS	31/05/2020
Biosecurity alerts and updates i.e., FAW	31/05/2020
Listing of BioSecure HACCP on domestic quarantine website	31/05/2020
Case Study – Touchwood Nursery	31/05/2020

Title	Milestone Date
Case Study – Trandos Hydroponics	31/05/2020
VR Crop Monitoring Training Module	31/05/2020
AMS upgrade	31/05/2020
Landcare Smart Farming Partnership program	31/05/2020
Biosecurity Alert – Serpentine Leafminer (Oct)	18/12/2020
Case Study – Arborwest Nursery	18/12/2020
Case Study – Azalea Grove Nursery	18/12/2020
Case Study – Ellenby Tree Farm	18/12/2020
Biosecurity Alert – Serpentine Leafminer (Nov)	18/12/2020

Industry Trade/Stakeholder Trade Shows

Industry/stakeholder trade shows/events to disseminate project outputs have been attended over the life of the project. A summary is provided as Table 3.

Table 3 - Industry Trade/Stakeholder trade Shows

Title	Milestone Date
NGIA National Conference Adelaide – 17 February 2016 (Presentation)	31/05/2016
Biosecurity Tasmania Forum Launceston – 12 October 2016 (Presentation)	30/11/2016
PHA Canadian Partnership Webinar – 2 December 2016 (Presentation)	31/05/2017
Hort Connections Adelaide – 15 May 2017 (Presentation)	31/05/2017
NT Biosecurity Roundtable Darwin – June 2017 (Presentation)	30/11/2017
Processing Tomato Conference Bendigo – 15 June 2017 (Presentation)	30/11/2017
International Society of Citrus Nurserymen Congress Mildura – 24 July 2017 (Presentation)	30/11/2017
Biosecurity Queensland Forum Gatton – 5 September 2017 (Presentation)	30/11/2017
DAWE Regulated Seed Imports Symposium Brisbane – 29 September 2017 (Presentation)	30/11/2017
National Biosecurity Roundtable Canberra – 2 November 2017 (Presentation)	30/11/2017
BerryQuest Conference Launceston – 13 February 2018 (Presentation)	31/05/2018
NGIA National Conference Hobart – 19 February 2018 (Presentation)	31/05/2018
International Plant Propagators Society (IPPS) Hobart 24 May 2018 (Presentation)	31/05/2018
PHA Industry Forum Canberra – 29 May 2018 (Presentation)	31/05/2018
ABARES Seed Pathway Conference – 7 June 2018 (Presentation)	30/11/2018
Fernlands Open Day Yandina – 25 July 2018 (Presentation)	30/11/2018
Australian Macadamia Society Workshop Hervey Bay – 3 September 2018 (Presentation)	31/11/2018
International Plant Propagators Society (IPPS) Maroochydore 24 May 2019 (Presentation)	31/05/2019
Science Protecting Plant Health Symposium Brisbane – 28 September 2017 (Presentation)	30/11/2019
DAWE National Phytophthora Workshop Melbourne – June 2019 (Presentation)	30/11/2019
Protected Cropping Australia Conference Gold Coast – 9 July 2019 (Presentation)	30/11/2019
Plant Biosecurity Research Initiative Symposium Brisbane – 12 August 2019 (Presentation)	30/11/2019
GIA National Conference Perth – 4 March 2020 (Presentation)	31/05/2020
APAL Webinar (Presentation) 10 December 2020 (Presentation)	18/12/2020
National Fruit Fly Council Webinar 15 December 2020 (Presentation)	18/12/2020

Annual Media Releases

Industry communication is managed by Cox-Inall Communications who have worked with this program to developed annual media releases (Table 4). The program has facilitated the development of posts on Facebook and content for the industry electronic platforms of Your Levy At Work blog and the National Nursery News (NNN).

An example (Nurseries Urged to Remain Vigilant After Citrus Canker Found in Northern Territory) is provided here - MEDIA RELEASE: Nurseries urged to remain vigilant after citrus canker found in Northern Territory : Greenlife Industry Australia.

Table 4 - Annual Media Releases

Title	Milestone Date
Protea Flora Nursery implementing BioSecure HACCP	30/11/2016
Case Study - Greenfingers Potting Mix	30/11/2017
Case Study - The Plantsmith	30/11/2017
Greater biosecurity harmonisation will help protect the nursery industry	30/11/2017
Nursery industry's John McDonald honoured with national biosecurity award	31/05/2018
Best Practice scheme 'BioSecure HACCP' gets tick of approval	30/11/2018
Nurseries urged to remain vigilant after citrus canker found in Northern Territory	31/05/2018
International Year of Plant Health 2020	31/05/2019
Nurseries Urged to Remain Vigilant After Citrus Canker Found in Northern Territory	30/11/2019
International Year of Plant Health 2020	31/05/2020
National Nursery Industry Biosecurity Program	18/12/2020
Nurseries urged to remain vigilant after Serpentine leafminer detected in Sydney	18/12/2020

Industry Forums

Over the life of the project, five industry forums across key states were to be delivered to disseminate project outputs. These forums were guided by state industry activities, industry participation and jurisdictional approval of the program (Table 5). These forums established to basis for awareness an implementation of future project activities.

Table 5 - Industry Forums

Title	Milestone Date
BioSecure HACCP Stakeholder Forum Geelong	30/11/2016
BioSecure HACCP Stakeholder Forum Perth	30/11/2017
BioSecure HACCP Grower Forum Melbourne	31/05/2018
BioSecure HACCP Stakeholder Forum Brisbane	31/05/2018
BioSecure HACCP Stakeholder Forum Sydney	30/11/2018
BioSecure HACCP Stakeholder Forum Adelaide	31/05/2019

Grower and Stakeholder Survey Completed

GIA, through project NY15004, joined with CSIRO to participate in the *National grower-led surveillance system: A method for developing effective grower-led surveillance systems for plant production industries in Australia project*. The aim being to understand how the nursery industry biosecurity surveillance system can be improved through surveying a range of producers and stakeholders in the industry. Industry stakeholders were invited to take part in a face-to-face or telephone interviews with producers being invited to take part in either a telephone or online survey.

The CSIRO researchers sought information on the following main topics:

- Current state of the plant health surveillance system and on strategies and initiatives led by GIA intended to improve plant pest surveillance and reporting
- Key challenges and barriers to plant pest and disease monitoring and reporting in the nursery industry
- High risk segments or pathways for the introduction and spread of pests and diseases within the industry
- Factors or approaches that could improve producer engagement and surveillance practices in the industry

Table 6 reported during November 2018, provides a summation of industry survey data from 2013 indicating the

activities and expectations industry has around biosecurity. Responses were considered in the delivery for further project activity and development.

Table 6- Summation of Responses to General Biosecurity Indicators

Summation of Responses to General Biosecurity Indicators
Approximately 34% believe that a pest or disease outbreak is likely or highly likely in the next 12 months
80% are supportive of biosecurity measures
Approximately 67% agree that they have good knowledge in making decisions about the potential risks of pests and diseases
47% are aware of a biosecurity plan for the nursery industry
31% have a biosecurity plan on-farm
66% monitor their crops/orchards/plantations
Approximately 40% keep a record of monitoring, with 73% of these willing to share this record
The vast majority (~97%) are willing to report a new pest or disease
• 77% would like a no-blame reporting and advisory service • 70% would like an easy reference for identification • 69% would like to know who to report to • 46% would like a reduced risk of quarantine • 29% would like biosecurity warning or alerts • 25% would like to know pest and disease types and symptoms • Approximately 30% would like no information about biosecurity
49% are members of their State industry NGI association
The most popular communication channels are DPI or Agriculture, State/territory departments, and industry bodies/groups, or the internet

General Communication Platforms

The APPS website has provided the project with a valuable tool in communicating project outcomes. Figure 1 provides an indication of website use over the final 12 months of the project.

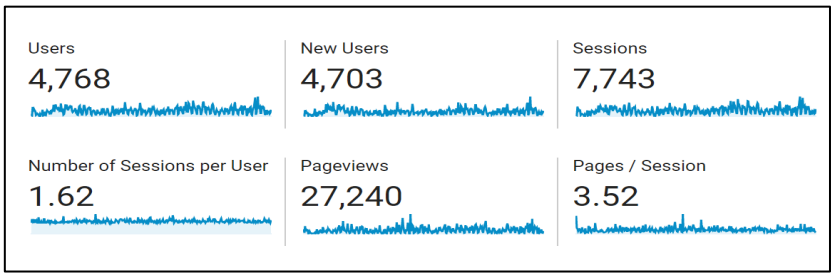


Figure 1 - Website use over the final 12 months of NY15004 (December 2019 to December 2020)

The APPS website is the portal GIA has built to host all relevant technical information appropriate for the Australian nursery industry with content constantly being updated or added under the key categories of; Biosecurity, Case Studies, Companion Volumes, Emergency & Disaster Planning, Energy, Environment, Growing Media, Irrigation & Water, Market Access, Minor Use Permits, Nursery Production, Pesticides, Pests, Diseases and Weeds, Policy Documents, Web Links and Videos. Most of the NY15004 project outputs are stored and available on the APPS website.

The GIA Facebook page (https://www.facebook.com/GreenlifeIndustryAU/) is a communication vehicle used to support delivery of project messages, while the GIA Twitter feed is used as an additional communications channel, and replicates stories from the GIA Facebook page.

Your Levy at Work is available as a blog as well as distributed in an Electronic Direct Mail (EDM) format. The blog can be found at www.yourlevyatwork.com.au.

The Plant Pod (https://soundcloud.com/theplantpod) brings the latest nursery R&D and marketing projects to life, and is hosted by Greenlife Industry Australia and Cox Inall Communications and is used to support delivery of project messages.

2. Development of an industry on-farm biosecurity program (BioSecure HACCP) as a national market access instrument that supports production nurseries in meeting intra and interstate quarantine entry conditions and electronic certification

BioSecure HACCP Governance Committee Meetings

The National Governance Committee has met on 16 occasions (Table 7) throughout the life of the project.

It has been the responsibility of the Committee to:

- at least annually, review, update and, if appropriate, recommend to GIA changes to the Procedures, the Guidelines, the NAP, the AMS, this Governance & Administration Framework document, and the Terms and Conditions;
- promote the BioSecure *HACCP* Program across all forums and media forms as identified by GIA. National promotional opportunities must be developed or initially approved by the National Governance Committee and, where possible, in conjunction with GIA and Horticulture Innovation Ltd (or successor body);
- ensure systems exist and are implemented to protect the integrity and credibility of BioSecure *HACCP* including professional development requirements for Authorised Auditors, appeals processes and third-party review of Procedures;
- ensure an annual review process is in place for Authorised Auditors including service delivery, position criteria and skills required to operate across BioSecure *HACCP*. Records of the review of Authorised Auditors shall include evidence of completed Audits, time taken to process Audits through the NAP and provide Applicants with Audit Reports, comparison of Audit Reports for particular Applicants over at least 3 years and competency in the Auditing process;
- review BioSecure *HACCP* Fees determined by GIA at least annually; and
- act in accordance with any GIA governance policy.

Table 7 - BioSecure HACCP Governance Committee Meetings

Title	Milestone Date
Meeting and TOR established	30/05/2016
Teleconference	30/11/2016
Face to face	30/11/2016
Teleconference	31/05/2017
Face to face	30/11/2017
Teleconference	30/11/2017
Teleconference	30/11/2017
Teleconference	31/05/2018
Face to face	30/11/2018
Teleconference	30/11/2018
Teleconference	30/11/2018
Video/Teleconference	30/11/2019
Face to face	30/11/2019
Video/Teleconference	26/05/2020
Video/Teleconference (03/09/2020)	18/12/2020

Title	Milestone Date
Video/Teleconference (11/12/2020)	18/12/2020

BioSecure HACCP Meeting with Horticultural Industry

The project has been proactive in promoting shared industry investment during the life of the project through discussion and consultation (Table 8). To date, the project has been successful in engaging the banana, avocado and macadamia industries to be part of the wider APPS project through the development of nursery stock specifications for each of those industries (Avocado Nursery Stock Specification, Banana Nursery Stock Specification and Macadamia Nursery Stock Specification).

Table 8 - BioSecure HACCP Meeting with Horticultural Industry

Title	Milestone Date
Growcom (x2)	30/05/2016
Australian Banana Growers Council (ABGC) R&D Manager (x4)	30/05/2016
Australian Nut Industry Council	30/11/2016
Australian Banana Growers Council (ABGC) R&D Manager (x3)	30/11/2016
Presentation at QFF BMP Showcase (Cotton, Vegetables, Grains, etc)	30/11/2016
Australian Cutflower Industry Council:	31/05/2017
Australian Banana Growers Council (ABGC) R&D Manager and QDAF - QBAN Transition	31/05/2017
Presentation to QFF Board in Brisbane	31/05/2017
Australian Processing Tomatoes Research Council forum (Echuca)	30/11/2017
International Society of Citrus Nurserymen (Mildura)	30/11/2017
FreshCare (Brisbane)	30/11/2017
Pome Fruit Implementation Program (Brisbane)	30/11/2017
Avocados Australia Limited (Brisbane)	30/11/2017
Lockyer Valley Growers Association (Brisbane)	30/11/2017
Meeting with Queensland Strawberry Grower Association	31/05/2018
Meetings with Australian Banana Growers Council (ABGC) R&D Manager and QDAF: QBAN Transition	31/05/2018
International Association of Horticultural Producers meeting Melbourne	31/05/2018
Presentation to QFF Biosecurity Taskforce in Brisbane	31/05/2018
Australian Banana Growers Council (x 5)	30/11/2018
Meeting Avocados Australia Limited (Brisbane)	30/11/2018
Meeting with Auscitrus (Brisbane)	30/11/2018
Meeting Ausveg (Brisbane)	30/11/2018
Meeting with Citrus Australia (Brisbane)	30/11/2018
Meeting with Australian Macadamia Society (Brisbane)	30/11/2018
Meeting with Vinehealth Australia (Canberra)	30/11/2018
Auscitrus Mildura	31/05/2019
VineHealth Australia and Vine Improvement (SA) Teleconference	31/05/2019
VineHealth Australia and Vine Improvement (SA)	31/05/2019
Australian Pome Fruit Improvement Program (Bris)	31/05/2019
Australian Banana Growers Council (x 2)	30/11/2019
Growcom	30/11/2019
Ausveg	30/11/2019
Citrus Australia via Project 'Ancestree' Vic Ag	31/05/2020
NSW PlantSure Program	31/05/2020

Title	Milestone Date
APAL	18/12/2020
Citrus Australia via Project 'Ancestree' Vic Ag	18/12/2020

Levy funded project oversight/participation

Ongoing levy funded oversight and participation has played a large part in GIA exercising due diligence within and across project portfolios. This is demonstrated with summary data provided as Table 9.

Table 9 - Levy funded project oversight/participation

Title	Milestone Date
Project NY15002 Steering Committee Meetings	30/05/2016
Project NY15002 program development meeting	30/05/2016
Project NY15002 Steering Committee Meeting	30/11/2016
Project NY15002 program development meeting	30/11/2016
Biosecurity Resource Development Project with PHA	30/11/2016
Project NY15002 Steering Committee Meeting	31/05/2017
Project NY15002 Incursion Exercise development meeting (x 2)	31/05/2017
Plant Biosecurity CRC (x 3)	31/05/2017
Invasive Animals CRC	31/05/2017
Hort Connections Conference	31/05/2017
Project NY15002 Steering Committee Meeting	30/11/2017
Project NY15004 Reference Group Meeting	30/11/2017
Project MT16004 Steering Committee Meeting	30/11/2017
Project NY16003 Reference Group Meeting	30/11/2017
Plant Biosecurity CRC Horticulture Advisory Panel meeting	30/11/2017
Project NY15002 Steering Committee Meeting	31/05/2018
Project NY15002 Incursion Exercise development meeting	31/05/2018
Tomato potato psyllid Transition to Management	31/05/2018
MT16004 Steering Committee meeting	31/05/2018
NY15004 Project meeting Project Planning Meeting Brisbane	31/05/2018
NY15004 Project meeting Project Achievement Criteria Hort Innovation Meeting	31/05/2018
NY15004 Project meeting Hort Innovation/Bunnings Project Meeting	31/05/2018
NY15004 Project meeting Minor Use Permit Program (AgAware) meeting Brisbane	31/05/2018
NY15004 Project meeting Project Reference Group meeting Brisbane	31/05/2018
NY15002 Steering Committee Meeting	30/11/2018
Project NY15004 Reference Group Meeting	30/11/2018
Project MT16004 VLM Steering Committee Meeting	30/11/2018
Project MT16004 VLM Steering Committee Meeting	30/11/2018
NY15004 Project Presentation to nursery SIAP	30/11/2018
Project NY15002 Steering Committee Meeting	31/05/2019
Project NY15002 Project Meeting	31/05/2019
Xylella Preparedness Program Manager Meeting	31/05/2019
MT16004 Steering Committee meeting	31/05/2019
NY15004 Hort Innovation Relationship Manager	31/05/2019
NY15004 Project Team Teleconference	31/05/2019
NY15004 Project Team Planning Meeting Brisbane	31/05/2019
NY15004 Future Planning Workshop	31/05/2019

Title	Milestone Date
NY15004 Minor Use Pesticide Planning Teleconference	31/05/2019
NY15004 Project Team Teleconference	31/05/2019
NY15004 Project Reference Group meeting Brisbane	31/05/2019
NY15004 Project Team Planning Meeting (Maroochydore)	31/05/2019
NY17009 Project Meeting (Teleconference)	31/05/2019
Project NY15002 Steering Committee Meeting; Friday 6 December 2019	30/11/2019
Project NY15002 Project Meeting; 02 October 2019	30/11/2019
SIAP Meeting/Presentation 7th August 2019	30/11/2019
SIAP facilitated visit to Pohlmans Nursery 8th August 2019	30/11/2019
Tomato potato psyllid coordinator meeting (Brisbane) 20th October 2019	30/11/2019
MT16004 Steering Committee meeting- Teleconference 16 October 2019	30/11/2019
NY15004 Project meetings phytophthora Workshop	30/11/2019
NY15004 Hort Connections Conference	30/11/2019
NY15004 Protected Cropping Australia Conference	30/11/2019
NY15004 Hort Innovation Export Meeting	30/11/2019
NY15004 Project Team Teleconferences	30/11/2019
NY15004 Plant Biosecurity Research Symposium	30/11/2019
NY15004 BQ RIFA Eradication Forum	30/11/2019
NY15004 Biosecurity Queensland Partners Forum	30/11/2019
NY15004 NBC Regional Biosecurity Roundtable	30/11/2019
NY15004 Forestry Biosecurity Surveillance Forum	30/11/2019
NY15004 Project Reference Group meeting	30/11/2019
NY15004 Project Team Planning Meeting	30/11/2019
NY15004 NBC National Biosecurity Roundtable	30/11/2019
NY15002 *Building the resilience and on-farm biosecurity capacity of the Australian production nursery industry. Steering Committee Meeting.*	31/05/2020
MT16004 project *RD&E program for control, eradication and preparedness for Vegetable leafminer. Project Meeting*	31/05/2020
MT16004 project *RD&E program for control, eradication and preparedness for Vegetable leafminer. Steering Committee Meeting*	31/05/2020
NY17009 *Improving Pest Management for the Nursery Industry*	31/05/2020
NY15004 CSIRO Fleabane Biocontrol Response meeting	31/05/2020
NY10054 Biosecurity Queensland – QBAN transition program	31/05/2020
NY15004 Project Reference Group meeting (Brisbane)	31/05/2020
NY15004 QDAF RD&E Showcase (Presentation)	31/05/2020
NY15004 Biosecurity Queensland – RIFA Market Access meeting	31/05/2020
NY15004 Hort Innovation – Smart Farming Partnership Project meeting	31/05/2020
NY15004 Chestnuts Australia Conference (Tawonga – VIC) 15/02/20	31/05/2020
NY15004 GIA National Conference (Perth)	31/05/2020
NY15004 ABGC QBAN Transition meeting 13/03/20	31/05/2020
NY15004 Biosecurity Queensland – RIFA Entry Conditions meeting	31/05/2020
NY15004 NSW Biosecurity – RIFA Entry Conditions meeting	31/05/2020
NY15004 Queensland Strawberry Growers Assoc – NIASA equivalence meeting	31/05/2020
NY15004 Hort Innovation – NY19002 Project meeting	31/05/2020
NY15004 Hort Innovation – NY18008 meeting	31/05/2020
NY15004 Hort Innovation – NY19007 Project Evaluation Group meeting	31/05/2020

Title	Milestone Date
NY15004 Hort Innovation – NY19002 Project meeting	31/05/2020
NY15004 Hort Innovation – NY18008 meeting	31/05/2020
NY15004 Project Reference Group meeting (Brisbane)	31/05/2020
NY15004 Hort Innovation – NY19003 IBP Project meeting	18/12/2020
NY15004 Hort Innovation – NY18008 meeting	18/12/2020
NY15004 Hort Innovation – NY18010 meeting	18/12/2020
NY15004 Hort Innovation – ST19024 Smart Farming Project meeting	18/12/2020
NY15004 Hort Innovation – Horticulture Sustainability Framework	18/12/2020
NY15004 Victoria Department of Agriculture 'Exercise Ancestree'	18/12/2020
NY15004 Impact Innovation APPS Commercialisation Roadmap (x 6)	18/12/2020
NY15004 MT16004 project *RD&E program for control, eradication and preparedness for Vegetable leafminer. Steering Committee Meeting*	18/12/2020
NY15004 – NY17009 Project Reference Group meeting	18/12/2020

Updated NIASA and BioSecure HACCP Manuals

Foundational project resources have been updated to ensure a culture of continual improvement throughout the life of the project. Table 10 provides a brief overview of these updates. Each edition and revision has included implementation or requirements specified within the GIA Quality Manual.

Table 10 - Updated NIASA and BioSecure HACCP Manuals

Title	Date
Edition 5 NIASA manual. Updated to address changes to administration and governance and various content updates completed	2016
Edition 6 NIASA manual. Updated NIASA BMP Guidelines and review of content by Lex McMullin and Steve Hart (Farm Management Systems Officers – NGIQ), John McDonald (Development Manager – NGIQ). Development of the NIASA Freight and Logistics Section written by Grant Dalwood and Dr. Anthony Kachenko with input from the National Accreditation & Certification Committee.	2016
Edition 7 NIASA manual. **Amended sections** •APPENDIX 8 NURSERY INDUSTRY WATER MANAGEMENT BEST PRACTICE GUIDELINES. The Nursery Industry Water Management Best Practice Guidelines have been removed from the NIASA Guidelines and are now available to download as a separate publication at http://nurseryproductionfms.com.au. **New sections** •REVISION GUIDE. This section has been added to provide users with an overview of changes to new editions of the NIASA Guidelines. •APPENDIX 12 FREIGHT AND LOGISTICS - A.12.10 Heavy Vehicle National Law. This section has been added to provide guidance in addressing new Heavy Vehicle National Law and associated Chain of Responsibility obligations in an expanded Freight and Logistics appendix. •APPENDIX 13 AVOCADO HIGH HEALTH PRODUCTION. This appendix has been added to provide guidance in the production of high health avocado nursery stock and allows a NIASA accredited nursery to implement additional practices and apply for and gain NIASA Avocado High Health Production Accreditation. •APPENDIX 14 TREE STOCK SPECIFICATIONS. This appendix has been added to provide guidance in the production of tree stock for landscaping use.	2018
Edition 8 NIASA manual. **Amended sections.**	2019

Title	Date
APPENDIX 15 MACADAMIA NURSERY STOCK SPECIFICATION. This appendix has been added to provide guidance in the production of quality macadamia nursery stock and allows a NIASA accredited nursery to implement additional practices and apply for and gain NIASA Macadamia Nursery Stock Specification Accreditation. **New sections.** APPENDIX 16 BANANA NURSERY STOCK SPECIFICATION. This appendix has been added to provide guidance in the production of banana plants and allows a NIASA accredited business to implement additional practices and apply for and gain NIASA Banana Nursery Stock Specification Accreditation.	
Edition 2 BioSecure HACCP. Manual updated to address changes to administration and governance and various content updates completed.	2016
Edition 3 BioSecure HACCP manual. **Amended sections** • Section and relevant subsections within A1.8 Pest, Disease & Weed Crop Monitoring Procedures. Crop monitoring frequency, weed monitoring frequency and crop indicator plant monitoring frequency previously required a monitoring round to occur at least once every 7 days. Relevant sections have been amended to reflect new intervals based on crop type and periods of pest susceptibility and potential impact (see Table 13). • Section and relevant subsections within A1.9 Site Surveillance Procedure. Site surveillance was previously to be undertaken at least once every 14 days. Sections have been amended to change frequency to at least once every 28 days to reflect typical import requirement standards. **New sections** • A1.12.5 Despatch Inspection Procedure for Growing Media and Mulch.	2018
Edition 4 BioSecure HACCP manual. **Amended sections** •Minor amendment to A1.12.5 Despatch Inspection Procedure for Growing Media and Mulch to confirm process to ensure the bagged product storage/despatch area is clean and free of signs of pest infestation. •HACCP charts updated.	2019

BioSecure HACCP Improvements Adopted

Throughout the life of the project many interested persons have purchased the BioSecure HACCP manual for consideration and use as a best practice resource with or without formal certification. Further, project staff have actively engaged with project stakeholders within the order of 488 nursery visits performed throughout 2019/20 alone. As of 15/12/2020 business that have fully adopted the system have certified more than 15,000 consignments under BioSecure HACCP for interstate transport (Table 11) issuing 15,000+ BioSecure HACCP Biosecurity Certificates (BHBC).

