



Know-how for Horticulture™

Industry development scoping study

Victoria Lane
QLD Horticulture Institute

Project Number: AH02015

AH02015

This report is published by Horticulture Australia Ltd to pass on information concerning horticultural research and development undertaken for Australian Horticulture.

The research contained in this report was funded by Horticulture Australia Ltd with the financial support of across industry programs.

All expressions of opinion are not to be regarded as expressing the opinion of Horticulture Australia Ltd or any authority of the Australian Government.

The Company and the Australian Government accept no responsibility for any of the opinions or the accuracy of the information contained in this report and readers should rely upon their own enquiries in making decisions concerning their own interests.

ISBN 0 7341 0941 5

Published and distributed by:
Horticultural Australia Ltd
Level 1
50 Carrington Street
Sydney NSW 2000
Telephone: (02) 8295 2300
Fax: (02) 8295 2399
E-Mail: horticulture@horticulture.com.au

© Copyright 2004



Know-how for Horticulture™

AH02015
Industry Development Scoping Study



Horticulture Australia

Victoria Lane and Janelle Dahler
Agency for Food & Fibre Sciences, Horticulture
Department of Primary Industries, Queensland
April 2003

Abbreviations

ABOA	Australian Bibliography of Agriculture
ARRIP	Australian Rural Research in Progress
AusHort	Australian Horticultural Industries
HAL	Horticulture Australia (Limited)
IDM	Industry Development Manager
IDO	Industry Development Officer
R, D & E	Research, Development and Extension

Table of Contents

1. Executive Summary	5
2. Introduction.....	8
3. The Approach Taken.....	9
3.1 Review of Australian and Overseas Literature	9
3.2 National Industry Consultation.....	9
4. Horticulture: Harvesting Future Potential.....	10
4.1 Industry segmentation	12
4.2 The challenges of the new marketplace.....	13
4.3 Evaluation of industry development activities.....	14
4.4 Development of competitive, whole-of-industry systems	15
4.5 Barriers to the export of Australian product.....	15
4.6 The changing face of horticulture	15
4.7 Education and training needs	16
4.8 The under-utilisation of women’s skills and experience	16
4.9 Risk management.....	17
5. Industry Consultation Findings	18
5.1 Key Issues Facing the Industry	19
5.2 Recommended Future Focus	22
5.3 Recommendations for AusHort	25
6. Comparison of Industry Consultation Findings with Literature Review Results.....	29
7. AusHort Investment to Date	31
8. Discussion of AusHort Investment Strategy – Including General Recommendations to AusHort	33
8.1 Environmental management R,D&E activities.....	33
8.2 Industry input into policy and debate.....	34
8.3 Marketing activities	34
8.4 Cross-industry cooperation and collaboration	35
8.5 Education and training initiatives	36
8.6 Whole-of-industry information products and services	36
8.7 New and emerging industries	37
8.8 Key industry concerns	38
8.9 Public relations activities	38

9. Recommendations for AusHort’s “Industry Development Services” Program.....	39
APPENDIX 1: Interview Questionnaire.....	42
APPENDIX 2: List of Survey Participants.....	43
APPENDIX 3: AusHort Strategic Plan 1999-2003.....	45
REFERENCES.....	49

1. Executive Summary

This *Industry Development Scoping Study* was commissioned by the Australian Horticultural Industries (AusHort) Research & Development Committee and conducted by staff from the Department of Primary Industries, Queensland. The aim of the study was to identify potential areas for investment in horticultural industry development, for input into the AusHort strategic planning process. The strategic approach undertaken included a literature review and industry consultation program.

For the purpose of the study, industry development was considered to encompass a broad range of activities leading to improved economic, environmental and social outcomes for the combined horticultural industry.

The results of the literature review revealed the combined Australian horticulture industry faces a number of challenges into the future, which include:

- Industry segmentation
- Barriers to export of Australian product
- The challenges of the “new marketplace”
- Changing education and training needs
- The “aging” face of horticulture
- Under-utilisation of women’s skills and experience
- Risk management

Interviews conducted with key stakeholders revealed a similar set of challenges. Those interviewed included members of the AusHort R&D Committee, HAL Program Management and Communications staff, Industry Development Managers and Officers, and relevant industry development and communications professionals from the Department of Agriculture agencies.

In the course of each interview, participants were asked to identify:

- Key issues likely to impact on the future development of the Australian horticulture industry, considered as a whole, over the next 5-10 years
- Activities that should be undertaken to address these issues, i.e. activities needed to ensure the continuing viability of the Australian horticulture industry over the next 5-10 years
- Specific activities that should be undertaken by the AusHort R&D Committee to maximise industry development outcomes for the combined industry

The interview participants identified 45 key issues expected to impact upon the future viability of the Australian horticulture industry, which were classified by theme. The most frequently cited themes were:

- Environmental management
- Marketing
- Production & product quality
- Industry structure

In descending order, the top 5 specific issues expected to impact upon the future viability of the Australian industry were:

- Global competitiveness
- Environmental sustainability
- Water access
- Water management
- Market access

Other key issues included:

- Product quality
- Cross-industry cooperation and collaboration
- The need for producers to work together
- Development of competitive production systems

The interview participants recommended the following activities be undertaken by the combined horticulture industry to address these issues:

- Working with government to address key issues (water, environmental sustainability, etc)
- Remaining globally competitive
- Facilitating market access
- Safeguarding water rights/access
- Working collaboratively with R&D providers
- Strategic development of horticulture's R, D & E human resources
- Environmental management research
- Development of effective communication/information systems

In the interviews, stakeholders recommended the AusHort R&D Committee specifically focus on:

- Ensuring horticultural interests are effectively represented at relevant national and international forums
- Supporting market development initiatives
- Facilitating cross-industry communication, cooperation and collaboration
- Facilitating communications through the development of whole-of-industry information products and services
- Performing PR activities on behalf of the combined industry (targeting Australian and overseas consumers, government groups etc)
- Developing whole-of-industry strategies to address key concerns (biosecurity, plant protection, market failure, OH&S etc)
- Supporting business management skills development
- Supporting the professional development of women in horticulture
- Developing and supporting systems for provision of technical advice (to make up for existing extension shortfall)
- Supporting training initiatives generally
- Conducting market research on behalf of the combined industry
- Supporting leadership skills development

In light of the literature and industry consultation findings, it is recommended that future AusHort Industry Development activities focus on the following themes:

- Planning & Strategy Development
- Adoption of R&D Outcomes
- Professional Development
- Facilitating Networks & Linkages

With priority given the following recommendations:

- Assess, finetune and maintain existing structures and systems to develop and implement strategies to deal with unforeseen pest or disease threats to horticultural industries
- Assess, finetune and maintain a structure to ensure horticultural industries have appropriate discussion and input into relevant national and international forums, such as WTO agriculture
- Ensure that all projects supported and managed by the AusHort R&D Committee have appropriate strategies to maximise technology transfer outcomes
- Ensure that all future environmental programs include clear, simple cost/benefit analyses and that profit opportunities are highlighted
- Develop specific initiatives to encourage adoption of environmentally sustainable practices (field days, demonstration plots etc)
- Maximise adoption of other R&D outcomes by supporting the development of:
 - whole-of-industry information products and services
 - systems for provision of technical advice (to support HAL's existing industry development officer network)
- Support education and training activities that foster the professional development of industry members at all levels (producers and other supply chain participants; research and development staff; peak industry body staff) with a specific focus on:
 - business management
 - marketing
 - technological innovation
 - successional planning
 - leadership
 - women's participation
- Support activities that foster the development of collaborative linkages and networks at all levels of horticulture

In addition, it is recommended that AusHort extend the scope of its Production Program activities to cover support for general cross-industry environmental R,D&E initiatives.

Effective industry development activities are expected to result in increased professionalism and business viability, as measured by the uptake of best practice schemes, participation in learning activities and implementation of business improvement ideas.

2. Introduction

This “Industry development scoping study” was commissioned by the Australian Horticultural Industries (AusHort) Research & Development Committee, and conducted by a consultancy team from the Queensland Horticulture Institute.

The aim of the study was to identify potential areas for investment in horticultural industry development, for input into the AusHort strategic planning process.

The key outcomes of this consultancy are:

- Detail of priority investment areas for horticultural industry development
- Recommendations for initial investment by Horticulture Australia and the AusHort R&D Committee

For the purpose of the study, industry development was considered to encompass a broad range of activities leading to improved economic, environmental and social outcomes for the industry.

Effective industry development activities are expected to result in increased professionalism and business viability, as measured by the uptake of best practice schemes, participation in learning activities and implementation of business improvement ideas.

To date, the sorts of industry development programs and projects supported by Horticulture Australia include:

- Communications, such as publications, Industry Development Officers, Websites etc
- Training activities, such as business management, farm management skills, leadership and personal development, succession planning etc
- Professional development
- Conferences
- Study tours
- Skills development of women to encourage greater participation in industry activities, particularly industry decision making

Within AusHort’s Industry Development Services program, the focus to date has been on broad cross-industry activities, including:

- Planning and strategy development
- Increasing the adoption of R&D outcomes

3. The Approach Taken

At the commencement of the study, the consultancy team sought to identify industry development principles and strategies that are relevant across all horticulture groups. The strategic approach included a literature review and industry consultation program.

3.1 Review of Australian and Overseas Literature

The aim of the literature review was to:

- Define the full range of industry development activities being undertaken globally
- Identify and analyse major driving forces impacting on the Australian industry
- Identify key success factors for the industry's continuing viability
- Analyse the gaps in the industry's current performance compared to the performance levels required in the domestic and global marketplaces

3.2 National Industry Consultation

In order to obtain valuable supplementary information, interviews were conducted with a range of key stakeholders, including:

- Members of the AusHort R&D Committee
- Representatives of the industries contributing to AusHort not represented on the Committee
- HAL-funded Industry Development Officers and Managers
- HAL Program Management and Communications staff
- Relevant industry development and communications professionals from Department of Agriculture agencies

Participants were asked to: identify the key issues likely to impact on the future development of the Australian horticultural industries; and to discuss how those issues should be addressed by the combined industry. Specifically, they were asked to identify activities that could be undertaken by the AusHort R&D Committee in order to maximise industry development outcomes for the combined industry.

Within the body of this report, the literature review findings are summarised in Chapter 4. In Chapters 5 and 6, the consultation results are overviewed and discussed. The current AusHort investment strategy is outlined in Chapter 7, and discussed in Chapter 8. The recommended investment strategy for AusHort's Industry Development Services program is presented in Chapter 9.

