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& DEVELOPMENT CORPORATION

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Foreword

The proceedings of the inaugural national organic conference will make a significant contribution to perspectives on organic food and agricultural systems. The breadth of papers reflects the organic industry's diversity and the conference organisers' deliberate strategy to stimulate awareness and debate in both industry and the community about new and sometimes radical issues relating to organic agriculture.

I hope this collection of papers are food for thought and useful to those who support the growth of the organic sector. The period following this important conference will be filled with hope and optimism as the substantial challenges before us are further articulated and realised.

The world has shrunk since the organic movement began. As we grow in numbers and sophistication, other countries will be looking to us for solutions to serious situations confronting the global environment and the means by which agriculture can both feed and provide the economic, ecological and social benefits so important for ecologically sustainable development.

Australia and many other parts of the world need to deal with severe environmental problems if agriculture is to achieve true sustainability. Organic agriculture may offer hope for the better management of our natural resources and lead to the resolution of some environmental management issues.

Rod May
Chair
Organic Federation of Australia

Don Fraser
Chair
Organic Produce R&D Committee RIRDC

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PART TWO

Speakers' Papers

1. Opening Paper

By Senator Judith Troeth
Parliamentary Secretary
to the Minister for Agriculture, Fisheries and Forestry – Australia

Introduction

Professor Beth Woods, Chair of the Rural Industries Research and Development Corporation; Rod May, Chair of the Organic Federation of Australia, Don Fraser, Chairman of the RIRDC Organic Committee, ladies and gentlemen.

It is a pleasure to be here today to officially open this Inaugural National Organics Conference.

I would like to congratulate both RIRDC and the Organic Federation of Australia for your initiative in bringing key players in the industry together for this forum.

There are two issues, in particular, I want to cover in my address and they are:

- the future of the organics industry and how the development of a National Food Industry Strategy might assist in enabling you to achieve your goals; and

- how best to develop and operate domestic standards for the organic industry.

The organics industry

The organics industry as a very important and growing part of Australia's food industry.

Estimates indicate that the global market for organic produce is currently of the order of $40 billion annually and growing.

Australia's share of this market is currently estimated to be between $250 and $300 million and growing at around 30 per cent annually.

We have also seen that Australia's major supermarkets now stock organic produce in response to this growing consumer demand – which is firm proof of the demand for organic products.

And many consumers are willing to pay price premiums for them.

There is also no doubt that this increased demand for organic products is being driven, in part, by growing consumer concerns about food safety, especially in light of the crises in Europe with BSE and Foot and Mouth Disease.

The organics industry is one of Australia's most diverse industries, not only in terms of products, but also in terms of the scale of individual operations and their location.

Your theme, *The Organic Challenge - Unity through Diversity*, is very appropriate for the organic industry.

The industry ranges from a number of extensive broadacre enterprises, primarily in the grazing industry such as OBE Organic Rangeland Beef up in the Channel country, through to many small horticultural operations.

As well, there are many smaller traditional family farms of a more intensive nature adopting organic systems and marketing their own produce. Horticultural production appears to dominate this sector of the industry.

Many of these smaller enterprises, do not participate in conventional supply chains for scale or technical reasons, or choose not to because they have a different vision of food and farming.

As an emerging industry, there are many issues and concerns before you. These have been highlighted to me in the National Food Industry Strategy consultations.

During the development of the National Food Industry Strategy, I had the pleasure of chairing 20 regional food industry forums and meetings with State food councils to gain industry input into the Strategy.

Issues relating to the organics industry were raised at just about every one of these meetings.

The issues raised included how to develop a profitable and sustainable enterprise, how to achieve product differentiation and the need for business skills and marketing strategies.

Many of the other issues raised at these meetings were those affecting small to medium sized enterprises generally and I would expect they apply equally to businesses in the organic industry.

Industry trends

The Australian food industry is at a critical stage in its development.

The industry now faces a number of competing, and sometimes conflicting, trends on a range of fronts.

At one end of the market we are seeing continuing demand for fast, convenient food – food that easily fits into our busy lifestyles.

At the other end we are seeing growing demand for high value, quality niche-market food products.

We are also seeing increasing consumer demand for food products that have been produced using environmentally sustainable practices and where animal welfare considerations have been taken into account.

In addition to these consumer trends, we are also witnessing a major transformation and restructuring of the food industry on a global scale.

The combination of these trends – changing consumer demands and industry restructuring – will dramatically change not only the face of the food industry, but also how it operates.

Before we achieve that, however, we have to examine where we currently stand in the marketplace. Our agricultural commodities and processed food products have long been internationally traded.
The composition of that global food trade, however, has changed significantly in recent years.

Our research shows that since 1980, the international trade in processed food has increased rapidly, while trade in bulk agricultural commodities has declined.

In 1985 trade in processed food products accounted for 50 per cent of global agricultural trade. Today it accounts for around 75 per cent of that trade and is growing at twice the rate of trade in primary products.

In addition, consumer tastes are changing rapidly as we become more sophisticated, affluent and discerning in seeking food that satisfies our needs, desires and expectations.

These issues are important in challenging our thinking about the changing shape of world trade; Australia's position in the global market; where our industries fit; and what is happening in rural and regional Australia.

They also highlight the importance of processed consumer and intermediate food products in world trade and how we, as a small trading nation, need to respond to that challenge.

Australia's food exports have averaged a growth rate of 7.7 per cent a year over the past decade to reach $14 billion in 1999-00.

While this may sound encouraging, we need to bear in mind that we account for only 2.7 per cent of the global trade in processed foods.

Equally important, our major competitors are rapidly increasing their share of the market, while our share of the market has remained static over the last few years – despite the substantial increase in exports we have had in our dairy and wine industries in recent years.

Globalisation

Earlier work by the Prime Minister's Supermarket to Asia Council identified globalisation of food processing and retailing as the key force exerting pressure on the food industry.

This globalisation is being fuelled by rapid movements of information, capital services and goods, transport and finance regardless of borders and barriers.

Historical comparative advantages are no longer sufficient when competing against imports in our domestic market or when trying to capture new opportunities in export markets.

The Council also found that the emergence of global retail chains would result in major changes to the structure and operation of the industry over the next five to 10 years.

In addition, the Council said that, with a number of long-term supply arrangements being established around the world, Australia must quickly position itself to participate in these global supply chains.

If we do not do this we risk seeing our share of our existing markets being eroded and losing the opportunity to capture or participate in new ones.

The Council also found that these trends would create a number of opportunities for Australia to increase its share of the global food market through:

- targeting new and increasing consumer demands;

- participating in global supply chains;
- taking up new technologies including e-commerce; and
- adapting to a changing regulatory environment.

National Food Industry Strategy

The need to address these issues and capture these opportunities led the Minister for Agriculture, Fisheries and Forestry, Warren Truss, to announce the development of a National Food Industry Strategy earlier this year.

The Strategy is to be considered by Cabinet next month.

Australia has had a number of food industry initiatives in the past and we have a number of very significant and valuable food industry programs operating at present.

The National Food Industry Strategy will, I believe, prove to be a watershed in the development of all sectors of Australia's food industry, including the organic industry.

The development of the strategy to date represents one of the most concerted and concentrated efforts by industry and government to address the issues, opportunities and challenges before the food industry.

The Strategy will put in place a framework for government and industry to work in partnership so that together we can address the major issues affecting all sectors of the industry.

The issues we identified when developing the Strategy are applicable to all sectors of the industry and it will be important for all sectors, including your industry, to identify the priority issues you want to address under the Strategy's framework for action.

The Strategy will address issues affecting cover processed food, including meat and dairy produce, beverages and ingredients, and fresh produce, such as horticultural produce.

It will also cover issues related to the whole food chain, including transport, packaging and related services.

The Department of Agriculture, Fisheries and Forestry – Australia, through the Food Business Group, has been facilitating the development of the Strategy.

This has involved the Department in analysing the key issues facing the industry and managing an extensive industry consultation program throughout Australia.

Some of the broad issues identified in these consultations were the need for the Strategy to focus on:

- increasing exports so that the industry optimises its profitability, attracts investment and generates jobs;
- how best it can use Australia's science and technology base so it becomes a recognised leader in innovative products, processing and systems development;
- further enhancing the international competitiveness of its business operating environment through the removal of regulatory and other bureaucratic impediments; and

- how it can ensure its long-term sustainability through responsible environmental, energy and waste management practices.

By addressing these issues, the Strategy will place the industry in a stronger position to adapt to and evolve with ever-changing market requirements.

The development of the Strategy has been a hugely challenging project and will continue to be for many years to come as we deal with the challenges and opportunities created by the globalisation of the food industry.

Organic food

I would now like to turn to some of the issues before the organic food industry - your industry.

As I mentioned earlier, the organic industry and the issues surrounding it were raised in some form at most of the regional forums I chaired during our consultations for the development of the National Food Industry Strategy.

And I am pleased to say that the National Food Industry Advisory Committee considered these issues when finalising its recommendations for the Strategy.

One of the key areas the Committee considered when developing the draft Strategy was how best the Australian food industry, as a whole, should deal with issues surrounding product integrity.

And it was within this context that the Committee considered the issue of domestic standards for various environmental and quality statements including organic and biodynamic.

The Government's preferred approach to industry development is to encourage and help facilitate industries to develop and implement standards for the domestic market.

All governments have adopted this approach to industry development in recent times, regulating only where necessary to protect public health and safety or where there is clear market failure and then, only when the broader community is affected.

Part of the reason for this is our firm belief that the introduction of regulations imposes unnecessary costs on business and can create a restrictive and less competitive business environment.

Government processes can be slow and laborious and very difficult to change once put in place.

This is often unhelpful for industries striving to be nimble in response to market demands.

I would expect the outcomes from the National Food Industry Strategy to be broadly consistent with this approach.

In line with our common interest in ensuring product integrity within the Australian food industry, I would therefore encourage the organic industry to continue to examine ways it can implement an industry-driven self-regulatory approach for the domestic market.

I believe this could be best done within a framework of minimal regulation through the development of a Code or Codes of Practice.

And I would encourage you to continue working with the relevant R&D corporations, and the RIRDC in particular, in developing a suitable outcome.

In my view, establishing a voluntary self-regulatory framework for the operation of the organic standard in the domestic market would be a major step forward.

The introduction of such a system would enable Australian consumers to make informed choices about the products they purchase, and differentiate between certified organic products and conventional products.

The domestic market would no longer be exposed to the potential dumping of imported food labelled as organic when it does not meet any recognised standard.

Such a system would also help guarantee the price premiums many of you now receive for your produce.

In the meantime, consumers and producers are able to lodge complaints under the Trade Practices Act and other fair trading laws when they have concerns about false or misleading labelling or inappropriate conduct.

This applies particularly in the case of a labelling claim that the product is 'certified organic'. Organic producers and consumers of organic products can avail themselves of the powers of the Trade Practices Act when this occurs.

We should also not forget that consumers can simply choose not to purchase products if they are unsure of their status.

Unity from diversity

It is against this background that I would encourage all of you here today to work towards greater organisational unity so that you can present a common voice on the issues affecting organic producers.

I am sure you will find advantages from developing a more unified industry structure, ranging from having a more coordinated approach to marketing issues and being able to present a unified stance when dealing with government.

For these reasons the efforts of the Organic Federation of Australia, the RIRDC Organic R&D Program and the programs and projects being undertaken by the States, in attempting to bring about cohesion are very welcome and a positive step forward.

The $160,000 grant provided by the Department of Transport and Regional Services to the Organic Federation of Australia to develop a strategic plan for the industry is also a very positive step forward.

And in developing that plan, I would encourage you to consider how best you might be able to align your objectives and strategies with the objectives and key actions within the National Food Industry Strategy.

The Government already provides substantial support to the organic industry through its financial support of the RIRDC's organics program and the recent grant for the development of an industry strategic plan.

I was also very pleased to see a number of projects funded through AFFA's New Industries Development and Farm Innovation Programs.

I would encourage organic producers to continue to target these programs for assistance.

With the implementation of the National Food Industry Strategy, I would also expect AFFA to have an increased capacity to further encourage and facilitate the organic industry's development.

Conclusion

I believe the organic industry plays a key role in ensuring there is diversity within our overall food production system.

We are keen to ensure that all appropriate forms of agricultural production, including organics, have the opportunity to grow and flourish.

Our goal must be to develop and encourage a range of production systems and food products so that our agricultural and food industries are capable of meeting the full spectrum of consumer needs, wants and expectations.

I now have pleasure in officially declaring the Inaugural National Organics Conference 2001open.

I wish you well in your discussions and I look forward to being informed of your conference outcomes.

Thank you.

2. Research and Development Investment into Organics

By Prof Beth Woods
Chair, Rural Industries Research and Development Corporation

Senator the Honourable Judith Troeth, Don Fraser, Rod May and distinguished guests.

The Australian organic industry has reached a significant point in its development.

There is unprecedented interest in organic foods from the consumer, as shown by the estimated $250-$300 million in retail sales during the past year.

That interest has been driven in part by concern about mainstream agricultural practices and by food safety and quality issues.

So-called "industrial agriculture" has been troubled by such events as the emergence of BSE or Mad Cow Disease, the recent foot and mouth epidemic and the development of genetically modified organisms.

Other factors of real concern are the impact of agriculture on the environment and the sustainability of farming systems into the long term.

However, it would be inaccurate to say that urban consumers believe organic agriculture can solve all these problems, because the simple fact is that most do not fully understand the management practices that organic farmers implement.

A recent survey of US consumers revealed that while there was not a complete understanding of organic farming, there was general knowledge about the fact that no synthetic chemicals were used and they believed it was more environmentally responsible.

I would suggest that similar attitudes currently prevail amongst Australian consumers of organic produce.

Therein lies one of the challenges for the organic industry.

Ensuring positive public perceptions

Every effort must be made to ensure the positive public perceptions are maintained as organic foods become more commonplace and the industry is inevitably subjected to greater levels of scrutiny.

That scrutiny will occur with regard to the industry's claims about environmental management and the quality of its produce.

Two recent developments show that interest is already growing.
The University of Sydney has announced that from next year it will offer a new degree in environmental agriculture through its campus at Orange.

In addition, NSW Agriculture has opened a Centre for Organic Farming at Bathurst.

The official opening of the Centre for Organic Farming last month also coincided with NSW Agriculture's inaugural, three-day Organic Farming Workshop.

I would urge the organic industry to embrace these developments and encourage students and others to study organic farming systems and further develop their usefulness.

It is important not to equate "organic" with "anti-intellectual" or "anti-science"

Organic production involves some fascinating questions of how to "work with" natural systems to improve industry and consumer outcomes.

The industry needs to achieve this not simply for the economic benefit of the organic industry but also for the broader community benefit of finding ways to halt degradation of the Australian farming environment.

Australia has critical salinity and water quality problems

At least 2.5 million hectares (5% of cultivated land) is currently affected by dryland salinity and this could rise to 12 million hectares (22%) at the current rate of increase.

One third of Australian rivers are in extremely poor condition - within 20 years Adelaide's drinking water will fail World Health Organisation salinity standards in 2 days out of 5.

Land and water degradation, excluding weeds and pests, is estimated to cost up to $3.5 billion per year.

Infrastructure (buildings, roads, etc) is also being severely damaged in many rural urban centres.

No-one would argue that we can continue with existing agricultural practices.

We need to find methods of farming that are truly sustainable and do not impact on the broader environment

The organic industry may have some of the answers to these problems and ongoing Research and Development is needed to evaluate and promote the rapid adoption of more sustainable farming systems.

The RIRDC organic R&D program

The Rural Industries Research and Development Corporation manages an organic produce research program that has the objective of facilitating the development of a viable organic industry through increasing adoption of sustainable organic farming systems.

Key strategies are:

- To design Australian organic production and processing systems that optimise use of our physical, social, and natural resources.

- To focus on the adoption of organic systems by rural producers, processors, manufacturers and marketers.
- Optimise market access for both Australian exports and imported products.
- Increase returns to organic enterprises through improved supply systems, better information, and the skills of supply chain participants.
- Collate and share information and knowledge for the benefit of organic enterprises and industry.
- Promote consistent and robust industry policy and R&D development.

The expected key outcomes in 2001–2002 are:
- Closer linkage to researchers, R&D Corporations and state agencies in industry planning.
- Publication of an organic industry directory.
- Consolidation of the role of the Organic Federation of Australia in leading and representing the national industry.
- Increased interest by conventional producers in "conversion" as the path to organic certification.
- Further development of plant and animal pest management strategies for organic agriculture.
- Enhanced knowledge of organic supply chain management and inefficiencies.

However, I would urge organic industry participants to bear in mind the fact that RIRDC has limited funds to support industry activities and development.

This organisation is pleased to be involved where it can, but it would not be prudent for the organic industry to look to RIRDC for the bulk of its development and research support into the long term.

A robust research program must be based on partnerships between government providers, funders like RIRDC, the industry personnel and commercial interest!

As I said at the start of this address, the organic industry has reached a significant stage in its development, but it is also an exciting time.

Community and government interest in organics is at an all time high and it is hard to not feel confident for the future when you look around this conference and see the quality of people involved in the industry.

I wish you all well for this conference and for the future.

3. Organic Growth Through Marketing

By Neville Fielke,
Area Vice President, H J Heinz Company

Good morning distinguished guests and delegates.
It is a real honour to be here at the first day of the first National Organics Conference. There is a sense of excitement and a feeling that organics is progressing rapidly along the path to come of age as a serious, mainstream food category.

That opportunity is not new. Perhaps the industry has been seen in the past as a bit "fringe" and not really as practical and commercially-minded enough as it needed to be. Today the opportunity is very real – and I think this inaugural conference adds to this sense of excitement and progress and is of invaluable assistance.

In the time available, I want to discuss the theme of *marketing* innovation and branding; and also put it in the context of many years' hard work and development.
For Heinz, the importance of building on strong foundations is very much part of both our marketing and our supply chain for organic foods.

From the marketing side, it is a blessing and a huge responsibility to be in the market with known and trusted brands. All of us know that having a brand name behind us, which has built trust over generations, gives us great leverage in bringing credible new products to consumers.
On the production and supply side, many people know that we have the potential to become influential because they have seen our learning commitment to the principles of organics in a number of countries over many years.

Today, I will look at some general global trends and issues and at the specific initiatives impacting on Heinz, particularly in Italy, the UK and New Zealand.

And, of course, I will reflect on what all this could mean for Heinz Wattie's in Australia.

Global markets, trends and issues

When we started looking seriously at organics, we were surprised with the size of the global market which is conservatively estimated to be around US$20 billion in total. We were more than surprised by growth rates of between 20-35% a year, even though this is off a low base and growing from a narrow niche.

The premium people willingly pay for organics has been quite high in the past and it seems likely to command an ongoing smaller premium in key markets for many years to come. While these premiums may not be sustainable as organics become more mainstream, it is notable that even in 'maturing' markets, such as the UK, retail premiums are expected to average around 10-20% for a variety of reasons.

Those figures alone speak for themselves. However, in addition and more importantly for Heinz, changing consumer preferences and needs drew us into organics as a <u>new</u> opportunity to refresh our existing categories.

If you ask me "what is driving the market", there is really only one answer: consumers need for choice given their anxieties. The emergence of organic categories has not been driven by clever marketing or packaging but by consumer demand.

I like to picture the space occupied today by organics as the "top tier" of the emerging consumers' values and desires. Consumers' concerns differ in importance from country to country but broadly include the environment, personal health and food safety. As well, many consumers believe that organic food offers better flavour and nutrition.

It is important that you promote the virtues of the product rather than denigrate others. If nothing else, make sure that is a key out-take from my comments.

Nevertheless, attitudes are being formed against choice of the alternatives and the corresponding implications. Throughout the affluent world, food safety is growing in importance for consumers' food choices. Attitudes are strengthened by a spate of "food scares" which have created, or reinforced, deep concerns about how food is produced and processed. Especially in Europe, the biotechnology debate has had an impact.

Remember that "Organics" is a euphemism for many consumers' search for trust and integrity and confidence in the food chain rather than a scientific argument in itself.

From the producers' side at the other end, there is an equal search for the "clean, green" environmental ideal. In many cases, producers have strong encouragement to "go green" if they want continued access to export markets. In many countries, trade liberalisation has come hand in hand with "green protectionism".

At Heinz, we have made a commitment to learn and to connect ourselves very strongly with both sides of this picture. Finally, the clear message worldwide is that the main constraint on future growth of the market is the limited supply of organic produce. Despite rapid conversion of land from traditional crops to organic farming, sustainable, reliable supply is a real barrier to growth.

I will come back in a minute to discuss how Heinz has addressed the supply issue in some key countries. For the moment, however, there is confidence that if you grow organic produce with consistency and sensible economies, it will be bought and it will be consumed.
So all of this makes "the space" around organics a really interesting area for us.

Heinz' approach to organics

Now I would like to talk about Heinz general approach to organics as a market opportunity.
Our goal is to provide food solutions that meet people's emerging needs. To do that productively and profitably, we seek out areas of growing consumer demand. We focus on areas where we have a potential genuine competitive advantage across the entire business system, from supply to branding and market segmentation using product and process integrity as the underwriting platform.

When we invest in product development, manufacturing and marketing, we need to ensure that the activity delivers appropriate margins, which means we need to manage both the competitive value for money offer and cost-effective supply. In our case, organics fits naturally within this overall business framework.

First, we know that we can credibly respond to this emerging consumer demand with a range of organic food solutions. We can help satisfy demand through expanded production and provide a wider range of organic products for sale.

Secondly, we can leverage an internationally competitive advantage through the strength of our trusted family of brands and go-to-market capability. We can offer new options that consumers find credible, especially as they are beginning to explore organic alternatives. In many of our key markets we have very

strong customer bases also in the food service trade – restaurants, cafes and so on – who are also very interested in organic alternatives. We will even selectively license our brands in very specific market areas. Of course, a critical factor for Heinz is the need to cultivate a strong and reliable base of consistent quality supply. There are several ways that we do this … and I'll talk about those shortly.

I want to emphasise that this does not mean that we are about to champion organics above other food groups or farming techniques.

As a food processor and marketer, we recognise the organic space as a valid choice for consumers. We are very pleased to offer a continuum between both organic and conventional options with a guarantee of quality and safety in production standards in all cases within the realms of appropriate market segmentation. As the organic niche expands, so it becomes appropriate for a mainstream brand to have an organic offer. As we say on the label of Heinz Organic Ketchup, we *"give you an organic alternative to the world's favourite ketchup"*. In fact, we made that product at our factory in Northern Victoria in the past few weeks; unfortunately from imported tomato paste and vinegar as we were unable to source locally.

We are not making moral or philosophical decisions or claims when we produce and market organic foods. We are responding to consumers' needs and offering a choice. If we do this well that differentiates us from our competitors.

This means that we will sell conventional baked beans or frozen mixed vegetables or tomato soup or ketchup with the same energy and commitment and belief in the quality of the product, as we will their new organic alternatives.

Heinz commitment in action: UK, Italy and New Zealand

I would like to talk now about a few ways that Heinz is responding overseas, that illustrate our approach to both meeting consumer needs, offering choice and ensuring reliable, consistent supply.

United Kingdom

One of Heinz' strongest traditional markets has been the United Kingdom. Along with many other European countries, there has enormous growth in demand for organic food. There have also been alarming food scares such as BSE and Foot and Mouth Disease that have damaged consumer confidence.

Heinz has responded by offering choice in a number of different and interesting ways. First, we have launched organic versions of our "flagship" products in Britain – tomato ketchup, baked beans and spaghetti. These all sit on the shelves next to the "original" versions and a number of other varieties, all under the Heinz brand.

Late last year, we launched organic varieties of baby food in the UK under the brand 'Heinz Organics'. These also offer choice in a market segment where the Heinz brand is extremely strong. Traditional variants continue to also enjoy strong sales.

Heinz UK's other key initiative last year was the release of a range of meal solutions – including organic burgers, grills, pasties and pies – under the late Linda McCartney's "Kitchen Garden" range. In this case, we are reaching to a different market – those who are less likely to be regular Heinz customers - and building on the existing credibility of a specialised brand in that market.

As an aside, one thing I did not mention earlier is that the emerging typical organics consumer tends to be young and/or have a young family. It is no coincidence that organic baby food taps into a strong aspirational and emotional need among young parents, who are already (as a generation) sensitised to

prefer organic food. People who have a concern for food safety are even more concerned when it comes to food for their children.

Italy

Baby food also brings me to one of Heinz' most prominent global initiatives in the "organics space". Italy is home to one of our very popular brands, Plasmon, which markets a range of strained organic baby food varieties.

Heinz has established an "ecological oasis" for farming and production of all baby food sold under that brand. This "oasis" initiative was started in 1986, and it provides rigorous control over every aspect of production, from cultivation and rearing right through to the finished product.

It is truly an oasis which we needed in order to guarantee total organic purity in Italy, given a range of issues the country had experienced. We could not brand a product sourced from another supplier, we could not even buy the produce and make the baby food at the factory – we had to involve ourselves from the beginning. From soil to table, the Plasmon initiative illustrates how far we are prepared to go at that stage to guarantee stable and reliable supply to satisfy consumers and, in this case, government regulations.

The experience in Italy with this oasis has given us a very good understanding of the spectrum of farming issues and practices necessary to meet high standards for certification and the associated economics besides consumer learning.

New Zealand

Moving closer to home, many of you may be aware of Heinz Wattie's involvement in organic production in New Zealand, particularly with frozen vegetable products.

Heinz Wattie's has been selling frozen peas, corn and mixed vegetables certified under the Bio-Gro standard internationally for ten years and last year launched a range of these products in Australia and New Zealand. We have also supplied the Japanese market for many years.

Unlike Italy, New Zealand provides a natural oasis. Certification standards are reliable and we are able to put our trust in a large number of organic producers. We have been working with farmers in New Zealand for ten years, encouraging conversion of land and buying their organic produce. This has created a substantially enlarged pool of certified land and an excellent supply chain.

We put a lot into the partnership with growers, as do they. Alongside technical assistance provided by our agricultural team we have newsletters, field days and reports so the growers know how we are progressing with organics, both technically and in the marketplace.

We now also run an organic demonstration farm in New Zealand, Kowhai Farm. This is a joint effort with Lincoln University, government, industry partners and research institutes. For example, it is involved in research funded by the Ministry of Environment aimed at encouraging mixed cropping farmers to enhance on-farm biodiversity.

Spread over 57 hectares adjacent to the university near Christchurch, Kowhai Farm provides a focus for our technical development of organic production systems. By operating open-book farm accounts, we are able to show growers that returns from organics are good and the risks manageable, even through the conversion phase. It is an excellent demonstration for our customers of our commitment to developing the organic market.

With Kowhai Farm and the relationships we have built with growers, we have developed a strong track record. We are continuing to find more New Zealand farmers wanting to get involved with organics. No doubt, some of this learning can be transferred to Australia.

What does all this mean for Australia?

So what does this mean for Heinz Wattie's in Australia – where the market, as per the brochure, for organics has more than doubled over the last five years, to sales of around $250 million retail, with similar growth in hectares converted to organic farming to 7.7 million hectares. The Organic Federation of Australia believes total sales including exports may reach up A$1 billion a year by 2006.

So, very clearly, we see there is a big opportunity in organics for Heinz Wattie's within the categories in which we operate. This requires teamwork.

As we have overseas, we intend to adopt a learning position – look at the opportunities, work with local partners and focus on areas where we can have an internationally competitive strategic advantage. We are already offering consumers a choice of organic products within our range and manufacturing for export (babyfood and ketchup) in Northern Victoria.

Our business alone plans to sell over A$10 million in Australia and New Zealand this fiscal year which is well over 3,000 tonnes of value-added product in total across all categories .

Heinz Wattie's in Australia has a range of locally produced organic baby food, under the Earth's Best brand. This is produced at our Centre of Excellence in Echuca, Victoria for both the Australian and New Zealand markets.

The range of Earth's best Organic Baby Food now includes the following varieties and these are also exported to New Zealand:

110G - GLASS - From 4 Months *170G - GLASS - From 9 Months*

Our capability to expand the range over time depends partly on reliable supply of certified organic produce. Given Australia's excellent grower capability, we expect to be able to satisfy our needs by working with a large number of organic suppliers rather than establishing our own 'oasis' program, although more teamwork is required.

In the future, once we have a proven supply chain, we plan to incorporate the organic baby food range under the trusted Heinz and Wattie's brands in Australia and New Zealand. So you will see a Heinz Organics range here and a Wattie's Organics range across the Tasman.

We would also hope that we will be able to build further value-added export markets as emerging consumers elsewhere in Asia create a sustainable demand for organic processed foods and a supply base for ingredients that has global reach.

We do not have any specific target in mind but I would expect that in five or ten years time we might see organics account for between one-fifth and one-quarter of our total baby food sales in Australia. By way of comparison, organic baby food currently accounts for about 10% of our sales in New Zealand and well over one third of our sales in the United Kingdom. We are committed to offering choice to our customers through organic babyfood. In order to achieve this, we will need to have the right supply and cost matrix – and this is something we need your help with.

Besides teamwork, above all, it requires a reliable, consistent supply chain. Our experience to date in Australia, has been mixed with great produce variability, with fragmented supply and reasonability issues. This variability requires high maintenance or it results in variable product output eg: runny strained apples. We need fruits such as apple, pear paste, tomato paste which is cost effective not two or three times base price material. Another example is organic lamb. We are working with a producer who will supply Italy and UK as well as Australia and New Zealand.

Remember, this is a big value-added export opportunity as we can supply our sister companies overseas. Therefore, it is essential to overcome the gaps around multiple certifying bodies. Above all, it can generate significant value-added exports and jobs. We, as a business, will export some A$270 million from Australia and New Zealand this year (between ourselves and to the rest of the world).

Conclusion

132 years ago, Henry J. Heinz founded, what is, today, the H.J. Heinz Company. It is little known that the company's first product was grated horseradish – prepared according to Henry's mother's recipe. In what was then considered a packaging revolution, the grated horseradish was bottled in clear glass to show its purity and advertising (such as it was) similarly emphasised the product's "pure and superior" qualities.

We live in a very different world today but our commitment to satisfying consumers' preference for "pure and superior" food has not changed. We will be passionate about delivering this to consumers whether they choose conventional or organic products. "It is about doing the common thing uncommonly well."

To end where I began, organic foods are entering the mainstream in Australia. This poses new opportunities and challenges, not the least of which is certification. Heinz Wattie's looks forward to working with the organic industry to help grow the overall market for organics and to meet the emerging needs the marketplace.

I congratulate the organisers for this initiative and wish you well for the rest of the Conference and more importantly, in realising the opportunity ahead. May there be a bit of Heinz in all of us when it comes to organics.

4. The Architecture of Organic Production

By John E. Ikerd
Professor Emeritus, University of Missouri, Columbia, MO – USA

The architecture of organic production has no single definition or description. Today, two groups of architects are competing to design the organic food system of the future. While the stated challenge of this conference is to seek "unity through diversity," the most critical challenge confronting humanity today is to find "sustainability." How can we meet the needs of the present while leaving equal or better opportunities for the future? Thus, "unity and diversity" must be viewed as *means* of achieving "sustainability" and not an *end* in itself. We cannot afford to sacrifice the principles of sustainability in our quest for unity.

The principles that support organic production today are being challenged by those who view the current biological and cultural architecture of organics as unnecessary constraints to future profits and growth of the organic industry. A sustainable architecture for organic production, however, demands that future profits and growth of organics be achieved by means that are in harmony with the biological and cultural principles that ensure ecological integrity and social responsibility. A system that is lacking in economic-, ecological-, or social-integrity is not sustainable. Unity achieved through compromise rather than complementarity, quite simply, is not sustainable.

Current organic farming and marketing systems were designed to support a philosophy of life – rather than provide a means of achieving prosperity. Organic farming methods are based on nature's principles of production – on farming in harmony with nature rather than trying to conquer nature. Diverse organic farming systems, most of which integrate crops and livestock enterprises, are designed to capture solar energy, to recycle waste, and to regenerate the health and fertility of the soil. Organic farmers see themselves as stewards of nature. Organic farmers also believe in living in harmony with other people – in cooperating with other farmers rather than competing. They view their customers as *people*, with whom they can maintain positive personal relationships, not as *markets* to be exploited for profits. They view "quality of life" as more than "standard of living." Healthy food, a healthy environment, caring communities, and a strong society are seen as the natural products of pursuing an organic philosophy.

During the early 1900s, essentially all food was produced without commercial fertilizers and pesticides, simply because they weren't available. During this time, use of organic methods wasn't a matter of philosophy; it was a matter of necessity. However, some farmers continued to produce by organic means throughout the 20th century. They resisted, even defied, the dominant trend toward reliance on inorganic fertilizers and pesticides, which emerged from World War II chemical technologies. Those who farmed organically by choice, rather than necessity, became the leaders of the modern organic farming movement.

The modern organic movement developed outside of the agricultural mainstream and maintained an essentially separate food system until the late 1980s. Organic was of little interest or concern to the large, corporate food organizations until the rapid expansion in organic markets during the 1990s, when 20-25 percent annual growth rates were typical for the organic market. At these rates, the organic market more than doubles in size every three years.

Corporations in the food industry are under pressure to keep pace with non-food sectors in returns on investment and growth. For example, they must compete with pharmaceuticals, computer technology, Internet, and other high-tech firms for stock market investors. Since overall food consumption has been growing at rates far slower than growth rates in the non-food economy, food firms have been desperate to

find alternative engines for economic growth. Their primary strategy has been to grow through mergers and acquisition of other firms, but they also have been quick to seize upon opportunities presented by any fast growing food market segment – such as organics. They realize also that continued expansion of organic markets eventually will cut into profits from non-organic food markets. So the economic stakes for corporate control of organic food production and marketing are large.

Prior to 1990 most organic sales in the U.S. were direct transactions between farmers and consumers -- through local farmers' markets, community supported agriculture (CSA), pick-your-own operations, or farmers' roadside stands. Few organic retail food stores were in existence at that time and they generally were small consumer cooperatives that purchased directly from local farmers or marketed local produce on consignment. The organic food system, from producers to consumers, was essentially separate from the conventional system of mass production, mass marketing of food.

Over the past decade, however, the organic food system has changed dramatically. By 1997, more than 60 percent of total organic food sales in the US were accounted for by specialty retailers such as Whole Foods and Wild Oats (Gilmore, 1998). Organic sales through conventional US supermarkets grew by more than 40 percent per year during the 1993-1997 period – doubling their share of the overall organic food and beverage market in the process. These same basic trends have continued into the new century, and there is little doubt that specialty retailers and supermarkets now dominate total organic food sales in the U.S.

