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Nursery & Garden Industry Australia

Final Report
HAL Project: NY 08002
Completion Date: 28 August 2009

Nursery Industry Environmental & Technical Research and Extension 08/09

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Dr. Anthony Kachenko has written this report as part of the reporting requirements of Horticultural Australia Limited (HAL). Industry funding from the Nursery Products Levy and HAL is acknowledged.

Contents

SUMMARY

The aim of this project was to provide a coordinated response to key environmental and technical issues that impact on the sustainability of the Australian Nursery & Garden Industry (NGI). This project builds on the successful achievements of earlier environmental and technical extension projects to ensure industry is equipped with the tools and knowledge to address key environmental issues. Key areas of focus included; climate change, invasive species, biosecurity, and natural resource management.

Independent direction to environmental and technical projects and activities undertaken by Nursery & Garden Industry Australia was provided by the Environment Committee. This committee played an active role in monitoring the progress of this project and provided strategic leadership on key environmental issues, to ensure that the industry was positioned as the community's leader on relevant environmental issues in alignment with the Nursery and Garden Industry Strategic Plan for 2006-2008. The committee members changed during the reporting period, with the retirement of Margy Clema and Kate Malfroy. These vacancies were filled by Steve Burdette and Sean O'Brien. The retirement of Diana Hall from her duties as Nursery & Garden Industry (NGIA) board representative saw Phil Nagle (NGIA Board Member) fill her vacancy. In addition to these changes, the acting National Environmental and Technical Policy Manager Robert Prince was replaced by Anthony Kachenko. The committee met on two occasions with minutes and recommendations circulated to all stakeholders.

An integral component of this project was the environmental extension and representations provided by the Industry Development Officer (IDO) network in their national policy roles. During this reporting period, several staffing changes in IDO representation and increasing pressures faced by IDOs in relation to issues arising from widespread drought and the global financial crisis, disrupted the focus of national policy issues to ensure the survival of industry at a local/regional level. Despite these challenges, industry was represented on key environmental issues, predominately relating to the areas of biosecurity and quarantine. Through this representation, NGIA maintained its commitment as a signatory to the Emergency Plant Pest Response Deed (EPPRD) to mitigate or minimise the introduction and spread of emergency plant pests. Nursery & Garden Industry Australia was also represented at several conferences in Australia and abroad on issues relating to industry initiatives in water and invasive plant management.

Five sub projects were investigated as part of this project. This report details the outcomes of three sub projects. The remaining two sub projects (Industry Carbon Footprint and Invasive Plants Audit) will form an appendment to this report to be lodged at a later date. The Industry has been successful in implementing the key objectives of the project with the following outcomes having been achieved:

- Development of four key pest contingency plans for high risk biosecurity pests of the nursery industry including:
    - Glassy-winged sharpshooter – *Homalodisca vitripennis* (and Pierces disease)
    - Guava rust – *Puccina psidii*
    - Sudden oak death – *Phytophthora ramorum*
    - Citrus longicorn beetle – *Anoplophora chinensis*

- Literature review on 'Plant Growth Impacts from Water Contaminants' that identifies improvements in current industry best management practices in relation to disinfestation.
- A technical report on the response of plants grown in blends of potting mix and ameliorants under restricted watering.

INTRODUCTION

In recent years, environmental issues have had a large impact on the sustainability of industry. Issues that have confronted industry for some years include water restrictions and urban water reforms, changes in Australia's biosecurity continuum and the management of potentially invasive plants. If proactively addressed, these issues can translate into new opportunities and sustain industry in the long term. Indeed, the need for industry to address emerging environmental issues and set a clear and strong environmental direction is paramount in order to sustain future development of the NGI.

It is critical for industry to demonstrate compliance to environmental legislation and sound environmental stewardship. Owing to the diverse nature of nursery production and its customer base, production nurseries typically occur in urban, peri-urban and regional localities across Australia. As such, industry is confronted with a variety of environmental and natural resource impediments that require careful consideration and management to ensure sound environmental outcomes are achieved. Moreover, industry is reliant on natural resources, such as water for irrigation. Consequently it is critical for industry to reduce its impact on these resources. Increasingly, the NGI is required to demonstrate a real commitment to achieving on-going improvements in its environmental performance.