4. Horticulture: Harvesting Future Potential

Key Points from the Literature

- The global marketplace in its many forms is dynamic, challenging and demanding.
- Future competition is expected to occur between chains rather than between firms.
- The Australian horticultural industry generally functions as separate commodity and/or regional groupings with little coordinated national focus and few linkages across the supply chain.
- Supply chain alliances allow individual operators to achieve competitive advantage through increased operational efficiencies and market responsiveness.
- The development of effective supply chains represents a significant challenge to the industry. At the supply chain level, there exists a significant need to enhance the skills of participants.
- Poor or inconsistent performance in meeting key customer needs by some of the industry's firms can tarnish the reputation of the industry as a whole.
- In order to survive and remain competitive, the industry as a whole needs to incorporate the key requirements of target market(s) into pre- and post-harvest management systems. Multi-partner collaborations that bring together industry, research and extension are needed to facilitate the development of such systems.
- At the global level, consumers are increasingly concerned with the integrity of food products and production practices. In response to this trend, the industry will increasingly need to demonstrate a high level of environmental accountability.
- Encouraging the adoption of good environmental practices within horticulture is a complex and challenging task. Effective and wide uptake of complex techniques and technologies will only occur where close cooperation exists between government institutions, farmers' organizations and individual industry members, and when appropriate information is readily available.
- Australian market share in the major horticultural export destinations varies considerably. In part, this is due to impediments to market access facing Australian exports of horticultural products.
- The Australian horticulture industry needs to work together to ensure that future WTO agriculture negotiations result in significant cuts to tariffs and other domestic support arrangements affecting horticulture. The industry also needs to ensure that the Australian authorities negotiate appropriate quarantine protocols with the relevant authorities in importing countries.
- At both the grower and employee level, the current industry skills base is relatively low, and school leavers increasingly view horticulture as an unattractive career option.
- Investment in the development of horticulture's human resource pool, including researchers and advisors, will maximise the opportunities and technology adoption outcomes arising from R&D investment.
- Industry members need to become more effective "business managers" and they would benefit from services/initiatives that increase knowledge of and capacity to effectively participate in global markets.
- There is a need to support the professional development of current and future industry leaders and managers.
- While women are increasingly taking on non-traditional farming tasks, they are still significantly less likely than men to participate in training initiatives or industry governance and policy development activities.
- There exists a pressing need for evaluations to be conducted during the life of the industry development and communication projects and programs, to provide the feedback needed to make improvements.
- Horticultural emergencies can impact upon the future prosperity and sustainability of the horticultural industry. Contingency plans, procedures and strategies are needed to ensure impacts are minimised.

Literature Findings

In recent years, the Australian horticultural industry has recorded significant economic growth. Between 1987/88 and 1997/1998, the gross value of horticultural production in Australia increased by more than 100% to A\$5.1 billion (3). At the same time, the value of horticultural production as a percentage of agricultural production increased steadily to a current level of around 16% (3).

This growth was achieved despite a general trend towards consolidation in the agricultural sector, driven by falling commodity prices. Over the past 40 years, the number of 'commercial' farms within Australia has halved (22). However, the average area of land occupied by those farms has increased by almost 50% (22). ABARE scientists attribute this increase to the fact that larger farms have generally been able to capture more benefits from new technologies, leading to significantly higher growth in total factor productivity over the past two decades (22).

While ABARE projections indicate a continued expansion in production of major horticultural commodities (3), it is generally accepted that the industry faces a number of challenges into the future, including:

- industry segmentation
- Barriers to export of Australian product
- The challenges of the "new marketplace"
- Changing education and training needs
- The "aging" face of horticulture
- Under-utilisation of women's skills and experience
- Risk management

4.1 Industry segmentation

The Australian horticultural industry is largely characterised by small-scale family holdings. Each holding typically produces a range of commodity-type products without strong, consumer-recognised brands (3).

In general the industry functions as separate commodity and/or regional groupings, which lack a coordinated national focus (3). Typically there is also little cross-sector cooperation or communication across the supply chain. To a large extent, the horticultural industry operates in three distinct and separate phases: production until harvest, post harvest handling, and marketing (34). Too often the linkages between these groups are poor. This has caused problems with quality, efficiency, and market acceptability of many products (34).

This lack of cross-sector cooperation is particularly significant in light of the fact that future competition in the global marketplace is expected to occur between chains rather than between firms (42). A key principal in the evolution of supply chain management, applicable across all sectors of the supply chain, is the concept of “chains competing with chains” rather than “firms competing with firms” (9). For this reason, the existing lack of effective supply chain linkages needs to be urgently addressed.

The development of effective supply chains represents a significant challenge to the industry. While supply chain alliances can allow participants to achieve competitive advantage through increased operational efficiencies and market responsiveness (42), supply chains in the Australian fresh produce industry typically lack maturity. In many instances, vertical coordination is restricted by a lack of trust and performance, resulting in limited cooperation and coordination of activities between supply chain participants (9).

By becoming involved in producer groups and other cooperatives, individual producers can work together within the supply chain to achieve critical mass, leading to:

- Greater strength when negotiating with chain stores in Australia
- An improved capacity to export to international markets

However, numerous producer groups that have ceased operating over the past decade due to an inability to effectively negotiate a sustainable position within the supply chain, coupled with a lack of producer commitment (35, 9). Retailers, particularly the large supermarket chains, have used their increasing size and market dominance to attempt to dictate terms to wholesalers and direct suppliers, particularly in times of oversupply (9). In many instances, short-term thinking based on achieving short-term profits has taken precedence over longer-term strategies based on improving vertical coordination and overall efficiency (9).

Successful supply chain partners exhibit 5 key elements (9), namely:

- Strategic orientation
- Effective organisational structure and business culture
- Ability to exploit market information
- Ability to measure and control the full costs of servicing customer requirements
- Ability to innovate

Supporting individual producers and producer groups to increase their skills in participating in value chains would improve overall industry performance, as poor or inconsistent performance in meeting key customer needs by some of the industry's firms can tarnish the reputation of the industry as a whole (36). Firms within a regional or national horticulture industry generally share a common reputation among buyers (35). This factor of a shared reputation seems to be especially important in fresh produce markets (36).

Across the entire supply chain, one way to raise the professionalism of new and existing supply chain alliances would be to increase participants' awareness, knowledge, skills and adoption of innovative value chain technologies and management practices (21). This would include facilitating a better understanding of the workings of the entire chain (35). Supply chain networks would also benefit from services and initiatives that increase knowledge of global markets and capacity to effectively participate in those markets (35).

With any supply chain network initiative or service, it should be noted that a minimum of 3-4 years is required to achieve sustainable results as behaviour patterns typically change slowly over time (32).

4.2 The challenges of the new marketplace

To a large degree the success of Australian supply chains will hinge upon their ability to meet the demands of the global marketplace. The new marketplace in its many forms is dynamic, challenging and demanding. Horticultural producers operate in an environment of increasing real costs and decreasing financial margins, coupled with rapidly evolving legislative and customer requirements. These include the production of safe products, guaranteed supply, compliance with quality specifications and price competitiveness (34). In parallel, consumer requirements are changing to reflect an increasing emphasis on the "triple bottom line" of economic, environmental and social sustainability.

Consumers are increasingly concerned with the integrity of food products and production practices. Global consumer preferences are shifting towards produce grown using environmental sound practices (2). This shift has significant implications for the industry. Within Australia, the community-driven trend towards increasing environmental legislation is likely to continue. At a global level, buyers will increasingly demand a higher level of environmental accountability from the horticultural industry. In recognition of this fact, supply chain members expect environmental management issues to become increasingly important in years to come, with a focus on managing water effectively, reducing chemical impacts and meeting legislative requirements.

Encouraging the adoption of good environmental practices within horticulture is a complex and challenging task (2). To date, a number of codes of practice have been developed, but adoption levels

remain relatively low (2, 29). In part, this is because the quality of environmental and economic information across horticulture is often poor (29). However, there are other sound reasons why many farmers and other industry members have failed to adopt sustainable practices (1). Research has shown that farmers will generally only adopt new practices if it is economically, socially and technically feasible for them to do so (37, 1, 30). This is in stark contrast with the fact that environmentally sustainable practices are often time consuming, difficult and costly to implement.

To encourage adoption, it is recommended that:

- Profit opportunities should be highlighted to create a case for change (37) and all future environmental programs should include clear, simple cost/benefit analyses (2)
- Governments should be strongly encouraged to develop financial incentives for the adoption of good environmental management practices (2)
- An improved environmental information gathering and communication network should be established for on-going use at all levels of Australian horticulture (27)

Experience in the field of Integrated Pest Management (IPM) has shown that effective and wide uptake of complex techniques and technologies will only occur where close cooperation exists between government institutions, farmer's organisations and individual producers (15). Within the wider agricultural sphere, the need for greater collaborative links between higher education, business/industry and government is widely recognised (26, 37). These types of collaborative partnerships arise naturally when key stakeholders are interlinked through effective networks.

4.3 Evaluation of industry development activities

Within Australia, one barrier to the adoption of new technologies and techniques is a lack of evaluation of extension and industry development programs. This is despite the fact that the need for formal evaluation of such programs has long been recognised (41, 10, 16, 25, 20, 40). The current lack of evaluation data means that IDOs and other advisors/facilitators do not have the information they need to ensure communications and extension activities are appropriately targeted to meet client needs (20).

Within Australian agriculture, project/program evaluations are typically conducted at the end of the project/program, for the benefit of an external audience (33). However, there exists a pressing need for evaluations to be conducted during the life of the project/program, to provide the feedback needed to make improvements. In order to achieve this, strong administrative support and leadership will be needed at the state and federal levels in order to ensure that effective program evaluations are implemented within the existing extension and industry development systems (19).

These and related issues are currently being addressed as part of the cooperative venture "Capacity building for innovation in rural industries and communities", managed by the Rural Industries Research and Development Corporation.

4.4 Development of competitive, whole-of-industry systems

One way in which the Australian horticultural industry could become more competitive is through the development and implementation of integrated, whole-of-industry pre- and post-harvest management systems that address the key requirements of target markets (34) and exploit linkages and interdependencies across the industry value network (39). Such systems would enable the industry to better respond to drivers such as climate and market signals, capital infrastructure, operational culture and product quality (39). To maximise industry development outcomes, such systems should be developed from a whole-of-industry perspective by industry leaders, researchers and advisers working in collaboration with supply chain members (34, 13). For ongoing effectiveness, these systems would need to be flexible and responsive to changing customer and consumer needs.