As food corporations joined the organic movement, they brought their own vision for the future architecture of organic production with them. Many of these new entrants, and would-be entrants, are "powerful players" in agriculture and food production, both locally and globally. They include such firms as Kroger, Albertson, and Wal-Mart of the food-retailing world. They include ADM, Cargill, and Con-Agra from food processing and manufacturing. And, they include Monsanto, Norvatis, and Du Pont, as would-be providers of modified-genetics for future organic products. These firms threaten, perhaps purposefully or perhaps unknowingly; to transform the organic food sector into just another industrialized food system.

Many sincerely believe that the only route to future profits and growth through organics is to reduce cost and increase market access. To achieve these goals, they are using the same business strategies that they have used to transform food production in general from a family farm, local processor, mom-and-pop grocery store system to an industrial farming, mass distribution, supermarket system. They are moving toward greater specialization, standardization, and centralization of control of organic food production and distribution. This corporate philosophy of food production is putting even the most ardent philosophical organic farmers under increasing pressures to conform to an industrial organic architecture.

Pressures to make organics conform to a system of mass-distribution is pressuring organic producers to industrialize. Demands for large quantities of specific products to supply large numbers of retail outlets are forcing farmers to specialize. Demands for consistency and uniformity of product quality are forcing producers to standardize. And demands for dependability and timeliness of delivery are forcing producers to centralize control of production and distribution processes. Such operations can reduce costs – but only if they are operated at a large scale. So large-scale, specialized organic production systems are emerging in the U.S. to conform to the architecture of large-scale, industrial systems for foods in general.

However, most organic farms remain relatively small-scale and diversified, even though larger retailers deal primarily with the larger producers who can ensure quality produce, of consistent grade, uniformly packaged, delivered on a timely basis, at a competitive price. Few of the smaller organic farmers have been willing or able to meet the large retailers' standards. Thus, the bulk of mass retailers' purchases are made from a handful of large-scale commercial organic operations. Anecdotal information indicates that

U.S. organic retailers only buy sufficient quantities from local farmers to lend an element of credibility to their claims of selling locally grown foods.

The oft-stated motives for industrializing organics is to make organic foods more accessible and acceptable to more consumers, to enhance the healthfulness, safety, and quality of food supplies, to expand markets for farmers, and to protect the environment from commercial fertilizers and pesticides. While these motives may seem logical, the consequences may be far different than initial expectations -- for consumers, for farmers, and for the environment.

The fundamental principles of the industrial architecture are specialization, standardization, and centralization of control. Adam Smith, the father of contemporary economics, expounded on the potential gains in productivity through specialization – as he called it, division of labor. Division of labor, put simply, means that each laborer specializes in performing a single task, or a limited number of tasks, in the production process rather than attempting to perform the entire process. By performing fewer tasks, each laborer could perform their specific tasks much more efficiently. Thus, several specialized workers, by coordinating their work, could produce far more than could an equal number of workers working independently.

Specialization alone is not adequate to capture the full benefits of industrialization. Industrial systems also require standardization, so that each function in the production process can be specified for the purpose of dividing responsibilities -- the output of each stage of production must fit the input requirements of the next. Also, when different organizations perform different functions, standardization is required so a given producer can obtain and utilize the same input materials from a number of different suppliers.

Industrialization also requires centralization of command and control. Specialization results in increased efficiency only if each stage in the standardized production process is coordinated with the others. Coordination is achieved through centralization – fewer people telling more people what to do and when, where, and how to do it. If each specialized worker performs his or her specific task, but does so independently, the process is not likely to be efficient.

Centralized command and control allows each decision-maker to control more resources – to achieve economies of scale. Thus, industrialization is characterized by large-scale operations. Large organizations require large amounts of capital, thus, and large "publicly owned" corporations have evolved to meet the capital requirements of industrial organizations. The separation of the management and financing functions, characterized by corporate ownership, is but another means of specializing within an industrial organization.

In spite of pressures to specialize, standardize, and consolidate into larger operations, most organic farms remain diverse, individualistic, and decentralized. At present, most organic farms are still small and diverse. Organic farmers are as varied in as the natural ecosystems and communities that support them. Most sell their products direct to their customers, relying on their personal reputation rather than organic standards to ensure product integrity. They are still making their living through decentralized local niche markets rather than industrial mass markets.

A 1998 survey conducted by the Organic Farming Research Foundation indicated that nearly 90 percent of U.S. organic farms are single-family operations or family partnerships. More than 60 percent are full-time farming operations, but the average size of an organic farm is only about 140 acres – just over one-third as large as the "average" US farm. Only one-out-of-seven farmers responding to the survey reported annual total sales of more than US$100,000. Thus, organic farming in the U.S., at least in terms of farm numbers, is still dominated by small, family farms. In terms of annual sales, organic farms are not greatly different

from the average of all U.S. farms – which includes a large proportion of small farms. However, the proportion of full-time organic farmers is far larger than the proportion of full-time conventional farmers.

In the future, however, small, diversified family farms will not be able compete economically in a fully industrialized agriculture – neither in organic nor conventional production. The number of farms in the U.S. has dropped dramatically over the past several decades and it's generally conceded that there will be few independent producers left producing basic agricultural commodities in the US in another ten to twenty years. Corporate control of input and marketing sectors will force farmers to become contract growers within vertically integrated systems that control all aspects of the system from genetics to retailing. Until recently, organics had seemed to be among farmers' best alternatives to avoid either giving in to corporate control or getting out of farming. Now it appears that organic production may become industrialized almost as quickly as conventional farming.

But, organic farmers do not have to become a part of the industrialized food system. Organic farmers can join with other small farmers in developing an alternative food system that can coexist with, and someday displace, the global-industrial, corporately-controlled food system. Independent organic farmers may well lose the battle to keep industrial agribusiness from dominating the mass production and mass distribution of organic foods. But, smaller, organic farmers can still compete effectively for the fast-growing and profitable organic niche markets – both locally and internationally. And more important, small-scale organic farming can be carried out by means that are ecologically and socially sustainable over the long run, whereas, industrial organic production cannot.

The sustainable agriculture movement offers the best hope for the future success of small-scale, independent organic producers. The sustainable agriculture movement reflects a philosophy of life that is quite compatible with the current organic philosophy. In fact, one might logically argue that all sustainable systems of agriculture production ultimately must be organic systems – although all "organic" systems most certainly are not sustainable. However, the industrial philosophy is fundamentally incompatible with the concept of agricultural sustainability.

The architecture of sustainability is currently competing with the architecture of industrialization for the future of organic agriculture, as well as for the future of agriculture in general. In essence, a sustainable agriculture is one capable of meeting the needs of the present while leaving equal or better opportunities for the future. Consequently, all sustainable systems must be ecologically sound, economically viable, and socially responsible. These principles define the architecture of sustainability.

A system lacking in any one of the three simply is not sustainable. It isn't necessary to prove this proposition; it's just plain common sense. Any system that uses up, or degrades, the productivity of its natural resource base cannot sustain production, and thus, is not sustainable. Any system that fails to provide an adequate economic return to producers eventually will become financially insolvent, and thus, is not sustainable. And, any system that fails to meet the needs of society, either as consumers or as producers, will not be sustained by society, and thus, is not sustainable. The economic, ecological, and social dimensions of sustainability are like the length, width, and length dimensions of a box. An agricultural system lacking in any one of its three dimensions is not sustainable, just like a "box" lacking in any one of its three dimensions is "not a box."

Organic production methods address most directly the ecological dimension of sustainability. True organic systems are inherently ecologically sound systems of production – they rely on the regenerative capacity of nature. The primary challenge of organics is economic viability. The economic challenge must be met through efficient management of natural resources so as to minimize costs, and through effectively marketing to customers who are concerned about food safety and nutrition and who most value

ecologically and socially responsible production. Such consumers realize that, over the long run, humanity must pay the full ecological and social costs of food, and not just the short-run economic costs.

The final dimension of sustainability, social responsibility, includes social justice and social equity. This is the dimension of greatest advantage for philosophically organic producers. Small-scale organic farms are management intensive – they require more thinking, caring people per acre and per dollar invested. They require people who understand how to work in the dynamic, living systems rather than simply follow someone else's "recipe" for farming. Thus, they provide opportunities for more people to make a better living farming, while providing consumers with an adequate supply of safer and more healthful food. Consequently, they provide the foundation for reconnecting farmers and consumers in a society made up of healthy, viable rural communities.

The architecture of sustainability in defined in terms of economic, ecological, and social principles rather than in specific farming methods or practices. Sustainable production methods are individualistic, site specific and dynamic. Sustainability for a given farmer, on a given farm, and at a given time may be different from those of another farmer, on another farm, or at a different point in time. Thus, sustainability cannot be standardized. Sustainable farming systems are inherently diverse because nature is diverse and sustainable farming must be carried out in harmony with nature. Thus, sustainable production cannot be specialized. Finally, since sustainability cannot be standardized or specialized, it cannot be centrally controlled or consolidated. Thus, a sustainable agriculture cannot be industrialized.

It follows directly, that an industrial agriculture quite simply is not sustainable, regardless of whether it might be defined as "organic." The growing ecologically problems associated with conventional agriculture are a direct reflection of conflict between the diversity of nature and the specialization of industrial farming. The chronic economic problems of conventional farmers is a direct reflection of the specialization and standardization of farming methods, which demand that farms become larger and fewer by forcing other farmers out of business. The demise of family farms, the decay of rural communities, and much of the social decay within the larger society are directly related to separation of people and the destruction of relationships that accompany industrialization. An industrial agriculture, quite simply, is not sustainable.

> Sustainable organic farmers must reject the industrial architecture. They must develop instead a food system that is compatible with the principles of sustainability. This alternative system may continue to rely on direct marketing through niche marketing methods, or may evolve into a flexible, decentralized, producer-agent-customer network. Regardless of how it evolves, it will not be an industrial system.
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> Sustainable organics may require government protection, at least to allow truthful labeling of products with respect to diverse production methods. Sustainable farmers may also require protection from predatory pricing tactics of industrial food producers. At the very least, sustainable organic producers should demand elimination of current government subsidies for industrialization of agriculture – conventional or organic.

However, small-scale sustainable producers can survive, with or without government help, and eventually can displace industrial agriculture – in fact, must displace industrial agriculture, if civilized human society is to survive on earth. But, sustainable producers must put more of themselves into their operation if they expect to survive, prosper, and ultimately succeed in replacing an industrialized agricultural economy. Sustainable agriculture may require more labor, but there is a limit to how hard anyone can work – at least, while maintaining a desirable quality of life. Thus, the key to sustainable organic production will be to manage more "intensively" – to apply more imagination, innovation, creativity, and thinking per acre farmed or dollar of investment.

Sustainable farmers must match their unique abilities and talents with their land, their community, and their markets. This requires a higher level of understanding of themselves, their capabilities, their values, and their purpose in life. This requires a higher level of understanding of consumer tastes and preferences and of the uniqueness of relationship markets. This requires a higher level of understanding of the land and of nature's productive capacities. Sustainable farming is thinking farming. It requires an ability to translate observation into information, information into knowledge, knowledge into understanding, and understanding into wisdom. Sustainable farming is not easy, but the reward is a broader and higher quality of life.

Today's organic farmers must choose between the two alternative architectures now competing for the future of organics. To choose wisely, they must realize that industrial organic production is no more sustainable than is chemically dependent conventional production they seek to displace. Perhaps unity can be found among the diverse opinions competing for the future of organics. Perhaps a system may be devised by which industrial organics initially displace conventional food in the industrial food system, while allowing sustainable organics to continue to evolve to serve the growing local niche segment of food markets. But eventually, niche marketing must become the dominant form of marketing, if agriculture is to be sustainable globally. We must create an agriculture that conforms to the diversity of nature and of humanity, rather than bend and twist nature and humanity to fit an industrial architecture. But first, we must move beyond thinking of organic as a means of food production, to seeing organic as a philosophy for sustaining human life on earth and a philosophy for quality living.

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5. A Different Approach to Uniformity

By Ken Commins
International Accreditation Service, IFOAM, USA

It is a great pleasure to be here to present a paper to this the first national conference on organic agriculture. My thanks to the organisers for inviting me and I wish you every success with this conference and many more to come.

My subject today is a complex one. In fact my contention is that it is too complex and that we need to find more rational and simplified methods by which we assess compliance with the diverse organic standards that exist around the world, and in particular how equivalency is determined with regard to imports.

I will be proposing a different approach to these problems, but the first question to be answered is why do we need a different approach. Is the current system inadequate? I do not have time to go too deeply into this question, but I do want to have a brief look at the current system, or rather systems, as there are three quite distinct systems.

The regulatory "front door" system

Briefly described - this system says that each country with have a regulation and a regulatory compliance system and that the governments will all establish equivalency agreements with each other. They will negotiate on the basis of the technical standards and reach mutual recognition.

So far all regulations that have been published with import restrictions have included this standard method of reaching trade agreements. In the case of the EU this was initially the only method that was envisaged.

What is wrong with this system?

- It assumes that all governments will have a regulatory system sooner or later.
  The problem with a tiny sector like the organic one is that this could take a very very long time. Experience has also shown that even once you have a regulation it can take several years for the negotiations to be worked out. In addition you have to go through this process with every country to which you intend to export. The EU discovered how slow this system works when it realised its list only included 6 countries (Australia being one) after several years. Consequently they have had to keep extending the deadline on the "backdoor" system. There are countries, particularly in the developing world, that produce organic food specifically for export, that are unlikely to have regulations in the next two decades. They have more pressing issues to worry about.
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- It does not lead to a fair resolution of equivalency. Rather the larger countries or regions - particularly those that are substantial importers, dictate the terms. It is not equivalency (a term that nobody seems quite sure what it means) but "do as I do". This leads to the situation where national standards are not written for the region in question, but rather to meet the importing country requirements. We have seen examples where countries have had to include provisions that had little or no relevance to their situation. We have had regulations written which basically copy the EU regulation. This may have worked while there was only this one import regulation of significance, but now those standards will have to incorporate bits and pieces of the US and Japanese standards and conformity assessment systems. By their very nature organic standards should be region sensitive, but this system mitigates

against that possibility. In addition the reality is that the country doing most of the importing requires equivalency from the exporting country but there is little (and in some cases no) equivalency demands the other way round. In short the whole system is somewhat neocolonial in its method.

- The government to government recognition model also runs the substantial risk of being more than a technical evaluation of equivalence. It can easily be used to keep out product that is competing with home grown under the guise of being a technical discussion. The technical barriers to trade agreement is not going to stop this happening until it has been through the WTO trade dispute resolution process- another long process. I am sure I do not need to inform you "down under" about attempts to keep agricultural product out of countries.

- The system's biggest failing is however that it makes the assumption that a product is produced in one country. While this is quite likely the case with raw materials it is often not the case with processed food. The sourcing of ingredients from many countries is of course prevalent in the non-organic food sector but is exacerbated in an undeveloped sector like organics, where you are more likely to have to seek ingredients further afield.

The country to country recognition does not cover this (or at least not in so far as the importing authorities are aware that ingredients did not originate in the country). So, to take Australia for example, the EU authorities have required that product from neighboring countries, even though these were certified by an approved Australian certification body against a standard that is approved in Australia, had to come through the back door.

An example is in order. A product is semi-processed in Brazil using ingredients produced in Brazil and in Argentina. This is imported into the US to be further processed for export to the EU. Now let us suppose it is year 2010 and the US has recognised Brazil but not Argentina. They approve the Argentinian product through some backdoor method (we will come to the problems with that next). Now the finished product is exported to EU who accept the USA and Argentina but not Brazil. I wish this was a fanciful example but it is happening every day and the front door method simply cannot cope with this reality. Add to this scenario ingredients coming from countries without a regulation and you can see how complex and confusing the situation can get.

The regulatory "back door" system

By backdoor I mean the systems that regulatory authorities have put in place for product imported from a country where they have no government to government recognition. In the case of the EU this was the first amendment they made when they realized they could not get the product they needed through the front door. I do not use this term in a derogatory fashion. I applaud the attempts to find more rational approaches to solve the problems. However this system has created its own problems.

- The first problem is that each regulatory authority is establishing entirely different back-door systems. This is a major problem for the organic industry and one which will without doubt kill off the good efforts of third world certification bodies and perhaps even some of the larger certifiers in the developed world. The certification bodies have to jump through a different set of hoops for every country to which their operators wish to export. They cannot afford this and it is redundant and repetitive. It was already a nightmare system for these certifiers just with exports to the EU but now they have to deal with the US and Japan and a whole lot more. I already know one organic certifier in the US that has four accreditations and is about to get its fifth. We developed a sane system of agriculture and its about time we had some sanity in the regulatory systems that oversee it.

- The problems get worse - Looking at the EU system - it is up to each country and in some countries such as Germany, each state, to interpret the backdoor system - The result is that your product may flow freely into one state and not into the others. Of course once it is in the EU it can then move freely- "go figure" as the Americans say.

However the EU attempted to get the Member States to agree a common position. Although this common position is left up to each member state to interpret (and they interpret it differently) it introduced the notion that the certification bodies should be ISO65 accredited by their national accreditation body. Essentially the EU bought into the system of the International Accreditation Forum - a body made up of national accreditation bodies. However this accreditation system is itself flawed - it simply replaces the question "how do I know whether a certification body on the other side of the world is operating in an equivalent fashion to the certification bodies in my country" with the question "how do I know whether the accreditation body is equivalent and applies the same interpretations of ISO 65 that my accreditation body does." In other words just adding another layer of bureaucracy. The answer is supposed to lie in an multilateral agreement (or MLA as it is known) between these accreditation bodies but to date the experience is that they do not follow their agreement and often do not accept each others accreditation. It is also quite clear that they apply different interpretations.

So if you happen to be exporting to a country that insists on ISO65 accreditation in order to get in the back door - will this help you get in the back door of the US or Japan? In the case of the US it will not help at all - they currently have only one back door method - accreditation by the USDA. Worse still, the accreditation requires compliance not equivalence, so you have to change your system to meet the US Rule even if this is contradictory to your own national law or the requirements of another importing country. Let us also hope that other countries do not follow the USDA system as it would lead to the skies filled with bureaucrats from different countries crisscrossing the planet accrediting organic certification bodies.

In the case of Japan, IFOAM accreditation or ISO65 accreditation is recognised to an extent - it enables the foreign certification body to act as the inspection body for a Japanese registered certification body - a form of recertification by Japanese based certification bodies. Good for Japanese certification bodies bottom line on their balance sheets - but a form of neocolonialism and not equivalency assessment.

The international private sector system

- Turning to the last system - the private system. Here we are talking about the IFOAM international guarantee system. This is made up of two normative documents (the IFOAM Basic standards established by the global membership, and the IFOAM criteria for certification bodies) and an accreditation program to assess conformity with these requirements. To carry out the accreditation function IFOAM established a separate non profit company- the International Organic Accreditation Service (IOAS).

  This system does not have many of the problems mentioned for the other systems due to the simple fact that it is an international system, with the same requirements wherever the certification body is situated, and the conformity assessment undertaken by a single accreditation body. As a result there are no questions about the equivalence of the conformity assessment. There are also no lingering questions about the equivalence of the measures undertaken by the certification body - they all have to meet the same requirements - the IFOAM Criteria.

  This system is increasingly supported by the trade who see the problems we mentioned regarding the regulatory systems as too flawed to offer sufficient confidence for their needs. It is also strongly

supported by the movement with 27 certification bodies having signed on and several more in the pipeline.

So what are the problems.

- The most serious problem is that this system is not integrated into the regulatory systems to any significant extent. To be IFOAM accredited may assist a certification body to gain access into foreign markets but it does not guarantee that at all. This means that it is an additional burden to the certification body on top of all the hoops they are already jumping through to achieve regulatory acceptance around the world.

- The second problem is that questions about the equivalency of standards are not entirely resolved in the IFOAM system. The IFOAM Basic standards are a bottom line. The certification body's standards must meet or exceed this standard. However the way in which one certification body chooses to exceed may differ significantly from that of another certification body, with the result that the IFOAM accreditation does not necessarily confer automatic equivalency of standards.

So to go back to the question - is the current system broke?
To summarise the problems with the present situation:

1 We do not need an estimated 100 or so standards around the world. This historical anomaly is not helping us. Now on top of all these private standards we have government after government establishing yet more standards. We may not be able to all use one international standard but we certainly could manage with a lot less. After all, a standard is basically an expanded definition - is there really a need for 100 different definitions of organic?

2 The regulatory system of country to country recognition is not swift enough and cannot deal with the complexities of multi-ingredient product sourced from across the globe. The alternative methods are different in each importing country and so place an impossible burden on the certification body in the exporting countries and could lead to the demise of third world based certifiers.

Solutions

- Before getting into solutions I want to make one assertion and that is this: The organic industry should be proud of its track record on self regulation. It has always taken its responsibility to the consumer seriously and did not wait to be required to self regulate under pressure from any government. It is quite extraordinary (and I dont know of any other industry or sector that has done so) to have established certification systems as far back as the early 1980s when the industry was still a fledgling one. Moreover, by the time the first regulation was being implemented the organic movement was on the point of launching its own accreditation program - the first international sector specific accreditation program.

  I therefore believe that regulatory authorities should respect this tradition of self regulation and forge genuine public/private partnerships to solve the problems we face.

- Taking the standards issue first - on the regulatory side there is no reason why , at least in most countries, the law cannot reference an existing international standard. In fact the Technical Barriers to Trade Agreement (TBT) of the World Trade Organisation obliges governments to do exactly this unless there is good reason not to. An international standard established by governments already exists - the Codex Alimentarus has elaborated such a standard, in large part thanks to Ruth Lovisolo's

impressive work. There is also nothing preventing a regulation from referring to the IFOAM Basic standards.

- On the private sector side, my personal view is that certification bodies need to take a hard look at whether it is really necessary to each have their own standard. An alternative would be a regional standard, not a standard for standard but a standard that can be taken off the shelf and used to certify. In recognition of this need IFOAM has established a procedure to enable a regional standard to be "IFOAM approved".

- Even better would be the creation of a national standard that is also an IFOAM approved standard and referencing this standard in law. In so doing it would enable the private sector demands and the regulatory sector demands to both be satisfied.

- On the question of conformity assessment for international trade we have to recognize that bilateral methods of assessing conformity are inadequate to deal with the needs of this expanding industry and the consequent increase in international trade. I am not suggesting that countries do not need to make individual decisions about what they accept as equivalent, but that the method by which they reach that judgment needs to be rational and not create unnecessary burden on the organic community. This means using multi-lateral methods of conformity assessment. What I am suggesting is that governments do not themselves have to undertake the work of evaluating a foreign certification system - they can use the work of the IOAS, which can be tailored to address all relevant issues for each country that requires evidence of compliance.

- I would go one step further. There is no reason why a regulation cannot, even for its internal approval of certification bodies, reference an appropriate standard of certification and require that certification bodies be accredited to this standard by an approved accreditation body. The regulation would then establish the requirements for the accreditor to be approved. In this way government interacts with the industry at the highest level of self regulation - the accreditation level. The WTO Technical Barriers to Trade Agreement requires members to adopt international systems for conformity assessment. The IFOAM Accreditation Programme is such a system.

- IFOAM and the IOAS need to consider widening the membership of the IOAS to include greater government participation. Partnerships have to work both ways.

- This leaves the question of which standard for certification to reference - there are only two appropriate references on the international level - ISO65 and the IFOAM Criteria for certification bodies. I do not have time to go into the reasons why ISO65 is not the best option for organic certification - suffice to say that the standard is not specifically written for certification of production method and is clearly orientated towards product certification. Being a generic standard for certification of anything, it also obviously does not address the specific issues faced by organic certifiers, something which the IFOAM criteria does.

So here is the different approach to uniformity promised in the title of this presentation.
The organic sector establishes a national standard that is a certification standard. This standard goes through the process of being IFOAM approved. It is then referenced in the law. The law requires being accredited to this standard by an approved accreditation body and lays out the requirements for such approval.

6. The Consumer, Capital and Conservation

By Corey Watts
Australian Conservation Foundation

Good morning everyone. Thank you very much for inviting the Australian Conservation Foundation to be here today at your inaugural conference. It's a really fine honour, and I'm sorry that Mike [Krockenberger, ACF Strategies Director] couldn't be here.

The title of the talk is 'The Consumer, Capital and Conservation'. It's based on the work of Mike and his colleagues, Peter Kinrade and Rob Thurman. They looked at present-day social economic and environmental conditions across Australia with a view to developing a strategy, a blueprint for a sustainable Australia. What would constitute a sustainable Australia and how would weget there?What would be required? They concluded that we've been successful in the 20th century economically and socially, but it's come at the cost of social cohesion to a certain extent and certainly of environmental condition. Environmental indicators are showing a worsening trend, and we are unlikely to be as economically successful in the 21st century unless we undertake quite substantial, quite radical economic reform, as other countries are proceeding to do now.

They looked at how the Australian public perceives the future of their country and those figures speak for themselves: Only 13% of Australians think that the quality of their lives is improving. Contrast this with the GDP which continues to grow and yet the two don't seem to be connected. And 52% think that we're getting worse, and only 33% think we're about the same. And how would this picture look for rural Australia? The continuing divide between rural and urban Australia is a cause of concern not just in social terms, or even in economic terms. In environmental terms the lack of connection between urban consumers and rural producers, I suggest, is one of the things we need to overcome as organics advocates and environmental advocates like myself. There are, however, tremendous opportunities for Australia in coming years, and they will rely to a large extent on these factors: Our electronics communications capacity, our ability to harvest and apply the knowledge and develop that knowledge further, our openness as a society and our democratic institutions, our cooperativeness, our image on the world stage, our ability to innovate and our environmental performance.

How are we doing on these fronts? Well, communications is doing okay. We've got good communications infrastructure, but education is slipping. Our expenditure on education is dropping and we're ranking lower and lower in the OECD. Our democratic institutions are reasonably good by world standards, we can always complain but they're reasonably good. We have a fairly tolerant and multicultural society and that's a good strength. Our record in international cooperative initiatives has slipped but it's certainly redeemable. Our image is not as good as it was. In the 1940s and '50s we were a sort of leading light on a hill, especially in developing the institutions of internationalism. We were instrumental in developing the United Nations and the UN Declaration on Human Rights, but we've fallen behind. We've certainly fallen behind in terms of our environmental performance and the world hasn't woken up to this yet. I would suggest that the rest of the world will very soon realise that there's no real substance behind our clean and green portrayal of ourselves, and we need to fix that up because the world is turning towards us now and they're going to scrutinise us more and more.

We have a fantastic research and development community, unfortunately business has not been as innovative as it could have been in commercialising R & D, especially when you compare us to other

countries; we rank 20th in the OECD in industrial efficiency. So there's a lot of room for improvement, and that's an opportunity. We shouldn't overlook that.

Environmentally, as I keep coming back to, we're going downhill, and we're gradually being seen to go downhill.

We have the highest per capita greenhouse gas emissions on the planet - higher than the United States, higher than Japan, higher than the European Community. It's mostly as a result of land clearing, and it's getting worse. The projected cap of increase which the government took to the meeting in Kyoto in 1997 of 8% on 1990 levels, we're well exceeding that and we'll continue to, especially after the last round of meetings in Bonn!

We have the worst land degradation. Nearly 6 million hectares of our land is damaged by salt or water logging, and there are other forms of soil degradation that are ongoing.

We have amongst the world's worst biodiversity loss. Certainly we have the worst record in the world for any country in terms of mammalian extinctions and Australia is continuing to lose biodiversity, especially as we clear more and more land.

We have amongst the highest per capita water use on the planet. We use 1 million plus litres of water every year on average, each Australian, a million litres. We're the driest inhabited continent on Earth and we're using this much water! Europeans use about 600,000. Americans use about 2 million. Highest per capita waste bar the United States! That shocked me - we're a wasteful society.

So we've received all the many benefits of 'progress' but they've come at the expense of our natural heritage, our natural capital if you like. So how do we arrest this decline? How do we turn things around?

Well, first of all we have to recognise that our economy is poorly suited to the needs of the 21st century – our social, our environmental *and* our economic needs. We have a hot, heavy and wet economy. We use up too much energy. We use up too much water and we produce an awful lot of waste. In the 21st century the successful economies on the planet will be cool, light and dry, and that's where we need to get to. So unless we environmentally modernise, we haven't got a chance.

Land use and agriculture, what's the present state of play?

I think few people realise just how much of this country is under rural landholdings, private landholdings. For me, as a conservationist, that's an awful lot of conservation area so to speak that needs to be managed sustainably.

Over half of our native vegetation has been destroyed or significantly degraded or fragmented. That's just staggering. And we are the highest clearer of native vegetation in the developed world – sixth highest on the planet – twice as bad as Malaysia and half as bad as Brazil. We're clearing over half a million hectares every year and still clearing. Still! And as I said before we're using over a million litres of water, 75% of that is through our irrigation industries. So there's a lot of room for improvement in terms of efficiency isn't there?

And our Murray-Darling basin: The flows down the Murray-Darling River system are down to 20% of what they were at the turn of the previous century, and with climate change, the CSIRO predicts a 30% drop in precipitation in the Murray-Darling basin over the next 50 to 100 years. That's going to have incredible impact on rural societies and on Australian society in general.

Dryland salinity – it's set to rise. The area at risk is set to rise to 17 plus million hectares in the next 50 years. That's an area more than twice the size of the state of Tasmania. A lot of that salt risk is in our food bowls, and there's 2 million hectares of native vegetation at risk. Thousands of native species are going to become extinct as result of saline intrusion into wetland and terrestrial habitat.

Land clearing, as I said, contributes about 13% of our greenhouse gas emissions. that's just land *clearing*. That figure doesn't include cow farts or emissions from rice or other land-use factors which come into play.

So there's a lot of talk about the new economy. What do we mean by a new economy? ACF thinks there's a way to go with lots of benefits. Australia can use environmental protection and action to drive the new economy. So by repairing the country, by managing our industries differently, by increasing efficiency, by introducing and encouraging new industries, we think Australians can really drive social and economic progress over the next few years.

And the benefits – jobs growth, increased profits, better health and lower costs for health, cleaner water, air, healthier soils and ecosystems, increased productivity and shared prosperity. In the case of that rural-urban divide I talked about, I think that environmental action in the regions and rural areas of Australia will engender a greater shared prosperity geographically across the country.

I'm not offering a Utopia. I am suggesting that there will be a range of real benefits that will flow from better environmental protection and the environmental modernisation of our economy - our rural economy as well as our urban industrial economies.

Some examples – Sweden, Denmark and the Netherlands have all legislated pesticide reduction targets. Germany has recently extended its environmental modernisation program to include agriculture, partly as a result of the BSE scare. Some of these other examples relate to various other industries such as energy, but you can see that it *can* be done, and it can be done profitably. Environmentally modern industries and properly environmentally managed industries can contribute significantly to a national economy.

It was said before that people invest in corporations or they buy up shares purely for profit. I would disagree. I think that these trends indicate that people invest in companies or in industries for a variety of reasons. The ACF, together with CSIRO and a number of Australian companies now sits on a Business Leaders' Roundtable, which recently commissioned Allen Consulting to determine how you actually leverage private investment in repairing the country. What sort of institutions, taxation arrangements and other aspects of reform would you need to harness the power of private markets, and to use that power in the public interest to improve land use across Australia?

Employment – in the energy sector, it's growing fantastically. Re-manufacturing, re-use of materials is a burgeoning industry in the United States and the Joint Venture Agroforestry Program estimates that 40,000 new jobs could be created across Australia in farm forestry. That's a welcome sight, that target.

So what sort of revolution are we looking for? The digital revolution was just the beginning – the first phase of a new industrial revolution. We need a revolution built on dramatic reductions in energy and environmental impact. It needs to be one focusing on closed loop production systems, whether those are at the micro-scale or at the property scale or at the regional or city scale.

And importantly, unless we begin to engage in this environmental modernisation process soon we will be left out. Other countries are surging ahead of us. We will be left peddling the industries and products of the 20th century and the 21st. I contend that we need - especially in rural Australia - a new pioneering spirit for a new century. No more Snowy Mountains Schemes! We need a different view of national progress and I

think we need to begin to talk about that a lot more, not just in farming areas but in urban Australia too: To begin to reconnect urban and rural Australia and move forward.

The rural sector – what sort of problems do they face? What are the limitations and opportunities there? Well we know rural industries have played a key role in Australia's development socially and economically. We have ridden on the sheep's back. Whether we will continue to or not in the future is a matter for contention, but the traditional role of rural Australia in the overall scheme is shrinking and farmers know it, and I think they feel pressured. They also face declining terms of trade, a deteriorating natural capital base and increased demands on them by consumers and voters. They are being told that they have to do things differently.

The damage in economic terms to our lands and waters is costing as much as $2 billion a year and that could rise to $6 billion. To be sure, these are rough guestimates because there are so many things – like the natural environment - that we cannot yet factor accurately. .

The CSIRO estimates that ecosystem goods and services - the products of our natural biodiversity - contribute almost $1½ billion a year to Australian agriculture, and yet we are destroying them! And this is the amazing thing.

In 2000, $14 billion worth of direct and indirect subsidies were put into unsustainable land use industries. Those indirect subsidies include improper pricing regimes – a lack of full-cost pricing. . So we are putting an awful lot of money into the way things were done in the past – the things that have brought us to this point - and we're not putting a lot of money into the way things *need* to be done.

Farmers themselves are getting older and intergenerational continuity of ownership is declining.

So why Australia? How can we do it? The image of clean and green - it does work, but I think the opportunities for us to capitalise on that image are fading fast. As I said before, the rest of the world is waking up. I have the BBC World Service calling me up wanting to know about salinity in Australia. A friend of mine, Prue Henschke, from Henschke Wines in South Australia stood up at a conference recently and she said they had the UK supermarket giant Sainsburys out there looking at their land, and Sainsburys are asking questions about the whole of the Murray-Darling basin, not just her property.

We have natural market advantages in environmental or environmentally beneficial industries. We have a whole suite of plant life here that we may be able to commercialise, that may be better suited to our environment, sowe can layout a new rural mosaic. We can make energy and environmental efficiency gains, it *can* be done. Other countries are already doing it.

The European Union has a 23% renewal energy target. Contrast that with Australia which, ostensibly, has a 2% renewal energy target. Unfortunately it's actually lower than 2% and it includes the burning of our native forests as a 'renewable' fuel'. I think Australians crave a big idea. Renowned social commentator Hugh McKay in his research concurs with that. I think that's why the Snowy Mountains Scheme was so successful, that's why the old black and white films garnered so much support from so many people.