Table 11 - BioSecure HACCP Improvements Adopted (2019/20)

Title	No.	Milestone Date
On-farm BioSecure HACCP visits to production nurseries across Australia	187	30/11/2019
On-farm BioSecure HACCP visits to production nurseries across Australia	30	31/05/2020
On-farm BioSecure HACCP visits to production nurseries across Australia	271	18/12/2020
BioSecure HACCP Biosecurity Certificates Issued at milestone date	7,000+	30/11/2019
BioSecure HACCP Biosecurity Certificates Issued at milestone date	10,000+	26/05/2020
BioSecure HACCP Biosecurity Certificates Issued at report date	15,000+	18/12/2020
Businesses actively using Audit Management System	22	30/11/2019
Businesses actively using Audit Management System	22	31/05/2020
Businesses actively using Audit Management System	22	18/12/2020

Number of growers operating & audited under BioSecure HACCP

At the close of the project 10 business were fully certified under the scheme (Table 12). A total of 124 program audits of businesses adopting the system were conducted between 2015 and 2020 (Table 13).

46 audits were conducted on businesses confirming compliance to interstate movement requirements for approved ECCPs (Table 14). Significant upgrades have been made to the AMS during 2020. Once rolled out, in the order of 160 businesses will have access to the AMS and updated business management and analysis tools.

Table 12 - Number of growers operating & audited under BioSecure HACCP

Certified	Uncertified	Milestone Date
QLD 2, VIC 3, SA 3 and WA 1 = 9	12 businesses audited	30/11/2016
QLD 3, VIC 3, SA 2 and WA 1 = 9		30/11/2017
QLD 4, VIC 3, SA 2 and WA 1 = 10	5 businesses audited	30/11/2018
QLD 4, VIC 3, SA 2 and WA 1 = 10		30/11/2019
QLD 4, VIC 4, SA 2 and WA 0 = 10	5 Businesses audited	11/12/2020

More than 30 businesses are engaged in the BioSecure HACCP program having received audits and the resulting Action Plans which provide guidance to work towards achieving compliance. The totals in Table 13 reflect these audits and those of the certified businesses.

Table 13 - BioSecure HACCP Program Audits

Program(s)	Audit type	Year
BioSecure Media (x 10)	Scheduled	2020
BioSecure HACCP (x 15)	Scheduled and preliminary	2020
BioSecure Media (x 10)	Scheduled	2019
BioSecure HACCP (x 10)	Scheduled	2019
BioSecure Media (x 10)	Scheduled	2018
BioSecure HACCP (x 14)	Scheduled	2018
BioSecure Media (x 6)	Scheduled	2017
BioSecure HACCP (x 10)	Scheduled	2017
BioSecure HACCP (x 8)	Scheduled	2016
BioSecure Media (x 2)	Scheduled	2016
BioSecure Media (x 7)	Scheduled	2015
BioSecure HACCP (x 21)	Scheduled	2015
Total audits		**124**

Table 14 – Entry Condition Compliance Procedures (ECCP) Audits

Reference	Jurisdiction	Dest. jurisdiction	Audit date
ECCPPCN02 Entry Condition Compliance Procedure (ECCP)	VIC	QLD	4/12/2020
ECCPRIFA21(NSW) BH-P-021_ECCPRIFA21_NSW-VIC_V1.1_051218	QLD	NSW	27/11/2020
ECCPRIFA21(VIC) BH-P-021_ECCPRIFA21_NSW-VIC_V1.1_051218	QLD	VIC	27/11/2020
ECCPRIFA24(SA) BH-P-024 ECCPRIFA24_SA-V1.0_031018	QLD	SA	27/11/2020
ECCPRIFA25(NSW) BH-P-025_ECCPRIFA25_NSW_SA_V1.2_111019	QLD	NSW	27/11/2020
ECCPRIFA25(SA) BH-P-025_ECCPRIFA25_NSW_SA_V1.2_111019	QLD	SA	27/11/2020
ECCPRIFA26(NSW) BH-P-026_ECCPRIFA26_NSW_SA_V1.2_040219	QLD	NSW	27/11/2020

Reference	Jurisdiction	Dest. jurisdiction	Audit date
ECCPRIFA26(SA) BH-P-026_ECCPRIFA26_NSW_SA_V1.2_040220	QLD	SA	27/11/2020
ECCPRIFA21(NSW) BH-P-021_ECCPRIFA21_NSW-VIC_V1.1_051218	QLD	NSW	26/11/2020
ECCPRIFA25(NSW) BH-P-025_ECCPRIFA25_NSW_SA_V1.2_111019	QLD	NSW	1/07/2020
ECCPRIFA03(NSW) BH-P-003_ECCPRIFA03_NSW_VIC_SA-V1.0_270317	QLD	NSW	30/06/2020
ECCPRIFA03(SA) BH-P-003_ECCPRIFA03_NSW_VIC_SA-V1.0_270317	QLD	SA	30/06/2020
ECCPRIFA03(VIC) BH-P-003_ECCPRIFA03_NSW_VIC_SA-V1.0_270317	QLD	VIC	30/06/2020
ECCPRIFA21(NSW) BH-P-021_ECCPRIFA21_NSW-VIC_V1.1_051218	QLD	NSW	30/06/2020
ECCPRIFA21(NSW) BH-P-021_ECCPRIFA21_NSW-VIC_V1.1_051218	QLD	NSW	30/06/2020
ECCPRIFA21(NSW) BH-P-021_ECCPRIFA21_NSW-VIC_V1.1_051218	QLD	NSW	30/06/2020
ECCPRIFA21(VIC) BH-P-021_ECCPRIFA21_NSW-VIC_V1.1_051218	QLD	VIC	30/06/2020
ECCPRIFA24(SA) BH-P-024 ECCPRIFA24_SA-V1.0_031018	QLD	SA	30/06/2020
ECCPRIFA25(NSW) BH-P-025_ECCPRIFA25_NSW_SA_V1.2_111019	QLD	NSW	30/06/2020
ECCPRIFA25(SA) BH-P-025_ECCPRIFA25_NSW_SA_V1.2_111019	QLD	SA	30/06/2020
ECCPRIFA26(NSW) BH-P-026_ECCPRIFA26_NSW_SA_V1.2_040219	QLD	NSW	30/06/2020
ECCPRIFA26(SA) BH-P-026_ECCPRIFA26_NSW_SA_V1.2_040220	QLD	SA	30/06/2020
ECCPTYLCV01(NSW) BH-P-001_ECCPTYLCV01_NSW_VIC-V3.0_270317	QLD	NSW	30/06/2020
ECCPTYLCV01(VIC) BH-P-001_ECCPTYLCV01_NSW_VIC-V3.0_270317	QLD	VIC	30/06/2020
ECCPTYLCV01(VIC) BH-P-001_ECCPTYLCV01_NSW_VIC-V3.0_270317	QLD	VIC	30/06/2020
ECCPRIFA26(SA) BH-P-026_ECCPRIFA26_NSW_SA_V1.2_040220	QLD	SA	10/02/2020
ECCPRIFA25(SA) BH-P-025_ECCPRIFA25_NSW_SA_V1.2_111019	QLD	SA	17/10/2019
ECCPRIFA24(SA) BH-P-024 ECCPRIFA24_SA-V1.0_031018	QLD	SA	4/10/2019
ECCPRIFA24(SA) BH-P-024 ECCPRIFA24_SA-V1.0_031018	QLD	SA	3/10/2019
ECCPRIFA26(NSW) BH-P-026_ECCPRIFA26_NSW_SA_V1.2_040219	QLD	NSW	11/09/2019
ECCPRIFA25(NSW) BH-P-025_ECCPRIFA25_NSW_SA_V1.2_111019	QLD	NSW	28/08/2019
ECCPRIFA21(NSW) BH-P-021_ECCPRIFA21_NSW-VIC_V1.1_051218	QLD	NSW	20/06/2019
ECCPRIFA21(VIC) BH-P-021_ECCPRIFA21_NSW-VIC_V1.1_051218	QLD	VIC	20/06/2019
ECCPRIFA21(NSW) BH-P-021_ECCPRIFA21_NSW-VIC_V1.1_051218	QLD	NSW	6/02/2019
ECCPRIFA03(NSW) BH-P-003_ECCPRIFA03_NSW_VIC_SA-V1.0_270317	QLD	NSW	17/10/2018
ECCPRIFA03(SA) BH-P-003_ECCPRIFA03_NSW_VIC_SA-V1.0_270317	QLD	SA	17/10/2018

Reference	Jurisdiction	Dest. jurisdiction	Audit date
ECCPRIFA03(VIC) BH-P-003_ECCPRIFA03_NSW_VIC_SA-V1.0_270317	QLD	VIC	17/10/2018
ECCPTYLCV01(NSW) BH-P-001_ECCPTYLCV01_NSW_VIC-V3.0_270317	QLD	NSW	17/10/2018
ECCPTYLCV01(VIC) BH-P-001_ECCPTYLCV01_NSW_VIC-V3.0_270317	QLD	VIC	17/10/2018
ECCPRIFA21(NSW) BH-P-021_ECCPRIFA21_NSW-VIC_V1.1_051218	QLD	NSW	13/07/2018
ECCPRIFA21(NSW) BH-P-021_ECCPRIFA21_NSW-VIC_V1.1_051218	QLD	NSW	13/07/2018
ECCPRIFA03(NSW) BH-P-003_ECCPRIFA03_NSW_VIC_SA-V1.0_270317	QLD	NSW	10/05/2018
ECCPRIFA03(SA) BH-P-003_ECCPRIFA03_NSW_VIC_SA-V1.0_270317	QLD	SA	10/05/2018
ECCPRIFA03(VIC) BH-P-003_ECCPRIFA03_NSW_VIC_SA-V1.0_270317	QLD	VIC	10/05/2018
ECCPTYLCV01(NSW) BH-P-001_ECCPTYLCV01_NSW_VIC-V3.0_270317	QLD	NSW	10/05/2018
ECCPTYLCV01(VIC) BH-P-001_ECCPTYLCV01_NSW_VIC-V3.0_270317	QLD	VIC	10/05/2018
Total audits			**46**

Prepare and update biosecurity resources

Under the project, biosecurity resources are continually reviewed and updated based on project needs and feedback from levy payers. In general, updates to biosecurity resources are addressed in reporting of outputs of other activity areas. Table 15 provides a snapshot of preparation and updates reported in other sections of this report – collated by milestone reporting period.

Table 15 – Snapshot of preparation and updates of biosecurity resources

Title	Milestone Date
BioSecure HACCP Quality Manual	30/11/2016
BioSecure HACCP Policy Documents	30/11/2016
BioSecure HACCP Guidelines	30/11/2016
16 x BioSecure HACCP Procedure Documents	30/11/2016
BioSecure HACCP Quality Management Forms	30/11/2016
BioSecure HACCP & NIASA BMP Program Forms	30/11/2016
BioSecure HACCP Circulars	30/11/2016
BioSecure HACCP Templates	30/11/2016
BioSecure HACCP & NIASA BMP Reference Documents	30/11/2016
Market access ECCP's drafted and approved by various jurisdictions	30/11/2017
Outputs from NY15002 uploaded to FMS	30/11/2017
Market access ECCP's drafted and approved by various jurisdictions	30/11/2018
Market access ECCP drafted for consultation (pending)	30/11/2018
NY15002 outputs uploaded	30/11/2018
BioSecure HACCP Guidelines Updated and released	30/11/2018
BioSecure HACCP policies revised - BioSecure HACCP Certification for Market Access	30/11/2018
BioSecure HACCP procedure revised - BioSecure HACCP Certification for Market Access	30/11/2018
Market access ECCPs drafted and approved by various jurisdictions	30/11/2019

Title	Milestone Date
Market access ECCP drafted for consultation (SA RIFA pending)	30/11/2019
Outputs from NY15002 uploaded to www.nurseryproductionfms.com.au	30/11/2019
BioSecure HACCP Guidelines Updated and released	30/11/2019
BioSecure HACCP policies reviewed - BioSecure HACCP Certification for Market Access	30/11/2019
BioSecure HACCP procedure reviewed - BioSecure HACCP Certification for Market Access	30/11/2019
All BioSecure HACCP administration, governance and delivery documents reviewed and re-issued.	18/12/2020

Training Package Developed for Each ECCP - Web Based

The e-learning platform that hosts and facilitates the delivery of training associated with the BioSecure HACCP program is established and operational at www.nurseryproductionfms.com.au.

Throughout the project a number of industry members having completed the required training for ECCPs allowing the businesses to self-certify consignments for interstate market access. The eLearning portal is the web-based resource growers are directed to for all their training needs associated with Entry Condition Compliance Procedures (ECCPs) related to BioSecure HACCP and specific market entry conditions per jurisdiction.

For the last 2 years of the project, the site saw 1326 site Logins from 359 ACTIVE users with a total of 1008 course completions (Figure 2). Overall, there have been 2921 assigned and 1219 completed courses from 640 active users on the site.

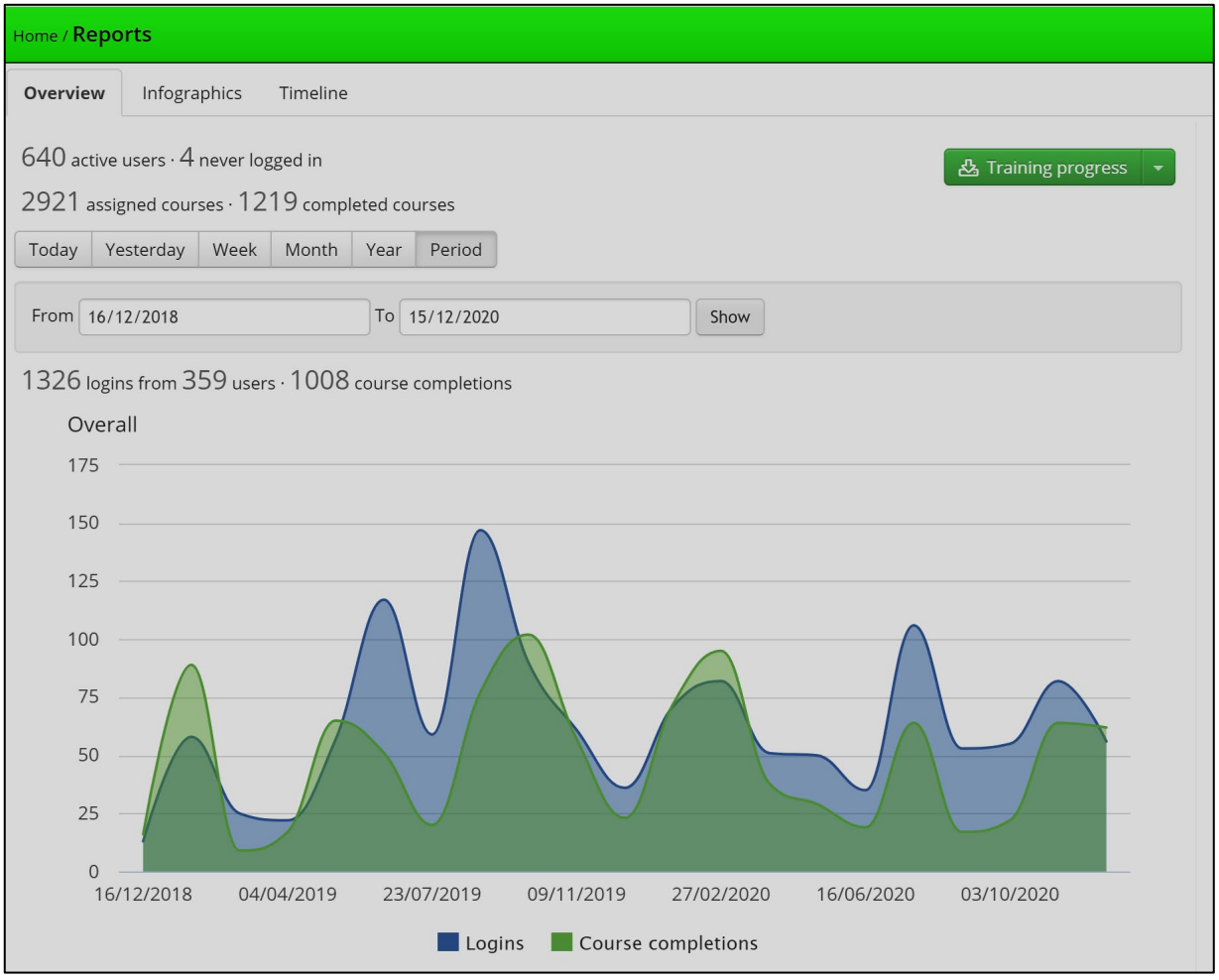


Figure 2 - Site logins and course completions

At the completion of the project, the follwing courses were active and show assigned and completed courses. These figures only include data related to ACTIVE users. Should a user delete their account their data is removed from the system (Table 16) which can occur due to staff turnover, and/or email address changes.

Table 16 - Biosecurity courses developed and user data

Course	Category	Assigned	Completed
BioSecure HACCP - An Introduction to the Audit Management System (AMS)	Biosecurity	59	38
BioSecure HACCP - Crop Monitoring	Biosecurity	171	62
BioSecure HACCP - Dispatch Inspection	Biosecurity	172	68
BioSecure HACCP - Generating a BioSecure HACCP Biosecurity Certificate (BHBC)	Biosecurity	68	33
BioSecure HACCP - Procedures and Techniques	Biosecurity	170	51
BioSecure HACCP - Site Surveillance	Biosecurity	196	76
BioSecure HACCP - Sticky Traps	Biosecurity	112	40
BioSecure HACCP - Understanding Entry Condition Compliance Procedures (ECCP's)	Biosecurity	147	65
BioSecure HACCP - Visitor Procedure and Vehicle Inspection Procedure	Biosecurity	192	75
ECCP Blueberry Rust (BR)(ECCPBR10) (V1.0)	ECCP	78	21
ECCP Blueberry Rust (BR)(ECCPBR19) (V1.0)	ECCP	49	34
ECCP Citrus Red Mite (CRM)(ECCPCRM15) (V1.0)	ECCP	27	10
ECCP Citrus Red Mite (CRM)(ECCPCRM18) (V1.0)	ECCP	26	8
ECCP Cucumber Green Mottle Mosaic Virus (CGMMV)(ECCPCGMMV20) (V1.0)	ECCP	0	0
ECCP Green Snail (GS)(ECCPGS09)	ECCP	16	2
ECCP Melon Thrips (MT)(ECCPMT07) (V1.0)	ECCP	72	17
ECCP Myrtle Rust (MR)(ECCPMR13) (V1.0)	ECCP	77	16
ECCP Potato Cyst Nematode (PCN)(ECCPPCN02) (V1.0)	ECCP	21	3
ECCP Potato Cyst Nematode (PCN)(ECCPPCN17) (V1.0)	ECCP	26	4
ECCP Pyriform Scale (PS)(ECCPPS014) (V1.1)	ECCP	25	5
ECCP Red Imported Fire Ant (RIFA) Growing media and organic plant mulch (ECCPRIFA21) (V1)	ECCP	48	23
ECCP Red Imported Fire Ant (RIFA) Growing media and organic plant mulch (ECCPRIFA24) (V1.0)	ECCP	34	27
ECCP Red Imported Fire Ant (RIFA) Mechanically processed mulch (ECCPRIFA25) (V1.1)	ECCP	27	22
ECCP Red Imported Fire Ant (RIFA) Organic mulch sourced. RIFA not known to occur (ECCPRIFA26) (V1.1)	ECCP	29	26
ECCP Red Imported Fire Ant (RIFA)(ECCPRIFA03) (V1.0)	ECCP	86	22
ECCP Regulated and Unwanted Quarantine Pests-TAS (RUQP)(ECCPRUQP11) (V1.0)	ECCP	62	29
ECCP Spiralling Whitefly (SPW)(ECCPSPW04) (V1.0)	ECCP	72	16
ECCP Spiralling Whitefly (SPW)(ECCPSPW06) (V1.0)	ECCP	72	14
ECCP Tomato Yellow Leaf Curl Virus (TYLCV)(ECCPTYLCV01) (V3.0)	ECCP	87	21
ECCP Treatment of Permitted Organisms - WA	ECCP	7	1

Course	Category	Assigned	Completed
(TPO)(ECCPTPO23) (V1.0)			
Introduction to the Nursery Production Farm Management System	ECCP	248	104
Totals		**2476**	**933**

Market Access and ECCP Agreed and In Place

At the commencement of the project, 'temporary' approval through sub-ordinate legal instruments were first provided by Queensland, Victoria, Tasmania and New South Wales by 31/05/2017. This was followed by South Australia and Western Australia by 31/05/2018.

Approval directly under the updated Acts of Queensland and New South Wales was achieved by and has continued since 31/05/2018, with GIA documented as a third-party accreditation provider. GIA has played, and continues to play, a major part in shaping this legislation. Victoria has since produced a draft Bill for a new Biosecurity Act along with South Australia (in the preliminary consultation phase) that is consistent with the approach taken by Queensland and New South Wales.

BioSecure HACCP is now accepted as a third-party accreditation scheme by all jurisdictions with the exception of the Northern Territory, however GIA has consulted with and prepared a detailed proposal for submission to the Northern Territory to achieve third party approval by means of a sub-ordinate provision to have the scheme acknowledged by the Chief Inspector. At the time of writing this Report the Northern Territory plant biosecurity legislation does not have the flexibility to accommodate approving third party providers nor do they the resources to update this legislation at this time.

The following ECCPs were in place or submitted for approval (Table 17) at the conclusion of the project.

Table 17 - BioSecure HACCP Entry Conditions Compliance Procedures.

Title	Code	Version	Comments
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Tomato Yellow Leaf Curl Virus (TYLCV).	BH-P-001	V3.0 270317	ECCPTYLCV01 – NSW, VIC.
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Potato Cyst Nematode (PCN).	BH-P-002	V1.0 270317	ECCPPCN02 – SA, QLD.
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Red Imported Fire Ant (RIFA).	BH-P-003	V1.0 270317	ECCPRIFA03 – NSW, VIC, SA
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Spiraling White Fly (SWF).	BH-P-004	V1.0 270317	ECCPSWF04 - VIC. For VIC only applies to greenhouse importer.
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Papaya Ring Spot Virus (PRSV)	BH-P-005	DRAFT	ECCPPRSV05 – QLD.
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Spiraling Whitefly (SPW)	BH-P-006	V1.0 270317	ECCPSWF06 – NSW.
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Melon Thrips (MT)	BH-P-007	V1.0 270317	ECCPMT07 – SA.
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Green Snail (GS)	BH-P-009	V1.1 010917	ECCPGS09 – NSW, TAS, VIC, (NT is DRAFT).
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Blueberry Rust (BR)	BH-P-010	V1.0 270317	ECCPBR010 – VIC.
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Regulated and Unwanted Quarantine Pests (RUQP)	BH-P-011	V1.0 270317	ECCPRUQP11 – TAS.
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Regulated Quarantine Pests	BH-P-012	DRAFT	ECCPRQP12 – NT.

Title	Code	Version	Comments
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Myrtle Rust (MR)	BH-P-013	V1.0 270317	ECCPMR13 – SA.
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Pyriform Scale (PS)	BH-P-014	V1.1 010917	ECCPPS14- QLD NSW VIC SA
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Citrus Red Mite (CRM)	BH-P-015	V1.0 270317	ECCPCRM15 – NSW SA
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Potato Cyst Nematode (PCN)	BH-P-017	V1.0 270317	ECCPPCN17 – NSW
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Citrus Red Mite (CRM)	BH-P-018	V1.0 270317	ECCPCRM18 – VIC
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Blueberry Rust (BR)	BH-P-019	DRAFT	ECCPBR19 – SA
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) CGMMV	BH-P-020	V1.0 270317	ECCPCGMMV20 – SA
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Red Imported Fire Ant (RIFA) – Composted Growing Media and Organic Mulch	BH-P-021	V1.1 051218	ECCPRIFA21 – NSW & VIC (for SA see ECCPRIFA24)
Entry Condition Compliance Procedure (ECCP) Treatment of Permitted Organisms - WA (TPO)	BH-P-023	V1.1 161018	ECCPTPO23- WA
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Red Imported Fire Ant (RIFA) – Composted Growing Media and Organic Mulch	BH-P-024	V1.0 031018	ECCPRIFA24 - SA
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Red Imported Fire Ant (RIFA) – Mechanically processed Mulch.	BH-P-025	V1.2 111019	ECCPRIFA25 – NSW SA Need VIC
BioSecure HACCP Entry Conditions Compliance Procedure (ECCP) Red Imported Fire Ant (RIFA) – Organic Mulch sourced from an Area where RIFA is not known to occur.	BH-P-026	V1.2 040220	ECCPRIFA26 – NSW SA Need VIC

BioSecure HACCP Commercialisation Plan Developed

In 2020 the Program commissioned a third party (Impact Innovation Pty Ltd) to undertake a commercialisation assessment of the BioSecure HACCP program and, by default, the entire APPS due to the prerequisite requirement of having NIASA Accreditation before BioSecure HACCP Certification can be awarded. The two programs are intrinsically linked, and were designed to be so, providing a pathway from Best Management Practice to a high health plant production program and market access privileges for production nurseries.