4.5 Barriers to the export of Australian product

Demand for horticultural products is a major determinant of the size and prosperity of the Australian horticulture industry (3). While domestic demand for horticultural products and services is unlikely to increase significantly over the next decade, the export market shows much promise. In the decade to 1999, the value of horticultural exports increased by 112% to A\$1.2 billion. However, exports represent only 23.5% of the total gross value of horticultural production (3). In comparison, 60-70% of total Australian agricultural production is exported each year (38).

Australian market share in the major horticultural export destinations varies considerably, in part due to impediments to market access facing Australian exports of horticultural products. Most of these impediments arise from foreign trade policies that restrict access to important Australian export markets. These include stringent quarantine requirements, tariff and quota protections, bilateral trade agreements and obstructive import licences (3).

Reducing these barriers to trade is critical to the future prosperity of the Australian horticultural industry (3). The Australian Bureau of Agriculture and Resource Economics (ABARE) suggests that the horticulture industry needs to ensure future WTO agriculture negotiations result in significant cuts to tariffs and other domestic support arrangements affecting horticulture (3). Because quarantine restrictions imposed by importing countries represent the major constraint on trade, the industry also needs to ensure the Australian authorities negotiate appropriate quarantine protocols with the relevant authorities in importing countries (3).

4.6 The changing face of horticulture

Over the past few decades, the “aging” of the industry has become a significant issue as evidenced by an increase in successional-planning courses and training. The average producer is middle-aged, with a family history of horticulture. A recent study showed that 65% of agricultural producers come from a farming background. In contrast, only 21% believe their farm will be operated by close relatives in the future (7). In part, this is because school leavers increasingly view horticulture as an unattractive career option.

4.7 Education and training needs

Over the next decade, investment in the development of horticulture's human resource pool will be needed to maximise the opportunities and technology adoption outcomes arising from R&D investment (21). Such investment would increase the pool of skilled and adaptable graduates for employment at all levels within the Australian horticultural industries (8).

Horticultural producers generally have strong production skills and capacity. However, to remain competitive into the future, they need to become more effective "business managers". A need for improved business management and marketing skills is widely recognised within the industry (12, 35, 31, 28, 34, 14) and it is suggested that industry members would benefit from services/initiatives that increase knowledge of global markets and increase capacity to effectively participate in global markets (35).

At the supply chain level, there exists a significant need to enhance the skills of groups and group participants. In many instances, supply chain members need to develop a better understanding of the workings of the entire chain (35). Supply chains participants need to understand their own inherent organisational strengths and weaknesses, as well as factors that drive the policies and actions of their actual or potential supply chain partners (9). In addition, all supply chain participants need to understand and act upon the preferences and concerns of the ultimate customer - the consumer (9).

Within the Australian horticulture industry, the need to develop current and future industry leaders is widely recognised (21, 35, 24). The role of group leaders is indicated as a stand-alone critical success factor for cooperative group activities (35). In addition, leadership training can be an effective local social development strategy. Certain types of training can produce community-level impacts that go beyond changes in the individual participants (24).

4.8 The under-utilisation of women's skills and experience

Increasingly, women are playing a significant role in running the family farm and taking on non-traditional farming tasks (7). However, they are still much less likely than men to participate in training initiatives or industry governance and policy development activities. The current average level of female participation at the Peak Industry Body Board level and in R&D Committees is around 7% of total participation (4).

Issues that need to be addressed in order to effectively harness the potential of women in Australian horticulture (17) include:

- the culture within the sector, which is seen to be male-oriented and unwelcoming or even exclusive of women as leaders and managers
- the competing demands of work within the sector and family responsibilities, the overwhelming burden of which still fall on women
- the extent to which women's self-perception of a lack of confidence inhibits their progress to positions of leaders and managers within their sector

4.9 Risk management

Horticultural emergencies, such as product recalls, drought or pest incursions, could significantly impact upon the future prosperity and sustainability of the horticultural industry. For example, the current drought conditions have adversely affected horticultural production in many areas through crop failure and a reduction or loss of water supplies (11). The drought has also significantly impacted on the natural environment, through vegetation and wildlife loss, erosion, and toxic algal blooms in depleted dams, rivers and lakes (11). To ensure that horticultural emergencies are handled efficiently and effectively at the whole-of-industry level, contingency plans and procedures should be developed and/or maintained wherever possible (23).

5. Industry Consultation Findings

To assist in the prioritisation of industry development options identified from the literature, national industry consultation was undertaken in February 2003. Phone interviews were conducted with a range of key stakeholders, including:

- Members of the AusHort R&D Committee
- Representatives of the industries contributing to AusHort not represented on the Committee
- HAL-funded Industry Development Officers and Managers
- HAL Program Management and Communications staff
- Relevant industry development and communications professionals from Department of Agriculture agencies

In total, 61 stakeholders were interviewed as part of the consultation process. A 100% participation rate was achieved, i.e. every individual who was contacted agreed to participate in the study. A list of participants is presented in Appendix 2.

In the course of each 15-minute interview, participants were asked to identify:

- Key issues likely to impact on the future development of the Australian horticulture industry over the next 5-10 years
- Activities that should be undertaken to address these issues, i.e. activities needed to ensure the continuing viability of the Australian horticulture industry over the next 5-10 years
- Specific activities that should be undertaken by the AusHort R&D Committee to maximise industry development outcomes for the combined industry

5.1 Key Issues Facing the Industry

The first question asked in the phone interviews was:

*“What do you see as the **major issues** that will impact on the future development of the Australian horticultural industries over the next 5-10 years?”*

Interview participants identified 45 key issues expected to impact upon the future viability of the Australian horticulture industry. These issues were classified by theme, as shown in Table 1. The most frequently cited themes were: environmental management; marketing; production & product quality; and industry structure. As listed in Table 2, the top 5 issues were, in descending order: global competitiveness; environmental sustainability; water access; water management and market access. Other key issues included: product quality; cross-industry cooperation and collaboration; the need for producers to work together; and development of competitive production systems.

Table 1. The major issues that will impact on the future development of the Australian horticultural industries over the next 5-10 years

Focus	Comment	No. of Respondents
Environmental Sustainability	Environmental sustainability	14
	Water access	14
	Water management	12
	General water issues	9
	Environmental compliance	3
	Soil management	3
	Total: 55	
Marketing	Global competitiveness	16
	Market access	11
	General marketing	7
	Market development	6
	Exporting	5
	Meeting consumer needs	3
	Educating consumers	1
Total: 49		
Production and product quality	Product quality (including quality assurance)	8
	Development of competitive production systems	5
	Profitability	4
	IPM	4
	Pests and disease issues	4
	Access to new varieties	3
	Chemical registrations	3
	Measuring chemical residues	1
	Development of organic production systems	1
	Value-adding	1
Total: 34		

Industry structure	Need for cross-industry collaboration and cooperation	8
	Need for producers to work together	6
	Supply chain development	4
	Structure of retail sector – a few mega-suppliers	4
	Gender imbalance at policy and governance level	2
	Total: 24	
Labour	Need to attract new entrants to industry	4
	Difficulty finding staff	3
	Need for increased professionalism	3
	Need more favourable national awards structure	2
	Need for business management skills and training	2
	Need for leadership skills development	2
	Workplace health and safety	1
	Total: 17	
R, D & E	Need to develop Australia's human R, D & E capacity	4
	Need to address extension shortfall	3
	Need to address decreasing research investment	2
	Need for effective national coordination of information	2
Total: 11		
Other issues	Urban encroachment – land availability	6
	Biotechnology and genetic engineering	3
	Attracting investment dollars to horticulture	2
	Climate (climate change, climate prediction)	2
	Transportation	1
	Legislation	1
	Total: 15	

Table 2. Key issues expected to impact on industry development over the next 5-10 years:

Issue	No. of Respondents
Global competitiveness	16
Environmental sustainability	14
Water access	14
Water management	12
Market access	11
General water issues	9
Product quality (including quality assurance)	8
Lack of cross-industry collaboration and cooperation	8
Marketing (general)	7
Market development	6
Need for producers to work together	6
Urban encroachment – land availability	6
Export development	5
Need for competitive production systems	5
Profitability	4
Integrated pest management	4
Pest & disease issues	4
Supply chain development	4
Structure of the retail sector (few mega-suppliers)	4
Lack of new entrants to the industry	4
The reduction in Australia's R, D & E capacity	4

5.2 Recommended Future Focus

The second question asked of interview participants was:

“How should these issues be addressed to ensure the continuing viability of the Australian horticultural industries? That is, what will the combined industry need to focus on in coming years?”

Responses to this question revealed a strong emphasis on issues relating to industry structure. Enhanced cross-commodity collaboration and cooperation was considered crucial to the continuing viability of the industry and an integrated, national approach to industry development was strongly recommended.

Comments:

Central coordination of the industry is needed to effectively address the issues of water management, market access and political lobbying. We need to speak to government as one voice with strength and unity.

At the moment we take a state-by-state approach, but we need a combined front under the umbrella of the horticultural industries. There is a conflict of small states versus big states. Dialog is needed all-round to keep people abreast of key issues.

We need improved lobbying connections with government at both the state and federal level and with places where knowledge resides. For example: the CSIRO; state departments; universities, etc. Lots of horticultural industries are extremely fragmented. They need to develop a sense of ownership of issues.

We need to think as an industry rather than as a group of individual businesses.

All groups should work together in harmony to create a sustainable, viable, professional, ethically-run and future-directed industry. We need to develop clear channels of communication both between and within industry groups and government bodies.

Every industry is tackling these things (environmental management, communications, identifying consumer needs, etc) separately, leading to duplication. We need to work together to create greater synergies. For example, there's fruit fly work going on in half a dozen places. Who's pulling it all together?