I think we can do the same thing for the environmental revolution, and what will be the results: Yes, there will be some pain. Inevitably there will be winners and losers and the way we deal with that will be crucial. Overall I think Australians and Australian business will benefit as an environmentally driven economy will create jobs. Unemployment will fall as new jobs are created in new environmentally positive industries, and the environmental modernisation of existing industries. Farmers will benefit. The abatement and reversal of landscape degradation. Efficiency gains – and there's a lot of room for efficiency gains in farming – can be made across all sectors . And farmers' ability to plug into new markets will be a positive

as Australian agriculture diversifies. Rural and regional Australia will benefit from a concerted strategy of repairing the land. There are jobs waiting to be created out there.

We need a new multi-partisan agreement. As national Competition Policy and economic liberalisation was the mantra of the '80s and '90s, we need our politicians to come to a consensus that environmental reform is needed across all sectors. It has to be backed up by powerful institutional arrangements and progressive legislation, substantial investment from government and business and a robust analytical and intellectual framework.

All those things that we talked about before – connecting social justice with environmental sustainability and economic viability – all of those need to come together, and that will mean that we need to move ahead on Reconciliation between Indigenous and non-indigenous Australians.

These are the things that are going to be required – a whole of government approach, integration between various levels of government. (Federalism has been one of the most limiting factors in moving ahead in natural resource management.) Public-private partnerships, community participation and an intelligent and responsive interplay between markets, education and regulation.

Rural Australia in 50 years time

I want to paint a picture of rural Australia in 50 years time. I believe that in 50 years time rural communities will fully support the protection of our natural environment, thatthey will be much more ecologically literate, as will urban Australians. The connections between urban Australians and rural Australians will be much tighter. Farm enterprise planning and management will be linked to whole landscapes as a matter of routine. Indeed, ACF is currently working with Southcorp to develop a catchment-informed environmental management system to take account of things like salinity, biodiversity conservation and greenhouse gas emissions - linking the catchment scale to the farm and back again to commercial catchment planning.

The successful integration of the social, economic and environmental aspects of production will have created truly sustainable communities whose production is tailored to the land and water context. I think it was really important what Ken Cummins said about the need to tailor accreditation of environmental peformance to the region because that's where you are doing things. In Australia, one of our fundamental mistakes, as I am sure John Williams will tell you, is that we have imposed upon the landscape things which are out of context, production systems which are out of context. We will need, as I alluded to before, a new rural landscape mosaic. Rural communities, our rural landscapes will be transformed through revegetation and farm forestry, new and more diverse economies and production systems, mandatory protection and connection of remnant and restored habitat and much higher standards of environmental performance. This environmental performance goes beyond Agvet chemicals and those sorts of things.

Domestic and international markets and it's crucial –not just international markets, will preference food and fibre that incurs no negative environmental impacts. It's crucial that we get both domestic and international markets moving on this. I guess we will still need to educate Australian consumers more because we cannot rely just on the environmental modernisation of Australian agriculture being driven by international markets. Green consumerism is certainly rife in Europe, and to a large extent in North America and Japan, but it's not in the Middle East or the Indian subcontinent where most of our grain is sold So there needs to be more pressure at home as well.

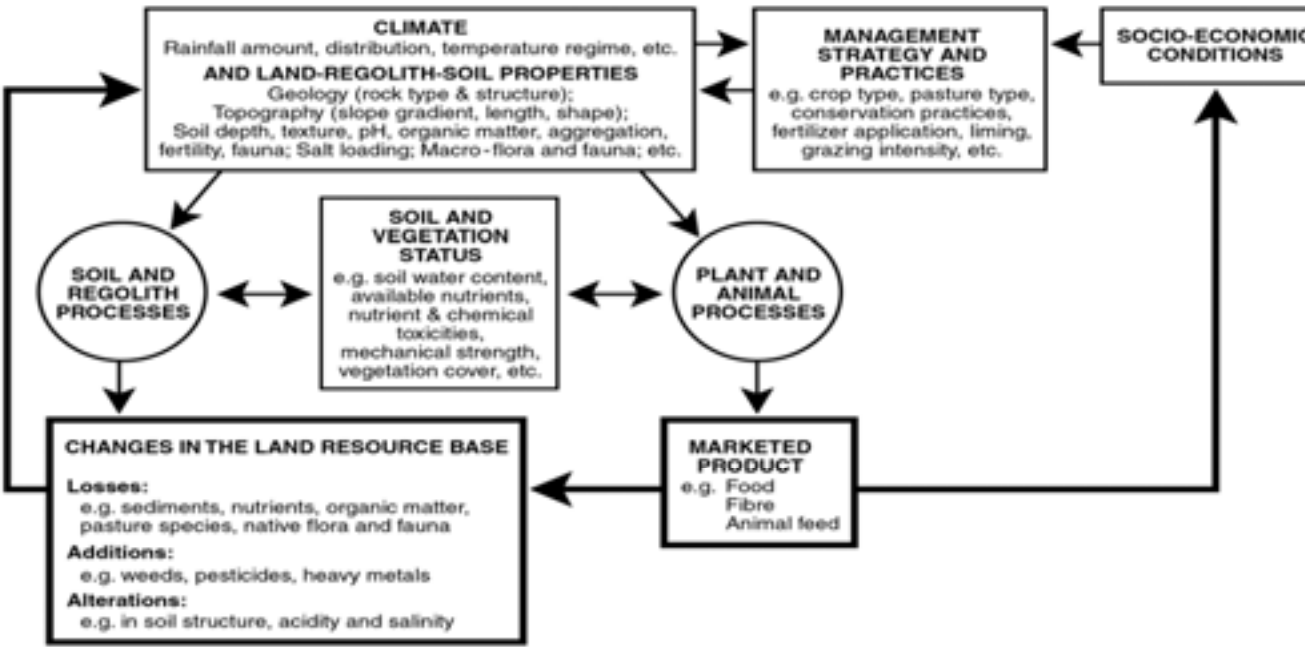
We will need professional catchment bodies who will be key drivers in effectively addressing critical issues on a region by region basis

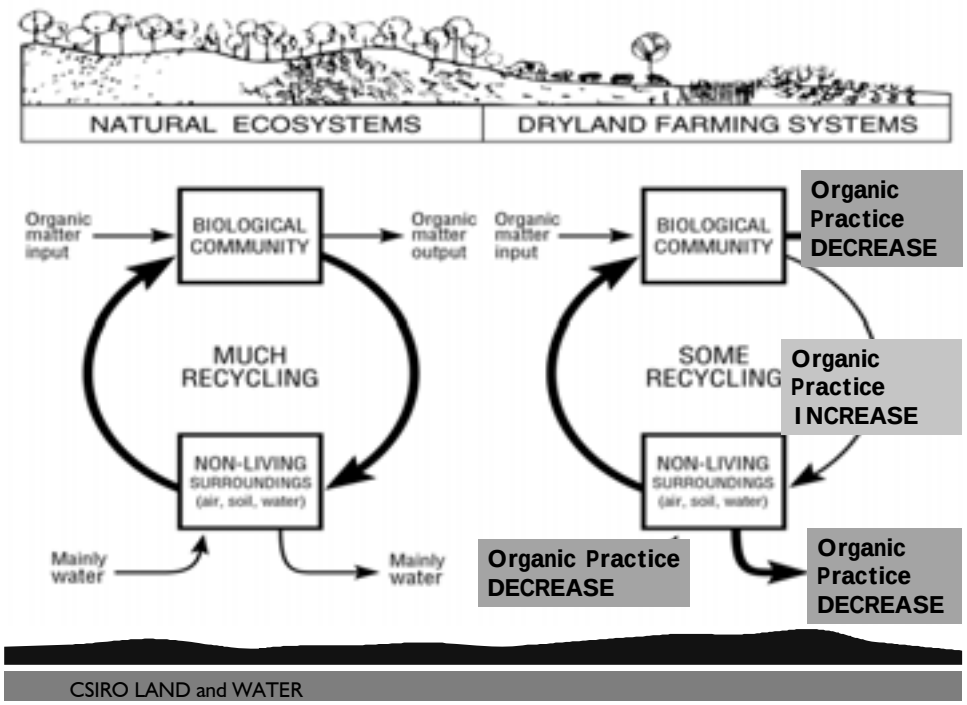
There will be in 2051 a culture of strong public and private investment, together with progressive laws, good monitoring and information systems - used as a matter of routine - and strong landholder engagement and support.

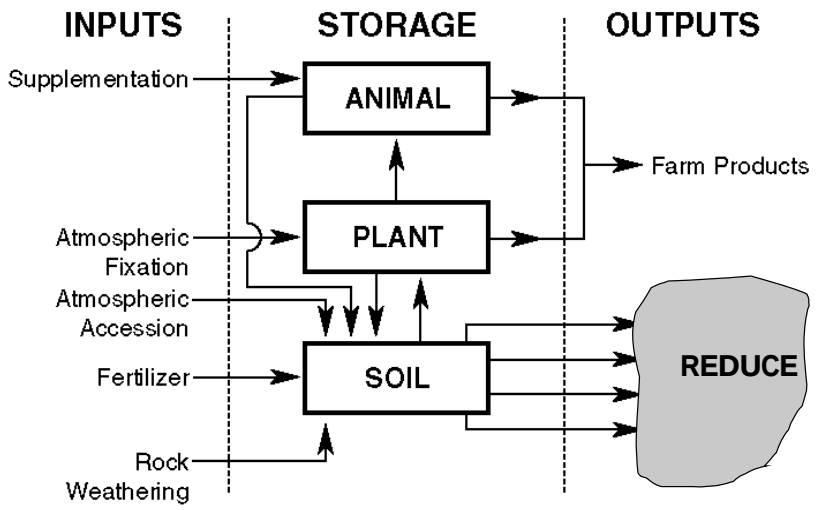
I got that quote ‘There is no fate but what we make’ from *The Terminator*. I apologise for that – for one who advocates non-violence I think that’s a terrible admission to make! But I think the quote is true;there’s no pre-destiny. We’ll only get there if *we* make it happen, and we are the generation who *will* make it happen, and I think that organics has a vital role to play in that.

7. Soils as a Mediator for Organic Agriculture

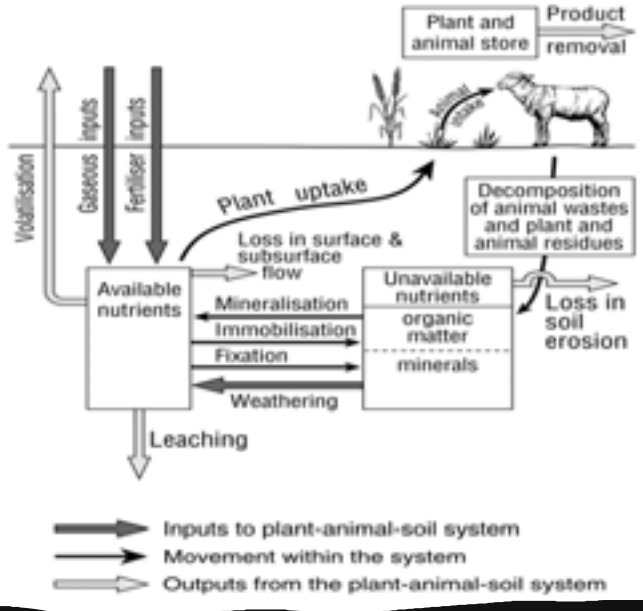
By Dr John Williams,
Chief, CSIRO Land and Water

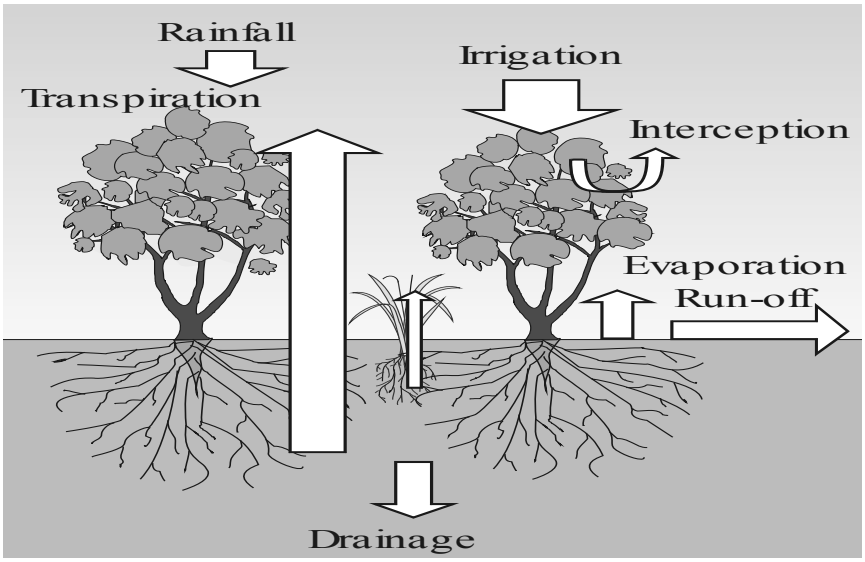




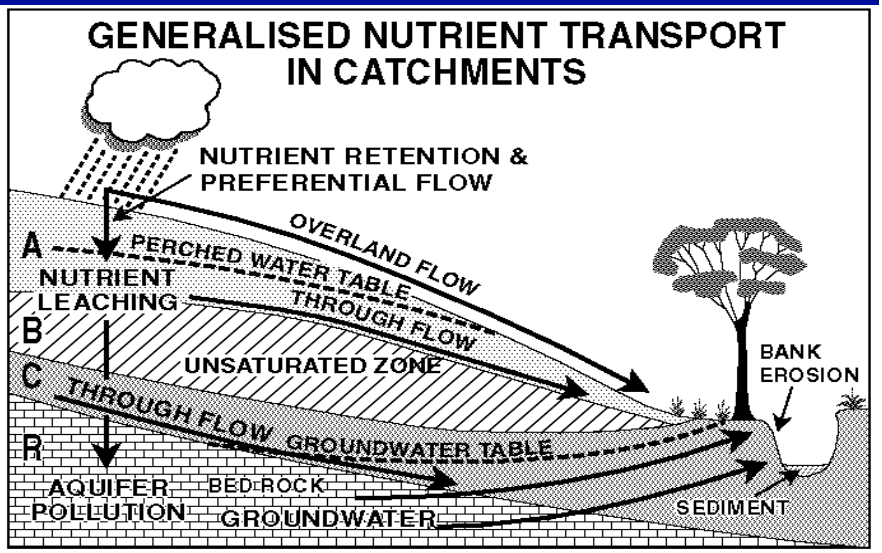


Williams, figure 1.



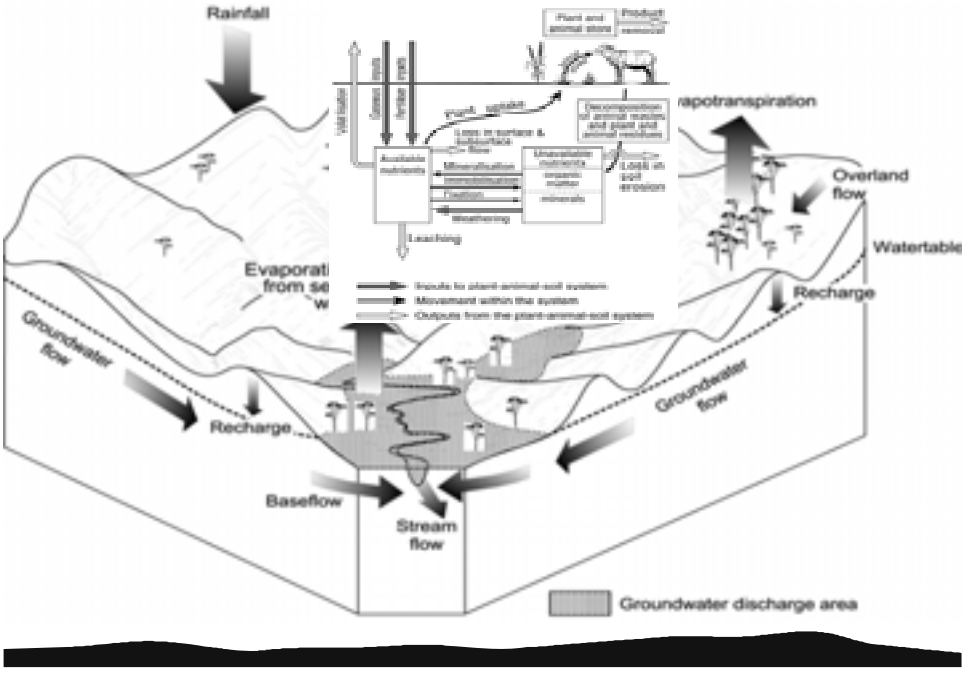


CSIRO LAND and WATER



Williams, figure 2.

CSIRO LAND and WATER



Damaging Production Processes Impact on Food products

- **FOOD PRODUCT**
- **FOOD COMMODITY**
- **FARM PRODUCTION SYSTEM**

CSIRO LAND and WATER

The issue globally

Industries and public authorities worldwide are increasingly implementing various voluntary Eenvironmental Management Systems (EMS)

- to demonstrate sound environmental management,
- improve market access and
- provide auditable evidence of public accountability and responsible management.

A requirement for agricultural production to demonstrate compliance with accredited EMS falls into the middle of the international trade/environment debate.

Consumers are increasingly expecting food to be produced in ethical manner, encompassing concerns such as:

- environmental stewardship,
- GMO
- fair trade and
- animal welfare.

The globalisation of major retail chains will:

- Impact on the ability of Australian producers to remain in or enter markets and comply with value chain specifications
- Increasingly retailers are responding to consumer concerns regarding food production processes.
- Finance/insurance sectors have broadened their approach to risk assessment
- Increasingly exposed to long-term liability issues, especially regarding environmental impacts.
- Sectors require their corporate clients to demonstrate evidence of effective environmental management procedures.

The issue for Australia

Australia is a young agricultural country with old landscapes and soils. Our practices have not been well adapted to suit the landscape. Our agricultural systems have significant impact on the environmental. Australian agriculture trades on being 'clean and green' in the marketplace. Our trading partners do not always necessarily share our view.

In addition to environmental aspects this view is also influenced by trade negotiation positions adopted between nations.

There is a growing body of anecdotal and market driven evidence which suggests that failure to adopt EMS may disadvantage Australia's agricultural export opportunities in the longer term, and that taking the lead may even enhance our market position.

The Minister for Agriculture, Fisheries and Forestry is now encouraging the agricultural sector to adopt EMS as a way of linking trade and the environment.

Damage to environmental assets

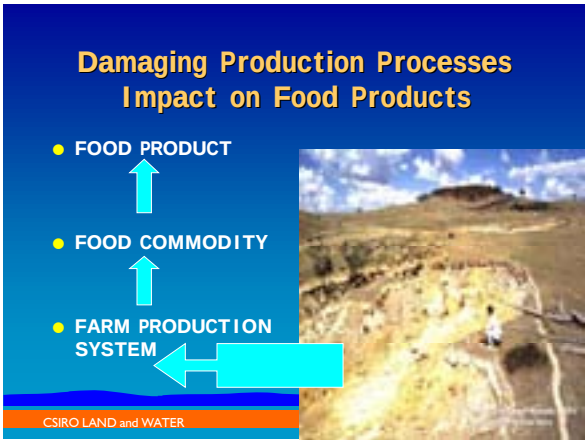
- soil nutrient depletion
- soil acidification

- soil structural decline
- soil biological decline
- dryland and irrigation salinization
- wind and water erosion
- contamination with residues of agricultural chemicals
- loss of habitat and biodiversity
- river processes and environmental flows
- nutrient, salts and pollutants to wetlands, rivers and water bodies
- contamination of groundwater with nutrients, salt and pollutants
- riparian, remnant vegetation damage and rural tree decline
- decline in native pastures and environmental value of rangelands

Consumer demand for organic production processes

Twyford-Jones & Doolan (1998):

- In 1996 OZ Organic sector $120-200M
- Organic Agriculture is International
- IFOAM has 527 organisation worldwide:
  - 58 Germany
  - 22 in USA
  - 5 in OZ
- "Organic" Standards will be first of the EMS
- Japan and Europe main importers of Organic products
- China could be increasingly important
- USA and NZ have developed significant exports of organic products
- Australia has been slow



Farming without harming

Can we do it in an old,dry,flat salty continent? So what's the problem?

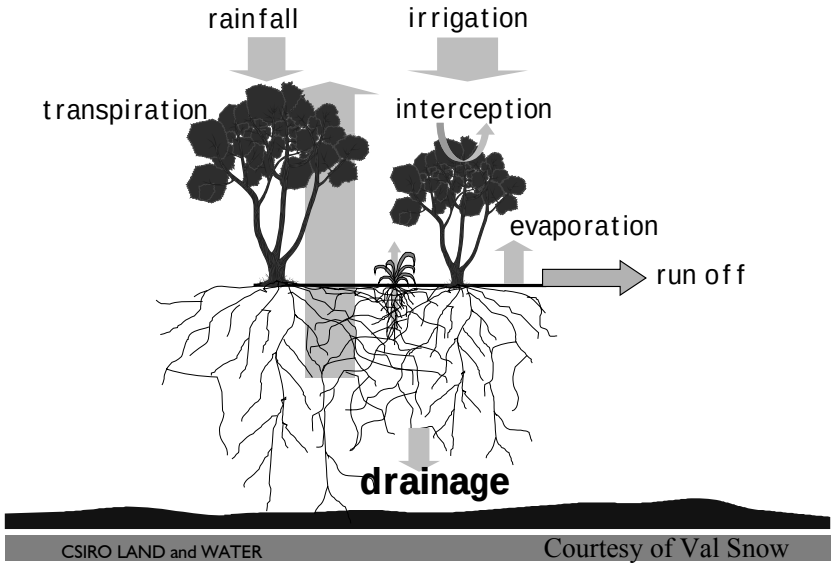
Oz is a dry, flat, salty landmass

- Australia's geological history makes us quite different to most other parts of the world.
- Our continent is a very old, flat, stable landmass that has eroded through time, accumulating sediments and salts.
- Much of the salts are carried from the oceans in rain, deposited, trapped and accumulate in the soils, regolith, lakes and groundwater, and have done so over millenia.
- These accumulated salts were blown and redistributed across the landscape during the extremely dry periods of geological time.

Therefore: the arteries and veins of the Australian landscape are not in good shape
they need special care!

Native vegetation evolved to balance salt and water

- Trees, woody shrubs and perennial grasses comprised much of Australia's native vegetation
- The perennial vegetation, deep roots takes full advantage of any available water, thus minimizing the amount of water that leaks past the root zone to groundwater.



Replacing native vegetation set water, nutrient ans salt moving

- Australian rural production systems were built on annual crops and pastures replaced the deep rooted trees and shrubs under which the landscape evolved. This radically changed the nature and seasonal patterns in the hydrological and nutrient cycles.
- The consequence is that current farming systems leak water and nutrients beyond the root-zone.

The Australian irony

Whilst our Agricultural productivity is constrained by lack of water and nutrients fundamental cause of much of our land degradation is an excess of water and loss of nutrients at key periods of the year.

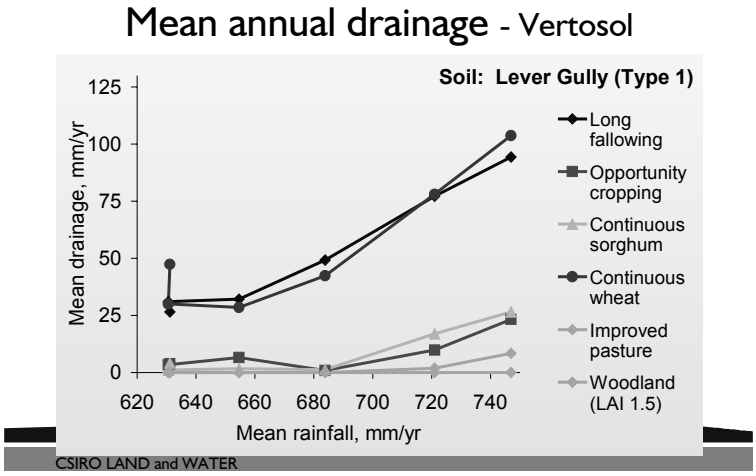
Oz agro-ecosystems are in trouble

- We are wasting what we need
- We are damaging the landscape in the process !!
  - Salinity/erosion
  - Acidification
  - Habitat loss
  - Water Quality

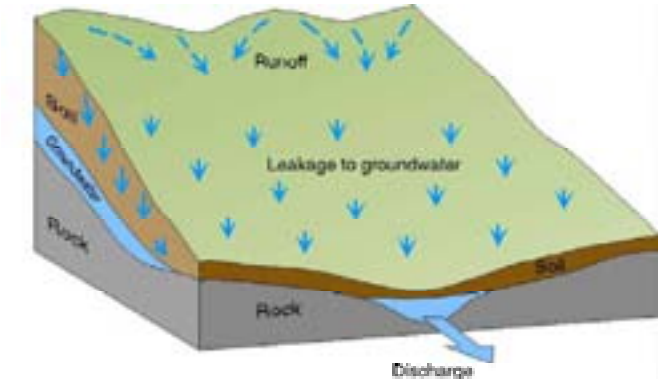
Effectiveness of current farming systems to control dryland salinity

Long term leakage rates are:

- usually 2 to 10 times greater than that which occurred in the native ecosystems.
- strongly dependent on amount and distribution of rainfall and soil properties.
- halved with deep rooted perennials.
- yet still twice or three times that of the native vegetation.

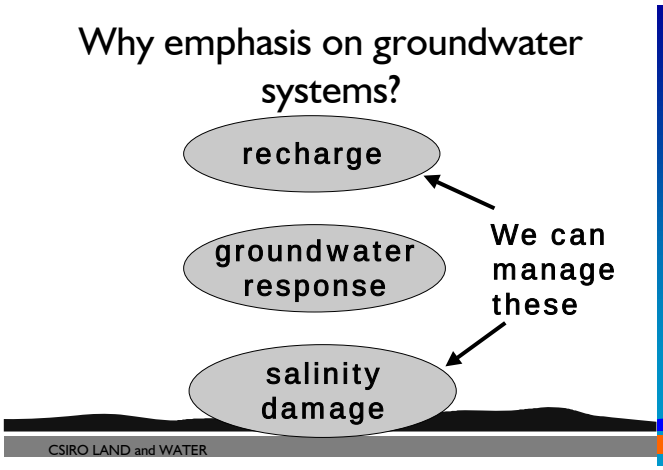


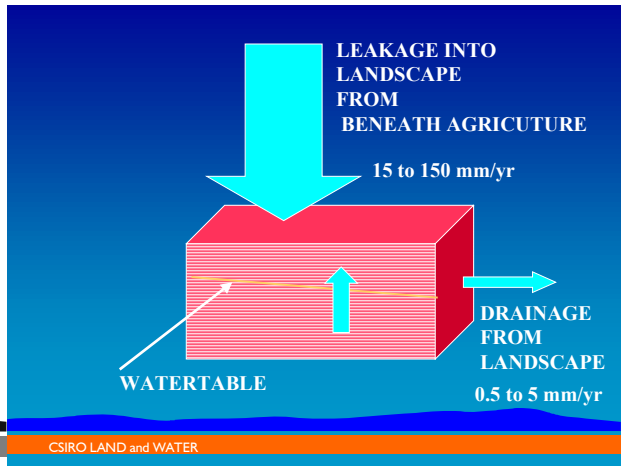
Differences between the Australian landscape and that in most other parts of the world mean that agricultural systems that are sustainable elsewhere do not necessarily transfer to our unique conditions.



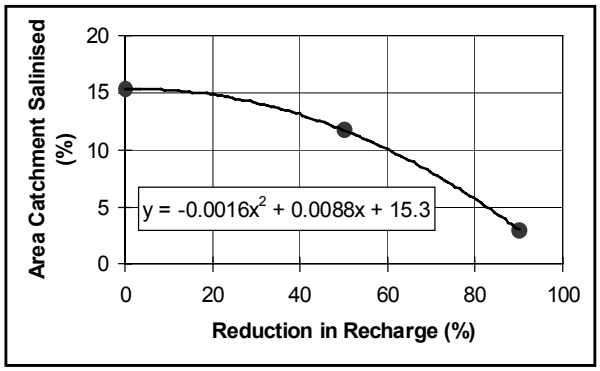
G-factor

G = Mean discharge capacity
Total recharge of catchment





Wanilla, Eyre Peninsula, SA - impact on salinity after 20 years



Solutions?

Treatment of cause:

- Recharge control to reduce (a) the rate of rise of groundwater, (b) the area of land affected by salinity, (c) the delivery of salt to water resources;
- Interception of fresh water to reduce the rate of rise of groundwater and delivery of salt to land and water resources.

Revolution in land use

Our landscapes require a mosaic of:

- Commercial land uses that are ecologically sustainable.
- Land uses that provides a suite of Ecosystem Services which are valued and paid for by stakeholders and beneficiaries

Earn more of our living from goods and services derived from deep rooted, perennial trees and shrubs.

Commercially driven tree production systems and/or new tree species, to be developed for large areas of the current crop and pasture zones of the Basin. These would include trees to produce fruits, nuts, oils, pharmaceuticals, foods from native plants, and forestry products such as specialty timbers, charcoal, and biomass energy.

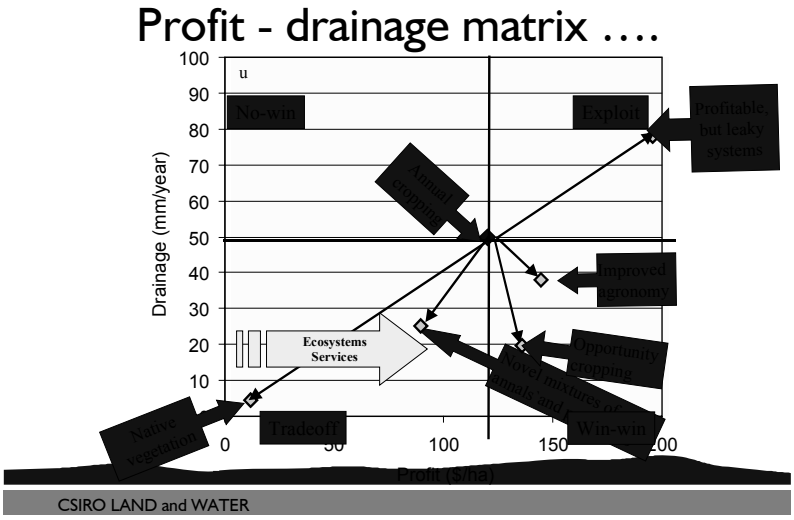
New farming systems made up of novel mixes of all the best current annual and perennial plants, the best agronomy, companion plantings, rotations and combinations.

New forms of cereals, pulses, oilseeds and forages selected or bred for characteristics that substantially reduce deep drainage and nitrogen leakage.

Refined land assessment tools that:

- best locate trees, other perennial plants, high-value annuals, and native species to meet water quantity and quality targets, and biodiversity goals.
- facilitate re-assignment of land so that on some parts we double productivity and other parts are removed from production to yield ecosystem services .

Courtesy Brian Keating: CSIRO Sustainable Ecosystems



To realise this vision

We will need to pioneer the development of a new landscape, a mosaic of:

- tree crops driven by large-scale industrial markets such as biomass fuels
- high-value annual crops
- mixed perennial-annual cropping system
- Significant areas devoted to maintaining those elements of native biota dependent on native vegetation.

Take home messages

By building new farming systems and new industries derived from tree and shrubs that capture all the water, nutrients and carbon:

- we treat the environmental damage at its cause and
- turn the leaked material into food and fibre and ultimately wealth…

Revolution in land use

Requires a mosaic of:

- Commercial land uses that are ecologically sustainable
- Land uses that provides a suite of Ecosystem Services which are valued and paid for by stakeholders and beneficiaries

Take home messages

- A real win-win situation.
- Let's go for it.
- The challenge before The Australian Organic Industry is to build organic practice so that leakage of water, nutrient and carbon from the agro-ecosystem is compatible with the ancient flows of the landscape.

- A competitive advantage on national and world markets could be captured if "Organic" or other EMS standards were required by Australian Food Industries.

- *But it may be too late!*

- Food Production Processes that are benign to the Environment and part of an EMS or "Organic" Standards is not an optional add-on.

- Can some advantage to be gained before it becomes an essential ticket for market access?

8. A Challenge For Everyone

By Mitchell H. Hooke,
Chief Executive, Australian Food and Grocery Council

Mr Chairman, Professor Woods, Mr May, Ladies and Gentlemen.

Let me begin by clearing the air.
There are some 400 people in this room and as I rose to my feet, after the Chairman's kind introduction, 399 of you were asking the question - is he for us or against us?.

In accepting your invitation to address you, I have to be honest, I was reluctant to do so, but I am already glad I did.

I was not sure that I would have anything to offer an audience better qualified, I suspect, than me in the production system and marketing of their produce and products. And that I ran the grave risk of offending people whose belief and commitment to a system of farming and food production is both profound and unwaverable – to the extent that some consider that, for its proponents, organic production amounts to a "philosophy", a movement or even a "religion".

I had no intention of claiming expertise that I do not have, and nor am I inclined to confrontation if I can avoid it.

Furthermore, I suspect that many of you would share a similar view to some organic industry advocates, one of which once declared, within the context of a policy discussion, that my reputation preceded me.
I doubted sincerely that they knew about my time as an agricultural advisor in Queensland, and particularly as a pioneer of reduced tillage farming in that State, or that I was involved in the very early drafting of the National Standard for Organic and Bio-dynamic Produce when I was with the Grains Council of Australia.
Of course, I suspect they were referring to the views I was expressing on behalf of the industry I represent as the Chief Executive of the Australian Food and Grocery Council.

However, it is that sort of premeditated judgement, perhaps even prejudice, that is understandable from participants of an industry that has often suffered the disdain and derision of some traditional agriculturalists, some in the broader community and, believe it or not, a number of consumers.

But it begs the question, "why does the organic movement engender such divisiveness in the community, often attract fierce criticism, and even the palpable disdain of others, to the point where, it at least gives the impression, that it considers anybody who's not in the "organic club" is opposed to them?'

Why is it that my first reaction to your invitation to address you, was that I felt that I would be a bit like Daniel walking into the lions den, even though I was the Chief Executive of an organisation whose broad church of membership covers just about every conceivable type of food product in the marketplace, including organic products?

