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**Rural Industries Research and
Development Corporation**

Production of Organic Vegetable Seeds and Seedlings

**A report for the Rural Industries
Research and Development Corporation**

by Robyn Neeson and Dr. Greg Howell

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Foreword

Changes to International and Australian National organic standards require that growers of organic produce source organically raised seed or vegetative propagation material (cuttings, bulbs, corms etc). This means that all seedling media and production processes falls under the scope of the Australian National Organic and Biodynamic Production Standards. This provision became enforceable beginning January 1, 2004.

In Australia, the majority of seed and seedlings currently supplied to organic producers are of conventional origin. However, existing organic suppliers are unable to meet present and future demands for supply of organic seed and seedlings. Furthermore, the market suitability and quality of organic seed and seedlings has been inconsistent. This situation presents both an opportunity and a threat to the Australian organic vegetable industry.

This project addresses some of the needs to facilitate the uptake of the production of certified organic seedlings across Australia's horticulture sector. A series of National workshops increased awareness of the requirements for organic seedling production and provided a forum for identifying some of the issues that could arise as a result of the Rule's implementation. A telephone survey of organic vegetable producers and seed and seedling suppliers was undertaken to determine their preparedness to adopt the changes or to supply this market and to identify issues impacting on their ability to do so. Technical information has been prepared describing regulatory and production information for organic certified stock.

This project was funded from RIRDC Core Funds which are provided by the Australian Government.

This report, an addition to RIRDC's diverse range of over 1500 research publications, forms part of our Organic Systems R&D program, which aims to facilitate the development of a viable organic industry through increasing adoption of sustainable organic farming systems.

Most of our publications are available for viewing, downloading or purchasing online through our website:

- downloads at www.rirdc.gov.au/fullreports/index.html
- purchases at www.rirdc.gov.au/eshop

Peter O'Brien

Managing Director

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Abbreviations

ABC	Australian Broadcasting Corporation
ACO	Australian Certified Organic
AFFA	Australian Government Department of Agriculture, Fisheries and Forestry
AIAB	Associazione Italiana per l'Agricoltura Biologica
AQIS	Australian Quarantine Inspection Service
APVMA	Australian Pesticides and Veterinary Medicines Authority
BDRI	Bio-Dynamic Research Institute
BFA	Biological Farmers of Australia Co-op Ltd.
COGS	Canberra Organic Growers Society
Codex	Codex Alimentarius Commission
DPI	Department of Primary Industries
EEC	European Economic Community
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
HAL	Horticulture Australia Limited
IFOAM	International Federation of Organic Agriculture Movements
NASAA	National Association for Sustainable Agriculture Australia Ltd.
OECD	Organisation for Economic Co-operation and Development
NS	National Standard for Organic and Bio-Dynamic Produce
OFA	Organic Federation of Australia
OGWA	Organic Growers Association of Western Australia
OGA	Organic Growers of Australia Inc.(formerly Organic Herb Growers of Australia Inc.)
RIRDC	Rural Industries Research and Development Corporation
TOP	Tasmanian Organic-Dynamic Producers

Contents

Foreword	iii
Acknowledgments.....	iv
Abbreviations.....	iv
Executive Summary	vi
1. Introduction	1
History of the Organic Plant Propagation Rule	1
Status of the Organic Plant Propagation Rule in Australia	2
2. The Project Objectives	3
3. Methodology	4
Raising Industry Awareness	4
Determining supply and demand for organic seed and seedlings	6
Developing a database for organic vegetable seed and seedling suppliers	6
Preparation of the Final Report	7
4. Raising Industry Awareness – Outcomes of the National Industry Workshops	8
SWOT analysis sessions.....	8
Recommended Strategies	11
Conclusion.....	12
5. The Survey of Certified Organic Vegetable Producers	13
Results of the survey of certified organic vegetable producers.....	13
Discussion of organic vegetable producer survey results.....	16
6. The Survey of Suppliers of Vegetable Seed and Seedlings	23
Results of the survey of seed and seedling suppliers	23
Discussion of seed and seedling suppliers survey results	25
7. Matching supply and demand for organic vegetable seed and seedlings	26
Diverse nature and size of the organic vegetable industry	26
Open-pollinated or hybrid?	26
Lack of reliable industry statistics.....	27
Industry uncertainty regarding the Rule and derogation	28
Current supply pathways for organic seed in Australia.....	28
8. Establishing a National Database for Organic Plant Propagation Material	31
Establishing and maintaining the database.....	31
A process for establishing an Australian database	32
Database design and delivery	33
9. Opportunities in Organic Seed and Seedling Production.....	35
Alternative market opportunities for organic seed and seedlings.....	35
Establishment of an organic seed breeding program.....	37
10. Conclusion and Summary of Recommendations.....	41
Maximising the opportunities and minimising the threats imposed by the organic plant propagation Rule and its derogation.....	41
Appendix 1 - Organic Seed and Seedling Production	43
Appendix 2- Materials permitted for organic seed and seedling production.....	53
Appendix 3 - Survey of Organic Vegetable Producers	65
Appendix 4 - Survey of vegetable seed & seedling suppliers.....	72
Appendix 5 - Database of Organic Seed and Seedling Suppliers.....	80
Appendix 6 - COMMISSION REGULATION (EC) No 1452/2003 of 14 August 2003	84
References	87
Websites of Interest	87
Useful contacts	90

Executive Summary

From January 1 2004, in recognition of a requirement imposed by European Union (EU) organic regulators and in order to maintain market access for Australian organic produce, Australia's National Standard for Organic and Bio-Dynamic Produce required that Australian certified organic growers source planting material from certified sources. However to comply with Article 6(3) of Council Regulation (EEC) No.2092/91, the National Standard set out a derogation that permitted the use in organic production of non-organic seed, provided farmers were unable to find the organic seed they required locally.

Section 3.6 of The National Standard for Bio-Dynamic Produce (December, 2002) states the following Rule with regard to the use of the organic propagation material:

Standards

- 3.6.1 *Organic crops must be grown in soil (i.e. terra firma). Seedling production must use products compatible with this Standard. Growing in earth-less media, hydroponic culture, nutrient-rich plastic films and similar methods and techniques are prohibited in organic and bio-dynamic production systems. The only exception to this rule is detailed under the Landless Production Systems section of this Standard.*
- 3.6.2 *Organic plants must be grown from organic seed or organic plant propagation material. New seeds and new vegetative reproductive material shall be considered organic when grown in accordance with the provisions of this Standard for at least one generation or, in the case of perennial crops, two growing seasons.*

Derogation

Where an operator can demonstrate to the approved certifying organisation that material satisfying 3.6.2 is not available in sufficient quality and quantity, the operator must seek written approval from the approved certification organisation to use seed or vegetative reproductive material not in accordance with this Standard.

- 3.6.3 *The use of genetically modified/engineered seed and transgenic plants or the application of GMO derived substances for treating plants is prohibited in organic and bio-dynamic farming.*

In recognition of the need for Australian organic producers to become familiar with the Rule and Derogation the organic industry in conjunction with RIRDC commissioned this project:

“To provide the necessary technical and regulatory information to producers of vegetable seedling and other propagative material to permit the production of organic certified stock.”

The project also estimated supply and demand profiles for organic seed and seedlings for a range of vegetables utilising two different methods:

- By survey - using lists compiled from organic certifiers (NASAA and ACO) and other industry sources

- By using National horticulture industry production statistics and calculating organic production as a proportion of this data.

Whilst neither of these methods could be said to have provided conclusive results, it became obvious from discussions with producers (most of whom had experienced difficulties obtaining certified organic plant propagation material) and through discussions with suppliers (who were in-the-main reluctant to supply this market) that a shortfall in specific varieties of organic material could significantly disadvantage Australian organic producers, particularly those supplying the supermarket trade or contemplating export production. This would largely depend on the extent to which Australia's trading partners enforce the requirements of the Rule for imported organic products.

Less affected by these shortfalls will be the smaller organic vegetable producer whose markets may accept a greater diversity of varieties, particularly open-pollinated and heirloom varieties. Suppliers of these varieties currently dominate the production of certified organic seed and seedlings.

The fact that major suppliers of imported organic seed report negligible sales should be of concern to industry. Poor sales are adding to the disincentive of these companies to supply the Australian market, and could severely disadvantage Australian organic producers' place on the world stage in the future. Most of these suppliers saw the complete removal, or a tightening of the Derogation, as a solution to the problem. However, certifiers may be apprehensive to make these changes fearing that some producers may chose to abandon their organic certification.

Our investigations identified that some of the main constraints affecting the supply and demand of organic vegetable seeds and seedlings included:

- The fragmented and small-scale nature of this sector of the industry
- The lack of transparent and harmonised records of organic production
- The lack of concise production criterion for organic plant propagation material
- The lack of industry-wide agreement on interpretation and implementation of the Rule and derogation
- Reluctance of major commercial suppliers of seed and seedlings to supply the organic market, largely due to uncertainty regarding the continuation of the derogation and its interpretation
- Inferior quality and increased production risks associated with organic production of seed and seedlings
- The lack of defined quality standards for seed production
- The difficulties associated with organic production of some species (for example, strawberries)
- The difficulty of forecasting the demand and supply for organic seed and seedlings (unreliable or incomplete industry statistics)

Clearly these issues are of concern for the supply and demand of organic seed and seedlings to all sectors in the organic industry. A national approach is urgently required to identify and prioritise strategies to help address supply and demand issues.

As a result of their investigations, the authors recommend the Organic Industry consider the following strategies:

- Convene a National Organic Industry Forum bringing together key stakeholders to discuss issues associated with the Rule for organic plant propagation material and the development of a harmonised approach to facilitate the supply and demand for this material within Australia
- As a matter of urgency, industry should determine a clear, concise and harmonised interpretation of the Rule and derogation, including a time frame for full implementation (i.e. removal of the derogation or sufficiently defining it and structuring it in such a way that it

leads to a genuinely supportive environment for the development of organic seed and seedlings.)

- The development of an interactive web-based National Database for listing of suppliers of certified organic varieties of seed and seedlings, which in addition, contains a listing of those species for which, as yet, no organic material is available. The database should aim to satisfy all the requirements of EEC Regulation (EEC) No 1452/2003
- Investigate opportunities and threats posed by the implementation of a national organic crop breeding program

In order to minimise the impact of the Rule and its requirements on organic producers (ware (what are these?) croppers) it is recommended that they:

- Where appropriate, organise into cooperatives to facilitate the supply and purchase of organic seed and seedlings
- Consider on-farm production for their requirements of organic seed and seedlings
- Form alliances with larger 'commercial' suppliers of seed and seedlings to provide mutual benefits with the facilitation of supply and demand
- Determine the annual requirements for organic seed and seedlings well in advance of the production season

In order to minimise the impact of the Rule and its requirements on suppliers of organic plant propagation material it is recommended that they:

- Investigate alternative markets for organic seed and seedlings (eg Green Life and Allied Products horticultural segments)
- Identify and establish market alliances with key producers, certifiers and other relevant users of organic seed and seedlings
- Identify export opportunities for 'out of season' supply of organic seed

1. Introduction

History of the Organic Plant Propagation Rule

In recognition of the long standing desire of the organic community (Codex, IFOAM, NS) and a requirement implemented by European Union (EU) organic regulators and in order to maintain market access for Australian organic produce, Australia's National Standard for Organic and Bio-Dynamic Produce required that Australian certified organic growers source planting material from certified sources. However to comply with Article 6(3) of Council Regulation (EEC) No.2092/91, the National Standard set out a derogation that permitted the use in organic production of non-organic seed, provided farmers were unable to find the organic seed they required locally.

Section 3.6 of The National Standard for Bio-Dynamic Produce (December, 2002) states the following with regard to the use of the organic propagation material:

Standards

- 3.6.4 *Organic crops must be grown in soil (i.e. terra firma). Seedling production must use products compatible with this Standard. Growing in earth-less media, hydroponic culture, nutrient-rich plastic films and similar methods and techniques are prohibited in organic and bio-dynamic production systems. The only exception to this rule is detailed under the Landless Production Systems section of this Standard.*
- 3.6.5 *Organic plants must be grown from organic seed or organic plant propagation material. New seeds and new vegetative reproductive material shall be considered organic when grown in accordance with the provisions of this Standard for at least one generation or, in the case of perennial crops, two growing seasons.*

Derogation

Where an operator can demonstrate to the approved certifying organisation that material satisfying 3.6.2 is not available in sufficient quality and quantity, the operator must seek written approval from the approved certification organisation to use seed or vegetative reproductive material not in accordance with this Standard.

- 3.6.3 *The use of genetically modified/engineered seed and transgenic plants or the application of GMO derived substances for treating plants is prohibited in organic and bio-dynamic farming.*

The derogation allowing organic farmers to use conventional stock was designed to compensate for the time lag between supply and demand in the burgeoning organic industry. This transitional period was to expire on December 31, 2003, and changes to International and Australian National organic standards beginning January 1, 2004 aimed to remove the derogation. From this date, all seedling media and production processes would be required to fall under the scope of the Australian National Organic and Biodynamic Production Standards. That is, all propagation material used in organic production was to be of organic origin. Australian regulators realised however, that there would always need to be a derogation and the proposal for ending altogether was probably intended as a wake up call to the production sector who had taken the open ended and limitless derogation for granted for many years.

Therefore, as the deadline for the removal of the derogation loomed and with limited supplies of organic planting material available, it became obvious to the regulators of organic standards that the complete removal of the derogation would place organic farmers at a distinct disadvantage.

In August 2003, EU regulators moved to extend the derogation under a new Regulation (Council Regulation EEC No.1452/2003). To be enforced from January 1 2004, the new EU Rule extended the derogation indefinitely (with review in 2006), but placed greater restrictions on its use. Council Regulation (EEC) No.1452/2003 placed the onus on organic farmers to prove they have endeavoured to source organic propagation material, and if this was unavailable, to then make formal application to their organic certifier to plant conventionally produced material, provided it was not treated with products not complying with organic standards or produced through transgenic modification (genetically modified). Furthermore, the EU Rule sought to maintain the derogation for certain species (these are still to be determined) and required EU Member States to establish and run an organic seed database, which would help to match seed suppliers with organic farmers. Before a farmer can get permission to sow conventional seed, both he/she and the authority responsible for verifying claims (his/her organic certifier) will be required to search the database for appropriate suppliers of organic seed or seedlings.

Review of Council Regulation EEC No 1452/2003 is scheduled for 2006. Whether or not the regulators of organic standards will eventually completely remove the derogation, is open to conjecture. As supply and demand for organic propagation material improves, it is anticipated that a decline in the number of applications to sow non-organic seed will occur. However, it is most likely that there may always be exemption for a limited number of crop species.

Status of the Organic Plant Propagation Rule in Australia

Whilst the Australian National Standard for Organic and Bio-Dynamic Produce reflects most of the changes to the provision, the EU requirement of referral to a national data base is yet to be formally recognised within the Standard or within the Administrative Arrangements (AAs). Some Australian certifiers however have already developed limited databases, which producers must search in order to determine the availability of organic propagation material. However, Australian certifiers are yet to agree on an homogenised database format or reporting system.

Anticipating that Australian organic standards will be assessed closely for equivalence with EEC Rule No. 1452/2003, the Australian organic industry, through an initiative put forward by the industry representatives moved to increase industry preparedness by urging RIRDC to commission this report.

The organic vegetable sector was perceived by industry as the sector most likely to be immediately impacted by the changes. It was estimated by industry that the annual requirement for organic seedlings was in the order of 10-15 million per annum, however, the majority of seed and seedlings currently supplied to organic producers are of conventional origin. It was clear that existing organic suppliers were unable to meet present and future demands for supply of organic seed and seedlings. Furthermore, the market suitability and quality of organic seed and seedlings was inconsistent. With changes to organic standards imminent, this situation presented both an opportunity and a threat to the Australian organic vegetable industry.

In late 2003, the Australian organic industry, through the Rural Industries Research and Development Corporation (RIRDC), funded this project to facilitate a process which would lead to the uptake of production of certified organic vegetable seedlings across Australia's horticulture sector.

2. The Project Objectives

This project aimed to increase awareness amongst conventional and organic seedling providers of the requirements for organic production and determine their preparedness to supply this market and identify issues impacting on their ability to do so. This involved providing appropriate forums for discussion, developing and delivering appropriate technical and regulatory information, and providing mechanisms for collecting and storing data on the source and availability of organic vegetable seedlings.

Whilst the project brief specifically focussed on organic vegetable seedling production, it soon became apparent that production and supply of organic vegetable *seed* would also need to be addressed.

The project involved the delivery of a number of outcomes that helped meet the project objectives:

- A series of National information workshops
- A telephone survey to determine supply and demand for organic vegetable seed and seedlings and to examine industry preparedness and ability to implement changes brought about by the Rule
- A National database of organic vegetable seed and seedling producers
- Technical notes for organic producers outlining regulatory and production requirements for organic seed and seedlings;
- A report that:
 - outlines the strength, weaknesses, opportunities and threats impacting on demand and supply of organically produced seeds and seedlings and the capacity of current and future suppliers to meet new organic certification requirements for seed and seedling production
 - identifies issues likely to impact on supply and demand of organically produced seeds and seedlings in Australia

3. Methodology

The project was carried out in 4 Stages:

- raising industry awareness and preparation of technical Agnotes
- determining supply and demand for organic seed and seedlings
- developing a database of organic vegetable seed and seedling suppliers
- preparation of the Final Report.

Raising Industry Awareness

Critical to the success of the project was the ability to engage industry in these activities. This was achieved utilising two key actions:

- preliminary awareness raising and promotional activities promoting the project and its objectives amongst the organic and conventional horticulture sectors;
- six, half- day workshops (in Western Australia, South Australia, Tasmania, Victoria, New South Wales and Queensland) for vegetable and herb producers and suppliers of organic inputs (seed, seedlings, potting media, pest and disease control products).

Increasing Awareness and Engaging Industry

Initial awareness raising activities focussed on promotion of the aims of the project and engaging organic certification organisations and regional groups in encouraging the participation of their members. Information was issued describing the project, its aims and major activities including the National information workshops, the survey and the development of a seed and seedling supplier database. This included media releases and articles in:

- ABC Organic Gardening Magazine
- Acres Australia,
- Australian Organic Journal
- BDRI newsletter
- Good Fruit and Vegetables
- NASAA Bulletin
- Newsleaf - Journal of Biodynamic AgriCulture Australia
- NSW Agriculture publications Agriculture Today (supplement to The Land), Vegie Bites and Organic News
- Organic Federation of Australia E-newsletters and website
- ACO/BFA, NASAA and OGA websites
- Regional organic group newsletters including Sapphire Coast Producers Association, Canberra Organic Growers, Tweed Richmond Organic Producers Organisation, Gippsland Organic Growers, Organic Growers Association Western Australia, Organic Producers Association of Queensland, Henry Doubleday Research Association.
- State Departments of Primary Industry and various universities.

Organic certifiers were approached for a list of their certified organic vegetable producers so that they could be personally approached regarding their participation in the project. Lists were obtained of conventional and organic vegetable seed and seedling suppliers and retailers. Information regarding the project, and inviting their participation, was disseminated to these businesses.

Preparation of Technical Agnotes

In order to increase industry awareness to the Rule there was a need to research and prepare relevant technical information.

It was felt that sufficient information on nursery or seed production techniques already existed within standard literature, and that the most relevant information would explain which inputs were permitted for organic production as well as any regulatory issues associated with the production and supply of organic seed or seedlings.

Two preliminary Agnotes – ‘Organic Seed and Seedling Production’ and ‘Materials Permitted for Organic Seed and Seedling Production’ - were produced prior to the National workshops, these forming the basis of presentations made during the workshops. Based on feedback received, these were then modified and published. (refer to appendices 1 & 2)

These Agnotes together with a summary of this Final Report, will be distributed to workshop participants and through industry networks.

The National Organic Seed and Seedling Production Workshops

As part of the project, six half-day workshops were held from September 1-8, 2003 in Sydney, Brisbane, Melbourne, Launceston, Adelaide and Perth. The aim of the workshops was to increase awareness of the changes to the Organic Standard with respect to supply of organic propagation material, and to outline the requirements of the National Standard for Organic and Bio-Dynamic Produce (AQIS. 1992, 1998, 2002) with respect to organic seed and seedling production.

Extensive promotion was undertaken inviting a wide variety of participants to the workshops, these included: the organic industry (certified growers, processors, input suppliers and the certification agencies themselves), research and extension (university and state departments of agriculture), regulatory agencies (AQIS) and the general vegetable industry suppliers of seed, nursery stock, pesticides, fertilisers and potting media.

The six, three-hour workshops, including feed-back sessions, gave ample opportunity for the consequences of the Rule to be communicated. Each session commenced with an introductory overview of the organic seed Rule presented by a certification organisation representative, followed by presentations on organic seed & seedling production and an overview of materials permitted as inputs into organic seed & seedling production. Once the formal presentations were completed, participants were provided with an opportunity to discuss the implications of the seed / seedling Rule during an interactive group session.

The group sessions were structured as SWOT analysis sessions. **SWOT** analysis was used as the framework for analysing the **Strengths** and **Weaknesses**, and the **Opportunities** and **Threats** arising from the introduction of the Rule and to reveal any potential issues impacting on industry. The ultimate goal of the SWOT Analysis was to develop strategies that will help to focus and build on the **Strengths**, minimise **Weaknesses**, take the greatest possible advantage of **Opportunities** available, and to counteract **Threats**.

The outcomes and recommendations arising from the National seed and seedling workshops were promoted in various publications and in an interim report to RIRDC in December 2003.

Determining supply and demand for organic seed and seedlings

Whilst a number of suppliers of organic vegetable seed and seedlings were known to exist, it was unclear what the actual (current or future) industry requirements were and if these requirements could be met by existing businesses. It was also unclear if the changes to the organic seed and seedling Rule would encourage other businesses to supply this market, and whether these would be existing conventional producers, current organic producers wishing to diversify, or new entrants with no prior experience in seed or nursery production.

Two telephone surveys were conducted to determine current and future supply and demand requirements and to gauge industry knowledge and understanding of the Rule and its implications:

- a survey of certified organic vegetable producers (ware? croppers)
- a survey of suppliers of organic and conventional seed and seedlings.

Survey of certified organic vegetable producers

For the purpose of the certified organic vegetable producer survey, preliminary lists of producers were obtained from BFA and NASAA databases. These certifiers collectively certify 79.4% of all certified organic producers. A search was made of these databases and listings that recorded vegetables as part of their production were included on a preliminary producer database. A total of 534 records were listed. State by state, New South Wales had 153 records, Northern Territory 2 records, Queensland 166 records, South Australia 38 records, Tasmania 23 records, Victoria 193 records, and Western Australia 53 listings.

A random sample of 20% of those listed in each state was chosen to approach for their participation in the survey and a casual assistant was employed to telephone those selected. Each participant was asked a series of questions during the survey, which lasted for approximately 10 minutes (Appendix 3).

The questions were designed to gauge producer knowledge of the production rule and its impact, and to document current and future producer requirements for organic vegetable and herb seed & seedlings.

Survey of seed and seedling suppliers

A broad database of seed and seedling producers had been previously collated from organic and conventional industry sources. It was decided that all businesses would be invited to participate in this survey so that a more accurate database of current and potential suppliers of organic seed and seedlings could be established. The foundation database for seed producers contained 98 entries, whilst the foundation seedling producer database contained 30 entries. Each participant was asked a series of questions during the survey, which lasted for approximately 10 minutes.

The questions were designed to gauge supplier knowledge of the production rule and its impact and to document current and future production of organic vegetable and herb seed & seedlings. Additional categories were created during analysis if required – these are highlighted in the survey in Appendix 4.

Developing a database for organic vegetable seed and seedling suppliers

An outcome for the project was the development of a database of those businesses that indicated a willingness to be listed as traders of organic vegetable seed and seedlings.

The database has been constructed in Microsoft®Excel®. Entries in the databases were initially sourced from organic certification organisations and mainstream horticulture industry sources.

Attempts were made to validate the entries in the organic vegetable seed and seedling database during the telephone survey. Further email and telephone contact was made to verify entries. Those

businesses which declined to be listed, or who did not intend to trade in organic seed or seedlings now, or in the future, were deleted.

Fields used in the database include the supplier's name and contact details, the products sold and, if data was available, the quantities produced (now and in the future), and whether the products were certified as organic.

Whilst every effort was made to provide a conclusive listing in the database of current producers of organic seed and seedlings the authors recognise that some suppliers may have been inadvertently omitted, whilst others may have since ceased production.

It is the intention that the database is made freely available to industry groups.

A printed version of the database is contained in Appendix 5.

Preparation of the Final Report

This Final Report includes recommendations on how best to achieve a viable and quality organic seedling production industry. A summary of the Report will be distributed to workshop participants and through industry networks.

Prior to submitting, the Report was reviewed by Mr. Rod May, NASAA and Dr. Andrew Monk, Australian Certified Organic.

The report will be presented to the Organic Industry Export Consultative Committee in November 2004, to be used as a basis for their deliberations on implementations and changes to the National Standard with respect to the Ruling on the use of organic propagation material.

4. Raising Industry Awareness – Outcomes of the National Industry Workshops

The series of National Industry workshops provided opportunity for key stakeholders to improve their knowledge of the Organic Plant Propagation Rule and to raise issues of concern regarding the Rule and its implementation in Australia.

Positive outcomes of the Rule's introduction that were highlighted in workshop discussions included:

- Adoption of the Rule is seen as an opportunity to ensure whole-of-chain integrity for organic products in the marketplace.
- Organic production of seed in Tasmania and Western Australia was seen as having potential, due to the isolation and strict quarantine regulations in these states
- Potential to expand organic production into other market sectors, for example, the retail nursery sector for home gardeners
- Potential reduction in the negative impacts of conventional nursery production systems, for example, reduction in the use of synthetic pesticides and fertilisers.