As detailed in Tables 3 and 4, interview participants recommended the combined industry focus on:

- Working with government to address key issues (water, environmental sustainability, etc)
- Remaining globally competitive
- Facilitating market access
- Safeguarding water rights/access
- Working collaboratively with R&D providers
- Strategic development of horticulture's R, D & E human resources
- Environmental management research
- Development of effective communication/information systems

Table 3: To ensure continuing viability into the future, the combined horticulture industry should focus on:

Focus	Comment	No. of Respondents
Industry Structure	Developing a national focus	20
	Cross-commodity collaboration and cooperation	17
	Collaborating with R&D providers	8
	Working with government	8
	Developing competitive supply chains	4
	Addressing gender imbalance at policy and governance level	3
	Encouraging involvement of smaller enterprises at policy and governance level	2
	Encouraging and supporting producers to work together	2
	Total: 62	
Environmental Sustainability	Collaboratively lobbying government in relation to water issues	9
	Water access	8
	Environmental management research	5
	General water issues	5
	Water management	3
	Determining the water needs of crops/plants	2
	Addressing environmental issues collectively as an industry	2
	Water use efficiency	2
	Developing a horticultural EMS that can be modified for specific industries	2
	Environmental compliance	1
	Total: 39	
Marketing	Becoming globally competitive	15
	Market access issues	9
	Gathering market intelligence	4
	Export assistance	4
	General marketing	2
	Meeting consumer needs	1
	Total: 35	
Production and Product Issues	Product quality (including quality assurance)	5
	Pests and disease issues	4
	Developing of competitive, whole-of-industry systems	2
	IPM	2
	Chemical registrations	2
	Developing effective decision support tools	1
	Total: 16	
Labour	Developing a more favourable national awards structure	5
	Attracting new entrants to industry	2
	Workplace health and safety	2
	Increasing labour efficiencies through mechanisation	2
	Addressing other labour issues	1
	Raising professionalism	1
	Total: 13	
R, D & E	Strategically developing R, D & E human resources	8
	Developing effective communication/information systems	7
	Auditing the skills base of government service providers	2
	Determining government priorities	1
	Monitoring overseas research	1
	Total: 11	
Education & Training	Environmental management training	3
	Business management skills development	2
	Leadership skills development	2
	Providing "hands on" training	2
	Developing the human capacity of horticulture	1
	Total: 10	

Other Issues	Addressing the issue of second grade fruit	1
	Determining the impacts of horticultural on rural communities	1
	Developing GMOs	1
	Supporting regional areas	1
	Plant biosecurity	1
	Total: 5	

Table 4. Top 20 priority actions for the combined industry

Action	No. of Respondents
Develop a national focus for horticulture	20
Facilitate cross-commodity collaboration and cooperation	17
Work with government to address key issues (water, environmental sustainability etc)	17
Focus on remaining globally competitive	15
Facilitate market access	9
Safeguard water rights/access	8
Work collaboratively with R & D providers	8
Focus on strategic development of R, D & E human resources	8
Fund environmental management research (including water management research)	8
Develop effective communication/information systems	7
Focus on general water issues	5
Focus on product quality (including quality assurance)	5
Develop a new national awards structure for horticulture	5
Gather market intelligence	4
Support export assistance initiatives	4
Address pest and disease issues	4
Support the development of competitive supply chains	4
Address gender imbalance at policy and governance level	3
Deliver environmental management training	3

5.3 Recommendations for AusHort

The final interview question was:

“What type(s) of industry development activities would you like to see supported by the AusHort R&D committee?”

As detailed in Tables 5 and 6, industry capacity building emerged as a key theme, as did whole-of-industry representation. Key recommendations for AusHort were:

- Support environmental research initiatives
- Ensure horticultural interests are effectively represented at relevant national and international forums
- Support market development initiatives
- Facilitate cross-industry communication, cooperation and collaboration
- Facilitate communications through the development of whole-of-industry information products and services
- Perform PR activities on behalf of the combined industry (targeting Australian and overseas consumers, government groups etc)
- Develop whole-of-industry strategies to address key concerns (biosecurity, plant protection, market failure, OH&S etc)
- Support business management skills development
- Support the professional development of women in horticulture
- Develop and support systems for provision of technical advice (to make up for existing extension shortfall)
- Support training initiatives generally
- Conduct market research on behalf of the combined industry
- Support leadership skills development

Comments:

AusHort needs to look at the big picture. As an industry, were too busy fighting fires, we need to be more strategic.

AusHort should be proactively involved in debate on chemical regulations and in negotiating trade barrier and market access issues. Currently, residue limits affect our ability to trade with other countries.

AusHort need so support the development of technologies that will result in greater water use and recycling efficiencies. They need to focus on whatever will help growers achieve compliance, and ensure the best possible environmental and commercial outcomes.

AusHort need to support the development of a general environmental management system that can be modified to meet the needs of individual industries and situations. They also need to focus on developing resources to help people make the right decisions, i.e. education tools.

AusHort should support projects looking into environmentally friendly ways of controlling pests and diseases.

AusHort needs to focus on issues that need to be addressed collectively by horticulture, such as water, global trade, and trade agreements. They need to determine where there's a clear benefit for all, i.e. a benefit collectively for all horticultural industries. They then need to determine if an activity is likely to have a commercial outcome and/or a return on investment.

Traditional agricultural research has been funded before. Now much more funding is needed for dissemination of the results. A centralised information system is needed so people don't get confused.

AusHort should promote sharing between industries at a higher level. People don't know what's going on in other industries. We can reduce costs by working with others. AusHort should foster this. They have mostly focused on quarantine issues in the past, but they've ignored people issues. AusHort should initiate a program that focuses on developing young people and not just technically. We cover the technical side very well already.

AusHort needs to commission scoping papers to figure out what's happening in the areas of water, VC development, labour, and leadership. Assessment is needed, across the board.

AusHort should focus on information gathering, assessment and provision. Industry members need the right information to be an efficient operator. They should invest in people to help the industry decipher information... Specialists are needed in the areas of water, marketing etc., because the IDOs can't always address specific issues.

AusHort should support activities where there's broad base support. They need to provide leadership to develop synergies and bring industries together.

I'd like to see AusHort more involved in building the international image of horticulture. They should provide a front for the horticulture industry. Our heavy state-focus is very confusing from an international point of view.

AusHort needs ensure outcomes are taken up, by making sure sufficient resources are given to communications. IDOs and IDMs are doing lots of stuff, but we need someone to bring it together so we can all benefit. If these things were all resourced centrally, we could all benefit, e.g. a database for pest and disease management.

AusHort should place an emphasis on getting research results actually utilised. Generally, this takes more time, effort and money. We see little out of the AusHort program regarding this. They need to address the issue if we want change.

Australia has great technology and great opportunities in Asian markets. AusHort needs to provide market development assistance, focusing on Asian markets. They need to identify specifications, growing areas, commodities, etc.

AusHort needs to focus on quarantine issues. We need to develop the pest freedom issue, to maintain import restrictions. We need to be able to show area freedom for pests we don't want in Australia. This is a very daunting task for individual industries. If we tell an overseas market "no we don't have that pest in this area", they'll say "how do you know; have you looked?" and our answer is "no". So, we want to be able to establish areas of freedom.

AusHort needs to promote the industry as a positive and interesting place to work.

AusHort need to make growers really aware of the trends, so they can position themselves better. They need to be made aware of what's happening along the chain, in the markets.

AusHort needs to support recognition of professionalism within the industry. The current awards system offers no encouragement, pay-wise, for study.

AusHort need so support the development of technologies that will result in greater water use and recycling efficiencies. They need to focus on whatever will help growers achieve compliance, and ensure the best possible environmental and commercial outcomes. As an industry, we should self-regulate to be prepared in advance.

Once regional natural resource priorities are established, then resources should flow to extension in those areas. AusHort should also support research into cover crops. We need to understand more about them.

Table 5: Recommendations for AusHort

Theme	Recommended Activity	No. of Respondents
Industry Capacity Building (including Education and Training)	Facilitate communications through the development of whole-of-industry information products and services Support business management skills development Develop and support systems for provision of technical advice (to cover existing extension shortfall) Support the professional development of women in horticulture Support training generally Support leadership skills development Encourage new entrants to the industry Support initiatives that assist industry members to manage change Provide industry development support to new and emerging industries Support initiatives that raise professionalism, including the development of a national awards system for horticulture Assist industry members to keep up-to-date with global trends Build the capacity of R, D & E staff through education and training initiatives Support supply chain development activities and services	8 6 5 5 5 4 3 3 3 2 2 2 2 Total: 50
Whole-of-Industry Representation	Ensure horticultural interests are effectively represented at relevant national and international forums (market access etc) Perform PR activities on behalf of the combined industry (targeting Australian and overseas consumers, government etc) Lobby for government incentives for environmental compliance Work with government to encourage investment in horticulture	13 8 2 1 Total: 24
Industry - Structure and Systems	Facilitate cross-industry communication, cooperation and collaboration Develop strategies to deal with key concerns (biosecurity, plant protection, market failure, OH&S, etc) Commission scoping papers to assess what's happening in key areas (water, etc) Ensure the needs of smaller enterprises are addressed Facilitate liaison with government	10 7 2 2 1 Total: 22
Environmental Management	Support environmental management R, D & E (including water-related R, D & E) Support the development of effective residue sampling tools and techniques Support the development of generic environmental management tools, techniques and systems	18 2 1 Total: 21

Marketing	Support market development initiatives Conduct market research for benefit of combined industry (including evaluation of consumer requirements/preferences)	11 4 Total: 15
Other Research	Support the development of decision support tools and systems Support the development of crop forecasting tools and other models Support genetic engineering research Support agricultural engineering research Support the development of new crops Support breeding research Commission a study of winged-vertebrate control options	1 1 1 1 1 1 1 1 Total: 7
Other Cross-Industry Issues	Support regional research initiatives Commission pilot projects as a means of fine-tuning larger project proposals Commission reviews of big past projects as a means of capturing data needed to refine future research proposals	1 1 1 Total: 3

Table 6: Key Recommendations for AusHort

Recommendation	No. of Respondents
Support environmental management R, D & E (including water-related R, D & E)	18
Ensure horticultural interests are effectively represented at relevant national and international forums	14
Support market development initiatives	11
Facilitate cross-industry communication, cooperation and collaboration	10
Facilitate communications through the development of whole-of-industry information products and services	8
Perform PR activities on behalf of the combined industry (targeting Australian and overseas consumers, government etc)	8
Develop strategies to deal with key concerns (biosecurity, plant protection, market failure, OH&S, etc)	7
Support business management skills development	6
Develop and support systems for provision of technical advice (to cover existing extension shortfall)	5
Support the professional development of women in horticulture	5
Support training generally	5
Support leadership skills development	4
Conduct market research for benefit of combined industry (including evaluation of consumer requirements/preferences)	4

6. Comparison of Industry Consultation Findings with Literature Review Results

In keeping with the literature review findings, our industry consultation results demonstrated issues relating to global competitiveness, environmental issues, marketing (market access and market development), product quality, cross-industry collaboration, supply chain linkages, and horticulture's human resource capacity are expected to impact on the continuing viability of the Australian horticultural industries over the next 5-10 years.