It's not just a case of competitiveness in the market – a fear of substitution – I suspect it goes much deeper, and I suspect a great deal of that cynicism and discredit may well be self-inflicted – and having just listened to Professor Ikerd (Professor Emeritus of Agricultural Economics, University of Missouri, United States of America), I think I'm starting to get the message – a better understanding of why.

However, to my opening remarks, I have no intention of pontificating to you as to why. Rather, I'm going to put some more fundamental questions to you and allow you to draw your own conclusions and determine where you might focus your efforts in meeting the challenges of any fast moving consumer goods market in developing and differentiating your product.

And in doing this, I have made a fundamental assumption that organic producers want to grow the market and their businesses. This goes to the challenge put before this conference this morning by Prof Ikerd that an organic system must have all three pillars of social responsibility, environmental soundness and economic viability to be sustainable. I'm looking at this subject from the perspective of all three pillars, but more particularly the market and therefore "economics", and not simply as a philosophically based system that provides a platform to challenge the effectiveness of liberal market economics and the industrialised world with a view to changing both, as Prof Ikerd suggested.

Because there is unquestionably a market for your produce and your products – even the most sceptical should acknowledge that without a market "organic" production could not be approaching, I'm advised, nearly 10% of Australia's total agricultural production, involving some 2000 producers supplying a wide range of fresh and processed products of animals, plants and aquaculture, and stockfeeds, wool, cotton, essential oils and herbs and spices.

Many of the companies I represent offer organic products in the market in meeting the needs and expectations of their consumers looking for variety and choice. Few make judgements about the organic system per se, but they are very sensitive to the market and continually make judgement about its direction and their capacity to meet it.

Is "organic" sustainable?

I understand the organic movement was founded (in the mid-1950s) in providing produce and products from an alternative farming system using husbandry principles and techniques that pre-dated the introduction of modern agricultural and veterinary chemicals and intensive farming methods. As such, organic food is the product of a farming system which avoids the use of man-made fertilisers, pesticides, growth regulators and livestock feed additives.

I take the term "organic", therefore, to refer to a production and process method or system, not the final product. Indeed, the National Standard for Organic and Bio-dynamic Produce differs from standards for other agricultural produce in that the production procedures are an intrinsic part of the identification and labelling of, and claims for, such products.

Quite simply, the organic sector founded its very being on differentiating its process and production methods from its traditional counterparts and continues to do so.

In so doing:

- is the organic movement falling into the all too familiar trap of drawing a simple equation between community attitudes to the environment and animal welfare with consumers' interests?

- do organic producers have a really good grasp of what is driving today's more affluent global consumer and their inherent contradictions in behaviour?

- has its producers and marketers exploited to the extent they might, organic product's strongest differentiating characteristic in the minds of consumers that influences their choice of those products – taste, health and a sense of well-being – and in doing so, are organic producers in a position to provide

a sound, scientific basis for claims of superior organoleptic, nutritional and/or therapeutic qualities given the importance of the integrity of promotional claims and validation of consumer benefits?

- are organic producers making the same mistake as many others in mainstream agriculture in attempting to differentiate their products by a characteristic, amongst others, that is simply not a differential in the market – food safety – by claiming organic products are safer?

- are organic producers placing sufficient emphasis in differentiating their products in the marketplace on promoting the virtues of their products, or do they rely far too much on discrediting, even denigrating, the production practices and compositional integrity, particularly of pesticide residues, of the products of their more traditional counterparts? Are they guilty of negative comparative advertising? And if so, does it really work and is it sustainable in the market?

- just what is the relative chemical residue status of the products of the two farming systems, given the profound shift in the nature and residual persistence of agricultural and veterinary chemicals, and that the organic movement itself declares that organic food can never be defined as pesticide free, or free of other contaminants (air, water, soil or other sources of contamination)?

- is there consistency and therefore consumer confidence in the integrity of the brand "organic" (I have chosen to call it a brand because in the US consumer research indicates that 90 percent of consumers could not recall a company brand, but identified with the category "organic")?. Are consumers just as suspicious and confused about the use of the term organic as many of them are in the labelling of food products as "fat-free" when there are tolerance limits, "fresh" when the product has been subject to high temperature processing or is a composite dairy product, and "natural", which can suggest nutritional superiority or healthfulness, notwithstanding that most anti-nutritional factors and toxins are also natural?

- has the organic industry embraced a self-imposed discipline of preventive food safety production systems based on the internationally recognised Hazard Analysis Critical Control Point (HACCP) programs?
- has the organic movement globally been far too hasty in dismissing new biotechnologies as an useful adjunct to organic farming systems as that technology can potentially deliver significant agronomic and environmental benefits, in terms of reduced pesticide usage, improved water and nutrient use efficiency?; and

- has anybody confidently determined just how sustainable organic farming systems are in meeting the increasing food demands of an expanding world population and burgeoning middle class with increased consumer purchasing capability.

Let me make a few points in relation to these questions on which you might ponder their answers.
The growing global middle class of consumers is more sophisticated and discerning.

In developed economies, consumer value is increasingly defined in terms of customer experience centred on lifestyle expectations, including indulgence and convenience. Consumer demands have transcended the traditional expectations of food for fuel and organoleptic properties as prime determinants of quality – consumer demands have gone beyond a simple product for a simple need.

Consumers now expect convenience, prompt and efficient fulfilment through products and services that deliver health and nutrition benefits and functional properties, including therapeutic benefits.

Consumers want choice but simple selections, yet products tailored to meet their individual requirements and lifestyle expectations and increasingly diverse and complex food consumption habits.

Mass customisation is increasingly a feature of operations as companies seek to differentiate products and services to cater shifting emphasis in consumer values and increased purchasing power – yet meet the cost imperatives of rationalisation and restructuring along with the environmental dictates of improved waste management.

In developing countries, as urbanisation and industrialisation progresses, food consumption is increasingly distanced from the source of production of the raw material or the transformation into a consumer product. It signifies the process of specialising in the production of goods and services that deliver the greatest economic return, and over time, provide the basis for the further development of marketing, processing and distribution systems and increasingly sophisticated food products.

The bottom line to all this, is that product and service differentiation is the dominant feature of the fast moving consumer goods market globally.

And herein lies the challenge for the organic sector that has founded its very being on differentiating its process and production methods from its traditional counterparts.

But in focusing on that part of the equation, and to my earlier questions, has your sector really connected with consumers to the extent you might, or could, to grow the market and in turn your businesses?
The consumer expects there to be no doubt about a product's hygienic, chemical and physical integrity.

Food safety has always been the price of market entry. It is simply not negotiable in the market. It is a given. Consumers trust and expect that their product will be safe. Witness the outcry when that trust is violated, notably in the UK, but we too have had our failures albeit minor by comparison.
One can draw parallels with ice-cream – the consumer expects it to be frozen. And just as there is no such thing as more frozen ice-cream, there is no such thing as more safe foods.

Therefore, to promote one's product as safer than another is simply attempting to make a distinction in the market that is not there, or if it is, it is illegal (it is against the law to sell unsafe food). It is not a sustainable marketing strategy.

Even so, as I put to you in my earlier remarks, just how far has the organic industry gone in ensuring the microbiological integrity of its products? The AFGC faced considerable opposition from farmers at one end of the value chain and restaurants, hoteliers and caterers at the other end in moving towards a national uniform regulatory standard of preventive food safety systems. Notwithstanding, our companies have adopted their own industry standard based on the HACCP systems.

It has to be an industry standard, because, as the Garibaldi smallgoods and Nippy's orange juice food poisoning cases demonstrate, the damage flows to all related products and it can be profound and lasting. Furthermore, and arguably so, organic production practices, particular the use of animal waste renders organic produce more susceptible to microbiological contamination. And of course, this is more likely where organic producers fail to observe their own codes of practice in the use of raw manure.

Consumers invariably make their purchasing decisions largely, if not entirely, on the basis of the product's fit with their lifestyle expectations. Indeed, nine out of ten consumers base their purchasing decisions on price, convenience, quality and brand.

In this sense, consumers of your products have honed in on the real, or perceived attributes of taste , health and a sense of well-being, and are prepared to pay a price premium, more often than not. This has always been my perspective, and I note from a consumer survey in the United Kingdom by MORI, that they draw the same conclusion – 45% of consumers siting health and 40% claiming taste as prime motivators in choosing organic.

My family, I suspect, is a good example of the mainstream consumer. We pay a premium for vine-ripened tomatoes, irrespective of whether they are products of organic, hydroponic, or traditional market garden systems. We prefer their taste to the dual purpose type of tomatoes with which you can play cricket with before you eat them. We buy meat from our favoured butcher, who advertises his products as organic, whatever that means to him or anybody else, for one reason only – taste. And, we buy his organic sausages because he uses rice, not wheat flour, as fillers, to which one of my three daughters has a mild intolerance as diagnosed by a respected natropath. And yet, we buy our fruit and vegetables from the Fyshwick markets in Canberra where we can browse for range, quality and, of course, taste.

My point is simply that consumers will make judgements about your produce in the market on a cost-benefit basis that equates with their particular circumstances, product expectations and lifestyle needs.

Few individuals, as part of the broader community with concerns, say for the environment, animal welfare, support for rural communities, and liberalised markets and globalisation, equate those concerns with their interests as a consumer as manifest in their product purchasing decisions.

Consumers are likely to continue, in the main to differentiate their support for individual brands from their attitude to company ownership. It is true that some Australians intensely dislike multinational companies, but as consumers they love their brands.

A similar parallel exists for consumers' who readily purchase imported products and yet vehemently protest the ills of globalisation.

This is notwithstanding that Marco Polo turned globalisation into an art form centuries ago, Singapore and Hong Kong are examples of economies founded on its virtues, and it is accredited with contributing to an unprecedented improvement in global economic growth and prosperity, increased consumer purchasing power and improved living standards, driving both aggregate and differentiated food demand.

The irony of those with prosperity enough to protest the advances of technology and trade should seek to deny developing countries the same good fortune, is not lost on me and I hope not you.

We live in a society that is inherently contradictory in its views, actions and aspirations. We are:

- reform-weary, but intolerant of inefficiency and excessive costs,
- time-poor, but frustrated with choice,
- demanding more information, but want it simple;
- seeking indulgence, convenience and taste, sometimes at the expense of health;
- rapid adopters of new technologies, but sceptical of scientists and motives of business;
- cynical of governments and regulators, but demanding of regulatory safeguards;
- risk takers when in control, but risk averse when subject to the decisions of others, and
- characterised by consumers saying one thing and doings something else.

How many consumers do you know who are looking for the ecological life-cycle assessment on grocery products, as they move through the supermarket aisles.

How many look for labels extolling the virtues of turtle excluder devices on their prawn packets.

How many look for the dolphin on the tuna can and knowingly equate it with dolphin-free nets in catching tuna fish and of an environmental benefit.

How many buy free-range eggs because it is allegedly improving the lifestyle of chooks, as distinct from their own interests in buying what they perceive to be fresher, maybe even healthier, eggs.

As a society, we can't even manage to bypass the universally condemned supermarket plastic shopping bag. And why? - because it contravenes the convenience priority in our lifestyles, even though we are all too familiar with the images of polluted waterways, beaches and the deleterious effects to marine life. The same can be said in terms of public policy impact.

For example, if the environment was such a major consumer concern in Europe, as some there would have it, the Common Agricultural Policy, which subsidises the overuse of inorganic fertilisers and pesticides and the exploitation of what little natural environment Europe has left, would have unravelled 20 years ago.

In this regard, is the organic movement making the same mistakes, albeit from the other side of the coin, as the proponents of biotechnology in attempting to transpose community and farmer environmental and agronomic benefits, to consumer benefits that are either not there, or the consumer doesn't recognise.

Quite simply, it is an uphill battle to convince consumers that benefits to farmers and the environment are in their interests, and particularly when they perceive, or are told that they are bearing all the risks. My point is simply that the concerns of the community do not always, indeed rarely, equate with the interests and actions of the consumer.

Therefore any marketing campaign that seeks to differentiate products on the basis of what community concerns are and what consumers "sayeth", as distinct from what consumers "doeth", is likely to fail.

And any campaign to reinforce community concerns by translating those to consumer preferences is, as a consequence, more likely to be "way over the top" if it is to make an impact, thereby stretching the bounds of credibility and invoking the wrath of those with competing views or products – and this can become a foundation for fierce, even bitter, division – as I reflected in my opening remarks.

We witnessed this pattern emerge during the biotechnology debate, particularly starting in Austria and then moving into England, where rival supermarket chains sought to differentiate their product offering on the basis of its biotechnology status.

In this vein, I was surprised that the organic movement, globally, moved so quickly, so comprehensively and so emphatically to dismiss new biotechnologies as a potential means of promoting the sustainability of the organic production system which, as I indicated earlier, was founded in a dedication to a system of production that negated the use of synthetic pesticides and inorganic fertilisers.

Many in this room will argue against the potential for new gene technologies to reduce the reliance on synthetic pesticides and improve the efficiency and ecological sustainability of agricultural and forestry production, particularly more efficient use of natural, but scarce resources, such as soils, water and fertility. Many will also engage in the debate as to whether or not this new technology is an extension of man's intervention to improve the quality and quantity of the food supply, which has its genesis around 8,000 BC, and that it enhances precision and risk management in the genetic improvement of plants and animals
.
Many will contest its potential as a critical adjunct to man's utilisation of technology in meeting the single largest increase in food demand over the next quarter of a century in the history of mankind. The world

will need to feed two more Chinas by the year 2025 off the same amount of arable land that hasn't changed significantly since the end of World War II.

Many will also contest claims that this technology will provide for increased differentiation in food products, meeting consumers' demands for tailored food products and services, developing food with greater nutritional value and health benefits.

Fine! – have that debate.

And don't rule the organic movement out as serious players by allowing it to be dismissed by its opponents as Luddites (opponents of technological innovation). There is no question that the organic movement has a right, indeed a responsibility, to contribute to that debate. But advocating moratoriums on the technology not only denies others the very choice organic producers want, but again seeks to position that sector and its products in the market place at the expense of others, which of course organic representatives quite legitimately mount as the concern they have about other's actions.

Even so, why would the organic movement restrict its options in the utilisation of a technology which its leaders openly declare a lack of knowledge about its application, and its longer-term effects. If you don't know, how can you be so categorical in your opposition to it.

I've never bought the argument that "you don't go if you don't know". Man would never have progressed past inventing the wheel if that line had real foundation.

Rather, I identify better with the Northern Territory Tourism ad, "If you never, never go – you'll never, never know!"

And those of you with a good knowledge of the history of your industry and agriculture more generally, will recall Rachel Carson's book "The Silent Spring," in which she declared that agriculture needed to go to a greener solution, with less reliance on synthetic pesticides and greater reliance on breeding for inherent resistance to pests and diseases and improved agronomic productivity.

Traditional agriculturalists, either as farmers or scientists, could be forgiven a persecution complex.
And before you credit the AFGC as an advocate of this new biotechnology, let me restate quite clearly that the AFGC's role has been <u>not</u> to do that, but rather to provide industry the choice in the technology's use and its commercialisation into products and operations. The very choice that many activists demanded, quite rightly, for consumers.

Our role in facilitating that choice was, and remains, to strongly advocate an appropriate regulatory regime governing the experimentation and development of the technology and the release and use of its products, ensuring effective safeguards exist for public health and the environment, and that the consumers of our products have meaningful information upon which to exercise their undeniable right to choose.

As a rural scientist, and as a former agricultural adviser specialising in reduced tillage farming systems, you might expect me to have a view about the sustainability of organic farming production systems. My involvement in that area is now so historic that I dare not.

Suffice to say, that others tell me that the jury is still out on the long-term sustainability of organic production systems in terms of:

- the recycling of nutrients and therefore depletion of the chemical and physical status of soils;
- the control, rather than fostering of weeds and pests; and
- the contribution to animal welfare.

Indeed, the practice of applying organic manure and other non-organic animal wastes (blood and bone) in the United Kingdom – estimated at 80 million tonnes per year in addition to 120 million tonnes "naturally", because of the timing of application and process of mineralisation, is significantly contributing to nitrate groundwater contamination.

Furthermore, scientists tell me that the jury is still out on the chemical residue status of organic products relative to the products of other agricultural production systems.

I have identified three key questions surrounding pesticides and chemical residues.

- First, is there an issue of accumulation from low level exposure over a lifetime to the residues of agricultural and veterinary chemicals. There are many untested hypotheses, because no animal models exist for the simulation of long term effects, and the epidemiological tools are not sufficiently powerful to detect and differentiate the cause and effect of chemicals/diseases in populations when they occur at very low levels or very infrequently. And it is difficult to measure the extent to which the body's natural DNA repair mechanisms account for any damage from low level exposure.

- Second, is the risk from the use of agricultural pesticides as great now as it was when the organic movement was founded and flourished. The characteristics of agricultural pesticides have changed so dramatically in the intervening period, such that their toxicity, epidemiological properties and longevity are greatly reduced, and their on-farm efficiency of use greatly improved, as evident in the Market Basket Survey which tracks a long-term trend of declining residue levels in foodstuffs.

  The sequel to this question is the costs and benefits equation, which I have no intention of exploring here today, other than to make the point that when the organochlorine chemicals first came under intense public scrutiny and DDT was subsequently banned, in that year alone, some one million children in continental Africa died from mosquito-borne malaria – a high price to pay for a suspected carcinogen whose only proven crime was to accumulate in the food chain.

- Third, science already indicates that the body does not differentiate between natural or synthetic origins of the same chemical compound.

The single most important question in my mind is whether the organic farming production systems, which rely on a plant's natural defences, including the vast array of natural toxins, actually contribute more chemical substances, also known as "natural pesticides", to our diets than the synthetic pesticides, the use of which can be targeted and controlled and a great deal washed off before ingestion.

To make my point in posing this question, let me quote Dr Bruce Ames, Professor of Biochemistry and Molecular Biology and Director of the National Institute of Environmental Health Sciences Centre, at the University of California:

"*Of all dietary pesticides, 99.9 percent are natural: they are toxins produced by plants to defend themselves against fungi and animal predators. Because each plant produces a different array of toxins, we estimate that on average, Americans ingest roughly 5,000 to 10,000 different natural pesticides and their breakdown products. Americans eat an estimated 1500mg of natural pesticides per person per day, which is about 10,000 times more than they consume of synthetic pesticide residues. By contrast, the FDA found that residues of 200 synthetic chemicals, including the synthetic pesticides thought to be of greatest importance, average only about 0.09mg per person per day.*"

If there is only one thing I am sure of today, those of you in this room will contest Dr Ames' research. Again, fine! But let's have the scientific basis to what claims you may make in contradiction of Dr Ames' findings. As a consumer, I would like to know. As an industry representative, I am obliged to find out.

If organic is to largely remain as a niche alternative based simply on a philosophy then there is not as strong a case for sound scientific accountability in this and other claims about the organic system and its products – and Prof Ikerd is right – organic producers only have to justify the philosophy of their system to its producers and its niche markets. However, once the system is promoted as a real alternative to mainstream agriculture then these questions of substance need to be answered with the same degree of scientific rigour that the organic movement rightly demands of traditional agriculture and the introduction of new technologies.

Accreditation and labelling

Notwithstanding the efforts of the industry to self-regulate through the production of what I interpret to be a Code of Conduct – the National Standard for Organic and Bio-dynamic Produce – consumers are wary that product labelled as organic does come from an organic production system. Given that there is no way of testing the product for its "organic" quality, the necessity for strict measures and controls over the production system is critical. Indeed, those seeking to preserve the identity of non-genetically modified systems are currently grappling with the same issues.

I am aware of moves within the organic lobby for an amendment to the Food Standards Code giving legislative effect to the national standard I have just referred to. It begs the question, what would be the regulatory justification for that against the objectives of the ANZFA Act. Is it a question of protecting public health and safety, would there be any greater force of law against fraud and deception that does not already exist under the Trade Practices Act, and do you need to legislate for the provision of adequate information for consumer choice. The requirement for facilitating international trade is, I suggest, already met in the administrative arrangements established by AQIS under the Export Control (Organic Product Certification) Orders 1996.

The commercial benefits of getting the standard/accreditation equation right should not be underestimated. Observers n the US consider the adoption of the USDA National Organic Program in October 2002 will be the seal of official approval many consumers are looking for, and could well be the watershed for growth – again, if that is what you want.

Mr Chairman, in conclusion, if this conference and others who share a passion for organic production systems can honestly answer the questions that I have put before you today in a positive sense, then you will have met the challenges facing your industry, that at least I could identify, if you choose to grow your system as a real alternative to mainstream agriculture in feeding the world, as distinct from advancing the philosophy of the system and only supplying the demands of niche markets.

If you meet these challenges, then you will have a sustainable product in the market and production systems with real growth prospects.
If not, then I suspect in time, mainstream consumers will judge you harshly and move on or passed, the environment is unlikely to sustain your systems, and rapid technological advances elsewhere could swamp you in terms of product offering and your competitiveness in the market.

In such a scenario, the organic movement may not just become but another fad of our time, but it is likely to remain a philosophically based system of agriculture meeting the needs of consumers who share the same philosophy. Nothing wrong with that, but I suspect you might find a significant swag of ordinary people who like your products for their virtues more so than the system that produced them, even if they knew or cared.

From their perspective, I sincerely hope, that you are able to meet the challenges I have identified.

9. Who Buys Organics, Who Doesn't, and Why?
Insights from a National Survey of Australian Consumers

By Stewart Lockie[1], Kerry Mummery[2], Kristen Lyons[3] and Geoffrey Lawrence[4]

Beliefs about who does and doesn't buy organic food are loaded with stereotypes of greenies, yuppies, health nuts and so on. This research attempts to move beyond these stereotypes and the polarised pictures of organic consumers that they paint by examining a range of factors identified in the literature that are believed to motivate food choices. Additionally, it examines the attitudes of consumers to a number of issues often associated with increasing demand for organic foods.

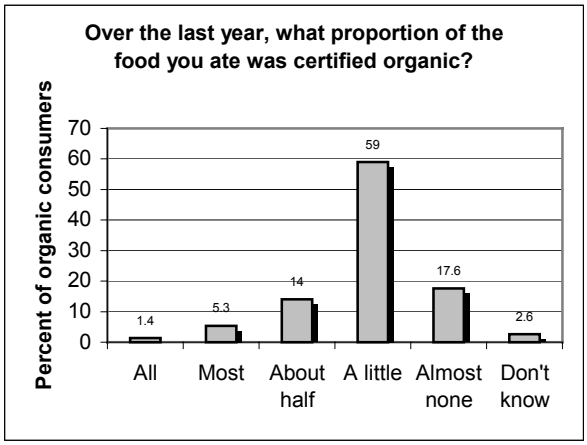
In June 2001 a national survey of 1,200 Australian consumers was conducted using Computer-Assisted Telephone Interviewing facilities at the Centre for Social Science Research, Central Queensland University. The quantitative data generated by this survey was supplemented by a series of 13 focus group interviews conducted in regional and metropolitan Queensland and Victoria that explored the ways in which consumers conceptualised organic food.

This paper presents a preliminary analysis of the survey data that compares organic and non-organic consumers in terms of their demographic characteristics; the factors that motivate their choices about food; and their attitudes to food-related issues such as biotechnology.

How many people buy organic food?

Over 40 percent of respondents claimed to have consumed at least some organic foods over the preceding 12 months. As Figure 1 shows, only a small proportion of these people ate more than a little organic food. But with such a large number of people eating small amounts of organic food, understanding the motivations of those people is of potentially great importance in charting the future of the organic industry.

Figure 1



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Who consumes organic food?

There were a number of demographic differences between consumers and non-consumers of organic foods.

For a start, there was a clear gender dimension to organic consumption with 44.1 percent of women respondents claiming to have consumed certified organic foods compared to only 33.8 percent of men. Figure 2 shows that of those consuming organic food, men and women had similar levels of consumption.

Figure 2

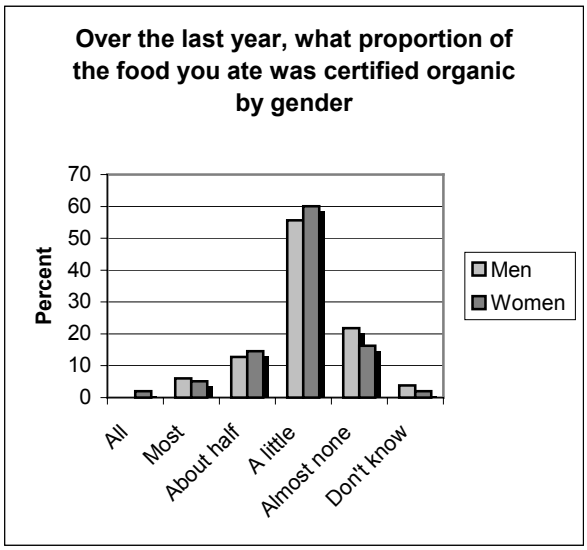
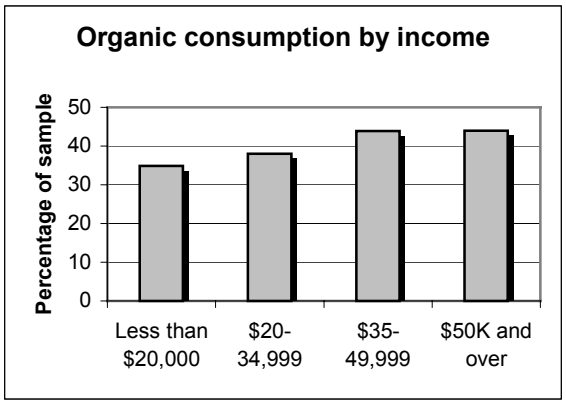


Figure 3 shows that income has some effect, but not enough to confirm the 'organic consumer as yuppie stereotype'. The number of people consuming organic food did increase slightly with income , but only until income reached about $35,000 per annum. And a third of those earning less than $20,000 per annum still consumed organic foods. This suggests that while the premiums associated with organic products may make them less affordable for low income earners, low income earners are not necessarily less interested in consuming them.

Figure 3



Education makes more of a difference. As Figure 4 shows, the number of people consuming organic food increases with both general and science education. Contrary to yet another stereotype, organic consumers are not anti-science Luddites.

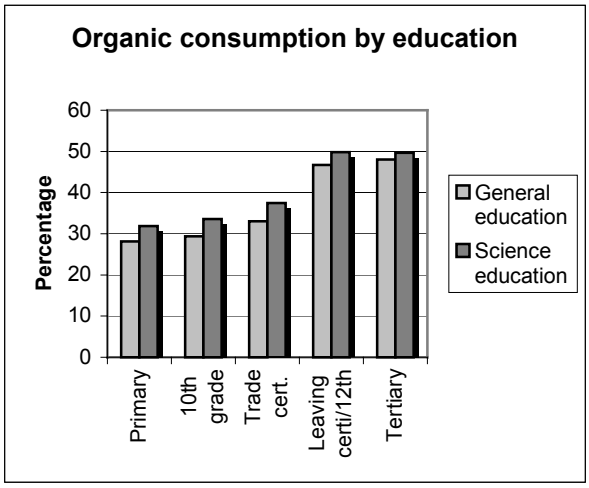


Figure 4

Organic consumption showed little variation across age groups until respondents reached their 60s, at which age the number of organic consumers dropped to 29.9 percent.

Where do they get it?

Over forty percent of organic consumers bought half or more of the organic food they consumed at supermarkets. Greengrocers were the next most popular source of organic foods with nearly 30 percent buying half or more there. Next came direct from farmers, then butchers, home delivery and restaurants/cafes.

What motivates organic consumers?

A number of factors believed to motivate food choice were identified in the literature (Steptoe et al. 1995) and measured against organic consumption.

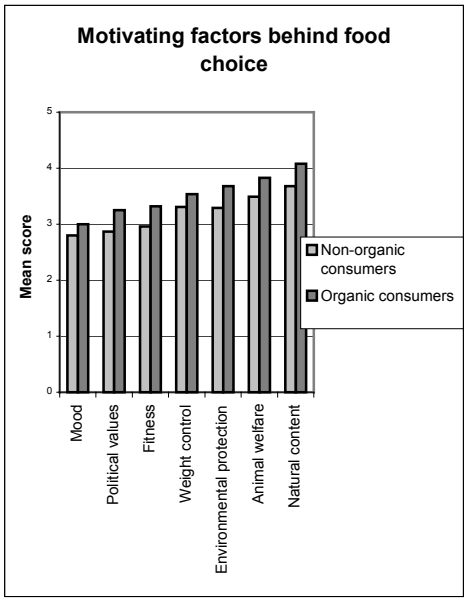


Figure 5

For Figure 5 one equals not at all important through to five equals extremely important.

Figure 5 shows those factors for which there were statistically significant differences between organic and non-organic consumers. Factors for which no differences were evident included convenience, sensory appeal, price, familiarity and religion.

For those factors for which differences were evident it is notable that a similar trend was found between organic and non-organic consumers in terms of the relative importance of each of these factors. Natural content and animal welfare rate highest for both groups followed by environmental protection and weight control. Organic consumers, however, did appear more motivated by each individual factor and may, on this basis, be more likely to prioritise these concerns over those such as price and convenience.

When the same factors were examined in relation to the level of organic consumption, increasing interest in weight control and fitness were shown not to have a significant correlation with increasing levels of organic consumption.

The other factors were all weakly correlated with increasing consumption of organics, the strongest being natural content (rho=.296) and environmental protection (.220) followed by animal welfare (.163) and mood (.166). The next phase of research will concentrate on the relationships between these factors and use them to construct a predictive model for organic consumption.

Figure 6 shows the relative scores for organic and non-organic consumers on a number of scales designed to measure attitudes to food-related issues that are also likely to influence food consumption. Specific dimensions of these scales included:

- Risks from industrialised foods—chemical residues, genetically modified organisms, irradiation, artificial ingredients, antibiotics.
- Healthiness of organic foods—lower residues, safer, healthier to eat.
- Quality of organic food—taste, shelf-life, appearance.
- Concern over biotechnology—going too far, against laws of nature, risky, labelling, incompatible with organics.
- Buy more if it was available: if I could find it, if it was available as convenience, packaged and pre-prepared food.

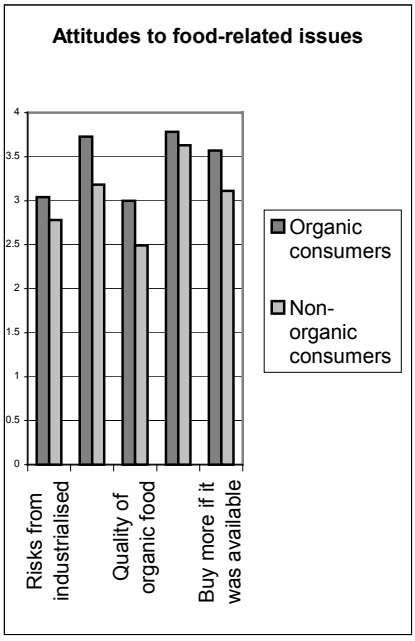


Figure 6

For Figure 6 one equals not at all concerned and five equals extremely concerned.

As with the motivating factors behind food choice, levels of concern over food-related issues follow similar patters for organic and non-organic consumers but with organic consumers expressing stronger levels of concern for each individual issue. Increasing concern was also correlated with increasing organic consumption (albeit weakly).

Respondents were also asked their views on the fairness of paying premiums to farmers for farming in an environmentally sustainable manner, with no significant differences emerging between organic and non-organic consumers.

Conclusion

Organic consumers are clearly drawn from a broad cross-section of Australian society—organic food is not the sole preserve of yuppies, greenies or health nuts. While organic consumers expressed stronger views and motivations in relation to issues such as the environment, animal welfare and biotechnology, their views were not radically opposed to those of non-organic consumers. As the focus group interviews also conducted as part of this research showed, acting on any issue of concern is always made potentially problematic by competing desires and concerns, of particular importance being convenience, availability, quality, price and trustworthiness. This data suggests that relatively small increases in motivation towards the factors and issues identified above may be sufficient to dramatically increase organic consumption at a national level. Given the small number of people who consume more than a little organic food this may be exactly the process responsible for the dramatic increases in demand the industry is currently experiencing.

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10. The Organics Industry - A Retailer's Perspective

By Barbara Murray
Annabel's Natural Food Store

Nineteen years ago I started an organic food cooperative in Bathurst, organising parcels for about thirty people. I packed, they collected, we split the costs - a community project.
Almost 12 years ago, after moving to Sydney, we opened Annabel's Natural Food Store in Crows Nest - a commercial venture.

At that time in Sydney, the late 1980's, there were 2 or 3 home delivery services and one or two retail outlets offering some organic produce. North of the Bridge there was only Warrah Farm at Dural, the earliest organic supplier in Sydney in the modem era.

Now, in 2001, there are about thirty outlets. The number of home delivery services has increased and they still supply the bulk of the market, 65% to 70%. The retail shops include both shops like our own who, in regard to fresh produce, only sell certified organics and others who sell a mix of organics and "conventional" produce, In Sydney there are only three shops certified with ORGAA as organic retailers in contrast to Melbourne where ORGAA has 30 shops and 13 home deliverers on its books, perhaps reflecting its Victorian base. BFA has one certified butcher's shop in Sydney. So there is a long way to go on the domestic retail certification front. The two certified wholesalers in Sydney, through whom we obtain most of our fresh produce, each have BFA and NASAA certification.

Two years ago we were invited to be the organic produce stall holder at the Growers' Market at Pyrmont organised through the Sydney Morning Herald's "Good Living" supplement on Tuesdays. This was followed by the Northside Produce Market at North Sydney, Being local, at Crows Nest, we were invited to join. Both markets provide a good exposd for organics. People are becoming more interested in the "non-supermarket" type of shopping, mostly wanting the open air, unpackaged, more immediate shopping experience. Weekend markets seem to be springing up everywhere. We have lots of invitations to join them, some on Saturdays, some on Sundays. Markets are fun but hard work. Two is enough. I suddenly find myself needing to observe the Sabbath again.

There have been marked improvements in the reliability of supply, the range of products and the quality of produce, but some less than presentable produce still slips through occasionally. At the retail level people buy with their eyes and this cannot be changed. The produce must look good as well as being good.

An increasing number of chefs prefer organics for its flavour. This is good for the industry not only because they are another buyer but also because they are increasingly writing for papers and magazines and doing T.V. and radio work. Other food writers often ring for an organic slant on a particular story. Friends ring to say they did not know I was such as expert on potatoes or honey. The organics network is generally pretty helpful when it comes to quick research on a specific topic like "Why do organic potatoes still have a wonderful earthiness and soil still on them?".