The Commercialisation Plan (see Appendix 1. Commercialisation Plan) was delivered in October 2020. The assessment took a mixed-methods approach, with a focus on the following evaluation principles which clearly define:

- Program effectiveness - achievement of outcomes consistent with objectives
- Technical efficiency - achievement of outputs relative to inputs
- Cost-effectiveness - achievement of outcomes relative to inputs (value for money).

The report has provided a roadmap of considerations for development of a future project. Importantly for NY15004, it provided that:

- The level of grower-perceived self-efficacy is high. Evidence exists to suggest that this may contribute to the low levels of accreditation adoption currently observed

- Perceptions of the value of accreditation are mixed, depending on the position within the supply chain
- Third party auditors and technical advisors and other supports (e.g., manual, website) for the APPS are effective
- There is evidence that nursery operators feel less anxious about biosecurity risk once management plans are in place.

When viewed together, these considerations provide an explanation to the relatively low uptake of the BioSecure HACCP certification, and the commercialisation plan has formulated a strategy for increasing grower membership of BioSecure HACCP in the future (see Appendix 1).

National MOU Signed

Advice provided by the Sub-committee on Domestic Quarantine & Market Access (SDQMA) and Plant Health Committee in 2015 first proposed that a MoU would assist GIA in allowing States and Territories to form a non-binding agreement to implement a harmonised system recognising BioSecure HACCP across Australia.

Subsequent to the completion of the national BioSecure HACCP trial in 2018 an MoU was drafted by GIA to achieve that objective and distributed for comment to relevant parties.

However, at the SDQMA meeting in Brisbane on 16 May 2018 the SDQMA agreed that a MoU is not the appropriate legal instrument to use due to there being legal blockages in some states to binding through a MoU to an industry owned third-party program. The SDQMA decided on the 16th May that a "Letter of Intent" signed between all jurisdictions confirming their obligations to each other around third-party biosecurity programs is the appropriate mechanism to secure the future operation (recognition, etc) of BioSecure HACCP.

GIA, working with other jurisdictions developed and sought that the "Letter of Intent" from each jurisdiction be signed before 31 April 2019.

The "Letter of Intent" has now been signed by all relevant jurisdictions, with the exception of Victoria – who have signed and endorsed an alternative letter which in effect serves the same purposes.

3. Appropriate activities to ensure that industry meets its obligations under the Emergency Plant Pest Response Deed (EPPRD) through committee level representation and input into the ongoing development of EPPRD support resources including Issues Resolution Groups and PlantPlan;

Delivered on EPPRD obligations

The Emergency Plant Pest Response Deed (EPPRD) is the key platform for ensuring industry biosecurity preparedness is met through participation in national meetings, forums and projects. The EPPRD, a legally binding document, imposes significant obligations upon the 42 signatories (Government and Industry) with industry required to provide representatives to key committees, participate in developing further the underpinning guidance documents, e.g., PlantPlan, and contributing to key issues requiring stakeholder input through resolution groups.

Furthermore, there are key areas that the signatory to the EPPRD must provide support to during an incursion response through to the eradication and stand-down or transition to management including industry wide communication, industry liaison, assessing owner reimbursement costs and response debriefing.

GIA is the industry member of PHA and the signatory to the EPPRD and as such has the responsibility to ensure all obligations are met on behalf of the nursery production industry. This project had significant input from GIA and required access to GIA resources including databases for national engagement and industry communication channels as well as key software platforms developed to support the APPS.

This project has provided industry representation on both the EPPRD National Management Group (NMG) and the Consultative Committee on Emergency Plant Pests (CCEPP) convened upon the detection of an emergency plant pest. These committees are responsible for determining the national status of a new emergency plant pest incursion (e.g., cost beneficial and technically feasible to eradicate) and approving the cost associated with implementing an eradication program (Response Plan) and the allocation of owner reimbursement costs.

As an Affected Party the nursery industry must be in position to contribute to the deliberations of these committees to ensure growers are represented and their key concerns/interests addressed, such as market access.

Participate in IRG, WG, activities supporting PlantPlan

Throughout the life of the project the National Biosecurity Manager has participated in Issues Resolution Groups (IRG's) and topic specific Working Groups and activities to support the integrity of PlantPlan and the functioning of the EPPRD.

A snapshot of activities is provided below as Table 19.

Table 18 - Participate in IRG, WG, activities supporting PlantPlan

Title	Date
PHA - Exotic Weed Deed - Teleconference (Hugh Millar)	21/03/2016
PHA Member Update meeting at Brisbane Novotel (airport)	22/03/2016
PHA – AusPestCheck national surveillance reporting, Biosecurity R&D Project, EPPRD Review and DQMA Chair (BioSecure HACCP Changes)	6/04/2016
PHA IRG Decision Making (Tech Feasibility) Meeting	3/07/2017
PHA Equity for Impacted Growers IRG Meeting and doc review	8/09/2017
PHA Equity for Impacted Growers IRG Meeting outcome review	22/09/2017
PHA Decision making IRG - technical feasibility tool webinar.	27/11/2017
Issues Resolution Group Normal Commitments Meeting 02/02/2018	02/02/2018
Issues Resolution Group Equity for Impacted Growers Meeting 23/02/2018	23/02/2018
Owner Reimbursement Costs (Citrus canker) Meeting 23/04/2018	23/04/2018
PHA IRG Equity for Early Reporters Meeting	2/11/2018
Issues Resolution Group Borders Meeting	14/12/2018
Issues Resolution Group Complexes Meeting	21/01/2019
Issues Resolution Group Complexes Meeting	23/01/2019
Issues Resolution Group Equity for Impacted Growers Meeting	22/02/2019
Issues Resolution Group Equity for Impacted Growers Meeting	4/03/2019
Issues Resolution Group Equity for Impacted Growers Meeting	21/03/2019
Issues Resolution Group Decision Making Meeting	4/04/2019
Issues Resolution Group Categorisation Meeting	3/05/2019
Issues Resolution Group Plant Plan Job Cards	17/07/2019
Issues Resolution Group Complexes Meeting	18/10/2019
Issues Resolution Group Equity for Impacted Growers	10/12/2019
Issues Resolution Group Equity for Impacted Growers	20/03/2020
Issues Resolution Group Borders Meeting	27/03/2020
Plant Biosecurity Preparedness Strategy Working Group	03/07/2020
Issues Resolution Group Borders Meeting	09/07/2020
National Pilot Traceability for Plant Industries Project Meeting (PHA)	14/07/2020
ORC Workshop Planning Group (PHA)	24/07/2020
ORC Workshop Planning Group (PHA)	10/08/2020
ORC Workshop (PHA)	20/08/2020
Plant Biosecurity Preparedness Strategy Working Group	22/09/2020
Issues Resolution Group Borders Meeting	08/10/2020
EPPRD 2020 Review Reference Group Meeting	21/10/2020
PHA Plant Industry Forum	17/11/2020
PHA Member Forum	18/11/2020

Title	Date
PHA EPPRD Parties Meeting	18/11/2020
National Pilot Traceability for Plant Industries Project Meeting (PHA)	25/11/2020
Plant Biosecurity Preparedness Strategy Working Group	01/12/2020
PHA EPPRD Parties Meeting	04/12/2020
PHA EPPRD Parties Meeting	07/12/2020
PHA Annual Surveillance Workshop	10/12/2020
EPPRD 2020 Review Reference Group Meeting	16/12/2020

One exotic plant pest incursion exercise completed

Exercise Fastidious was a discussion-based simulation exercise that aimed to improve the appreciation of critical determining factors for technical feasibility of eradication of an EPP, focussing on decision making and implementation of effective response strategies for the destructive plant disease, *Xylella fastidiosa*.

The activities centred around the utilisation of the technical feasibility of eradication decision making support tool, development of response objectives through an appreciation process and the development of a Response Plan, all utilising the agreed-in-principal EPPRD elements relating to complexes and PlantPlan.

It was conducted over 14 and 15 November 2018.

General activities including planning and the event are detailed below:

Planning meetings:

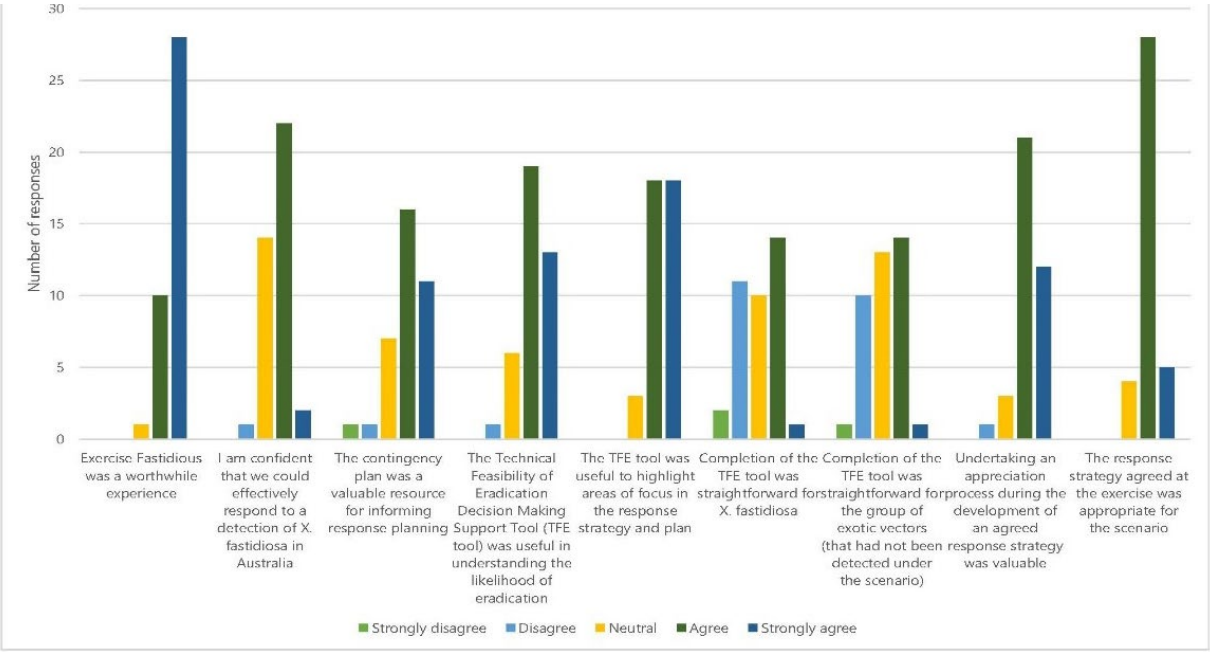
- 1 x planning meeting (Brisbane) 29 June 2018
- 1 x planning meeting (Brisbane) 09 August 2018
- 1 x planning meeting (Brisbane) 08 October 2018

Exercise Fastidious:

- Day 1 – Brisbane 14 November 2018
- Day 2 – Brisbane 15 November 2018

Participant feedback for the event is detailed below in Figure 3.

Figure 3 - Exercise feedback



New contingency plans developed (Support NY15002)

Over the life of the project 3 new contingency plans were to be developed in support of the NY15002 project. An overview is proved by milestone reporting date under this project as part of Table 20.

Industry threat specific contingency plans have been developed for significant exotic plant pests to inform the development of response plans. These plans can be accessed here- Australian Plant Production Standard (APPS) | Pest Contingency Plans (nurseryproductionfms.com.au)

Table 19 - New contingency plans developed (Support NY15002)

Title	Milestone Date
Brown Marmorated Stink Bug Contingency Plan	30/11/2016
Exotic Invasive Ants Contingency Plan	30/11/2018
Southern Red Mite Contingency Plan (delayed and delivery March 2019)	30/11/2018
Aphids – Black Bean Aphid	30/11/2019
Pseudomonas syringae (Exotic strains) Contingency Plan	18/12/2020

Reviewed contingency plans (Support NY15002)

This program is the principal biosecurity investment under the Nursery Products Levy and has the human resources, industry linkages and biosecurity knowledge providing direct links to relevant projects that will add to the outcomes. The program currently has very close links to the QDAF NY15002 *Building the resilience and on-farm biosecurity capacity of the Australian production nursery industry.* The NBM sits on the steering committee and provides annual planning advice (deliverables) and reviews outputs such as emergency plant pest contingency plans, pest management plans and factsheets.

As GIA is the industry member of PHA and the industry signatory to the EPPRD review of contingency plans require significant input from the industry body.

A snapshot of project review activity is provided below in Table 21.

Table 20 - Reviewed contingency plans (Support NY15002)

Title	Milestone Date
Pierce's Disease Contingency Plan (*Xylella fastidiosa*)	30/11/2016

Title	Milestone Date
Glassy Winged Sharpshooter Contingency Plan (*Homalodisca vitripennis*)	30/11/2017
Phytophthora ramorum Contingency Plan (Sudden Oak Death)	30/11/2018
Gypsy moth Contingency Plan	30/11/2019
Thrips / Tospoviruses Contingency Plan	18/12/2020

State Biosecurity Agencies Have Received Training

GIA has provided BioSecure HACCP training to a number of jurisdictions during the life of the project whereby biosecurity agency staff, policy and operations, have been informed of the scheme.

The training consisted of the on-farm implementation of the BioSecure HACCP system (BioSecure HACCP Manual – documented procedures and records), NGIA governance and administration and the operation and access to the Audit Management System (AMS).

Table 22 provides a list of dates on which jurisdictions were provided training.

Table 21- State Biosecurity Agencies Have Received Training

Title	Date
Workshop Biosecurity Victoria	07/06/2016
Workshop Biosecurity Queensland	09/08/2016
Workshop Biosecurity New South Wales	24/08/2016
Workshop Biosecurity Tasmania	13/10/2016
Workshop Biosecurity Western Australia	26/06/2017
Workshop Biosecurity New South Wales	18/09/2017
Training Activity for AMS Biosecurity Victoria	04/12/2018
Training Activity for AMS Biosecurity Western Australia	21/01/2019
Teleconference Biosecurity South Australia	20/09/2018
Workshop Biosecurity South Australia	21/03/2019

4. Ensuring industry maintains access to appropriate pesticides (insecticides, fungicides, herbicides, etc) to manage plant pests across cropping systems through the pesticide minor use program.

Minor Use Permits Delivered

Minor use permits are of critical importance to nursery production due to the extremely limited new chemistry registrations available for the exceptionally large number of pest/host combinations that affect the industry. The Minor Use Program for nursery production is managed by this program and utilised the services of AgAware Consulting Pty Ltd to develop and submit the minor use permit applications to APVMA. The program has the role of working with AgAware Consulting Pty Ltd to identify priority pest/chemistry combinations that will improve the pest management of growers across the industry.

Before a pesticide can be used in Australia, it must first be registered for use with the Australian Pesticide and Veterinary Medicines Authority (APVMA). The registration process requires pesticide manufacturers to submit a comprehensive application including information on its chemistry and manufacture, the toxicological impacts on public and occupational health, any residues, environmental safety of the product, and the efficacy of the product.

Table 23 presents an examples of Minor Use Permits delivered, issued or available during the final year (2020) of the project, providing a snapshot of the value of this project activity to industry investors through responding to critical industry needs. Key recent examples of responding to industry needs include PER88977 to deal with exotic new biosecurity threats posed by leafminers and PER899330 to deal with Fall armyworm.

Table 22- Example of Permits delivered, issued or available during 2020.

Permit Number	Permit Description	Mode of Action Group
PER88977	Various insecticides (abamectin, azadirachtin, cyromazine, emamectin, chlorantraniliprole + thiamethoxam, cyantraniliprole, indoxacarb, spinetoram) / Nursery Stock (non-food) / **leafminers**	Various
PER88719	Serifel Biofungicide (Bacillus amyloliquefaciens strain MB1600) / Nursery Stock (non-food) / suppression of various foliar and soil diseases/**Foliar:** Alternaria leaf spot (Alternaria spp.), Anthracnose (Colletotrichum spp.), Cercospora leaf spot (Cercospora spp.), Downy Mildew (Peronospora spp.), Grey Mould (Botrytis cinerea), Powdery Mildew (Erysiphe/Leveillula/Podosphaera/ Sphaerotheca spp.), Rust (Puccinia spp.) and White Mould/Watery soft rot (Sclerotinia spp.). **Soil/Media:** Fusarium Wilt (Fusarium spp.), Leaf Drop (Sclerotinia spp.), Phytophthora Root Rot (Phytophthora spp.), Pythium Damping Off (Pythium spp.), Rhizoctonia Rot (Rhizoctonia spp.) and Verticillium Wilt (Verticillium spp.).	Group 44 Fungicide
PER89330	Acephate (LANCER or ORTHENE), acetamiprid + novaluron (CORMORAM), alpha-cypermethrin (DOMINEX or CONQUEST ALPHA FORTE), azadirachtin (AZAMAX), chlorantraniliprole (CORAGEN or ACELEPRYN GR), chlorantraniliprole + thiamethoxam (DURIVO), cyantraniliprole + thiamethoxam (SPINNER TURF), emamectin (PROCLAIM), indoxacarb (AVATAR or PROVAUNT TURF)), lambda-cyhalothrin (KARATE ZEON), Methomyl (LANATE-L), methoxyfenozide (PRODIGY) and pyrethrins (PYGANIC). NURSERY STOCK (NON-FOOD) – SEEDLINGS, TUBES & PLUGS, POTTED COLOUR, TREES AND SHRUBS, FOLIAGE PLANTS, PALMS, GRASSES, FRUITING PLANTS (NON-BEARING), CUT FLOWERS AND ORNAMENTALS'. Fall armyworm (Spodoptera frugiperda)	Multiple groups including: 1B, 4A, 3A, 6, 18, 22A, 28.
PER88741	Actinovate Biofungicide (Streptomyces lydicus WYEC108) / Nursery Stock (non-food) / Fusarium wilt, Powdery mildew, Phytophthora root rot, Pythium damping-off, Rhizoctonia rot (suppression)	Group 9D Insecticide
PER88660	Versys Insecticide (afidopyropen) / Nursery Stock (non-food) / various aphids and Silverleaf whitefly	Group 9D Insecticide
PER88657	Banrot 400 WP & 80G (thiophanate-methyl + etridiazole) / Nursery Stock (non-food) / damping-off, root and stem rots caused by: *Pythium, Phytophthora, Rhizoctonia, Theilaviopsis* (*Chalara*)	Group 1 14 Fungicide
PER81707	Acramite Miticide (BIFENAZATE) / Nursery Stock (Non-Food)/ Mites	Group 2D
PER81491	Acrobat/Mancozeb (DIMETHOMORPH & MANCOZEB) / Nursery Stock (Nonfood) / Alternaria, Anthracnose, Downey Mildew & Phytophthora	Group 40/M3
PER81707	Admiral Insect Growth Regulator Insecticide (PYRIPROXYFEN) / Nursery Stock (Non-Food) / Whiteflies and Fungus Gnats	Group 7C
PER81263	Aero Fungicide (METIRAM/PYROCLOSTROBIN)/Nursery Stock (Nonfood)/Alternaria, Phytophthora, Colletotrichum, Powdery Mildew & Downy Mildew	Group M3/11

Permit Number	Permit Description	Mode of Action Group
PER84744	Agador Turf Nematicide and Miticide (abamectin) / Nursery stock (non-food), cut flowers & foliage / nematodes (various)	Group 6 Insecticide
PER81491	Amistar (AZOXYSTROBIN) / Nursery Stock (Non-Food) / Downy Mildew, Powdery Mildew, Grey Mould, Rusts and Leaf Spots	Group 11
PER81707	Applaud Insecticide (BUPROFEZIN) / Nursery Stock (Non-Food) / Mealybug, Leafhoppers, Scale and Whitefly	Group 16
PER81707	Avatar Insecticide (INDOXACARB) / Nursery Stock (Non-Food)/ European Earwig, Heliothis, Lightbrown Apple Moth & Weevils.	Group 22A
PER84303	Barricade Turf Herbicide (PRODIAMINE) Nursery Stock (Non-Food) Preemergent For Grass and Broad Leaf Weeds	Group D Herbicide
PER14856	Bifenthrin, Chlorothalonil, Chlorpyrifos, Imidacloprid, Mancozeb / Nursery stock (nonfood) / Quarantine pests	Various
PER81491	Blue Shield DF Copper Fungicide (COPPER HYDROXIDE) Nursery Stock (Nonfood)/Alternaria, Colletrotrichum, Downy Mildew, Myrtle Rust	Group M2
PER81707	Chess Insecticide & Fulfill Insecticide (PYMETROZINE) / Nursery Stock (Nonfood) / Aphids and Whitefly	Group 9B
PER81707	Confidor 200 SC (IMIDACLOPRID) / Propagation Nursery Stock (Non-Food) / Silverleaf Whitefly	Group 4A
PER81707	Coragen Insecticide (CHLORANTRANILIPROLE) / Nursery Stock (Non-Food) / Heliothis, Lightbrown Apple Moth, Apple Looper and Soybean Looper.	Group 28
PER86931	CORMORAN INSECTICIDE (Containing: 80 g/L ACETAMIPRID and 100 g/L NOVALURON as the only active constituent) / NURSERY STOCK (NON-FOOD), CUT FLOWERS AND ORNAMENTALS / Aphids, Bugs (Hemiptera spp.), Leafhoppers, Lepidoptera larvae, Mealybugs, Psyllids, Scale, Thrips	Group 15/4A Insecticide
PER80699	Sporekill (dodecyl dimethyl ammonium chloride), Oxydul (copper oxychloride), Grochem Copper (copper sulphate pentahydrate) & methylated spirits / nursery stock growing surfaces / pathogens (bacterial and fungal organisms)	Various
PER86930	Dimethoate systemic insecticide plus other registered products (Dimethoate) - cut flowers, ornamentals and other (non-food) nursery stock / Spiraling Whitefly and Mirids	Group 1B Insecticide
PER83506	Diptex Insect Growth Regulator (cyromazine) / Nursery stock (non-food) / larvae of leafminer flies and Sciarid flies	Group 1B Insecticide
PER81707	Dominex Duo Insecticide (ALPHA-CYPERMETHERIN) Nurserystock (nonfood)/Aphids,Cutworms, Grasshoppers, Locust, Rutherglen bug & Thrips	Group 3A
PER81707	Durivo insecticide (THIAMETHOXAM/CHLORANTRANILIPROLE) /Nursery stock (nonfood)/Lepidoptera including Diamonback Moth, Cabbage White Butterfly, Helicoverpa, Caterpillars, Loopers, Leafhoppers, Aphids, Whitefly, Bugs, Thrips & Leafrollers	Group 4A/28
PER81290	Ecocarb Fungicide (POTASSIUM BICARBONATE)/Nursery Stock (Nonfood)/Powdery Mildew	Group M2
PER81707	Insegar Insecticide (FENOXYCARB) / Nursery stock (non-food) / Lepidoptera pests and San Jose scale	Group 7B
PER83964	Mainman 500 WG insecticide (flonicamid) / nursery stock / aphids, mealybugs, mirids, silverleaf whitefly and thrips & western flower thrips (suppression)	Group 9C Insecticide