Interview respondents suggested that the combined industry should focus on:

- Developing cross-commodity collaboration and cooperation at the national level
- Working with government to address key issues, such as market access and environmental sustainability
- Remaining globally competitive
- Developing greater linkages with R&D providers
- Strategically development of industry's R, D & E capacity
- Environmental management R, D & E initiatives
- Development of effective communication/information systems
- Quality assurance
- Labour issues (encouraging new entrants and improving employment conditions)
- Marketing, with a focus on market access and market development
- Development of competitive supply chains
- Pest & disease issues
- Addressing gender imbalance at the policy and governance level

These suggestions, if implemented, would go a long way towards addressing the industry development needs described in the literature:

- The Australian horticulture industry generally functions as separate commodity and/or regional groupings with little coordinated national focus and few linkages across the supply chain
- The combined industry needs to work with government to address market access and other key issues
- In order to survive and remain globally competitive, the horticulture industry needs focus on meeting consumer requirements
- At the global level, consumers are increasingly concerned with the integrity of food products and production practices, therefore the industry will increasingly need to demonstrate a high level of environmental accountability
- The quality of environmental and economic information across horticulture is often poor
- Effective and wide uptake of complex techniques and technologies will only occur where close cooperation exists between government institutions, farmers organizations and individual industry members
- The industry needs to work more closely with R, D & E providers and other key stakeholders
- School leavers increasingly view horticulture as an unattractive career option

- Investment in the development of horticulture's human resource pool, including researchers and advisors, will maximise the opportunities and technology adoption outcomes arising from R&D investment
- There is a need to support the professional development of women and current/ future industry leaders and managers
- Industry members need to become more effective "business managers" and they would benefit from services/initiatives that increase knowledge of and capacity to effectively participate in global markets

7. AusHort Investment to Date

The AusHort R&D Committee was formed in 1998 to facilitate multiple-industry R&D, leading to:

- The conduct of important R&D that would otherwise not be undertaken by individual industries
- Wide benefits to horticulture for minimum investment by individual industries
- Industry collaboration through identification of, and addressing, common R&D for horticulture

As detailed in Appendix 3, the AusHort portfolio comprises the following programs:

- Market Requirements and Opportunities
- Production
- Product to End-User
- Industry Development Services

The aim of the **Market Requirements and Opportunities** program is to “better understand markets and consumers, to define market opportunities, improve industry competitiveness and match products to marketplace requirements”. Within the program, activities are focused on:

- Whole-of-market identification, investigation & evaluation
 - Export – market access
 - Export – determining potential
 - Trends in food consumption
- Understanding end users
 - Consumer research
 - End-user profiling

The aim of the **Production** program is to meet market, industry, community and other stakeholder needs by “providing innovative, profitable, efficient, market-driven production balanced with sustainable resource management”, including on- and off-farm production. Activities fall into the following areas:

- Production efficiency
 - Sustainable pest and disease management
 - Quarantine incursions
- Natural resource management
 - Environmental audit
 - Chemical, soil and water management

Within the **Product to End-User** program, the aim is “to develop efficient, cost effective, safe, environmentally sustainable, integrated marketing and supply systems for products from harvest to end-user”. Activities are focused in the areas of:

- Quality supply systems
 - Common-based quality assurance system
 - Irradiation
- Marketing systems
 - Quarantine market access
 - Non-quarantine trade issues

Within the **Industry Development Services** program, AusHort has focused activities in two key areas:

1. Planning & Strategy Development
2. Adoption of R&D Outcomes

“Planning & Strategy Development” activities has included the development and use of dynamic plans and strategies to advance horticulture. Specifically, AusHort have focussed on:

- The establishment and maintenance of a structure and systems to development and implement *strategies to deal with unforeseen specific pest or disease threats* to horticultural industries
- The development of *contingency plans to deal with specific horticultural emergencies*, such as product recalls and public health threats
- The establishment and implementation of a structure to ensure horticultural industries have appropriate *discussion and then input into relevant national and international forums*, such as WTO negotiations

The **Adoption of R&D Outcomes** sub-program was developed “to promote the adoption of R&D outcomes through management of information, development of technology adoption strategies and effective and appropriate networks”. This has been achieved by ensuring that all projects supported and managed by the AusHort R&D Committee have appropriate strategies to maximise technology transfer and adoption.

On an ad-hoc basis, AusHort's “Industry Development Services” program has also supported a number of other industry development initiatives over the past 5 years. These include support for:

- Future development of women in horticulture through the WinHort program
- Improved labelling of pesticides to encourage optimum use in horticultural crops
- Conferences, workshops and field days
- Training activities, including Monash's Produce Executive Program
- Study tours
- Other professional development activities
- General communications, such as publications and Websites

8. Discussion of AusHort Investment Strategy – Including General Recommendations to AusHort

The current AusHort investment strategy needs to be considered in light of the literature review and industry consultation outcomes. As discussed in Chapter 6, the industry consultation findings largely corresponded to the literature review results. Key recommendations for AusHort arising from the industry consultation process were:

1. Support environmental management R,D&E
2. Ensure horticultural interests are effectively represented at relevant national and international forums
3. Support market access initiatives
4. Support market development activities
5. Facilitate cross-industry communication, cooperation and collaboration
6. Facilitate communications through the development of whole-of-industry information products and services
7. Perform PR activities on behalf of the combined industry
8. Develop strategies to deal with key concerns (biosecurity, plant protection, market failure, OH&S, etc)
9. Support business management skills development
10. Develop and support systems for provision of technical advice
11. Support the professional development of women in horticulture
12. Support training generally
13. Support leadership skills development
14. Conduct market research for benefit of combined industry
15. Encourage new entrants to the industry
16. Support initiatives that assist industry members to manage change (e.g. successional planning activities)
17. Provide industry development support to new and emerging industries

8.1 Environmental management R,D&E activities

The current AusHort Strategic Plan, through the Natural Resource Management subprogram, provides for determination of “current and possible future environmental issues, their relative importance and likely impact on horticultural industries”, leading to the development of “strategic recommendations for consideration by industries”. AusHort’s Production Efficiency subprogram provides for “the development and implementation of strategies (eg labelling, registration etc) that will ensure horticultural industries: maintain access to appropriate chemicals; and/or develop non-chemical alternative products and practices”.

Neither subprogram provides support for general cross-industry environmental research, development and extension initiatives. However, as a group, interview participants strongly recommended that AusHort support these types of initiatives (recommendation 1). Some participants described a need for the development of general environmentally sustainable techniques and technologies that can be tailored to meet the needs of specific industries or regions. Others described a need for a cross-industry extension program for environmental management, developed in collaboration with industry.

In light of the industry consultation findings, it is recommended that AusHort extend the scope of its Production program activities to cover support for general cross-industry environmental R,D&E initiatives, as well as maintaining support for strategic activities.

8.2 Industry input into policy and debate

Within AusHort's Planning & Strategy Development subprogram, provision is made for "industry input into policy and debate". To date, AusHort have established and implemented a structure "to ensure horticultural industries have appropriate discussion and then input into relevant national and international forums (e.g. World Trade Organisation negotiations)". As summarised in recommendation 2, interview participants expressed a strong need for ongoing support of such of initiatives. Therefore, it is strongly recommended that AusHort continue to facilitate industry input into policy and debate. However, as a first priority, the existing structure should be formally evaluated to determine whether it would continue to meet industry needs into the future. It is anticipated that minor, and in some cases major, refinements will be needed to ensure the ongoing relevance of the existing structure.

8.3 Marketing activities

Recommendations 3, 4 and 14 are covered within AusHort's existing Market Requirements and Opportunities program. The aims of the program are to:

- Identify, investigate and evaluate market requirements and opportunities for better business decisions
- Identify, investigate and evaluate specific needs of end-users, to better match products and services to consumer requirements

Again, based on the industry consultation findings, it is recommended that support for these types of marketing activities be ongoing. Summing up a number of key issues, one interview participant made the following recommendations:

"To expand our export markets, AusHort should support:

- A) Targeted market access activity to gain entry to overseas markets and reduction of protection mechanisms unrelated to pest or disease concerns*
- B) Activities to identify the current preferred varieties for each horticultural industry in each overseas market*
- C) Identifying the likely trends to desired new varieties*
- D) Identifying the best market window in each market*
- E) The development of an industry market plan for each market – incorporating input from the peak industry body, HAL and exporters to determine the following:*
 - a. The preferred volumes to target to each market based on historical data of supplies and that relationship with profitable returns to growers*
 - b. Agree on the class of fruit/product and count sizes for each market*
 - c. Agree on a minimum maturity standard for each market*
 - d. Agree on a standard carton weight*
 - e. Agree on enforceable sanctions to be imposed on any who break the agreed terms of the plan that they were involved in developing*
 - f. Agree on an overriding identifying brand on Australian produce to link with exporters' individual brands"*

8.4 Cross-industry cooperation and collaboration

In general, the Australian horticultural industry functions as separate commodity and/or regional groupings that lack a coordinated national focus. Typically, there is also little cross-sector cooperation or communication across the supply chain. Therefore, it is not surprising that interview participants strongly emphasised the need for enhanced communication, cooperation and collaboration across the Australian horticulture industry (recommendation 5). Interestingly, the current AusHort strategic plan does not specifically address the issue of industry segmentation. Therefore, based on both the industry feedback and literature review results, it is strongly recommended that AusHort's Industry Development Services program be extended to cover support for initiatives that facilitate cross-industry collaboration and cooperation and build linkages across the supply chain.

The industry consultation findings suggest that AusHort should facilitate cross-industry communication, collaboration and cooperation by supporting the development of formal and informal networks and systems, including forums. Specific stakeholder recommendations to AusHort include:

AusHort should invest in coordinating a forum for development activities that impact on 50% or more of the participating industry groups, such as market development. An integrated approach is needed.

AusHort should promote sharing between industries at a higher level. People don't know what's going on in other industries. We can reduce costs by working with others. AusHort should foster this. They have mostly focused on quarantine issues in the past, but they've ignored people issues.

AusHort should support activities where there's broad base support. They need to provide leadership to develop synergies and bring industries together.

AusHort needs to get all industries together to bounce ideas off each other.

AusHort need to fund some forums to bring all the players together, so everyone is talking the same language. The industry needs a mechanism to develop that ownership.

AusHort should work on how the industry can work together for common good. They should investigate how the wine industry works and see how that model can be applied to other industries.

8.5 Education and training initiatives

Interview participants strongly emphasised the need for general, cross-industry education and training initiatives (recommendation 12, 16). They described a specific need for skills development in the areas of business management, marketing and leadership (recommendations 9, 13) and for activities to support the professional development of women in horticulture (recommendation 11).