I think people are gradually realizing the value of the relationship between the food they eat and where it comes from - clean soil, clean water, and caring farmers who value what they do for the environment and for our health.

Education is so important and comes in so many ways to such a diverse population. There is the mass media - usually quick grabs, which, if they are often enough and positive, can reach large numbers of the general population. Having a national spokesman through the OFA has been a marked improvement. For retailers the opportunities for communication and education are usually informal and spontaneous. We have to be prepared to answer quickly, concisely **and accurately any number of questions about** organics, from health, to nutritional value, to pricing, to cooking, to " did you pick this this morning?", or " from what part of Australia do you get your organic products?" On this last question there seems to be a widespread misconception that organics all comes from one magical and mysterious place. Perhaps organic farmers across the State and the Nation could help the industry by raising their profile.

Retailers - we are open to the public 7 days a week from early morning to late evening - are on the front line when it comes to being accessible, we are the public face of the organics industry. The more information we can get from you the producers about your products, the better informed we are, the better we can sell it. And we are the front line contact with the consumer. Consumers are, of course, the experts about what consumers want. But, within the industry, we, the retailers are your most direct contact with them. We deal with hundreds of them every day. If you want to know about the domestic market, please listen to us.

For suspiciously loitering customers I use the feather duster technique. There I am busily dusting shelves around them while seeing that nothing gets slipped into the bag surreptitiously and casually striking up a conversation. The honest, interested loiterer often wants to chat. It is 16 metres form the back of our shop to the front and when I set out to do the banking it often takes me 30 minutes to traverse that distance. When my husband comes to collect me my conversations drive him nuts. Getting Barbara out of the shop is like pulling teeth he says.

Only last week I was approached by a lingering customer on my way to the bank. He was a charming man looking into honey - another one. It turned out he was a well known Sydney chef and a food writer for the Sydney Morning Herald's Saturday Metropolitan section, readership 175,000. Even if organics is not mentioned every time by these writers, they and their readers are exposed to organics Just by coming into our store. The organics industry has to get more active and more sophisticated in dealing with the media. We have to develop and nurture relationships with the key personnel of all the media outlets - the people that are interested to write copy for us. "The Land" is read by farmers, not consumers.

We have a brochure and a business card, at the moment being up dated, and also distribute the Organics Brochure produced by Catriona MacMillan of Heaven and Earth Systems for the Royal Easter Show for the past few years.

The Royal Easter Show has been another great expos6 for the organics industry. Getting into the Hall of Excellence with the "conventional" produce displays at the Show proved almost impossible the first time in 1998. Catriona elicited a letter from the Minister for Agriculture which did the trick. Organics was seen as a fringe hippy thing. "Conventional" farmers turned their eyes the other way when they heard or saw the word "organics". Thousands of brochures were distributed; we even checked the rubbish bins just in case people were being polite in taking a brochure but very few were recycled. The next two Shows saw a huge shift. Farmers were coming to the stand seeking information. We set a high standard of presentation and won a "best exhibitor" Ribbon in 2000. The Royal Agricultural Society begged us to be there this year but, unfortunately, the resources were just not available.

At the markets at Pyrniont and North Sydney I give out the "Organics 2000" brochure to almost everyone. A recent "Weekends in Sydney" show on Channel 9 featured the Pyrniont market and the director of the market described the interest in organics as huge. That was on a Friday evening before a market and the next day we were flat out and sold out of most lines.

The May-June Inflight Magazine on the Qantas Sydney to Tokyo flight features the Pyrmont market and many of our organic products - some great shots of limes (for the gin **and tonic) and rhubarb.** Not to mention our stall, one of 200 or so. Interestingly, the big sellers at the markets are snow peas, beans, silver beet, beetroot, rhubarb, broccoli, tomatoes and cauliflower. I pile these so high at 7 am we cannot see over them. We love doing the markets. It's a short enjoyable days work - except for the planning, packing and unpacking.

There is still a perception that organic food is expensive. And it is, relatively speaking. I find that many more people could afford organics if there was an acceptable difference between organic and "conventional" produce. But an average difference of 70% (Choice September 2000) with some products as much as 400% higher is not acceptable. This needs to be addressed urgently, both in terms of making the difference more reasonable and in justifying the difference to the consumer, if the industry is to grow. We need specific detail about the relative cost of production of lines that are more expensive. At the retail level we stay in line with conventional margins. We are not responsible for the difference. Where there isn't a marked difference in production costs between organic and "conventional" produce, there should not be a marked difference in the retail price.

We want to see that farmers are paid properly for their product. Patrick Holden of the British Soil Association talks about the real cost of fanning and the possible subsidised cost of some "conventional" farming produce. If this subsidy of "conventional" farming applies here in Australia, this too needs to be explained, or organics similarly subsidised. As retailers we have taken organics out of the closet, raised its profile. We are selling your product. We need one another. Let's work together to further the industry.

My other concern is good marketing practices. I have mentioned the importance of good presentation of fresh produce. With value added products "the eye of the beholder" must be the focus because that is who decides to buy the product and the majority do it on the basis of what they see, what catches the eye. Appropriate packaging - style, wording, design - to fit the product and its point of sale is vital. Maybe there are R&D funds available for developing marketing assistance for the smaller producers who want to value-add themselves. I have brought along an example of contrasting packaging. It is a classic. Two jars, two sizes, two labels, one price, same jam. Which sells best? The lighter more attractive label, the tall slim Jar which holds less jam.

There are more and more traders coming into the store, and faxing and phoning with "organic" products from more and more countries with more and more certifiers. For the uninitiated the decisions, the choices, can be mind boggling. And then there are the questions of taste and quality. In the wider food industry samples are generally left for you to assess the product by its taste. Not so with organics! There appears to be an assumption that a product is saleable simply because it is organic. I have taken the occasional risk and this has left me pretty wary. With this proliferation of "organic" products coming into the country and onto the open market, I would suggest that assistance from experts in organic certification be readily available to give guidance to retailers and wholesalers. This, I believe, is an urgent item for the domestic legislation agenda.

There is also a trend towards proliferation of " organic" retailers. The certifying bodies need to be more vigilant in their certification and promotional support for retailers claiming to be organic. To date it has been impossible to run a viable retail outlet that is exclusively organic. On the other hand, there needs to be some kind of standard set for who can claim to be an organic retailer. Two recent cases illustrate the point, A shop in South Australia was given front page coverage by a certifier as an organic retailer. They had only four or five organic products in the shop. Another shop was described by journalists as organic when amongst its 4000 lines it had one organic product, a packet of com chips.

Smaller local organic growers and producers need special mention. Again, with media hype, they seem to come out of the woodwork. They need easier access to a cheaper and simpler form of certification. As mentioned earlier, growers markets are the latest trend around Sydney and up and down the coast. Market organisers and genuine small organic growers and traders need protection from others jumping on the "organic" bandwagon. Believe me, there are some terribly creative people when it comes to describing products as organic. Consumers and the organics industry at the domestic level need legislative protection. Small though it may seem, important it is.

A word about on farm packaging of fresh produce. Despite all its obvious advantages, the polystyrene box has to go. It is environmentally unsustainable and therefore inconsistent with the principles of organics. But whatever of the principles, it is, now, impractical. They can no longer be reused and we have no way of disposing of them. Waste disposal services will not accept them. If farmers or wholesalers deliver goods to us in them we will unpack the goods on the spot and send the box back with the delivery truck.

To leap from the extremely mundane to the highly abstract let me leave you with some bigger questions to reflect on. What is the place of a small specialist organic retailer in the globalising capitalist economy, what are our chances of survival and success in such a setting? Some of the parameters of this question to consider are:

the size of the business - David versus Goliath product value - image versus substance product character - global standardisation versus local diversity service - corporate versus personal success - profit alone versus value and viability the relationship between the large corporation, e.g. the supermarket chain, and the small retailer - are we only competitors or do we need one another?

If, for example, the supermarkets succeeded in their stated aim of getting ever increasing market share until they put the small, independent, specialist retailer out of business how would a new product ever get on the market? The supermarkets only take the proven best sellers. They watch us to see what sells. communication - advertising versus education consumers' interests - who do they want and who do they need? Consumer representatives, The Australian Consumers Association and the ACCC, seem to focus only on the best price. But are not quality and range of choice also issues for the consumer? environmental impact - massive v minimal. do ideals have a future? Is the organics industry not only an alternative method of production but also an alternative way of doing business and offering a service? Are we questioning the economic rationalist as well as the chemical producer?

We think about these questions but are too busy unpacking the boxes to read around the subject and develop and write down our thoughts. We need some theorists, some researchers, to do this for us.

If you are in Sydney sometime drop in for an organic coffee and, hopefully soon, see our new lay out and colour scheme. It is a mixed blessing having a student architect for a partner.

11. Home Delivered and E-Shopping

by Geoff Richardson (Home-Delivery)
and Peter Richardson (E-shopping)

Overview

The Organic produce home delivery business is not just a food business. It is in fact a service business as much as anything else. Increasing numbers of supermarkets are now offering an expanding range of Organic produce. The only way for Mr. Little to compete is on the basis of service. Coles and Woolies will never be in a position to ask about the new baby or greet a customer's kids by name. This is where a small independent business has an advantage.

Today I thought I'd touch on some of the more important aspects of starting and operating an Organic home delivery business. Peter will then cover the role of email and the use of the web in greater detail.

Firstly, your choice to embark on the home delivery option must be soundly based. I'll briefly compare home delivery with the operation of a retail shop.

PART ONE – HOME DELIVERY

Home delivery vs retail shop

Home delivery involves working from either your home or a factory/warehouse space. Working from home involves **no extra rent** although your car may have to give up its garage. Remember every $100 saved on rent is $300 or more of sales you don't need to make. Travel time to work is eliminated and this option is especially convenient if you have pre-school age children or wish to be there when kids get home from school.

Warehouse rent is lower than a shop and you'll get a larger area as well. If you have designs on a large number of customers or like the idea of getting away from home this may suit you.
Retail shops achieve **greater impulse sales** because customers can see and feel stock. This is especially true for grocery items. However, this can be partly overcome with a **good catalogue or website**.

If you home deliver you will need a roomy vehicle such as a van or truck. It needs to be reliable and costs money to run and maintain. In fact the costs of running and maintaining a vehicle in addition to your family car can be can be more than shop rent.

Home delivery hours are **more intensive** but can be over fewer days than those of a shop and are also more flexible. Shop hours are longer and fixed.

You also really need to be a **'people person'** to operate a shop. This quality is also desirable for home delivery but not as vital as often you do not meet customers or only meet them for a few seconds.

Finding customers or letting them find you?

Yellow Pages - We have found the Yellow Pages a very effective form of advertising but it can be costly especially if your delivery area is limited by choice or geography.

Letterboxing costs about 15 cents per household including printing and delivery via Australia Post over a large area but obviously is much cheaper if you do your own walking.

Door-knocking in a prime area (i.e. one with a high density of potential customers) this is a very effective, although initially time-consuming, way of finding customers. Personal contact is made right from the start and the customer feels 'special'. You can achieve a relatively high number of customers in a small, easily serviced area.

Word of mouth is very effective because a happy customer's friends are highly likely to have similar interests and values. We offer a small gift if a new customer quotes being recommended by another, existing customer. We don't make a big deal about it. We just put it in their box with a handwritten 'thank-you' on their next delivery. Pretty soon they are recommending us to everyone.

The Local paper is almost useless unless of the free, home delivered magazine type which may lie around the house for a month or so.

Free publicity - It's also possible to get free publicity. Organics is still slightly fringe but at the same time topical and trendy. As such it is relatively easy to convince your local rag or radio station to do a story about your business. Every square cm of editorial is worth 7 sq cm of paid advertising.

Try to avoid the 'scare 'em to death' approach to advertising and publicity. Present Organics as a return to old-fashioned values, trendy, the new direction in agriculture, safe etc but do not go on at length about the dangers of pesticides, cancer etc. You will turn as many people off as on with this approach because you are confronting their value system. After all, most of them currently eat non-Organic food by choice. If you tell them they are poisoning their families they are more than likely to go into denial mode.

Creating the personal touch

There are a number of strategies which you can employ to keep contact with your customers where face-to-face contact does not exist or is minimal. Remember, you haven't the time for a long chat or cup of tea with each customer.

Above all, each customer must feel that his/her needs are being met by you and that any communication with you is both appreciated and will be acted on.

Strategies we employ

Newsletter - We try to put a half or one page newsletter in the boxes on most weeks. It contains details of this weeks produce (e.g. 'the funny looking potatoes are Jerusalem Artichokes'), news about Organics in general, reminders about upcoming school/public holidays, recipes etc.

Email - Over 50% of our customers now have email at either home or work. We issue an email newsletter on Monday afternoon with a detailed list of what will be in the mixed boxes for the week and a reminder to visit our website if they would prefer to order a custom box. Customers can then simply reply to this email

to either order a mixed box or alter a standing arrangement. e.g. “no potatoes this week but add extra oranges”

The Phone is a very time consuming method for larger numbers of customers (over 30) and can get very expensive. Most of our customers are in another STD area so we try to keep phone calls to a minimum. We utilize an answering machine and have ‘trained’ our customers to leave short simple messages.

This interaction is minimal and rather impersonal but the customer does feel he/she is communicating directly with you and that their requests/concerns are being addressed.

User Manual - We also issue each new customer with a *Doorstep Organics User Manual* which details how our ordering and delivery systems work, information about Organics, specific information about some of our grocery items etc. This helps make the customer part of our “family’ of customers and more likely to order again.

Packing the boxes

Most home delivery services offer both **standard boxes and custom boxes**. Standard boxes are a mixture of this weeks produce with the only element of choice for the customer being an indication of the items they particularly do or don’t like. These boxes are quick to pack on an assembly line system and order stock for.

Custom boxes involve the customer giving you a specific list of items and quantities. If you are taking these orders over the phone you will spend **a lot of time on the phone,** usually at night and often in the middle of dinner or the ABC news.

A few customers will use a fax and some will initiate an email. You will then probably have to retype them into a format which suits your packing operation.

By far the best way to receive and process these orders is via the web.

The customer places the order in their own time and you receive an email/order in the format which suits you. You simply cut and paste the order from the email to your customer database.

The web is also a good way to reach male consumers who are often antagonistic to their partner’s idea of buying Organics on the basis of cost.

Surprisingly, it’s a good idea when they can do it from the office. They can do the order Monday afternoon just after their long lunch, which probably cost about the same as a week’s worth of vegies for the whole family.

Almost all new customers are happy to start with a standard box and as long as you are willing to accommodate their preferences from week to week they usually stick with the standard box system.

You're packed. Now how to deliver them?

The most important factor here is getting the produce to the customer as **quickly and freshly** as possible. My experience is that customers do not want a delivery after about 8 pm as they still have to unpack the box and store in the refrigerator.

Home delivered produce has come straight from your coolroom to the customer and as such should be fresher than produce from the shelves of a retail shop. It is a shame to negate this advantage by having the box take an excessive time to get from you to the customer, especially in hot weather.

Delivery options include-

- **Courier.** You will need to have the boxes packed early morning so that they can be delivered same day. This means either a very early start or a lot of preparation/pre-packing the day before. Cost can vary from $4-$7 per box.

- **Personal delivery**. A limited number of boxes can be packed and delivered personally on the one day. We found the limit about 50 customers but that involved a very long and exhausting day. When we were using this system I often started at 4 am and got home at 10 pm.

- **Customer/helpers.** We have devised a system whereby some of our customers do our deliveries for us in return for their box. We drop of a number of boxes to their home and they then head off and deliver to our customers in their area. They collect empty boxes from last week and any payments. We pick these up later or next week when we drop off again. This system means we can start later and finish earlier. The deliveries are also condensed into a shorter period so get to the customer fresher. Cost to us works out about $2.50 per customer.

Beware The GST: Whilst most Organic produce is GST free, delivery is not. If you charge a separate delivery fee you should be charging GST on that component. We home deliver free and thus avoid that hassle altogether but have a minimum order size so we are not delivering small orders for free.

So there you have it.

If you are prepared to work some long and odd hours and be a little innovative in your approach you can succeed in this business. If you are already involved in home delivery, I hope I have made sense and that there may have been a point or two which will help your improve your business.

In any aspect of the Organic industry you get the opportunity to mix with some great people and promote the health of both your customers and the planet. Home delivery is no different and in addition it "keeps me ON the streets".

PART TWO – E-SHOPPING

E-mail & your customers – the first step

The most basic approach to e-commerce is to at least initiate email contact with your customers. Just about everyone now has a dedicated email address that allows them to receive messages instantly. Simple, quick, direct, easily replied to, cheap and most importantly acts as a reminder to order or adjust a standing order – the paperwork does itself, no need to write notes to yourself!

Ways to use it

1For Home-Delivery businesses it allows customers to quickly and efficiently inform you of their needs. If customers start throwing produce away at the end of the week they will more than likely drop off. The trick is to give the **maximum opportunity to your customers to fine tune an order** at minimum cost to your time.

Make the email easily accessible giving customers the option to email you from every page. A very sensible idea is to provide an **email form** that your customers can fill out. Instead of clicking on the link and receiving a blank email to fill out it provides a web page with a series of fields that the customer can fill out.

These aid you in collecting the customer's data, making sure you know as much about the customer as possible. This can be extremely useful as initial success with your customers is important. **First impressions are the most important.**

By having an email form you can prompt consumers to give you the information that you require from them. This makes marketing to the customer more effective whilst managing customer data is easier with most databases able to read comma separated files.

Setting up an organic business on-line

Hosting & addressing your site

There are two ways to host your site.

The first is relatively simple and exceedingly cheap. Most isp's provide free web hosting to their subscribers. Whilst this of course is free there are limitations to what you can do with the free hosting. Firstly the address will be a sub-shoot of your isp e.g. **www.one.net.au/organicbusiness**.

Secondly the size will be limited to say **10MB** – enough for a simple site but once you start to add large graphics etc you will exceed their limit. Thirdly you wont be able to use software engines such as cold fusion etc. which are necessary to power active database interactions such as shopping carts.

Independently hosting your site allows several advantages. Firstly the ability to host your own domain name. E.g. www.organicbusiness.com.au or www.organicbusiness.com. (Note below the addendum to registering com.au names). Your own domain will cost you **$150** to **register** for **3 years**. That's about $35-

$40 per month total. I think it's well worth it especially if you advertise at all. Your own name will be easy for others to remember. To host your site will cost about about **$30 per month to host** at most ISP's.

1. Email advantages
Available through an isp but if you have you site hosted with a web host & you have a domain name it is a simple procedure for the host to set up an email that uses your domain name as the email. The mail is simply redirected to your regular email. This makes it easy for customers to remember your email and handy should you change isp's.

Eg. your domain name is www.organicbusiness.com.au

Your email can be anything@organicbusiness.com.au

This is an important issue as it brands your service as a professional electronic service. Email coming in can be directed to any employee or subject you wish it. For example any emails regarding your web site can be sent to webmaster@organicbusiness.com.au or orders to sales@organicbusiness.com.au. It costs nothing more, once you have set it up it is usually included the web-hosting fee.

2. Registering a com.au domain name
You need to have a business name registered in the name you wish to take out.
The domain name can only be an abbreviation of the registered business name.

Portals & search engines

1. Search engines
There are 3 types of search engines:

- **Crawlers or spiders**
  These search sites on the internet and (periodically) index their pages
  Listings are given prominence by several factors – site name, description, keywords & metatags. All have their own formula and are constantly reviewing it to take into account web designers reverse engineering their sites to promote them.

- **Human powered directories**
  These work in a completely different way to the crawlers in that each page is reviewed by an editor. Sites are suggested and then disseminated to be reviewed by volunteer editors around the world. The better the site is the more likely it is to be reviewed for free.

- **Combination**
  Working with both criteria above. Generally these use the human reviewed sites with additional content for advanced searches from another crawler.

For more information see www.searchenginewatch.com

2. Use of portals
Anyone can have a website but it's being found by potential customers that is the secret to making it work for you. Much time and money can be spent on search engine recognition with little results.

The size of the portal is important but a small specific portal well marketed to its target audience can often be more effective to the listees and advertisers than a large generic portal.

Building your website

Keep it simple; your customer knows less than you!
The easier you can make it for your customer to use your website or email the better.

Make your website circular. This means that from wherever the consumer is they can then access any other part of the web site easily without getting lost. The main aspect of the web site should never be more than 3 clicks away, With ordering of products clear and accessible from the homepage.

Things should be quick & easily accessible without too many large images to slow down the loading of the page. However you still want the customer to come away with a feeling from your site. Striking the right balance can be tricky. The use of frames can help here. Whilst the side frames load customers can access text-links on the alternate page giving you the best of both worlds.

Whether your aim is to show a cheap image or a classy one functionality is still of paramount importance.

Never let your customers leave the web site
If your site links to another site make sure it opens in a new window. This leaves your site open on the desktop and regardless of whether they actually return to your site for active browsing, they will still have to close the window.

How far do you need to go?

General tips when commissioning a website
Just go to the limit of what you can do for now. Don't spend a fortune, a small amount of effort can go a long way but a large amount of money can be wasted in web design fees in a very short space of time. Baby Steps!

Like building a physical shop, the virtual shop takes time and ultimately someone has to spend the time creating it. A popular misconception is that anything to do with computers is quick and easy. Moving the mouse can be as consuming as the paintbrush or the hammer or the saw. You have to build the walls (backgrounds), features (graphics) as well as the fixtures and fittings (shopping cart etc) by HAND. They are not spontaneously generated by computer.

Likewise when going to develop your website be prepared – research what you want to say. What look/feel do you want your customers to go away with? Your web-developer can help you mould this but ultimately the decision on what direction will be yours. It will save you much aggravation and possibly money in redesign fees if you can have a clear idea from the start. It will also cut down the developer's time (and your cost) if he/she has a clear direction especially in regards to content.

Tips
1. Get your developer to provide a colour scheme to start.
2. As the project continues get samples of the graphics for each section before the developer creates the whole set.
3. Provide the developer with coherent researched content.
4. Ask the developer specifically what sections to provide content for and how many words in each.

Doing it yourself - knowing when it's time to stop
Many people make the mistake of taking on too much in a business. Concentrate on what you know and leave complex or specific tasks to others who have experience or expertise in a particular area. Web development is very much one of those areas. Whilst it is very simple to develop a site on Dreamweaver or some other web development tool eventually you will reach a stage where it becomes to time consuming and complex to continue.

The importance of professional and industry based web-designers
It is important not only to have web designers and graphic designers who are talented and proficient with their tools but it is also important for these people to know the marketplace they are designing for. This can not only save you valuable time but also money.

A common story I hear from people is as follows…'Oh we're getting a website developed…my brother is doing it. He started it 6 months ago.'

If you are serious about getting into E-commerce be sure that the person doing your website is a professional. There is no value in getting a website that either doesn't achieve what you need or never eventuates.

OR…'A website! We got one done – it cost us $3000 and were very unhappy with it. They just designed it, took the money and that was it.' – Many people I speak to getting their first website have had a bad experience for a number of reasons.

They are from an industry or an area which is traditionally non-tech i.e. organics - they don't know what to expect from a web-designer or a web-site so they don't feel they can challenge what has been done. Nor do they know what it is initially that they want or need from a site.

Just as good however is the co-operation of marketing of personnel with industry specific knowledge about the desires of consumers. However this approach involving a third party will add an extra expense one not likely to be warranted by small organic businesses whose primary aim of an internet site is to make business more efficient.

Direct e-trading (shopping carts)

When a customer comes to the site they are immediately given the option to purchase. Rather than you having to contact them back.

Purchasing shopping carts
You can purchase shopping carts in 2 fashions…

1. You can get one developed
You pay all the development fees up front. This is slightly cheaper in terms of the amount you pay for the cart (especially if you know you aren't going to need any significant changes over the next couple of years). Changes to your weekly product list will of course incur a fee (usually included in your hosting package if the host is the same firm as the developer).

2. You can rent one
You pay as you go for the use of a piece of software that plugs into your site.
This means you have to pay an additional hosting fee. This is offset with several advantages. You can make changes with out having to radically alter the structure of your website and product updates can be done on the spot.

How shopping carts increase average sale and turnover

Doorstep's average non-web sale is $42. Average sale via the website is $58. That's a 38% margin.
Why? It turns your products from a need-buy basis to a more want-buy basis.
Also money that consumers can't see is money they are more likely to spend.

Credit card transactions over the net

Since most sales are to regular customers so you only need to get their credit card details once. This can be done by you phoning them on receipt of their first order. This is also a good opportunity to have a short chat about where they heard about you, any special dietary requirements, their delivery day and likely time of delivery.

The alternative is to set up a secure site with automatic credit card debit facilities but this can be costly and for this type of business unnecessary. Direct credit card transactions are still treated with suspicion from consumers and online transactions tend to be avoided whenever possible.

12. Australian Regulations for Organic Produce

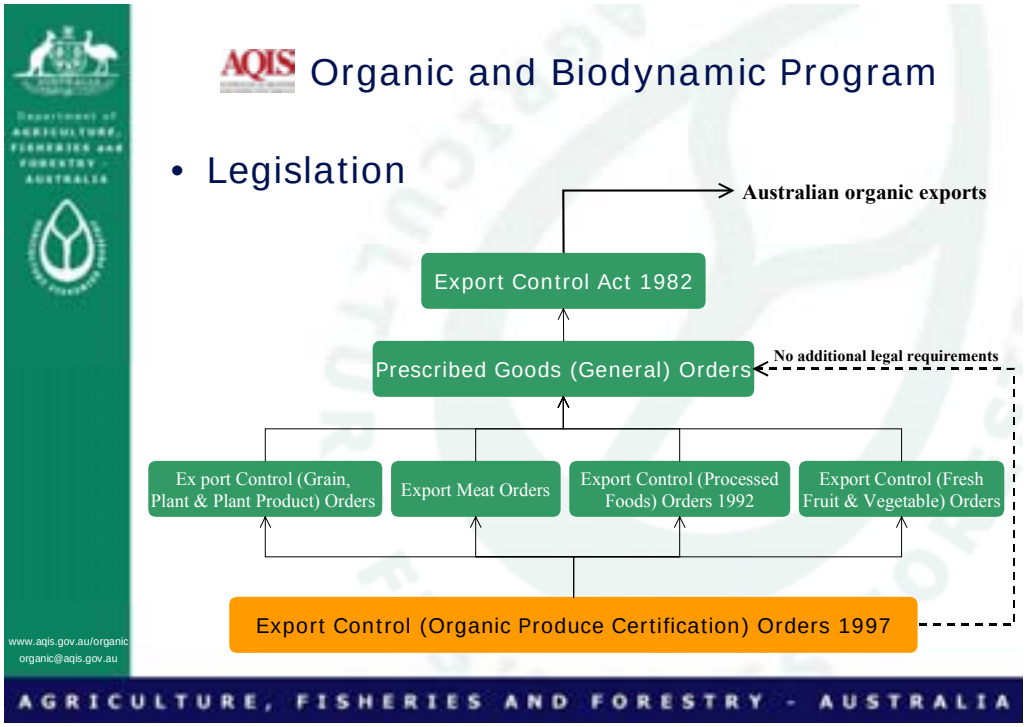
By Ian Lyall
Australian Quarantine and Inspection Service (AQIS)

AQIS began its partnership with the Australian organic industry in the late 1980's.

Approved certifying organisations provide inspection and certification services for Australian farmers, processors, exporters and importers.

Australian organic management systems are based on:

- Australian legislation; and
- the National Standard; and
- Importing country requirements:
  - European Regulation 2092/91 - including certification standard EN 45011.
  - and soon - the Japanese Agriculture Standard and US National Organic Program.



National Standard provides *minimum* guidelines for the production, labelling, transportation, importation and processing of organic produce.

National Standard is continually reviewed against legislation, standards and organic practices both within Australia and overseas.

AQIS obligations to stakeholders includes:

- auditing approved certifying organisations + selected "certified operators";
- regulatory enforcement when non-compliance occurs; and
- financial transparency and accountability; and
- overseas market access submissions and maintenance.

AQIS/industry outcomes for 2001-02

- Development of database utilising organic export information;
- Amend export legislation;
- amend the National Standard (*priority*);
- "equivalence" with Japan and European (livestock) regulation;
- develop operational policy that further enhances the verification processes of the program.

Conclusion

The AQIS Organic and Biodynamic program:

- is a third-party inspection/certification model primarily administered by the industry with:
  - systems/processes that are measured against the National Standard, importing country requirements and legislation.
  - AQIS providing a *minor* operational role.
- will amend documents and legislation to ensure harmonisation between Australian and international regulatory systems/standards.

13. Organic Standards and Food Safety

By Andrew Monk

Standards comparison

- Comparison of systems and standards internationally
- Performance of Australian Standard
- Position of Food Safety and Organics
- Recent developments and Future

Standards

Standard – "to stand"

- "a flag or ensign set up and around which men rally, or under which they unite for a common purpose."
- "that which is established as a rule or model by public opinion, custom or general consent."

Standard development

- Development of organic standards late 1970s
- IFOAM – International Federation of Organic Agriculture Movements
- EU – 1993 – EC 2092/91
- Australia – 1992 + OPAC Group
- Across the world (mostly) private certifiers developing and certifying to generally common Standard(s) – now increasingly regulated at a state (national) or regional level.
- Note – industry and stake holder driven industry – strength in market and industry

How do we stack up?

- Australia has third country importer status with EU
- Immanently signing agreement with Japan
- USDA – expected 2002
- Based upon development in 1990s which saw establishment of uniform (and internationally compliant) National Standard

The organic myths

- Industry is disunited (7 certifiers; cf US 49+; EU…)
- Industry needs only one certifier (effective competition for services)

- Australian national organic system is not of use to domestic trade nor well known OS (Australian Standard playing key trade role – EU, Japan, US, whilst a BINDING agent domestically)
- Export Standard is too high and stifling organic growth (on par with all key international texts – organic as "transnational" and domestic for OS. Anything less would affect the market place).

Comparisons

- General criteria - equivalent
- Eg Conversion periods to certification
  - US, Japan, Australia 3 years (harvest)
  - EU 2yrs from planting (3 yrs for perennials)
- Domestic regulation – cf Export
- Animal feeds – Australia in excess of requirements – eg 100% versus 80% from certified organic.

Why higher or more standards?

- Recognised need for addition of:
  - Organic Management Plans
  - Biodiversity Management
  - Addition of honey, textiles…
- Food Safety?
- So…, when is it sensible to go above basic Standards…?

Answer

- When the consumer demands/EXPECTS it!
- When it doesn't RESTRICT industry
- Producers produce organic in general because: Money; Environment; health farm/family; "chemical-free" foods/food "safety"
- Consumers consume organic in general because: Food Safety; Health; Environment
- That is – an inverse (upside down) relationship!!

What is food safety?

- A traditional organic version:
  - "Process" rather than "product"
  - Eg free from *production* use of synthetic "chemicals", GMOs, most food additives
- A more general version:
  - Free from pathogen and other foreign material which may cause harm
- A comprehensive (organic) version:

- Food safety – non disease inducing whilst assisting in preventative measures and boosting of overall health

Producer driven demand

- "I have produced a product which is the best in the country, free from use of synthetic chemicals and GMOs"
- "Consumers want this product – they can't get enough and they pay a premium."
- "What I do must be sufficient as it is"
- "Food safety concerns of over blown"

Consumer driven demand

- "I want food which is free from synthetic products – is in its natural or close to natural state"
- "I need and expect food which will not poison myself or my family but will assist in building health and well being"
- "I am an "at risk" population / or sick and require fresh, natural, safe foods to consume"
- "I pay a premium price for food I expect is the best in the country"

Organic opportunities

- To engage in and transform the "food safety" arena and debate
- To deliver superior (certified) products which perform at the leading edge of consumer expectations
- To continue to deliver what the consumer has expected all along

Lead by example …

- Submission to National Standard
- Biological Farmers of Australia – Version 4 of the Organic Standard:
  - Full Codex HACCP component (non mandatory)
  - Registered QSA (for food safety) and trained organic auditors in field – dual audits for clients
  - Basic specifications (of Standard) currently under review by major retailers for compliance with core requirements of safety programs for (indirect) farm suppliers

Key benefits

- Delivering what customers (eg supermarket) and consumers want (if not expect!)
- Delivering what producers are demanding (and otherwise grumbling about)
- Non invasive and producer and market driven
- Region specific – Australian conventional industries leading this charge – need to remain ahead.

Our standards on par?

- Currently maintaining EU import arrangements
- Slow (and tedious) but successful Japanese arrangements being put in place
- USDA to be announced 2002
- Domestic control of Australian product – including imports?
- Change process of National Standard?
- Delivering on expectations of consumers?

Key messages

- Australian National Standard has been at forefront of Standards developments throughout 1990s
- Since late 1990s new players internationally regulating organic
- Key need for ongoing investment in Standards development to ensure parity and promotion of Australian system to OS markets
- This "investment" requires direct input of all stakeholders – consumers, sectors…
- Domestic legislation a key part of this
- Delivering on consumer and customer expectations and demands essential.

14. Certification Relevance - The Role of JAS-ANZ

By John Dean
Director, Policy and Development, JAS-ANZ
Joint Accreditation System of Australia and New Zealand

Key issues for certification

- Does the certification system have credibility?
- Can users have confidence in the certificates?

To achieve credibility

- Competence
- Impartiality
- Consistency
- Transparency
- Accountability

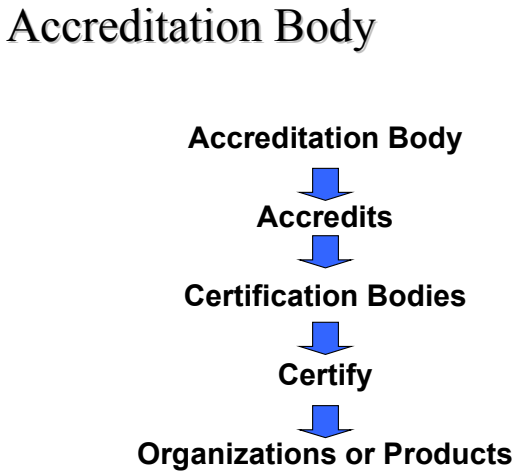
Accreditation

Is providing assurance that a body or person is competent to carry out specific tasks.

ISO/IEC Guide 65

"General requirements for bodies operating product certification systems"

Accreditation Body



What is JAS-ANZ?