Some of the concerns regarding the introduction of the Rule included:

- Lack of industry preparedness
- Lack of consistency amongst certifiers in interpretation of the derogation
- Lack of concise guidelines for organic nursery production and permitted inputs
- Organic Standards were vague when it came to interpreting what was permitted in organic seed and seedling production
- Poor availability and lack of evaluation of permitted inputs for use in organic nursery production
- Inconsistent supply of organic vegetable seed and seedlings
- The quality of currently available organic seed and seedlings is poor. Quality issues were related to germination and keep-ability (shelf-life?) of seed
- Lack of market choice – varieties and price
- Reduced biodiversity in organic production systems
- Small, infrequent orders for organic seed and seedlings discouraged businesses entering into organic nursery production
- Existence of the derogation ad infinitum would prevent investment in organic production systems
- Producers were not planning sufficiently to provide adequate time for nurseries to meet orders
- Some certified organic producers may exit the industry or de-certify.

SWOT analysis sessions

A primary activity during the National Organic Seed and Seedling Workshops was the group discussion sessions. These group sessions were structured as SWOT analysis sessions. It was decided that a SWOT Analysis approach would provide the best opportunity to reveal potential issues to be faced by industry arising from the introduction of the Rule. The ultimate goal of the SWOT Analysis was to develop strategies that would help to focus and build on the *Strengths*, minimise *Weaknesses*, take the greatest possible advantage of *Opportunities* available, and counteract *Threats*. A summary of the outcomes of the group sessions follows.



Above: West Australian workshop participants discuss ramifications of the seed / seedling Rule during SWOT group sessions

Strengths

Participants identified that the major strength of the potential end of derogation is that this change to the production Rule increases the integrity of the product and gave greater legitimacy to the integrity of the certified organic label.

In contrast to some other world producers of organic products, Australian organic producers have the potential to capitalise on the introduction of the Rule due to Australia's geographical isolation and (relative) GMO-free status.

A great deal of expertise currently exists within conventional crop breeding and nursery production industries which was seen as advantageous for the development of organic seed and seedling production enterprises.

The development of a database was seen as a major advantage for those wishing to source organic vegetable seeds and seedlings and organically acceptable inputs.

Weaknesses

By far the greatest weakness identified by all groups was insufficient knowledge about the supply and demand for organic seeds and seedlings. Lack of supply was currently inhibiting the production capabilities of existing organic producers, whilst lack of knowledge about market demand was restricting investment in new organic seed and seedling production enterprises.

Added costs associated with new infrastructure development or with modifications to existing infrastructure in order to comply with organic standards (eg. segregation issues in nurseries practicing parallel production) were seen as additional factors that could retard the establishment of organic seed and seedling production enterprises.

Lack of knowledge of organic production systems and access to inputs permitted in organic production were perceived as impediments to industry development.

Some participants believed given the industry's present size that only one or two businesses would be established and therefore there was a high potential that monopoly trading in organic seed/seedlings would occur.

Some workshop participants believed that the Rule went too far, and that over-regulation was occurring. Certifiers were seen as inconsistent in their implementation and interpretation of the derogation, which was causing industry confusion and this had the potential to cause damage to the integrity of the organic certification system and organic products. Whilst extension of the end of the derogation from January 1, 2004 to 2006 was met with relief by most participants, they felt that continued extension beyond 2006 could further erode confidence in the organic certification system.

Opportunities

The greatest opportunities arising from the implementation of the Rule were seen as the potential for the development of small to medium enterprises that focussed on organic seed/seedling production and new product development. These included enterprises that:

- Capitalise on increased export opportunities for organic seed,
- Develop and promote local and regional seed/seedling and seed saving enterprises, including the potential for specialist production states eg Tasmania.
- Market organic seed/seedlings in 'conventional' nursery outlets and supermarkets
- Manufacture potting media, fertilisers and pest and disease control products that are suitable for organic production.

The implementation of the Rule was seen as an opportunity to promote certified organic products. The industry could capitalise on this by implementing a comprehensive marketing campaign promoting the whole-of-chain integrity of organic products.

There is great opportunity for R&D into organic seed/seedling production. The development of 'organic' plant-breeding lines could be promoted to conventional R&D providers as offering benefits such as the potential for reduced fertiliser usage and increased seed/seedling vigour. The groups indicated that there was an opportunity to target 'conventional' R&D providers for funds to undertake research into the development of organic nursery production standards, promoted on the basis that the broad adoption of organic production techniques could confer greater environmental stewardship to conventional nursery enterprises.

Threats

The implementation of the altered Rule (ie removal of the derogation) was seen as potentially discouraging conversion into organic production, and that some producers may even leave the industry if the Rule is fully enforced. If the derogation was eventually removed producers could be faced with an inability to source sufficient amounts of organic seed or seedlings, or be limited to using crop varieties that are of inferior quality or are not a market preferred variety. Most participants felt that continued access to hybrids was critical. It was also felt that the full implementation of the Rule could lead to an overall decrease in genetic diversity within organic systems or that available varieties may have less than optimal performance under an organic management regime.

Conversely, if the derogation was extended *ad-infinitum* participants felt that this may lead to a loss of integrity and consumer confidence in organic products. Some respondents feared that an "ethic of complacency" could develop within the industry as seed producers are likely to constantly invoke the derogation. Participants felt that it was critical for organic certification organisations to agree on a consistent interpretation of the derogation.

Uncertainty regarding demand volumes, costs of production, production techniques and other associated risks of production (eg pests, diseases and availability of organically acceptable potting media and fertilisers) were perceived as threats to the emergence of viable organic seed and seedling production businesses.

All groups were very concerned by the threat from genetically engineered species which may contaminate organic seed supplies should they become widely grown.

Recommended Strategies

A number of key strategies are recommend for industry to pursue in order to facilitate the implementation of the altered organic seed/seedling Rule and to encourage confidence, and thus investment in organic seed/seedling enterprises.

To increase industry confidence:

i. Rule interpretation:

- AQIS should consult with the EU regarding interpretation of the Rule, its derogation and requirements for compliance.
- AQIS should convene a meeting of the National Standard sub-committee to clarify Australia's interpretation of the Rule and its derogation and to confirm an implementation time frame.
- AQIS should convene a meeting with the Organic Industry Export Consultative Committee (OIECC) to homogenise interpretation of the organic seed/seedling Rule and its derogation, after which organic certification organisations need to more widely promote the unified interpretation of the Rule and its derogation within industry.

ii. Adoption of the Rule and derogation and its implementation:

- Develop Best Practice Guidelines for the production of organic seed and seedlings, which include quality control requirements. Investigate funding opportunities within the Nursery Industry Association and HAL to benchmark successful organic seedling production systems as well as conventional nursery systems.
- Develop a database of suppliers of organic propagation material and associated providers of allowed inputs and ensure its equivalence to EU database requirements.

To formally promote the organic gene pool:

i. Rule interpretation:

- Persuade each certifier to clearly state their position on the use or not of hybrid propagation material within organic production systems, reflecting this position within their standards and to the broader industry.

ii. Adoption of the Rule and derogation and its implementation:

- Investigate opportunities for the establishment of an organic crop breeding program in Australia.
- Identify regions within Australia that would favour the establishment of organic seed production enterprises. This will require industry to consult with the Gene Technology Regulator regarding location of GM trials and the potential to regionalise production of organic propagation material.
- Prepare a database of available organic genetic material and prepare an assessment of future availability of material and potential risks to the organic gene pool.
- Promote minimum quality standards for organic seed production which are equal to or better than conventional standards.
- Conduct a survey of organic producers to determine requirements for genetic material.

To encourage ongoing economic development:

i. Rule interpretation:

- AQIS to consult with importing countries to determine the level of compliance required in order to maintain market access as a result of the implementation of the Rule and consequences should the derogation be removed.
- Certifiers to release accurate levy figures which will enable the uncertainty surrounding the industry's critical mass to be addressed.
- Certifiers consider and agree upon a response (with regard to the derogation) should monopoly trading occur as a result of the implementation of the Rule and consequences should the derogation be removed.

ii. Adoption of the Rule and derogation and its implementation:

- Conduct a survey of industry to estimate projected supply and demand figures for organic seed and seedlings.
- Develop a database of certifiable inputs, including propagation materials, which conforms to the database currently being developed by the EU.
- Commission an economic study to quantify costs of production in an organic seed and seedling enterprise.
- Investigate regional and business development funding opportunities (eg AFFA's NIDP) to facilitate the establishment of small to medium seed/seedling production and seed saving enterprises as well as the development of new products (varieties and inputs).
- Conduct a survey of export markets to quantify opportunities for organic seed.
- Investigate ancillary marketing opportunities for organic seed and seedlings (eg 'conventional' outlets such as supermarkets and retail nurseries).

Conclusion

The national organic seed/seedling workshop series provided an opportunity to highlight a number of important issues relevant to the entire organic industry and its suppliers in relation to changes to the organic seed/seedling production Rule and consequences should the derogation be removed.

The workshops highlighted the need for consistency in the interpretation and implementation of the derogation allowing for the use of non-certified material in organic production systems. Australian certification organisations are yet to agree on this point but first clarification should be sought from the EU regarding compliance.

Workshop participants were largely enthusiastic about the adoption of the seed/seedling Rule, considering business development opportunities to be a positive spin-off. Uncertainty regarding supply and demand is currently inhibiting production, however, the development of a comprehensive database of seed/seedling and input suppliers and the provision of technical material outlining production requirements and quality control procedures should increase producer and investor confidence.

Maintenance of an adequate genetic resource base is a major challenge for the industry. Ideally cultivars would need to exhibit traits that are desirable for use in organic production systems such as pest and disease resistance, seedling vigour, and various other physiological attributes, whilst also satisfying market preferences for cultivars. As there are few vegetable breeding or selection programs currently operating in Australia it is imperative that the organic industry use this opportunity to create a solution to their need.

5. The Survey of Certified Organic Vegetable Producers

In order to gauge some idea of the impact of the production Rule and to estimate the potential size of the trade in organic seed & seedlings the known certified organic vegetable growers were surveyed.

Results of the survey of certified organic vegetable producers

From the combined BFA and NASAA grower database, 41 of the 104 vegetable growers in the foundation database (534) were selected to participate in the telephone survey. This represents a response rate of 39.4%. 55 producers declined to participate when contacted citing various reasons such as: they no longer produced vegetables, were not interested, too busy, or were no longer certified. The final number of recordable responses was 7.7% of the foundation database of 534 producers.

On a State by State basis participation was greatest in Victoria and South Australia with 66.7% of those identified responding (12/18 and 4/6 respectively). The next highest was Western Australia with 40 % (4/10), followed by NSW 36.4% (12/33) and Qld 27.7% (9/33), with none of the Tasmanians contacted being available. On a national basis it is possible that the high rate of participation by Victorians (29% compared to an expected 17%) could bias the outcomes where there is little consensus.

State	No. Growers Approached	No. Growers Declining or Unable to Answer	No. Incorrectly Identified as Current Veg. Growers	Number Actually Surveyed	% State Representation of Surveys
Qld	33	20	4	9	22.0
NSW	32	17	3	12	29.3
ACT	0	0	0	0	0.0
Vic	18	5	1	12	29.3
Tas	5	5	0	0	0.0
SA	6	2	0	4	9.8
NT	0	0	0	0	0.0
WA	10	6	0	4	9.8
Total	104	55	8	41	100.0

Table 1. Response from January 2004 telephone survey of a 20% sample of vegetable growers listed on current BFA & NASAA databases.

A transcript of the full survey and the responses from participants is contained in Appendix 3.

The survey was divided in to two parts (Parts A and B).

Part A of the survey aimed to introduce the interviewee to the purpose of the survey and to get an overall view of their understanding of the Rule and how it would impact on their business.

Most of those interviewed (88%) had some knowledge of the existence of the Rule. Opinions were divided as to whether the change would affect their business (44% no affect on business, 56% would affect business). Of those who felt there would be an impact on their business, the majority (43%) could not specify a reason but still thought the Rule would affect their business.

Of the others, 13% felt they would have difficulty in obtaining organic seed, 4% felt that obtaining organic seedlings would be difficult, 9% felt obtaining other input products such as potting media would be difficult, 17% believed cost would be the biggest constraint and 13% broadly categorised the reason as planting material being difficult to obtain.

The majority of those surveyed (98%) were certified by an AQIS accredited certification organisation. However when asked what they intended to do regarding their organic certification when the Rule became fully operational only 73% indicated they would retain their certification, with 15% applying for exemption from the Rule (but retaining their certification) and 7% discarding their certification completely.

90% of interviewees indicated that they would like follow-up information about the project. Most (80%) indicated their preferred method to receive information about the Rule was through printed material such as industry newsletters, whilst the next preferred method (15%) was electronically via the Internet.

Questions 6a & b appeared to cause some confusion amongst interviewees. The intention was to determine their willingness to be listed on the industry database. However when asked if they would be willing to publicly release details of their products or requirements for production, 93% replied in the negative. This NO response then precluded them from answering 6b which asked if they were willing to sign a privacy release form giving permission to publish their details.

Part B of the survey asked growers specific questions relating to their business and the perceived impact of the Rule.

In order to gauge vegetable producers' understanding of the Rule we posed a hypothetical scenario that required an active response. From their responses it was clear that 95% of producers had a good understanding of the actions that were required when sourcing seed or seedlings in order to fully comply with the Rule and derogation.

Demand for organic seedlings

The next part of the survey was to try and gauge the quantity and type of organic *seedlings* that producers currently used or may require in the future.

Participants were more or less equally divided on use of seedlings in their production systems. 46% replied they used seedlings whilst 56% did not (this adds up to more than 100%). Of those that used seedlings, the majority (47%) grew some as well as purchasing in some for their own use. 32% responded that they only used seedlings they had produced themselves, whilst 21% purchased all their requirements.

Producers purchasing seedlings were asked to identify what type and quantity they purchased annually. They were also asked what percentage of these (if any) were organic and where they purchased these from (i.e. from a specialist organic producer/trader, or a specialist conventional producer/trader, or a producer/trader of both organic and conventional seedlings, or a non-specialist ware cropper (?) who also traded in seedlings).

Most producers (81.6%) required small quantities (< 10,000 seedlings) of each species grown on an annual basis. These consisted of brassicas (broccoli, cabbage, cauliflower), *Solanaceous* species (capsicum, eggplant and tomato), celery, lettuce, spinach (leafy) and ginger (tuberous). Larger quantities (20-40,000 / annum) were required by the remainder of producers with the main products being brassicas (cabbage and cauliflower).

The majority of producers (50%) currently purchased non-organic seedlings, whilst 36.4% of producers surveyed purchased organic seedlings. 13.6% declined to state what they purchased. The majority of seedlings (32%) were purchased from a specialist producer/trader of both organic and

conventional seedlings, 24% were purchased from a specialist organic producer/trader, 16% were purchased from a conventional produce/trader and 20% were sourced from a non-specialist ware cropper.

Users of seedlings were then asked how they intended to meet their *future* requirements for *organic* seedlings. 37% stated they would produce all their own requirements for organic seedlings, 21% would purchase all their requirements, whilst 32% would produce some and purchase some. 5% were not sure how they would meet their future requirements. No producers indicated they would seek exemption from the Rule (ie invoke the derogation), suggesting that within 5 years they intend to utilise all organic seedlings in their production.

In order to gauge requirements for *purchased* organic seedlings in the future, organic vegetable producers were asked to estimate their annual requirements in 5 years time. 32% indicated that it would be much less than currently purchased, 26% indicated they would have the same requirements, 21% indicated their requirements would be 10-25% greater, 11% indicated a 25-50% increase in requirements, and 5% indicated their requirements would increase by greater than 50%.

Requirements for organic seed

Producers were then asked questions relating to the quantity and type of organic *seed* that they currently used or may require in the future.

Asked where they currently sourced their seed from, the majority of producers (56%) produced some and purchased the remainder. Those that *produced* all their own requirements for seed (20%) were equal in number to those that *purchased* all their own requirements for seed. 4% did not use seed at all in their production.

Producers purchasing seed were asked to identify what type and quantity (in grams) they purchased annually. They were also asked what percentage of these (if any) were organic and where they purchased these (from a specialist organic producer/trader, or a specialist conventional producer/trader, or a producer/trader of both organic and conventional seed, or a non-specialist ware cropper who also traded in seeds).

Most producers (58.9%) required small quantities (1-1000g seed) of each species grown on an annual basis. These consisted of brassicas (cabbage), cucurbits (cantaloupe, pumpkin, squash, watermelon, zucchini) leafy (lettuce, rocket, spinach), legume (peas, sugar snap peas, other not specified), root (beetroot), *Solanaceous* species (capsicum, chilli, eggplant and tomato), and sweet corn. 25% of producers required 1,001-5,000 gram quantities of onion, cucurbits (pumpkin, watermelon and zucchini), green pod beans, and carrots. 14.3% of producers required 10,001-50,000 gram quantities of mixed species (not specified), green pod beans, peas, snow peas, beetroot, carrot, potato (tubers) and sweet corn. The remainder of producers (1.8%) required 5,001-10,000 grams of spinach.

The majority of producers (45.3%) currently purchased *all organic* seed. 39.6% of producers currently used *all conventional* seed, 13.2% did not state what proportion of their purchased seed was organic and 1.9% of producers purchased less than 10% organic seed.

The majority of seed (46.6%) was purchased from a specialist producer/trader of organic seed, 20.7% were purchased from a specialist conventional seed producer/trader, 17.2% from a specialist producer/trader of both organic and conventional seed, and 12.1 % were sourced from a non-specialist ware cropper. 3.4% were sourced from other avenues not specified.

Users of seed were then asked how they intended to meet their *future* requirements for *organic* seed. 51% stated they would produce some and purchase some of their own requirements for organic seed, 21% claimed they would produce all their requirements, whilst 13% would purchase all their requirements. 5% of producers indicated they would seek exemption from the Rule and invoke the derogation. 10% of producers were not sure how they would meet their future requirements.

In order to gauge requirements for *purchased organic seed* in the future, organic vegetable producers were asked to estimate their annual requirements in 5 years time. 21% indicated that it would be much less than currently purchased, 49% indicated they would have the same requirements, 21% indicated their requirements would be 10-25% greater, and 3% indicated their requirements would increase by greater than 50% of current requirements. 8% were unsure or did not wish to reply.

Those organic producers that raised organic *seed or seedlings* on their farm were asked if they traded any of these. 15% replied they did with 85% not trading in any organic seed or seedlings.

Use of Open-pollinated and Hybrid Varieties

Of those that did grow and trade in organic seed or seedlings 88% indicated they used open-pollinated varieties in their production, whilst 12% did not. When asked if they were satisfied with performance of open-pollinated varieties, 89% of the producers indicated they were satisfied with the performance whilst 11% were not satisfied with the performance of open-pollinated varieties. Those that were unsatisfied cited inconsistent batch performance (25%), and poor performance under organic cropping conditions (25%) as specific reasons for their dissatisfaction. 50% of those who were dissatisfied cited other reasons or did not state a reason.

All producers were asked if they used hybrid varieties in their production. 59% indicated they used hybrids, whilst 41% indicated they did not. Of those using hybrids, 83% indicated that they were satisfied with their performance whilst 17% said they were dissatisfied. Of those who were dissatisfied, 50% claimed inconsistent batch performance as the reason, whilst 50% cited other reasons or did not state a reason.

When producers were asked if they believed hybrid varieties should be retained as an option for use in organic production 73% thought they should be retained and 24% believed they should not. 2% did not specify a response. Of those that believed they should not be retained as an option in organic systems, 50% had a 'gut feeling' that it was wrong to use them, 10% believed in reducing externalities in production, and 30% cited other non-specified reasons. 10% did not respond to the question.

The final question in the survey asked producers how they rated their chances of sourcing organic seed or seedlings for *all* their cropping and rotation requirements (including green manures) if the Rule was fully enforced. 59% cited that they felt they had a poor (0-25%) chance, 27% felt they would have a moderate (25-50%) chance, 12% felt they had a (50-75%) good chance, and 2% felt that they had a very good (75-100%) chance of sourcing organic seed or seedlings for *all* their cropping and rotation requirements.

Discussion of organic vegetable producer survey results

The foundation database used as a source for the telephone survey was drawn from the parent databases of the two largest organic certifiers, ACO and NASAA, whose combined membership represents over 90% of Australia's Certified Organic producers. Therefore when interpreting the survey results the assumption has been made the survey results are representative of the entire certified organic vegetable industry.

The authors do acknowledge, however, that the approach taken of the random selection of survey participants may have inadvertently omitted larger producers, which may have resulted in significantly greater responses in some categories. However unavoidable this may have been, the nature of this segment of the organic industry may have also contributed to this outcome. The organic vegetable sector is mainly represented by a large number of producers who generally farm smaller units. A Hassall and Associates survey (RIRDC, 1995) supports this view, with this survey revealing that the organic horticulture sector represented 75% of all organic industry producers, but that they only farmed 8% of the total organic land area. Whilst this survey is dated, and recent entrants into

this sector may typically have larger farm sizes, a skew towards the smaller production unit is still most likely.

Awareness to the Rule and Ability of Industry to adopt it and the Derogation

The majority of organic vegetable producers (88%) exhibited some knowledge that the Rule and derogation existed. Overall there was a very good understanding of the procedure to follow should the derogation need to be invoked, with 95% indicating they would formally apply to their certifier for exemption from the Rule should organic planting material be unavailable.

Organic vegetable producers seemed unsure as to how (if at all) implementation of the Rule would affect their businesses. Those that did cite a reason largely believed the difficulty in obtaining organic propagation material (seed, seedlings, corms, tubers or rhizomes), increased costs, and difficulty in obtaining other input products such as potting media, would have the biggest impact. Only 14% of producers believed they had a good to very good chance of being able to obtain all their requirements for organic propagation material, with 86% believing they had a poor to moderate chance.

Perhaps of major concern to industry was producer response when asked what impact the Rule would have on their certification. 7% of organic vegetable producers indicated they would become uncertified, suggesting they intended to either trade in uncertified organic produce or cease organic production entirely.

Estimating Demand for Organic Vegetable Seedlings

Determining organic vegetable producers' current and future requirements for organic seedlings from the survey results is difficult. The size of this industry sector (relatively small compared to the conventional vegetable industry), and nature of the sector (typically a large number of smaller producers, growing a diverse range of crops) adds to this difficulty. If the survey is representative of the industry as a whole then only 46%, or 246 producers, currently use seedlings in their production systems. The results indicate a skew towards smaller producers with the majority (71%) requiring less than 5,000 seedlings per annum. Adding to the difficulty of determining future demand for organic seedlings is the fact that some producers indicated they would produce all of their own future requirements for seedlings, whilst others would grow some and purchase some. Only 21% indicated they would purchase all their future seedling requirements. Table 2 attempts to estimate the current and future industry requirements for organic vegetable seedlings.

Table 2: Estimates of current and future demand for organic vegetable seedlings.

Seedling numbers	Mixed	Brassicatae					Leafy					Solanaceous			Tuberous / perennial	
		Broccoli	Cabbage	Cauliflower	Celery	Lettuce	Spinach	Capsicum	Eggplant	Tomato	Ginger					
<1,000				1,000					3,000	1,000			1,000	1,000		1,000
<5,000	5,000	5,000	5,000	10,000	5,000							5,000	5,000	5,000		
<10,000														15,000		
<20,000																
<40,000				60,000												
>40,000																
Total ¹	5,000	5,000	65,000	71,000	5,000			3,000	1,000			25,000	21,000	36,000		1,000
Current Industry Requirements ²	65,000	845,000	923,000		65,000			39,000	13,000			325,000	273,000	468,000		13,000
TOTAL - current requirements	3,094,000															
Future Industry Requirements – 50% increase in requirements ³	97,500	97,500	1,267,500	1,384,500	97,500			58,500	19,500			487,500	409,500	702,000		19,500
TOTAL – 50% increase in requirements	4,641,000															
Future Industry Requirements – if only 37% are purchased ⁴	36,075	36,075	468,975	512,265	36,075			21,645	7,215			180,375	151,515	259,740		7,215
TOTAL – if only 37% are purchased	1,717,170															

1 Values given are highest possible value for that category multiplied by the number of responses given in the survey. For example: if there are 2 nominated responses for tomatoes in the <10,000 category then 10,000 (top value = 10,000) x 2 (nominated responses in survey) ie 20,000 is the value used.

2 Estimate of current requirements for organic vegetable seedlings. Figures obtained by using a multiplier of 13 to extrapolate to 100% of industry requirements. Multiplier of 13 is derived from the survey data which suggests that only 19 of 41 surveyed or 46% use seedlings, and extrapolating this to total industry (533), (0.4634 x 533)/19 = 13.

3 Based on assumption that there would be a 50 % increase in the demand for organic vegetable seedlings and all of these would be purchased.

4 Based on assumption that 50 % increase in demand in 5 years, but only 37% are purchased.

An estimate of the current requirements for seedlings was made from the survey response data in Question 3 (Part B). A multiplier was applied to the number of responses and the top value was used in each quantity category. It has been assumed that all current and future requirements would be for organic seedlings only.

The survey results suggested that current annual demand is 3,094,000 seedlings, well below the estimate of 10-15 million seedlings provided by industry at the outset of this project. As previously mentioned, the authors acknowledge that due to the survey method, some larger producers may have been inadvertently excluded due to the sampling method.

An estimate of the future requirements for purchased organic vegetable seedlings in 5 years, based on a 50% increase in demand, suggested that a total of 4,641,000 organic vegetable seedlings would be required. Whilst a 50% increase has been used here, it should be noted that the majority of those surveyed (32%) indicated they would purchase much less than their current requirements, whilst only 11% indicated their purchases would increase by 25-50%, and only 5% would purchase greater than 50% more seedlings. This could largely be due to the fact that many of those interviewed (37%) suggested they would either produce all their own needs for organic vegetable seedlings, or produce some and purchase some of their requirements (32%). If only 37% of all seedlings used are purchased, a 50% increase in demand would indicate an annual demand of 1,717,170 seedlings.

An alternative method of calculating seed requirements has been used below as a comparison to the survey data.