While broad-based education and training activities are not outlined specifically in the current AusHort Strategic Plan, a number of education and training initiatives have been supported by AusHort's Industry Development Services program. To date, initiatives have been funded in the following areas: business management; farm management; leadership; successional planning; personal development; and professional development. These initiatives include training activities, study tours and conferences.

Through the WinHort project, AusHort has supported the skills development of women with the aim of encouraging greater participation in industry activities, particularly industry decision making. Such initiatives are needed to address the significant issue of gender imbalance. At present, the average level of female participation at the Peak Industry Body Board level and in R&D Committees is around 7% of total participation. Therefore, it is strongly recommended that funding for the WinHort program be ongoing.

More generally, it is recommended that support for training and education activities be continued in keeping with the stakeholder suggestions. It is also recommended that support for these activities be formally recognised within the next AusHort Strategic Plan.

8.6 Whole-of-industry information products and services

Interview participants recommended that AusHort facilitate communications through the development of effective whole-of-industry information products and services (recommendation 6). They also suggested that AusHort should be involved in developing and supporting systems for provision of technical advice, as an adjunct to Horticulture Australia's existing industry development officer networks (recommendation 10).

Specific comments from the interviews included:

AusHort should focus on information gathering, assessment and provision. Industry members need the right information to be an efficient operator. They should invest in people to help the industry decipher information (this is the point of the IDO network). Specialists are needed in the areas of water, marketing etc, because the IDOs can't always address specific issues.

AusHort need to provide ongoing funding for technical officers in each of the states. The industries themselves can't afford this. The assistance should be in the form of independent funding to different state bodies to supply technical advice. At present, tight budgets mean that individual members don't get their benefits.

AusHort needs ensure outcomes are taken up, by making sure sufficient resources are given to communications. IDOs and IDMs are doing lots of stuff, but we need someone to bring it together so we can all benefit... If these things were all resourced centrally, we could all benefit, e.g. a database for pest and disease management. We might need information, such as "where do you go for a good consultant". We need a database. AusHort should place an emphasis on getting things actually utilised. Most of the time, this takes more time and effort and money. We see little out of the AusHort program regarding this. They need to address the issue if we want change.

More advice is needed for people who want to export their plants. Industry members don't know where to go for advice. They need technical advice. The states don't want to know about some problems in exporting.

Traditional agricultural research has been funded before. Now much more funding is needed for dissemination of the results. A centralised information system is needed so people don't get confused.

To date, AusHort has funded only limited initiatives in this area, most with a focus on scoping and strategic planning, rather than implementation:

AH00022	A strategy for horticulture to best capture, store and make available relevant information on environmental management
AH00025	AusHort R&D program communication strategy
AH00026	Statistical scoping study for the Australian horticultural industries
AH01028	Horticulture gene technology communication package
AH02010	Fruit and vegetable market monitor
AH02014	Second stage of information scoping study for Australian horticulture

In the interviews, the development of effective communication/information systems emerged as one of the top 10 priority actions for the combined industry (Table 4). Development of such systems would help to counterbalance the ongoing reduction in Australia's horticultural extension capacity – one of the key issues expected to impact on future industry development over the next decade (Table 2). In light of this, it is recommended that AusHort give serious consideration to funding specific information and communication activities. Appropriate investment in this area would be expected to significantly increase the adoption of R&D outcomes.

8.7 New and emerging industries

In the interviews, a number of stakeholders recommended that AusHort provide industry development support to new and emerging industries (recommendation 17). To date, the AusHort R&D Committee has not supported initiatives in this area. However, new and emerging industries have been able to access industry development support through Horticulture Australia, through the provision made for Voluntary Contributions. In addition, new and emerging industries (eg the lychee and longan industries) have been able to access Commonwealth funding through the Rural Industries Research and Development Corporation (RIRDC). For the time being, it is recommended that, unless otherwise determined by the AusHort R&D Committee, no additional provisions be made in this area.

8.8 Key industry concerns

A common theme emerging from the interviews was the need for AusHort to take a lead role in scoping key industry concerns, leading to the development of integrated strategies to address those concerns (recommendation 8). To date, AusHort has been fairly active in this area, across all programs and subprograms. Initiatives falling into this category include:

- AH01034 Methyl bromide usage and alternatives for disinfestation of exported Australian fresh produce (*Sustainable Pest & Disease Management subprogram*)
- AH99007 Addressing quality management and food safety issues in horticultural industries (*Quality Supply Systems subprogram*)
- AH99012 Needs analysis of Codex issues as they relate to horticulture (*Marketing Systems subprogram*)
- AH99013 Worker exposure to endosulfan in the Australian horticultural industries (*Natural Resource Management subprogram*)

One of the benefits of the AusHort program is that it provides horticulture with a mechanism for funding of strategic, cross-industry initiatives. Through AusHort, the combined industry is able to conduct important strategic activities that would not otherwise be undertaken by individual industries, offering wide benefits to horticulture for minimum investment by individual industries. Over the next decade, such activities will be crucial to the future prosperity of the industry. For this reason, it is strongly recommended that AusHort continue to support broad-based scoping and strategy development activities.

8.9 Public relations activities

A number of interview participants suggested that AusHort should play a role in promoting the combined industry (recommendation 7):

AusHort should take on a public relations role [for the industry as a whole], targeting government and the consumer.

AusHort should make the Australian public more aware of where their food is coming from. They don't know the difference between conventional and organic farming, e.g. what they mean to the environment. A public education campaign is needed.

I'd like to see AusHort more involved in building the international image of horticulture. They should provide a front for the horticulture industry. Our heavy state-focus is very confusing from an international point of view. From a business point of view, we don't want to work that way. We need to be seen as well organised. We need to hide the complexity between states. Individual states don't have the charter to take an international perspective.

There's not enough promotion of our product. New Zealand do this very well. We aren't as good at promotion.

To date, AusHort has not supported initiatives in this area. However, it is recommended that funding for general public relations activities be considered, as a lower-level priority, with a view to evaluating the success or otherwise of whole-of-industry promotional activities. Should such activities demonstrate significant cross-industry benefits, a higher level of support would be recommended.

9. Recommendations for AusHort’s “Industry Development Services” Program

The aim of AusHort’s Industry Development Services program is to support cross-sector activities that improve the prosperity and future viability of the Australian horticulture industry, focusing on the achievement of sustainable economic, social and environmental outcomes.

It is recommended that future Industry Development Activities focus on the following themes:

- Planning & Strategy Development
- Adoption of R&D Outcomes
- Professional Development
- Facilitating Networks and Linkages

Planning & Strategy Development

Issue	Recommendation	Priority
Unforeseen pest or disease threats	Assess, finetune and maintain existing structures and systems to develop and implement strategies to deal with unforeseen pest or disease threats to horticultural industries	1
Other horticultural emergencies	Assess and finetune existing contingency plans (including strategies, management structures, funding etc) to deal with specific horticultural emergencies (product recalls, public health threat etc)	2
Industry input into policy and debate	Assess, finetune and maintain a structure to ensure horticultural industries have appropriate discussion and input into relevant national and international forums, such as WTO agriculture	1
Understanding key industry concerns	Identify, investigate and evaluate options for the combined industry to address key industry concerns (biosecurity, market failure, occupational health & safety etc)	2
Addressing key industry concerns	Develop and implement effective strategies to address key industry concerns (biosecurity, market failure, occupational health & safety etc)	2

Adoption of R&D Outcomes

Issue	Issue Description	Priority
Technology transfer plans	Ensure that all projects supported and managed by the AusHort R&D Committee have appropriate strategies to maximise technology transfer outcomes	1
Adoption of environmentally sustainable practices and systems	<ul style="list-style-type: none"> • ensure that all future environmental programs include clear, simple cost/benefit analyses and that profit opportunities are highlighted • develop an improved environmental information gathering and communication network for use at all levels of Australian horticulture • lobby governments to develop financial incentives for the adoption of good environmental management practices • develop specific initiatives to encourage adoption of environmentally sustainable practices (field days, demonstration plots etc) 	<p>1</p> <p>2</p> <p>2</p> <p>1</p>
Adoption of other R&D outcomes	<p>Maximise adoption of other R&D outcomes by supporting the development of:</p> <ul style="list-style-type: none"> • whole-of-industry information products and services • systems for provision of technical advice (to support HAL's existing industry development officer network) 	<p>1</p> <p>1</p>

Professional Development

Issue	Issue Description	Priority
Education and training	<p>Support education and training activities that foster the professional development of industry members at all levels (producers and other supply chain participants; research and development staff; peak industry body staff) with a specific focus on:</p> <ul style="list-style-type: none"> • business management • marketing • technological innovation • successional planning • leadership • women's participation 	1
Availability of labour	<ul style="list-style-type: none"> • Support initiatives that encourage new entrants to the industry • Develop a national awards system for horticulture (as a means of promoting and rewarding professionalism, and increasing labour retention rates) 	2 3
Supply chain development	Support individuals and groups to increase their supply chain participation skills by increasing participant's awareness, knowledge and adoption of innovative supply chain technologies and management practices	2

Facilitating Cross-Industry Networks and Linkages

Issue	Issue Description	Priority
Networks and linkages	Support activities that foster the development of collaborative linkages and networks at all levels of horticulture	1
	Facilitate the development of multi-partner collaborations that bring together research, development and extension to address key industry concerns, leading to the development of competitive, whole-of-industry systems	2
	Build linkages with government, consumers and the community through the development and delivery of integrated public relations campaigns that promote the successes and achievements of the combined horticulture industry	2
New entrants to the industry	Encourage new entrants to the industry by:	2
	<ul style="list-style-type: none"> • Promoting the industry as an interesting and rewarding place to work 	2
	<ul style="list-style-type: none"> • Supporting the development of a more favourable awards structure that encourages and rewards professionalism 	3

APPENDIX 1: Interview Questionnaire

Industry Development Scoping Study Questionnaire

Interviewer:

Date:

Name:

Position:

Organisation:

Thanks very much for agreeing to help us with this brief industry development questionnaire. Your assistance is greatly appreciated!

These interviews are being conducted as part of an AusHort-funded "Industry development scoping study". As you're probably aware, the AusHort program was initiated in 1998 to address **cross-horticultural** industry research & development issues. The range of projects that have been funded to date includes a general audit of horticultural production and sustainability, and an examination of worker exposure to endosulfan in the horticultural industries.

The aim of this interview process is to **scope priorities for future investment in broader horticultural industry development**, that is, we would like to identify a **range of industry development activities that are relevant across at least several horticultural industries**. Focused, commodity-specific industry development activities are considered to be the domain of the specific Industry Advisory Committees and the peak industry bodies.