Permit Number	Permit Description	Mode of Action Group
PER81491	MANCOZEB / Nursery Stock (Non-Food) / Alternaria, Anthracnose, Cercospora, Downy Mildew, Grey Mould, Leaf Spot, Phoma, Rhizoctonia, Rust	Group M3 Fungicide
PER81707	Movento Insecticide (SPIROTETRAMAT)/Nursery stock (non-food)/Aphids, Silverleaf whitefly & Scale insects	Group 23
PER81491	Nimrod Fungicide (BUPIRIMATE)/Nursery Stock (Non-Food)/Powdery Mildew	Group 8
PER81448	Octave |Fungicide (PROCHLORAZ) / Nursery Stock (Non-Food) / Anthracnose	Group C Fungicide
PER81707	Orthene & Lancer Insecticide (ACERPHATE) Nursery stock (non-food) Western Flower Thrips	Group 1B
PER81707	Paramite Insecticide (ETOXAZOLE) Nursery stock (non-food) Spider mites	Group 10B
PER81707	Pegasus Insecticide (DIAFENTHIURON) / Nursery Stock / Aphids, Mites and Whitefly	Group 12A
PER81707	Pest Oil (PETROLEUM OIL) Nursery stock (non-food)/Aphids, Leafhoppers, Mites, Scale and Thrips	N/A
PER84735	Pirimor WG Aphicide (pirimicarb) / Nursery stock (non-food) / aphids (various)	Group 1A Insecticide
PER81491	Pristine Fungicide (BOSCALID + PYRACLOSTROBIN)/Nursery Stock (Nonfood)/Anthracnose, Botrytis, Leaf Spot, Powdery Mildew	Group 11/7
PER81707	Proclaim Insecticide (EMAMECTIN) / Nursery stock (non-food) / Diamondback moth, loopers, green mirid, mites, cluster caterpillar, Heliothis, lightbrown apple moth	Group 6A
PER81707	PyGanic Organic Insecticide (PYRETHRINS) Nursery stock (nonstock)/Greenhouse Thrips, Diamondback moth, Cluster caterpillar, Heliothis & Lightbrown apple moth	Group 3A
PER87173	Quali-Pro Evolution Fungicide (azoxystrobin + tebuconazole) / Nursery Stock (Non-Food), Cut Flowers and Ornamentals / Anthracnose, Leaf mould, Myrtle rust, Powdery mildew, Rhizoctonia and Sclerotinia	Group 3/11 Fungicide
PER84707	Ranman 400 SC (cyazofamid) / nursery stock (non-food) and fruit trees (no-bearing) / Pythium, Phytophthora, Downy mildew)	Group 21 Fungicide
PER81707	Regent 200SC Insecticide plus Instar Granular (FIPRONIL) Nursery stock (nonfood)/Ants, Cutworms/Wireworms, Earwigs, Fungus gnats/Sciarid flies, Root mealybug, Scarab beetles, Sugar cane weevil borer, Symphylids, Termites and Thrips	Group 2B
PER81491	Ridomil Gold MZ – (MANCOZEB + METALAXYL) / Nursery Stock (Non-Food)/ Alternaria, Anthracnose, Septoria Leaf Spot & Phytophthora	Group 4/M3
PER85010	Spinner Turf (cyantraniliprole + thiamethoxam) / nursery stock (non-food) and fruit trees (no-bearing) / Beetle larvae, weevil larvae, armyworm, cutworm	Group 4A 28 Insecticide
PER84742	Starkle Insecticide (dinotefuran) / Nursery stock (non-food), cut flowers and foliage / aphids, borers, leaf beetles, leafhoppers, mealybugs, mirids, scales, whiteflies, thrips, weevils	Group 4A Insecticide
PER87433	Success Neo Insecticide (spinetoram) /nursery Stock (non-food) – Cut Flowers, Foliage and Ornamentals / Psyllids and Thrips	Group 5 Insecticide
PER81707	Suscon Maxi Controlled Release Insecticide (IMIDACLOPRID) / Nursery Stock (Non-Food) / Various Insects	Group 4A

Permit Number	Permit Description	Mode of Action Group
PER81491	Switch Fungicide (CYPRODINIL + FLUDIOXONIL)/Nursery S Stock (Nonfood)/Rhizoctonia, Sclerotinia, Botrytis, Colletotrichum, Aspergillus	Group 12/9
PER85011	Transform (sulfoxaflor) / nursery stock (non-food) and fruit trees (no-bearing) / aphids, mealybugs, mirids, scale, greenhouse whitefly	Group 4C Insecticide
PER87434	Transform Insecticide (Sulfoxaflor)/ Nursery Stock (Non-Food), Cut Flowers and Ornamentals / Psyllids and Stink bugs	Group 4C Insecticide
PER81491	TRIADIMENOL, TRIFORINE, MANCOZEB, AZOXYSTROBIN, COPPER OXYCHLORIDE, OXYCARBOXIN AND PROPICONAZOLE / Nursery Stock (Nonfood), Ornamentals and Cut Flowers / Myrtle Rust (Uredo Rangelii)	Various

Outcomes

The outcomes of this project demonstrate clear success in achieving the four strategic imperatives that form part of the project that have been refined over the life of the project in consultation with Hort Innovation, stakeholders and through external review of the project. The project has evolved over time based on a model of continual improvement with agreed amendments made as part of that process. It has adapted and adopted new approaches based on analysis and feedback to maximise the benefit to levy investors. This final report has been modelled on four key strategic imperatives, with a snapshot of project achievements demonstrated in the Outputs section of the report against established project deliverables. The Outcomes below provide a summary of achievements under each of those key strategic imperatives.

1. Industry wide communication across aspects of both on and off-farm biosecurity issues that impact the grower including both endemic and emergency plant pest management.

The project has increased the industry awareness of critical biosecurity issues including national pest surveillance, early detection and reporting of exotic plant pests and opportunities to economically eradicate emergency plant pests. This has been achieved through the use of Plant Protection Officers engaging growers at a business level through on-site visits, biosecurity forums and e-communication using Biosecurity Alerts, Grower Case Studies, Technical Papers (Nursery Papers), eLearning Courses, and the APPS Technical website. The independent Monitoring and Evaluation Report from AgEconPlus found in June/July 2020 that on average 73% of the industry is aware of the National Nursery Industry Biosecurity Project and the key areas being addressed. More than half of all businesses surveyed were aware of seven of ten extension components. Nursery Papers were the most recognisable communication tool at 80% of respondents followed by articles in the Your Levy at Work blog. Case study videos may not be an appropriate extension tool for production nurseries as only 37% of respondents were aware of them. Growers are better prepared than before with 50% of respondents in June 2020 reporting their engagement in relation to Pest Alerts, Pest Facts, interstate market access, managing pest incursions and industry representation under the EPPRD. Importantly, 70% of growers are aware of the BioSecure HACCP manual for their on-site plant protection and biosecurity activities along with available training courses (50%) and extension materials (42%).

2. Appropriate activities to ensure that industry meets its obligations under the Emergency Plant Pest Response Deed (EPPRD) through committee level representation and input into the ongoing development of EPPRD support resources including Issues Resolution Groups and PlantPlan.

The reported Outputs above clearly demonstrate that the industry has been well represented across all aspects of the EPPRD and that all obligation under the EPPRD have been met. With more than 500 activities occurring annually, relevant to emergency plant pest incursions, the contribution to the national responses by the project have been significant. Major activities that the project responded to included the eradication responses to banana freckle (NT), brown marmorated stink bug (WA, NSW, VIC, QLD), tomato potato psyllid (WA), and citrus canker

(NT/WA) with each requiring a high degree of effort and attention across the response phases as well as providing industry wide communication and affected growers with targeted assistance including the processes to seek and receive Owner Reimbursement Costs (ORCs). The project has participated in all Plant Health Australia Issues Resolution Groups over the past 5 years improving the EPPRD and PlantPlan based on the experiences from the various plant pest incursion responses that the industry has been involved in. Of significance is the addition to the EPPRD (in draft) to support industry early reporting and surveillance by ensuring those business reporting suspect emergency plant pests are no worse off due to actions taken prior to a Response Plan being initiated. This will allow those growers 'quarantined' while the investigation occurs to seek ORCs for any applicable losses, currently not available under the EPPRD. A further initiative of the project has seen the creation of the Plant Industries Biosecurity Committee, under the PHA Plant Industries Forum, that will drive the relationship building between the Plant Health Committee and plant industries to seek and explore areas of common ground across the national biosecurity continuum in which partnerships can be formed to improve the domestic system and maintain business continuity and profitability.

3. Development of an industry on-farm biosecurity program (BioSecure HACCP) as a national market access instrument that supports production nurseries in meeting intra and interstate quarantine entry conditions and electronic certification.

The National Nursery Industry Biosecurity Program has improved overall pest, disease and weed management reducing crop losses and operational costs due to a structured pest management system and resources. The provision has been made for knowledge-based decision making leading to operational efficiency gains in labour allocation (e.g., reduced pesticide application) and cropping inputs (e.g., reduced pesticide usage) through the application of on-farm biosecurity procedures and access to a secure data storage and retrieval system reducing administration costs through efficient data management. BioSecure HACCP is a flexible market access instrument providing self-certification allowing businesses to meet client demands 24/7.

The project has delivered the program as planned and has national agreement across all states and territories recognising BioSecure HACCP as the only Australian plant industry owned and operated market access instrument for the movement of plant material across jurisdictions. The Monitoring and Evaluation Report June 2020 compared the industry awareness of BioSecure HACCP with that of the 2016 Report and found a difference had grown from an initial 26% awareness to 85% for BioSecure HACCP.

The program received this national recognition in April 2019 with the signed 'Letter of Intent' and with the legislative approvals in Queensland and New South Wales in 2018. The project has negotiated market access Entry Condition Compliance Procedures for interstate market access in all states excluding the Northern Territory. The Audit management System (AMS) has been expanded, and continues to be expanded, as the electronic platform supporting businesses operating under the APPS including auditors, administrators, and government partners in BioSecure HACCP. The AMS is the only functioning eCertification platform for plant market access in Australia having in excess of 15,000 BioSecure HACCP Biosecurity Certificates generated in the past 3 years. Businesses operating within the BioSecure HACCP program have reported productivity gains of 3-5% which on an average production nursery is a return of between$57,000 to $95,000 per annum. There are also further labour, administration and fees and charges savings that have the potential to drive business savings past 10% per annum.

4. Ensuring industry maintains access to appropriate pesticides (insecticides, fungicides, herbicides, etc) to manage plant pests across cropping systems through the pesticide minor use program.

Industry has access to the most up to date chemistry available in Australia for the management of pests, diseases and weeds with the program having secured more than 55 different actives under Minor Use Permits (MUPs) across the 5 years of the project. Those MUPs applied for and received from the APVMA include those for general pest management as well as those to address emergency plant pests detected in Australia e.g., tomato potato psyllid, serpentine leafminer, etc. The project has been actively planning each year to source the most appropriate active ingredients guided by a number of sources including the data from the Nursery Strategic Agrochemical Review Process (SARP), new national active ingredient registrations, knowledge of what older chemistry to replace and industry emerging requirements. The NY17009 project found that when seeking to find alternative insecticides to the neonicotinoid family the Nursery MUP program had already secured those available actives excluding two new actives under consideration by the APVMA, and not registered at that time, demonstrating the

effectiveness of the MUP program managed under this project.

Monitoring and evaluation

Monitoring and evaluation of the project was conducted in accordance with Hort Innovations agreed approach (specified in the executed Research Agreement), that is, through monitoring and evaluation of milestones detailing achievement criteria and deliverables supported by a mid-term review.

The Project Reference Group (PRG) investigated the opportunity to act on recommendations from the NY15004 mid-term review to assess the reach of the program across industry which the Review considered has been limited so far to a small sample group. With a draft survey and methodology provided by the project M&E specialist (AgEconPlus) in November 2019 the PRG assessed this against the investment proposed to deliver a substantial M&E effort in early 2020. The PRG agreed to the methodology and GIA contracted AgEconPlus to undertake the larger (40 growers) direct telephone survey.

The purpose of this Review (survey), completed as part of the monitoring and evaluation component of the National Nursery Industry Biosecurity Program, was to investigate:

- Production nursery preparedness, awareness, and adoption of biosecurity initiatives.
- Communication reach, satisfaction, and improvement opportunities.
- Research awareness and future directions for investing in technical support.
- Policy priorities for the nursery industry.
- Conclusions on project benefit to industry and the impact of R&D investment.

Forty surveys were completed, this sample included twenty production nurseries that had previously expressed interest in achieving BioSecure HACCP certification and a further twenty nurseries that had no prior experience with biosecurity certification.

Results of the Review were finalised in July 2020 and are presented as Appendix 2. Monitoring and Evaluation Report.

In short, the survey has shown that the nursery industry values, and has benefited from, key components of the National Nursery Industry Biosecurity Program. Components valued by industry are likely to generate a positive overall impact from investment in the National Nursery Industry Biosecurity Program. These components include biosecurity preparedness and extension activities, the Nursery Papers, the Pest Identification Tool, minor use chemical permits, email updates, project officer led workshops and on-site visits by technical officers.

Recommendations

The following recommendations are made in relation to ongoing development and continual improvement of project outcomes to support industry investment. They recognise the learnings of the project and input provided through third part assessment in monitoring and evaluation while considering advice in regard to taking a practical and reasonable long-term approach to existing industry investment.

Findings from the project support the ongoing need to make production nurseries more resilient due to identifying, mitigating and addressing the emerging risks of increasing plant biosecurity threats, climate change and supply chain pressures and influences. Industry must be more informed and aware of opportunities to improve and fortify their cropping systems within a dynamic, diverse and ever evolving market place.

Under the APPS, the industry is well placed to address emerging risks, for example, climate change, through existing standards including NIASA and EcoHort. The overarching standards that make up the APPS place industry in an ideal place to meet these challenges.

It is recommended that any future project (investment) should build upon and continue the momentum, successes and learnings achieved under NY15004 *National Nursery Industry Biosecurity Program* including outputs developed such as:

1. Enabling the nursery industry to fulfill its obligations under the Emergency Plant Pest Response Deed (EPPRD)

through the provision of technical advice.

2. Maintaining and building new plant protection resources and strategies requiring grower adoption and implementation support.
3. Delivery of research outputs and innovation to support biosecurity and sustainable plant production.
4. Market access development for the nursery industry so that it meets government certification requirements.
5. Digitisation of production data management documents.
6. Development and delivery of pest identification resources.

As with this project, any future project should keep Levy Payers nationally informed on the implementation, integration and adoption (and benefits) of advanced technical elements and systems to deliver profitable, sustainable and high health plant production within a credible business improvement and biosecurity system. Growers should have the opportunity to improve business profitability, efficiencies, flexibility and markets while demonstrating sustainable business functions that meet community, industry and government expectations.

An extension network must continue to ensure industry is informed and aware of opportunities to improve and fortify their cropping systems based on adoption of technical advances and best management practice, risk mitigation, market opportunities and enhanced skilling. Any future project must aim to guide consistent improvement and best management practice in the nursery industry to facilitate trade, increase productivity and profitability, and provide high quality plants to Australia's plant-based industries. Overall, future investment must ensure the industry has a robust and effective plant protection and biosecurity program accessible to growers that provides growers with the resources and skills to implement an effective integrated pest management program.

Skilled staff are required to provide technical representation of the nursery industry on key national strategic bodies to ensure that evidence based scientific and technical information is available, including biosecurity, market access, water and energy security, domestic and international trade.

The industry must ensure that industry remains a recognised national leader and an effective and knowledgeable representative of industry within the national plant health system which will ensure that the industry has the ability to meet its obligations under the Emergency Plant Pest Response Deed (EPPRD) and PlantPlan.

It is recognised that any future project must deliver against the Nursery Strategic Investment Plan, specifically; Outcome 3 – *Improved industry protection from exotic, emerging and endemic pests and diseases* and Outcome 4 – *Improved productivity, profitability, and professionalism through the creation of opportunities through innovation and adoption of industry best management practices.*

Intellectual property, commercialisation and confidentiality

No project IP, project outputs, commercialisation or confidentiality issues to report over and above agreed arrangements.

Acknowledgements

This final project report acknowledges the efforts of John McDonald (National Biosecurity Manager) in both developing, managing and delivering the NY15004 Project and his drive to continually improve the preparedness and profitability of nursery industry levy investors.

It also acknowledges all of the hard work of project staff and external contractors that have contributed to its success since initiation.

It acknowledges the current project team including Grant Telford, Steve Blyth, Celeste Cook, Emma De Landre and Kimberley Thomas who have contributed to and seen this project through to completion. A special acknowledgement is also given to Chris O'Conner who has played a major role in delivery of project outcomes through the life of the project.

Appendices

Appendix 1. Commercialisation Plan

Appendix 2. Monitoring and Evaluation Report

Appendix 1. Commercialisation Plan

Australian Plant Production Standard Commercialisation Project 2020

Prepared for

Greenlife Industry Australia

by

IMPACT INNOVATION

www.impactinnovation.com

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CONTENTS

Executive Summary

This report presents the findings from a commercial 'health check' assessment of the Australian Plant Production Standard (APPS). The context of the assessment was to determine a commercial delivery strategy for APPS. The APPS had never been assessed before, but the component programs have each been evaluated independently as part of the normal funding review processes since 1995.

This report focuses on the assessment of the APPS as the overarching framework binding the Australian nursery industry's Best Management Practice (BMP) program according to the national Nursery Industry Accreditation Scheme Australia (NIASA); Environmental and Natural Resource Management – EcoHort; and Plant Protection/Biosecurity Programs (BioSecure HACCP) into a ***cohesive interlocked support system*** for production nurseries, greenlife markets and growing media manufacturers.

Greenlife Industry Australia (GIA) engaged Impact Innovation Group to develop options for the commercial development of the APPS. Impact Innovation is a specialist innovation and commercialisation consulting firm operating across the Asia Pacific region. It drew on extensive sector experience and applied bespoke commercial tools to fulfil the objectives this project.

The commercial options outlined in this report provide GIA with a robust approach for the commercial development and delivery of the APPS, including the skills and mindset required for success. The roadmaps presented have been designed be undertaken concurrently at the start. Insights revealed during the execution of recommended activities will inform future decisions and help navigate towards the optimum commercial model for the APPS and GIA.

APPROACH

The assessment took a mixed-methods approach, with a focus on the following evaluation principles which clearly define:

- **Program effectiveness** - achievement of outcomes consistent with objectives
- **Technical efficiency** - achievement of outputs relative to inputs
- **Cost-effectiveness** - achievement of outcomes relative to inputs (value for money).

The nature of the APPS as a cohesive, interlocked support system for production businesses and its history as a series of externally funded projects required a mixed method approach for its evaluation. We split this Stage 1 assessment into two parts:

1. **Summative**[1] review of the past four years of operation (2017–2020) with the purpose of learning lessons.
2. **Formative**[2], taking a more forward-leaning and predictive perspective on what is required to make the APPS a *commercial ready* service system. The focus of this work was biased toward effectiveness as a system and less focused on efficiency because the system is still only in its formative stage.

[1] **Summative evaluation** determines the extent to which anticipated outcomes are produced for participants.
[2] **Formative evaluation** is generally any evaluation that takes place before or during a project's implementation, with the aim of improving the project's design and performance.

An evaluation approach grounded in systems thinking was necessary because the APPS is a voluntary suite of three programs designed to be a cohesive interlocked support system for production businesses. Each program is intended to mutually reinforce the ability of accredited businesses to contribute to the common industry goal of nursery production best practice, maintaining market access and the social licence to operate.

What does this mean for the APPS? (implications for the future)

MAJOR FINDINGS

1. Technical and Operational efficiency

Sufficient evidence supports the claim that NIASA-accredited businesses are better off when based on the BEFORE and AFTER comparison of established industry parameters.

A minimum economy-of-scale threshold could be associated with gaining sufficient return on investment from accreditation, particularly for BioSecure *HACCP*.

The level of grower-perceived self-efficacy is high. Evidence exists to suggest that this may contribute to the low levels of accreditation adoption currently observed.

Perceptions of the value of accreditation are mixed, depending on the position within the supply chain.

Third party auditors and technical advisors and other supports (e.g. manual, website) for the APPS are effective.

There is evidence that nursery operators feel less anxious about biosecurity risk once management plans are in place.

A review of the Standard Operating Procedures (SOP) for the APPS Service Delivery Process identified that in the event of a review or reworking of a step being required, the responsibility for resolution would most likely fall to the APPS National Administrator and this could occur at any time. This has the potential for significant overload on this pivotal role.

The Audit Management System (AMS), a web-based platform, is one of the four critical components that make up the APPS. The AMS also facilitates a number of "business critical" feedback loops upon which all system stakeholders are dependent for successful engagement with the APPS. These stakeholders include accredited production businesses, approved auditors, GIA for efficient management of the audit process, and government biosecurity agencies.

There are two steps in the APPS Service Delivery Process June 2020 SOP where efficiency could be improved. Firstly, by considering how to redesign the information sharing; and secondly, by reviewing the decision-making process between the APPS National Administrator and the GIA Financial and Administration roles.

The processes for financial and administration support of the APPS from GIA will need to be reviewed and improved when considering any options for commercialisation of the APPS in future.

2. Cost effectiveness

The individual program outcomes (both intended and unintended) represent value for money for the cost to businesses accredited for NIASA and EcoHort. However, the evidence is not yet clear on the cost/benefit of Biosecure HACCP, noting that "cost" to the businesses includes the investment required to upgrade infrastructure, fees for accreditation, and annual audit costs.

A proportion of GIA CEO salary and finance/administration support costs are allocated to the APPS P&L and taken up from the annual accreditation fees charged to APPS production businesses. The APPS receives direct and indirect contributions from NY15004 National Nursery Industry Biosecurity Program by default because Biosecure HACCP is a component part of the APPS.

The program outcomes (both intended and unintended) are dependent on the use of in-kind contribution from GIA staff, which is congruent with GIA objectives. It is also critical to recognise the important place that the APPS holds within the inaugural GIA strategic plan 2020 – 2023. The associated Key Performance Indicator (KPI) and target for 2023 is that the APPS covers 80 percent of Australia's nursery production volume.

The program outcomes (both intended and unintended) could not be achieved without the in-kind contribution from GIA staff, particularly the current National Biosecurity Manager. The outcomes also depend on the contributions of the GIA CEO and GIA administrative/financial staff. However, neither are sufficient on their own. There will be a need for GIA to ensure that the APPS is sufficiently well resourced to enable the associated KPI and target for 2023 to be achieved.

Future adoption of the APPS accreditation and effective governance oversight depend on the current industry policies and incentives that are in place to support the APPS. To this end, the GIA Board and the National Governance Committee (NGC) provide the governance infrastructure for the program. The NGC has supported and facilitated the attainment of "legal status" by the APPS within NSW and Queensland legislation.

Evidence suggests that there is limited additional industry awareness, use of resources or supports for ensuring biosecurity compared to the old state-based legislative system (pre-2000). A trade-off that the APPS leadership needs to consider is between an unmet need for a degree of flexibility for producers to negotiate or tailor the requirements to ensure relevance and feasibility of the practices for the business, and working closely with government to overcome regulatory barriers.

The APPS has provided better support and improved competency of production nurseries to operate on their own, and/or seek access to advice from private providers of expertise and services. Since 2017, GIA has organised or scheduled all official program audits and assigned auditors to each specific business whilst maintaining the database of approved auditors and approved technical advisers.

3. Program effectiveness

The GIA strategic plan suggests that the industry sees the APPS as being critical to ensure that the industry is prepared for and informed about biosecurity and maintaining its social licence to operate. It is seen as incorporating environment, plant protection/biosecurity (including traceability and use of Property Identification Codes) and best management practices that will be the basis upon which governments, developers and other specifiers decide to use only accredited suppliers.

The GIA strategic plan suggests that there are high levels of leadership, readiness and learning regarding biosecurity within individual businesses and across the industry. The greenlife industry has arrived at identifying the APPS as being a critical piece of industry infrastructure to address critical areas that the industry requires supporting, including production nurseries being more resilient due to the emerging risks of increasing plant biosecurity threats, climate change, markets, technology and supply chain pressures and influences.

The APPS has contributed to equity and fairness regarding biosecurity compliance and individual responsibility for maintaining biosecurity within a supply chain context, but only to a very limited extent to date. Work is needed to address the quite negative grower perception of "shared responsibility", with growers perceiving that responsibility for biosecurity has simply been shifted from government to industry rather than shared in an equitable way.

Adoption varies significantly on a state-by-state basis. The synergy between the accreditation of NIASA and EcoHort appears to be much greater than between NIASA and Biosecure HACCP. Indeed, in both Victoria and Western Australia a significant number of "low hanging" fruit in terms of businesses appear to be ready to achieve additional EcoHort certification.

The AMS will form a critical platform for the future efficiencies in a fully funded APPS. It will need to be an external to GIA's stable of websites, to allow for unimpeded access, business critical operation and further development.

No specific SOPs tie the APPS component programs to form part of an operations manual for the APPS.

What should be considered regarding commercialisation of the APPS?

COMMERCIAL OPTIONS

Option #1: ***Continue the APPS in its current state***

Feedback from GIA has confirmed that an income of approximately $230,000 per year is a reliable baseline assumption for revenue for a standalone APPS program in the future. However, the assessment's analysis suggests that this amount equates to a "bare bones" minimum cost for servicing existing businesses (approximately 160) who are already accredited.

Limited resources are available in the forecast P&L for any of the following growth-oriented activities, as suggested in the SWOT analysis of the APPS in its current state:

- Expanding scope and targeting supply chains with information dissemination and marketing at a national scale.
- Reviewing, refining, and updating APPS content through research, innovation, and new technology to support growers.
- National expansion to address APPS sub-programs for other nursery stock
- National expansion of BioSecure HACCP into other sectors of horticulture.

At best, an income of approximately $230,000 per year would maintain the status quo. Without income from additional sources the APPS could head into decline, with its relevance diminished in the future to the broader industry and even to the existing businesses that are currently accredited approximately 160).

Option #2: ***Close/exit (let the enterprises do their own QA)***

A critical question to be addressed when considering this option would be to understand "When is it the right time for GIA to exit?"