- Established by a Treaty between the governments of Australia and New Zealand
- To be the national accreditation body
- Part of the National Standards and Conformance Technical Infrastructure
- Established by legislation
- Not-for-profit
- Fee for Service
- Based in Canberra - 10 staff
- Office in Wellington

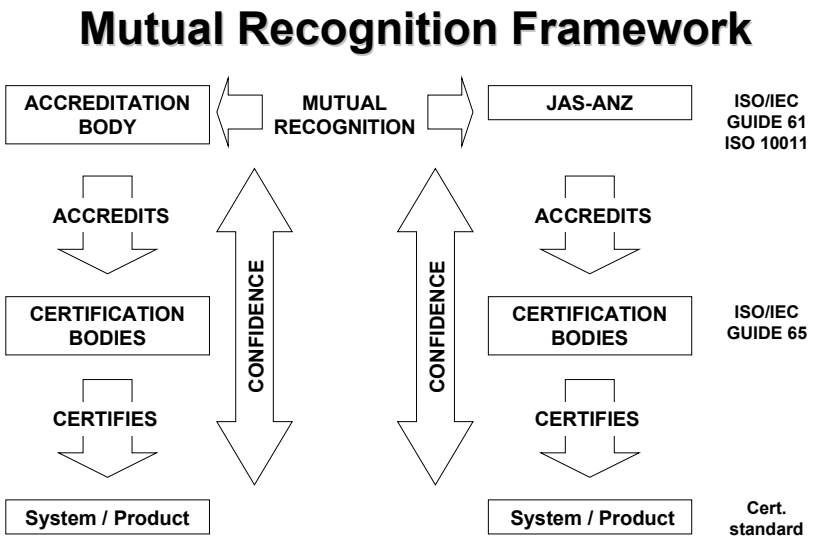
Objectives

- Provide an accreditation system that gives users confidence in goods and services
- Obtain international mutual recognition and thereby strengthen trading relationships.

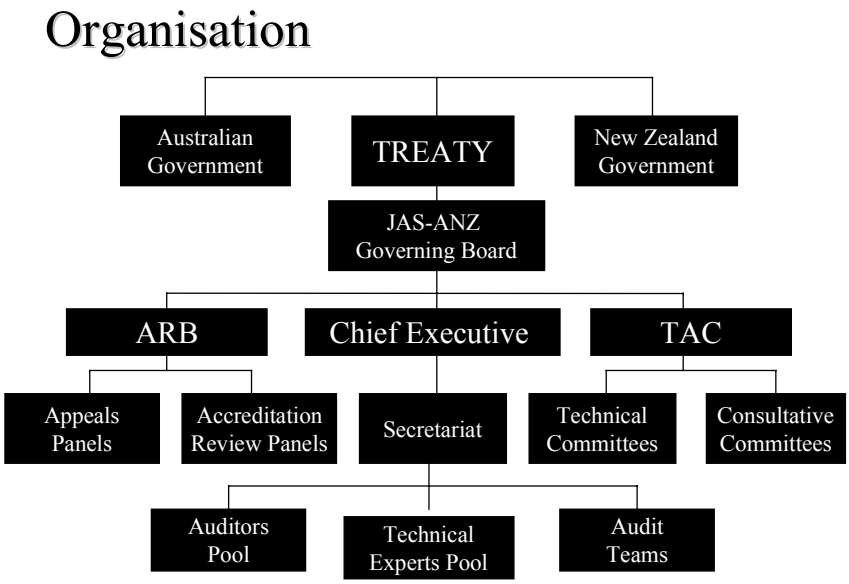
International

- Foundation member of IAF
- Foundation member of PAC
- Foundation member of IATCA
- Peer Evaluation by IAF/PAC/IATCA/EA
- Signatory to IAF/ PAC/IATCA/EA multilateral recognition arrangements

Mutual recognition framework



Organisation



What we do

Our business is accreditation of:

- Management system certification
- Personnel certification
- Product certification
- Inspection bodies
- Auditor training course providers

JAS-ANZ to date

Quality Systems	19
QS-9000	10
Environmental Management	10
Product Certification	7
Training Course Providers	2
Auditor Certification	2
HACCP Food Safety	4
OH&S	9
Medical GP	1
Disability Services	6
Dept of Transport	6
Information Security M'ment	App 3

Options

- Status quo
- Status quo plus JAS-ANZ option
- JAS-ANZ based system

Technical committee

Terms of reference:
To develop the criteria to be met by the certification bodies – based on ISO and IAF guidelines

Membership:
Representatives of stakeholder groups

Advantages

- Meets international guidelines
- Established by government for this purpose
- Established credibility
- Consistent with environmental and quality accreditation
- Transparent complaints and appeals processes
- Stakeholder involvement
- International operation

15. The Economics of Cereal-Livestock Farming in the 21st Century
What Has Changed?

By Dr Els Wynen
Eco Landuse Systems

Introduction

- Survey of 5 organic cereal-livestock farms
- Aim of the survey:
  - Get recent data
  - Compare with survey of mid-1980s and find common characteristics
- Funding: RIRDC and Agriculture Victoria

3

Farm Selection

- Farms (from NASAA and BFA list):
  - Victoria (Mallee-Wimmera and Central)
  - Southern New South Wales
- Requirements:
  - Dry-land farmers
  - Farmed organically for at least three years
- Average rainfall:
  - 425mm - 450, 1 pair: 650 mm

4

Conventional Farmers

- Similar to the organic farm:
  - Soil type
  - Climate
  - Enterprises
  - Management skill
- Names of potential inclusions:
  - Officers of local Department of Agriculture
  - Organic farmer

5

Average farming (years)

- Organic farmers: 23
- Conventional farmers: 22
- Conclusion:
  - No difference in experience in farming in general

6

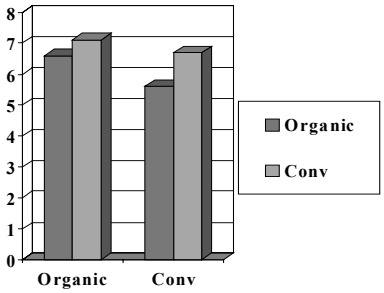
Organic Farming

- Conversion:
  - between early 1960 and mid 1990
- Average years farmed organically: 14

7

Farm management skills

- Conventional farmers managerial skills ranked more highly by themselves and organic farmers



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Physical Characteristics

			1998-99		1985-86
		Org	Conv	Org/Conv	Org/Conv
				%	%
Area operated	ha	962	1208	80	81
Improved capital					
value	$/ha	866	875	99	97
Arable area /					
operated area	%	81	82	99	90
Cropped area /					
arable area	%	32	52	62	61

Inputs ($ per ha cropped)

			1998-99		1985-86
		Org	Conv	Org/Conv	Org/Conv
				%	%
Fertilisers	$/ha	49	69	73	33
Pesticides	$/ha	1	33	3	6
Fuel	$/ha	58	35	165	107
Machinery	$/ha	108	108	100	88

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Inputs ($ per ha operated)

			1998-99		1985-86
		Org	Conv	Org/Conv	Org/Conv
				%	%
Fertilisers	$/ha	17	29	57	16
Pesticides	$/ha	0	17	2	3
Fuel	$/ha	14	15	94	54
Labour	$/ha	61	58	106	85
Machinery	$/ha	26	45	57	42

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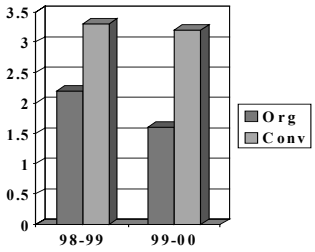
Wheat yields (t/ha)

- Organic yields lower
- Similar yields between systems in 1985-86



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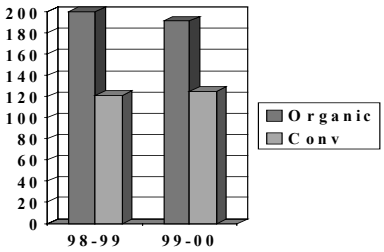
Wheat prices ($/tonne)

- Organic wheat price premiums high



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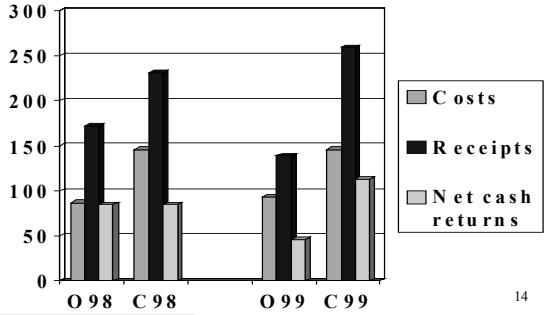
Cash returns ($/ha)

- Organic farmers:
  - lower costs, lower receipts, mixed cash returns



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Financial Measures ($/ha operated)

			1998-99		1985-86
		Org	Conv	Org/Conv	Org/Conv
Total cash costs	$/ha	87	146	59	59
Total cash receipts	$/ha	172	231	74	69
Net cash receipts	$/ha	85	85	99	78
Adjusted returns to capital and management					
$ per ha operated		11.78	8.45		
% per investment		0.82	1.43		

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Financial Measures ($/ha operated)

			1999-2000		1985-86
		Org	Conv	Org/Conv	Org/Conv
Total cash costs	$/ha	93	146	63	59
Total cash receipts	$/ha	139	259	54	69
Net cash receipts	$/ha	46	113	41	78
Adjusted returns to capital and management					
$ per ha operated		-15.8	39.7		
% per investment		-1.41	3.94		

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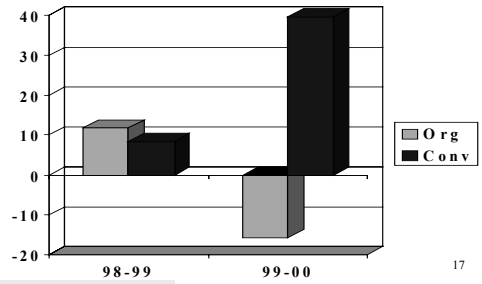
Returns to capital and management ($/ha)



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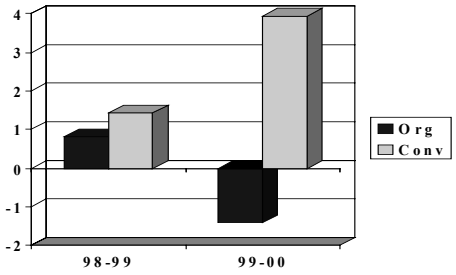
Return on investment



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Summary

- Longer rotations (less cropping)
- Relative yields per hectare:
  - Lower in recent survey
  - 'Oldest' organic farmers: highest rel. yields
- Premium prices: high at present (wheat)
- Net cash returns: higher and lower
- Returns to capital and management: lower

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Conclusions

- Under present conditions:
  - Some organic farmers: close to conventional financial performance
  - More recently converted organic farmers: seem to have a bit more of a struggle
- Conclusions are limited due to small sample

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Policy Implications

- **Farmers**:
  - plan carefully to minimise negative effects
- **Research**:
  - Production: directed towards the early phase of organic management
  - Economics: monitor larger sample and more years to provide conventional farmers with a true picture of what they can expect when converting.

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16. Organic Food Exports
Meeting Expectations of Export Trading Partners

By Gary Hullin
Project Manager – Agribusiness, Austrade

Presentation Coverage

- World organic market
  - Demand drivers
  - Common themes
- Target markets for Australian organic suppliers
  - Japan, Singapore, Hong Kong, United Kingdom, Scandinavia
    - *Market characteristics*
    - *Consumer Trends*
    - *Market Access*
    - *Opportunities for Australia*
    - *Key messages for success*
- Developing an increasingly export-oriented organic sector

World Demand for Organics

- World organic market worth more than *A$35 billion annually
- USA largest (A$15b), followed by Western Europe (A$8b)
  - Germany (A$3.9b), France (A$1.1b), UK (A$1b)
- Demand drivers
  - Food safety scares (BSE, GM foods, bacterial infection)
  - Increased awareness of environmental impact of modern farming techniques
  - Consumption of organics moving (to varying degrees in different markets) towards mainstream levels

*(Source: *Organic Food and Beverage: World Supply and Major European Markets, International Trade Centre,UNCTAD/WTO, 1999)*

Key Markets - some common themes

- Market Expectations
  - Price – variable margin levels accepted
  - Quality, presentation, nutritional value
  - Consistent supply
  - Critical mass
  - Reliable supply chain (↑ requirements for consolidation)

- Consumer Trends
  - ↑ awareness of food safety and quality issues
  - ↑ purchasing power and consumer sophistication
  - ↑ demand for nutrition and convenience
  - ↑ in niche consumers

Key Market Characteristics - Asia

Japan

- Demand exceeds supply
- Domestic production limited due to small field sizes, high density, difficult to create organic environment
  - local produce includes soybean, rice, buckwheat (soba), tea
- The USA and EU are the main suppliers
- China and South America also gearing up to supply
- Australia currently exports:
  - brown rice, spaghetti, cooking oil, wheat flour, cheese, fruit juices, coffee, beef (including hamburger patties), wine, sesame seeds, lamb
- **Market opportunities**
  - premixes, flour, maize, snacks, sugar, meat (ground beef, prime cuts), semi-processed meal bases, pasta sauces

Key Market Characteristics - Asia

Japan (cont'd)

- **Market entry issues**
  - MAFF Japanese Agricultural Standards (JAS) updated to cover 'Organic Certification Program' (effective 1 April 2001)
  - Australian (AQIS) certified suppliers granted equivalency to the JAS (some EU members also granted)
  - Despite equivalence, Australian certifying bodies yet to be recognised limiting ability to export (discussions underway)
  - Until full equivalency reached Australian supply to Japanese retail can be:
    - via JAS certified organic importer in Japan
    - Certified in Australia by JAS certified Australian company
  - US in abeyance, no recognised certification program – yet
  - Only 8 importers certified (June 2001) – further delays expected

Key Market Characteristics - Asia

Japan (cont'd)

- **Consumer trends**
  - Confusion over labelling requirements
  - Mainstream (supermarket) consumers will pay up to 10% premium
  - Commitment organic consumers willing to pay at least 10%
  - Quality to be as good, if not better than conventional (taste, presentation, value-for-money)
- **Key customers**
  - Supermarkets & consumer co-ops
  - Niche traders (catalogue companies, home delivery companies, premium food stores & natural food stores)
  - Food manufacturers (certified) to produce finished goods from Australian raw materials

Key Market Characteristics - Asia

Japan (cont'd)

- Key **messages** for success
  - Potential for growth limited until full equivalency reached - once granted, Australian suppliers need to be ready
  - Research target markets (manufacturers, niche retailers, prices)
  - Consider Customer requirements
    - expand variety of products (flour, oil, sugar, juice, honey etc.)
    - increase volume
    - prices to be competitive
  - Build Customer relationships to understand consumer needs, (product appearance, size, packaging, taste etc)
  - Marketing strategy to improve organic image
  - Expectation that Australian suppliers able to consolidate

Key Market Characteristics - Asia

Singapore

- Organic demand small but growing
  - Organic **retail outlets doubled** in three years, ↑ in concept stores
- The EU, USA and Australia the main suppliers of
  - Fresh fruit & vegetables; brown rice, bread, cereals, grains & legumes; wine; personal hygiene & beauty products
- Key issues
  - Supply challenges: retailers request ↑ variety, ↑ volume
  - **Premiums** range from **20-30%**
- Consumer trends
  - 65% of consumers are women in mid-30's with young children
  - Nutritional awareness ↑, but **price determining factor**
- Market entry issues
  - Same as for conventional food – open access
  - Certification to be agreed upon between importer and exporter

Key Market Characteristics - Asia

Hong Kong

- Demand **small but growing**
  - UK major supplier to supermarket grocery lines
  - USA (California) and Canada major suppliers for pre-washed produce
  - Small quantity of Australian product
- Key customers
  - **Supermarket** chains (Park'n'Shop and Wellcome)
    - premium highly variable from **50-300%**
  - Dedicated **health stores** (individual & small chain)
  - **Food service** operations
- Consumer trends
  - ↑ health awareness, **willingness to pay** (middle/high income earners)
  - Organic products seen as a 'treat', health benefits seen as vague
  - ↑ importance on **food safety issues** (GM products not accepted)

Key Market Characteristics - Asia

Hong Kong (cont'd)

- Market Opportunities
  - **Innovative**, complementary products, eg: **gift packs** (wine + pasta + cheese) and (yoghurt + honey + cereal + dried fruit)
- Market entry issues
  - Import requirements the same as for conventional foodstuffs
  - Certification by AQIS bodies recognised by importers, wholesalers & retailers
  - Preference for consolidation, important to appoint experienced agent or distributor
- Key messages
  - People want **value** for money – unless the premium is reduced, organics will remain niche
  - Market the concept not just individual products

Key Market Characteristics – Western Europe

United Kingdom

- Organics **most dynamic** food sector – demand exceeds supply and growing at 40% per year
- **UK imports 70%** of total organic produce and products
  - Germany, Netherlands, Italy, France and the USA main suppliers to the UK
  - Australian suppliers have had some success
- **Opportunities** for Australian suppliers
  - Grocery products: pasta, cereals, snacks, condiments, sauces, confectionery
  - Fresh fruit: premium apple varieties, stonefruit, citrus, tropical fruits
  - Fresh vegetables: asparagus, Asian vegetables, herbs
  - Food ingredients: for the food service sector
  - Meat: premium beef, lamb and possibly game meat (NB: quota)

Key Market Characteristics – Western Europe

United Kingdom (cont'd)

- Key customers
  - Major **supermarkets** account for 69% of organic sales
  - **Specialist** organic supermarkets account for 16% of organic sales
  - Remaining 15% to farmers markets, gate sales and **home delivery**
  - Growth in number of mainstream food manufacturers developing organic lines
- Consumer trends
  - British consumers prepared to pay a premium of between **20-30%**
  - Focus on quality assurance, food safety issues
  - **Convenience** key driver, ready-to-eat or pre-prepared meals ↑popularity
  - Most successful organic products **mirror mainstream** products
  - Packaging and presentation important

Key Market Characteristics – Western Europe

United Kingdom (cont'd)

- Market entry issues
  - Australian status as a third country organic supplier
    - certified organic products with an **organic authority inspection certificate** allowed to freely enter the EU
    - organic food access requirements the same as per conventional foods
- Key messages
  - Not yet considered a major source for organic products but highly regarded for 'clean, green' image
  - Access **independent** and **specialist retail** sectors in partnership with a UK distributor (eg: Selfridges, Harvey Nichols, Harrods or specialist organic stores)
  - UK based companies expect to have long term relationships with their suppliers - UK needs to be considered as a long term strategic market

Key Market Characteristics – Western Europe

Scandinavia

- Most organic produce is **locally produced**
- Existing Australian organic exports include:
  - Wheat to Norway
  - Oranges to Sweden
  - Edible oils and seeds
    - Little competition for these products from other countries.
- Danish market for valued at A$300m, approx 5% total food sales (1999) with growth expected to level at about 15%
  - Opportunities for Australian suppliers include:
    - Wheat and other cereals
    - Citrus, fruit juices
    - Oilseeds and ready edible oils
    - Ingredients for further manufacturing

How To Increase Export Orientation

Key is planning, co-operation, networking among suppliers and listening to the customers

- Total organisation commitment
- Critical mass
  - Building volume not easy
  - Strategic alliances to pool product
  - Consolidate with other products to share distribution
- Supply chain management
- Innovation to build competitiveness at every stage
- Meet market expectations on
  - price, delivery, quality, reliability
- Strengthen industry and government partnerships
- Closer linkages with research and development

Who Can Help You?

17. New Zealand and the Organic Market

by Mr Chris May
Bioglobal Consultancy Ltd Tauranga , New Zealand.

This paper will provide an overview of New Zealand's export and domestic markets for organic products.

The New Zealand market for certified organic product in 2000 – 2001 is estimated to be at least NZ$60 million for exported products and NZ$80 million plus for local market sales.

'New export figures exceed the current industry growth predictions which would deliver organic exports exceeding NZ$500 million in six years.' (Dr Hugh Campbell).

'Survey results show that New Zealand certified organic exports reached over NZ$60 million for the year 1999-2000. This was an increase of 77% on the previous year's figure of NZ$34.08m'. (Trade New Zealand).

Key growth areas of growth are the European export market by nearly NZ$18 million to NZ$28.7 million and the US market has also increased sharply from NZ$1.3 million the previous year to NZ$8.02 million for 1999-2000. (Trade NZ)

The Japanese market is showing a slight decrease, with only 25% of total exports (NZ$15.1 million), versus 60% two years ago (NZ$17.5 million). This decline can be directly attributed to the considerable increase in demand from both Europe and the United States and the uncertainty regarding market access and the risk of fumigation to fresh produce. This uncertainty has resulted in a significant decrease in the volume of fresh produce eg squash, exported to Japan.

It is estimated that since the introduction of the JAS (organic standards) in April 2001, the amount of fresh certified organic product in Japan has declined by more than 90%. Explanations for this are that prior to the JAS there was a wide range of spray free lines being presented to the market as organic. Once regulations came into place requiring products being presented to the market be certified to a CODEX equivalent organic standard these spray free products could not be certified and therefore disappeared from the organic section of the shop shelves. In response to this dilemma many of the supermarkets and cooperative stores have developed and are marketing 'green food' branded safe food. Marketed in much the same way as they previously marketed their 'organic' lines.

Random product fumigation which if applied to an organic line forces the removal of organic certification is another disincentive for risking organic exports to Japan. For NZ kiwifruit for example it is estimated that up to 73% of all fruit is fumigated on entry to Japan for conventional fruit it can be higher. To avoid the cost of repacking and labelling in Japan if a line of organic fruit is fumigated product is being exported in bulk bins to be packaged and labelled as required in Japan.

Fruit is the backbone of the organic exports built around the success of organic kiwifruit exports that have expanded over the past 12 years. Fresh fruit exports have nearly doubled, reaching NZ$47.8 million versus NZ$23.2 million last year.

Another significant increase is reflected in the meat and wool sector reaching a NZ$1.3 million – an increase from just under half a million last year.

Table 1 Market trends

MARKET	June 2000 (NZ$ million)	June 1999 (NZ$ million)	June 1998 (NZ$ million)	June 1997 (NZ$ million)	June 1996 (NZ$ million)
Japan	15.10	16.12	17.50	15.75	5.28
Europe	28.70	11.07	8.00	2.10	2.56
USA	8.02	1.30	1.40	1.50	1.63
Australia	2.82	1.79	1.30	0.62	0.89
Other	4.43	3.80	0.50	0.02	0.08

Source OPEG Web Page

The Organic Producers Export Group (OPEG) in-conjunction with Trade NZ have played a significant role in coordinating NZ's organic product marketing programme. The statistics and charts provided in this paper have been drawn from the OPEG Web Page. Email info@organicsnewzealand.org.nz

Local market

While the sizzle in the organic sector seems to always surround the export sector the local market has been expanding rapidly over the past 5 years with key wholesalers estimating the market to be in the $NZ80-120 million range. Much of the local market product is producer claimed organic which creates a dilemma for both retailers and consumers. Recently the MAF NZ allocated $450k over 18 months to the development of a small-scale producer certification programme aimed specifically at providing a cost effective certification that would meet the needs of both the producers and the consumers. Small-scale producers were targeted as they contribute significantly to the pool of organic product but often do not carry certification due to the cost of certification in relation to their overall turnover. Elements of this programme include the development of a group certification based on peer assessment and supported by an independent audit from a recognised certification provider. A consumer questionnaire conducted as part of the small-scale producer programme revealed that almost all consumers distrusted spray free and grower claimed organic labelling reinforcing the need for a universal certification.

The local market trend in NZ is for supermarkets to carry more and more organic lines including milk, eggs and meat along with fresh and processed products. Well managed specialist stores continue to develop as do box schemes particularly in the larger urban areas.

Conclusion

What is on the horizon for organic production in NZ? While the cry might be for export! export! export! The most exciting prospect lies in how we develop our local market, the way in which we infuse the production standards with the organic philosophy and the way in which we promote the linkages between food production and the health of people and the environment.

18. Organic Soy Beans
A Case Study Where Demand Exceeds Supply

By John Melville
Independent consultant

I have noted many changes and developments in the organic food industry over the last 13 years in my role as an inspector with NASAA and BFA and as a technical and standards committee member of both these certification agencies. Not least of these changes is the vast expansion of the industry Internationally and the growing involvement of mainstream players in development of organic markets.

In Australia - companies such as Heinz Wattie, Coles Myer, Goodman Fielder, MasterFoods of Australia and Southcorp wines have joined the push to have a range of organic foods represented in their product selection.

Australian per capita consumption of organic foods still lags behind the EU countries but there is room for growth and consumption in constantly increasing . Danes consume $126 of organic foods per capita and Austrians $69 per capita compared to Australians who currently averaged less than $16 per head in 2000. When the geographical and topographical variations present throughout Australia are considered - there are few if any world foods which cannot be produced in some Australian locality.

Export potential for certified organic crops from Australia remains very significant providing there is commitment to the appropriate conversion process.

The EU, USA and now SE Asian markets are all showing strong expansion and the demand for high quality products is of tantamount importance. Gone for ever are the simplistic notions - for example - that organic apples can be identified due to worm holes and scab because the produce is not soaked in pesticides during the growth phase.

Organic production must be targeted to produce high quality foods of fine appearance which are better in all ways when compared to the conventional product. The quality of produce is the factor that inevitably secures the premium price for the commodity and mainstream processors will pay premiums only for quality produce.

The continued input and market opportunity provided by major companies is of paramount importance to the continued strong economic growth of organics in general.

A new company established in Australia has epitomised this mainstream move towards organics with its commitment to process and supply soy beverages which come **only** from certified **Organic** systems which are of course also guaranteed GM free.

Vitasoy Australia Products P/L (VAP) is a joint venture operation between Vitasoy International Holdings P/L of Hong Kong (51%) and National Foods P/L of Australia (49%).
This company has set up a $30 million processing plant at Wodonga , NE Victoria - for the processing of soy beans for the soy beverage market. The plant went on line commercially in July this year. The company also has manufacturing plants in Hong Kong, China and the USA .

There is thus a huge demand for organic soy beans on site which will expand over the next 3 years from the current demand of 3,000T per annum to 5,000 T of white hilum soy varieties such as Curringa and Bowyer for soy beverage production in Wodonga.

Irrigation varieties such as those above have proven the best for the company products but other varieties can be used from dryland irrigation systems. These dryland systems in Northern NSW and Queensland are supplying current organic soy crops but there is a current, stable and growing demand for organic soy to be produced in the Riverina. Northern Victorian and Murrumbidgee irrigation regions.

This provides a huge local market opportunity for growers in the local NSW and Victorian irrigation areas and indeed any Australian areas where the appropriate varieties of soy beans can be produced.

Any crop production in excess of the Wodonga plant needs has potential to be exported to plants in SE Asia and Japan.

Soy beans as a crop are considered a very viable crop for irrigation areas as they not only have huge market potential but also provide their own nitrogen source for growth [being legumes] and also use half the irrigation water that rice demands.

Soy is an appropriate rotational crop to fit with e.g. faba beans, rice, maize etc as it supplies its own N sources. In some cases the nitrogen balance in the soils can improve rather than create a fertility deficiency as occurs with nitrogen hungry crops such as safflower which require large fertility inputs.

Australia is in a strong position to develop organic soy production as GM soy is not commonplace as yet in the agricultural environment. As long as this position is maintained there will be major local and export potential for crops which can be guaranteed GM free.
With governmental support for organics and GM free foods - Australia is well placed to seize this market opportunity and offer guaranteed export of GM free crops to the world including the US.

As farmers do not necessarily need to convert their entire property to organic in one go - there is scope for a planned transition to organic which enables producers to get the organic soy bean system right and to provide guaranteed income from existing conventional operations on the same property.

The reality of economic sustainability is understood by certifiers and a rational approach to conversion cropping is considered critical.

Certification is vital to supply consumers with the external guarantee that they are indeed getting products produced and processed to the highest International organic standards.

One of the biggest hurdles to overcome is the time required to achieve full organic status.
There is a three years inspection and assessment process which comprises an initial **Pre-certification** year and then a 2 year **Converion to Organic** period after which **Organic** status can be approved.

In some cases the pre-certification year can be waived if no "prohibited products" have been used on the crops for at least 12 months and farm records can demonstrate this clearly and there is a clear understanding of and commitment to organic production methods and sustainable farming.

The 2 major Australian certifiers of Organic production and processing operations - National Association for Sustainable Agriculture (NASAA) And Biological Farmers of Australia (BFA) both offer information packages and application forms to interested farmers.

These certifiers are themselves approved and inspected by AQIS [Australian Quarantine and Inspection Service] and also by the International Federation of Organic Agriculture Movements (IFOAM).

It can be expected that the initial applications and inspection fees will average $400 - $600 and then annual costs associated with inspections and administration will generally average $200-300 per year .

Common "Conversion to Organic" challenges to be met include:

- Markets - what markets exist, how do I find them and how do I sell pre certification and conversion produce?
- Pests - how do I control pests such as the green vegetable bug without pesticides?
- Weeds - how do I manage Bathurst Burr, Barnyard grass and other irrigation weeds in an organic soy crop?
- Where do I get advice on organic agronomic issues and specific advice on organic standards and their application to my operation?

Vitasoy Australia P/L has recognised these organic conversion challenges and offers a range of assistance and advisory services to farmers in the fields of organic standards interpretation and implementation plus agronomy. Market advice for pre certification products is provided and there is also assistance for growers to sell conversion products for the best price in International markets.

Organic farming requires a change in operation to best suit the environmental conditions.
This will involve smarter thinking, different farming methods and problem solving, and is never a case of substituting a conventional herbicide /fertiliser / pesticide with an equivalent organic alternative.
Such thinking will inevitably result in failure to manage the conversion successfully.

It is clear however that organic farming must offer economical as well as ecological sustainability.

The world market generally expects to pay a premium for good quality organic crops - usually 10 - 30% higher but in some cases this is exceeded if there is a shortfall of the desired quality commodity.

There is little economic rational to suggest that companies to pay 100% or even 200% premium for a crop which is produced organically. Consumers of organic foods are not willing to pay this type of premium either so there must be a balance of healthy sustainable production and profit.

All this can be achieved - and the scope for organic soy production in the Riverina, N Victorian and Murrumbidgee irrigation cropping areas is immense over the coming 3-5 years and onwards.