Assessing seedling requirements using industry averages

Comparing the requirements for the Australian vegetable industry as a whole, and then basing organic requirements as a proportion of this, may gain a more accurate estimate of the requirements for organic seedlings.

Australian production area statistics are available for a range of conventionally farmed vegetable crops. Hassall & Associates (RIRDC, 1995), projected that 2% of Australian agricultural land, excluding the pastoral zone, will be organic by 2005. Table 3 provides an estimate of organic seedling requirements based on the assumption that the proportion of land used for organic vegetable production for each crop is 2% of the total land area for each similar conventionally farmed crop.

The survey results indicate that those who purchase seedlings are happy to do so from a range of sources. The most popular sources being specialist organic nurserymen / traders and specialist nurserymen / trader of both conventional and organic seedlings.

Determination of the market demand for each species is difficult. The survey results suggested greatest future demand would be for Brassicates and Solonaceous species. Most producers tended not to specialise their production, with their crop selection largely determined by market demand and their rotation requirements in any particular year. Therefore, they were unsure or not prepared to commit what their future species requirements would be. This adds to the difficulty of matching market demand with supply of organic vegetable seedlings, the uncertainty potentially acting as a deterrent to specialist conventional nurserymen / traders to supply the organic market.

Many producers indicated during the survey, workshops, and through other channels, that they had experienced difficulty sourcing organic seedlings. Many nurserymen / traders of seedlings, on the other hand, indicated they were either not prepared to produce such small quantities of seedlings or, if they were conventional nurserymen / traders, were unwilling to modify their production system to produce organic seedlings. It would appear then that the most likely scenario is that the vast majority of organic producers will produce their own requirements for organic seedlings. The survey results support this view. If this is the case then there is a need to gain a better insight into the demand and supply for organic vegetable *seed*.

Table 3: Estimates of producer requirements for organic seedlings as a proportion of the Australian vegetable industry.

Vegetable	Total Area Australia (Ha)	Organic Area (2% of Total) (Ha)	Seedling Number (per Ha)	No. of organic seedlings / Corns (using 2% estimate)	No. of organic seedlings / Corns (using survey results)	% Variation
Broccoli (2)	7,285	146	50,000	7,285,000	65,000	99.11
Cabbage (1)	1,799	36	25,000	899,500	845,000	6.06
Cauliflower (2)	3,879	78	32,000	2,482,560	923,000	62.82
Celery (1)	915	18	86,450	1,582,035	65,000	95.89
Lettuce (1)	5,170	103	50,000	5,170,000	39,000	99.25
Spinach / Silverbeet	100	2	100,000	200,000	13,000	93.50
Aubergine (eggplant) (4)	300	6	18,000	108,000	273,000	-152.78
Capsicum (incl. chillies & peppers) (2)	2,485	50	30,000	1,491,000	325,000	78.20
Tomatoes (1)	8,323	166	12,000	1,997,520	468,000	76.57
Ginger (3)	150	3	250,000	750,000	13,000	98.27

(1) Horticulture Australia Ltd., 2002

(2) ABS Agricultural Commodities 2002-03

(3) Qld DPI, 2004

(4) NSW DPI, 2004

Demand for Organic Vegetable Seed

The survey results indicated that 95% or 506 producers do use organic seed in their production system.

In order to gauge market demand for organic seed it is necessary to determine the proportion of organic seed that is purchased. Question 7 in the survey asked those producers who did purchase seed to estimate their current requirements. Table 4 extrapolates their responses to determine organic vegetable producer's current requirements for purchased organic seed.

The survey results suggest that the current annual demand for organic vegetable seed is 6,269.9 kg (6.27 tonnes). Greatest demand was for pumpkins (221 kg), zucchini (145.6 kg), spinach (143 kg), green pod beans (715 kg), peas (663 kg), snow peas (650 kg), beetroot (651.3 kg), potatoes (650 kg) sweet corn (676 kg) and carrot (806 kg). The data clearly shows inaccuracies, with requirements for seed likely to be much greater for some species such as potatoes.

An alternative method of calculating seed requirements has been used below as a comparison to the survey data.

Assessing seed requirements using industry averages

Comparing the requirements for the Australian vegetable industry as a whole, and then basing organic requirements as a proportion of this may gain a more accurate estimate of the requirements for organic seed.

Table 4: Estimates of current and future demand for organic vegetable seed.

Seed quantity (Kgs)	Mixed	Alliums	Brassicace	Cucurbit	Leafy	Legume	Root	Solanaceous	Tuberous & Perennial	Other														
		Garlic	Cabbage	Cantaloupe	Pumpkin	Squash	Zucchini	Lettuce	Rocket	Spinach	Beans - Green Pod	Peas	Snow Pea	Sugar snap	Other	Beetroot	Carrot	Aubergine	Capiscum	Chilli	Tomato	Potato	Sweet Corn	
<.1				1	1	1	2	4	1	1	1	1	1	1	1	.1		.1			.4			
>.1			1	1	1	2	2	4		1					1				1	1	1		2	
>2		2		9	6		2	2									2							
>5		5		10	10		5	5									10							
>10										10														
<50	50										50	50	50	50		50	50					50	50	
Total ¹ (Kgs)	50	5	1	17	221	27.3	91	145.6	1.3	1.3	1.1	55	51	50	50.1	62	806	1.3	14.3	1.3	18.2	50	52	
Current Industry Requirements ² (Kgs)	650	26	13	221	221	40.95	136.5	218.4	1.95	1.3	1.3	715	663	650	651.3	806	806	1.3	14.3	1.3	18.2	650	676	
TOTAL - current requirements (Kgs)	6269.9																							
Future Requirements – 50% increase ³ (Kgs)	975	39	19.5	331.5	331.5	40.95	136.5	218.4	1.95	1.3	1.3	1072.5	994.5	975	976.95	1209	1209	1.95	21.45	19.5	27.3	975	1014	
TOTAL – 50% increase in requirements (kgs)	9404.9																							
Future Industry Requirements – if only 37% are purchased ⁴	370.5	14.82	7.41	126	126	15.56	51.87	83	.74	.74	.74	407.6	377.9	370.5	371.2	459.4	459.4	.74	8.2	7.4	10.4	370.5	385.3	
TOTAL – if only 37% are purchased (kgs)	3573.8																							

- Values given are highest possible value for that category multiplied by the number of responses given in the survey. For example: if there are 3 nominated responses for pumpkins in the <2 Kg category then 2 (top value = 2) x 3 (nominated responses in survey) ie 6 is the value used.
- Estimate of current requirements for organic vegetable seed. Figures obtained by using a multiplier of 13 to extrapolate to 100% of industry requirements. Multiplier of 13 is derived from the survey data which suggests that 39 of 41 surveyed or 95% use seed, and extrapolating this to total industry (533), $(0.95 \times 533)/39 = 13$.
- Based on assumption that there would be a 50 % increase in the demand for organic vegetable seed and all of these would be purchased.
- Based on assumption that 50 % increase in demand in 5 years, but only 38% are purchased

Australian production area statistics are available for a range of conventionally farmed vegetable crops. Hassall & Associates (RIRDC, 1995), projected that 2% of Australian agricultural land, excluding the pastoral zone, will be organic by 2005.

Table 5 provides an estimate of organic seed requirements based on the assumption that the proportion of land used for organic production for each crop is 2% of the total land area for each similar conventionally farmed crop.

Table 5. Estimates of requirements for organic seed as a proportion of the Australian vegetable industry.

Vegetable	Total Area Australia (Ha)	Organic Area (2% of total) (Ha)	Sowing Rate (Kgs/Ha)	Weight of organic seed (using 2% estimate) (Kgs)	Weight of organic seed (using survey results) (Kgs)	% Variation
Garlic (1)	81	1.6	1200	1,944	65	96.66
Onions (2)	5,263	105	4	421	26	93.82
Cabbage (1)	1,799	36	2	72	13	81.93
Melons (rock & cantaloupe)	2,635	53	1.5	79	13	83.55
Pumpkins (1)	8,997	180	3	540	221	59.06
Squash / Marrow (4)	50	1	2.5	3	27.3	-992.00
Watermelon (2)	4,335	87	3	260	91	65.01
Zucchini (1)	1,894	38	5	189	145.6	23.13
Lettuce (1)	5,170	103	2	207	1.3	99.37
Rocket	20	0.4	0.3	0.1	1.3	-983.33
Spinach / Silverbeet	100	2	10	20	143	-615.00
Beans, french & runner (2)	6,951	139	112	15,570	715	95.41
Peas (processing) (2)	5,147	103	134	13,794	663	95.19
Peas (in pod) (2)	380	8	134	1,018	650	36.17
Beetroot (1)	1,220	24	8	195	651.3	-233.66
Carrots (2)	7,367	147	1	147	806	-447.03
Aubergine (eggplant) (4)	300	6	0.25	2	1.3	13.33
Capsicum (incl. chillies & peppers)(2)	2,485	50	3	149	14.3	90.41
Tomatoes (1)	8,323	166	1.5	250	1.3	99.48
Ginger (3)	150	3	10	30	18.2	39.33
Potatoes (2)	35,899	718	2500	1,794,950	650	99.96
Sweet Corn (1)	4,234	85	15	1,270	676	46.78

(1) Horticulture Australia Ltd., 2002

(2) ABS Agricultural Commodities 2002-03

(3) Qld DPI, 2004

(4) NSW DPI, 2004

6. The Survey of Suppliers of Vegetable Seed and Seedlings

In order to gain some insight into the availability of organic seedlings and seed it was necessary to survey organic and conventional industry sources. All businesses listed in the foundation database were invited to participate in this survey in an effort to compile an accurate database of current and potential future suppliers.

Results of the survey of seed and seedling suppliers

Of the original 128 entrants in the combined seed and seedling supplier database used in the telephone survey, only 30 or 23.4%, surveys were completed (see Table 6). Some businesses declined to be interviewed due to lack of time or lack of relevance, or directed the interviewer to parent companies. In some cases contact details were incorrect or the company had ceased operation.

Follow up contact was made with some businesses that were unable or unwilling to participate in the telephone survey to determine their preparedness to be listed in the final database of organic seed and seedling suppliers.

Of those businesses who took part in the survey, 60% produced seed, 22.9% seedlings, 2.9% composts / mulches, 2.9% fertilisers and 11.4% produced unspecified products.

The survey questionnaire and summary of responses are contained in Appendix 4.

Table 6. Response from February 2004 telephone survey of Australian seed and seedling suppliers.

State	Number Actually Surveyed	% State Representation of Surveys
NSW	12	40.0
Qld	6	20.0
Vic	8	26.7
WA	4	13.3
SA	0	0.0
TAS	0	0.0
ACT	0	0.0
Total	30	100.0

Awareness to the Rule and Ability of Industry to adopt it and the Derogation

There was good awareness of seed and seedling suppliers to the introduction of the organic seed and seedling Rule, with 86.7% indicating they were aware of the impending changes to the Rule. However, when asked to explain the procedure to follow should the derogation need to be invoked, only 44% indicated the appropriate response.

Participants were more or less equal in their opinion as to whether the changes would affect their business, with 56.7% indicating there would be no change and 43.3% believing the change would have some impact on their business. Of those indicating an impact, the greatest proportion (50%) suggested that the biggest constraint would be their ability to obtain organic seed. 41.7% indicated some impact but were not specific in their reasons, whilst 8.3% saw their biggest constraint as their ability to achieve organic certification for their business.

66.6% of those participants who indicated they traded in *seed* stated they were certified. 20% of seed traders indicated they would apply for organic certification for their product and 10% indicated they would remain uncertified when the Rule becomes operational. Of those who stated their product was certified, 60% indicated they would retain their certification, whilst 10% would apply for an exemption from their certifier when the Rule becomes operational.

75% of those participants who indicated they traded in *seedlings* were certified and 66.7% of those who produced certified seedlings indicated they would retain organic certification for their product when the Rule became fully operational. 22.2% of seedling producers indicated they would apply for organic certification for their product and 11.1% indicated they would remain uncertified.

Participants were asked if they understood the requirements for their products to become certified. 86.7% understood the requirements, whilst 13.3% did not.

Future trade in organic seed and seedlings

The majority of suppliers interviewed were not prepared to provide detailed estimates of their production. They either stated these statistics were confidential or were unsure of the volumes produced. Consequently no detailed statistics of future production in organic were obtained.

When asked how they would meet any future demand for organic seed or seedlings, 34.6% of suppliers indicated they would produce their own requirements, 34.6% indicated they would purchase their requirements and 23.1% indicated they would produce some and purchase some of their requirements. 3.8% indicated they did not intend to service the organic market in the future.

In order to gauge requirements for *purchased organic seed or seedlings* in the future, suppliers were asked to estimate their annual requirements in 5 years time. 18.5% indicated that it would be much less than currently purchased, 22.2% indicated they would have the same requirements, 25.9% indicated their requirements would be 10-25% greater, 7.4% indicated an increase of 25-50% and 25.9% indicated their requirements would increase by greater than 50% of current requirements.

When suppliers were asked how they rated their chances of obtaining all their requirements for organic seed and seedlings when the Rule was fully enforced, 33.3% of participants believed they had a poor (0-25%) chance, 25% felt they would have a moderate (25-50%) chance, 8.3% felt they had a good chance (50-75%), and 25% felt that they had a very good (75-100%) chance of sourcing organic seed or seedlings for *all* their requirements. 8.3% were unsure or did not offer a response.

Use of Open-pollinated and Hybrid Varieties

Of those that did trade in seed or seedlings 96% indicated they traded in open-pollinated varieties, whilst 4% did not. When asked if they were satisfied with performance of open-pollinated varieties, 70.8% indicated they were satisfied with the performance, whilst 29.2% were not satisfied. Those that were unsatisfied cited poor germination (12.5%) and unsuitability for market (37.5%) as specific reasons. 50% cited other reasons or did not specify a reason. Of those species where problems were experienced, alliums eg onions were most problematic (33%), followed by *Brassicates* (22.2%), cucurbits and leafy vegetables and mixed and other vegetables (each 11.1%).

All suppliers were asked if they used hybrid varieties in their production. 54.5% indicated they used hybrids, whilst 45.5% indicated they did not. Of those using hybrids, 87.5% indicated that they were satisfied with their performance whilst 12.5% said they were dissatisfied. Those who were dissatisfied with the performance of hybrids gave no reasons.

When suppliers were asked if they believed hybrid varieties should be retained as an option for use in organic production 80% thought they should be retained and 20% believed they should not. Of those who believed hybrids should not be retained as an option, 20% of suppliers had a 'gut feeling' that it was wrong, 60% cited other non-specified reasons, and 20% did not offer a response.

Project information and privacy release

96.4% of those interviewed indicated that they would like follow-up information about the project. 48.3% indicated the preferred format to receive information about the Rule was electronically via the Internet, whilst the next preferred format (34.5%) was through printed material such as a technical note or industry newsletter. 10.3% indicated a workshop would be their preferred method of receiving information, and 6.9% cited other, unspecified methods.

The question which aimed to determine the willingness of suppliers to be listed on the industry database, once again appeared to cause confusion amongst interviewees. When asked if they would be willing to publicly release details of their products or requirements for production, 55.6% replied in the negative and 44.4% in the positive. A NO response precluded them from question 15a which asked if they were prepared to sign a privacy release form to publish their company and product details.

Discussion of seed and seedling suppliers survey results

The purpose of this survey was to gauge interest and ability of suppliers (both conventional and organic) in trading organic seed and seedlings now and in the future. A large proportion of those suppliers who were initially approached to undertake the survey declined to do so. The main reason cited that they currently supplied the conventional market with no interest in future production of organic seed or seedlings.

Most suppliers surveyed were aware of changes to organic standards, which would require producers to use organic seed or seedlings.

Although the survey did provide opportunity for suppliers to detail their production, unfortunately, few were willing or unable to provide a detailed breakdown of their output of seed or seedlings.

Significantly, many of those interviewed commented they were unprepared to commit to future organic production until the Rule becomes fully enforced. They felt that whilst derogation could still be invoked and whilst there was inconsistency by industry in interpreting when the derogation could be invoked, investment in a new production system was too risky.

One large Victorian-based seedling producer emphasised that they currently had in place HACCP and ISO quality control procedures. They also had 'isolated' facilities where they were prepared to undertake organic production. They were however, unsure of production requirements. If concise organic production guidelines were provided they believed their current quality control standards and procedures would easily accommodate the new system. They questioned the need for formal organic certification, citing that if clear organic production guidelines were available, that their existing quality assurance systems should fulfil audit requirements.

Some seedling producers had been supplying the organic industry for a number of years. Whilst all considered their production techniques were organic, some were not certified. Most indicated they would apply for organic certification. Most seedling producers indicated their greatest difficulty in meeting the requirements of the Rule would be their ability to obtain organic seed.

7. Matching supply and demand for organic vegetable seed and seedlings

Determining the supply and demand of organic vegetable seed and seedlings in Australia is difficult. This is compounded by a number of factors:

- The diverse nature and size of this sector of industry,
- Unreliable industry statistics
- Industry uncertainty regarding the interpretation of the Rule and derogation governing the use of organic propagation material.

Diverse nature and size of the organic vegetable industry

The Australian organic vegetable sector is largely dominated by a large number of smaller production units (less than 5 Ha) growing a diverse range of crops. Typically, these producers use a combination of both seed and seedlings in their production. The larger producers tended to source their seed and seedling supplies from larger commercial 'conventional' companies that produced organic products as a sideline.

The results of the survey suggested that the majority of organic vegetable producers used less than 5,000 seedlings / annum. Due to the irregularity and small size of orders, commercial seedling suppliers were generally unwilling to meet the demands of these producers. Consequently, many smaller organic vegetable producers were having difficulty purchasing a regular supply and believed that in the future they would place a greater emphasis on on-farm production of seedlings. However, if the trend is towards larger production units then demand for the supply of organic seedling transplants could rise. The questions are: how big will these be, will they source their requirements externally, and over what time frame will this occur?

Currently the majority of producers that purchase seedlings utilised non-organic sources. Indications are that this may change in the future with all producers interviewed in the survey suggesting that they would not be seeking exemption from the Rule through derogation.

Seed supply and demand is similarly being influenced by size and nature of the sector. The majority of producers currently sourced their seed requirements from a specialist producer / trader of organic seed and most of these were open-pollinated varieties. Most producers required small quantities (1-1000g) of seed. This suggests that many obtained their supplies of organic seed from specialist suppliers such as seed saver and heritage (heirloom) -type seed companies. Larger producers generally sourced their seed from larger commercial seed suppliers that traded in conventional and organic lines.

Open-pollinated or hybrid?

The majority of producers and suppliers believed that hybrid seeds should be retained in organic production; however, there was a trend amongst producers towards the use of open-pollinated varieties. The reasons given for this were largely philosophical, rather than pragmatic. However, since the current suppliers of organic seed were mostly inclined to trade in open-pollinated varieties, one could speculate that many producers were given no option but to use open-pollinated varieties whilst organic standards required them to purchase seeds of organic origin. The extent to which this is occurring would largely depend on the degree to which the Rule was being enforced by individual Certification organisations.

Market forces may also dictate to some extent whether producers decide to utilise hybrid or open-pollinated varieties. Many smaller producers utilise local outlets such as farmers markets, home delivery and specialist retail outlets such as restaurants. Consumer preferences may not be as discerning when purchasing from these outlets, and in fact consumers may actively seek out the more unusual lines such as heirloom varieties. On the other hand, larger traders of organic vegetables such

as wholesalers, supermarkets and export markets often prefer lines that reflect broader consumer preference trends. Some of these lines are hybrids that have been developed by traditional breeding programs over a number of years utilising crosses selected for their quality attributes and tolerance to pests and diseases, but where as yet, an organic seed source is unavailable.

The questions need to be asked: will consumers purchasing organic products from larger merchants be discerning enough to demand organic vegetables produced from organic seed, and if so, will they accept lines that are unfamiliar or of potentially inferior quality? If not, are seed companies prepared to put the effort into organic production of hybrid seed? Will organic certifiers demand that organic open-pollinated seed be used in preference to non-organic hybrid seed (assuming unavailability of organic hybrids) , or will certifiers be prepared to derogate for the use of non-organic hybrids where there is a clear market preference for these lines?

The above findings were supported by the First World Conference on Organic Seed in Rome in July, 2004:

“The Conference revealed that the organic sector has two distinct but not mutually exclusive faces:

- Farmer groups (often small farmers),.....interested in producing for the local market with local varieties or conservation varieties, with sometimes established systems of participatory seed production and exchange ...;
- Large-scale farmers who need to supply local supermarkets or competitive export markets and who have specific quality requirements that are best met by using the modern (hybrid) varieties of commercial seed companies. Conventional seed companies who also produce organic seed are the main suppliers of this seed. These companies’ continued investment in organic seeds is at risk if market conditions are not favourable for a profitable business.”

(FAO, 2004. Report on the First World Conference on Organic Seed. Challenges and opportunities for the organic agriculture and seed industry. FAO, Rome, 5-7 July 2004)

The Conference concluded that whilst these sectors had different markets, requirements, varieties and needs, these two segments are developing in parallel.

Lack of reliable industry statistics

The lack of, or confidentiality of, data pertaining to the production and supply of organic seed and seedlings has hampered the ability to determine accurate supply and demand figures. Similar difficulties in obtaining information regarding seed availability in Europe and the rest of the world has been reported by overseas researchers (Cook, A., 2000). Most suppliers of seedlings were unwilling to release details of production outputs for confidentiality reasons. In any case, many larger seedling suppliers were waiting to see what the demand would be before committing resources to organic production.

At best, an estimate of potential demand could only be gauged utilising survey data or the assumption that the area under organic vegetable production represented 2% of the total vegetable production area in Australia. Comparison between the two methods reveals significant variations, suggesting that neither method could provide sufficiently conclusive results.

Industry uncertainty regarding the Rule and derogation

Many suppliers of organic seed or seedlings believe that whilst derogation exists within the Rule, and there was a lack of a clear, consistent, and agreed position of the interpretation of the derogation amongst organic certifiers, there would be greater risks in supplying this market.

Organic vegetable producers feared that as there was a lack of competition in the market place (not enough seed/seedling suppliers) this would lead to a lack of choice in the marketplace, monopoly trading, and inflated prices for organic seed and seedlings.

This view was supported during the recent First World Conference on Organic Seed with “the different regulations for organic seed use, different country interpretations of the EU regulation and derogations resulting in a decreased industry interest in investing in organic seed. The seed industry called for a harmonisation of the many certification schemes in existence, especially with reference to the question of derogation” (FAO, 2004).

Current supply pathways for organic seed in Australia

The availability of good quality organic seed will be paramount for a smooth transition of the implementation of the organic propagation material Rule in Australia.

Whilst, the First World Conference on Organic Seed differentiated the organic seed sector into “traditional/natural” (i.e. open-pollinated and heirloom varieties) or “modern” (i.e. hybrids), there was broad agreement that the provision of good quality seed remains a prerequisite for all and that good cultivation practices, appropriate varieties and plant hygiene are the foundation of all seed production (FAO, Rome 5-7 July 2004).

Organic seed supplies in Australia are currently sourced through three major channels:

- ‘Conventional’ suppliers of organic and non-chemically treated (NCT) seed – includes imported seed largely from the European Union and USA
- Seed saver networks and specialist nurseries
- On-farm production - commercial organic farmers, usually ware croppers, sub-contracted to seed companies or direct selling to organic producers.

‘Conventional’ suppliers of organic and non-chemically treated seed

Some commercial seed companies are trading in organic seed. Non-chemically treated seed is also promoted for sale to organic producers. Organically produced seed is sourced from overseas, whilst a small number of ‘local’ organic producers are contracted to produce some seed.

Since it is not a requirement to differentiate imported organic from imported conventional product upon entry into Australia, it is difficult to quantify the volume of imported organic seed.

The majority of imported organic seed originates from the European Union and U.S.A. Imported organic vegetable seed is available in larger ‘commercial’ quantities and quality is often more consistent than current ‘local’ supplies, due to strict requirements for testing under AFFA’s OECD Vegetable Seeds Scheme which requires seeds to be grown under field multiplication by a Designated Authority, and samples taken to confirm varietal identity & purity, freedom from pest and diseases, and germination.

Currently one of the main sources of organic vegetable seed imported into Australia is the Dutch company Rjik Zwaan. This includes spinach (4 million seeds), carrot (2 million seeds), tomato (20,000 seeds), and mini cucumber (5,000 seeds). In addition, ‘local’ seed producers are commissioned to grow lettuce (120kg) and parsley (200kg).

Rijk Zwaan have indicated that in the future, due to insufficient demand, they will not list organic vegetable seed, and will only consider supplying organic seed for “chain” projects (i.e. projects with good communication between seed supplier, grower and marketer).

Internationally, Rijk Zwaan still has a commitment to the organic industry where the organic sector is sufficiently large. The focus will be on greenhouse crops and annual field crops such as lettuce and spinach. (Arie Baelde, Rijk Zwaan, personal communication, 2004)

Bejo Zaden (also a Dutch company) specialises in the development, production and treatment of outdoor vegetable seeds and is the European market leader in carrots and onions, and to a lesser degree leek, parsley, cauliflower, broccoli, cabbage (green & red) and radish.

Bejo’s seed production areas (not in any order of importance) for conventional and organic production are mainly France, Italy, USA, Australia & New Zealand. Currently they have organic production in Australia (Tasmania - brassica) and New Zealand (carrot & beetroot).

An Organic Seed Programme launched by Bejo focuses not only on organic seed production, but also on organic breeding. Bejo also offer varieties 'non-chemically treated' (NCT). This is seed which is conventionally produced, then treated by methods such as heat treatment/hot water treatment etc. as opposed to a chemical coating. Due to the high cost of organic seed, allied with the fact that their use is not mandatory, Bejo reports that sales of organically produced seed are at this moment negligible. However, the sales of NCT are progressing well (Tony Hubbard, Bejo Seeds, personal communication, 2004).

It is clear from the comments provided by representatives of Rijk Zwaan and Bejo that whilst they are still committed to organic production, albeit in a small way, continued supply to the Australian organic industry will largely be determined by market and policy developments related to the implementation of the Rule and continuation of the derogation.