It is clear from the analysis that considerable emphasis has been placed on adopting the APPS as a core pillar of the GIA Strategic Plan 2020 – 2023, which also includes supporting the nursery industry biosecurity program. GIA has advocated on behalf of the industry with state biosecurity agencies to see BioSecure *HACCP* adopted as complementary to existing regulatory mechanisms for businesses to gain and maintain market access between jurisdictions.

Adopting the APPS seems to have been a negotiated condition of "shared responsibility" arrangements between the industry and various jurisdictions, with the NGC's governance oversight. In addition, the APPS represents the body of knowledge that has been accumulated over 25 years of member, industry, and levy-funded R&D expenditure, for which GIA owns the intellectual property (IP) rights.

A similarly critical question would be to understand "What conditions would have to exist for GIA's closure/exit of the APPS to be acceptable from the perspective of APPS participants, members and levy payers?"

Option #3: ***Sell the APPS in part or whole***

A positive insight is that the IP audit conducted as part of this project has confirmed GIA (formerly NGIA) as the owner of all related trademarks, domain names, social media accounts and copyright associated with the APPS.

However, what has not been sighted is documentary evidence that the rights from the software developers of the NAP, now AMS, have been assigned to GIA. It is this software platform that is potentially the single most valuable component part of the APPS. It seems that the AMS is a critical enabling infrastructure for the practical implementation of Biosecure *HACCP* by production nurseries seeking to become certified in future.

This is primarily due to the capacity that the AMS provides for biosecurity agencies with online access to the records of individual business to verify electronic biosecurity certificates (eCertificate). This means they can track the movement of product consignments in real-time.

It is worth recognising the emergence of "Regtech" as a category of digital startups that serve the identified business needs. "Regtech", also known as regulatory technology, consists of a group of companies that use cloud computing technology through software-as-a-service (SaaS) to help businesses comply with regulations efficiently and less expensively.

It seems that the APPS could be sold as a whole. Yet, the single most valuable component part of the APPS is likely to be the AMS platform. This is because it claims to enable effective implementation of Biosecure *HACCP* in order to achieve regulatory compliance. It also enables the capture of business efficiency benefits arising from the capability to implement the following practices: in-field data capture on mobile devices; automated data sharing to key staff; data basing of growers' information; interrogation and reporting for trending analysis; and business performance monitoring by growers.

Option #4: Licence/outsource

The assessment assumed that GIA would consider under this arrangement to provide for an exclusive or non-exclusive licence of its existing rights to trademarks, domain names, social media accounts and copyright associated with the APPS. It is also assumed that GIA would target potential licensees who are existing providers of auditing services in horticulture, agriculture, and food.

If this is the case, and if the production nurseries which are already accredited are as price sensitive as they seem to be to that cost of audits, then it is unlikely that GIA would be able to charge more than a nominal licence fee to a licensee.

If guided by the audit costs typically charged in other agribusiness sectors, then GIA may have to provide a subsidy for the licensed audit services provider to take up the licence. This is particularly significant if the licence is non-exclusive, especially if it is based on the current practice whereby full recovery of direct travel costs for more remotely located business continues to be cross-subsidised such that no single accredited site pays any more than any other for travel costs.

Furthermore, it is unlikely that specialist audit service providers would not want to adopt the AMS as their audit management system. This is because it seems to be proprietary software that is a bespoke development that supports the efficient auditing of the APPS. Therefore, it is not likely to be compatible with other audit management information systems that are commonly in use across the sector.

Finally, if GIA successfully licensed the APPS to a third-party auditing services provider, the role and terms of reference for the NGC would need to be reconsidered in this context. The absence of AMS may also impact on the willingness of biosecurity agencies to continue to permit accredited nurseries to meet interstate market access requirements and continue self-certification of consignments.

SUGGESTED COMMERCIALISATION APPROACH

Given the review and summary above, Impact Innovation suggests a two-phase approach to commercialising the APPS:

1. Address priority recommendations for the existing operating model, with a focus on building revenue and cash flow and building a stronger user base.
2. Then transition towards a stand-alone operating entity by completing recommendations and building new service and product offerings that seek external revenue from allied industry suppliers and partnerships.

Following this approach increases commercial options for the APPS in the future. Given sufficient resources, Stage 1 could be expected to take 6-12 months. To guide execution of this approach, we provide three Strategic Roadmaps below that outline the tactical activities.

Impact Innovation recommends that GIA proceed to implement all three concurrently and then reallocate resources to the most promising option(s) as critical assumptions about the commercial viability of each are revealed over time.

The assessment used Impact Innovation's Commercialisation Navigator™ to prioritise tactical activities in the three strategic roadmaps below. The information from Stages I and II of this review informed the decision-making.

Prioritised mapping of the top 10 recommendations from Stage #1 against the Commercialisation Navigator framework	
Commercialisation Navigator Question	**Now what? Immediate actions in next 12 months to inform decision making**
What is the problem? Is it well defined?	**R1:** Explore a simple way for these benefits to be modelled for non-accredited businesses (A good example was shown in ref_014)
Are adoption costs too high? (not enough perceived value)	**R8:** Segment the sites within production nursery sector by capacity to invest in infrastructure (both physical and IT) (e.g. median $ spend/year) and target sites for accreditation that exceed the threshold for minimum necessary investment (Good source of industry data can be found in ref_022, but it does not breakdown to an analysis at the level of an individual enterprise.)
Any IP management issues?	**R11:** It will be important for GIA to ensure it has a risk management plan in place for APPS operations. Current and future success depends heavily on key GIA staff members and contributions from external third-party resources. Consideration is needed of succession planning for these critical roles as part of the commercialisation road map.
Any regulatory and/or legal hurdles?	**R12:** The NGC should be maintained and resourced as a critical piece of governance infrastructure for the APPS in future, but with a review of its terms of reference and membership.
Was the right proof of concept (POC) data collected (key assumptions tested)?	**R23:** Review the adoption data to understand the reasons for adoption variations on a state-by-state basis and also variations in adoption intensity in each state. In both Vic and WA there appears to be a significant number of "low hanging" fruit in terms of businesses that could readily achieve additional EcoHort certification.
What's the product/service business scalability?	**R24:** GIA needs to plan for operating AMS as a stand-alone platform. For now, we assume that GIA owns AMS with no encumbrance. **R25:** GIA staff to build the operations manual.
Are internal or investor resources (incl funding) mobilised?	**R9:** GIA reports with relative certainty that there is a reliable revenue base line of $230,000 per year. However, the APPS also receives direct and indirect contributions from NY15004 National Nursery Industry Biosecurity Program by default because Biosecure *HACCP* is a component part of the APPS. The revenue must increase above this baseline to at least cover the value of the contribution by NY15004, a minimum of $210,000 per year.

Is there regular reporting to the board/advisory board/executive leadership team (governance structures)?	**R10:** The future success of the APPS will make a critical contribution to the GIA's strategic objectives. Therefore, greater financial transparency of the APPS operations as a whole will need to be provided to the GIA board as part of the future commercialisation road map for the APPS.
What's the optimum sales and marketing approach?	**R14:** To achieve adoption to the levels desired in the GIA strategic plan, the APPS needs to find the right balance between grower effort and regulatory outcome desired by biosecurity agencies. One way to consider this is a graduated or stepped process for businesses to achieve certain accreditations under the APPS.

Commercial Skills and Mindset

Our review identified strength in APPS technical processes. Sufficient skills exist within the program to undertake auditing and certification, including developing APPS content and associated management practice systems. However, the skills required to take the APPS to a standalone entity had not yet been mobilised. We recommend a suite of new skills be added to the APPS team to help navigate the program as it transitions to a standalone commercial entity.

As the customer base for funding the APPS shifts further away from industry-led funding (via a levy mechanism) towards being wholly funded from a customer subscriber-base, including nurseries or other industries, the commercial viability of the APPS will depend on whether value can be delivered to these new customers. Design-led and lean innovation approaches can be used to systematically adjust the business model, via testing and iteration, for maximum value delivery to these customers.

Subsequently, as the program grows and transitions to a standalone entity, dedicated resources and skillsets should be included in the operating team. These include general management, marketing and communications, and innovation. As FTE roles are unlikely to be required during transition, these resources could be outsourced initially. The skills would provide a commercial focus to balance the strong technical skill sets that currently exist.

Strategic Roadmaps

Three Strategic Road Maps provide specific guidance on how to action our recommendations. The Maps are designed to guide targeted and actionable activities, linked to the recommendations. It is important to note that the tactical activities suggested below are examples of how to validate assumptions and iterate the commercial development process. Often there are multiple ways to execute a strategy, which should be considered based on the resources available.

Strategic Roadmap #1: *Customer engagement activities and a system for ongoing customer insights*

Goal: *Attract new businesses to the APPS and upsell programs to existing businesses with improved understanding of the current commercial value proposition to existing participants.*

Key tactical activities:

1. Improve the understanding of the explicit value the APPS delivers to the business models of nursery businesses currently engaged.
2. Review and validate insights to re-position the APPS.

3. Ensure the right skillsets are acquired to deliver this strategy effectively.
4. Prepare information and processes to validate and underpin existing and all future new revenue options, creating continuous customer insights.

Strategic Roadmap #2: *Expand program access and utility using AMS.*

Goal: *Engage more nurseries in the APPS, focussing on value from 1) improved productivity and 2) market access with Biosecure HACCP. Structure access to tools and units and experts as fee-for-service model.*

Key tactical activities:

1. Design a model to deliver productivity improvement and biosecurity services via AMS.
2. Undertake focused customer assessment and testing of the new approach.
3. Based on feedback and insights, review and adjust the AMS to be used as a data-driven performance improvement vehicle and an audit management system.
4. Package a small number of "products" or features to engage nurseries who want to improve their operating performance.
5. Offer self-service use of AMS for BMP and data management. Include certification as a feature that can be adopted at a later date as required (with an appropriate fee-based service).
6. Develop and offer a range of fee-based assistance options (explore options for a subscription type service that includes a virtual "QA manager" to undertake all certification activities).
7. Ensure the AMS system can provide value that links to other business systems that nurseries use, e.g. stock and customer management systems.
8. Test with a small group of target nurseries (identify targets from activities in Strategy Roadmap 1). Assess the costs of delivery and the level of engagement of these targeted nurseries.
9. Refine the approach based on information and insights from the user group.
10. If the proof-of-concept data indicate a profitable option, then broaden promotions and scale the new approach.

Strategic Roadmap #3: Expand the use of the APPS systems and content for other horticulture industries.

Goal: *Increase the number of customers and revenue from other horticultural industries that use the APPS system and content.*

Key tactical activities:

1. Undertake targeted surveys of potential new customers to understand the underlying problems facing potential and actual customers.
2. Select the target industry group with the greatest alignment between their potential needs and existing needs and assess the adoption costs for the new offer compared to other ways potential customers may access the same type of service.

3. Consider the regulatory or legal implications of the new offer to industries using the APPS.
4. Identify and recruit into the project sufficient resources, with skills across marketing, business model design, technical proficiency to undertake this strategy effectively.
5. Design a small, entry level APPS for "X" service package.
6. Undertake a limited release of the APPS for "X" and ensure that sufficient data is collected during a trial period (6-12 months).
7. Scale or improve the offer to the target industry group.
8. Repeat the process for a new industry target.

Appendix 2. Monitoring and Evaluation Report

M&E – National Nursery Industry Biosecurity Program (NY15004)

Final Survey Report

13 July 2020

ABN 41 107 715 364
Michael Clarke
Duncan Farquhar
Meredith Kirton
P: (02) 9817 5888
M: 043 88 44 024
E: clarke@AgEconPlus.com.au
W: www.AgEconPlus.com.au

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Abbreviations

EPPRD	Emergency Plant Pest Response Deed
FMS	Farm Management System
GIA	Greenlife Industry Australia
HACCP	Hazard Analysis and Critical Control Points
ID	Identification
IPM	Integrated Pest Management
IPPS	International Plant Propagators Society
M&E	Monitoring and Evaluation
NGIQ	Nursery and Garden Industry Queensland
NIASA	Nursery Industry Accreditation Scheme Australia
NNIBP	National Nursery Industry Biosecurity Program
NNN	National Nursery News
NP	Nursery Papers
NSW	New South Wales
NT	Northern Territory
QLD	Queensland
R&D	Research and Development
SA	South Australia
VIC	Victoria
WA	Western Australia
WP	Work Program
YLAW	Your Levy at Work

Executive Summary

The purpose of this survey, completed as part of the monitoring and evaluation component of the National Nursery Industry Biosecurity Program (NNIBP), was to investigate:

- Production nursery preparedness, awareness, and adoption of biosecurity initiatives.
- Communication reach, satisfaction, and improvement opportunities.
- Research awareness and future directions for investing in technical support.
- Policy priorities for the nursery industry.
- Conclusions on project benefit to industry and the impact of R&D investment.

Forty surveys were completed, this sample included twenty production nurseries that had previously expressed interest in achieving BioSecure HACCP certification and a further twenty nurseries that had no prior experience with biosecurity certification.

NNIBP preparedness, awareness, and adoption

Twenty nine of forty respondents (73%) indicated they were aware of the NNIBP. On average, 50% of those surveyed were aware of all four NNIBP work programs (On-farm biosecurity, Biosecurity preparedness, Biosecurity awareness and Minor use pesticides). Nursery businesses were most likely to be familiar with biosecurity preparedness and biosecurity extension activities. Low levels of use/awareness were recorded for case study extension videos. Lowest levels of awareness were associated with the coordination and communication components of securing minor use chemical permits.

Some 85% of surveyed businesses were familiar with BioSecure HACCP and understand its purpose. Businesses prefer to be updated on BioSecure HACCP via email. Unprompted, nursery businesses indicated that the cost to their business of BioSecure HACCP, as it is currently structured (e.g. 10 to 20 hours per month), exceeds the perceived benefit of the biosecurity initiative.

Only 45% of surveyed nursery businesses are aware of the Emergency Plant Pest Response Deed (EPPRD) and its purpose. However, more than half those surveyed are aware of specific incursions that triggered the Deed in the last four years. Businesses prefer to be updated on the EPPRD by email.

The Nursery Papers are well regarded by surveyed nursery businesses with around 50% of those contacted aware of key issues addressed in the last four years ("All six issues provide valuable content for our business"). Case studies achieved a lower level of awareness than the Nursery Papers with an average awareness score of just eleven out of forty. The Farm Management System (FMS) website is not in regular use by most surveyed businesses and there would appear to be a need to remind nursery businesses of the website's value ("I will visit now; you have prompted me").

Conference attendance by those surveyed is low (around 25% Garden Industry Australia and 4% International Plant Propagators Society) but those who did attend saw value in the NNIBP investment. The Pest Identification Tool is accessed by 50% those surveyed ("straightforward to use", "Great resource!") and almost as many make use of information generated on minor use chemical permits ("Helps you know you're up to date and good to have on hand").

There appears to be some confusion regarding access to the Biosecurity Manual and its purpose. There is also confusion between Plant Protection/Biosecurity Field Officer visits and the audit program attached to NIASA, EcoHort, and BioSecure HACCP.

Communication reach, satisfaction, and improvement opportunities

Preferred forms of program communication include emails, project officer workshops, technical papers, and site visits by project officers. Nursery businesses are less inclined to engage with trade displays at conference, notification via letter, the nursery production FMS website, and social media.

When nursery businesses were asked about their preferred way to receive technical support in the future, they indicated on-site visits by technical officers. Nursery businesses also stressed the importance of updating contact databases – many complained that they were not receiving GIA correspondence.

Research awareness and future directions for investing in technical support

Low levels of recognition were apparent for twelve of thirteen research and levy funded projects listed in the survey. A single project ("neonicotinoid alternative insecticides") was recognised by more than half of those surveyed.

High priorities for future technical support were identified as irrigation, water recycling, growing structures, pests/diseases/weeds, integrated pest management, production efficiencies and training.

Policy priorities for the nursery industry

Policy priorities for the nursery industry were identified as water access and use, land use/urban encroachment, state government regulation, education and skilling of staff, market power of the retailer, new market development, and market access.

Progress since NNIBP inception

In comparison to baseline (July 2016) and mid-term (May 2018) survey findings, this June 2020 investigation finds an industry much more aware of BioSecure HACCP and the NNIBP – Table E1.

Table E1: Surveyed Business Familiarity with BioSecure HACCP

NY15004 M&E Survey Dates (2016-2020)	Awareness of BioSecure HACCP
Baseline – July 2016	20% - low
Mid-term – May 2018	50% – medium
Final – June 2020	85% - high

Survey conclusions

The survey has shown that the nursery industry values and has benefited from key components of the NNIBP. Components valued by industry are likely to generate a positive overall impact from investment in the NNIBP. These components include biosecurity preparedness and extension activities, the Nursery Papers, the Pest Identification Tool, minor use chemical permits, email updates, project officer led workshops and on-site visits by technical officers.

Introduction

Background to the project

This survey was completed as part of the monitoring and evaluation (M&E) component of the Hort Innovation funded project NY15004: National Nursery Industry Biosecurity Program (NNIBP).

The NNIBP commenced February 2016. Baseline data on nursery industry biosecurity was collected (July 2016) from a 20% sample of 97 production nurseries expressing interest in the NNIBP and achieving BioSecure HACCP certification (AgEconPlus 2016).

A mid-term survey completed in May 2018 measured progress with NNIBP implementation. The same sample of production nurseries contributing baseline data were re-surveyed at the program midpoint. Data from the midpoint survey showed little change in biosecurity practice over the lapsed 26-months. Changes in market access, biosecurity preparedness and biosecurity awareness were expected to be more pronounced as the NNIBP was further rolled out and production nurseries become more familiar with the BioSecure HACCP manual and procedures (AgEconPlus 2018).

This document reports awareness of the NNIBP, communication reach and satisfaction, future directions for investing in technical support, and policy priorities for the nursery industry at the end of the NNIBP in June 2020. Surveying was completed in May and June 2020.

Terms of reference

The terms of reference were to complete a final M&E survey to provide insight into:

- Nursery industry preparedness, awareness, and adoption of biosecurity initiatives.
- The reach and satisfaction of the target audience (levy paying production nurseries) with current communication materials and events.
- Approaches that might be used to improve levy payer engagement with key technical levy-funded activities.
- Project benefit to industry and the impact of R&D investment.

Approach used to deliver the project

The original survey sample of 20 production nurseries interested in achieving BioSecure HACCP certification was expanded to include a further 20 production nurseries that had no prior experience with biosecurity certification i.e. they had not expressed interest in either the NNIBP or achieving BioSecure HACCP certification.

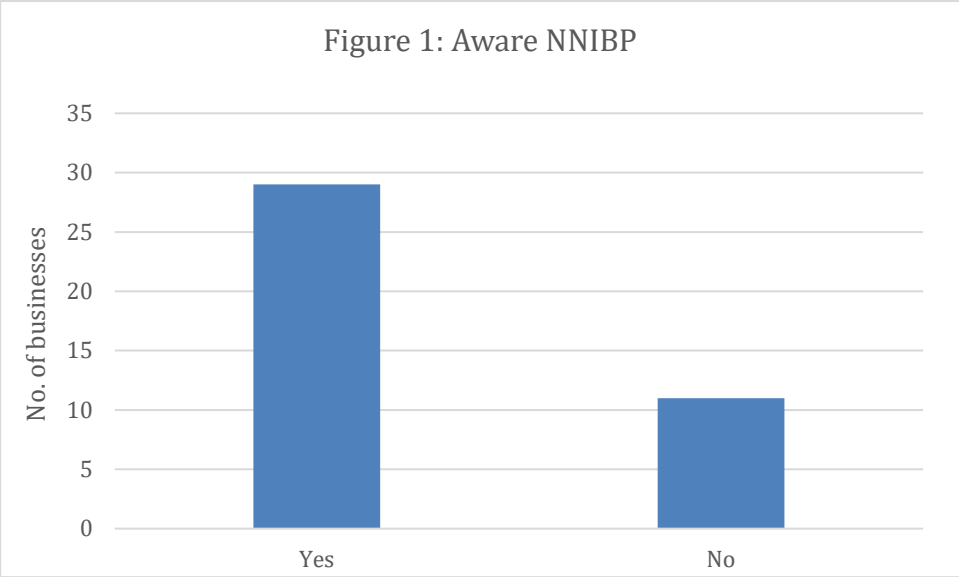
A survey instrument was designed in partnership with the National Biosecurity Manager, GIA (Appendix 1). This survey instrument was more comprehensive than the survey used for baseline and midpoint data collection.

The protocol for survey delivery included:

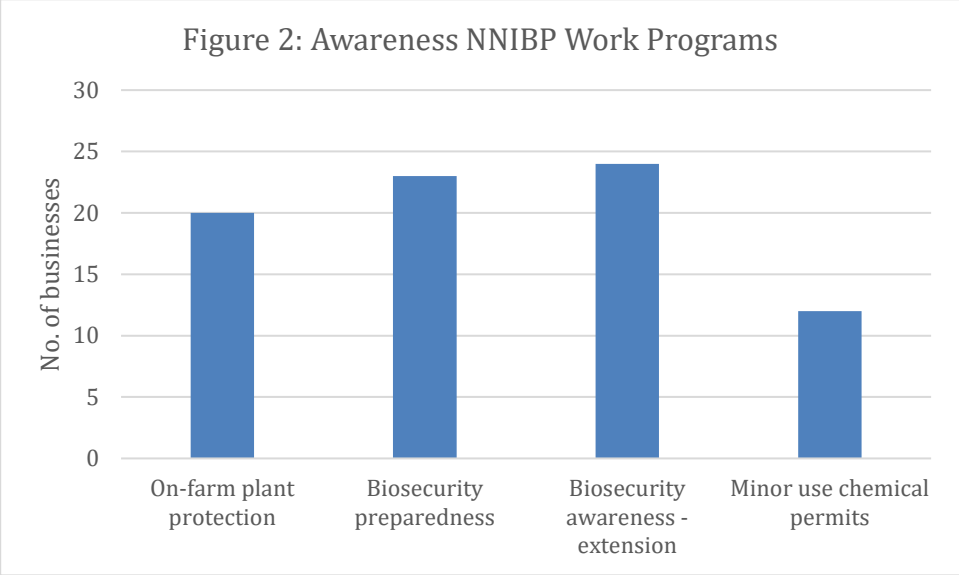
- Telephone contact with production nurseries, provision of a brief explanation of survey purpose and importance, request that the survey instrument be read and considered prior to interview.
- Importance was attached to the provision of considered responses rather than simple 'knee-jerk' reactions to survey questions.
- A request was made for a day and time that would be convenient for a telephone interview to work through the content of the survey with the business owner or manager.
- The survey instrument was emailed to the production nursery summarising what had been agreed and clearly restating the interview day and time.
- A single production nursery from the original survey sample declined an interview and this nursery was substituted with another business.

National Nursery Industry Biosecurity Program - Awareness

Nursery business owners/managers were asked whether they were aware of the levy-funded NNIBP (Figure 1) – 29 of 40 respondents (73%) indicated they were aware of the program. Nine of twenty-one randomly selected nurseries were not aware of NNIBP and disappointingly, two previously surveyed nurseries indicated a lack of awareness.



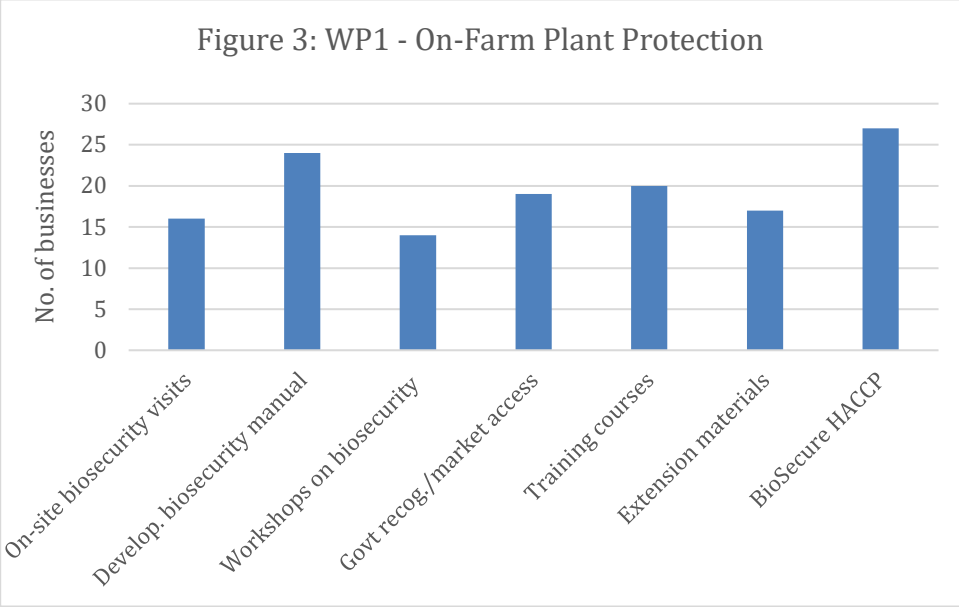
The NNIBP consists of four work programs, nursery businesses were most aware of work program 2 "biosecurity preparedness" and work program 3 "biosecurity awareness- extension, communication and evaluation" – Figure 2.