19. Sustainable Management of Pests and Diseases in Viticulture

By Dr DeAnn Glenn (Grape and Wine Research and Development Corporation) and David Braybrook (Cooperative Research Centre for Viticulture)

IPM and Pest Control

- IPM – expanding to the strategic management of the agro-ecosystem
- IPM considerations in different crop systems
- Examples in viticulture
- Different aspects are important for each pest and disease

IPM

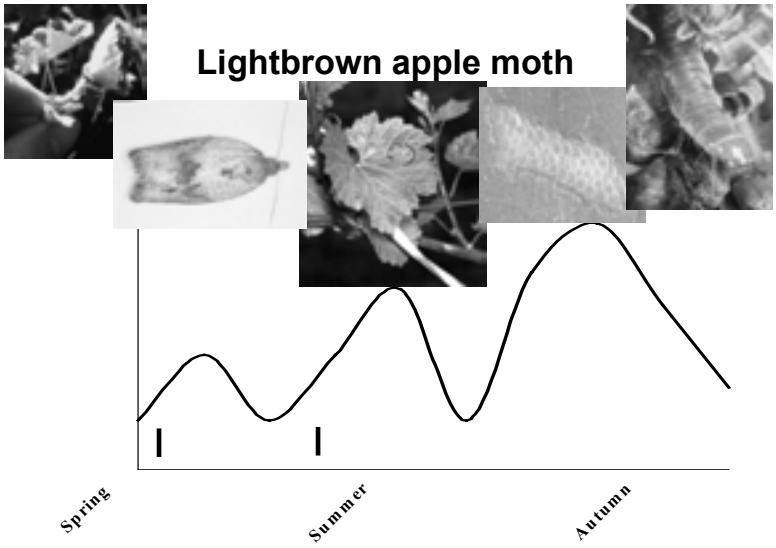
- Whole system –non-crop plants; other pests and diseases
- Includes growers, researchers, crop consultants, suppliers
- Environmentally and economically sound
- Better understanding of agro-ecosystem to promote inherent strengths rather than intervention

IPM

- Monitoring is the key
- Historic information - mapping
- Anticipates and prevents pest problems
- Timing and targeting treatments
- Understanding and strategic use of control options
- Climatic factors

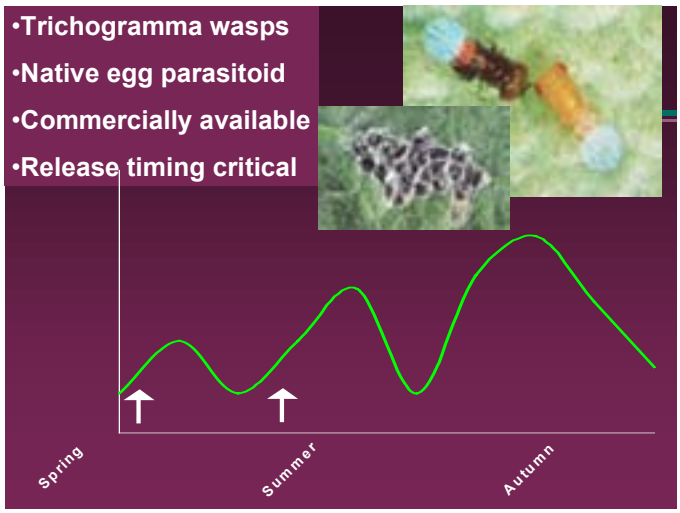
Integrated Pest Management

- Strategic approach to viticulture pest and disease management (IPDM)
- Sound knowledge of the pest and disease
- Correct identification and diagnosis
- Dynamic, adapt to conditions, different regions, management requirements



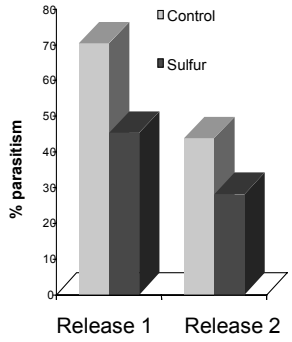
Lightbrown Apple Moth

- Consider economic impact
- Localised movement, not migratory
- Over wintering habitat/vineyard floor
- 2 generations in season
- Egg monitoring / pheromone traps
- Understanding control options (e.g. Bt, Mimic, chlorpyrifos)
- Correct timing of application is the key to success



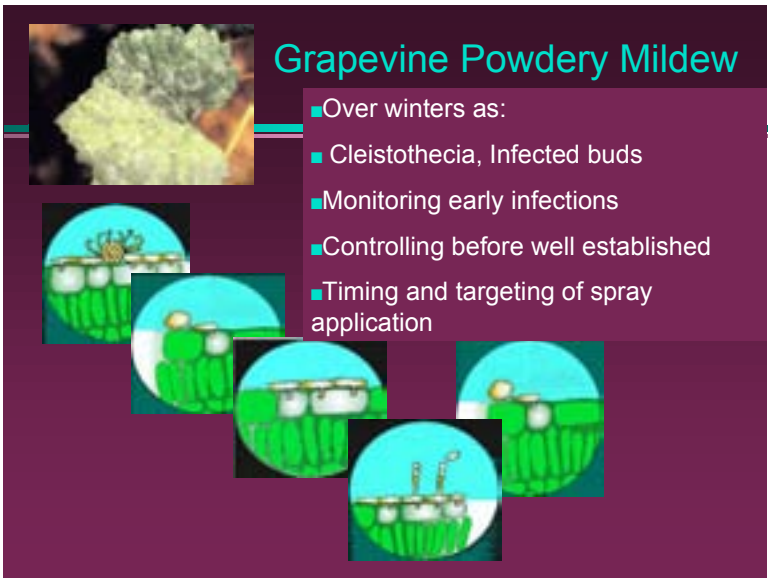
Effect of Sulfur on Field Parasitism of Trichogramma

- reduced acceptance of sprayed eggs
- reduced emergence from sprayed eggs
- reduced parasitism by females which emerge from sprayed eggs



Botrytis Bunch Rot

- **Tissue damage**
  - » **LBAM**
  - » **Irrigation**
- **Weather**
- **Vine management**
- **Variety, bunch architectu congestion**



Grapevine Rust Mite

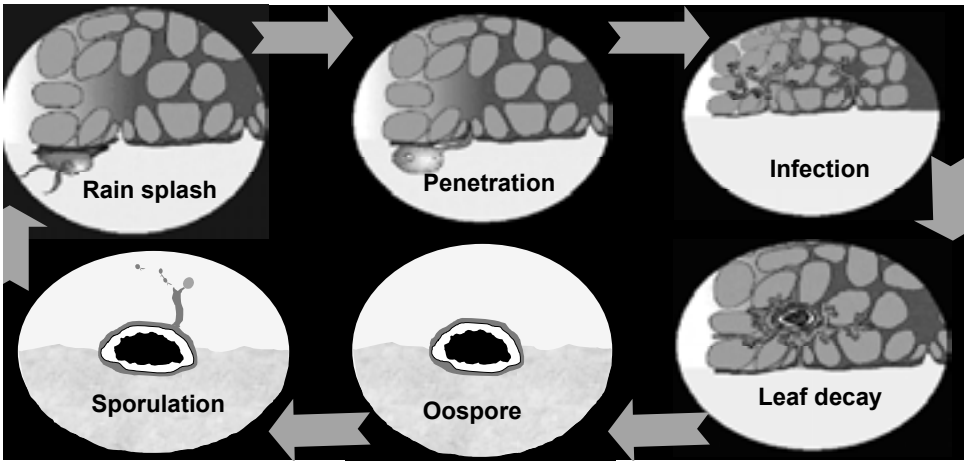
- Correct identification and diagnosis
  - » Phomopsis, bud mite, bud necrosis
- Maintaining predators
- Spray timing and application

Grapevine Downy Mildew

- Monitor
  - » Specific weather conditions
  - » Symptoms
- Understand control options

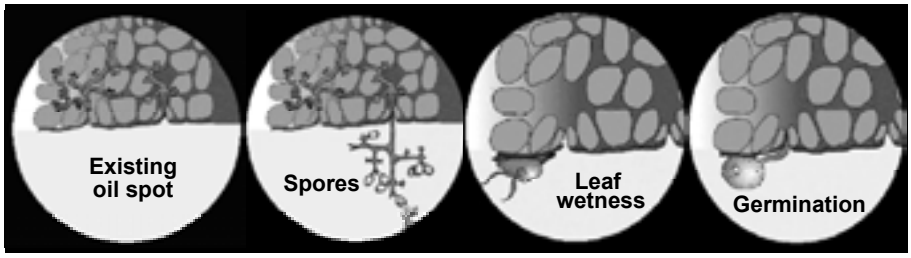
Downy Mildew Primary infection 10:10:24

temperature - 10^{0}C rainfall - 10mm over past 24 hours



Downy Mildew Secondary infection

- **Spores develop after:**
  - **98% humidity**
  - **more than 13^{o}C**
  - **4 hr darkness**
  - **leaves wet for 2-3 hr pre-dawn**



If spraying before infection conditions occur

Prevents appearance of oil spots

- **provides protective barrier**
- **prevents spore germinating**
- **spray close to anticipated event**
- **spray coverage of undersides of leaves important**

Spraying after infection conditions occur

Prevents appearance of oil spots

- **systemic/partially systemic (rain protected 2-3 hr after spray)**
- **affect growth and sporulation, or kills fungus**
- **apply within 5 days of infection event**
- **protects new growth**
- **spray coverage important**

The future of IPM

- Improved weather forecasting
- More non chemical alternatives
- Research on agro-ecosystems
- Models to handle complexity
- Plant host resistance

20. Managing Weeds Organically

By Chris Penfold
University of Adelaide, Roseworthy Campus

Defining weeds

- A plant out of place
- A plant whose virtues have not yet been discovered

Are there good weeds?

Weed management issues with vineyards

- Mid-row and under-vine areas
- No grazing animals
- Traffic in the mid-row
- Monoculture vs species diversity
- Nematodes
- Yield vs quality
- Aesthetics

Intervention control options

- Cultivation
- Cultural
- Thermal
- Smothering
- Mowing
- Grazing

Thermal control

- Flame
- Steam
- Hot water
- Foam
- Hot air

Mulching – relative costings

- Straw @ $1,300 / ha
- Green organics mulch $1900 ? 2400 /ha
- Green organics compost -$3,700 /ha
- Spreading - $ 550-$700 /ha
- Jute matting -$1,600 - $3,300 /ha

Cover crops

Determine the reason for a cover crop:

- Ground cover / weed suppression
- N fixation
- Biofumigation
- Aesthetics
- Water use ? uptake or suppression
- Perennial or annual

Basic principles

- Do not start with a weed infested site
- Know your weeds ? emergence, seed set, seed life, response to different controls
- Control while juvenile
- Prevent seed set
- Minimise soil disturbance
- Occupy spaces with crop/mulch

Research program

Investigating:

- Cover crop impact on weeds, vines and water availability
- Cover crop management for regeneration and weed suppression
- Under-vine weed control - Mulches vs mechanical vs thermal
- Cover crop options

21. Cows, Canola, Compost Teas and Fine Wine
Controlling Disease in Organic Vineyards

By Peter Crisp, Eileen Scott, Sharmini John, Belinda Rawnsley
University of Adelaide, Department of Applied and Molecular Ecology

Introduction
A range of diseases can have a significant impact on the quality and yield of grapes in Australian vineyards; these include powdery mildew, downy mildew, botrytis grey mould and bunch rot, phomopsis cane and leaf spot and Eutypa dieback. The control of disease in organic vineyards relies on; sulphur for powdery mildew control, copper sprays for downy mildew, pruning or vine replacement for Euytpa die back and phomopsis. Regular applications of copper and sulphur can have undesirable impacts on populations of beneficial organisms within the vine canopy and the soil. Both sulphur and copper have the potential to contaminate soil and water in and around the vineyard and can have adverse impacts on the health of vineyard staff.

There are, however, a range of other potential controls for these diseases that do not have the negative environmental impacts of sulphur and copper nor the yield loss and costs associated with cutting back or replacing diseased vines. The controls include beneficial fungi and bacteria, vegetable oils and milk. Recent research has shown that some of the alternative controls are as effective as conventional methods and may equal the efficacy of synthetic fungicides for disease control in the field.

Powdery mildew
Grapevine powdery mildew, caused by the fungus *Uncinula necator*, is estimated to cost the Australian viticulture industry approximately $30 million per year (Wicks *et al*., 1997). This figure comprises reduction in yield and quality and the cost of control programs. The disease is controlled mainly be regular applications of sulphur and demethylation inhibiting fungicides (DMIs) in conventional vineyards and by sulphur and canola-based oils in organic agriculture. With the possible withdrawal of sulphur from the schedule of acceptable inputs for organic vineyards (EC regulation 2092/91: International Federation of Organic Agriculture Movements), there is a need to look for alternatives for organic viticulture.

Initial efficacy trials of 34 potential control agents for grapevine powdery mildew were conducted in glasshouses on potted grapevines, *Vitis vinifera* cv. Viognier at 20-25^{0}C. Treatments were selected following a literature search, and from discussions with organic growers. An exception was whey, which was included as a fraction of milk that is often discarded as waste, and which may help to identify the active agent in milk. Proprietry products were applied at recommended rates, milk was applied as a 1:10 dilution and whey powder was initially used at 15 g /litre. The bacteria and fungi used in the experiments were cultured for 48 hours in a medium of yeast extract, sucrose and micronutrients then applied at approximately 10^6 propagules/ml. The efficacy of two concentrations of milk and three of whey was examined in a further trial. Powdery mildew infection arose from natural inoculum plus inoculation using laboratory strains of *U. necator*.

The most effective treatments in the glasshouse trials were Synertrol Horti-oil, a canola oil based product (disease reduced by 92% compared to untreated control), *Bacillus subtilis* (94% reduction), milk (70% reduction), whey (64% reduction) and potassium bicarbonate (Ecocarb) (58% reduction), (figure 1). Milk and whey provided greater control of powdery mildew as the concentration increased. Results from other glasshouse experiments (not reported here) showed similar results but other treatments tested did not provide protection superior to those mentioned above.

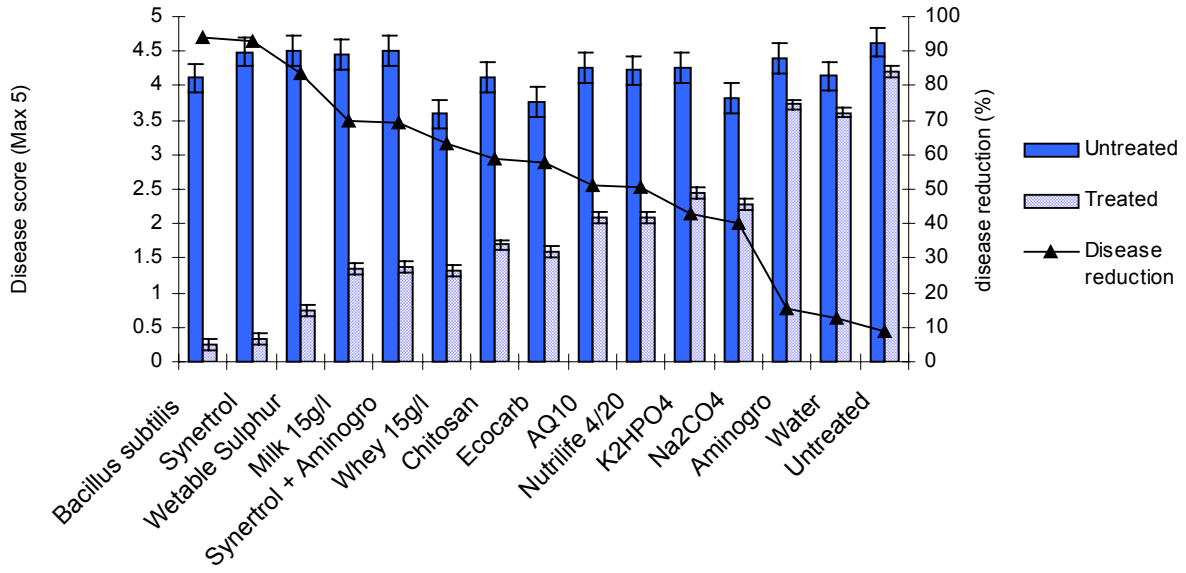


Figure 1. Powdery mildew levels on leaves of cv. Viognier after application of various treatments in the glasshouse, and disease reduction achieved compared to untreated leaves. 0 = no disease, 1= 1–20% of leaf infected, 2 = 20-40% etc.
AQ10 is a proprietry formulation of the fungus *Ampelomyces quisqualis.*

Several of the treatments tested appear to be suitable replacements for sulphur and synthetic fungicides for control of grapevine powdery mildew in the glasshouse. They include Synertrol Horti-oil, bicarbonate solutions, *B. subtilis*, milk and whey. Mixtures of the vegetable oils and either Ecocarb or whey improved the levels of control achieved following individual treatments.
The severity of powdery mildew infestations can be minimised by using trellising and pruning methods that maximise bunch exposure and minimise canopy humidity. High levels of nitrogen in fertilisers and mulches can lead to excessive growth of the vine which provides increased amounts of young green tissue that powdery mildew requires for establishment.

Suitable replacements for sulphur for control of grapevine powdery mildew include Synertrol Horti-oil (Organic Crop Protectants Pty Ltd), Biotrol (Gullf Ag Pty Ltd) bicarbonate solutions, milk and whey. Mixtures of the vegetable oils and either potassium bicarbonate (Ecocarb, Organic Crop Protectants Pty Ltd) or whey improved the levels of control achieved by individual treatments. Similar levels of control of powdery mildew were achieved in field trials for these controls, however, *B. subtilis* proved less effective under field conditions. One of the critical factors in the success of treatments such as milk, oils and bicarbonates is that good coverage of plant tissues is achieved.

Downy mildew

Downy mildew is caused by *Plasmopara viticola* (Berk. and Curt.) Berl. and de Toni is like powdery mildew, thought to be native to North America (Perold, 1927) and was first recorded in Australia in 1917. Downy mildew thrives in warm wet conditions and is most active in spring or early summer. All green tissues, including berries, are susceptible to infection and are damaged by the disease. Currently, copper sprays are used as a preventative measure to limit downy mildew outbreaks. If no measures are taken to limit the disease, crop losses can exceed 10% and in severe seasons almost total crop losses can be experienced.

The impending withdrawal of copper from the list of acceptable inputs in organic viticulture means that other control methods must be investigated and developed. Ferric ions, Fe^{+++}, applied as ferrous sulphate, are approximately one third as effective as copper for control of downy mildew, but Fe^{+++} is unstable and oxidises to Fe^{++} that does not inhibit this disease. Applications of ferrous sulphate to the vines at triple the rate of copper provide similar levels of protection from downy mildew as copper in the short term (Perold, 1927), up to three days; reapplication is then required to maintain control making this an expensive option. New formulations and delivery methods need to be developed to stablise the ferrous ions to provide extended protection from downy mildew in the field.

There have been a number of reports on the use of "compost teas", also called watery compost extract, to control a number of diseases of grapevines and other horticultural crops (Elad and Shtienberg, 1994; Ketterer and Weltzein, 1987; Washington *et al*., 1999). The level of protection from downy mildew damage varies between reports and appears to vary with the type and age of the compost used, other additives to the tea and environmental conditions. While these treatments may be effective in some situations, the variable nature of the control achieved makes relying totally on compost teas a risky option.

The risk of infection and severity of downy mildew can be reduced by maintaining an open, well-drained vineyard with good air flow to reduce humidity in the canopy.

Eutypa dieback

Eutypa dieback, sometimes known as ‘dying arm” is caused by the fungus, *Eutypa lata*, which colonises the woody tissues of the vine. The symptoms include stunted primary shoots, cupped leaves and death of limbs. Shoots and inflorescences appear stunted and, in severe cases, will die, reducing the yield significantly. Eutypa diebackis most commonly seen on vines more than 10 years of age, with varieties such as Grenache and Cabernet sauvignon among the most susceptible. The fungus lives within the trunk of the vine and the foliar symptoms are the result of reduced sap flow and production of phytotoxic compounds.

Sharmini John from the University of Adelaide’s Department of Applied and Molecular Ecology is assessing the use of *Trichoderma* spp. for biological control of *Eutypa* dieback. *Trichoderma* preparations can be used to paint wounds to reduce the risk of infection of vines or can be injected into the vine to combat the disease within the vine reducing the need for removal of infected tissue. The three strains of *Trichoderma* tested to date produce antibiotics that inhibit the growth of, or kill, *Eutypa lata* in laboratory conditions. Evaluation of interactions between *Trichoderma* strains and *E. lata* in vines in the glasshouse is in progress.

Phomopsis cane and leaf spot

There are two main types of *Phomopsis* on grapevine type 1 and type 2. Type 2 is more damaging to grapevines, and symptoms include leaf spots surrounded by a yellow halo (1-2 mm in diameter) and deep, black lesions on shoots. The lesions on the shoots cause yield loss by weakening the cane, which may break, leading in a reduction in the number and size of bunches.

Type 1 has no confirmed impact on grape quality or yield. Symptoms of phomopsis cane and leaf spot can be confused with many other factors, such as the damage caused by high populations of rust mite, *Calepitrimerus vitis*, and hail damage, therefore, accurate diagnosis of the of the disease needs to be made before treatment is commenced.

The disease spreads by rain splash from infected tissue to new developing shoots in spring. The most effective control of *Phomopsis* type 2 in organic vineyards is the removal of infected spurs from the vine and either removal of the prunings from the vineyard or mulching the material.

Botrytis grey mould and bunch rot

Grey rot of bunches, is caused by *Botrytis cinerea,* a disease that appears to be less severe in organic vineyards than in chemically subsidised vineyards. While Botrytis manifests itself on bunches between verasion and harvest in extended periods of wet warm weather, the fungus infects flowers soon after cap fall. *B. cinerea* over-winters on the grapevines and sources of infection can be reduced by removing dead canes and berries from vines by pruning and either removing them from the vineyard or mulching in the vineyard.

The reasons for the apparent resistance of organically grown grapevine to botrytis diseases is unknown, but may include reduced nitrogen from synthetic fertilisers, thicker skins on the berries or removal of wax layers on berries grown in chemically subsidised vineyards by repeated application of pesticides containing surfactants. Increasing airflow, reducing humidity in the vine canopy, may also help to reduce the incidence of botrytis rots.

Conclusions

Most of the major fungal diseases of grapevines can be controlled in organic vineyards in a cost effective manner without substantial loss of yield or increased costs. Treatments such as milk and whey for powdery mildew are inexpensive, have no known impact on beneficial organisms in the orchard and are unlikely to be hazardous to vineyard staff. However, for this type of treatment, efficacy is dependent on thorough coverage of leaf and bunches. Spray coverage can be enhanced by establishing vines on trellising, and using a canopy structure that enhances spray penetration, such as a Scott Henry or Smart Dyson system. These systems help to reduce the severity of diseases like powdery mildew by reducing shading of bunches and humidity within the canopy.

Monitoring of vineyards for disease symptoms and accurate diagnosis of the cause of the symptoms is required to ensure that the treatments applied are appropriatet for the disease. Knowing the conditions that are conducive to the outbreak to various diseases will increase the efficacy of monitoring programs and assist in field identification and subsequent management.

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22. Organic Winemaking
A Technologically Diverse Challenge

By David Bruer
Temple Bruer Wines

SO2

SO2 is required in almost all wines to prevent oxidation, to scavenge off characters and to inhibit unwanted microbial activity.

Limits for SO2 exist in Australia but are rarely policed. This is the case for both non-organic and organic wines.

For organic wines, the lack of domestic legislation further weakens policing efficacy.

Temple Bruer is a modern, all stainless steel small winery processing only certified organic grapes.

Temple Bruer has adequate refrigeration and refrigeration delivery, an excellent control of fermentation including counting yeast cell density before inoculation.

These levels should be considered in the light of recent Temple Bruer bottlings, the SO_2 history of which is set out in Table 2.

●SO_2 Limits for Australian non-organic, Australian, UK and US organic wine

TABLE 1

	Free ppm	**Total ppm**
Australia non-organic	Not specified	250 if < 35g/L ref. sugar 300 if > 35g/L ref. sugar
OVAA	30	125
BFA	Not specified	125
NASAA	20	90
Soil Ass (UK)	Red 25 White 30 Sparkling 10 Desert 70	90 100 100 250
FDA – organic (US)	Not specified	100

TABLE 2

SO_2 changes with time from juice to wine All SO_2 figures are ppm			
Variety	**Verdelho 2001**	**Chenin Blanc 2001**	**Shiraz Malbec 1999**
Yeast (all Lalvin)	M69	QA23	BR
Juice Free / Total	13/37	12/37	7/20
End of Ferment	0/27	0/64	0/1
Arrival at Bottling (SO_2 in as tanker loaded)	7/61	20/102	10/28
Final Bottling	25/100	24/117	18/38
TB Range	- Whites 100 → 124 - Reds 35 → 50		

These data suggest that if levels in organic wines need to be specified then reds could be specified much lower than white and that for whites a level of 125ppm is very tight for a winery with good equipment and good technique.

Apart from asthmatics who can't tolerate any SO_2, no negative health effects from SO_2 in any food have yet been found despite more than 130 years of research on this subject.

I should point out that our 2001 Verdelho is the first white wine we have ever made that is within specification of the UK and US authorities.

I think these levels, set arbitrarily, have been set too low.

Organic winemakers have learnt to use proteinacous fining agents:

- gelatine
- isinglass
- egg white

instead of polyvinyl polypyrollidene (PVPP) – a highly effective, gentle and uniform synthetic peptide.

Invariably the proteins are less effective, and their results often more unpredictable so that our production processes have been modified to minimise low molecular weight phenol pick up from grape skins and seeds.

This means machine harvest of white grapes pre-dawn (the coolest part of the night) short transport distances, rapid crushing, and juice separation and cooling.

Long skin contact times for whites are most likely not an option for organic wine makers.

All winemakers are familiar with barrels and most with their cleaning and maintenance and much has been written on this.

A relatively new product called a Stakvat is a hybrid stainless steel and oak vessel with four sides stainless steel and two new oak sides, accommodating approximately 30 toasted staves.

More than one internal rack maybe fitted.

With 30 internal staves and new oak sides, the surface area to volume ratio equals that of four barriques (approx. 225L). They hold 900L and cost about the same as four barriques.

Replacement sides and internal staves cost about a quarter of the cost for four new barriques, so that second and subsequent years we have effectively new oak storage for approximately a quarter of the cost of new oak storage.

Other economies are possible, e.g., shaving sides and converting them to internal staves. Also, used staves may be converted to shavings for composting.

Some analysis of wines at the Australian Wine Research Institute for oak volatiles is shown in Table 3.

TABLE 3

		Samples					
Compound		**NB1**	**NB2**	**SV4**	**SV5**	**SV6**	**OB2**
Cis-Oak Lactone	µg/L	115	131	46	63	251	178
Trans-Oak Lactone	µg/L	146	132	30	31	26	15
Guaiacol	µg/L	19	11	8	8	23	4
4-Methylguaiacol	µg/L	14	10	6	6	7	1
Vanillin	µg/L	150	186	104	107	167	59
4-Ethyphenol	µg/L	1250	1300	1160	1140	69	1180
4-Ethyguaiacol	µg/L	408	448	428	427	21	389

Key
NB1, NB2: New barrique 1 and 2
SV4, SV5: New Stakvat 4 and 5
SV6: New Stakvat not water conditioned
OB2: Old barrique (third use)

TABLE 2

SO_2 changes with time from juice to wine ***All SO_2 figures are ppm***			
Variety	**Verdelho 2001**	**Chenin Blanc 2001**	**Shiraz Malbec 1999**
Yeast (all Lalvin)	M69	QA23	BR
Juice Free / Total	13/37	12/37	7/20
End of Ferment	0/27	0/64	0/1
Arrival at Bottling (SO_2 in as tanker loaded)	7/61	20/102	10/28
Final Bottling	25/100	24/117	18/38
TB Range	- Whites 100 → 124 - Reds 35 → 50		

NB1, NB2, SV4, SV5 and OB2 were a 1999 Merlot from Temple Bruer. SV6 was a 1999 Merlot from another winery.

Some sensory analysis of the five Temple Bruer wines showed that NB1, NB2, SV4 and SV5 were all showing more new oak character than OB2, and were preferred to OB2.

Differences between new barriques and new Stakvats were inconclusive, with some preference for new barriques and some for new Stakvats.

One highly significant difference between Stakvats and barriques is in their ease of cleaning.

Most wineries attempt to clean barrels by placing them upside down on a sprinkler of some type and hoping that the action of the water, with or without the addition of chemicals, will remove everything they want to remove. It is hard to check barrels for cleanliness without disassembly – that bit is easy, but you need a cooper to rebuild the barrel.

Stakvats have a swing door so that an operator can reach every part of the vessel with a standard high-pressure water cleaner – no chemicals are required, and you can see easily every surface.

The amount of water required to completely clean a Stakvat is so little that we use rainwater in order to save a rinsing step.

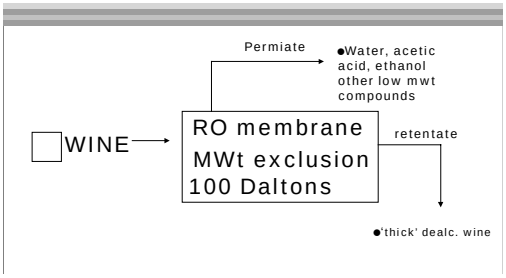
Production of wines showing abundant fruit flavours, preferred by consumers, requires ripe to very ripe fruit. Such ripe fruit can lead to high to very high alcohol content wines 14% v/v is common with some over 15%v/v.

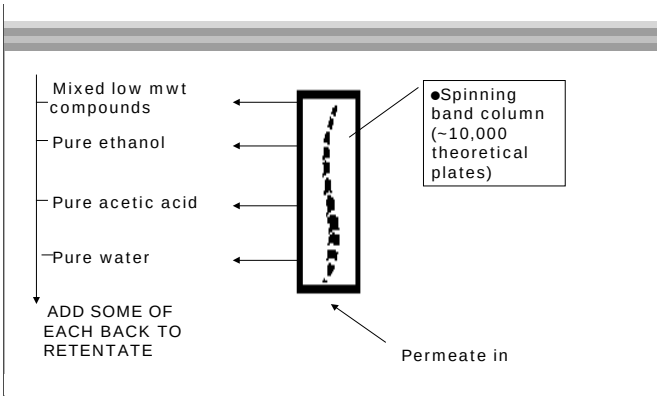
Apart from negative sensory effects (perceived "hotness" on palate) we have a duty of care to our customers to help reduce their alcohol intake.

At present this can be done by Reverse Osmosis (RO) followed by vacuum distillation of the membrane permeate and partial removal of the alcohol fraction.

While this technique is very selective and routinely used in Australia it has disadvantages:

- first it is energetically expensive as RO needs very high pressure on the membrane
- second there are some negative sensory effects on the wine, as it is difficult to prevent oxygen access at all points in the process.





While the negative sensory effects will in time be reduced by more attention to detail, better seals, lower temperatures etc. the high energy cost will remain.

An alternative method for partial dealcoholisation is to use a Genetically Engineered Yeast (GE Yeast).

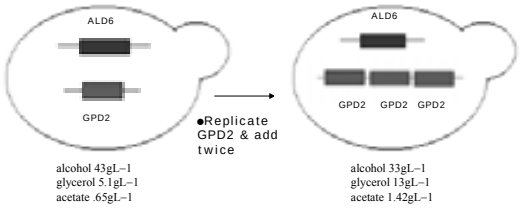
The strategy chosen by a research group at the Australian Wine Research Institute was to try to divert the flow of carbon from sugar to secondary metabolic pathway (eg glycerol) rather than ethanol.

Glycerol was chosen because it has no negative health effects, and at moderate levels, improves the sensory properties of wines.

Glycerol production is controlled by Glycerol-3-phosphate dehydrogenase – there are 2 genes coding for 2 enzymes GPD1 and GPD2. For various reasons GPD2 was easier to work on.

Acetate production in yeast is controlled by six acetaldehyde dehydrogenase genes, ALD1, 2, 3, 4, 5 and 6.

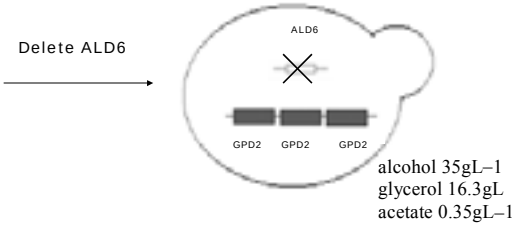
●The GPD2 gene from the yeast to be used was copied and added back twice to the yeast so that



Original yeast	Yeast with 2 extra GPD2 genes
alcohol 43gL–1	alcohol 33gL–1
glycerol 5.1gL–1	glycerol 13gL–1
acetate .65gL–1	acetate 1.42gL–1

●While the alcohol was reduced by 23%, the acetate was more than doubled to unacceptable levels.

●A single deletion mutation of ALD6 gives another yeast



	Original yeast	Yeast + 2 extra GPD2 genes	Yeast + 2 GPD2's – ALD6
Alcohol gL^{-1}	43	33	35
Glycerol gL^{-1}	5.1	13	16.3
Acetate gL^{-1}	0.65	1.42	0.35

Thus this yeast produces 19% less alcohol, more than three times the glycerol and nearly half the acetate of the original yeast (Lalvin EC 1118 – a commonly used strain.)
If this modified yeast were used in the production of wine, the energy cost will be essentially the same as the original yeast, and the sensory properties improved in part by the lower alcohol, and in part by the raised glycerol.

Here is an example of a GE yeast which clearly involves no other species – it contains 2 extra copies of a gene it has already and a deletion mutation at a different site.

Moreover this yeast falls out of the wine at the end of fermentation – the few that may remain are filtered out by very tight filtration prior to bottling.

I would commend this kind of Genetic Engineering to your further study.

23. Organic/Biodynamic Industry Development
Diversity and Unity

By Dr Richard Crossing PhD
Project Co-ordinator - Organic Federation of Australia

Introduction
In July this year, the Organic Federation of Australia finalized a 5-year strategic plan for industry development to 2006.

The OFA is the industry's national peak industry body. It became incorporated in 1998 and under the Articles of Association it has a representative Board of 12 from the various sectors that make up the organic industry. In this context the term *organic* means *organic/biodynamic* as defined in the Australian National Standard for Organic/Biodynamic Produce (1998). The OFA has 200 members and increasing. The principal requirement for membership is support of the organic industry. For a business concerned with organic production or processing, there are requirements that the business is certified. The OFA is a young, new and dynamic industry organization and is seeking members and partners that can contribute to the leadership and development of the OFA, and in turn the organic industry. There are situations available for people that have energy, vision and a can-do approach at national, commodity, enterprise and regional level to support the drive for a bigger and better organic industry.

The diversity, and quest for unity, poses challenges for the organic industry. To be *diverse* is to be unlike in nature or qualities. *Diversity* is being diverse, unlikeness, or of different kind. Diversity becomes dysfunctional when it has a significant negative influence on critical result areas (although there may always be some diversity as a necessary driver to prompt change).

Industry characteristics
There is reliable information that the overall prospects for the industry are significant. Like any wide-ranging industry, there will be some sectors where the prospects will be better than others. The industry has a diverse range of differentiated products. There are a number of product specifications, and a range of marketing, labeling, advertising and business profiles that also contribute to the differentiation.

The organic industry's diversity is substantial also. Commodities, enterprises, regions and different systems make the industry very diverse. The question is Whether the degree and extent of this diversity is actually harming the industry? From the consultation, planning and review while developing the strategic plan, the OFA found there was little cohesion between the participants in the supply chain. It was widely acknowledged that a major barrier to the growth and development of the organic industry was the fact that the industry was fragmented and lacked cohesion from one end to the other – from the paddock end through to the plate end.

The people in the organic industry have some special qualities. They are respected and known for their passion. They are knowledgeable and willing to share this knowledge to help others. The industry has had sustained growth in recent years and the view is that this growth will continue. Growth of 15 to 25 percent or even 40 percent must be regarded as rapid and substantial. Yet the industry still has problems. Industry networks and linkages between the various stakeholder groups are currently very weak and the fragmented nature of the industry poses barriers to growth and development.

Vision

The OFA vision 5 years ahead is for an industry that is integrated, cohesive and viable. If the OFA can successfully implement its 5-year strategic plan it will remain the single professional peak industry body acting on behalf of the whole organic sector. The production base will grow significantly. Four percent of all agricultural production in Australia will be certified organic. Sales of organic produce on domestic and export markets will top $1 billion dollars a year. Consumers and markets will understand and accept the importance of the health and environmental benefits of organic systems. Four percent of all products consumed will be certified organic. The QA systems of the Australian organic supply chain will be recognized internationally as being to the forefront of the global organic industry. There will be user-friendly language, namely clear and unambiguous definitions and effective branding at every stage of through chain processes. All of Australian agriculture will have been influenced by the benefits of sustainable and profitable organic systems and the majority of Australia's agricultural producers will be using some form of organic systems. All Australian governments (Commonwealth, state and local governments) will support and be politically committed to organic systems.

Targets

To achieve this vision, the OFA has set the goal to develop the national organic industry from a niche into a major component of Australian agriculture, which is delivering benefits to consumers, industry participants and the Australian environment.

There are 6 key result areas in the strategic plan. The OFA must develop into an effective body that presents strong industry policy and attracts significant resources for research and development, education, extension, promotion and marketing. Conversion will be encouraged through the provision of sufficient information, education and extension support options. R&D capacity within the Australian organic industry will be developed. The community's understanding of the benefits of organic products and organic farming systems in terms of food quality and environmental sustainability will grow and there will be more consumers that are OFA members. Government support for industry development will be fostered through united and clear industry policies. The role of organic farming systems in environmental sustainability and clean food production will be maintained and strengthened with organic certification standards recognised as the highest level of commodity groups environmental management systems.

Professional image

The OFA will develop its professional image through the implementation and promotion of a 5-year business plan and funding strategy involving productive communication with industry groups. Professional staff will be employed for OFA operations. Industry-data information will be collated and published in a readily available form. Networks of industry bodies and regional groups will be developed and integrated into the OFA's communication and policy-making processes. There will be an Internet based industry directory, and there will be emphasis on communication with other peak industry bodies and regional groups. Growth in OFA membership levels will provide broad industry representation and increase lobbying power. 50% of the industry will be OFA members in 2003. There will be a drive for consumer membership.