Seed saver networks and specialist nurseries

Seed saver groups and specialist nurseries currently represent the largest group of suppliers of organically produced seed and seedlings in Australia. These seed suppliers generally supply a large range of varieties in small seed lots. Many of these suppliers favour open-pollinated and heirloom vegetable and herb varieties, and have well-established market niches in the home gardening sector and with smaller organic producers.

Some groups such as the Seed Savers Network are non-profit organisations that promote and organise the preservation, free distribution and exchange of open-pollinated seeds within Australia and overseas. These often community-based production entities generally aim to conserve existing varieties, including rescue and development of varieties considered best suited to low-input conditions. The main target markets for their production are the local home gardener and smaller organic producer.

Specialist nurseries supply a large range of varieties (often exceeding 500). Most of these suppliers promote organic open-pollinated and heirloom varieties. Non-chemically treated seed is also promoted. Seed is derived from a range of sources including on-site production, local farmers and imports. The majority of sales are to the home garden market and smaller organic market gardeners.

There has been some concern amongst producers regarding the quality of open-pollinated seed from some of these sources. Inconsistent batch performance (variability) and poor germination were some of the problems experienced. Interestingly, our survey of organic vegetable producers suggested that producers felt that poor performance of hybrids was greater than open-pollinated. However, the seed supplier survey showed that a larger proportion of seed traders were dissatisfied with the performance of open-pollinated seed than they were with hybrids.

Few of these outlets sell certified organic seeds. There is however a trend towards applying for organic certification since the Rule became mandatory. Some nurseries have opted for outright certification, whilst others have opted to purchase in certified organic seed for resale.

Within the current organic certification system no provision is made for on-farm or community produced organic seeds – organic farmers selling organic seed require double certification (for the seed itself and for their other farming practices), whilst informal seed production systems are not recognised at all within the standards. During the First World Conference on Organic Seed, IFOAM was requested to consider organic certification within its current effort to develop alternative certification for local market development.

On-farm organic seed production

On-farm production of organic seed consists of specialist seed producers, organic producers who grow their own seed for replanting and who sell any excess to their requirements, and producers who are commissioned by seed companies to produce organic seed on consignment. A more transparent system of on-farm recording of AQIS accredited organic certification organisations would help to determine the sales volumes of certified organic vegetable seed from each of these sources.

8. Establishing a National Database for Organic Plant Propagation Material

In order to stimulate increased production and to help farmers and companies to obtain organically produced seed, Member States of the European Union are required to establish an online database where suppliers of seed can register seed and seed potatoes produced by the organic production method, for sale. The database is a requirement of European Commission Regulation (EEC) No 1452/2003 of 14 August 2003, maintaining the derogation provided for in Article 6(3)(a) of Council Regulation (EEC) No 2092/91 which came into force on 1 January 2004.

Chapter III, Rules on registration of seed or seed potatoes obtained by the organic production method, Article 6 of (EEC) No 1452/2003, states that:

- 1. Each Member State shall ensure that a computerised database is established for the listing of the varieties for which seed or seed potatoes obtained by the organic production method prescribed in Article 6(2) of Regulation (EEC) No 2092/91 are available on its territory.*
- 2. The database shall be managed either by the competent authority of the Member State or by an authority or body designated for this purpose by the Member State, hereinafter referred to as 'manager of the database'. Member States may also designate an authority or a private body in another country.*
- 3. Each Member State shall inform the Commission and the other Member States of the authority or private body designated to manage the database.*

In order for Australian organic products to maintain export market access it is concluded that a similar obligation to develop a database of suppliers of organic propagation material will be required. An analysis of EU requirements follows.

Establishing and maintaining the database

The EU Regulation requiring the establishment of a database for organic propagation material outlines a number of requirements Member States must adhere to when compiling and administering a database for this purpose. Appendix 6 contains the full transcript of Chapter III EEC Regulation No 1452/2003 which pertains to the database, its requirements for establishment, and administration.

Establishment and management of the database is the responsibility of the Competent Authority of the Member State (in Australia this would be AFFA via AQIS), or an authority or body designated for this purpose by the Member State.

Those varieties not listed on the database are considered by the EEC as unavailable as a registered source of organic propagation material. Requirements also include the provision for an annual review and update of the database at a time to be determined by each Member State.

Listing as a supplier of organic propagation material is only available where the supplier can demonstrate that the material has been under an organic inspection system (ie is certified) and that the material conforms to other general requirements pertaining to seed and vegetative propagation material (eg. state and federal laws).

EEC Regulation (EEC) No 1452/2003 recommends the development of a harmonised model for the registration form to be used by the supplier of seed and vegetative propagation material for registering their products in the database.

The Regulation states that:

1. For each registered variety and for each supplier, the database shall contain at least the following information:

- a. The scientific name of the species and the variety denomination, eg. Brassica var. Black Jack. Or alternatively, common name of the species and the variety denomination eg. Zucchini var. Black Jack;*
- b. The name and contact details (address, phone number, email) of the supplier or his / her representative;*
- c. The area where the supplier can deliver the seed or seedlings to the user and the time needed for ordering and delivery;*
- d. The country or region in which the variety is tested and approved for the purpose of the common catalogue of varieties of agricultural plant species and vegetable species (ie the source of the seed / seedlings);*
- e. The date from which the seed or seedlings will be available;*
- f. The name of the inspection authority (certification organisation) or body in charge of the inspection of the operator as referred to in Article 9 of Regulation (EC) No 2092/91.*

Furthermore,

- 2. The supplier shall immediately inform the manager of the database if any of the registered varieties are no longer available. The amendments shall be recorded in the database.*
- 3. Besides the information specified in paragraph 1, the database shall contain a list of the species listed in the Annex.*

Links to databases for organic propagation material in EU Member States can be found on the Web at: <http://europa.eu.int/comm/agriculture/qual/organic/seeds/>

A process for establishing an Australian database

A key element for the adoption and smooth transition for the implementation of the organic plant propagation Rule in Australia is the development of a National database. A National database is required to not only provide listings of certified organic seed and seedlings, but as a means to put in place reporting and monitoring mechanisms. This is essential to ensure Australia has continued access for its organic products to export markets and to track the availability and demand for certified organic propagation material.

As yet, a coordinated, National approach to the listing and recording of certified suppliers has (at the time of writing) not been undertaken in Australia. Furthermore, Australian organic certifiers are inconsistent in their approach to implementing the Rule and interpretation of the Derogation. An ad hoc approach is currently occurring, however some individual organic certifiers do maintain limited lists of suppliers of organic seed and seedlings. Whilst an effort is being made, Australia is lagging behind Europe in a coordinated approach to implementing the Rule.

As a matter of urgency, it is essential for a clear, concise, and harmonised interpretation of the Rule and derogation be negotiated between AQIS (as the Competent Authority) and Organic Certifying Organisations. This would involve all parties agreeing on the development of clear and concise production Standards for organically produced plant propagation material, as well as concurrence on a format for a National database and employment of 'a manager' for the database. The appropriate forum for these negotiations would be through the Organic Industry Export Consultative Committee and the National Standard Sub-committee.

Three possible scenarios could be considered by industry regarding the construction and management of a National database:

- i. AFFA (AQIS), as the Competent Authority, administer the database through existing reporting structures established under the export control program for organic products. This would require the responsibility of establishment and management of the database to be undertaken by the Approved Organic Certifying Organisations
- ii. AFFA (AQIS), as the Competent Authority, delegate construction and management of the database to an umbrella industry organisation such as the Organic Federation of Australia (OFA)
- iii. AFFA (AQIS), as the Competent Authority, delegate construction and management of the database to an independent third party.

An appropriate mechanism for this approach could be negotiated through the Australian Seeds Authority Limited (ASA). Established by the Federal government in June 2002, the ASA is a non-profit, fully incorporated organisation responsible for maintaining seed certification and accreditation, and matters relating to international seed trade including the schemes by the Organisation for Economic Cooperation and Development (OECD), the International Seed Testing Association (ISTA) and the Association of Official Seed Certifying Agencies (AOSCA). (see ASA website: <http://www.grainscouncil.com/ASA/ASA.htm>)

One significant benefit of this approach is that seed quality standards may also be negotiated to ensure that producers are supplied with seed of a guaranteed quality, purity and phytosanitary cleanliness.

With this approach the role of the Approved Certifying Organisation's would be limited to establishing clear and concise production Standards for organic plant propagation material and the certification of suppliers of this material. Producers would be referred to the 'independent database' for sources of appropriate material and a mechanism included which allows a producer to apply for Derogation to their appropriate Approved Certifying Organisation.

It is interesting to note that ASA was due to discuss a possible role for OECD Seed Schemes for the certification of organic seed during its annual meeting in September 2004.

Database design and delivery

As a minimum, a database that contains the information required under EEC Regulation (EEC) No 1452/2003 should be designed. This should include an appropriate mechanism for organic producers to apply for derogation.

A web-based, interactive database similar to the European-based OrganicXseeds would offer significant benefits. The organisation responsible for the database is FiBL (Research Institute of Organic Agriculture) in Switzerland, in cooperation with the United Kingdom's Soil Association and NIAB in England, AIAB in Italy, the LBI (Lois Bolk Institut) and the Stichting Zaadgoed in Holland and the German working group ALOG.

The OrganicXseeds website site aims to provide up-to-date information on the availability of organic seeds, vegetative propagation material and seed potatoes. The site is designed to be used by organic farmers and growers to find organic seed, certification bodies to help authorize derogations and seed companies looking to sell certified organic seed. Details are provided on the quality criteria of the seeds and seedlings on offer, and information is available to seed suppliers who wish to advertise their products. The OrganicXseeds website is located at: <http://www.organicxseeds.com/>

In the United Kingdom, The Soil Association – the UK's main certifier and promoter of organic food and farming – has been chosen by the UK's 'competent authority', DEFRA (Department of

Environment Forest and Rural Affairs) to run the project in the UK. The database is funded by DEFRA and managed by the Soil Association, working in partnership with FiBL and NIAB (refer to: <http://212.249.198.56/oxs/do/Login?paramCountry=188>)

An additional advantage of an interactive database would be the potential fiscal benefits offered through an on-line trading service. Due to the extensive coverage of Web-based information, this could provide the impetus to improve investment confidence in the domestic supply and trade of organic seed and seedlings, whilst also offering opportunity for bi-lateral trade between Australia and its international markets.

Administrative costs for the database could be recouped by placing a nominal annual fee for listing on the database.

9. Opportunities in Organic Seed and Seedling Production

The introduction of the organic plant propagation Rule and Derogation creates the potential for various opportunities and threats for the Australian Organic Industry. By and large, the potential threats relate to supply, demand, and quality issues. There are however, several opportunities industry may wish to investigate to help lessen the impact of these threats.

Alternative market opportunities for organic seed and seedlings

In order for production and supply issues for organic propagation material to be minimised it is clear that the demand for the products needs to be increased. Currently the smallness of the Australian organic industry is preventing larger suppliers of seed and seedlings from entering the market. Uncertainty regarding the continuation of the derogation is also adding to this reluctance.

The nursery and retail trade

Organic gardening is becoming increasingly popular amongst home gardening enthusiasts. The popular television series, ABC's 'Gardening Australia', advocates organic techniques and publishes the monthly 'Organic Gardener' magazine. Noticeably, other 'high' profile gardening personalities are also increasingly making reference to 'organic' solutions. Mr. Fothergill has launched an organic (non-certified) seed range into 'conventional' nurseries and supermarket outlets.

This increased interest in organic gardening could offer significant alternative markets for certified organic seed and seedlings, trees and shrubs (referred to as Green Life products) as well as allied garden products such as organic growing media and mixes, fertilisers and plant care products.

In their 2002 Australian Horticultural Statistics Handbook, Horticulture Australia Limited reported the combined garden services and retail trade in Green Life products was valued at \$468 million, whilst the allied garden product trade for retail products was valued at \$780.5 million and the café and gift segment accounted for \$42 million. If the certified organic industry could capture just 1% of this trade this would represent \$4.68 million for Green Life, \$7.8 million for allied garden products and \$0.42 million in the café and gift segment.

Organic seed production opportunities

Organic production of seed offers potential income diversification opportunities for ware crop producers. This could be through contracting production to existing seed companies or by direct sale to other organic producers. Production of organic seed for export could also offer some potential. The development of an organic seed breeding program could offer the potential for regionally adapted varieties to be made available to organic producers.

An important sales point for organically produced seed is its non-GM nature. However, producing organic seed free of GM contamination will be increasingly difficult to achieve given the current global increase in GM crops.

The production of seed under organic farming conditions can however pose a number of challenges.

Challenges of organic seed production

Production of quality, disease free seeds for some crops, such as those requiring two seasons for seed production (eg. biennial vegetable crops such as cabbages, carrots and onions) can significantly increase the risk of disease and pathogen contamination. Furthermore, organic seed production is at the moment more expensive than conventional seed production, and seed is more likely to be contaminated with weed seeds and seed-borne pathogens (Groot, S.P.C. *et. al.*, 2004).

Organic seed production requires a high degree of sanitation, eg. disease freedom of the basic seed, diligent roguing during all stages of plant development, and a stringent isolation of production fields from potential sources of cross-contamination.

Groot *et. al.* (2004), recommend investigations in a number of areas to improve the quality and supply of organically produced seed:

- Develop adequate methods for detection of pathogens during seed production
- Determination of critical control points during seed production as a basis for disease monitoring activities and treatments
- Develop new seed sanitation treatments as alternative to fungicides (eg. thyme oil and ascorbic acid – see Groot *et. al.*). This must be effective against the pathogen and also maintain seed viability, be in accordance with organic standards, and be permitted according to national (APVMA) and international regulations for crop protectants
- Develop novel seed sorting techniques, such as chlorophyll florescence (CF) to sort diseased from contaminated seeds or for discarding less vigorous seeds
- Investigate acceptable methods to stimulate rapid seed germination and establishment (eg. priming).

Organic seed production for export

During the National organic seed production workshops there was interest shown in the production of organic seed for export. Tasmania and Western Australia, due to their relative isolation and quarantine restrictions were seen as the most likely locations for these operations.

‘Conventional’ vegetable seed crops are currently grown in Tasmania for the main export markets (in the Northern Hemisphere) and for Tasmanian and Australian mainland states’ vegetable industry requirements. The advantages of Tasmania as a climatically suitable ‘out of season’ producer for Northern Hemisphere markets has been recognised by several seed companies.

The major crop types include brassicas, especially hybrid cabbage and cauliflower, root crops such as potato, carrot and parsnip, onions, and leaf crops such as spinach and silver beet.

Good quality, reliable production is seen as an important requirement for the export trade. Seed is a high value, low volume commodity and can therefore be competitive despite freight costs. In all seed production systems, quality assurance and a high quality product are important components. Field Fresh Tasmania contracts for the production of the majority of its onion seed requirements in the Derwent Valley. The following companies contract for the production of seed, predominantly for export to other areas of Australia or international markets:

- South Pacific Seeds - Coal River Valley, Hagley/Westbury
- Bejo Seeds - Coal River Valley, Derwent Valley, east coast (also organic seed)
- Henderson Seeds (Serve-Ag) - Devonport area, east coast
- Yates Seeds - Coal River Valley, Derwent Valley

South Pacific Seeds, Henderson and Yates are major Australian seed companies with their own breeding, production and sales operations. Vegetable seed production in Tasmania complements their other seed production areas in Australia. Bejo Seeds is a European company (Tasmanian Dept of Primary Industries, Water and Environment, 2004).

Establishment of an organic seed breeding program

In 2002, breeders reportedly produced 530 varieties of organic seeds for the European market. Anticipating the growing demand for organic seeds, the Louis Bolk Institute, the Seed Association (Stichting Zaadgoed) and the NAK published a catalogue containing about 700 varieties of organic seeds. The sector anticipates, however, short supplies of seeds for some minor crops and the EEC is investigating the need for exemptions for certain crops in some countries. (Source: USDA Foreign Agricultural Service GAIN Report Number: NL304511/17/2003).

Production of organic seed holds the potential for a new generation of varieties and strains developed to perform well in organic growing conditions. Almost all current commercial varieties are developed in high-input conventional agricultural systems and bred to respond well to those systems. Converting an existing conventional variety to organic by producing it on certified organic land is what has been called substitution agriculture. Organic hybrid seed is expensive and difficult to produce because two inbred open-pollinated lines are crossed to make a hybrid and those inbred lines are often weak and susceptible to disease and pests.

Conventional seed growers protect the weakened strains with applications of chemical pesticides. There is the potential of developing organic varieties; the question is how and where this sort of work will be done?

In his discussion paper, '*Participatory Organic Plant Breeding Closing the Loop for Organic Grain Growers*', Dr David Luckett Senior Research Scientist with NSW Department of Primary Industries at Wagga Wagga Agricultural Research Institute, has proposed a model for planning and implementing an organic plant breeding program for grain.

In his paper Dr. Luckett points out a number of technical considerations influencing a breeding program for organic crops:

- Organic growers do not accept GMOs and wish to respect all natural species boundaries
- Organic growers are opposed to using patented genes in varieties and oppose Plant Breeders' Rights
- Organic growers in Europe and Canada have formulated guiding principles that state that certain other plant breeding methods are 'prohibited' from an organic approach: anther and microspore culture, induced mutations, protoplast fusion, and some types of F₁ hybrid
- The key to organic varieties is increased genetic heterogeneity with increased (inherent) ability to buffer the effects of weather, pests, diseases and weeds
- Organically bred crop varieties will be regionally-specific (high levels of regional adaptation), and may be quite different in ideotype to current varieties in conventional systems. As yet these organic ideotypes are not well defined for the main crop species
- Natural selection will play a large part in deciding the outcome. Many genetic forces may be at work in the populations, e.g. frequency-dependant selection
- Europe and Canada are moving towards plant breeding specifically for organic grain cropping. The first project on organic winter wheat breeding has begun in the UK.

The role of participatory plant breeding

- Participatory plant breeding is increasingly popular in developing countries where farmer-based selection schemes produce adapted and reliable varieties much more quickly than conventional approaches, biodiversity is increased, and year-to-year production fluctuations are minimised
- Participatory plant breeding has been supported and used by significant international breeding organisations, such as The Consultative Group on International Agricultural Research (CGIAR)
- Organic growers are willing to sacrifice high potential yield levels for a lower but more stable yield over seasons, achieved while nurturing the natural environment
- Organic grain growers need a number of cropping options (cereals and broad-leaf crops) to establish a sustainable rotation
- Public plant breeders currently do not have ready access to organically-farmed land at research stations on which to conduct organic breeding. Participatory organic plant breeding (POPB) is required to fill this niche.

Implementing the breeding program

- Genetically diverse populations would be produced by the coordinating breeder at a central location. Additional (public) germplasm would be sourced as required, including conventional varieties under PBR which are free to be used for further research
- The sequence of events envisaged would be: consult with industry groups and funding providers, secure funding, and establish a network of participating growers (say, ten), have intense consultation with the organic industry as to their requirements for new varieties in each of the target crops, then begin crossing
- The suggested target crops are: wheat, barley, canola, albus lupins, chickpeas and field peas. This suite will provide a range of options for growers throughout NSW (and beyond)
- The crossing would be done on a 'rolling' basis to spread the load and would be repeated for each crop as the desired ideotype becomes clearer and progress towards it is made. In this sense it becomes a kind of recurrent selection process (see Table 7)
- The amount of work at the centralized location would be much less than in a conventional program because all trials and selection will be done by the participating organic growers on their properties
- It is envisaged that some sort of diallel, hierarchical or chain-crossing procedure would be required to generate the starting populations (called Composite Cross populations in the breeding literature).
- The parents of the crossing would need to include all the genes likely to be necessary to achieve the ideotype
- Growing the F₂ and F₃ generations might be compressed into one year if off-season nurseries are appropriate
- The precise generation distributed to organic growers will depend on the multiplication rate of the species, how many growers are involved, and the number of plants to be grown in each starting population at each location
- It will be easier to generate and maintain genetic diversity in the species that are partially outcrossing, eg albus lupins and canola
- The organic growers would be simultaneously selecting, raising organic seed for next season, and growing their own evolving (not homogeneous and static) variety
- After a number of years (say, three) of supervised selection by participating organic growers, samples of the resultant populations would be brought together by the breeder in combined organic trials to assess progress, and facilitate planning for the next stage
- Promising pure-bred lines would be isolated from the populations and be fed back as parents of new populations, and could be sent out into the conventional breeding program for evaluation.

Table 7: Proposed sequential crossing to establish organic breeding lines

Year	Breeder			Organic growers		
	Stream 1	Stream 2	Stream 3	Stream 1	Stream 2	Stream 3
1	Lupins & barley					
2	Grow F ₂	Field peas & wheat				
3	Grow F ₃ & distribute	Grow F ₂	Canola & chickpea			
4	Lupins & barley	Grow F ₃ & distribute	Grow F ₂	Selections		
5	Grow F ₂	Field peas & wheat	Grow F ₃ & distribute	Selections	Selections	
6	Grow F ₃ & distribute	Grow F ₂	Canola & chickpea	Selections	Selections	Selections
7	Lupins & barley	Grow F ₃ & distribute	Grow F ₂	Trials	Selections	Selections
8	Grow F ₂	Field peas & wheat	Grow F ₃ & distribute		Trials	Selections
9	Grow F ₃ & distribute	Grow F ₂	Canola & chickpea			Trials
10		Grow F ₃ & distribute	Grow F ₂			
11			Grow F ₃ & distribute			

A business model

- PBR registration of organic varieties will not be possible (due to the heterogeneity of the populations, and the wishes of the organic industry). Consequently, unless this breeding is seen as 100% public-good, a new business model will be required to capture some income stream from the varietal populations produced
- a joint venture could be negotiated with the funding providers and the organic growers (or their peak industry body) so that when the resultant populations are ‘traded’ with other organic growers, a royalty is collected to help continue the breeding effort.
- alternatively, there could be an agreement up-front to collect an organic variety levy at the point of delivery or use
- as time progresses and the organic industry begins to benefit from the research, there should be a clear understanding that they would shoulder an increasing proportion of the research costs.

From: Lockett, D., (2003). “Participatory Organic Plant Breeding - Closing the Loop for Organic Grain Growers. A Discussion Document”. NSW Department of Primary Industries. Wagga Wagga. Unpublished.

Whilst not specifically associated with vegetable production Dr. Locketts’ model exemplifies some of the considerations required to establish a successful organic plant breeding program.

Challenges of establishing an organic breeding program

However, there is some concern plant breeding specifically for organic propagation material may severely disadvantage the industry. The International Seed Federation (ISF) in their paper 'Position on Plant Breeding for Organic Farming' (Chicago, May 2002) holds the position: "that the proposed evolution, in which several current and efficient breeding techniques are banned, will lead to enormous difficulties for the organic farming community:

- The necessary time for breeding an 'organic' variety will be prolonged and a lower efficiency will be reached
- Because it is less efficient, breeding will be more expensive. This extra expense would need to be carried by the organic market
- Restricting the exchange of material between traditional and organic breeding programs will strongly limit the possible access to genetic resources, essential for progress in plant breeding
- Quick reactions to new biotic and abiotic stresses will be complicated and limited, because of the restricted use of efficient techniques and of the restricted exchange of breeding material".

(ISF Website: http://www.worldseed.org/Position_papers/Pos_org_farming.htm)

10. Conclusion and Summary of Recommendations

Maximising the opportunities and minimising the threats imposed by the organic plant propagation Rule and its derogation

It was clear at the outset of this project that the findings would go far beyond the expected outcomes of the original brief:

“To provide the necessary technical and regulatory information to producers of vegetable seedling and other propagative material to permit the production of organic certified stock.”

Attempts were made to estimate supply and demand profiles for organic seed and seedlings for a range of vegetables utilising two different methods:

- By survey - using lists compiled from organic certifiers (NASAA and ACO) and other industry sources
- By using National horticulture industry production statistics and calculating organic production as a 2% proportion of this data.

Whilst neither of these methods could be said to have provided conclusive results, it became obvious from discussions with producers (most of whom had experienced difficulties obtaining certified organic plant propagation material) and through discussions with suppliers (who were in-the-main reluctant to supply this market) that a shortfall in specific varieties of organic material could significantly disadvantage Australian organic producers, particularly those contemplating export production. This would largely depend on the extent to which Australia's trading partners enforce the requirements of the Rule for imported organic products.

Less affected by these shortfalls will be the smaller organic vegetable producer whose markets may accept a greater diversity of varieties, particularly open-pollinated and heirloom varieties. Suppliers of these varieties currently dominate certified organic seed and seedling production.

The fact that major suppliers of imported organic seed report negligible sales should be of concern to industry. Poor sales are adding to the disincentive of these companies to supply the Australian market, and could severely disadvantage Australian organic producers' place on the world stage in the future. Most of these suppliers saw the complete removal, or a tightening of the derogation, as a solution to the problem. However, certifiers may be apprehensive to make these changes fearing that some producers may choose to abandon their organic certification.

Our investigations identified that some of the main constraints affecting the supply and demand of organic vegetable seeds and seedlings included:

- The fragmented and small-scale nature of this sector of the industry
- The lack of transparent and harmonised records of organic production
- The lack of concise production criterion for organic plant propagation material
- The lack of industry-wide agreement on interpretation and implementation of the Rule and derogation
- Reluctance of major commercial suppliers of seed and seedlings to supply the organic market, largely due to uncertainty regarding the continuation of the derogation and its interpretation
- Inferior quality and increased production risks associated with organic production of seed and seedlings
- The lack of defined quality standards for seed production

- The difficulties associated with organic production of some species (for example, strawberries)
- The difficulty of forecasting the demand and supply for organic seed and seedlings (unreliable or incomplete industry statistics)

Clearly these issues are of concern for the supply and demand of organic seed and seedlings to all sectors in the organic industry. A national approach is urgently required to identify and prioritise strategies to help address supply and demand issues.