Nursery businesses were least aware of NNIBP investment in the coordination of activities associated with the securing of minor use chemical permits – work that typically takes place "behind the scenes".

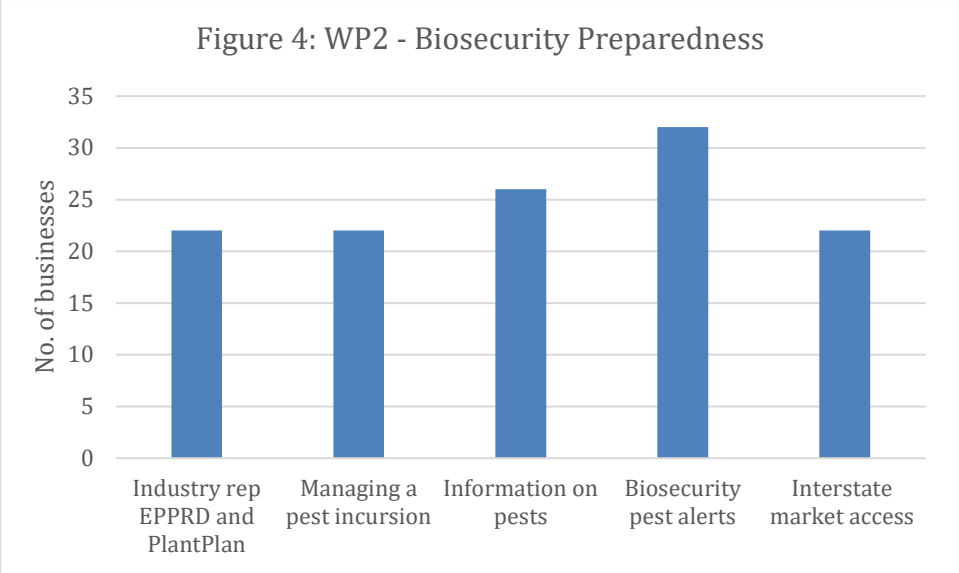
Nursery business awareness of each component of each work program is shown in the following figures.

WP1: On-farm plant protection/biosecurity



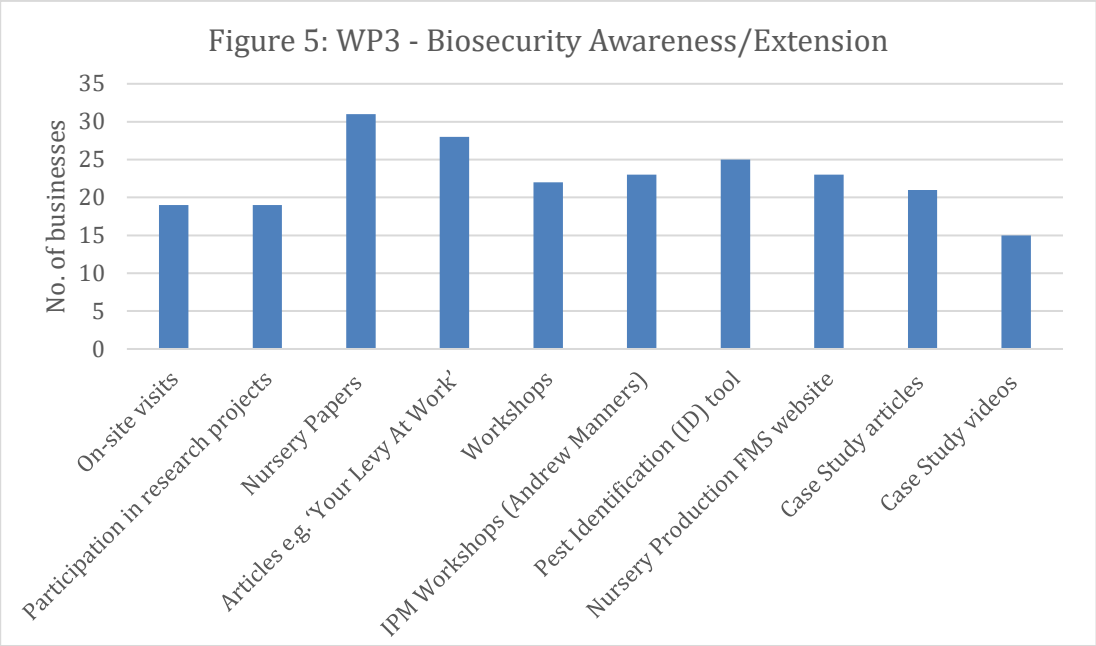
WP1: More than half the businesses surveyed were aware of the program-generated biosecurity manual and BioSecure HACCP. While the program has invested considerable resources in promoting adoption of BioSecure HACCP, positive awareness results are dominated by those who have previously expressed interest in BioSecure HACCP certification.

WP2: Biosecurity preparedness



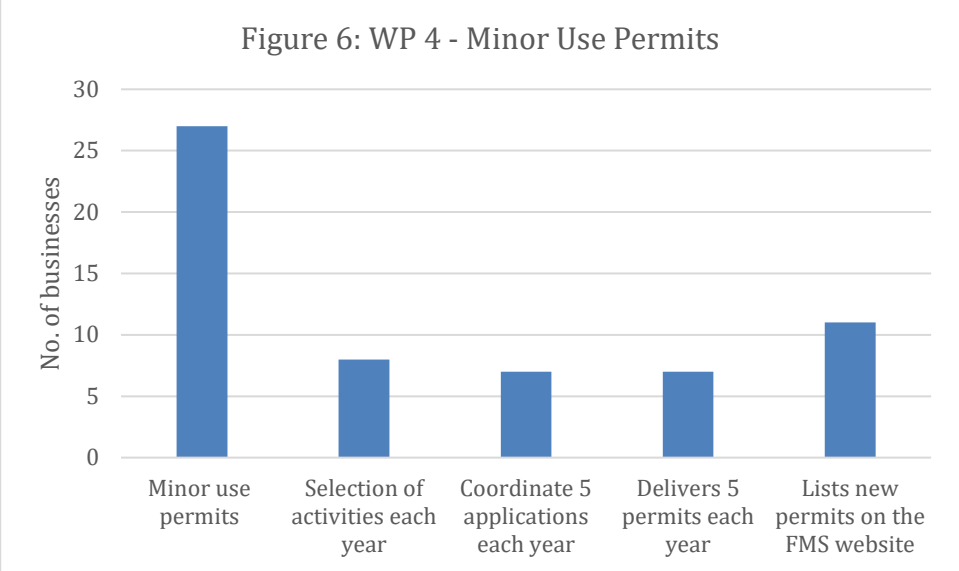
WP2: More than half of all businesses surveyed were aware of all components on WP2 – biosecurity preparedness. Highest recall was associated with biosecurity pest alerts.

WP3: Biosecurity awareness – extension, communication, evaluation



WP3: More than half of all businesses surveyed were aware of seven of ten extension components. On-site visits, participation in research projects and case study videos failed this threshold. Lower awareness/participation in on-site visits and research project participation are likely to be a function of resources available for NY15004 implementation. Case study videos may not be an appropriate extension tool for production nurseries.

WP4: Minor use chemical permits



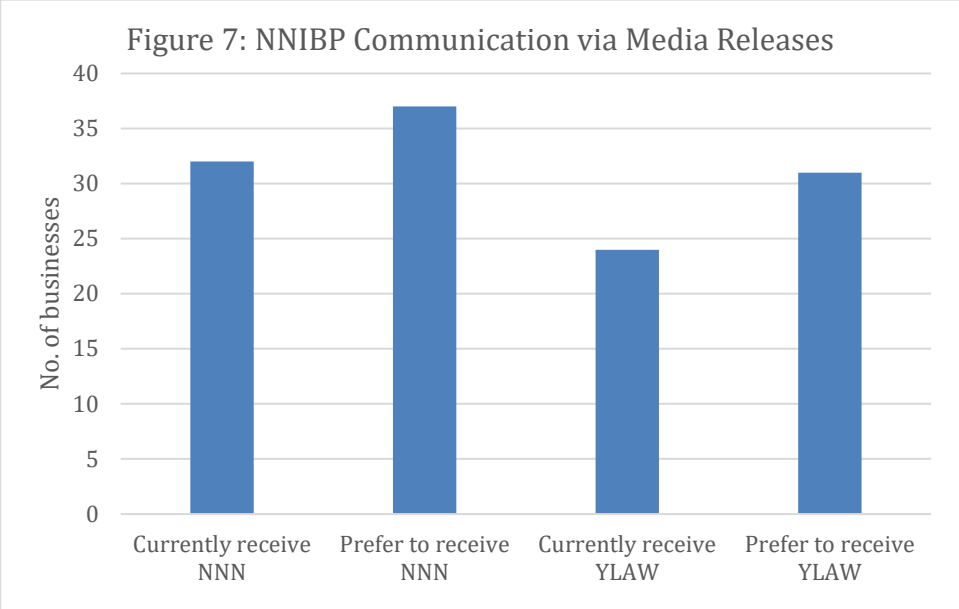
WP4: nursery businesses are aware of the program to secure minor use chemical permits for production chemicals. They are less aware of the coordination and communication components of this work program.

Conclusions on NNIBP awareness

On average, half those surveyed were aware of all four NNIBP work programs. Unsurprisingly, the highest levels of awareness were amongst those nursery businesses that had previously expressed interest in BioSecure HACCP. Nursery businesses were most likely to be aware of biosecurity preparedness and biosecurity extension. Low levels of use/awareness were recorded for case study extension videos. Lowest levels of awareness were associated with the coordination and communication components of securing minor use chemical permits.

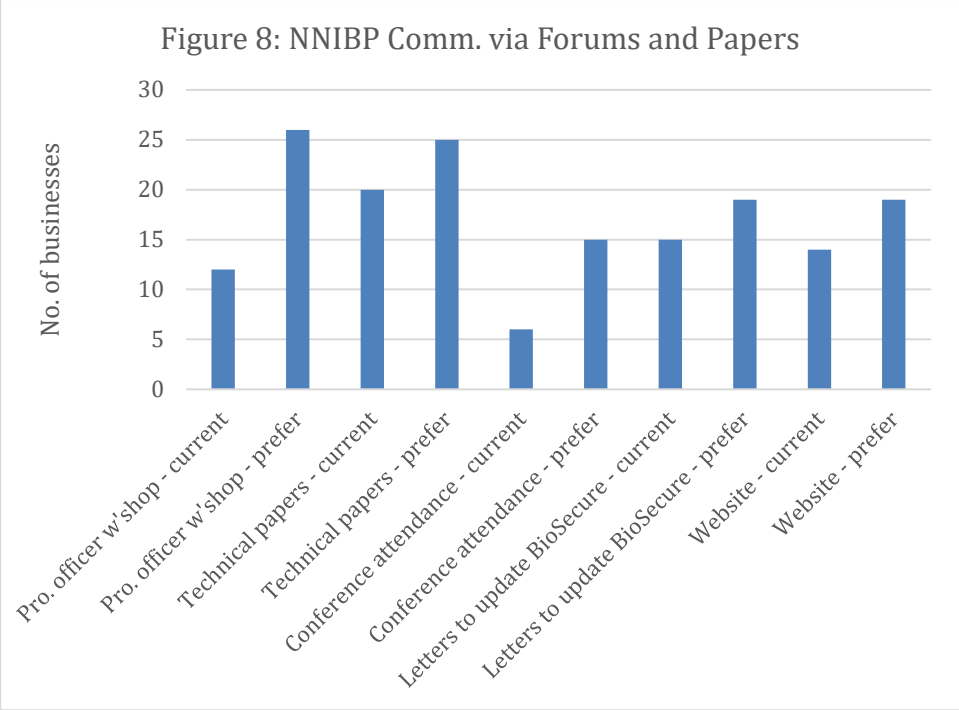
Communication – Reach and Satisfaction

Media releases



NNIBP information is communicated to production nurseries monthly through two emails – National Nursery News (NNN) and Your Levy at Work (YLAW). Monthly emails are being received by production nurseries and there is a preference for their ongoing use.

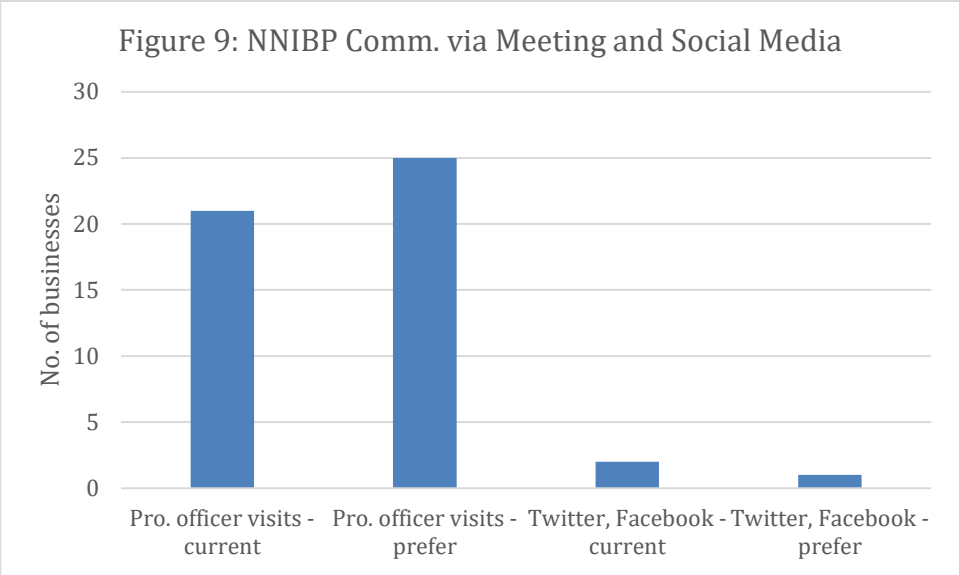
Technical forums and papers



Technical forums and papers include project officers conducting biosecurity workshops, technical papers prepared and distributed by NNIBP, trade displays at conference, an annual distribution of letters to NIASA members updating progress with biosecurity investments such as BioSecure HACCP, and the www.nurseryproductionfms.com.au website.

Half the nursery businesses surveyed indicate they are not receiving information via technical forums and papers. Their preferred channels for communication of technical information is project officer biosecurity workshops and technical papers.

Face-to-face meetings and social media

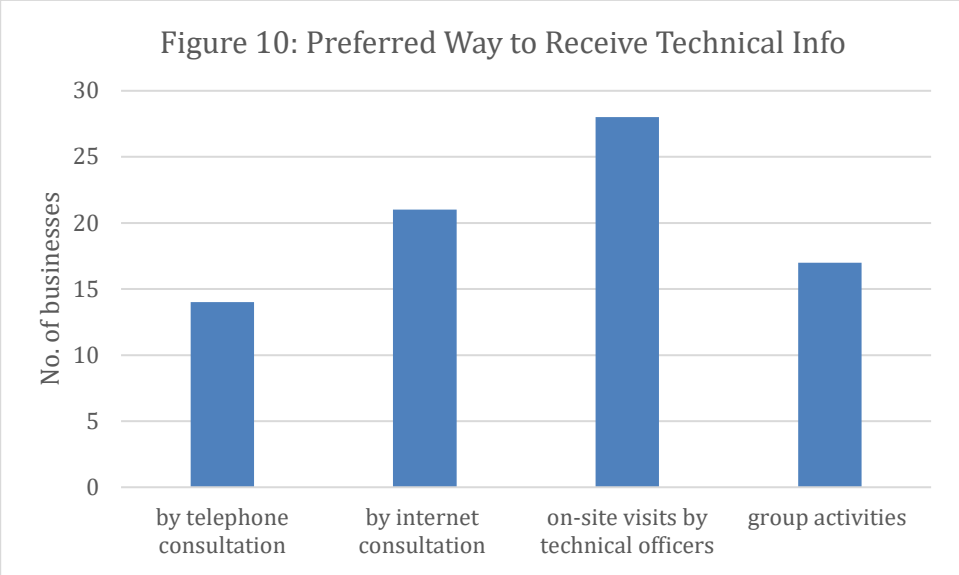


Project plant protection/biosecurity officers visit NIASA businesses as part of the program. Officers include John McDonald and Celeste Cook (QLD), Chris O'Connor (NSW), Tony Filippi (VIC), John

McDonald and Tony Filippi (SA), and Steve Blyth (WA, NT). The project has a presence on social media via Twitter and Facebook.

Surveyed businesses prefer face-to-face meetings with project officers at their nursery. This is an expensive form of communication/extension activity. Nursery businesses are not ready to engage with social media for information on their biosecurity program.

Preferred way to receive technical support



Other suggestions for ways to receive technical support included:

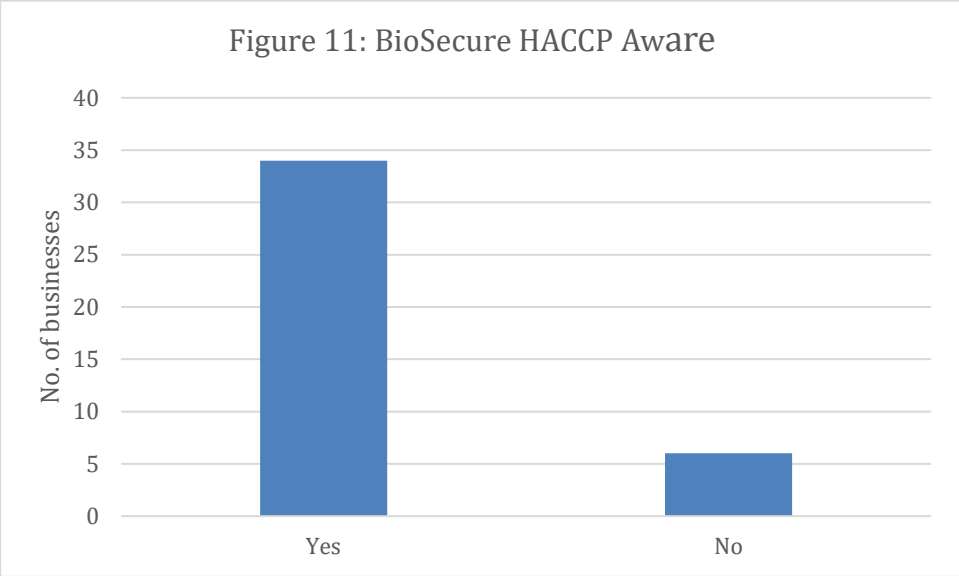
- 1st preference is for in-person contact.
- Preference for on-site visits, followed by internet, followed by group activities.
- Biosecurity training workshops would be great, Boomeroo happy to help by providing a site.
- Farm management system visits are the important conversations. It is more than just an audit.
- Depends on what the information is. PowerPoint then practical works well.
- Workshops are good for general information.
- Hands on style.
- The program is complex, and a simple flow chart might add clarity.
- Zoom and other online systems are the future. Would pay for opportunity to get technical advice over the phone say $50 to show an issue with a phone camera.

Conclusions on communication reach and satisfaction

Preferred forms of program communication include emails, project officer workshops, technical papers, and site visits by project officers. Nursery businesses are less inclined to engage with trade displays at conference, notification via letter, the nursery production FMS website, and social media. Investment is required to update nursery contact email lists; many complained their contact details were not current and they were missing correspondence.

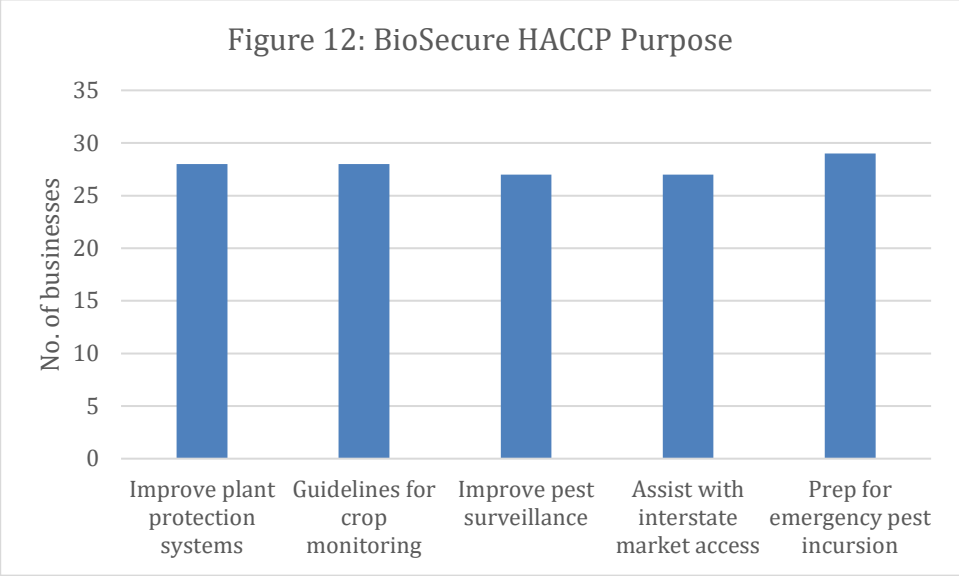
BioSecure HACCP – Purpose and Awareness

Aware of BioSecure HACCP



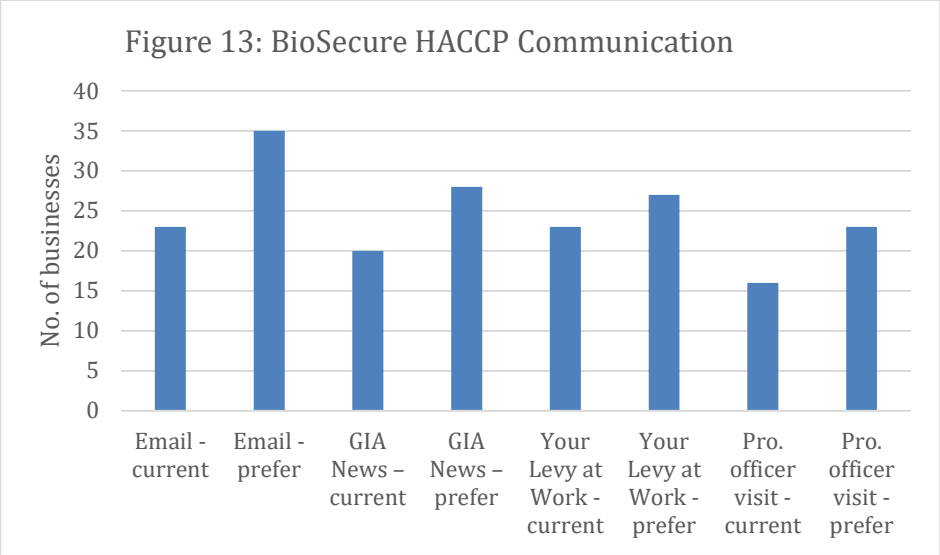
Some 85% of surveyed nursery businesses are aware of BioSecure HACCP. Nursery businesses claiming not to be aware of BioSecure HACCP include five of twenty-one randomly selected nurseries and a single previously surveyed nursery whose ownership/management had changed since the last M&E survey in 2018.

Purpose of BioSecure HACCP



Nursery businesses surveyed had a sound understanding that BioSecure HACCP was addressing plant protection systems, guidelines for crop monitoring, improved pest surveillance, interstate market access and preparedness for an emergency plant pest incursion.

Communication of information on BioSecure HACCP



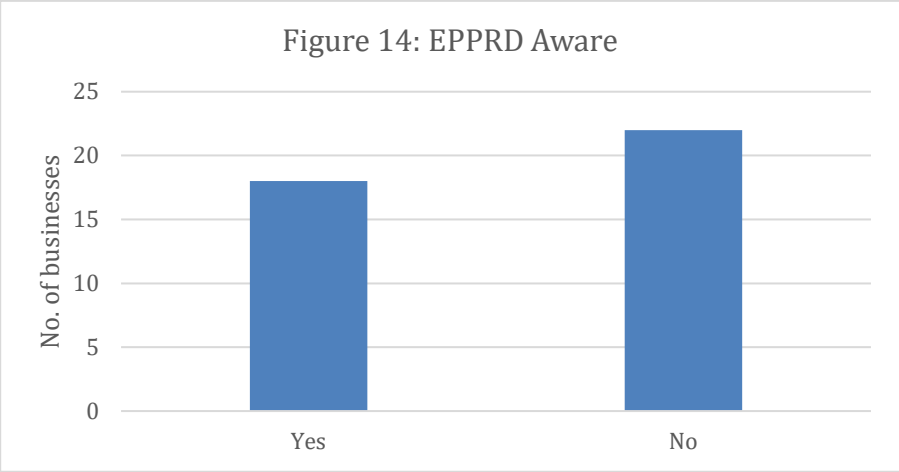
There is a preference for BioSecure HACCP communication to be received via email – both as a dedicated communication and as part of emailed GIA News and the emailed Your Levy at Work newsletter.

Conclusions on BioSecure HACCP

Some 85% of surveyed nursery businesses are aware of BioSecure HACCP and understand its purpose. Businesses prefer to be updated on BioSecure HACCP via email. Unprompted businesses indicated that the cost of BioSecure HACCP in staff time (e.g. 10 to 20 hours per month) exceeded perceived benefits. A number of respondents also suggested engagement with Robert Chin from Bunnings Victoria to drive streamlining and uptake. GIA note that they are already engaged with Robert.