For the purpose of this study, we consider industry development to encompass a broad range of activities, leading to improved economic, environmental and social outcomes for the industry.

- 1) What do you see as the **major issues** that will impact on the future development of the Australian horticultural industries over the next 5-10 years?
- 2) How should **these issues** be addressed to ensure the continuing viability of the Australian horticultural industries? That is, what will the combined industry need to focus on in coming years.
- 3) What type(s) of industry development activities would you like to see supported by the AusHort R&D committee?

APPENDIX 2: List of Survey Participants

Participant	Company/ Affiliation
Abraham, Libby	Horticulture Australia Limited, AusHort R&D Committee
Anderson, Alison	New South Wales Farmers
Beardsell, David	Department of Natural Resources and Environment (Victoria)
Beer, Michelle	Gascoyne Development Commission
Bennett, Chris	Australian Almond Growers Association
Bonnardeaux, John	Department of Agriculture Western Australia
Brunswick-Hullock, Chris	Department of Primary Industries Water and Environment (Tasmania)
Buchanan, Greg	Agriculture Victoria
Burt, John	Department of Agriculture Western Australia
Chin, Robert	Nursery & Garden Industry Victoria
Comiskey, Shane	Queensland Fruit and Vegetable Growers
DeVos, Richard	Nursery & Garden Industry Australia, AusHort R&D Committee
Diczbalis, Yan	Department of Primary Industries (Queensland)
Drinnan, James	Department of Primary Industries (Queensland)
Durham, Jon	Australian Apple and Pear Growers Association Inc., AusHort R&D Committee
Dyer, Tim	Australian Processing Tomato Council, AusHort R&D Committee
Eagle, Neil	Australian Citrus Growers Incorporated, AusHort R&D Committee
Eccles, Jonathan	Horticulture Australia Limited
Fabian, Rudi	Nursery and Garden Industry NSW and ACT
Fulton, Amabel	Rural Development Services (Tasmania)
Gollnow, Bettina	New South Wales Agriculture
Hart, Ray	Department of Primary Industries Water and Environment (Tasmania)
Haugretter, Hilary	Nursery and Garden Industry Tasmania
Hawkett, Brian	Key Centre for Polymer Colloids, Sydney
Heanes, Dennis	Primary Industries and Resources South Australia
Hine, David	Queensland Fruit and Vegetable Growers
Holmes, Rowland	Department of Primary Industries (Queensland)
Howell, Greg	New South Wales Agriculture
Irish, Annette	Australian Institute of Horticulture, Annette's Irish Management Services
Jarosz, Nathalie	Australian Citrus Growers Incorporated
Jones, Kim	Australian Macadamia Society
Kenzie, Stephen	Australian Walnut Industry Association
Keskula, Edda	Nursery and Garden Industry NSW and ACT
King, Arno	Australian Institute of Horticulture, Arno King Landscape Architects
Mann, Liz	Australian Processing Tomato Research Council Inc
Martin, Emily	Australian Melon Association
McCarthy, Alec	Department of Agriculture Western Australia
McGowan, Cathy	WinHort, Catherine McGowan Consulting
McMullen, Bernie	New South Wales Agriculture
Meiburg, Geraldine	Queensland Flower Growers Association
Metcalf, Dean	Department of Primary Industries Water & Environment (Tasmania)

Moorhead, Merv	Moorhead and Rutter
Morrish, Peter	Murray Valley Citrus Marketing Board
Panitz, Mark	Queensland Fruit and Vegetable Growers, AusHort R&D Committee
Parlevliet, Gerry	Department of Agriculture Western Australia
Pate, Sandy	Nursery and Garden Industry Western Australia
Pearce, Andrew	Australian Macadamia Society, AusHort R&D Committee
Plant, Paul	Queensland Association of Landscape Industries Inc
Portman, Tony	Department of Agriculture Western Australia
Robilliard, James	Nursery and Garden Industry Western Australia
Ross, Maureen	Ross Roses
Ryan, Dan	Horticulture Australia Limited
Sherwood, Alicia	Nursery and Garden Industry Queensland
Sparrow, Leigh	Horticulture Australia Limited
Steinhauser, Anna	Tasmanian Stonefruit Association Inc
Sweeney, Susan	Primary Industries and Resources South Australia
Thiel, Kim	Cherry Growers of South Australia
Top, Murat	Department of National Resources and Environment
Tyas, John	Horticulture Australia Limited
Van Essen, Ashley	Botanical Resources Australia
Walters, Leigh	Australian Potato Industry
Watters, Philip	Australian Almond Growers Association

APPENDIX 3: AusHort Strategic Plan 1999-2003

AusHort STRATEGIC PLAN, 1999 - 2003

[Introduction](#)

[What are the roles and responsibilities of the AusHort R&D Committee?](#)

[How does the AusHort R&D Committee operate?](#)

[How to become involved in implementing the AusHort R&D program?](#)

[How are multi-industry R&D projects funded?](#)

[What are the benefits for industry?](#)

[Market requirements and opportunities](#)

[Understanding end users](#)

[Product development](#)

[Production](#)

[Natural resource management](#)

[Industry development services](#)

[Adoption of R&D outcomes](#)

[Product to end user](#)

[Participants](#)

Introduction

The Horticultural Research and Development Corporation (HRDC) is identifying more and more research and development (R&D) opportunities that affect multiple horticultural industries. In addition the Corporation faces an increased demand from industry to manage and coordinate multiple industry R&D. Until now, there has not been an efficient mechanism to initiate, review and fund multiple industry R&D programs. HRDC and industry has now put in place a mechanism to facilitate multiple industry R&D through the formation of the AusHort R&D Committee. This Committee is comprised of industry nominated leaders from the major industry groups who are partners with the HRDC. The Committee members represent their own and other related horticultural industries.

What are the roles and responsibilities of the AusHort R&D Committee?

- Develop an AusHort Strategic Plan.
- Recommend to the HRDC Board multi-industry R&D projects based on the Strategic Plan.
- Assist the HRDC to communicate to the wider horticultural industry the benefit of multi industry R&D initiatives.
- Liaise with the horticultural industries the Committee members represent on multi industry R&D issues.

How does the AusHort R&D Committee operate?

- Focuses on project commissioning based on priorities in the Strategic Plan to ensure that immediate R&D issues are addressed.
- Considers multi industry R&D issues relevant to horticulture.

How to become involved in implementing the AusHort R&D program?

- Generally, AusHort R&D projects will be advertised in 'The Weekend Australian' and submissions are to be in line with advertised specifications.
- Communicating to the AusHort R&D Committee relevant multi industry issues by directly contacting HRDC.

How are multi-industry R&D projects funded?

- The AusHort R&D Committee determine the annual funding requirement based on new projects to be commissioned and existing project commitments.
- All statutory levied horticultural industries and major voluntary contributor industries have agreed to support the AusHort R&D Program.

What are the benefits for industry?

- The conduct of important R&D that would otherwise not be undertaken by individual industries.
- Wide benefits to horticulture for minimum investment by individual industries.
- Industry collaboration through identification of, and addressing, common R&D for horticulture.

Market requirements and opportunities

To better understand markets and consumers, to define market opportunities, improve industry competitiveness and match products to marketplace requirements.

Whole of market identification, investigation & evaluation

To identify investigate and evaluate market requirements and opportunities for better business decisions.

Issue	Issue description
Export - market access	Identify the technical market access barriers in relation to horticultural produce for targeted overseas markets; and then develop strategies to overcome those barriers.
Trends in food consumption	Identify and analyse current and developing trends in food consumption to determine their likely implications for, and impact on, horticultural industries.
Export - determining potential	Conduct investigations and analyses to determine opportunities for Australian horticultural exports. Including, but not limited to, criteria where Australia may have a competitive advantage (such as price, access, varieties or seasonality).

Understanding end users

To identify, investigate and evaluate the specific needs of end users to better match products and services to consumer requirements.

Issue	Issue description
Consumer research	Conduct consumer research into consumption, usage, attitudes and trends across all fruits and vegetables. Analyse the results, determine the implications and provide strategic recommendations for horticultural industries.
End use profile	Develop a comprehensive profile (including volume, % share, value and trends) of horticultural product end-use. For example, fresh and processed, consumer and food service, and domestic and export

Production

Market, industry, community and other stakeholder needs will be met by providing innovative, profitable, efficient, market driven production balanced with sustainable natural resource management. It will include on and off farm production

Production efficiency

Most appropriate and efficient production systems meeting market requirements.

Issue	Issue description
Sustainable pest and disease management	Develop and implement strategies (eg labelling, registration etc) that will ensure horticultural industries: <ul style="list-style-type: none">• Maintain access to appropriate chemicals and/or• Develop non-chemical alternative products and practices.
Quarantine incursions	Identify and rank the major quarantine incursion threats, determine the likely impact each one may have on horticultural industries, and develop plans to manage such incursions.

Natural resource management

Production systems that improve, manage and maintain the soil, water, air, flora and fauna.

Issue	Issue description
Environmental audit	Determine current and possible future environmental issues, their relative importance and likely impact on horticultural industries. Provide strategic recommendations for consideration by industries.
Chemical, soil and water	Develop strategies to manage the issues associated with on-farm chemical use. This should include understanding, and where necessary, responding to consumer attitudes/perceptions.

Industry development services

To foster a progressive and informed horticultural industry through the facilitation of:
Technology adoption strategies
Information management
Unity within and cohesion between industry sectors
Development of people, a knowledge of culture and networks

Planning & Strategy Development

To support industry in the development and use of dynamic plans and strategies which will advance horticulture.

Issue	Issue description
Specific issue R&D	Establish and maintain a structure and systems to develop and implement strategies to deal with unforeseen specific pest or disease threats to horticultural industries. (eg ash white fly).
Horticultural Emergency Management Plan	Develop contingency plans (including strategies, management structure, funding etc) to deal with specific horticultural emergencies (such as product recalls, quarantine incursions, public health threat etc).
Industry input into policy and debate	Establish and implement a structure to ensure horticultural industries have appropriate discussion and then input into relevant national and international forums (eg World Trade Organisation negotiations).

Adoption of R&D outcomes

To promote the adoption of R&D outcomes through management of information, development of technology adoption strategies and effective and appropriate networks.

Issue	Issue description
Technology transfer plans	Ensure that all projects supported and managed by the AusHort R&D Committee have appropriate strategies to maximise technology transfer and adoption.

Product to end user

To develop efficient, cost effective, safe, environmentally sustainable, integrated marketing and supply systems for products from harvest to end use.

Quality supply systems

To research and develop environmentally sustainable, reliable integrated supply systems that improve efficiency and quality of delivery of product to the end user.