Exacerbating this need are external pressures such as the way environmental issues are regulated and managed by local, state and federal governments. For example, the disparate legislature between state governments in handling quarantine arrangements that underpin plant health standards has impacted on the movement of nursery stock across Australia. In addition, the disparity in water restrictions across Australia has seen intense focus on water related issues to ensure industry survives the current drought. Effective management of environmental issues by individual businesses, and the need to provide strong and relevant environmental leadership by industry is recognised within the National Strategic Plan as vital to the industry's long-term sustainability.

Nursery & Garden Industry is committed to promoting and encouraging environmentally sound business practices and is dedicated to assisting industry in working towards this goal. To achieve this, focus from industry is required to address a number of key environmental issues with the potential to cause significant impacts on the long-term health and sustainability of the NGI. In 2006, NGIA recognised that to successfully meet the challenges it needed a holistic approach to identify and manage key environmental issues, rather than dealing with them in isolation. This project builds on the successful achievements of earlier environmental and technical extension projects that address key environmental and technical issues that impact on the sustainability of the Australian NGI.

A key threat to the sustainability of the NGI is the risk of an exotic plant pest incursion such as *Phytophthora ramorum* (Sudden oak death). As a signatory to the Emergency Plant Pest Response Deed, it is imperative that industry is equipped with the resources to minimise and prevent such an occurrence. Based on the Nursery and Garden Industry Biosecurity Plan there is a clear stated outcome to provide Industry with Pest Contingency Plans of major plant pests that offer a significant potential risk to the Industry. These contingency plans cover pest biology, host range and distribution, identification, controls and eradication methods and monitoring techniques to provide technical input into the emergency plant pest response, if an emergency plant pest is detected in Australia.

Another equally important issue for industry is managing the risk of pathogens in recycled irrigation water. In production nurseries, one of the key mechanisms to manage this risk is to gain Nursery Industry Accreditation Scheme Australia (NIASA) accreditation. These accreditation guidelines detail nursery Best Management Practices and cover areas such as crop hygiene and water disinfestation. To ensure these guidelines stay abreast of relevant developments arising from the scientific community, research is required to address whether improvements can be made in the guidelines. Moreover, in recent years there have

been considerable advancements made in this area (i.e. new disinfestation technologies), which need to be researched and brought to the attention of industry.

Nursery and Garden Industry recognises that managing water efficiently is a key driver to sound environmental performance. In recent years, NGIA has implemented various programs to enhance and demonstrate sound water management (e.g. Nursery Industry Water Management Best Management Practice Guidelines 2005). Arising from the need to become more efficient in the conservation of water, an extensive range of products marketed as 'water holding enhancers' has emerged for incorporation into potting mixes and artificial soils. With the exception of a very small number of these products, no scientific evidence is available to show whether they increase water holding capacity in the tension range of water freely accessible to plants. A further complication is that some types of additives (e.g. water crystals) are not responsive to the usual laboratory methods for assessing moisture retention by physical methods. There is an urgent need for scientific data to address these products to ascertain if they are suitability in the production and consumer environment.

MATERIALS AND METHODS

The sub projects within this project were managed by the National Environmental Policy Manager and the Environment Committee together with the support of the Industry Development Officers**.**

1. Facilitate Environment Committee

This sub project ensured that NGIA maintained the function of the Environment Committee to provide leadership and independent direction in addressing relevant environmental issues. The Environment Committee consists of 4 industry representatives and NGIA representatives responsible for managing key outcomes of the Environment and Technical Research program to position NGIA as the community's leader on relevant environmental issues.

The Committee has the following members:

- John Bunker (Acting Chairman), Managing Director, Redlands Nursery Pty Ltd, Queensland
- Phil Nagle, Sales Manager, Van Schaik's Bio-Gro, Victoria
- Steve Burdette, Business Development & Nursery Manager, Agriexchange, Renmark, South Australia
- Sean O'Brien, Horticultural Manager, Hunter Valley Gardens, New South Wales

The Committee met formerly on two occasions (9/12/08 and 16/6/09) during the reporting period.

2. Industry Development Officer national portfolio roles

This sub project continues the approach taken in 2006 to engage the skills and knowledge base of the IDO network in representing the industry at a national level on key environmental issues. The aim of this project was to enhance the industries representation with key environmental issues while increasing the opportunity for skill development within this resource.