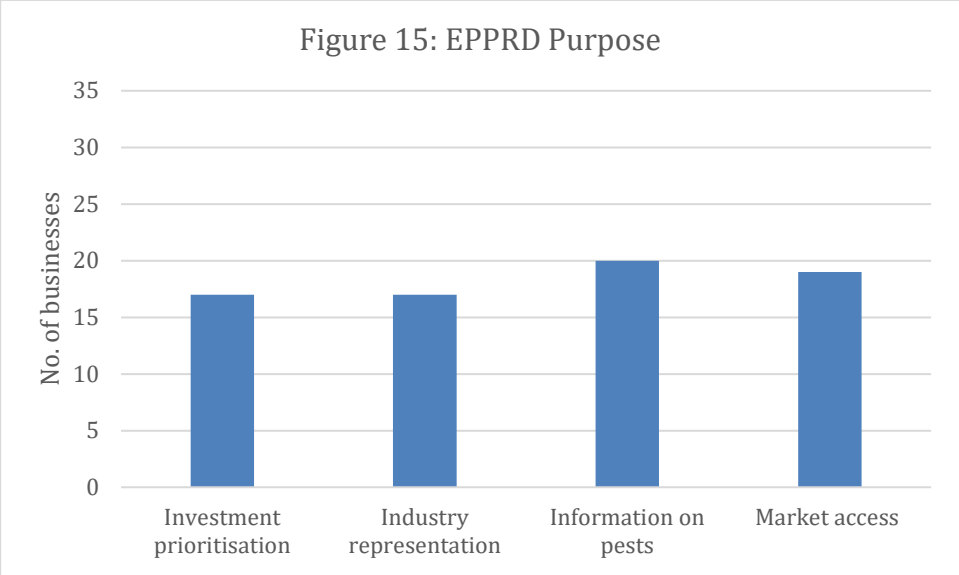
EPPRD – Purpose and Awareness

Aware of the Emergency Plant Pest Response Deed (EPPRD)



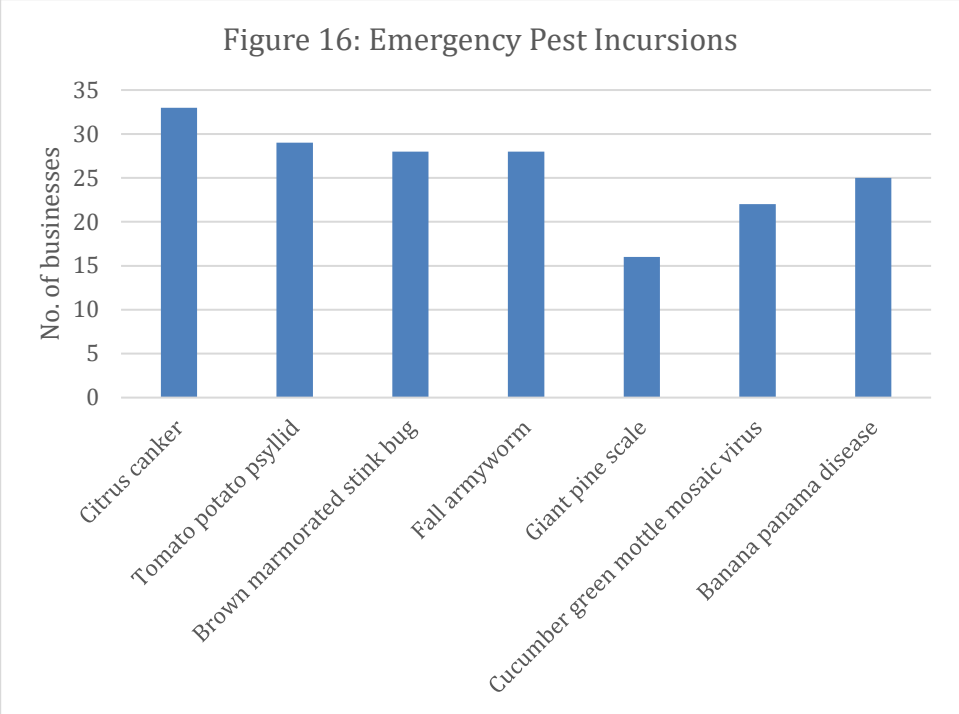
Only 45% of surveyed nursery businesses indicated that they are aware of the Emergency Plant Pest Response Deed.

Purpose of the EPPRD



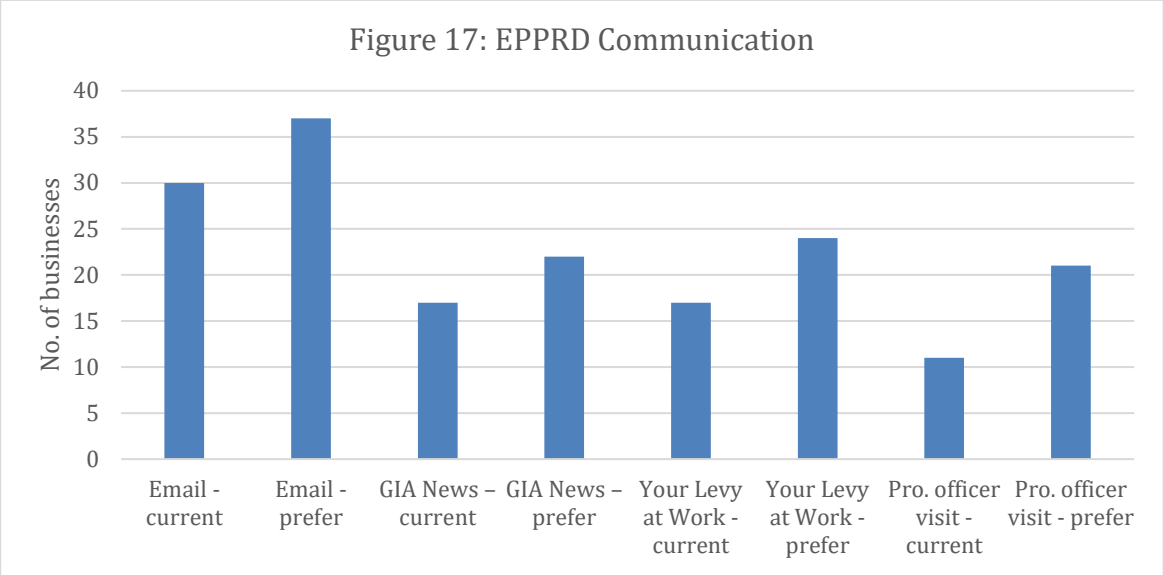
Understanding of EPPRD purpose is consistent with responses received for understanding EPPRD awareness. In most instances less than half respondents were aware of the Deed's role in PlantPlan and EPPRD investment prioritisation, industry representation in response to a pest incursion, distribution of pest information, and maintaining interstate market access.

Awareness of recent pest incursions that triggered the EPPRD



Nursery businesses were provided with a list of seven recent emergency plant pest incursions that triggered the EPPRD in the last four years. All respondents indicated some awareness of these events and all but one event (giant pine scale) was familiar to at least half the surveyed population. One respondent noted the biosecurity risk associated with mail order sales and the need to address this gap.

Communication of information on the EPPRD



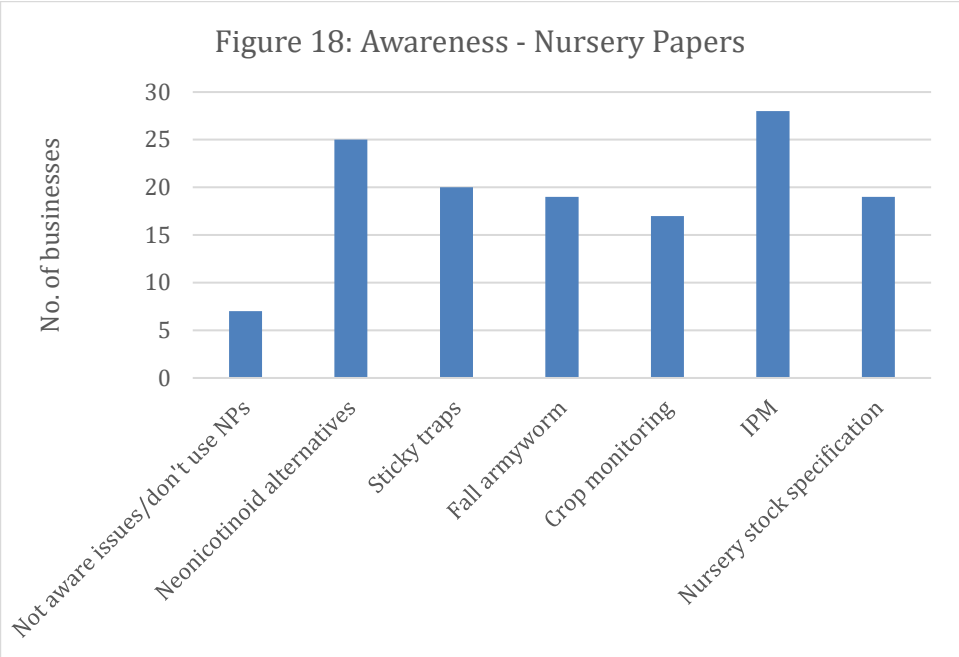
There is a preference for EPPRD communication to be received via email – both as a dedicated communication and as part of emailed GIA News and the emailed Your Levy at Work newsletter.

Conclusions on the EPPRD

Only 45% of surveyed nursery businesses are aware of the EPPRD and its purpose. However, more than half those surveyed are aware of specific incursions that triggered the Deed in the last four years. Businesses prefer to be updated on the EPPRD by email.

NNIBP Outputs

Awareness – Nursery Papers last 4 years

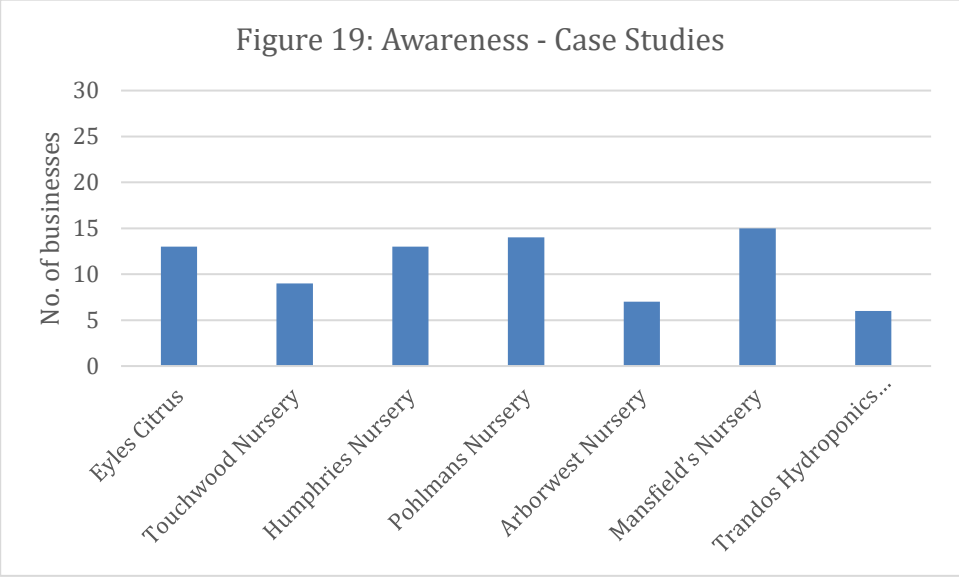


Seven surveyed businesses indicated that they were not aware of any issues addressed or did not make use of NNIBP generated Nursery Papers. Three of these businesses had been previously surveyed after indicating interest in BioSecure HACCP certification. Highest levels of awareness of Nursery Paper content were associated with material related to Integrated Pest Management (IPM) and alternatives to neonicotinoid insecticides. Specific comments received in relation to the Nursery Papers included:

- All six issues provide valuable content for our business.
- Any pest control papers are great.
- We look at all papers to see if relevant. See if they can incorporate trials in IPM if possible.
- Would have liked to see material on these issues but NPs not supplied.
- Neonicotinoids, sticky traps and IPM are going to become bigger issues as we go on.
- Would like to be sent these papers – look useful.
- Aware of those that are relevant to my business.
- Good mix of often relevant topics.
- They are very good. Need to be promoted better via Greenlife Magazine 'Hort Journal'.
- Good to see industry perspective on these topics.
- Usually very well written in sufficient detail. An important resource.
- Pretty well put together. There was a paper on resilience which was not well put together. Could have more detail on managing supply chain for resilience. Insurance evidence of customers lost, for example, would really help practically in a challenge like COVID19.
- All are valuable programs.
- Don't use them a lot because the goal posts change and information changes so I seek information that is up to date. Particularly from suppliers. Other growers experience also provides specific information.
- I find them very valuable, easy to access, current, written by industry people and covering a broad range of topics.

Overall, the Nursery Papers are well regarded by surveyed nursery businesses with around half of all those surveyed aware of key issues addressed.

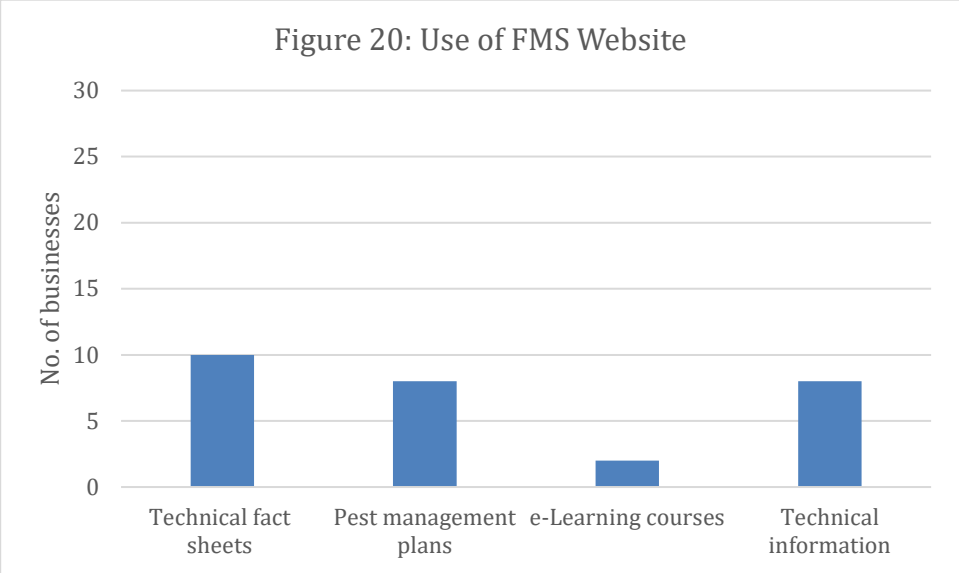
Awareness – case studies published by NNIBP



Case studies achieved a lower level of awareness than nursery papers with an average awareness score of just eleven out of forty. Specific comments in relation to case studies were:

- All of value.
- Pohlmans are one of our biggest clients so would have been great to see their case study.
- Would like to be sent them.
- Generally aware that case studies were done. Will now look at some of these.
- Who is Cox Inall, people don't put 2 and 2 together? Put Hort Innovation on these so people know it is levy money.
- Not aware but will look now.
- Have not read these.
- Supports program and promotes Farm Management System well.
- All good motivational things.
- Very important to get a sense of what others are doing.
- All of value.
- I know these businesses. Will check out the case studies now I know that they are there.
- Watched them once. Good overviews, few specifics.
- find these interesting and home in on relevant ones.

Use of FMS website resources



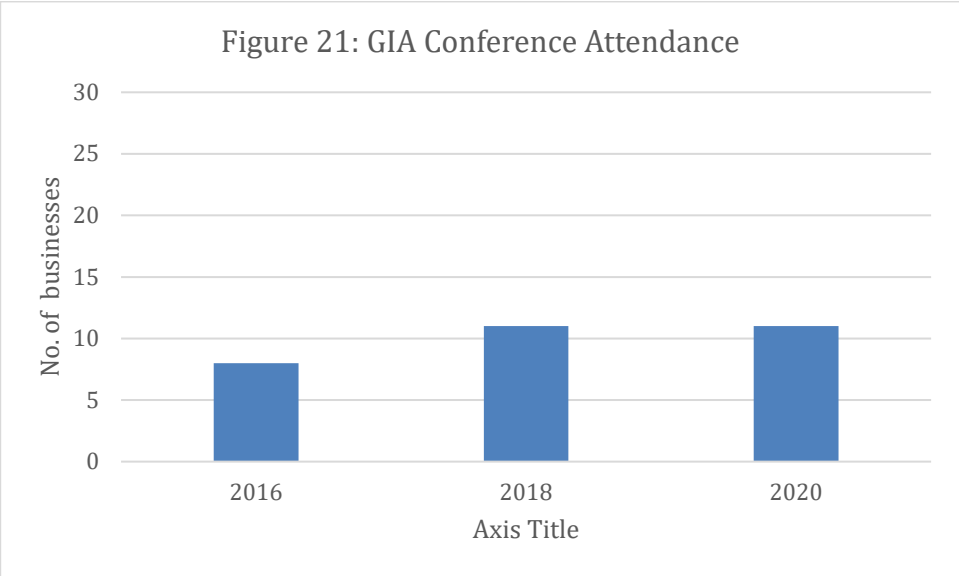
13 of 40 nursery businesses surveyed made use of the FMS website. Most use was made of the technical fact sheets on the website – irrigation, water storage, growing media, etc. Specific comments in relation to the FMS website included:

- We make use of the production information in the NIASA EcoHort Manual.
- Irrigation (technical fact sheet) is helpful. Lots of treatment methods.
- I should look up the website.
- Pretty useful and accessible.
- Will use this in the future.
- Have not used the website at all. Will have a look after this conversation.
- Need to be reminded the resource is available. More courses would be helpful for training staff.
- Went there once to make sure I had the latest copy of the FMS Manuals.
- No use made of this website, "our processes are in place", use a network of consultants from outside the industry, will have a look at the website now.
- Will now look at this after this interview.

- I will visit now; you have prompted me.

Comments point to the need to remind nursery businesses of the website's value.

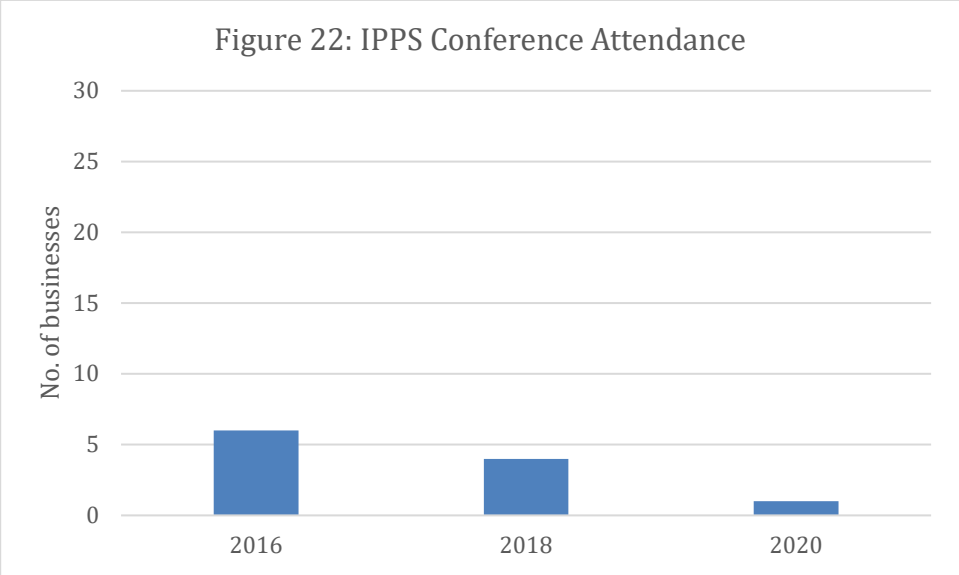
Attendance, technical sessions GIA national conferences



Around 25% of those surveyed attended the GIA National Conference supported by the NNIBP in 2016, 2018 and 2020. Comments received included:

- Excellent speakers and very informative sessions. The speakers don't change much but the information is up to date and relevant.
- The session was really good and is why I can answer so much of this survey.
- No.
- Representatives (from the business) attended.
- Other may have (attended).
- Other staff attended.
- We only employ 10 people, too busy.
- Time out of business difficult to do, great networking when I did attend 20 years ago.
- Good conference for many reasons.
- Also attended the 20 years before this. Standard getting better, Perth was excellent!
- Business represented but not this respondent.
- Pretty good!
- One day it will be just a grower conference and the retail will be a separate stream. Technical stuff important.
- Department of Ag guy was really good on how pests come into the country.
- We did send someone in each of these years.
- Not my thing.
- They're good.
- Was really valuable when we attended for the networking.

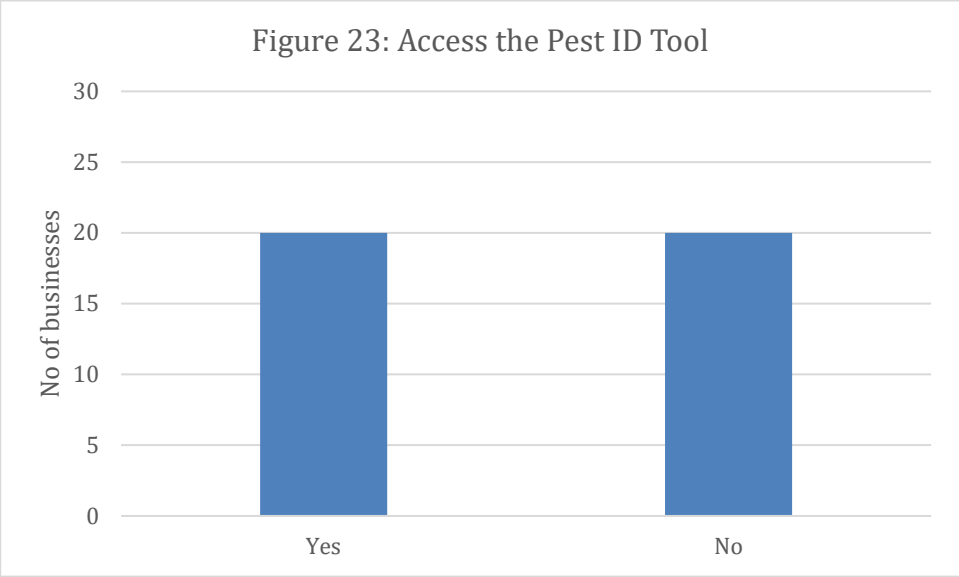
Attendance, International Plant Propagators Society conferences



Around 4% of those surveyed attended the International Plant Propagators Society (IPPS) Conference supported by the NNIBP in 2016, 2018 and 2020. Comments received included:

- Have attended for many years, but not personally the last few.
- Only attended one session when it was in Melbourne.
- Prioritise the National Conference.
- I'm a tree and shrub grower and I do not propagate.
- On the 'like to do' list.
- A long way to come when I'm not really a 'propagator'.
- If this was the Tassie conference I was present.
- More my thing but timing doesn't suit us in Autumn.
- Not since we moved. Should send someone.

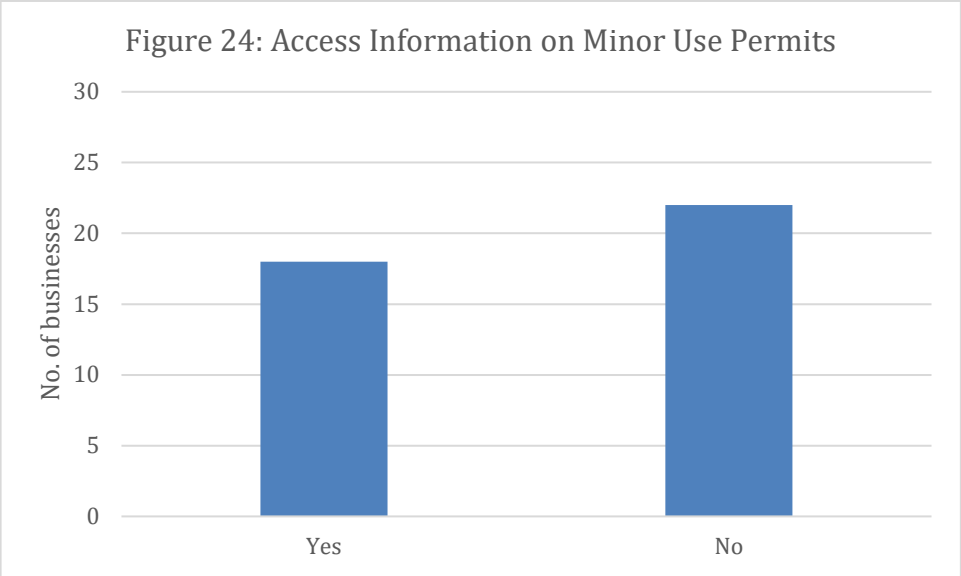
Access the Pest ID Tool



Half the businesses surveyed make use of the Pest ID Tool platform (https://www.pestid.com.au/) supported by NNIBP. Comments received in relation to the tool include:

- Two of us use it at work.
- One staff member worked for CSIRO and uses it.
- One guy there used to use it a lot, but he is no longer with us.
- Straightforward to use.
- We know what the pests are and if we don't then this tool would not have the detail required.
- It is too difficult, not agile enough.
- Probably should use it more.
- New NSW state person coming to show me how it works.
- Not regularly.
- Will now look at this.
- Great resource!
- Two of us use it at work.
- Quite good.
- I knew it existed, but we have never used it.