Issue	Issue description
Common based quality assurance system	Support the development of a single Hazard Analysis Critical Control Point based quality assurance system for horticultural products.
Irradiation	Investigate government and consumer attitudes (and determine barriers) to the use of irradiation by horticultural industries. Also, determine what further technical research or study is needed for industries to make use of the technology. Then, develop recommendations on the introduction of this technology.

Marketing Systems

An innovative approach to marketing systems and impediments to trade. To investigate impediments to trade (including general restraints to market access) and undertake quarantine related R&D initiatives.

Issue	Issue description
Quarantine market access	Support specific R&D (eg. Fruit fly, codling moth) activity that will enable new or improved access for horticultural produce to international markets.
Non-quarantine trade issues	Identify the non-quarantine issues (eg. tariffs, pesticide residues, Codex Alimentarius Commission) which are impediments to trade and generate appropriate information to enable negotiation. Then where appropriate, develop and implement strategies to overcome the barriers.

Participants

Vegetables and Other Crops	
<i>Representatives</i>	Representing
Silvio Favero, AUSVEG	Vegetables
Ian Rickuss, Australian Potato Industry Council	Fresh and processed potatoes
Tim Dyer, Australian Processing Tomato Industry Council	Processed tomatoes
Group 2: Temperate Fruit	
<i>Representatives</i>	Representing
Robert Armstrong, Australian Fresh Stonefruit Growers of Australia	Fresh stonefruit and canned fruit
Jon Durham, Australian Apple and Pear Growers Association Incorporated	Apples and pears, and nashi
Rod Lewis, Strawberries Australia	Strawberries and cherries
Group 3: Citrus and Tropical Fruits	
<i>Representatives</i>	Representing
Neil Eagle, Australian Citrus Growers Incorporated	Citrus
Mark Panitz, Queensland Fruit and Vegetable Growers	Fresh tomatoes, melons, mangoes, pawpaw, bananas and pineapples
Andrew Pearce, Australian Macadamia Society	Avocadoes, macadamias and custard apples
Group 4: Nursery and Cut Flowers	
<i>Representative</i>	Representing
Jolyon Burnett, Nursery Industry Association of Australia	Nursery
Group 5: Nuts	
<i>Representative</i>	Representing
Peter Freeman, Australian Almond Growers Association	Almond and chestnut
Other participants	
Mark Napper, Australian Horticultural Corporation	
Lindy Hyam, Horticultural Research and Development Corporation	
Les Baxter, Horticultural Research and Development Corporation	
Libby Abraham, Horticultural Research and Development Corporation	

Facilitators

Richard de Vos and Karin Richard, Richard Strategic Services

REFERENCES

1. Abel, N., Ross, H., Herbert, A., Manning, M. Walker, P. and Wheeler, H. (1998). Mental models and communication in agriculture. *Rural Industries Research and Development Corporation Publication No. 98/140*.
2. Anderson (2002). Understanding the elements and adoption of environmental best practice in horticulture. *Horticultural Research and Development Corporation Publication AH00018*.
3. Australian Bureau of Agricultural and Resource Economics (2000). Australian Horticulture in the Global Environment. *Horticultural Research and Development Corporation and Australian Horticultural Corporation, Canberra, ACT*.
4. Australian Horticultural Corporation and Horticultural Research and Development Corporation (2000). WinHort program - In - *HortLink*, Summer 2000, p. 7.
5. Bagnara, G.L., Zampagna, A. and Casadei, G. (2000). Competitive analysis of cooperative enterprises in horticulture. *Rivista di Frutticoltura e di Ortofloricoltura* 62(3): 55-59.
6. Beckingham, C. (1997). Strategies for horticulture industry development. *Proceedings of the National Field Days Seminar*, 12-14 November 1996, Orange, N.S.W., pp. 60-63.
7. Black, A.W. and Reeve, I.J. (1998). The impact of farmers' participation in home study programs, local groups and wider information networks on the adoption of sustainable farming systems in the grains industry. *Rural Industries Research and Development Corporation Publication UNE-40A*.
8. Broadhead, R. (2003-). Riverlink postgraduate research training network. *Current research by Horticulture Australia Limited, as listed on the ARRIP database, Record no. HRDC00348*.
9. Bunt, C. and Piccone, M. (2002). Supply chain management in the Australian banana industry – a case study. *Acta Horticulturae* 575: 433-435.
10. Cape, J., Chamala, S. and Syme, G. (1994). National program for irrigation R&D: technology transfer and adoption in irrigation. *Occasional Paper No. 03/94, The Land and Water Resources Research and Development Corporation*.
11. Chapman-Novakofski, K. and Boeckner, L.S. (1997). Evaluating evaluation – what we've learned. *Journal of Extension*, February 35(1).
12. Chase, J. (2003-). Riverland horticultural training facilitator. *Current research by Horticulture Australia Limited, as listed on the ARRIP database, Record no. HRDC00381*.
13. Christiansen, I. and Hunt, R. (2000). Research, extension and industry - working together can achieve results. *Marine Pollution Bulletin* 41(7): 310-318.
14. Cook, T. (2000). Development of the Australian nursery industry into the 21st century. *Horticulture Australia Limited Project No. NY99037*.
15. Dabrowski, Z.T. (2001). Indices and criteria used in the evaluation of integrated pest management programmes. *Progress in Plant Protection* 41(1): 77-87.
16. De Vos, R. and Richard, K. (1995). Fresh potato industry technology transfer: needs and assessment and strategic recommendations. *Horticultural Research and Development Corporation Publication PT 452*.

17. Dimopoulos, M. and Sheridan, M. (2000). Missed opportunities: unlocking the future of women in Australian agriculture. *Rural Industries Research and Development Corporation Publication No. 00/44*.
18. Elsey, B. and Sirichoti, K. (2001). The adoption of integrated pest management (IPM) by tropical fruit growers in Thailand as an example of change management theory and practice. *Integrated Pest Management Reviews* 6(1): 1-14.
19. Emergency Management Australia: Hazards, Disasters and Survival: A Booklet for Students and the Community, <http://www.csu.edu.au/faculty/health/aemf/HDS/contents.htm>, viewed April 10, 2003.
20. Fulton, A., Clowes, A., Fulton, D., Tabart, T., Ball, P. Champion, S. and Weatherley, J. Opportunities for RD&E to foster the development of human capacity in Australian agriculture. *Rural Industries Research and Development Corporation Publication* (unpublished).
21. Grains Research and Development Corporation: GRDC Investment Plan, 2003-04, http://www.grdc.com.au/researchers/docs/Investment_Plan_03_04.pdf, viewed April 10, 2003.
22. Hooper, S., Martin, P., Love, G. and Fisher, B.S. (2002). 'Get big or get out': is this mantra still appropriate for the new century? *Australian Bureau of Agricultural and Resource Economics Conference Paper* 02.12.
23. Horticulture Australia: AusHort Strategic Plan, 1999-2003, <http://www.horticulture.com.au/aboutus/strategy.cfm>, viewed April 10, 2003.
24. Jones, J.F. (2001). Training for rural development: a community impact study. *Regional Development Dialogue* 22(1): 138-149.
25. Keen, M. and Stocklmayer, S. (1999). Communicating research: an overview of communication efforts of rural industry research funding bodies. *Rural Industries Research and Development Corporation Publication* 99/54.
26. Kennedy, P. (2000). Acid soils tackled, research skills enhanced. *Australian Sugarcane*, February, 6(3): 19-20.
27. Lane, V., Dahler, J. and Fletcher, T. (2002). A strategy for horticulture to best capture, store and make available relevant information on environmental management. *Horticulture Australia Limited Project No. AH0002*.
28. Lindsay, S.J. (2002). Improving the banana industry's business management skills through futureprofit workshops. *Research by Horticulture Australia Limited, as listed on the ARRIP database, Record no. HRDC00297*.
29. MacArthur Agribusiness and Sinclair Knight Merz (2001). Horticulture: Productivity and Sustainability. *HRDC and the National Land and Water Resources Audit*, Commonwealth of Australia, Canberra, ACT.
30. Marsh, S.P. and Pannell, D.J. (2000). Agricultural extension policy in Australia: the good, the bad and the misguided. *The Australian Journal of Agricultural and Resource Economics* 44(4): 605-627.
31. Milstein, D. (2001). 'Future Focus' a self-assessment tool for training in horticulture. *Research by Horticulture Australia Limited, as listed on the ARRIP database, Record no. HRDC00831*.
32. OECD Paper: Policy for inter-firm-networking and clustering: a practitioner's perspective, <http://www.idc-hunter.org.au/cgi-bin/IDCremdm.pl?Do=page&Page=PNum80>, viewed April 10, 2003.

33. Petheram, R.J. (1998). Review of evaluation in agricultural extension. *Rural Industries Research and Development Corporation Publication 98/136*.
34. Piccone, M.F. (2002). Preharvest management systems that meet the needs of the new marketplace. *Acta Horticulturae* 575: 443-445.
35. Pinnacle Management (2000). Audit of the activities of producer groups in the Queensland horticultural industry. *Queensland Fruit and Vegetable Growers Vegetable Committee, Producer Groups Audit Project, Final Report*.
36. Ricks, D., Boughton, D., Lyford, C., and Woods, T. (1996). Strategic planning with horticultural crop industries. *Acta Horticulturae* 429: 575-581.
37. Ridge, P. and Wylie, P. (1996). Farmers' training needs and learning for improved management of climate risk. *Proceedings of the Of Droughts And Flooding Rains: Managing With Climate Variability Conference*, 16-17 November 1995, Canberra A.C.T., pp. 126-130.
38. Sheales, T. and Barrett, D. (2002). Agricultural outlook for 2001-02. *Australian Bureau of Agricultural and Resource Economics Conference Paper 2001.17*.
39. Sugar Research and Development Corporation: SRDC Annual Operational Plan 2002-2003, http://www.srdc.gov.au/downloads/oper_plan/AOP2002_2.pdf, viewed April 10, 2003.
40. Turnbull Porter Novelli (2001). AusHort Research and Development Program: Communication strategy. *Prepared by Turnbull Porter Novelli for Horticulture Australia Ltd., South Australia*.
41. Woods, E., Moll, G., Coutts, J., Clark, R. and Ivin, C. (1993). Information exchange: a report commissioned by Australia's Rural Research and Development Corporation, Goanna Print, Canberra.
42. Woods, E.J., Wei, S., Singgih, S. and Adar, D. (2002). Supply chain management as beyond operational efficiency. *Acta Horticulturae* 575(2): 425-431.