Allocation of environmental portfolios was as follows:

Biosecurity and Minor Use	John McDonald	QLD IDO
Environmental Management	Vacant	TAS IDO
Invasive plants	Robert Chin	VIC IDO
NRM/Climate change	Grant Dalwood	SA IDO
Quarantine	Garry Hatcher	WA IDO
Water	Michael Danelon	NSW IDO

3. Development of key Pest Contingency Plans

The aim of this sub project was to develop Pest Contingency Plans for the following key threatening pest species identified by industry and government as 'high risk' to the NGI:

- Glassy-winged sharpshooter – *Homalodisca vitripennis* (and Pierces disease)
- Guava rust – *Puccina psidii*
- Sudden oak death – *Phytophthora ramorum*
- Citrus longicorn beetle – *Anoplophora chinensis*

This project was undertaken by Plant Health Australia.

4. Determination of the validity of physical tests for soil moisture retention as predictors of the response of plants grown in blends of potting mix and ameliorants under restricted watering

This project aimed to evaluate the effect of a variety of water holding products intended to improve the performance of a potting mix meeting Australian Standard 3743-2003 and to determine the veracity of their manufacturer's claims. This evaluation was done using laboratory and field experiments at the Amenity Horticulture Unit, University of Sydney Plant Breeding Institute.

5. Plant growth impacts from water contaminants

The aim of this project is to reconsider existing literature and generate a comprehensive literature review to:

- Determine how recycled water effects plant growth (with an emphasis on pathogens)
- Evaluate existing and future recycled water disinfestation technologies
- Consolidate existing information on treatment guidelines for pathogens
- Identify any gaps for future investment

This literature review was authored by Dr. Sally Stewart-Wade, Burnley Campus, the University of Melbourne.

EVALUATION

Sub project	Activity	Outcomes and benefits
1. Facilitate Environment Committee meetings	• Environment Committee met on two occasions 9/12/08 and 16/6/09)	• Meeting minutes circulated to whole of industry to enable awareness of key issues. The minutes from these meetings are provided as **Appendix 1.** • Overseeing the activities being undertaken in the areas of environmental program development.
	• Draft Environment Position of NGIA	• Draft Environmental Position developed and under review by NGIA Board. The draft Environmental position is provided as **Appendix 2.** • Enable all participants to be aware of the NGI position on major environmental issues.
	• Monitor progress of sub projects within NY08002	• Details of the activities and outcomes are included in the attached Environment & Technical Policy and Extension Annual Operating Plan (AOP) for this project. The AOP for this project is provided as **Appendix 3.**
	• Outline of risk management plan for environment and technical issues impacting industry	• Environmental Risk Matrix developed that will be utilised for setting priorities for future research. The Environment Risk Matrix is provided as **Appendix 4.** Key priorities identified as water issues, biosecurity and the impact of climate change. • With environmental issues identified as major threats and opportunities for industry growth, it is important that priorities and risk assessments are monitored to assist in the focus of future investment. The Environmental Risk Matrix forms the foundation to the NGIA Environmental Position. • Provides guidance for members of industry on areas they need to address in there own businesses.

Sub project	Activity	Outcomes and benefits
2. Integrated policy support	• Establish and coordinate Industry Development Officer national policy responsibility	• Funding made available to State Associations to facilitate extra time needed by IDO's to undertake National roles. States are using this funding for admin support and the use of consultants to undertake tasks otherwise done by the IDO. • Weekly contact with IDOs via phone links and regular information updates via email to cover all key issues within Environment sector. • Meeting reports from meetings/presentations circulated to whole of industry to enable awareness of key issues. The representation of NGI at major meetings with government agencies has increased the general awareness of industry. • IDO Group Meeting (17/2/09) to improve communication between NGIA and technical staff. The outcomes from this meeting are provided as **Appendix 5.** • IDOs were involved in identifying and assessing the key issues for presenting to IAC. Projects were discussed and ranked by all prior to submission for funding in 2009/10 plan. The ranking template is provided as **Appendix 6.** Stakeholders in the industry have the opportunity for input into the key areas of expenditure for technical and environmental issues. Industry input is being canvassed and issues identified.
	Biosecurity Representation	• Obligations as signatory to the Emergency Plant Pest Response Deed and Plant Health Australia are being addressed. • Represented industry at Biosecurity - Interstate Certification Assurance (ICA) Scheme Workshop and Citrus Greening Workshop. The meeting report from these workshops are provided as **Appendix 7.**