As a result of their investigations, the authors recommend the Organic Industry consider the following strategies:

- Convene a National Organic Industry Forum bringing together key stakeholders to discuss issues associated with the Rule for organic plant propagation material and the development of a harmonised approach to facilitate the supply and demand for this material within Australia
- As a matter of urgency, industry should determine a clear, concise and harmonised interpretation of the Rule and derogation, including a time frame for full implementation (i.e. removal of the derogation)
- The development of an interactive web-based National Database for listing of suppliers of certified organic varieties of seed and seedlings, which in addition, contains a listing of those species for which, as yet, no organic material is available. The database should aim to satisfy all the requirements of EEC Regulation (EEC) No 1452/2003
- Investigate opportunities and threats posed by the implementation of a national organic crop breeding program

In order to minimise the impact of the Rule and its requirements on organic producers it is recommended that they:

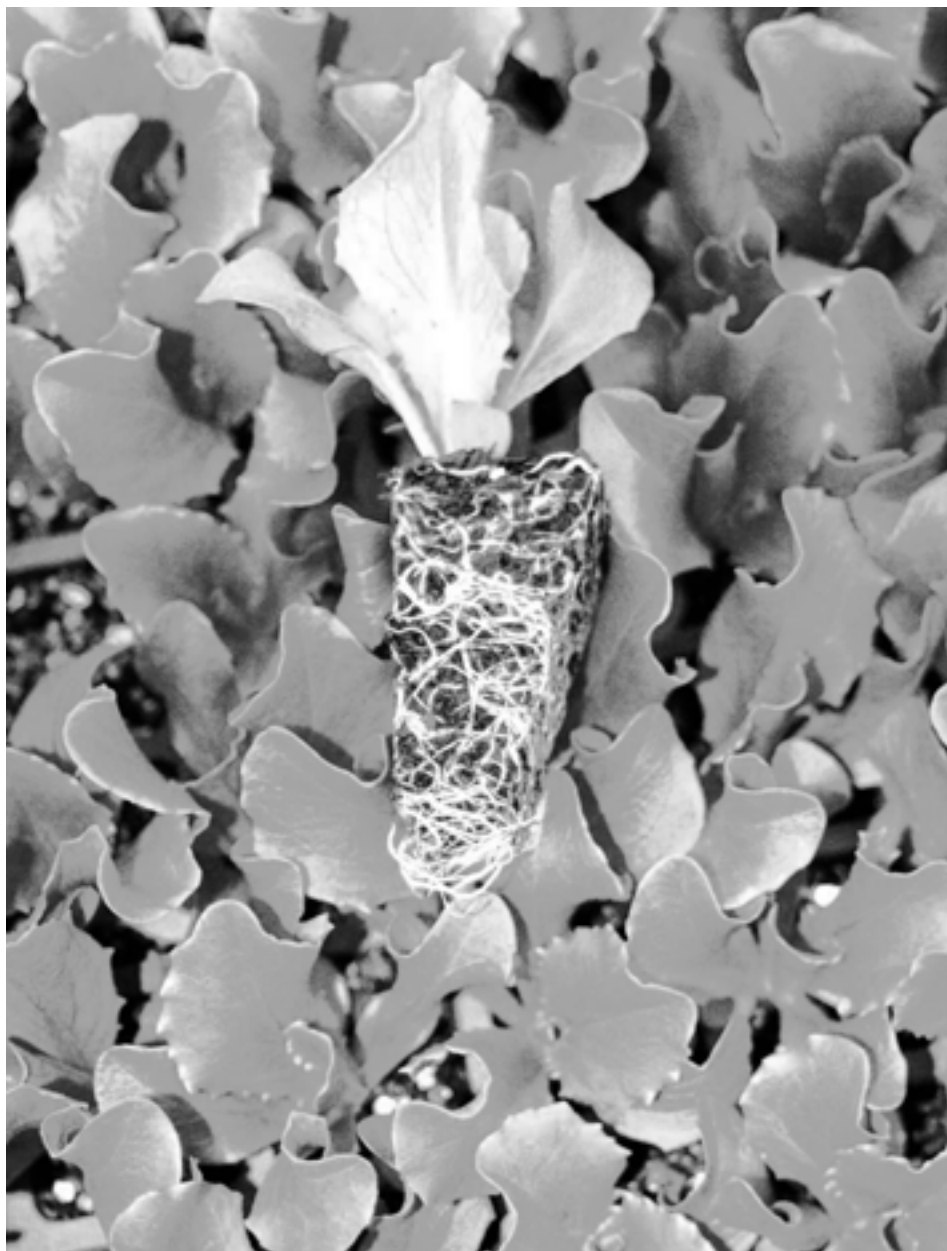
- Where appropriate, organise into cooperatives to facilitate the supply and purchase of organic seed and seedlings
- Consider on-farm production for their requirements of organic seed and seedlings
- Form alliances with larger 'commercial' suppliers of seed and seedlings to provide mutual benefits with the facilitation of supply and demand
- Determine the annual requirements for organic seed and seedlings well in advance of the production season

In order to minimise the impact of the Rule and its requirements on suppliers of organic plant propagation material it is recommended that they:

- Investigate alternative markets for organic seed and seedlings (eg Green Life and Allied Products horticultural segments)
- Identify and establish market alliances with key producers, certifiers and other relevant users of organic seed and seedlings
- Identify export opportunities for 'out of season' supply of organic seed.

Appendix 1

Organic Seed and Seedling Production



A guide to the production of certified organic seed, seed potatoes and seedlings for vegetable growers and production nurseries

Organic Seed and Seedling Production

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Introduction

The Australian National Standard for Organic and Bio-dynamic Produce (December, 2002) states that plant propagation material utilised in organic production systems must be from a certified organic source. This requirement has been subject to exemption in the event that suitable planting material was unavailable, for example, if the desired cultivar was not commercially available. However, this clause will cease to exist in 2006, thus requiring mandatory use of certified organic material beyond this date.

Organic certification organisations recognise that some planting material may never be available in the organic form, and whilst this may mean a little more paper work for producers to prove this is the case, it is not the intention of the certifiers to unfairly restrict the commercial activities of producers.

This Agnote outlines guidelines for the production of certified organic seed and seedling production. Seed and seedling producers will be required to have their premises and practices certified for compliance to organic standard if their products are to be traded as “certified organic”. Trade in seed and seedlings may also be subject to legal restrictions governing the movement or sale of seed, plants or soil. Anyone contemplating dealing with these materials should familiarise themselves with the relevant legislation. It is recommended that growers or agents contact the regulatory divisions of your chosen organic certification body, state Department of Agriculture, Agriculture Forestry & Fisheries Australia or the relevant national agencies in any importing country or state before trading in any plant or plant product.

The NSW Agriculture Agnote ‘Materials permitted for organic seed and seedling production’ provides further details on acceptable inputs for producers of certified organic seeds and seedlings.

State and Federal regulatory issues

Organic farmers must abide by the same legal requirements as other farmers. State, Territory and Federal laws relating to issues such as health and food safety, Plant Breeders Rights, interstate / import / export phytosanitary laws, noxious weed control, fruit fly, feral animal control, exotic pest and disease outbreaks and pesticide use must all be obeyed even when implementation contravenes the organic standard.

i. Plant Breeders Rights

Production of most modern vegetable varieties is regulated through the Plant Breeder's Rights Act (1994), making it illegal to retain and sell seed from a crop without permission from the owner of the material. Very little vegetable breeding is now done in Australia so PBR is usually owned by large national or multi-national seed company or PBR on the variety may be licensed to an importer. Without PBR ownership or licence for affected varieties, an individual or corporation may not engage in the following activities:

- (a) produce or reproduce the material;
- (b) condition the material for the purpose of propagation (conditioning includes cleaning, coating, sorting, packaging and grading);
- (c) offer the material for sale;
- (d) sell the material;
- (e) import the material;
- (f) export the material; and
- (g) stock the material for any of the purposes described in (a) to (f).

In certain circumstances, principally if the breeder has not had a reasonable opportunity to exercise the right on the propagating material, PBR extends to harvested material and, subject to a similar set of qualifications, to products obtained from harvested material. Exceptions to the breeder's right are the use of the variety privately and for non-commercial purposes, for experimental purposes, and for breeding new plant varieties. A variety can be used for these purposes irrespective of the existence of PBR. Farm saved seed is permitted, unless the crop is declared by regulation to be one to which farm saved seed does not apply. Currently no crops have been declared in this way.

More detailed information on this topic can be accessed through the following web address:
www.ipaccess.gov.au/content/index.phtml?itemId=37102

ii. Quarantine regulations covering the movement of soil and plant material

State and Federal quarantine regulations exist which may restrict the movement of seeds and seedlings and other input products between states, as imports, or as exports. This may prevent supplying organic products to markets in other states or countries, or prevent the importation of organic products. For some field crops and potatoes, Seed Certification schemes exist in order to maintain disease free industries.

Import regulations

Import restrictions exist for a range of agricultural products including seed and nursery stock.

Those producers intending to import vegetable seed for multiplication would have to register with Agriculture, Fisheries and Forestry - Australia (AFFA). AFFA is currently responsible for implementation of the OECD Vegetable Seeds Scheme in Australia. This scheme distinguishes between certified and commercial seed types and permits the maintenance of varietal identity and purity. Under the scheme, seeds must be grown under the minimum conditions outlined in the agreement and are inspected during the field multiplication by a Designated Authority and samples are taken to confirm varietal identity & purity, freedom from pest and diseases and germination.

The organic status of imported material may be compromised if found to contain contaminants. Non – legume seed must be free from soil, live insects, plant material (eg fruit pulp, leaf or stem material, etc), and contamination with prohibited seeds. If found to contain contaminants, treatment of the material with a non-permitted substance such as methyl bromide or phosphine would result in the product losing its organic status. Leguminous seed must be dusted with Thiram® which would automatically preclude it from organic certification.

Import permits are required before entry is approved. Samples must be packed in new containers that are clearly labelled with the botanical name. Samples less than 10 Kg are visually assessment by an AQIS officer, and for those greater than 10 Kg, a sub-sample is taken for AQIS accredited testing.

In addition, from December 2002, organic products imported from countries outside Australia, must be deemed to have certification equivalence with the National Standard for Organic and Bio-dynamic Produce (December, 2002) in order to retain their organic status once in Australia.

Application to Import Quarantine Material can be obtained by contacting AQIS on (02) 6272 4578. Further information on the importation of products can be found at the AQIS website:
<http://www.aqis.gov.au>

Growers should be aware that most commercial seed imported into Australia has been conventionally grown and treated with non-certified fertilizers and may, according to need, have been treated with chemicals (herbicides, desiccants, insecticides or fungicides) at some point in the production chain. Even if certified organic seed is imported into Australia it may have to be treated upon entry. The use of this seed will cause both the land and the subsequent crop to loose organic certification and revert to “in conversion” status. Seed saved from crops grown in conversion can be planted into organically certified land and the subsequent crop will be classed as organically certified. AQIS and the individual certifiers should be contacted to see how best to approach this issue.

Export regulations

Export regulations are governed by the importing countries requirements most of which are signatories of the OECD Seed Scheme, the rules of which are available on the OECD web site: <http://www.oecd.org/dataoecd/20/19/1933955.pdf>. Additional importation requirements such as those implemented by the EU are very strict. These requirements are in addition to the normal requirements for the entry of organic products. Organic certification organisations can assist in providing information on the importing countries requirements for organic produce. Other import regulations can be obtained from the importing countries departments of agriculture.

State regulations

There are restrictions on the interstate movement of plant material and soil between some states. This prevents the movement of pests and diseases into areas that do not have a specific pest or disease.

The Tri-State Agreement for control of fruit fly exists between Queensland, NSW and Victoria. This restricts the movement of fruit and vegetables into zones that are fruit-fly free (exclusion zones). If a declared outbreak occurs in an exclusion zone, legislation is in place that requires the chemical treatment of susceptible crops. An affected organic seed crop, such as tomatoes, if in a declared outbreak area, would also be required by law to implement fruit-fly control. In recent years, NSW Agriculture has negotiated with organic producers and certifiers to implement strategies that permit producers to retain their organic status. Affected producers should check with their relevant state department of agriculture and their certifier for approved control methods.

Tasmania has quarantine restrictions which places restrictions on the importation of some plants and all soil from the Australia mainland. This includes onions from South Australia (onion smut prohibition), solanoids eg potatoes, tomatoes, eggplants must be treated with the fungicides Ridomil® or Thiram®, peas require chemical fumigation for pea weevil, sweet corn requires clearance for boil smut and treatment with Vitavax®, and potato tubers require clearance for PCN if from an infected area.

Western Australia also has restrictions on the movement of some plant and all soil from interstate. Sweet corn requires clearance for boil smut and treatment with Vitavax®, potato tubers require clearance for PCN if from an infected area (tissue cultured or cutting material is exempted). All seed must be provided in new containers.

Queensland has restrictions on the movement of cucurbit seedlings because of the risk of them carrying papaw ringspot virus. The movement of all plants from far north Queensland to southern regions is restricted because of the risk of them hoasting Mango leaf-hopper. Clearance may be granted following inspection by a DPI/AQIS.

New South Wales restricts the movement of broccoli seedlings from other States because of the risk of white blister.

iii. Seed Certification Schemes

Vegetables, with the exception of potatoes are not covered by Seed Certification schemes, however many field crops used as green manures are. Trade in certified seed is subject to the rules and directives of the Organisation for Economic Co-operation and Development (OECD) Seed Schemes so that Australian certified seed can compete globally for sales into OECD and European Union countries.

Certified Seed is produced to standards set down by Government in a quality assurance scheme. Certification is voluntary and adds value and marketability to the seed by documenting it's genetic purity and physical quality. In addition, Certification may guarantee against the import of specified weeds, pests and diseases. Certified seed is also grown and processed to meet physical quality standards, relevant to the crop, such as:

- the percentage of clean, whole seed relative to inert materials (such as chaff, dirt etc).
- germinability
- minimum numbers of other crop and weed seeds
- maximum number of generations the material has been exposed to out of aseptic culture

iv. Exotic Pest and Disease Control

As stated in the Standard, all measures required by the State in the event of an outbreak of an exotic pest or disease must be enacted by affected growers even when this conflicts with organic production methods. Any affected grower should seek the assistance of their certifying agency in such an event so as to minimise the impact of any treatment on the grower's certification status.

v. Use of Non-Registered Agents for the Control of Pests & Diseases

Legally no product can be applied to a crop for the purpose of control of any pest or disease unless it is registered for that purpose by the Australian Pesticides and Veterinary Medicines Authority (APVMA, formally NRA). The cost of registration is significant so many organic products are not registered for the purpose for which they have become known and may be sold as "soil amendments".

Producing Certified Organic Seed Potatoes for Sale

The movement of potatoes within and between states is subject to various State quarantine laws designed to prevent the spread of diseases like Potato Cyst Nematode. Potatoes are one of the few vegetables that are vegetatively propagated. This means that while varietal integrity is more easily maintained, than for sexually reproducing species, they are more liable to acquire diseases which will affect quality, productivity and ultimately the profitability of the enterprise. To overcome this, a seed potato certification scheme has been introduced. To avoid confusion with the use of the term "certified" organic seed potato in this document, the tubers produced through these schemes will be referred to as "registered" seed potatoes. Seed potato registration schemes rely on the maintenance of disease free lines, sourced from virus tested, tissue cultured stocks. Certified organic potato growers should be aware that their product can not be legally marketed as "certified seed potatoes" (i.e. their product is certified organic but not registered) unless they are members of a registered seed potato scheme and the product meets the criteria to be marketed as a registered seed potato.

For Organic growers, producing a ware crop (table or processing), the use of registered seed potatoes may fall within the derogation allowing for the use of non-organically grown propagating material. Growers should be aware that this material has been conventionally grown and treated with non-certified fertilizers and may, according to need, have been treated with chemicals (herbicides, desiccants, insecticides or fungicides) at some point in the production chain. Without reference to the derogation the use of conventionally produced registered seed will cause the subsequent crop to lose organic certification. If the derogation is invoked then tubers from this crop, referred to as one off registered seed (i.e. one field generation away from registered material) can be planted into organically certified land and the subsequent crop will be classed as organically certified. Individual certifiers should be contacted for further details regarding this issue.

The derogation allowing for the use of conventionally produced seed potatoes in organic systems is unlikely to continue, however, the opportunity exists to produce a certified organic, registered seed potato. Such a product could only be produced within declared seed potato production areas. Declared seed potato production areas are protected by legislation making it illegal to import potato tubers or implements likely to carry soil, into these regions. Potato Certification Schemes (i.e. Registration Schemes) are administered by individual Australian States and growers wishing more information should contact their relevant State Departments of Agriculture for full details of the scheme operating in their state. Guidelines for the production of a certified organic, registered seed potato are yet to be established, so any qualified grower wishing to do so should consult with their local seed association and their organic certification agency.

Producing Certified Organic Seed for Sale

Reliable sources of high quality certified organic seed suitable for use a certified organic enterprise is becoming more available but still falls short of all variety and cultivars required. Organic certification agencies and the Australian organic database (Yet to be published as part of DAN – 217A) have only documented domestic seed suppliers.

Growers producing seed crops for sale should be aware that most commercial seed has been conventionally grown and treated with non-certified fertilizers and may, according to need, have been treated with chemicals (herbicides, desiccants, insecticides or fungicides) at some point in the production chain. The use of such seed will cause the subsequent crop to lose organic certification. Growers wishing to plant seed other than that which has already been certified as organic should contact their certification body for guidance on the status of their crop.

With the exception of lettuce, sweet-corn, cucurbits, carrots, parsnips, and brassicate crops, most vegetable seed is imported into Australia. Many of the modern, higher yielding varieties are PBR protected or are hybrid lines and this will mean that organic production will need to take place by or in co-operation with a seed company. Smaller seed companies often have a range of ‘un-protected’, open pollinated varieties which may suit some growers wanting to venture into seed production once licensing issues (PBR) have been agreed to where relevant. In addition to the requirements of the grower’s organic certification agency, any grower undertaking to produce a seed crop will have to comply with a set of quality assurance standards laid down by the owner of the variety to insure the integrity of the variety, the seeds freedom from pests, diseases and contaminants such as seed of any other variety, broken seeds, weed seeds or vegetable matter.

The Seed Industry Association of Australia (SIAA) represents the interests of all individuals and organisations involved in the breeding, production and marketing of sowing seed - at state, national and international level. Growers and consumers of seed requiring quality assurance should consider membership of the SIAA. The SIAA’s web-site can be viewed at <http://www.sia.asn.au/>.

Storage of Seed

Correct seed storage is one of the most important issues facing producers, marketers and consumers of seed. Seed of each species has specific characteristics which determine its longevity and the rate at which viability or dormancy is lost under differing environmental conditions. Seeds are living organisms and they continue to metabolise and age even though they are dormant, so for most species it is important to reduce oxygen levels and moisture to slow this process. Nitrogen purging of seed in sealed packets is sometimes undertaken prior to cryonic storage by some specialist seed storage facilities. In general lower temperatures result in an extension of viability however oil-storing seeds (eg pumpkins) are damaged at very low temperatures. Cold storage has a further advantage in that the seed is safe from insect or vertebrate pests and many spoilage micro-organisms. Even the quality (colour) of light during storage may make a difference to the dormancy of some seed (eg lettuce).

Each plant species has an optimal set of seed storage conditions which will ensure conservation of seed viability. Some specialist literature is available on this subject but anyone storing seed will have to compromise according to their needs. Producers, marketers and consumers of seed each have different needs. For example, rapid loss of viability may not be a problem if turnover is also rapid however investment in controlled temperature and atmospheric storage facilities may be necessary if longer periods are required.

Producing Certified Organic Seedlings for Sale

With the end of the derogation exempting organic producers from the need to use certified organic seed and seedlings, the organic industry will soon be required to have procedures in place to allow them to comply with the standard. For many vegetable growers this will mean sourcing and producing their own certified organic seedlings however if the demand is large enough specialist

commercial nurseries will develop. Seedling producers will be required to have their premises and practices certified for compliance to organic standard if their products are to be traded as “certified organic”. Trade in seedlings may also be subject to legal restrictions governing the movement or sale of seed, plants or soil. Anyone contemplating dealing with these materials should familiarise themselves with the relevant legislation.

Many aspects of certified organic seedling production will not be worked out until a precedent is set. For example, it is not known if seedling producers will be allowed to operate conventional and organic operation in parallel on the one site because of the risk of contamination and substitution but common machinery may be able to be shared after adopting suitable decontamination procedures. Because organic operations are mostly smaller than conventional operations, the usual economies of scale and systems used to deliver and return seedling trays will have to be carefully negotiated with the supplier, courier and consumer.

Nurseries or others wanting to produce their own certified organic seedlings must ensure that their inputs and practices comply with one of the AQIS accredited organic certification agencies. Since seedling production is not done in the soil, a production facility may be eligible to receive organic certification directly after implementing an approved production process.

Existing conventional seedling production nurseries wanting to access the certified organic market will need to develop new procedures which are compatible with the organic standard and which still deliver the varietal integrity, vigour and freedom from pests, weeds and disease that consumers expect. Quality assurance standards may need to be negotiated between an organic certification agency, and the enterprise. Qualified growers might also benefit from participation in the Nursery & Garden Industry of Australia (NGIA). More information on the NGIA can be found at <http://www.ngia.com.au/>.

Seedling production methods divide into non-containerised or containerised systems. The most common non-containerised system is the compressed soil-block system. Details of this method can be found on the ATTRA web (<http://attra.ncat.org>). Non-containerised systems are not amenable to mechanisation either in the nursery or later on in the field. Soil block systems are more suitable for ware growers who wish to produce their own seedlings.

Multi-cell, containerised seedling production systems have been widely adopted by seedling production nurseries and their customers. Such production systems are readily automated both in the nursery and in the field. Seedling trays constituting many individual cells are mechanically filled with a suitable medium and precision vacuum planting equipment is used to simultaneously plant the entire tray in one operation, so that each cell receives single seed. For this reason very high quality seed must be used so tolerances for trash and foreign objects, broken or otherwise inviable seeds is low. Care must be taken to store seeds correctly i.e. away from excessive heat, moisture, and pests & diseases

Seedling trays are usually recycled and must be carefully disinfected with approved and effective chemicals. Some trays, such as those made from polystyrene, are not only difficult to disinfect but may be unacceptable under the standard so it is important to involve an organic certification agency before any seedlings are produced. All inputs must be compliant with the organic standard however while many products are certified few have been rigorously tested for fitness to purpose. Growers undertaking to supply organic seedlings will have to test each product for efficacy. For example, many seed lines presently marketed as organic are mixed and some may have poor germination percentage and vigour. Organic liquid fertiliser formulations and pest or disease control formulations may not be as effective or as fast acting as their conventional chemical counterparts.

Useful contacts

AQIS Approved Certifying Organisations – October 2004

Bio-Dynamic Research Institute
Post Office
POWELLTOWN VIC 3797

Phone 03 5966 7333
Fax: 03 5966 7433

Australian Certified Organic Co-Operative Ltd
Post Office Box 530
L1 766 Gympie Rd
CHERMSIDE QLD 4032

Phone: 07 3350 5716
Fax: 07 3350 5996
E-mail: info@bfa.com.au
Web: <http://www.australianorganic.com.au/>

National Association for Sustainable
Agriculture (Australia) Ltd
Post Office Box 768
STIRLING SA 5152

Phone 08 8370 8455
Fax: 08 8370 8381
E-mail: enquiries@nasaa.com.au
Web: <http://www.nasaa.com.au>

Organic Growers of Australia
Post Office Box 6171
SOUTH LISMORE NSW 2480

Phone: 02 6622 0100
Fax: 02 6622 0900
E-mail: admin@organicherbs.org
Web: <http://www.organicherbs.org/>

Organic Food Chain
Post Office Box 2390
TOOWOOMBA QLD 4350

Phone: 07 4637 2600
Fax: 07 4696 7689
E-mail: organicfoodchain@hotmail.com
Web: <http://www.organicfoodchain.com.au/>

Tasmanian Organic-Dynamic Producers
Post Office Box 434
MOWBRAY HEIGHTS TAS 7248

Phone: 03 6363 5162
Fax: 03 6363 5162
Email: juliepage001@yahoo.com.au

Safe Food Queensland (SFPQ)
Spring Hill 4004
55 McLachlan St
Fortitude Valley 4004
Contact: Phil Pond

Phone: 07 3253 9800
Free Call: 1800 300 815
Fax: 07 3253 9824
Email: info@safefood.qld.gov.au
Web: www.safefood.qld.gov.au

Non-accredited Australian Organic Industry (umbrella) organisation:

Organic Federation of Australia
E-mail: info@ofa.org.au

Regulatory sites

(PBR & Quarantine Issues)

Agriculture Forestry & Fisheries

Web: www.affa.gov.au

AQIS Organic and Bio-dynamic Program

Additional information regarding export requirements for organic products and the National Standard for Organic and Bio-dynamic Produce can be obtained from AQIS by telephoning (02) 6271 6638; e-mail organic@aqis.gov.au or by visiting the AQIS Home page at www.aqis.gov.au/organic

Vegetable and Associated Industries Branch
Department of Primary Industries, Water and Environment
Stoney Rise Centre
PO Box 303, DEVONPORT TAS 7310

Phone: 03 6421 7698
Fax: 03 6424 5142
E-mail: Iain.Kirkwood@dpiwe.tas.gov.au
Web: www.dpiwe.tas.gov.au/inter.nsf/WebPages/TAR-5AYUGP?open

Seed Potatoes – Victoria

VICSPA Manager
Keith Blackmore
PMB 1 HEALSVILLE 3777

Phone: 03 59629 043
Fax: 03 59629 045
E-mail: kblackmore@vicspa.org.au
Web: www.vicspa.org.au

Russell Sully
Industry Manager Potatoes
Institute for Horticultural Development
Private Mail Bag 15
Ferntree Gully Delivery Centre
Knoxfield VIC 3156

Phone: 03 9210 9222
Fax: 03 9800 3521
E-mail:
Web: www.nre.vic.gov.au/agvic/ihd

Seed Potatoes –Western Australia

Phil Ross
Horticulture Program
Manjimup Horticultural Research Institute
Manjimup Western Australia 6528

Phone: (08) 9777 0127
Fax: (08) 9777 0001
E-mail: pross@agric.wa.gov.au
Web:

<http://www.agric.wa.gov.au/programs/hort/potatoes>

Seed Certification – South Australia

SA Seed Services

Phone: (08) 83039549
Fax: (08)
E-mail: pirsa.seeds@saugov.sa.gov.au
Web:

www.pir.sa.gov.au/pages/agriculture/seed_services/growcertseed.htm:sectID=1211&tempID=11

Seed Certification – New South Wales

Beverley Zurbo
Seed Production Officer
Wagga Wagga Agricultural Institute
Pine Gully Road
PMB WAGGA WAGGA NSW 2650

Phone: (02) 6938 1976
Fax: (02) 6938 1995
E-mail: beverley.zurbo@agric.nsw.gov.au
Web: www.agric.nsw.gov.au/reader/1887

Disclaimers

The information contained in this publication is based on knowledge and understanding at the time of writing - 7 November 2003. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Agriculture or the user's independent adviser.