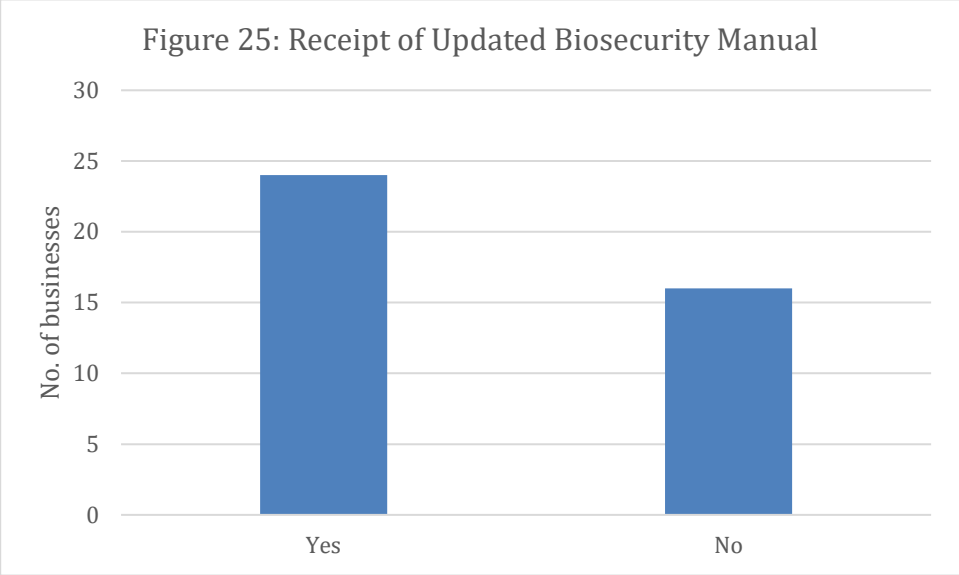
Access advice generated on minor use chemical permits



Eighteen of forty (45%) businesses surveyed make use of advice on minor use chemical permits generated by NNIBP. Comments received in relation to minor use permits include:

- User friendly.
- They (my staff) know they should (access up to date information from this source)!
- Helps you know you're up to date and good to have on hand.
- We use only occasionally
- Not relevant in Victoria.
- Difficult to find and access these.
- Don't need them.
- Staff do look at these permits.
- Don't use chemicals except for interstate protocols.
- Use the products, don't need advice.

Receipt of Biosecurity Manual

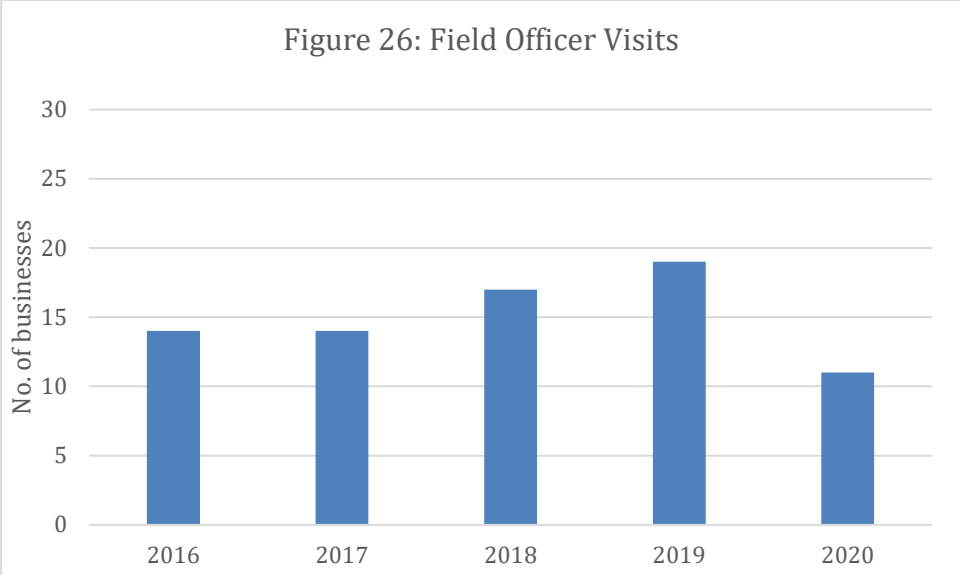


Twenty-four of forty (60%) businesses surveyed acknowledged receipt of an updated copy of the NIASA/EcoHort/BioSecure HACCP Manual supported by NNIBP. Comments received in relation to the manual include:

- Would like to receive it!
- Not sure - was this electronic?
- Not aware that EcoHort and BioSecure HACCP were attached to it. It's a big folder.
- We use it as a resource.
- A couple of years since hard copy delivered.
- Very good.
- Delivered electronically a month ago.
- Eventually Bunnings will require accreditation.
- Not accredited anymore. When it became national the content was not there and it was expensive.
- Not accredited any more.
- Maybe others in the organisation did.
- Not accredited so we are out of this loop.

There appears to be some confusion regarding access to the Biosecurity Manual and its purpose.

Visits by NNIBP funded Field Officers



NB: data for 2020 is for 6 months only

In the first four years of the NNIBP an average of 16 nurseries had visits from program funded Field Officers. The data for 2020 is for 6 months but is 'on track' to surpass visit levels for previous years. Comments on Field Officer nursery visits include:

- A field officer visit occurs in May every year.
- We are NIASA and EcoHort accredited so a visit occurs every year.
- Celeste (Cook, QLD) came up with a few good ideas relating to some fungal issues and advice on alternative plant varieties.
- David from NGIV visits but not this year yet.
- David Reid Audits so does DPI for ICA29 to access Tasmania.
- Tony Filippi came to discuss BioSecure HACCP. Auditors come every year and are getting better.
- Auditor comes every year, not funded by the program.
- Chris O'Conner, the Auditor. Until we dropped out of the scheme. (Extra 20 hours per month for compliance not worth it. Excessive water sampling and potting mix testing.)
- Valuable visits. Also get annual audit but staff go through this.
- State Industry Development Officers do come out.
- Audits have improved over the years and become more regular.
- Always beneficial.
- This is an important question, to check up on whether audits are actually happening (there was an issue in Victoria in the past)
- Due this month every year.
- Not always clear if a visit is a part of the program.

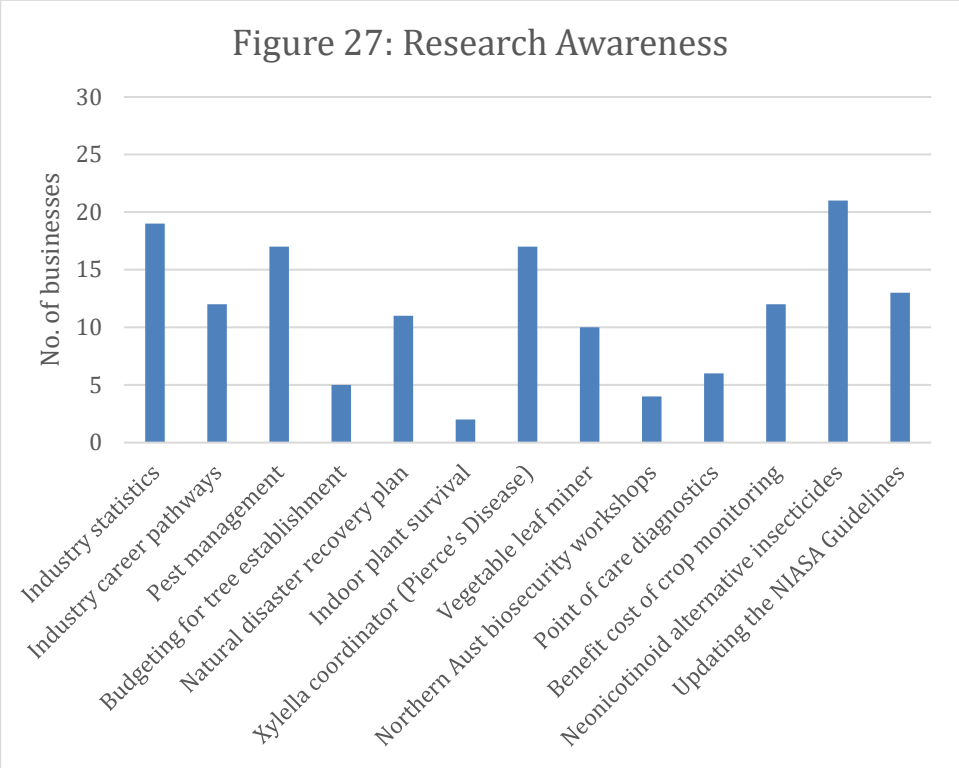
There appears to be confusion between Plant Protection/Biosecurity Field Officer visits and the audit program attached to NIASA, EcoHort, and BioSecure HACCP.

Conclusions on awareness of NNIBP outputs

The Nursery Papers are well regarded by surveyed nursery businesses with around half of those contacted aware of key issues addressed in the last four years. Case studies achieved a lower level of awareness than the Nursery Papers with an average awareness score of just eleven out of forty. The FMS website is not in regular use by most surveyed businesses and there would appear to be a need

to remind nursery businesses of the website's value. Conference attendance by those surveyed is low (around 25% GIA and 4% IPPS) but those who did attend saw value in their investment. The Pest ID tool is accessed by half those surveyed and almost as many make use of information generated on minor use chemical permits. There appears to be some confusion regarding access to the Biosecurity Manual and its purpose. There is also confusion between Plant Protection/Biosecurity Field Officer visits and the audit program attached to NIASA, EcoHort, and BioSecure HACCP.

Research and Levy Funded Project Awareness



Nine nursery businesses were unable to identify any research projects. Low levels of recognition were apparent for all research and industry projects listed in the survey. A single project ("neonicotinoid alternative insecticides") achieving a breakeven or better score of twenty-one. Specific comments on research and levy funded projects include:

- Very good programs
- Vaguely aware that this stuff is going on in the background. Was once on a NIASA committee to determine R&D priorities.
- I take an interest.
- This is essential work, particularly statistics, career pathways and pest management.
- Every project has been justifiable, well thought through and targeted.
- Disappointed people were taken off the ground in smaller states.
- Look at these if relevant. Not something I am involved in.

Future Directions for Investing in Technical Support

Nursery businesses were asked to comment on ten suggestions for future technical investment priorities. The ranking of priorities is shown in the table.

Future Technical Investment Priorities	H, M, or L
Irrigation (system design, operating parameters, emitters, etc.)	**High**
Water recycling (storage, treatment, filtration, etc.)	**High**
Site layout and drainage	Medium
Growing structures (protective structures, shade, benching, growing beds, etc.)	**High**
Pests, diseases, and weeds (identification, diagnostics, treatment, etc.)	**High**
Integrated Pest Management (IPM)	**High**
Growing media (properties, blends, fertiliser, etc.)	Medium
Production efficiencies (potting, dispatch, automation, etc.)	**High**
Technical training activities (eLearning, face to face learning workshops, etc.)	**High**
Environmental and natural resource management elements	Medium

Other suggestions for technical investment included:

- Nursery transport standards for pots per tray, etc.
- Alternatives to peat moss.
- Garden Promotion, most promotions seem to start with a bang then fizzle out.
- Clear treatment advice. This is often fudged as 'commercial decision'. Pest, disease and weed advice needs to provide clear treatment advice.
- Some simple benchmark information (e.g. hourly output of 140ml potting team) might provide added value for accreditation/audit visits system.
- Provided the information is new not just a supplier telling me how good his product is.
- Benchmarking would be valuable for production efficiency.
- Lean process management. Tracking where plants go around the nursery through to Bunnings on pallets. Could some standard pallets be developed for the industry?
- Could benchmark against other sectors and countries.
- Growing structures - laws have changed recently and need to understand the new construction codes for growing structures.
- Benchmarking production efficiencies was useful when we did this years ago.

GIA note that the industry already has a benchmarking program.

Policy Priorities for Nursery Industry

Nursery businesses were asked to comment on ten suggestions for policy priorities for their industry. The ranking of priorities is shown in the table.

Key policy area	H, M, or L
Water access and use	**High**
Land use/urban encroachment	**High**
Local government regulation	Medium
State government regulation	**High**
Labour access and use	Medium
Education and skilling of staff	**High**
Market power of the retailer	**High**
New market development	**High**
Market access	**High**
ECommerce	Medium

Other suggestions and comments on policy research included:

- Some of these things the industry needs to get behind. Some are business decisions.
- Being responsive about 'Gardening' in the media.
- Biosecurity needs to be highest priority.
- Licensing industry participants.
- I am envious of the 'tree and shrub network' in Victoria. Can we do this nationally.
- All high priority is there is a change that will affect business. Please Hort Innovation and the association watch these issues.
- Policy to encourage greenspace in cities and biophilia generally. Keep regional areas viable and livable.
- OH&S and Staff Welfare, particularly mental health. Nursery is a unique business. Insurance, particularly Hail insurance is an important question and risk.
- State and Territory bodies are not overly concerned about individual mail order of a few plants, more concerned with bulk commercial movements. Could just as easily move pests and diseases through a few plants as with bulk movements.
- Well covered variety of topics.
- Biosecurity Planning. Federal Government regulation.

Concluding Comments

Concluding comments in relation to the biosecurity program and industry association engagement included:

- Constant information is needed and a lot of follow-up. The realities of what associations can afford is limited. Never enough for all to achieve what needs to be done.
- I wasn't going to bother renewing with NGIQ, but I think they are starting to move in the right direction with these surveys to get good honest feedback.
- We see the value in it. Harder to get smaller nurseries involved and help spread the success and value of industry engagement.
- Education is really important. When a nursery starts up, they get help, but when it's established, they are forgotten about. Revisiting, educating, make sure they haven't slipped through and are getting emails and marketing stuff as it seems some doesn't get through.
- When the accreditation came through for HACCP, I wasn’t prepared to spend the money. Otherwise reasonably happy with association.
- Biosecurity is a very important part of what we do, protecting country and industry. COVID19 has highlighted what could go wrong. I was involved in a mock incursion a few years ago. The next week the equine flu came in and that whole industry was shut down. A shut down can easily be on the cards.
- Thinks industry needs to work at updating their data base so information gets to the right people. We use CODEX HACCP rather than industry. We also have participated with our staff in glitter-bug training. We are involved with Deakin Uni research and would love to be involved in more industry workshops.
- Never seen Your Levy at Work News – please update the database.
- We need information and emails. Can the database be updated.
- NNIBP does a great job if you need a hand or ask for assistance. Attended a leadership course last year that helped me communicate and handle staff better. Loved it.

References

AgEconPlus (2016) M&E – National Nursery Industry Biosecurity Program – Baseline Survey Report

AgEconPlus (2018) M&E – National Nursery Industry Biosecurity Program – Mid-term Survey Report

Clear Horizon Consulting (2019) National Nursery industry Biosecurity Program – Mid-Term Review (NY15004). Prepared for Hort Innovation.

Appendix 1: Industry Survey

NATIONAL NURSERY INDUSTRY BIOSECURITY PROGRAM – WHAT VALUE IS IT?
Confidential Industry Survey

Purpose

The National Nursery Industry Biosecurity Program (NY15004) is funded using the nursery products levy. The Biosecurity Program has been in place since February 2016. This independent and confidential survey of growers is to assess the delivery of information on biosecurity and the satisfaction with biosecurity program communication.

As a levy payer your opinion on program information, value and future direction is important. Your help with the following questions is much appreciated.

_____

Owner or manager contact name:_____

Nursery name: _____State_____

Q1: Are you aware of your levy funded National Nursery Industry Biosecurity Program?

i) Aware (YES/NO)? _____

ii) Can you identify what services and support the Program is providing (*read bold heading, tick the subheadings identified, some prompting permitted*)?

National Nursery Industry Biosecurity Program	**Tick**
1) On-farm plant protection/biosecurity	
On-site plant protection/biosecurity visits	
Development of a plant protection/biosecurity manual	
Workshops/forums – on site biosecurity program	
Government recognition/market access	
Training courses	
Extension materials	
BioSecure HACCP	
2) Biosecurity preparedness	
Representing the industry in relation to Emergency Plant Pest Response Deed (EPPRD) and PlantPlan	

Representing industry when managing a pest incursion/response/nursery reimbursement of costs incurred	
Information to industry on pests	
Biosecurity pest alerts	
Interstate market access – protocols, etc.	
3) Biosecurity awareness – extension, communication, evaluation	
On-site visits	
Participation in research projects	
Nursery Papers – pest management technical information	
Articles – 'Your Levy At Work', 'National Nursery News'	
Workshops	
Coordinating relevant projects – IPM Workshops (Andrew Manners)	
Pest Identification (ID) tool	
Nursery Production Farm Management System (FMS) website	
Case Study articles of growers across Australia	
Case Study videos of growers across Australia	
4) Minor use chemical permits	
Minor use permits for insecticides, fungicides and herbicides	
Coordinates the selection of activities each year	
Coordinates the 5 applications each year	
Delivers 5 permits each year	
Lists all new permits on the FMS website	

iii) How do you currently receive / wish to receive information on the program and other nursery biosecurity activities (*read out all options and tick responses, some prompting*)?

Program Information Received	**Current (tick)**	**Preferred (tick)**
Media releases		
NGIA – e-news (National Nursery News) monthly email e-news		
Your Levy at Work (YLAW) monthly email e-news managed by Cox Inall (Project updates, Case studies, etc)		
Workshops/forums, information resources, technical papers, trade show		
Project officers conducting biosecurity workshops in state jurisdictions		
Project produced technical papers		
Attended International Plant Propagators Society Conference (Trade Display) May 2019		
Annual communication (Letters) with Nursery Industry Accreditation Scheme Australia (NIASA) members updating on BioSecure, etc.		
Project resources (e.g. Minor Use Permits, etc) at www.nurseryproductionfms.com.au		
Face to face meeting with a state based project officer		
Project Plant Protection/Biosecurity Officers visit NIASA businesses John McDonald and Celeste Cook (QLD), Chis O'Connor (NSW), Tony Filippi (VIC), John McDonald and Tony Filippi (SA), Steve Blyth (WA, NT)		
Twitter, Facebook		

Q2: Are you aware of BioSecure HACCP and what it is attempting to achieve for industry?

i) Aware (YES/NO)?_____

ii) Do you know what BioSecure HACCP is addressing (*tick and provide some prompts*)?

BioSecure HACCP	**Tick**
Improve grower plant protection systems?	
Provide guidelines for crop monitoring?	
Improve pest surveillance across production nurseries?	
Assist businesses in their interstate market access?	
Allow businesses to be biosecurity ready to face an emergency plant pest incursion?	

iii) How do you currently receive/ wish to receive information on BioSecure HACCP?

BioSecure HACCP Information Received	**Current (tick)**	**Preferred (tick)**
Email?		
GIA News – electronic/email?		
Your Levy at Work (YLAW)		
Contact by on-site industry extension?		

Q3: Are you aware of the Emergency Plant Pest Response Deed (EPPRD) and its purpose?

i) Aware (YES/NO)? _____

ii) Are you aware of what EPPRD provides for industry and growers?

EPPRD Purpose	**Tick**
Representing industry in relation to PlantPlan and EPPRD investment prioritisation?	
Representing industry when managing a pest incursion/ response/ nursery reimbursement of costs incurred?	
Distribution of information to industry on pests?	
Market access – protocols, etc.	

Q4: Are you aware of key emergency plant pest incursions over the past 4 years?

i) In relation to EPPRD, have you received any information on specific biosecurity and pest alerts?

EPPRD Triggering Events	**Tick**
Not aware of any alerts	
Citrus canker	

Tomato potato psyllid	
Brown marmorated stink bug	
Fall armyworm	
Giant pine scale	
Cucumber green mottle mosaic virus	
Banana panama disease	

ii) How do you currently receive/ wish to receive information on emergency plant?

EPPRD Information Received	**Current (tick)**	**Preferred (tick)**
Email?		
GIA News – electronic/email?		
Your Levy at Work (YLAW)		
Contact by on-site industry extension?		

Q5: Awareness of National Nursery Industry Biosecurity Program outputs?

i) Are you aware of any of the key issues dealt with in the Nursery Papers over the past 4 years?

Nursery Papers	**Tick**
Not aware of any issues/do not use Nursery Papers	
Neonicotinoid insecticide alternatives	
Sticky traps	
Fall armyworm	
Crop monitoring	
Integrated Pest Management (IPM)	
Nursery stock specification	
Comments…….	

ii) Are you aware of any case studies published by the program that might add value to nursery businesses?

Case Studies	**Tick**
Eyles Citrus	
Touchwood Nursery	
Humphries Nursery	
Pohlmans Nursery	
Arborwest Nursery	
Mansfield's Nursery	
Trandos Hydroponics Nursery	
Comments…….	

iii) What resources do you make use of, if any, from the Farm Management System (FMS) website www.nurseryproductionfms.com.au?

FMS Website	**Tick**
Do not use the FMS website	
Technical fact sheets - irrigation, water storage, growing media, etc.	
Pest management plans	

e-Learning courses	
Technical information	
Comments…….	

iv) Did you attend any of the technical sessions at Greenlife Industry Australia National Conference supported by the biosecurity program, if so what years?

National Conference Technical Sessions	**Tick**
2016	
2018	
2020	
Comments…….	

v) Did you attend any of the International Plant Propagators Society (IPPS) Conferences supported by the biosecurity program, if so what years?

IPPS Conference	**Tick**
2016	
2018	
2020	
Comments…….	

vi) Do you or your staff access the Pest ID Tool platform (https://www.pestid.com.au/) supported by the biosecurity program?

Pest ID Tool	**Tick**
Yes	
No	
Comments…….	

vii) Do you or your staff access advice on Minor Use Pesticide permits generated by the biosecurity program?

Minor Use Pesticide Permits	**Tick**
Yes	
No	
Comments…….	

viii) Did you receive an updated copy of the NIASA/EcoHort/BioSecure HACCP Manual supported by the biosecurity program?

Biosecurity Manual	**Tick**
Yes	
No	
Comments…….	

ix) In what years, if any, have you been visited at your nursery by a biosecurity program funded field officer?

Nursery Visits by Field Officers	Tick
2016	
2017	
2018	
2019	
2020	
Comments…….	

Q6: Are you aware of any other research or levy funded projects going on or completed in the past 4 years?

Research and industry projects	Tick
Not aware of any research projects	
Industry statistics	
Industry career pathways	
Pest management	
Budgeting for tree establishment	
Natural disaster recovery plan	
Indoor plant survival	
Xylella coordinator (Pierce's Disease)	
Vegetable leaf miner	
Northern Australia plant protection/biosecurity workshops	
Point of care diagnostics	
Benefit cost analysis of crop monitoring	
Neonicotinoid alternative insecticides	
Updating the NIASA Guidelines – avocado, macadamia, banana, tree stock specifications	
Comments…….	

Q7: Future directions for investing in technical support

i) What priority do you place on the following future investments– please rank as either a High, Medium, or Low (*read options to respondent, mark H, M, or L*)?

Future Technical Investment Priorities	H, M, or L
Irrigation (system design, operating parameters, emitters, etc)	
Water recycling (storage, treatment, filtration, etc)	
Site layout and drainage	
Growing structures (protective structures, shade, benching, growing beds, etc)	
Pests, diseases and weeds (identification, diagnostics, treatment, etc)	
Integrated Pest Management (IPM)	
Growing media (properties, blends, fertiliser, etc)	
Production efficiencies (potting, despatch, automation, etc)	
Technical training activities (eLearning, face to face learning workshops, etc)	
Environmental and natural resource management elements	
Anything else…….?	

ii) What is your preferred way of receiving technical support (*read options to respondent and tick preferences*)?

Preferences for Receiving Technical Information	**Tick**
by telephone consultation	
by internet consultation	
on-site visits by technical officers	
group activities (area based grower groups, workshops, forums, etc)	
Anything else…….?	

Q8: Policy priorities for nursery industry

iii) What priority do you place on the following policy areas (*read options to respondent, mark H, M, or L*)?

Key policy area	**H, M, or L**
Water access and use	
Land use/urban encroachment	
Local government regulation	
State government regulation	
Labour access and use	
Education and skilling of staff	
Market power of the retailer	
New market development	
Market access	
ECommerce	
Other….	

Q9: Other comments in relation to the biosecurity program or industry association engagement with greenlife producers

_____
_____
_____
_____

THANK YOU FOR YOUR TIME AND ASSISTANCE