Sub project	Activity	Outcomes and benefits
2. Integrated policy support (*Continued*)	**Quarantine Representation**	• Represented industry on Australian Quarantine Inspection Services Post-entry Plant Industry Committee (PEPIC). • Presentation at Dieback Information Meeting. Provided delegates with industry position and accreditation programs in relation to *Phytophthora*. The meeting report from this meeting is provided as **Appendix 8.**
	Water Representation	• Represented industry at Horticulture Water Initiative with input into urban water policy. • Presentation at International Plant propagators Society Conference on water management best practice guidelines. Provided industry delegates with overview of how production nurseries can become more water use efficient.
	Invasive Plants Representation	• Presentation in Canada at the British Columbia Invasive plants Council Forum which showcased industry initiatives in tacking invasive plants. Strengthening industry collaborations with key environmental bodies. The presentation is provided as **Appendix 9.** • Publication of 5 Grow Me Instead booklets. These booklets ensure that industry is proactively addressing this issue by educating the consumer and industry.
3. Development of Key Pest Contingency Plans	• Formulate Pest Contingency Plans for emergency plant pests identified by Industry and government as 'high risk'	• Contingency plans developed for: Glassy-winged sharpshooter – *Homalodisca vitripennis* (and Pierces disease) Guava rust – *Puccina psidii* Sudden oak death – *Phytophthora ramorum* Citrus longicorn beetle – *Anoplophora chinensis* These plans are provided as **Appendix 10** and will be incorporated into Nursery and Garden Industry Biosecurity Plan.

Sub project	Activity	Outcomes and benefits
3. Development of Key Pest Contingency Plans (*Continued*)	• Develop industry capacity and implement EPPRD and Biosecurity Plan adoption strategy	• Industry specific Pest Contingency Plans will enable Industry to identify gaps in preparedness and engage targeted training programs to be developed. • Maintain obligations as signatory to the Emergency Plant Pest Response Deed. • Drive the need for greater adoption of BioSecure *HACCP.*
4. Determination of the validity of physical tests for soil moisture retention as predictors of the response of plants grown in blends of potting mix and ameliorants under restricted watering	• Technical report on the comparative performance of various water saving materials	• Technical report developed that highlights the disparity between various water saving technologies. This technical report is provided as **Appendix 11.** • Incorporated into NIASA accreditation guidelines to ensure guidelines are consistent with current scientific literature. • Provide industry and consumers with awareness of how these water saving material perform and how they may assist with water saving • Provide input into the decision making process of Smart Approved Water Mark. This program is Australia's national labelling scheme for outdoor water efficient products and services and is supported by the National Water Initiative, and the Water Smart Australia program. • This report will be communicated to industry via a technical Nursery Paper in late 2009.

Sub project	Activity	Outcomes and benefits
5. Plant growth impacts from water contaminants	• Literature review on the comparative performance of various water saving materials	• Literature review identified improvements in current industry best management practices in relation to disinfestation. These changes will be discussed at future Technical Officer Group meetings in relation to NIASA accreditation guidelines. This technical report is provided as **Appendix 12.** • Consolidate existing information on treatment guidelines for pathogens to assist growers in making the right management decision in relation to disinfestation of irrigation water. • Evaluate existing and future recycled water disinfestation technologies to assist growers in making the right management decision in relation to disinfestation of irrigation water. • Identifies gaps for further investigation to ensure industry is equipped with the knowledge and information to manage the potential risks associated with recycled irrigation. • This review will be communicated to industry via a Technical Nursery Paper in late 2009.

IMPLICATIONS FOR INDUSTRY

Nursery and Garden Industry is confronted with several environmental challenges that have the potential to impact on the sustainable development of industry. Industry reliance on natural resources, together with proximity of business operations to the natural environment, require continued investment in research and development to ensure sound environmental outcomes are achieved. Moreover, the need for industry to address emerging environmental issues has never been more relevant as Australia moves towards a carbon constrained economy. To successfully meet this challenge, an integrated approach to identify and manage environmental issues is required. With the recognition that environmental issues are interconnected, this project aimed to address these challenges collectively and provide industry with the knowledge and tools to successfully manage technology and to meet these challenges.

The Environment Committee played an integral role in positioning the industry as the community's leader on relevant environmental issues. The development of an Environmental Position that reflects industry's position is critical in conveying to stakeholders the environmental credentials of industry. Although the committee met with change during the reporting period, the aptitude of its members ensured that key environmental issues were monitored. This committee provided independent direction to NGI which has seen national and state associations develop a stronger interest in environmental and technical issues.