ALWAYS READ THE LABEL

Users of agricultural or veterinary chemical products must always read the label and any permit, before using the product, and strictly comply with the directions on the label and the conditions of any permit. Users are not absolved from compliance with the directions on the label or the conditions of the permit by reason of any statement made or not made in this publication.

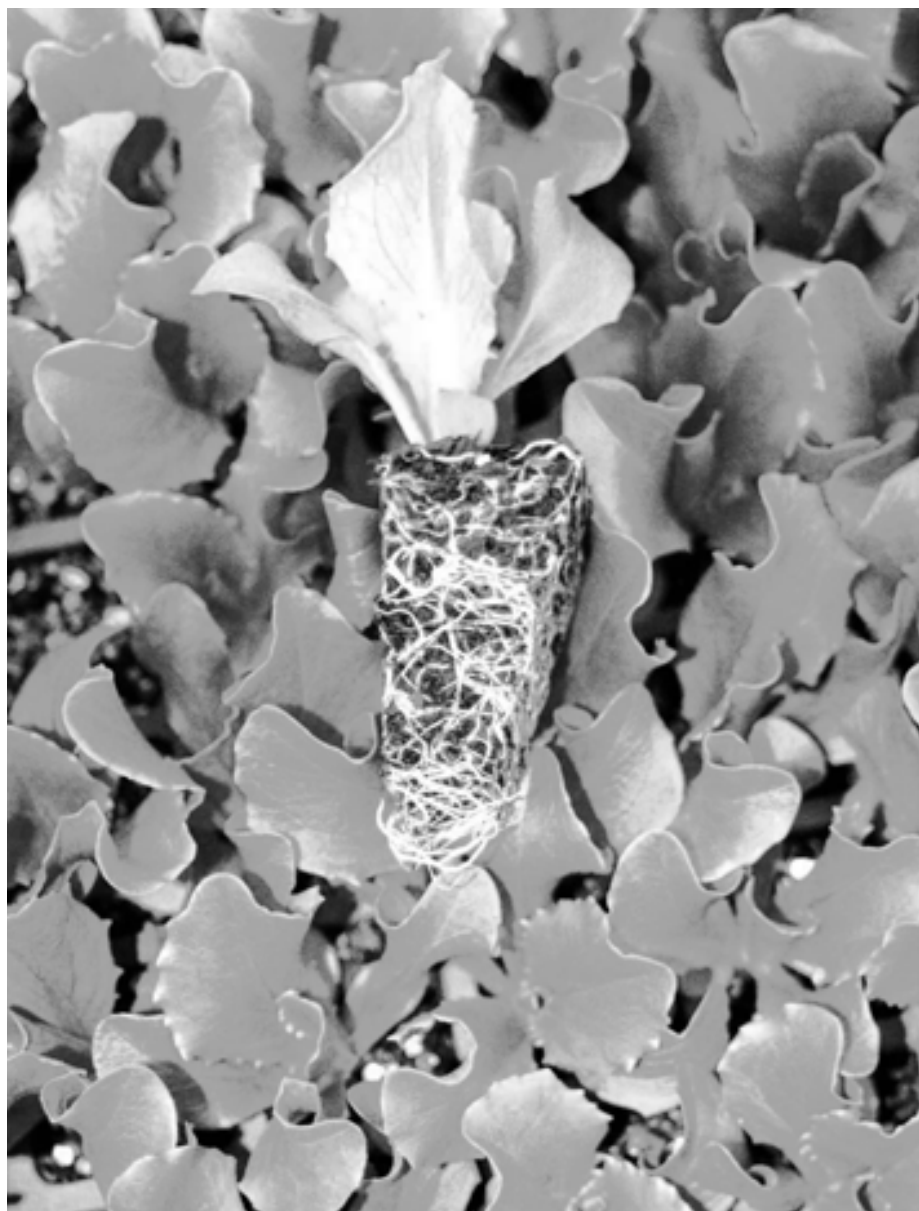
Registered Trade Names

The product trade names in this publication are supplied on the understanding that no preference between equivalent products is intended and that the inclusion of a product name does not imply endorsement by NSW Agriculture over any equivalent product from another manufacturer.

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Appendix 2

Materials permitted for organic seed and seedling production



Materials permitted for organic seed and seedling production

Robyn Neeson and Greg Howell
NSW Department of Primary Industries
Yanco Agricultural Institute YANCO NSW

Introduction

The Australian National Standard for Organic and Bio-dynamic Produce (December, 2002) states that plant propagation material utilised in organic production systems must be from a certified organic source. This requirement has been subject to exemption in the event that suitable planting material was unavailable, for example, if the desired cultivar was not commercially available. However, this clause will cease to exist in 2006, thus requiring mandatory use of certified organic material beyond this date, and from December 31, 2003 written approval shall be required from your certification organisation for the use of non-organic propagative material.

Organic certification organisations recognise that some planting material may never be available in the organic form, and whilst this may mean a little more paper work for producers to prove this is the case, it is not the intention of the certifiers to unfairly restrict the commercial activities of producers.

Organic seed and seedling producers will be required to have their premises and practices certified for compliance to organic standards. Organic seedlings need to be grown in an organically approved potting media, using organically approved fertilisers and pest control products.

This Agnote describes which inputs are acceptable for use in a certified organic seed and seedling operation, and the conditions under which they may be used. The NSW Agriculture Agnote 'Organic Seed and Seedling Production' provides further details on the production requirements for certified organic seeds and seedlings.

Definition of an organically acceptable input

Organically acceptable input refers to any product or substance that is allowed for use in the production of a certified organic product. Products may be further classified as "permitted", which are those where their use will not prejudice organic certification and "restricted". The criteria used to determine if materials are acceptable include necessity, nature and method of production, environmental impact, human health and quality, animal welfare issues and relevant socio-economic issues.

Even though an input may be comprised of or derived from a permitted product, their use on an organic enterprise may be "restricted" and may only be used on the basis of a demonstrated need, for a specific purpose or at a maximum rate for example. Written permission to use any restricted input product should be obtained from your certifier prior to its use. Use of any input product must be recorded in the farm or business diary.

In the production of certified organic seedlings inputs can be broadly classified into:

- i. Certified organic seed and seedlings
- ii. Products used as ingredients for potting mixes
- iii. Products used as fertilisers
- iv. Products used in pest and disease control
- v. Containers and packaging material

Some certifiers have certified a variety of commercial products such as potting mixes, fertilisers and composts, for use in organic systems. These products will be labelled with the certifier's logo and a certification number. Whilst use of these products is not mandatory, using a certified product can avoid the inconvenience of having to verify the acceptability of non-certified products with your certifier. If you do decide to use a non-certified product you would be advised to check its acceptability with your certifier before making a purchase.

Your certifier's standards should be checked for any additional requirements regarding the use of specific input products.

i. Certified organic seed and seedlings

Organic seedling production begins with the use of certified organic seed or certified organic plant material that is obtained through vegetative propagation methods such as cuttings. Certified organic seeds (or vegetative propagation material) is probably the most difficult input to obtain. Currently there are only a few suppliers of certified organic seed in Australia.

The availability of cultivars that have market acceptability as well as desirable pest and disease resistance features can often be an issue when purchasing organic seed. Buyers of organic seed should insist that suppliers provide purity and germination data as a condition of sale. Regardless, germination tests of purchased seed should always be undertaken prior to planting in the field or in containers.

Producers of commercial standard organic seed (seed to be planted to produce the ware-crop) will need to consider that the seed crop must be grown on organically certified land or in organically certified production facilities. This means that if the seeds are to be planted in the soil of the greenhouse floor or in the open field, the land unit must have been under an organic inspection system for a minimum period of 12 months or for one full production cycle (known as pre-certification) prior to harvest, before being classified as 'In-conversion' and marketed as such. For seeds to be marketed and sold as 'Organic' the land unit upon which the seed crop is produced must be under an organic management system for a minimum of 3 years prior to harvest.

If a certified organic producer uses seeds which are certified and marketed as either 'In-conversion' or 'Organic' as propagative material for future crops their certification status will not be affected.

Seed and ware crop producers alike will also need to consider that green manuring and crop rotation will be an integral part of the organic management. This will require them to obtain organic seed sources of these crops for planting.

Producers of certified organic seedlings must use seeds or propagation material from a certified source. In this instance seeds are considered as inputs into a certified operation and so the production of seedlings is not subject to the 3 year certification period (unless they are to be raised in the soil or in the open field then the same pre-certification and in-conversion period for the land unit must be followed).

Certification of non-land based nursery production systems eg. containerised seedling production, can be granted following one full production cycle under an organic inspection system. Further details regarding the certification requirements for producing organic seed and seedlings can be found in the NSW Agriculture Agnote "Organic seed and seedling production".

ii. Organic potting mix ingredients

Producers of organic seedlings may either decide to purchase a proprietary potting media or to make their own from raw materials. Some producers may arrange for a potting mix manufacturer to custom-blend a mix to suit their requirements.

Manufacturers of organic potting media, or organic producers who make their own potting media on-farm, require access to raw materials that are acceptable for use in certified production. Whilst a broad range of materials are permitted for use in organic media (Table 1), the challenge is to assure consistent quality and supply of these materials.

Table 1: Materials permitted for use as ingredients in organic potting mixes.

Material	Permitted	Restricted
Compost from organically sourced materials (produced in accordance with ASA 4454-1999 or recognised equivalent system)	X	
Compost from non-organically sourced materials, and from food and textile industry, household and municipal waste sourced materials (no contaminants)		X
Uncontaminated soil (harvested in a sustainable fashion)	X	
Loam (sustainability of harvest site)		X
Leaf mould	X	
Earthworm casts or by-products (verified free of heavy metals and pesticides)		X
Clean inert material of a natural origin	X	
Untreated bark fines	X	
Palm peat (pulverised coir)	X	
Peat (sphagnum bog, sustainably mined)		X
Sawdust from untreated wood		X
River sand (extraction must not cause environmental damage)		X
Vermiculite (note vermiculite may contain asbestos and its use may be restricted in organic systems in the future)	X	
Perlite	X	
Newspaper (not from glossy or coloured paper)		X

Note: If exporting, conditions of application may vary depending on standards of importing country. Check with certifier for conditions of application. Always record use in diary.

Most potting mix manufacturers opt for a soil-less media. This reduces the risk of infection by soil-borne diseases. Organic standards require that soil forms a component of potting media or that the media eventually be brought into contact with the soil – as happens during transplantation. The most common raw materials used in organic potting media include sand, soil, compost, peat moss, coconut fibre (coir), perlite and vermiculite. Organic nursery producers would need to make certain these are not contaminated or treated with prohibited substances. For example, asbestos contaminated vermiculite has been reported in the U.S., whilst some commercial sources of peat are treated with wetting agents, most of which are disallowed under organic standards.

Commercial products that contain non-permitted substances are prohibited for use. Many commercial products contain chemically derived fertilisers (for example, Osmocote®) and/or synthetic wetting agents, or other ingredients that are incompatible with organic standards. Acceptable wetting agents include some seaweed products, plant products (including oils) and natural soaps. If unsure, the use of a certified commercial organic mix can help to overcome some of these concerns.

Prior to sowing, soil or potting mixes are often treated to suppress diseases and weeds by the use of steam pasteurisation. In conventional production this is assisted by the use of chemical seed dressings. Acceptable organic adjuncts to steam pasteurisation include: solarisation, composting and the use of compost teas, and appropriate microbial inoculants (for disease suppression).

iii. Organic fertilisers

All seed and seedling production requires supplementary nutrient fertilisation. Nutrients are often added to potting media to carry seedlings through their time in containers and until they are transplanted in the field. Under organic production systems synthetic fertilisers are not permitted, so organic alternatives will need to be sourced. Commercial organic fertilisers are available, however, their acceptability should be verified by an accredited organic certification body prior to use. Organic certifiers have accredited some commercial organic fertilisers but this should not be interpreted as an endorsement of product efficacy or fitness for purpose.

Table 2 shows a range of materials used as fertilisers in certified organic enterprises.

Materials used as fertilisers may need to be assessed prior to purchase for unacceptable contaminants such as excessive levels of heavy metals. For example, phosphate rock may naturally contain unacceptable levels of cadmium. Levels must be below 20ppm cadmium to be acceptable under organic standards. A written analysis of the product's ingredients should be requested from the supplier.

Foliar fertilisers are permitted in organic production provided they are used to correct deficiencies and do not constitute the main source of crop nutrition. A range of substances are permitted including fish emulsion, seaweed extract, compost teas (also for disease suppression), bio-dynamic preparations and extracts made from other soluble materials such as dried blood, bat guano, worm castings, humates, manure teas, herbal extracts and molasses. Where deficiencies can be demonstrated, the use of commercially prepared trace elements is also acceptable, providing they do not contain nitrogen compounds.

Table 2: Fertilisers permitted for use in organic potting media and typical NPK levels (dry weight basis)

Material	Typical NPK levels (dry weight basis)	Permitted	Restricted
Compost	N(1.5-3.5%):P(0.5-1%):K(1-2%)	X	
Manure- Pelleted or granulated composted chicken manure (no contamination)			X
Compost tea (made from material which meets compost standards and which does not pose contamination risks to crops and livestock)		X	
Worm casts / worm liquid (verified free of heavy metals and pesticides)			X
Bio-dynamic preparations		X	
Blood and bone	N(5.3%):P(5.2%):K(0%)		X
Bone meal	N(2-6%):P(15-27%):K(0%)		X
Hoof and horn meal	N(13%):P(0%):K(0%)		X
Fish meal (waste product or pest species)	N(10.4%):P(2.5%):K(0%)		X
Lucerne meal (from a certified source)	N(2.5%):P(0.3):K(1.9%)	X	
Soybean meal (from a certified source)	N(7.5%):P(0.7%):K(2.4%)	X	
Wood ash (from chemically untreated source)	N(0%):P(1-2%):K(3-7%)		X
Seaweed & seaweed products (assess salt level, licensed harvest sites, low heavy metals, unfortified)	N(0.2%):P(0.1%):K(0.5%)		X
Phosphate rock (cadmium levels below 20ppm)			X

Material	Typical NPK levels (dry weight basis)	Permitted	Restricted
Phosphatic guano (cadmium levels below 20ppm)			X
Sulphate of potash (demonstrated need only, in solid form, natural source)			X
Commercial organic fertiliser blends that <u>do not</u> contain prohibited substances	Products will give nutrient analysis (often expressed as a range) on the label.		X
Zinc sulphate			X
Epson salt (magnesium sulphate)		X	
Minerals and trace elements from natural sources that are not chemically treated to improve water solubility, including: <ul style="list-style-type: none"> - calcium (dolomite, gypsum, lime) - clay (bentonite, Kaolin, Attapulgit) - magnesium - potash (rock and sulphate potash) - elemental sulphur 	X		
Foliar fertilisers, including trace elements without nitrogen compounds (sole reliance is prohibited).	Varies – dependent on source		X

Note: If exporting, conditions of application may vary depending on standards of importing country. Check with certifier for conditions of application. Always record use in diary.

iv. Pest and disease control products

Pest and disease management is one of the most difficult areas for organic seed and seedling production. No single pest or disease control method is 100% effective, so organic management must integrate cultural practices, environmental controls, biological control and the use of naturally derived pest control products. For organic seedling producers an excellent overview of techniques can be found in the ATTRA (Appropriate Technology Transfer for Rural Areas) publication “Integrated Pest Management for Greenhouse Crops” (at <http://attra.ncat.org/attra-pub/gh-ipm.html>).

Table 3 list some products that are acceptable for the control of pest and disease in certified organic production systems. The use of any pest and disease control product is only permitted when all other practices recommended under organic standards have been exhausted.

There is a range of commercial products available for organic pest and disease management. Some of these have been certified as acceptable for use by organic certifiers. The efficacy of some of these products can be inconsistent and it is recommended that a trial application is carried out prior to major use. Manufacturers should also be consulted about application methods that could improve efficacy.

Any pesticide, whether it is biologically based or not, is regulated by the Australian Pesticides and Veterinary Medicines Authority (APVMA) and by law each pest-crop-pesticide combination must be approved. Certified organic products claiming activity against pests and diseases must be registered for efficacy, crop tolerance, risks to human health and withholding period with the APVMA. Approved uses are clearly written on the insecticide label and any use contrary to the label is illegal (see Regulatory Issues in this Agnote).

v. Containers and packaging

Organic standards state that containers and packaging material should consist of non-contaminating products and should be recyclable, however all seed traded must be in new containers. Table 4 shows some materials acceptable for containers and packaging. Containers and packaging should be approved by your certifier prior to purchase.

Table 3 Materials acceptable for use in pest and disease control.

Material	Permitted	Restricted
Sticky barriers, physical barriers and mechanical traps	X	
Sound and Ultra Sound	X	
Light and UV light	X	
Controlled temperature and Controlled atmosphere (CO ₂)	X	
Diatomaceous earth	X	
Plant-based repellents	X	
Homoeopathic preparations	X	
Sodium silicate (as a fungicide)	X	
Propolis	X	
Light mineral oils (paraffin, white oil, summer oil). Note: some petroleum based oils may be restricted	X	X
Potassium soap (soft soap)	X	
Herbal and Bio-dynamic preparations	X	
Clays – bentonite, kaolin	X	
Mineral powders	X	
Compost teas (from material which meets compost standards)	X	
Bacillus thuringiensis (non GMO)		X
Biological control releases (naturally occurring cultured organisms. Includes predators, microbial inoculants –for disease suppression. Non GMO)		X
Bordeaux (only on dormant tissue) and Burgundy mixes. Hydroxide, oxide and sulphate forms. Note: some States have regulations regarding home preparations. Monitor bio-accumulation. Annual application not to exceed 8Kg/Ha.		X
<i>Derris elliptica</i> , Derris Dust (not near aquatic systems or on edible plant portions). Note: may be associated with health risks.		X
Neem oil and extracts (No prohibited inputs. Note NRA restrictions)		X
Plant and animal oils (specified source, free of prohibited inputs)		X
Pheromones in traps or twists (not used directly on crops, not combined with synthetic pesticides, non GMO)	X	
Potassium permanganate (Seed dressing only)	X	
Pyrethrum (extracted from <i>Chrysanthemum cinerariaefolium</i>). Only naturally occurring and naturally derived forms allowed)		X
<i>Quassia armara</i>	X	
Rotenone (not near aquatic systems or on edible plant portions). Note: may be associated with health risks.		X
Salt (Sodium chloride). (Must be unadulterated sea salt. Not to be used as herbicide)	X	
Sodium bicarbonate	X	
Sterilised Insect Males (Use within an integrated program. Non GMO)	X	
Sulphur (natural, unadulterated source)		X
Viral, fungal and bacterial preparations (as biological releases, non GMO)		X
Wetting agents (natural origin including saponins and microbial wetting agents. No synthetic additives)		X

Note: If exporting, conditions of application may vary depending on standards of importing country. Check with certifier for conditions of application. Always record use in diary.

Table 4. Materials permitted for containers and packaging

Material	Permitted	Restricted
Cardboard (Unwaxed, not impregnated with synthetic fungicides)		X
Soil Blocks (conditions apply as for composts and soil)	X	
Peat pots (not chemically treated, sustainably mined)		X
Paper (glossy paper and coloured ink prohibited)		X
Plastic pots (recyclable or reused where phytosanitary considerations are satisfied)		X
Straw (from non-contaminated source)	X	

Note: If exporting, conditions of application may vary depending on standards of importing country/state. Check with the state agricultural authorities and your certifier any restrictions. Always record use in diary.

Nursery hygiene

Maintaining good nursery hygiene is imperative to minimise losses through pest and disease. Table 5 illustrates some materials and methods permitted to maintain nursery hygiene.

From an organic certification perspective, facilities used for organic production must be separated from conventionally managed facilities by impermeable walls and ceilings, sealable doors and windows.

Installing insect screening and double doors to production facilities can facilitate exclusion of insect pests. A foot-bath containing an acceptable disinfectant can be installed at the entrance to the facility to reduce unwanted entry of soil-borne disease organisms. Bench surfaces and other areas used for plant propagation should be regularly disinfected with an approved substance. Depending on the substance, these areas may require further rinsing down with clean water prior to use.

Sterilisation for the purpose of disease management can be achieved by steam, heat or other physical means, or by using products acceptable under organic standards.

State and Federal regulatory issues

Organic farmers must abide by the same legal requirements as other farmers. State, Territory and Federal laws relating to issues such as health and food safety, interstate / import / export phytosanitary laws, noxious weed control, fruit fly, feral animal control, exotic pest and disease outbreaks and pesticide use must all be obeyed even when implementation conflicts with organic standards.

In some instances the use of chemical controls may be the only option for organic producers. If a non-permitted chemical must be applied then your certifier must be immediately notified, and whilst certification will be withdrawn it may only occur for a limited time or relate to a specific part of the enterprise. In some instances, your certifier may be able to negotiate a solution to the problem with the statutory body responsible for administering the Law. Sometimes a non-chemical solution may be possible. These need to be clearly explained to the responsible statutory organisation, and a win-win outcome will need to be demonstrated.

i. Pesticide Registration

Unfortunately many minor crops, although significant in total value, are too small for agrochemical companies to warrant the high cost of registering crop protection products. Occasions also occur when it becomes necessary to use agricultural chemicals for a use not specified on the label. To use registered or unregistered products in an off-label manner an off-label permit must be obtained. The Australian Pesticides and Veterinary Medicines Authority (APVMA) recognises two categories of justification for off-label permits.

Table 5. Materials and methods permitted to maintain nursery hygiene

Materials and methods	Permitted	Restricted
Steam sterilisation	X	
Hot water treatment	X	
Potassium permanganate (not to exceed 1% solution)		X
Alkali carbonates		X
Bleach (not to exceed 10% solution)*		X
Biodegradable detergents (e.g. low phosphate and rapidly degradable)		X
Lye, Caustic potash and caustic soda		X
Natural acids (e.g. vinegar, lactic, phosphoric)*		X
Hydrogen peroxide		X
Iodine (non-elemental, not to exceed 5% solution e.g. iodophors)		X
Lime		X
Potassium permanganate (not to exceed 1% solution)		X
Soaps		X
Sodium bicarbonate		X
Sodium borate		X
Ammonium compounds*		X
Vinegar		X
Solarisation	X	
Equipment cleaners – allowed cleaners include Peracetic acid, acetic acid, carbonic acid, citric acid, hydrogen peroxide (H ₂ O ₂), soap and water.		X

Note: If exporting, conditions of application may vary depending on standards of importing country. Check with certifier for conditions of application. Always record use in diary.

* Products or surfaces cleaned with these substances would require rinse down prior to final use.

Minor Use Permits

Refers to a specialty crop produced only on a small scale, i.e. production less than 500 ha or \$500,000 per annum,

or where only a small percentage of a major crop is affected. ie less than 2% of a major crop,

or on a minor or infrequent pest or disease, on either a minor or major crop,

or when method of application differs to what is described on the label because of unique local circumstances, i.e. aerial application of a chemical, registered only for ground application, due to local wet conditions not allowing ground application.

Emergency Use Permits

Refers to a situation that needs a rapid response. The most common example is when it is necessary to control a new or exotic pest or disease that has no registered products for control.

Making an application for a permit

Enquiries regarding applications for Minor Use Permits should be directed to Horticulture Australian Limited, on: Ph: (02) 8295 2300; Fax: (02) 8295 2399.

ii. Quarantine regulations covering the movement of soil and plant material

State and Federal quarantine regulations exist which may restrict the movement of seeds and seedlings and other input products between states, as imports, or as exports. This may prevent supplying organic products to markets in other states, or countries, or prevent the importation of organic products. For some field crops and potatoes, Seed Certification schemes exist in order to maintain disease free industries.

State regulations

There are restrictions on the interstate movement of plant material and soil between some states. This prevents the movement of pests and diseases into areas that do not have a specific pest or disease.

The Tri-State Agreement for control of fruit fly exists between Queensland, NSW and Victoria. This restricts the movement of fruit and vegetables into zones that are fruit-fly free (exclusion zones). If a declared outbreak occurs in an exclusion zone, legislation is in place that requires the chemical treatment of susceptible crops. An affected organic seed crop, such as tomatoes, if in a declared outbreak area, would also be required by law to implement fruit-fly control. In recent years, NSW Agriculture has negotiated with organic producers and certifiers to implement strategies that permit producers to retain their organic status. Affected producers should check with their relevant state department of agriculture and their certifier for approved control methods.

Tasmania has quarantine restrictions which places restrictions on the importation of some plants and all soil from the Australia mainland. This includes onions from South Australia (onion smut prohibition), solanoids eg potatoes, tomatoes, eggplants must be treated with the fungicides Ridomil® or Thiram®, peas require chemical fumigation for pea weevil, sweet corn requires clearance for boil smut and treatment with Vitavax®, and potato tubers require clearance for PCN if from an infected area.