The involvement of the IDOs, based at state level, was critical to the industry's success in strengthening industry's relationship with decision makers. During the reporting period, these roles were met with several staffing changes in IDO representation. This resulted in some individuals needing to become conversant with the local/regional requirements of their role as well as becoming aware of all the complexities that exist with their national portfolio roles. This project is closely aligned to the industry's on-going Industry Development Officers project, NY06025 and may change to meet both industry and HALs requirements. Moreover, the appointment in October 2008 of Dr. Anthony Kachenko has seen a greater level of industry representation on key environmental issues at a national level.

The developments of Pest Contingency Plans for emergency plant pests are integral for industry to ensure its preparedness in the event of an incursion. These plans have been circulated to the IDO network and will form part of the Nursery and Garden Industry Biosecurity plan at a later update. The Environment Committee has flagged biosecurity as a major focus for industry and the level of engagement and investment by industry will continue to be a key focus.

As water is an integral component in the production and care of plants, it is important that industry maintains reliable access whilst at the same time being mindful that it's a finite resource that requires sound management. The technical report arising from the research into water saving technologies is crucial to ensure both industry and consumers are equipped with relevant data that aims to drive water efficiencies from cradle to grave in the production of plants. Moreover, the report on disinfestation technologies is necessary to ensure industry best management practices surrounding the management of water are relevant. This document has also identified 'gaps in knowledge' that require industry focus.

In moving forward, industry will be under increased attention and scrutiny of external stakeholders, including the general public, as the concern for the environment escalates. Therefore, it's important that NGIA can demonstrate that it is working towards environmentally sustainability business practices. In order to achieve this, continued focus on relevant and emerging environmental and technical issues is required. In addition, industry must continue to promote its 'green credentials' through its Communications and Public Relations programs, managed by other industry funded programs. It is also important that these channels deliver key environmental messages to the general public, particularly in relation to the value of plants in the urban environment.

FINANCIAL REVIEW

All sub projects have been included in the financial summary below. Sub projects 6 and 7 will form an appendment to this report to be lodged at a later date. The financial summary for the project is as follows:

Sub Project	Budget	Actual	Variance
1. Facilitate Environment Committee Meetings	$12,000	$12,000	-
2. Integrated policy support (IDO National roles)	$110,000	$110,000 Itemised as follows: Qld: $20,000 NSW: $20,000 Vic: $20,000 WA: $15,000 SA: $15,000 Tas: $10,000 Conference Registration $10,000	-
3. Development of Key Pest Contingency Plans	$45,000	$45,000	-
4. Determination of the validity of physical tests for soil moisture retention as predictors of the response of plants grown in blends of potting mix and ameliorants under restricted watering	$15,000	$15,000	-
5.Plant growth impacts from water contaminants	$10,000	$10,000	-
6. Nursery specific carbon foot printing and cost benefit analysis tool	$60,000	$42,300	$17,700
7. Audit of the incidence of invasive plants being grown and sold by industry	$20,000	$1,000	$19,000
Total	**$272,000**	**$144,046**	**$36,700***

***** These funds to be paid upon acceptance of the appendment to this report due 21/12/09

Milestone	Funding Amount	Status
101 Contract Signed (15/08/08)	$183,000	Received by NGIA from HAL
102 6 Month Progress (30/01/09)	$31,600	Received by NGIA from HAL
103 Final Report (28/08/09)	$28,700	
190 Appendment to Final Report summarising outcome of sub projects 6 and 7 above (21/12/09)	$28,700	

APPENDICES

The following appendices relate to the outcomes of the project:

1 Minutes of NGIA Environmental Committee meetings held 9/12/08 and 16/6/09.

2 Industry Environmental Policy (draft).

3 Project Annual Operating Plan.

4 Environmental Risk Matrix.

5 Minutes of IDO Group Meeting held 17/2/09.

6 IDO ranking of key environmental projects.

7 Meeting report from Interstate Certification Assurance (ICA) Scheme Workshop held 17/2/09 and Huanglongbing and its Vectors Contingency Planning Workshop held 24-25/2/09.

8 Meeting report from the annual Dieback Information Group held 5/6/09.

9 Presentation by Robert Chin at Invasive Plant Council of British Columbia 20/1/09.

10 Industry Pest Contingency Plan.

11 Report on Determination of the validity of physical tests for soil moisture retention as predictors of the response of plants grown in blends of potting mix and ameliorants under restricted watering.

12 Report on Plant growth impacts from water contaminants.