Western Australia also has restrictions on the movement of some plant and all soil from interstate. Sweet corn requires clearance for boil smut and treatment with Vitavax®, potato tubers require clearance for PCN if from an infected area (tissue cultured or cutting material is exempted). All seed must be provided in new containers.

Import regulations

Import restrictions exist for a range of agricultural products including seed and nursery stock.

Those producers intending to import vegetable seed for multiplication would have to register with Agriculture, Fisheries and Forestry - Australia (AFFA). AFFA is currently responsible for implementation of the OECD Vegetable Seeds Scheme in Australia. This scheme distinguishes between certified and commercial seed types and permits the maintenance of varietal identity and purity. Under the scheme, seeds must be grown under the minimum conditions outlined in the agreement and are inspected during the field multiplication by the Designated Authority and samples are taken to confirm varietal identity & purity, freedom from pest and diseases and germination.

The organic status of imported material may be compromised if found to contain contaminants. Non – legume seed must be free from soil, live insects, plant material (eg fruit pulp, leaf or stem material, etc), and contamination with prohibited seeds. If found to contain contaminants, treatment of the material with a non-permitted substance such as methyl bromide or phosphine would result in the product losing its organic status. Leguminous seed must be dusted with Thiram® which would automatically preclude it from organic certification.

Import permits will be required before entry is approved. Samples must be packed in new containers that are clearly labelled with the botanical name. Samples less than 10 Kg are visually assessment by an AQIS officer, and for those greater than 10 Kg, a sub-sample is taken for AQIS accredited testing.

In addition, from December 2002, organic products imported from countries outside Australia, must be deemed to have certification equivalence with the National Standard for Organic and Bio-dynamic Produce (December, 2002) in order to retain their organic status once in Australia.

Application to Import Quarantine Material can be obtained by contacting AQIS on (02) 6272 4578. Further information on the importation of products can be found at the AQIS website: <http://www.aqis.gov.au>

Export regulations

Export regulations are governed by the importing countries requirements most of which are signatories of the OECD Seed Scheme, the rules of which are available on the OECD web site: <http://www.oecd.org/dataoecd/20/19/1933955.pdf>

Additional importation requirements such as those implemented by the EU are very strict. These requirements are in addition to the normal requirements for the entry of organic products. Organic certification organisations can assist in providing information on the importing countries requirements for organic produce. Other import regulations can be obtained from the importing countries departments of agriculture.

Useful contacts

AQIS Approved Certifying Organisations – November 2004

Bio-Dynamic Research Institute
Post Office
POWELLTOWN VIC 3797

Phone 03 5966 7333
Fax: 03 5966 7433

Australian Certified Organic Co-Operative Ltd
Post Office Box 530
L1 766 Gympie Rd
CHERMSIDE QLD 4032

Phone: 07 3350 5716
Fax: 07 3350 5996
E-mail: info@bfa.com.au
Web: <http://www.australianorganic.com.au/>

National Association for Sustainable
Agriculture (Australia) Ltd
Post Office Box 768
STIRLING SA 5152

Phone 08 8370 8455
Fax: 08 8370 8381
E-mail: enquiries@nasaa.com.au
Web: <http://www.nasaa.com.au>

Organic Growers of Australia
Post Office Box 6171
SOUTH LISMORE NSW 2480

Phone: 02 6622 0100
Fax: 02 6622 0900
E-mail: admin@organicherbs.org
Web: <http://www.organicherbs.org/>

Organic Food Chain
Post Office Box 2390
TOOWOOMBA QLD 4350

Phone: 07 4637 2600
Fax: 07 4696 7689
E-mail: organicfoodchain@hotmail.com
Web: <http://www.organicfoodchain.com.au/>

Tasmanian Organic-Dynamic Producers
Post Office Box 434
MOWBRAY HEIGHTS TAS 7248

Phone: 03 6363 5162
Fax: 03 6363 5162
Email: juliepage001@yahoo.com.au

Safe Food Queensland (SFPQ)
Spring Hill 4004
55 McLachlan St
Fortitude Valley 4004
Contact: Phil Pond

Phone: 07 3253 9800
Free Call: 1800 300 815
Fax: 07 3253 9824
Email: info@safefood.qld.gov.au
Web: <http://www.safefood.qld.gov.au/>

Further information on the Australian organic industry may be obtained from:

Organic Federation of Australia
Suite 502 "Park Place"
3 Waverley Street
Bondi Junction NSW 2022

Phone: 02 9340 7808
Fax: 02 9340 7807
Mob: 0412 905203
Email: info@ofa.org.au
Website: <http://www.ofa.org.au/>

For information about export requirements on organic produce contact AQIS on AQIS Organic Program:

Program Management and Operations: +61-2-6271-6638

Policy and Market Access: +61-2-6272-3509

Fax: +61-2-6272-3238

Email Address: organic@aqis.gov.au

Australian Pesticides and Veterinary Medicines Authority (APVMA) - formerly National Registration Authority.

John Curtin House,

PO Box E240

Kingston ACT 2604 Australia

Internet home page: <http://www.apvma.gov.au>

Permits and minor uses: http://www.apvma.gov.au/minor_use/subpage_minor.shtml

Email: General inquiries to contact@apvma.gov.au Phone: (02) 6272 5852

Disclaimers

The information contained in this publication is based on knowledge and understanding at the time of writing - 7 November 2003. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Agriculture or the user's independent adviser.

ALWAYS READ THE LABEL

Users of agricultural or veterinary chemical products must always read the label and any permit, before using the product, and strictly comply with the directions on the label and the conditions of any permit. Users are not absolved from compliance with the directions on the label or the conditions of the permit by reason of any statement made or not made in this publication.

Registered Trade Names

The product trade names in this publication are supplied on the understanding that no preference between equivalent products is intended and that the inclusion of a product name does not imply endorsement by NSW Agriculture over any equivalent product from another manufacturer.

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Appendix 3

Survey of Organic Vegetable Producers

PART A – General questions (1-6)

No	Question	Percentage of Response in Category	RAW Count
1	Are you aware of upcoming changes to organic production rules which require producers to use organically raised seeds and seedlings after January 1, 2004?		
	a. Yes	88%	36
	b. No	12%	5
		100%	41
2	Do you think that this change will affect your business?		
	a. No – go to 3	44%	18
	b. Yes - then	56%	23
		100%	41
2a	The biggest constraint to your compliance will be in the area of:		
	a. Obtaining organic seed	13%	3
	b. Obtaining organic seedling transplants	4%	1
	c. Obtaining other suitable input products	9%	2
	Cost	17%	4
	Planting Material	13%	3
	Not Specified	43%	10
		100%	23
3	Is your product currently certified by an AQIS accredited organic certification organisation?		
	a. Yes	98%	40
	b. No	2%	1
		100%	41
4	What do you intend to do with regard to certification when the new Rule becomes operational:		
	a. Retain organic certification for your product	73%	30
	b. Apply for organic certification for your product	0%	0
	c. Apply for an exemption from my certifier	15%	6
	d. Abandon my organic certification	7%	3
	e. Remain uncertified	0%	0
	Unclear	5%	2
		100%	41

5 One of the major outcomes of this project is to provide information about the Rule and its consequences. What is the best format for you to receive this information?

a.	Workshop	0%	0
b.	Printed (technical note, industry newsletter)	80%	33
c.	Electronic (internet)	15%	6
d.	Other (please specify)	0%	0
	No Response	5%	2
		100%	41

6a Would you be willing to publicly release details of your company's products or requirements which relate to organic vegetable production

a.	Yes – go to 6c	7%	3
b.	No – go to 6d	93%	38
		100%	41

6b Would you be willing to fill out, sign and return to us a privacy release form giving permission to publish your details.

i.	Yes	33%	1
ii.	No	0%	0
	Not Stated	67%	2
		100%	3

6c Would you like to receive future information about this project.

i.	Yes	90%	37
ii.	No	10%	4
		100%	41

PART B - Vegetable and herb grower specific questions

1 We need to gauge the level of understanding of the Rule within the industry, so the following questions are designed to achieve this.

You are planning to plant a spinach crop in your certified organic field. You are unable to find any Certified organic seed. What process do you need to follow in order to be compliant with the new seed/seedling Rule

a.	Use conventional seed.	0%	0
b.	Contact certifier and gain approval to use conventional seed.	2%	1
c.	Contact certifier and supply them with proof that you were unable to find certified organic seed, and request certifier approval to use conventional seed.	95%	39
d.	Plant something different.	0%	0
	Not Stated	2%	1
		100%	41

2 Do you currently use seedling transplants?

i.	Yes- go to Question 2a	46%	19
ii.	No - go to Question 6	54%	22
		100%	41

2a. What is the source of your seedling transplants?

a.	grow all seedlings required	32%	6
b.	purchase all requirements	21%	4
c.	Grow some & purchase some	47%	9
		100%	19

3 Of the seedlings that you actually purchase:

- i. what type and quantity do you acquire on an annual basis
- ii. what percentage of the purchased seedlings are organically raised
- iii. what is the source of these seedlings

Understood	42%	8
Not understood	16%	3
Unclear	42%	8
		100%
		19

Category	Type	Number of Seedlings or Seed Pieces						% Organic							Source				
		<1000	<5000	<10000	<20000	<40000	>40000	NS	0	<10	<30	<50	<80	100	a	b	c	d	e
Mixed	Mixed		1											1	1				
Alliums	Any																		
	Broccoli		1						1								1		
	Cabbage		1			1			2								2		
Brassicatae	Cauliflower	1	2			1			3							1	3		
Cucurbit	Any																		1
	Celery		1														1		
	Lettuce	3							1					2	1	1		1	
Leafy	Spinach	1												1				1	
Root	Any																		
	Capsicum		1	2				1	2						1	1			
	Eggplant	1	1	1				1						2	2				1
Solanaceous	Tomato	1	1	2				1	2					1	1	1	1	1	1
Tuberous & Perennial	Ginger	1												1					1
Other	Any																		
Count		8	9	5	0	2	0	3	11	0	0	0	0	8	6	4	8	5	2
Proportion of Category (%)		33.3	37.5	20.8	0.0	8.3	0.0	13.6	50.0	0.0	0.0	0.0	0.0	36.4	24.0	16.0	32.0	20.0	8.0

Seedling source codes:

- | | | | | | |
|----------|--|----------|--|----------|-------|
| a | A specialist organic producer/trader of seed or seedlings | c | A specialist producer or trader of both organic and conventional seedlings | e | Other |
| b | A specialist conventional producer/trader of seed or seedlings | d | A non-specialist ware cropper who also trades in seed or seedlings (self or other) | | |

4 How do you intend to meet your future requirements for ORGANIC seedlings?

a.	Produce your own requirements for organic seedlings	37%	7
b.	Produce some of your own requirements for organic seedlings	32%	6
c.	Purchase all your requirements for organic seedlings	21%	4
d.	Ask certifier for exemption and use conventional seed	0%	0
e.	Don't know	5%	1
	Not Stated	5%	1
		100%	19

5 In 5 years time what do you anticipate will be your annual requirements for purchased organic seedlings?

a.	Much less than now	32%	6
b.	Same (i.e. 0 - 10% of current requirements)	26%	5
c.	10-25% greater than current requirements	21%	4
d.	25-50% greater than current requirements	11%	2
e.	> 50% than current requirements	5%	1
	Not Stated	5%	1
		100%	19

6 From what sources you currently obtain seed

a.	Produce own requirements for seeds	20%	8
b.	Produce some and purchase the remainder of seed required	56%	23
c.	Purchase all requirements for seeds	20%	8
d.	Don't use seeds in production (Go to Question 10)	5%	2
		100%	41

7 Of the seeds that you actually purchase what type and quantity do you acquire on an annual basis?

	Understood	36%	14
	Not understood	15%	6
	Unclear	49%	19
		100%	39

Category	Type	Quantity (g)						% Organic						Source					
		<100	<1000	<2000	<5000	<10000	<50000	NS	0	<10	<30	<50	<80	100	a	b	c	d	e
Mixed	Mixed						1							1	1				
Alliums	Garlic																	1	
	Onion			1	1					1						2	2		
Brassicatae	Cabbage		1						1										
Curcubit	Cantaloupe		1										2	1					
	Pumpkin		1	3	2				2				2	1	2	2	1		
	Squash	1	2						2				1				1	1	
	Water melon		2		1			1	1					1	1				
	Zucchini	2	4	1	1			1	4					4	3	2	1	3	
Leafy	Lettuce		1										1	1					
	Rocket		1										1	1					
	Spinach		1			1		1	1					1					
Legume	Beans - Green pod				1		1	1					2	3					
	Peas		1				1	1	1				1		1			1	
	Snow pea						1	1						1					
	Sugar snap		1										1					1	
	Not Specified		1										1	1					
Root	Beetroot	2					1		2				1	2	1				
	Carrot			1	2		1		2				1	1	1	2			
Solanacious	Aubergine												1	1					
	Capsicum	1	1						1					3					
	Chilli		1																
	Eggplant	1						1						1					
	Tomato	4	1					1	1				3	3				1	
Tuberous & Perennial	Potato					1		1									2		
Other	Sweet Corn		2				1	2					1	1	2				
sum		14	19	6	8	1	8	7	21	1	0	0	0	24	27	12	10	7	2
Proportion of Category (%)		25.0	33.9	10.7	14.3	1.8	14.3	13.2	39.6	1.9	0.0	0.0	0.0	45.3	46.6	20.7	17.2	12.1	3.4

Seed source codes

- | | | |
|--|---|-----------------------|
| <p>a A specialist organic producer/trader of seed or seedlings</p> <p>b A specialist conventional producer/trader of seed or seedlings</p> | <p>c A specialist producer or trader of both organic and conventional seedlings</p> <p>d A non-specialist ware cropper who also trades in seed or seedlings (self or other)</p> | <p>e Other</p> |
|--|---|-----------------------|

8 How do you intend to meet your future requirements for organic seed?

a. Produce own organic seeds	21%	8
b. Produce some and purchase some organic seeds	51%	20
c. Purchase all requirements for organic seeds.	13%	5
d. Ask certifier for exemption and use conventional seed	5%	2
e. Don't know	10%	4
	100%	39

9 In 5 years time what do you anticipate will be your future annual requirements for purchased organic seed?

a. Much less than now	21%	8
b. Same (i.e. 0 - 10% of current requirements)	49%	19
c. 10-25% greater than current requirements	21%	8
d. 25-50% greater than current requirements	0%	0
e. > 50% than current requirements	3%	1
Not Stated	8%	3
	100%	39

10 If you raise organic seed or seedlings on your farm do you trade any of these?

a. Yes	15%	6
b. No. – Go to 11	85%	35
	100%	41

11	Do you use open-pollinated varieties in your production?		
	a. Yes	88%	36
	b. No (Go to Question 13)	12%	5
		100%	41
12			
	Were you satisfied with their performance?		
	a. Yes – got to 13	89%	32
	b. No	11%	5
		100%	37
12a			
	If NO, can you please briefly explain what problems you experienced		
	a. Poor germination	0%	0
	b. Inconsistent batch performance	25%	1
	c. Poor vigour	0%	0
	d. Disease and pest susceptibility	0%	0
	e. Variety not suitable for market	0%	0
	f. Uneven cropping (mixed variety)	0%	0
	g. Poor performance under organic cropping conditions	25%	1
	h. Other (specify) or not stated	50%	2
		100%	4
13			
	Have you used hybrid vegetable varieties in your production?		
	a. Yes	59%	24
	b. No (Go to Question 14)	41%	17
		100%	41
13a			
	Were you satisfied with their performance?		
	a. Yes – Go to 14	83%	20
	b. No	17%	4
		100%	24
13b			
	If NO, can you please briefly explain what problems you experienced.		
	a. Poor germination	0%	2
	b. Inconsistent batch performance	50%	0
	c. Poor vigour	0%	2
	d. Disease and pest susceptibility	0%	0
	e. Variety not suitable for market	0%	0
	f. Uneven cropping (mixed variety)	0%	0
	g. Poor performance under organic cropping conditions	0%	0
	h. Other (specify)	0%	0
	Not Specified	50%	0
		100%	4
14			
	Do you think hybrid varieties should be retained as an option for organic production?		
	a. Yes – Go to 15	73%	30
	b. No	24%	10
	Not Specified	2%	1
		100%	41

14a If NO, can you please briefly explain why you feel hybrids should be excluded in organic production.

a.	Financial cost of new seed	0%	0
b.	Reduce “externalities” in production	10%	1
c.	Dislike multi-national companies	0%	0
d.	Don’t perform in organic systems	0%	0
e.	Distrust of genetics involved	0%	0
f.	Loss of self-sufficiency	0%	0
g.	“Gut Feeling” its Wrong	50%	5
h.	Other (specify)	30%	3
	No Response	10%	24
		100%	33

15 How do you rate your chances of sourcing organic seed or seedlings for ALL your vegetable cropping and rotation requirements (including green manures) if the Rule is fully enforced:

a.	Poor (0-25%)	59%	24
b.	Moderate (25-50%)	27%	11
c.	Good (50-75%)	12%	5
d.	Very good (75-100%)	2%	1
		100%	41

Appendix 4

Survey of vegetable seed & seedling suppliers

Survey Part 1

Number and or part	Question	Percentage of Response in Category	RAW Count
--------------------	----------	------------------------------------	-----------

Part 1

1		Do you currently buy-in organic seed or seedlings for resale?	Proportion %	Count
	a.	Yes	46.7	14.0
	b	No	53.3	16.0
			100.0	30.0

2		Do you ever intend to buy-in organic seed or seedlings for resale?	Proportion %	Count
	a	Yes	36.4	8.0
	b	No	63.6	14.0
			100.0	22.0

3		Do you currently grow organic seed or seedlings for sale?	Proportion %	Count
	a	Yes	46.7	14.0
	b	No	53.3	16.0
			100.0	30.0

4		Do you ever intend to grow organic seed or seedlings for sale?	Proportion %	Count
	a	Yes	27.3	6.0
	b	No	72.7	16.0
			100.0	22.0

Part 2

1		Are you aware of upcoming changes to organic production rules which require producers to use organically raised seeds and seedlings after January 1, 2004?	Proportion %	Count
	a.	Yes	86.7	26.0
	b.	No	13.3	4.0
			100.0	30.0

2	Do you think the changes will affect your business?	Proportion %	Count
a.	No – go to 3	56.7	17.0
b.	Yes - then	43.3	13.0
		100.0	30.0

2a.	Without changing your current mix of investment areas, by what percentage do you think that the implementation of this rule will affect the gross value of your business?	Statistic	Value
		n=	10.0
		Mean=	118.4
		SD=	215.2
		Variance=	46302.8

2b.	On a sliding scale from one to five, where one is totally unprepared and five is fully prepared, how would you rate your preparation for the implementation of the rule on January 1, 2004	Proportion %	Count
	1= Totally Unprepared	9.1	1.0
	2	18.2	2.0
	3	27.3	3.0
	4	18.2	2.0
	5 = Fully Prepared	27.3	3.0
	Don't Know	0.0	0.0
		100.0	11.0

2c.	What do you perceive to be the biggest constraint to your business fully complying with the Rule by January 1, 2004?	Proportion %	Count
a.	Obtaining organic seed	50.0	6.0
b.	Sourcing pest & disease control	0.0	0.0
c.	Gaining Certification	8.3	1.0
d.	Sourcing weed controls	0.0	0.0
e.	Sourcing potting media	0.0	0.0
f.	Sourcing biological control agents	0.0	0.0
g.	Sourcing composts/mulches	0.0	0.0
h.	Sourcing infra structure/land	0.0	0.0
i.	Sourcing pots/punnets/trays	0.0	0.0
j.	Sourcing agronomic services	0.0	0.0
k.	Sourcing fertilizers	0.0	0.0
l.	Other (specify)	41.7	5.0
		100.0	12.0

3

	Can you tell me what types of product your company produces and if they are currently certified by an AQIS accredited organic certification agency?	Proportion %	Count
a	Seed	60.0	21.0
b	Seedlings	22.9	8.0
c	Potting media	0.0	0.0
d	Composts/mulches	2.9	1.0
e	Pots/Punnets/Trays	0.0	0.0
f	Fertilizers	2.9	1.0
g	Pest & disease control	0.0	0.0
h	Weed control/suppression	0.0	0.0
i	Biological control agents (pest disease & weeds)	0.0	0.0
j	Irrigation/Glass House or other equipment	0.0	0.0
k	Agronomic services	0.0	0.0
l	Other (specify)	11.4	4.0
		100.0	35.0

3a.	For each of your products what does your company intend to do with regard to its organic certification when the Rule becomes operational:	Proportion %	Count
	Seeds		
a.	Retain organic certification for your product	60.0	12.0
b.	Apply for organic certification for your product	20.0	4.0
c.	Apply for an exemption from my certifier	10.0	2.0
d.	Abandon my organic certification	0.0	0.0
e.	Remain uncertified	10.0	2.0
	Not Applicable/used	0.0	
		100.0	20.0

	Seedlings	Proportion %	Count
a.	Retain organic certification for your product	66.7	6.0
b.	Apply for organic certification for your product	22.2	2.0
c.	Apply for an exemption from my certifier	0.0	0.0
d.	Abandon my organic certification	0.0	0.0
e.	Remain uncertified	11.1	1.0
f.	Not Applicable/used	0.0	0.0
		100.0	9.0

	Composts and mulches	Proportion %	Count
a.	Retain organic certification for your product	100.0	1.0
b.	Apply for organic certification for your product	0.0	0.0
c.	Apply for an exemption from my certifier	0.0	0.0
d.	Abandon my organic certification	0.0	0.0
e.	Remain uncertified	0.0	0.0
f.	Not Applicable/used	0.0	0.0
		100.0	1.0

Fertilizers		Proportion %	Count
a.	Retain organic certification for your product	100.0	1.0
b.	Apply for organic certification for your product	0.0	0.0
c.	Apply for an exemption from my certifier	0.0	0.0
d.	Abandon my organic certification	0.0	0.0
e.	Remain uncertified	0.0	0.0
f.	Not Applicable/used	0.0	0.0
		100.0	1.0

Other (specify)		Proportion %	Count
a.	Retain organic certification for your product	66.7	2.0
b.	Apply for organic certification for your product	0.0	0.0
c.	Apply for an exemption from my certifier	0.0	0.0
d.	Abandon my organic certification	33.3	1.0
e.	Remain uncertified	0.0	0.0
f.	Not Applicable/used	0.0	0.0
		100.0	3.0

4	Do you understand the requirements for producing this product to meet organic standards?		Proportion %	Count
	a.	Yes	86.7	26.0
	b.	No	13.3	4.0
			100.0	30.0

5	What type and quantities of seed do you trade in on an annual basis?		% giving quantitative data	No of responses taken
	amount of seed		82.1	23.0
	% Raised Organically		85.7	24.0
	Source of Seed		89.3	25.0

6	How do you intend to meet any future demand for ORGANIC seed or seedlings?		Proportion %	Count
	a.	Produce your own requirements for organic seed or seedlings	34.6	9.0
	b.	Produce some of your own requirements for organic seed or seedlings	23.1	6.0
	c.	Purchase all your requirements for organic seed or seedlings	34.6	9.0
	d.	Ask certifier for exemption and use conventional seed or seedlings	0.0	0.0
	e.	Do not intend to service the organic market	3.8	1.0
	f.	Don't know	3.8	1.0
		100.0	26.0	

7	In 5 years time what do you anticipate will be your annual requirements for purchased organic seed or seedlings will be?		Proportion %	Count
	a.	Much less than now	18.5	5.0
b.	Same (i.e. 0 ± 10% of current requirements)	22.2	6.0	
c.	10-25% greater than current requirements	25.9	7.0	
d.	25-50% greater than current requirements	7.4	2.0	
e.	> 50% than current requirements	25.9	7.0	
		100.0	27.0	

8	Do you trade in open-pollinated vegetable varieties?		Proportion %	Count
	a.	Yes	96.0	24.0
b.	No - go to Question 10	4.0	1.0	
		100.0	25.0	

9	Are you satisfied with the performance of OP varieties?		Proportion %	Count
	a.	Yes – go to 10.	70.8	17.0
b.	No	29.2	7.0	
		100.0	24.0	

9a.	If NO, can you please briefly explain what problems you experienced.		% giving quantitative data	No of responses taken
		Alliums	33.3	3.0
	Brassicates	22.2	2.0	
	Cucurbits	11.1	1.0	
	Leafy	11.1	1.0	
	Legume	0.0	0.0	
	Root	0.0	0.0	
	Solanacious	0.0	0.0	
	Tuberous & Perennial	0.0	0.0	
	Other	11.1	1.0	
	Mixed	11.1	1.0	
		100.0	9.0	

	Explanation of poor performance of "open pollinated" varieties							
	a	b	c	d	e	f	g	h
Poor Performance Reasons	Poor germination	Inconsistent batch performance	Poor vigour	Disease and pest susceptibility	Variety not suitable for market	Uneven cropping (mixed variety)	Poor performance under organic cropping conditions	Other (specify)
% of Total	12.5	0.0	0.0	0.0	37.5	0.0	0.0	50.0
Sum of Category	1.0	0	0	0	3	0	0	4

10

Do you trade in hybrid vegetable varieties?	Proportion %	Count
a. Yes	54.5	12.0
b. No - go to Question 10	45.5	10.0
	100.0	22.0

10a.

Are you satisfied with their performance?	Proportion %	Count
a. Yes - go to 11	87.5	14.0
b. No	12.5	2.0
	100.0	16.0

10b.	If NO, can you please briefly explain what problems you experienced.		% giving quantitative data	No of responses taken
	a.	Alliums	0.0	0.0
	b.	Brassicates	0.0	0.0
	c.	Cucurbits	0.0	0.0
	d.	Leafy	0.0	0.0
	e.	Legume	0.0	0.0
	f.	Root	0.0	0.0
	g.	Solanacious	0.0	0.0
	h.	Tuberous & Perennial	0.0	0.0
	i.	Other	0.0	0.0
			0.0	0.0

11	Do you think hybrid varieties should be retained as an option for organic production?		Proportion %	Count
	a.	Yes – Go to 12	80.0	20.0
	b.	No	20.0	5.0
			100.0	25.0

11a.	If NO, can you please briefly explain why you feel hybrids should be excluded in organic production.		Proportion %	Count
	a.	Financial cost of new seed	0.0	0.0
	b.	Reduce “externalities” in production	0.0	0.0
	c.	Dislike multi-national companies	0.0	0.0
	d.	Don't perform in organic systems	0.0	0.0
	e.	Distrust of genetics involved	0.0	0.0
	f.	Loss of self-sufficiency	0.0	0.0
	g.	“Gut Feeling” its Wrong	25.0	1.0
	h.	Other (specify)	75.0	3.0
			100.0	4.0

12	How do you rate your chances of sourcing organic seed or seedlings for ALL your vegetable cropping and rotation requirements (including green manures) if the Rule is fully enforced:		Proportion %	Count
	a.	Poor (0-25%)	33.3	8.0
	b.	Moderate (25-50%)	25.0	6.0
	c.	Good (50-75%)	8.3	2.0
	d.	Very good (75-100%)	25.0	6.0
	e.	Not Stated	8.3	2.0
			100.0	22.0

Our project aims to gauge the level of understanding within the seed & seedling industries of impending changes to the organic production Rule. The following scenario is designed to test this.

13	A client wants to produce a certified organic spinach crop. You are unable to provide any certified organic seed or seedlings. What do you advise your client to do in order that the crop complies with the new seed/seedling Rule?		Proportion %	Count
	a.	Use conventional seed.	4.0	1.0
	b.	Contact certifier and gain approval to use conventional seed.	16.0	4.0
	c.	Contact certifier and supply them with proof that they were unable to find certified organic seed, and request certifier approval to use conventional seed.	44.0	11.0
	d.	Plant something different.	16.0	4.0
	e.	Other (eg obtain from O.S, don't know, N/A)	16.0	1.0
			100.0	25.0

PROJECT INFORMATION & PRIVACY RELEASE

14	One of the major outcomes of this project is to provide information about the Rule and its consequences. What is the best format for you to receive this information?		Proportion %	Count
	a.	Workshop	10.3	3.0
	b.	Printed (technical note, industry newsletter)	34.5	10.0
	c.	Electronic (internet)	48.3	14.0
	d.	Other (please specify)	6.9	2.0
		100.0	29.0	

15	Would you be willing to publicly release details of your company's products or requirements which relate to organic vegetable production?		Proportion %	Count
	a.	Yes – go to 15a	44.4	12.0
	b.	No – go to 15b	55.6	15.0
		100.0	27.0	

15a.	Would you be willing to fill out, sign and return to us a privacy release form giving permission to publish your details?		Proportion %	Count
	i.	Yes	75.0	12.0
	ii.	No	25.0	4.0
		100.0	16.0	

15b	Would you like to receive future information about this project?		Proportion %	Count
	i.	Yes	96.4	27.0
	ii.	No	3.6	1.0
		100.0	28.0	

Appendix 5

Database of Organic Seed and Seedling Suppliers

Suppliers of vegetable seedlings

Business Name	State	Telephone	e-mail	Comments	OP	Hybrid	Produces	Certification
Austral Seedlings	NSW	02 9606 8410		Considering organic production				
Daley's Nursery	NSW	02 66321441	gres@daleysfruit.com.au	Will consider buying in organic seedlings for resale at later date			Fruit trees & natives	
Excel Seedlings	NSW	02 4651 2459						
Marshall's Nursery	NSW	02 64932932	marshall@axisis.net.au					
Oasis Horticulture	NSW	02 4754 1422	brents@oasisaustralia.com	Interested in buying in organic seedlings for resale in the future	Y	Y	Wide range vegetables (1.9 million seedlings)	No
Patio Plants	NSW	0409 551 1056	eamenduncan@optusnet.com.au				Organic seedlings, potted herbs, veges & wheat grass	
Rivendell Eco Farm	NSW	02 6628 2391	hogan21@bigpond.com	Production underway by Autumn 2005			Setting up network to supply & buy seed/seedlings	
Roseberry Gardens	NSW	02 6636 4307						
Southern Cross Botanicals Pty Ltd	NSW	02 66876706	info@sbotanicals.com.au					
The Natural Nursery	NSW	02 44478648	thenaturalnursery@bigpond.com					
Edible Landscapes Nursery	QLD	07 3857 8775	nscf@powerup.com.au	Grows organic seed and seedlings for sale- final stages of being certified	Y	N	All vegetables & backyard garden species	
Milford Farm	QLD	07 3392 1416	rodfer@creativecuisine.com.au					ACO
Premier Nurseries	QLD	07 38030444	robertjack48@yahoo.com	When organic seed rule set in concrete will produce seedlings	Y	Y	Conventional vegetable cuttings & cut flowers	No
Victor Schwenke	QLD	0417 719139						
Bickleigh Vale Farm	SA	08 8383 0603	dbickford@ozemail.com.au	Seedlings. NASAA certified. Uses organic seed (some US certification). Direct sale to growers, organic retail outlets and local Farmer's Market	Y	Y	Vegetable & specialist salad seedlings	NASAA
Rob Collett	SA	08 8391 3078		Intending to supply				
Forest Hill Farm	TAS	03 6426 1184	foresthillfarm@bigpond.com	Large vegetable operation. Some imported seed (Netherlands)			Vegetables	
Boonaroo Nurseries	VIC	03 5282 2199	post@boomaroo.com	Produces 2 million vegetable seedlings per annum. HACCP & ISO certified.			All varieties. Collaborating with suppliers of "organic" seed	
Gippsland Seedlings Co Pty Ltd	VIC	03 51571650		Grows organic seedlings on consignment	Y	Y	Lettuce, brassicas, herbs	

Southern Light Herbs	VIC	03 54752763	Purchasers and suppliers of organically grown herbs	Y	Tomatoes, broccoli, silver beet, cucumbers, zucchini, garlic	OGA
Terra-Verm Products	VIC	03 51 568513	Seedlings. OGA certified. Supplies home gardener, nurseries, retail, can supply farmers if required			
White Cottage Herbs	VIC	03 57662285	Organic nursery - retail & wholesale pot plants & seedlings on contract			
Black Sheep Organics	WA	08 9399 1775		Y	All vegetables (2mill/annum)	
Select Seedlings	WA	08 9732 1253	Buys in seed & resell seedlings; experimenting seed production	Y		
Steve's Organic Seedlings	WA	08 9733 1312				

Note: Whilst every effort was made to verify the accuracy of information contained in this database, no responsibility for incorrect information is taken by the authors. This is a shortened version of an electronic database produced in Microsoft® Excel® as part of this project.

Suppliers of vegetable seed

Business Name	Town	State	Telephone	e-mail	Comments	OP	Hybrid	Vegetable type	Certification
Charlton Seeds	Austral	NSW	02 9606 0522	charlton@hoksey.net.au	Grows organic seed for sale				
Greenpatch Organic Seeds	Taree	NSW	02 6551 4240	enquiries@greenpatchseeds.com.au	Buys in and grows organic seed for sale Future Australian organic prodn. Supplies organic farmers & nurseries	Y	N	Large Variety (over 300) 100% organic onions, carrot, pumpkin, melons	
Jarri Aust Pty Ltd	GOSFORD WEST	NSW	02 4321 0111	robl@jarri.com.au		Y	Y	900 varieties.	
Kings and Exclusive Seeds	Penrith	NSW	02 4776 1493	kirstenole@ozemail.com.au	Mail Order only. Buys in seed from NZ (certified) for resale.	Y	Y	Soybean, legumes, pulses, oilseeds	
Mara Seeds Pty Ltd	Mullingahee	NSW	02 6664 5145		Grows organic seed for sale. BFA certified			Potato	
Moonacres	Fitzroy Falls South	NSW	02 4821 5441		Buys in seed for own use / potential seedlings particularly potato			14 varieties	ACO
Mr.Fothergill's Seeds & Bulbs	Windsor	NSW	02 4577 5457	fothergills@optusnet.com.au	Buys imported organic seed for retail. Packet seeds to retail market only.	Y			
Pleasance Herbs		NSW	02 666 33390	info@pleasanceherbs.com.au					
Purkiss Seeds	Armidale	NSW	02 6772 2341	purkiss@ruralco.com.au	Small quantities seed on demand. Will increase with demand	Y	Y	Most vegetables, ryegrass, legumes	
Seed Savers Network	Byron Bay	NSW	02 6685 6624	info@seed savers.net	No sales - run courses on growing organic seed for themselves				
Sunland Seeds Pty Ltd	Coopermook	NSW	02 6556 3234	sunbeart@tpgi.com.au	Importer of organic seed (certified Idaho DPI)	Y	N	a number varieties of beans and peas (pea seed fumigated)	USA
Vegco	Penrith Hills	NSW	0417 697 628		Future buy-in organic seed/seedlings for re-sale	Y	Y	lettuce, leafy vegetables	
May & Ryan Ltd	PUKEKOHE	NZ	64 9238 9729	peter@mayandryan.co.nz					
Annamd & Robinson Pty Ltd	Toowoomba	QLD	07 4632 2688		Buys in and grows organic seed for sale	Y	not vegies	Soybean, adzuki bean, linseed	
Eden Seeds	Lower Beechmont	QLD	07 5533 1107		Buys in and grows organic seed for sale - certified	Y	N	All types of vegetable seed	

Bajo Zuden, WA agent	WA	0419 925 592		Untreated seed					
Ballard Seeds	WA	08 9883 2005		Grain / green manure seed					
Bay Seed Garden	Busselton	08 9752 2513		Grows organic seed for sale - getting certified	Y	N		Home garden - vegetables, herbs, flowers	
Black Sheep Organics	Bedfordale	08 9399 1775		Will grow seed for sale when rule comes in 100% (currently own use only)	Y	N		Herb seeds	
Gourmet Garden Seeds	Cottesloe								
Palmerston Farms (Biodynamic)	Nedlands	08 9328 7355		Buy in seed and sell seedlings	Y	N		All vegetables	
Rijk Zwaan Seeds, WA agent	WA	08 9410 2233		Organic seed					
South Pacific Seeds	WA	08 9331 6356		Untreated seed					
Symonds Seeds	WA	08 9443 7100							
Rehovot, 76122	Israel	972 8 931 8966	Isaacmir@genesisseeds.co.il	Supplying org. seeds to Aust. & NZ past 3 years. Produced in Israel.	Y	Y		> 350 varieties of vegies, herbs, flower seed. Distributors & seed companies only	USDA, AGRIOR, PPIS
Genesis Seeds (USA & Israel)	EU / UK			Official database of organic seed and seedling suppliers in the EU					
Organicxseeds - database									

Note: Whilst every effort was made to verify the accuracy of information contained in this database, no responsibility for incorrect information is taken by the authors. This is a shortened version of an electronic database produced in Microsoft® Excel® as part of this project.

Appendix 6

COMMISSION REGULATION (EC) No 1452/2003 of 14 August 2003

CHAPTER III

RULES ON REGISTRATION OF SEED OR SEED POTATOES OBTAINED BY THE ORGANIC PRODUCTION METHOD

Article 6 **Database**

1. Each Member State shall ensure that a computerised database is established for the listing of the varieties for which seed or seed potatoes obtained by the organic production method prescribed in Article 6(2) of Regulation (EEC) No 2092/91 are available on its territory.
2. The database shall be managed either by the competent authority of the Member State or by an authority or body designated for this purpose by the Member State, hereinafter referred to as 'manager of the database'. Member States may also designate an authority or a private body in another country.
3. Each Member State shall inform the Commission and the other Member States of the authority or private body designated to manage the database.

Article 7 **Registration**

1. Varieties for which seed or seed potatoes produced by the organic production method are available shall be registered in the database at the request of the supplier.
 2. Any variety which has not been registered in the database shall be considered as unavailable with regard to the application of Article 5 of the present Regulation.
1. Each Member State shall decide in which period of the year the database has to be regularly updated for each species or group of species cultivated on its territory. The database shall hold information on this.

Article 8 **Conditions for registration**

1. For registration, the supplier must be able to:
 - (a) demonstrate that he or the last operator, in cases where the supplier is only dealing with prepackaged seed or seed potatoes, has been subject to the inspection system referred to in Article 9 of Regulation (EEC) No 2092/91;
 - (b) demonstrate that the seed or seed potatoes to be placed on the market comply with the general requirements applicable to seed and vegetative propagating material;
 - (c) make available all the information required under article 9 of this Regulation, and undertake to update this information at the request of the manager of the database or whenever such updating is necessary to ensure that the information remains reliable.
2. The manager of the database may, with the approval by the competent authority of the Member State, refuse a supplier's application for registration or delete an already accepted registration if the supplier does not comply with the requirements set out in paragraph 1.

Article 9
Registered information

1. For each registered variety and for each supplier, the database shall contain at least the following information:

- (a) the scientific name of the species and the variety denomination;
- (b) the name and contact details of the supplier or his representative;
- (c) the area where the supplier can deliver the seed or seed potatoes to the user in the usual time needed for the delivery;
- (d) the country or region in which the variety is tested and approved for the purpose of the common catalogue of varieties of agricultural plant species and vegetable species;
- (e) the date from which the seed or seed potatoes will be available;
- (f) the name and/or code number of the inspection authority or body in charge of the inspection of the operator as referred to in Article 9 of Regulation (EEC) No 2092/91.

2. The supplier shall immediately inform the manager of the database if any of the registered varieties are no longer available. The amendments shall be recorded in the database.

3. Besides the information specified in paragraph 1, the database shall contain a list of the species listed in the Annex. 15.8.2003 L 206/19 Official Journal of the European Union EN

Article 10
Access to information

1. The information in the database shall be available through the Internet, free of cost, to the users of seed or seed potatoes and to the public. Member States may decide that users who are registered according to Article 8(1)(a) of Regulation (EEC) No 2092/91 shall obtain, at request, an extract of data concerning one or several groups of species from the database manager.

2. The Member States shall ensure that all users who are registered according to Article 8(1)(a) of Regulation (EEC) No 2092/91 are informed, at least once a year, about the system and how to obtain the information in the database.

Article 11
Registration fee

Each registration may be subject to the levying of a fee, which shall represent the cost of introducing and maintaining the information in the database. The competent authority of the Member State shall approve the level of the fee practised by the manager of the database.

CHAPTER IV
REPORT AND FINAL PROVISIONS

Article 12
Annual report

1. The authorities or bodies designated to grant authorisations in accordance with Article 4 shall register all authorisations, and shall make this information available in a report to the competent authority of the Member State and to the manager of the database.

The report shall contain, for each species concerned by an authorisation according to Article 5(1), the following information:

- (a) the scientific name of the species and the variety denomination;
- (b) the justification for the authorisation indicated by a reference to Article 5(1)(a), (b), (c) or (d);
- (c) the total number of authorisations;

(d) the total quantity of seed or seed potatoes involved;

(e) the chemical treatment for phytosanitary purposes, as referred to in Article 3(a).

2. For authorisations according to Article 5(4) the report shall contain the information referred to in paragraph 1(a) and the period for which the authorisations were in force.

Article 13

Summary report

The competent authority of the Member State shall, before 31 March each year, collect the reports and send a summary report covering all authorisations of the Member State from the previous calendar year to the Commission and to the other Member States. The report shall cover the information specified in Article 12. The information shall be published in the database. The competent authority may delegate the task of collecting the reports to the manager of the database.

Article 14

Information upon request

Upon request from a Member State or the Commission, detailed information on authorisations granted in individual cases shall be made available to other Member States or to the Commission.

Article 15

Revision

Before 31 July 2006 the Commission will examine the availability and use of seed or vegetative propagating material obtained by the organic production method and the effective implementation of the present regulation and will, if necessary, make the appropriate amendments.

Article 16

Entry into force and application

This Regulation shall enter into force on the 20th day following that of its publication in the *Official Journal of the European Union*. It shall apply from 1 January 2004. This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 14 August 2003.

For the Commission

Franz FISCHLER

Member of the Commission

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Websites of Interest

Supplier database sites

OrganicXseeds: The OrganicXseeds database is produced and published on the Web by the BioGene Division of the Swiss Research Institute of Organic Agriculture (FiBL) in cooperation with the European Initiative for Organic Seeds and the German GM-free foods working group (Arbeitsgemeinschaft Lebensmittel ohne Gentechnik ALOG). This site aims to provide buyers with up-to-date information on the availability of organic seeds and seedlings in Europe. Details are provided on the quality criteria of the seeds and seedlings on offer, and information is available to seed suppliers who wish to advertise their products in OrganicXseeds. <http://www.organicxseeds.com/>

Links to databases for organic propagation material in EU Member States can be found at: <http://europa.eu.int/comm/agriculture/qual/organic/seeds/>

Genesis Seeds Ltd Certified Organic Seed:

Genesis Seeds Ltd. Are an Israeli company that provides the international seed industry with high quality certified organic seeds of vegetables, flowers and herbs (both culinary and medicinal), including open pollinated, F-1 hybrid and heirloom varieties.

10 Plaut St.
Weizmann Science Park
Rehovot 76122
Israel

Tel: +972 8 931 8966; Fax: +972 8 931 8967; E-mail: genesis@genesisseeds.co.il
<http://www.genesisseeds.com/aboutus.htm>

SeedQuest: Created in 1992 by a seed industry veteran, the SeedQuest website contains news, product information, seed suppliers, suppliers of products and services for the seed industry, statistical data, position announcements, job seekers, contact information, etc.:
<http://www.seedquest.com/organic/suppliers/default.htm>

Vegetables / Tradeworlds: http://vegetables.tradeworlds.com/web_category_4467.html

An interesting US project: <http://www.ars.usda.gov/is/AR/archive/oct99/seed1099.htm>

Seed breeding scheme and seed certification agencies

The Australian Seeds Authority Limited (ASA) was established in June 2002 as a non-profit company limited by guarantee to represent the national and international interests of the Australian seed industry in matters relating to seed certification and seed testing.
<http://www.grainscouncil.com/ASA/ASA.htm>

The Biodynamic Seed Development Project has been set up to establish a sustainable on-farm plant breeding programme involving a network of farmers and gardeners in the development and maintenance of Demeter certified organic plant varieties, to supply the growing organic seed market with high quality biodynamically grown and certified seeds and to increase public awareness for their importance. <http://www.biodynamic.org.uk/Seeds.htm>

The American Seed Trade Association (ASTA), was founded in 1883, and is one of the oldest trade organisations in the United States. Its membership consists of about 850 companies involved in seed production and distribution, plant breeding, and related industries in North America. As an authority on plant germplasm, ASTA advocates science and policy issues of industry-wide importance.
<http://www.amseed.com/about.asp>

The Association of Official Seed Certifying Agencies (AOSCA) represents a network of independent seed certification agencies that are committed to providing official unbiased field inspection and lab testing services within their respected boundaries or domain. The agencies membership consists of 44 state certification agencies within the United States and seven national agencies: Argentina, Australia, Canada, Chile, New Zealand, Panama and South Africa. Programs offered include, but are not limited to seed certification, Quality Assurance, Identity Preserved, OECD Schemes and Organic Certification. <http://www.aosca.org/>

The International Seed Federation (ISF) is a non-governmental, non-profit organization representing the seed industry. With members spread over 70 developed and developing countries on all continents, ISF represents the mainstream of the world seed trade and plant breeders' community, and serves as an international forum where issues of interest to the world seed industry are discussed. Emphasis on increased recognition of the importance and value of our members' major contributions to world food security, genetic diversity and sustainable agriculture, in particular through the development, production, and use of high quality seed and modern technology.
<http://www.worldseed.org/> Also see some interesting position papers relevant to organic farming:
<http://www.worldseed.org/positions.html>

NASAA requirements for organic seed and seedlings, and suppliers of certified organic plant propagation material:
http://www.nasaa.com.au/content.asp?targetPage=consultants_products.html

ACO requirements for organic seed and seedlings:
<http://www.australianorganic.com.au/Pages/technical.htm>

Seed saver networks, projects and resources

The Seed Savers Network is a non-profit organisation, founded by Michel and Jude Fanton in 1986. It has both national and international significance promoting and organising the preservation, free distribution and exchange of open-pollinated seeds.

P.O. Box 975 Byron Bay
NSW 2481, Australia
Tel +61 (02) 6685 7560 Tel/Fax +61 (02) 6685 6624
Email: info@seedsavers.net
Website: <http://www.seedsavers.net/index.html>

The Permaculture Association of South Australia Inc. has an active Seed Savers Group and a group specialising in Permaculture Education: <http://www.users.bigpond.com/brookman/seeds.html>

Seed Saving Projects: http://www.worldhungeryear.org/ria/ria_seeds.asp

Seedsaving and Seedsavers' Resources: <http://homepage.eircom.net/~merlyn/seedsaving.html>

Seed Savers Aotearoa New Zealand (SSANZ) has been established to facilitate the sharing of information and resources between regional seed saving groups. <http://www.seedsavers.org.nz/>

Regulatory information

AQIS: To find out conditions for the importation of seeds:
http://www.aqis.gov.au/icon32/asp/ex_querycontent.asp

Bulletin 4589 Western Australia's seed import requirements:
<http://www.agpsrv38.agric.wa.gov.au/pls/portal30/docs/FOLDER/IKMP/PW/Q/BULLETIN4614.PDF>

Australian Pesticides and Veterinary Medicines Authority (APVMA) - formerly National Registration Authority:

APVMA
John Curtin House,
PO Box E240
Kingston ACT 2604 Australia
Internet home page: <http://www.apvma.gov.au>
Permits and minor uses: http://www.apvma.gov.au/minor_use/subpage_minor.shtml
Phone: (02) 6272 5852
Email: contact@apvma.gov.au

Useful contacts

AQIS Approved Certifying Organisations – October 2004

Bio-Dynamic Research Institute
Post Office
POWELLTOWN VIC 3797

Phone 03 5966 7333
Fax: 03 5966 7433

Australian Certified Organic Co-Operative Ltd
Post Office Box 530
L1 766 Gympie Rd
CHERMSIDE QLD 4032

Phone: 07 3350 5716
Fax: 07 3350 5996
E-mail: info@bfa.com.au
Web: <http://www.australianorganic.com.au/>

National Association for Sustainable
Agriculture (Australia) Ltd
Post Office Box 768
STIRLING SA 5152

Phone 08 8370 8455
Fax: 08 8370 8381
E-mail: enquiries@nasaa.com.au
Web: <http://www.nasaa.com.au>

Organic Growers of Australia
Post Office Box 6171
SOUTH LISMORE NSW 2480

Phone: 02 6622 0100
Fax: 02 6622 0900
E-mail: admin@organicherbs.org
Web: <http://www.organicherbs.org/>

Organic Food Chain
Post Office Box 2390
TOOWOOMBA QLD 4350

Phone: 07 4637 2600
Fax: 07 4696 7689
E-mail: organicfoodchain@hotmail.com
Web: <http://www.organicfoodchain.com.au/>

Tasmanian Organic-Dynamic Producers
Post Office Box 434
MOWBRAY HEIGHTS TAS 7248

Phone: 03 6363 5162
Fax: 03 6363 5162
Email: juliepage001@yahoo.com.au

Safe Food Queensland (SFPQ)
Spring Hill 4004
55 McLachlan St
Fortitude Valley 4004
Contact: Phil Pond

Phone: 07 3253 9800
Free Call: 1800 300 815
Fax: 07 3253 9824
Email: info@safefood.qld.gov.au
Web: <http://www.safefood.qld.gov.au/>

Further information on the Australian organic industry may be obtained from:

Organic Federation of Australia
Suite 502 "Park Place"
3 Waverley Street
Bondi Junction NSW 2022

Phone: 02 9340 7808
Fax: 02 9340 7807
Mob: 0412 905203
Email: info@ofa.org.au

Website: <http://www.ofa.org.au/>

For information about export requirements on organic produce contact AQIS on AQIS Organic Program:

Program Management and Operations: +61-2-6271-6638
Policy and Market Access: +61-2-6272-3509
Fax: +61-2-6272-3238
Email Address: organic@aqis.gov.au

Approved Seed Testing Laboratories in Australia

AGWEST Plant Laboratories

Department of Agriculture
Baron-Hay Court
SOUTH PERTH WA 6151
Phone: (08) 9368 3844
Fax: (08) 9474 2658
Email: mvistisen@agric.wa.gov.au

CASCO Agritech

214 McDougall Street
PO Box 549
TOOWOOMBA QLD 4350
Phone: (07) 4633 0599
Fax: (07) 4633 0711
Email: castwb@casco.com.au

Seed Services Australia

Primary Industries and Resources South
Australia
GPO Box 1671
ADELAIDE SA 5001
Phone: (08) 8303 9549
Fax: (08) 8303 9508
Email: pirsa.seeds@saugov.sa.gov.au

Seeds Testing Laboratory of Australia Pty Ltd

2/18 Devlan Street
MANSFIELD QLD 4122
Phone: (07) 3849 2744
Fax: (07) 3849 2704
Email: seedtest@powerup.com.au

Seed Testing Laboratory Mt Pleasant

Tasmanian Department of Primary Industries,
Water and Environment
165 Westbury Road
PROSPECT TAS 7250
Phone: (03) 6336 5248
Fax: (03) 6344 4961
Email: Mary.Dearing@dpiwe.tas.gov.au

Queensland Seed Technology Laboratory,

University of Queensland
GATTON QLD 4343
Phone: (07) 5460 1487
Fax: (07) 5460 1486
Email: seedlab@aghort.uq.edu.au

Agriquality

3-5 Lillee Crescent,
TULLAMARINE VIC 3043
Phone: (03) 8318 9023
Fax: (03) 8318 9002
Email: freelands@agriquality.com

Futari Grain Technology Services

15 Francis St, PO Box 95,
NARRABRI, NSW, 2390
Phone: (02) 6792 4588
Fax: (02) 6792 4221
Email: brendarose@futari.com.au

NT Seed Testing Laboratory

Department of Business, Industry and Resource
Development
PO Box 3000
DARWIN NT 0801
Phone: (08) 8999 2236
Fax: (08) 8999 2043
Email: albert.simonato@nt.gov.au