Conversion to organic/biodynamic systems

Conversion to organic production systems will be encouraged through sufficient information, education, extension and marketing support options. Strategies will be implemented to increase the adoption of organic principles by non-organic farmers and secure the support of non-organic farming bodies and R&D corporations for the organic industry. Collaborators will be state government extension agencies, regional groups and educational institutions. Assistance to convert to organic systems will involve practical information being readily available for bodies such as certifiers, state agencies and educational institutions. Educational institutions will generate professionals capable of supporting the future development of the organic industry. A dedicated degree course will be established; organic units will be incorporated in all

tertiary agricultural courses; there will be apprenticeships and training and accreditation of consultants, teachers and extension staff. More post graduate research will be undertaken in organic systems. Government funding will be sought for organic export and trade development programs. Domestic and export market information systems will be readily available for the private sector seeking to invest in the organic industry.

Research and development

To develop organic production and processing systems R&D capacity in Australia, there will be an integrated approach to identifying and prioritizing R&D needs; R&D corporations will be aware of the potential of the organic industry and commit to funding organic R&D, and industry priorities will be communicated to state governments and the private sector.

Community's understanding

In developing the community's understanding of the benefits of organic food and organic farming systems in terms of food quality and environmental sustainability, there will be co-ordinated and focussed industry promotion, regional groups will be actively involved and information about the health and environmental benefits will be readily available in retail outlets; consumers will be able to easily identify organic produce through a common logo that they have trust in, and a professional working relationship will be developed with the media through a media strategy and training of industry representatives.

Government support

The OFA will foster government support for industry development through united and clear policies. The broad industry will be involved in policy development; domestic legislation will be enacted to protect the organic industry and consumers from misrepresentation. Governments will have the power to prosecute fraudulent activity. Governments and other natural resource management policies and programs will recognize the principles and role of organic production systems and even provide funding for the organic industry from natural resource management budgets.

Environmental and food benefits

The role of organic farming will be strengthened and enhance environmental sustainability and clean food production. Programs will be initiated so that organic standards and certification arrangements will be recognized as the best environmental management systems for a broad range of agricultural commodities. Organic standards will be updated to reflect the broader social issues in agriculture. The support of traditional commodity organizations will be obtained to promote organic production systems and strong linkages between commodity, agricultural groups and the OFA will be developed and become an essential component of the industry's structure.

Performance criteria

By 2006 it is planned that the OFA will be the peak industry body with 80% of the industry OFA members. There will be an effective manufacturing, distribution and retail infrastructure handling the 4% of Australian food consumed that is certified organic. Consumers looking for organic food will easily recognize the products they want through clear language and branding. Accreditation and certification will remain vigorous and robust and be complemented by domestic legislation. Consumer confidence in organic food will be strong. The use of organically prohibited and environmentally damaging inputs will be reduced by 30% on 1999 levels across all Australian agricultural sectors. Governments in Australia will support and be politically committed to organic systems and comprehensive organic policy development will occur in partnership with industry.

Acknowledgement

The support from the Rural Industries Research and Development Corporation to produce and implement the strategic plan is gratefully acknowledged.

24. Organic Agriculture
An Opportunity to Link Urban Consumers with Rural Producers Through Direct Marketing Mechanisms

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The Australian population is one of the most urbanised in the world, with 86% of the population living in urban areas and just over 2% employed in agriculture (ABS 1998). As a result, few of us, whether living in the city or the country, connect directly with the people who produce our food, the farmers. This widening gulf has many implications: as a distant minority, farmers have become convenient scapegoats for environmental problems facing Australia while urban populations are not making the connection between what they eat and what is happening to the land. By its very nature, organic farming is well positioned to improve the connections and strengthen linkages between farming and urban populations. This paper outlines the types of marketing mechanisms that can bring consumers and farmers together, looks at the recent strengthening of farmer-consumer linkages in the Sydney Basin, and discusses the role of government in strengthening these.

As Australian society has become increasingly urbanised over the past 30 years, supermarkets have become our principal food connection. Their buying power enables them to dictate the terms of purchase to farmers and provide consumers with very cheap food. Their convenience and cheapness has led most of us to rely on them for our food supplies without really questioning the process. However, outbreaks of Newcastle disease in chickens here in Australia, and mad cow disease and foot and mouth disease in Europe, combined with concern over pesticide residues and genetically modified organisms, are causing consumers to look more closely at what they are eating.

> *Consumers are aware that food and health are linked. They want the certainty that the food they eat will not give them food poisoning; that it will provide the benefits claimed by manufacturers and nutrition experts; that it will not interfere adversely with the biology of their body; and that it will have no dire effect on their genetic makeup or that of their children. (Lindenmayer 2001)*

Consumers' demand for information about the food they eat is an understandable response to food safety concerns, and has its roots in their geographic and cultural separation from farmers and food production. For most urban consumers, food is something you buy at the supermarket. As a result, many people have lost touch with the time, effort and skill it takes to grow food, whether it be fruit, vegetables, milk, eggs or meat. Supermarkets promote the price and appearance of the end product, not the methods used to grow it. As a result, farmers are under increasing pressure to produce perfect looking food for minimal cost and few consumers realise the impact these market pressures have on farmers' returns, their farming methods and their ability to nurture the land. Nor do they realise the impact it has on the taste and freshness of food. As NSW organic grower Stuart Ross points out, food is not just an economic activity.

> *Rather it reflects a social contract. And this social contract must be revitalised. City-dwellers need to recognise that they have a role to play in fair returns to the grower; fair returns that will allow the grower to ensure the food stock, manage the land in a sustainable manner and ensure the viability and the biodiversity of the country as a whole. (Ross 2001)*

One way to revitalise the social contract between food producer and food consumer is to physically reconnect them so that consumers know who grows their food and farmers know who buys it and what they

want. In Australia urban consumers often live hundreds if not thousands of kilometres away from the farmers who grow the food they eat. Some people are already questioning the wisdom of eating food that has had to travel long distances, consuming energy and losing freshness in the process. They applaud the stance of anti-globalisation campaigner Helena Norbert-Hodge who said last year:

> *There is almost nothing more important than the localisation of food. Every human being has to eat three times a day, so to call a system efficient that separates people further and further from their source of food is nothing short of madness. (Leser 2000)*

This is not an isolated view. In his paper, 'The proximity principle', given at the Soil Association's annual conference earlier this year, UK organic farmer Sir Julian Rose asked:

"Is it sustainable to transport food 300 miles to a decentralised distribution centre, only to have it returned three days later, and three days older, to the shelves of the local supermarket, when it could have come fresh from the fields, earned the farmer a better price and saved considerable pollution to the environment? (Rose 2001)

Even the popular press is noticing. Earlier this year, Sydney Morning Herald writer Maggie Alderson fulminated at the ridiculousness of eating frozen spinach shipped half way round the world using fossil fuels for transport and freezing, instead of buying locally grown spinach.

> *This globalisation of fruit and veg makes me yearn for those French country markets where little old men putt-putt down the hill on their scooters to sell a few bunches of spinach from an old basket. The only way to counter it must be to eschew the convenience of frozen spinach, support local growers and insist on Australian produce. To paraphrase the environmentalist's motto: Think global, eat local. (Alderson 2001)*

If we are to reconnect urban consumers with farmers, we need to look at alternative marketing systems to the ubiquitous supermarkets. We need mechanisms based on geographic closeness and personal relationships, mechanisms that emphasise the responsibility of farmers to produce good quality food for their customers, and the responsibility of consumers to enable farmers to continue growing safe, nutritious and flavoursome food.

> *That kind of interdependence of customer and merchant was out of fashion for a long time. But once again we're beginning to see the value of what sales people call 'relationship marketing'. We see it particularly in the rising interest in buying fresh, locally grown produce either directly from farmers or at farmers' markets. More and more, consumers appreciate a personal involvement with those who produce their food. (Poitras 2000)*

Organic farming is particularly well situated to establish these connections. Organic farmers by their nature are ideologically committed to producing safe, nutritious food using methods that nurture the soil so consumers concerned about their food and how it is produced, want to buy from them. The huge size of cities offers the largest number of consumers concerned enough about food quality and safety to buy organic, so are the ideal client base for organic farmers. Many organic farms are small, family run concerns that are well suited to building personal relationships with individual customers and have the flexibility to adapt to direct marketing mechanisms that help build such relationships. Most organic farms are horticulturally based, growing fruit and vegetables, and maybe growing chickens and eggs on the side. These foods are the easiest to market directly, rather than large scale broadacre crops such as grains that need harvesting and processing in bulk before retail sale.

There are several direct marketing mechanisms available to organic growers. Most have been around for centuries, but have largely disappeared with the arrival of supermarkets and are only now making a comeback. They include farmers' markets, community supported agriculture, vegetable box schemes and farm retail.

Farmers' markets

Historically, farmers' markets are one of the oldest mechanisms for connecting food producers and consumers, but in most Western countries have fallen out of favour in recent decades with the advent of supermarkets. However, they are becoming more popular as consumers take more control of their food purchases and farmers look for alternative outlets for their produce. In the US and UK governments are supporting farmers' markets as catalysts for rural regeneration and diversification, and a means of encouraging urban-rural linkages.

The general principle of farmers' markets is that all produce sold has to be grown or produced by the seller. Benefits for farmers include better prices, steady cash flow, increased flexibility and networking, direct customer feedback and reduced packaging and transport costs. Consumers gain a one-stop shopping alternative to supermarkets, access to competitively priced, fresh local produce and a stronger community. Environmentally, there is less energy used in transport, packaging and storage of food, and the direct contact with customers encourages farmers to sell less intensively produced food. In economic terms, more money is spent and circulated in local economy, it is easier for new businesses to start up, there is flow-on spending in surrounding shops, and reinforcement of local job and business networks.

The British government actively supports the farmers market movement as a means to link town and countryside, boost farm incomes and conserve a rural way of life. It sees farmers' markets creating a significant opportunity for the small and medium-sized family farms most at risk from competition in the global commodity markets. Many markets have a significant proportion of producers who have been able to turn round a declining business and thereby protect and create employment in the rural economy. In 1999 the UK's main organic organisation, the Soil Association, joined with environmental and farmer groups to form the National Association of Farmers' markets to protect and advance farmers' markets at a national level. There are now more than 200 farmers' markets in the UK and the government wants to see 400 through the country (Local Government Association 2001).

In the USA the number of farmers' markets has grown dramatically, increasing 63% from 1994 to 2000, with more than 2,800 markets now operating. The US Department of Agriculture is supporting them as a means to help farmers supplement their income, provide communities with a source of fresh nutritious food, particularly in urban areas, and develop goodwill between farm and urban communities. USDA believes the growth in market numbers indicates that they are meeting the needs of a growing number of farmers with small to medium sized operations (USDA 2001).

In Australia farmers' markets are becoming popular, particularly in metropolitan areas where people have less opportunity to get out into the country and buy direct from farmers. In Sydney, for instance, there is the Farmers Market twice a week at Fox Studios, the Good Living Growers Market at Pyrmont, the Organic Market at Frenchs Forest, Leichhardt Farmers Market and Northside Produce Market. These markets are less rigorous than the US farmers' markets, so they stock a range of products beside farmer grown produce.

> *The markets that are evolving here tend to be geared more towards value-added products and less towards raw produce. In fact, several veer more towards offering gourmet items rather than staples and the prices reflect that. What's more, because most aren't weekly affairs, it's almost impossible to replace your conventional shopping routine with a regular trip to the market. (Greenwood 2001)*

Outside metropolitan areas there are small local growers markets operating or being planned as regular or occasional events. In Lismore on NSW's north coast the weekly Rainbow Region Organic Market, started in December 1999, has become very successful, with 20 or more stallholders serving a regular clientele of restaurateurs, vegetable box suppliers and retail customers. One of the market's founders, David Roby, says the markets have boosted local growers' incomes and helped newcomers enter the organic industry.

> *The markets have been profitable for everyone involved. They are very social. Farmers are forced to know more about the food they sell so that they can answer customer queries, and customers advise each other on how to deal with different foods. We have found that the market doesn't really cater for farmers who grow only one food; they have to have a range of food to do well. (David Roby pers.comm.)*

The general weekend markets that have sprung up around Australia are not farmers' markets as such but are proving profitable venues for smallholders selling locally grown fresh produce. Like farmers' markets these weekend markets provide a social outlet for often isolated growers and help improve their networks. Their stalls act as an awareness raiser to people visiting the markets for non-food products, thereby attracting more consumers to buy fresh and local. The size and number of existing weekend markets make them an excellent base for organic farmers to build up a clientele if there are no farmers' markets nearby.

Community supported agriculture

Community supported agriculture is a system whereby consumers pay farmers to grow what they want to eat. This system originated in Japan in the 1960s when housewives joined together to buy milk in bulk from a dairy farmer. The success of this venture has encouraged several groups of consumers to deal direct with farmers, a system known as teikei, a word meaning tie-up or partnership which has come to represent partnership between producers and consumers.

There are ten principles of Teikei which are worth mentioning here:

1. To build a creative, personal relationship based on friendship, not business.
2. Planned production based on mutual agreement between farmers and consumers.
3. Consumers to accept all produce harvested.
4. Mutual agreement on prices which are fair to both parties.
5. Exchange of information and communication to strengthen the relationship.
6. Self distribution of produce, either by farmers or consumers.
7. Democratic group activities.
8. Emphasis on self education programs.
9. Keep groups small enough to maintain the important face to face interactions.
10. Consistent progress towards the realisation of the goals of organic agriculture and an ecologically sound life (Kavanagh 1996).

Japan has a range of teikei groups, varying in size. In 1994, there were 800-1000 groups with a total membership of 11 million people and a turnover of more than $US15 billion each year (Pretty 1995). The Seikatsu Club, with more than 200,000 households, guarantees farmers business if they avoid using chemical pesticides and fertiliser. The members place orders direct with farmers, and visit regularly to observe production methods and help with farm tasks. The consumer-farmer link is highly valued because it is considered to moderate and humanise the market, especially in the area of food production (Right Livelihood Award 2001). The Japan Organic Agriculture Association requires that farmers use no synthetic chemicals and that in return consumers buy whatever the farmers produce. Consumers also help with weeding and other farm tasks, and contribute toward the purchase of capital items such as delivery vans and cold storage facilities (Ceres 1994).

CSA reached the US east coast in 1986 and there are now more than 1000 community supported farms in the US and CSA groups. The Madison Area Community Supported Agriculture Coalition (MACSAC), for example, comprises:

> *consumers and farmers working together to build sustainable relationships among farms, local communities, and the land. Our actions are guided by the desire to promote a healthy local food supply, to support small-scale farms, and to protect the environment. MACSAC 2001)*

In the US CSA model, consumers buy shares in a farm. The price of a share is the farm's operating budget divided among the shareholders. The shares are paid in advance, providing the farm capital to help buy seed, greenhouse supplies, tools and equipment etc. In return consumers are provided with food distributed weekly during the growing season. Farmers benefit from the arrangement because they have upfront capital to work with and a community of shareholders to share the risk with. If the crop fails, all lose out proportionally. Shareholders benefit by knowing where their food comes from and how it is grown. They may also have a voice in the farming practices used and the varieties selected. Growers have to be able to grow a range of crops in succession to provide consumers with enough variety of foods (Milstein 1999).

CSA is not as popular in the UK, where it is also known as subscription farming. There are only a handful of schemes, possibly because CSA does not suit the British temperament in that it involves commitment in advance and close involvement which people may be uncomfortable with or do not have the time for (Soil Association 1999).

CSA is only in its infancy in Australia. There have been several schemes initiated, but most seem to have foundered or changed direction. One of the first CSA farms, Berry Organic Subscription Farm, established in Kangaroo Valley in 1987, subsequently became an organic home delivery service but is now branching out into a type of CSA with its Club Organic where members pay for food in cash and labour (Doorstep Organics 2001). The Challenge City Farm at Lismore ran a CSA scheme for a short time, but it ultimately shut down (Roberts 1996). Currently, CSA schemes run in Hobart, Berry, Mudgee, and at Primrose Hill Farm on NSW Central Coast (Peter Kenyon, pers.comm.) where Nick Pook grows vegetables for a number of subscribers who pay each month and pick up their boxes each week at Marrickville.

> *Subscribers rely on Nick to do his best to provide produce to the standard and in a variety representing good value for money. Nick relies on the subscribers to hold their commitment to support the farm –especially when the going gets tough. (Kenyon 2001)*

CSA enthusiast Peter Kenyon encouraged Nick Pook to get into CSA and believes it is the path to sustainability for city-based consumers.

> *If you are not connected to the ring of land around the city, then you won't care if that ring is lost and the city goes on expanding forever. Cities have traditionally been supported by the land around them, but now we don't find it abnormal to buy oranges from California or garlic from China. (Maddox 2000)*

Vegetable box schemes

Vegetable box schemes are similar to CSA schemes in that consumers receive a regular supply of fresh seasonal vegetables but, unlike CSA, there is no upfront commitment required from the consumers. In the UK they are one of the fastest growing forms of getting food straight from farmers to consumers. Boxes of fresh, seasonal organic food are delivered directly to customers' homes or a central drop off point. The boxes usually contain local produce to keep packaging, storage and transport to a minimum. Customers value the personal contact and being able to receive vegetables usually picked the same day. The scheme is

a great success in the UK where there are 200 certified organic box schemes and most have long waiting lists (Soil Association 2000).

The Soil Association says the scheme is helping many people discover the seasonality of British vegetables for the first time. Benefits to producers are the direct contact with customers and removal of the sense of isolation often associated with modern industrial agriculture. Growers can respond directly to customer requests, with less wastage because they know what harvest will be sold. They establish a secure and loyal market with higher returns because the middleman is cut out. There is also scope for growers to form cooperatives to provide a greater range of produce. One successful box grower, Jan Dean, says the system is more enjoyable and more profitable than supplying in bulk.

> *And there is the sense of being more in control of our destiny. We decide what to grow, we decide what the acceptable quality parameters are and we decide the selling price. We even decide how many customers we wish to have. All we have to do is ensure that our customers are happy with our decisions and certainly, for us, that has not been very difficult. We have a very settled customer base - the majority have been with us for six or seven years and we have an extensive waiting list with which to fill up any gaps caused by people moving away or simply decidinge that the system is not for them. (Dean 1998)*

The Japanese scheme Radish Boya is a national home delivery network that provides a weekly supply of fresh produce packed and delivered in the same day. The fruit and vegetable combinations are selected by the consumer, goods are produced using few or no pesticides or herbicides by farmers who have agreed to supply safe products. The network was launched in 1988 by the Japan Citizens Movement for Recycling, a group who wanted to protect the soil from harmful chemicals and consumers from health hazards. Because the farmers were initially nervous about the risks involved in growing for the network, members initially guaranteed to purchase all yields from the farmers. (Oikawa 1999)

Farm retail

Farm retail includes farm shops, pick your own operations and farm gate sales. Britain has a farm retail association that offers a consultancy service for farmers wishing to set up direct selling, and an education and training program on production and merchandising (Farm Retail Assocation 2001). In the US the North American Farmers' Direct Marketing Association provides 'an organisation and environment which promotes and fosters the growth of farm direct marketing by offering opportunities for education, networking and fellowship to its members' (NAFDMA 2001). Many British and US farms have quite sophisticated farm shops selling fresh seasonal produce from their own and neighbouring farms. This trend is only starting in Australia where roadside stalls have been a traditional outlet for farmers wishing to sell produce. Many producers are working with tourist organisations to develop food trails to encourage visitors and tourists to the area to buy local produce. Examples include Gippsland Food Chain, Yarra Valley Regional Food Group food trail and the Hawkesbury Harvest farm trail.

By linking farmers with urban consumers, direct marketing mechanisms give consumers access to fresher local food, provide farmers with alternative incomes, and reduce the potential for conflict between urban and rural populations. Building personal relationships between farmers and consumers helps farmers understand what consumers want in their food, and helps consumers understand what is required to grow food in terms of time, natural resources and climate. Greater awareness by consumers about food production helps consumers understand the hidden impacts of buying cheap food, thereby reducing the potential for farmers to be scapegoats for environmental damage.

Direct marketing of food produce in cities already exists in Australia, due largely to the passion and commitment of a few individuals. But if we are to maintain the local aspect of food for city dwellers we

need to ensure that urban sprawl does not swallow the agricultural land that rings cities, forcing food production further and further away from the point of consumption. The UK has very strict guidelines to ensure that cities do not detract from the nation's famously beautiful countryside, and several US states are bringing in strict antisprawl measures to protect farmland from development. This is an issue Australia is just starting to encounter, and NSW Agriculture has been working closely with the state government and local government councils in Sydney to protect agricultural land in the Sydney Basin. This has required much consultation as the following case study shows, and the successful outcome ensures that urban consumers have the potential to access locally grown food in the Basin.

Case study: agriculture in the Sydney Basin

Less than a decade ago, agriculture did not have a future in the Sydney Basin. When NSW Agriculture officer David Mason moved to Windsor in 1992 to work with socio-economic and environmental issues related to agriculture in the Sydney region he attended a national land planners conference at Penrith Panthers. When he asked what planning provisions were being made for agriculture in the Sydney region, the answer was curt: 'There is no planning for agriculture in the region as agriculture has no place here. It belongs over the range. Agricultural land is a land bank waiting higher economic use.' This was despite the fact that agricultural production in the region was worth at least $1 billion per annum at the farm gate, had a multiplier factor of at least three, and employed many thousands of people, mostly from non -English speaking backgrounds.

Through an extensive and genuine community consultation process over the next five years David Mason found there were a significant number of people, groups and organisations who did not agree with the planners' view. The outcome of the consultation process was the release in 1998 of the *Strategic Plan for Sustainable Agriculture: Sydney Region* (NSW Agriculture 1998) which clearly establishes the role of sustainable agriculture and its capacity to contribute to the quality of life of the Sydney community. Benefits of having agriculture so close to a major metropolitan centre include:

- economic returns from highly productive lands
- reliable supply and availability of fresh produce to residents of Sydney region
- minimal freight costs
- employment opportunities
- integration of diverse agricultural activities
- provision of a green belt with scenic value, lifestyle and recreational opportunities.

The plan is based on the three essential principles of sustainability: security of tenure, security of resource and equity. It addresses the issues of planning, benefits of sustainable agriculture, data, incentives and equity, education and promotion, and agricultural resource management. While the plan relates to farmers its main purpose is to provide power to agriculture at the political and bureaucratic levels. As a result of that consultation and the release of the strategic plan, there are now a number of initiatives to secure the future of sustainable agriculture in Sydney and provide the opportunity for urban consumers to connect more closely with farmers. These initiatives are detailed below.

TeamWest

Team*West* is a coalition of public, private, educational and community groups and organisations in Western Sydney. It supports the development of agribusiness in Western Sydney, a move endorsed by the Department of State and Regional Development and the Greater Western Sydney Economic Development Board. Team*West* is defining and developing a regional agenda that meets the specific needs of the region, and its recommendations to State Government are proving a very effective lobbying mechanism. The Western Sydney Regional Organisation of Councils (WSROC) facilitates the process (Team*West* 2000*)*.

Western Sydney industry awards

The Office of Western Sydney has included agribusiness as a distinct category in the annual Western Sydney Industry Awards. The Tolson Group, who produce mushrooms and mushroom substrate in the Hawkesbury and Penrith, was the only company to win three categories of awards in the 2000 Western Sydney Industry Awards. One of those awards was the Global Excellence - Most Outstanding Large Business Award. The Tolson Group employs nearly 300 people the majority being from other cultures.

Planning strategies

The Department of Urban Affairs & Planning' s strategy for Western Sydney - 'Shaping Western Sydney' (DUAP 1998) and its Strategy for the Central Coast 'Shaping the Central Coast' (DUAP 2000) support the retention of sustainable agriculture.

The Draft Hawkesbury Nepean Catchment Strategic Plan recognises the environmental role that sustainable agriculture plays in the management of the catchment, eg. natural resource and landscape management (DLWC no date).

Community support

The Western Sydney Regional State of the Environment Report 2000, based on extensive community consultation, identified that three of the fourteen environmental priorities for Western Sydney would benefit from the retention of agriculture in the region. They were the 'need to retain breathing space' (no. 2) the 'need to appreciate the value of rural industries' (no. 7) and waste utilisation and reduction (no. 11) (WSROC 2000).

Sydney's Fresh Food Bowl

Sydney's Fresh Food Bowl is a network of representatives from the natural resource, agriculture, health, education, waste and industry sectors of the Sydney region. It was established in recognition of the relationship between healthy catchment, healthy food and healthy people and was launched by the Hon Richard Amery, Minister for Agriculture in March 1999 at Parliament House. NSW Agriculture has played a significant role in the development of the network and its operations by establishing strategic alliances of a socio-economic nature with other related community and government sectors.

An outcome of this process is the recent release of *the Fruit and vegetable tool kit - a guide for local testing events* (NSW Health 2001). NSW Health contracted the Fresh Food Bowl network to produce the kit which is a 'how to' resource for tasting events. Its primary target is community/public health nutritionists and other health professionals. The kit however can be used by anyone who wants to promote increased fruit and vegetable consumption. Research has shown that taste is a very effective way to raise awareness of fruit and vegetables and interest people in consuming more. Tasting events will improve consumer's attitudes, perceptions, knowledge and skills with respect to fruit and vegetables.

The kit presents case studies including such things as open farm days; how to promote fruit and vegetables at local festivals; how to get health messages across to NESB communities; and how to get sponsorship for fruit and vegetable promotion.

Rural land studies

Local government support for the retention of agricultural land is indicated by the rural land studies carried out by Penrith, Wollondilly, Camden, Baulkham Hills and Hawkesbury Councils.

Hawkesbury Food Program

Hawkesbury City Council in particular has recognised the role local sustainable agriculture has to play in the food security, food safety and health status of people at the local government level. It is actively involved in the Hawkesbury Food Program, a partnership between Council, Hawkesbury District Health Service, NSW Agriculture, Centre for Healthy Futures - UWS Richmond Campus, Hawkesbury Care, Hawkesbury Earthcare and Hawkesbury Skillshare. One outcome of this process is Hawkesbury Harvest.

Hawkesbury Harvest

Hawkesbury Harvest is an organisation that seeks to ensure the sustainability of local/regional agriculture (Hawkesbury Harvest 2001). It is based on several philosophical assumptions:

- Personal development is the primary motivating factor of people. There is an innate desire by people to achieve their potential.

- The responsibility and role of government (political and bureaucratic levels) is to ensure the necessary social and economic infrastructure, underpinned by environmental standards, is in place to provide the opportunity for people to achieve that potential.

- A balance of bottom up (community and industry) and top down (government) regional development using appropriate processes empowers people to achieve their potential.
- Developing strategic alliances/partnerships with other social, economic and environmental elements at both the local/regional and broader societal levels significantly enhances the potential for small scale, large scale and high-tech peri-urban agriculture to become sustainable. In so doing it offers a competitive form of triple bottom line land use i.e. social, economic and environmental.

The first strategic alliance Hawkesbury Harvest has developed is with tourism through the farm gate trail concept. It also aims to develop partnerships between the various individuals, groups and organisations that represent the social, economic and environmental capital of the local region.

Hawkesbury Harvest is already having a positive impact on the profitability of farmers. It is proving to be an economic generator for the region and a catalyst for community development. It is also proving to be a mechanism for the retention of agricultural lands in the region due to its increasing support from the community and Council.

Hawkesbury Harvest is providing a model of a process initiated through a partnership between government, bureaucracy and the community. As the process develops the ownership and commitment to its on-going success will increasingly move from the government and bureaucracy to the community.

Hawkesbury Harvest is providing an increasing sense of confidence in people by opening up possibilities to those who want to become involved in agriculture in the region or who want to better utilise their land. A recent workshop to explore the potential for the development of a wine industry in the Hawkesbury attracted more than 50 people which is a good result given that the workshop was conceived and conducted within a week. It is also planned to conduct similar workshops to explore the potential for such things as bush tucker food, herbs and spices and organic food. Organic agriculture provides an ideal mechanism for environmentally responsible social and economic development congruent with personal development at a regional level.

Role of government in linking urban consumers with rural producers

The Sydney Basin case study and the growth of farmers' markets and other food marketing mechanisms both internationally and in Australia shows that there is a groundswell of concern among consumers,

farmers and government about the physical and cultural gulf between food consumption and production, and the need to reconnect people with their food. Many of the marketing systems available have been developed by passionate individuals who care about the quality and freshness of the food they eat, and the importance of the role of farmers. What role can government play to help these people and encourage further urban-rural food linkages?

The Sydney Basin experience shows that government can help with policy formulation at a state and local level, and that local government can help at the community level, by providing the space, secretariat support and funding for meetings and start-up activities. Regional food ventures such as farmers' markets and regional cuisine groups often receive developmental support from local government and groups such as the department of State and Regional Development Dept. NSW Agriculture can play an important role in supporting smaller-scale agricultural ventures as well as its more traditional agribusiness clientele. This support can be technical advice, garden advisory service for people wanting to grow more food at home, and systems to help consumers connect with farmers, as Jules Pretty suggests.

> *Local economies benefit when stakeholders within the system are connected up so as to help create social capital. This may mean the creation of new community businesses and enterprises, or the emergence of new social institutions, such as farmers' groups, community cooperatives, or community councils. However, social capital needs a deliberative process to bring different people together and an external person or agency usually best facilitates this. (Pretty 1998)*

The real role of government in food is facilitating and ensuring that people have access to their birthright, good quality, and nutritious healthy food. Traditionally agriculture departments have worked with food producers and in recent years have participated in the trend towards viewing food as a commodity rather than a vital and fundamental part of life. But it is important for agriculture departments to work with both consumers and producers interested in smaller scale agriculture and local, as opposed to global, food networks, thereby encouraging competition for supermarket monopolies.

> *Evidence is beginning to point toward a safer, simpler path: getting small farmers back on the land and more people directly involved in producing their food. Small and personal, it turns out, is not only more beautiful than big, it is more efficient, equally productive, more adaptable, more secure and it contributes much more to our communities, our economies, our health and our lives. The only trouble with small, in a country focused on big, is that it is often invisible. We see only the long shadow of big agriculture, and miss the generativity, inventiveness, adaptability of the agricultural revolution going on at the local level, in farms, town halls, living rooms, farmers' markets and city gardens. (Poitras 2000)*

The US Department of Agriculture and the UK Department of Environmental Food and Rural Affairs (formerly the Ministry of Agriculture Fisheries and Food), are both looking at mechanisms for linking consumers with producers and improving consumers' connections with food production. The USDA's website provides extensive practical information on mechanisms such as farmers' markets (USDA 2001d), direct marketing (USDA 2001c) and community supported agriculture (USDA 2001 b). One of the aims of the USDA's Community Food Security Initiative is to improve community food production and marketing by aiding projects that grow, process and distribute food locally (USDA 2001a). In July 2001 DEFRA launched its 'Eat the View' program in July to forge better links between consumers, the food they buy, and the countryside so that consumers are more aware of how their buying decisions impact on the countryside, how it looks and its economic viability.

> *Through this program, we want to show how buying power can be harnessed to benefit the countryside. This means creating a stronger consumer demand for certain products, and*

helping small and specialist producers find markets in the face of increasing globalisation and the powerful forces of large retailers. We hope that if producers can be given the right support and financial signals they will be motivated by sound economic reasons to change their practices, as organic farming has already shown. If people buy products from enterprises which are managing the land sustainably, then those enterprises will be better able to protect and improve the countryside in the future. (Countryside Agency 2001)

Although its early days for Australian agricultural policy makers in making closer urban-rural consumption production linkages, NSW Agriculture's support for agriculture in the Sydney Basin and the recent opening of its organic centre at Bathurst in June indicates that the department is listening to consumer concerns and facilitating consumers' desire for closer links with producers and support for smaller-scale agriculture. When the department's executive director of research, advisory and education, Helen Scott-Orr, visited the US last year to look at genetically modified and organic food production, she found that:

innovative consumer-farmer marketing groups are providing local outlets for organic produce, but depend on strong ideological commitment from group members to keep running. (Scott-Orr 2000).

In her published report, she has recommended that Australian organic associations investigate the development of consumer-farmer alliances.

It is important to note that government's role is to facilitate the process of improving urban rural food linkages, rather than dictate the agenda. Producers and consumers have the most important roles to play. Producers have to initiate alliances with other producers, consumers and government, and be imaginative in their sourcing of new outlets for their produce. Consumers have to actively seek out local food and organic food, by asking for it in shops and by approaching local government to facilitate trading venues for local food. As Mary Rose Liverani noted in her review of Eric Schlosser's recently published book *Fast food nation: the dark side of the all-American meal*, consumer discipline is vital: 'Self-discipline in consumers will empower them to discipline the food franchisers. That's all it takes.' This point is supported by social scientist Noreena Hertz in her recently published book *The silent takeover*:

So it is left to consumers, through individual action to take the lead. In a world in which power lies increasingly in the hands of corporations, the most effective way to be political is to cast one's vote not at the ballot box but at the supermarket or a shareholders' meeting. (Hertz 2001)

Conclusion

Growing concerns about the globalisation of our food supplies, the safety of food production methods and the distances food has to travel are alerting consumers to be more responsible about their food choices. Changing food marketing mechanisms to more local, direct systems, requires action by passionate, disciplined consumers, committed farmers, particularly organic farmers, and government, particularly local government and agriculture departments. We all need to work together to encourage smaller-scale agriculture and organic agriculture; support initiatives to develop local food networks that link urban consumers and farmers; enhance farmers' standing in the community so that they are paid well for their life sustaining work; and revitalise communication and understanding between the city and the country. To finish with the words of Hugh Raven, of Organic Scotland:

What fires me up is the knowledge that to be true to our values and to restore food and farming to its primordial place in our national life, we have to think global and eat local, and we need the structures to let us do that. (Raven 2001)

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25. Rural Revitalisation with Organic Agriculture

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Abstract

Organic farming provides better financial, environmental and health outcomes for rural communities.

The current paradigm of industrial agricultural production is clearly failing the farmers and the communities they support. Most rural communities are in decline, with high unemployment, decreasing population, loss of essential services, environmental problems and lower than average health expectations.

Organic farms spend less on imported chemicals and more on labour and other locally supplied inputs than conventional farms. The multiplier effect, of the money spent on employing local labour and inputs, has a very positive stimulating effect in the local community and the wider economy.

Published studies comparing the income of organic farms with conventional farms have found that the net income is similar and that when the market premium for organic produce is factored in, organic farms can be more profitable.

Studies have consistently found that organic systems are the most environmentally sustainable agricultural systems. Organic agriculture helps to reduce greenhouse gases by converting atmospheric carbon dioxide into soil organic matter.

Research based on USDA figures shows a major decline in the nutritional value of conventionally farmed foods. Two recent independent studies had consistent results showing that organic food contains much higher vitamin and mineral contents than conventionally farmed food.

Organic food has no toxic chemical residues. There is a growing body of published scientific evidence showing a large range of adverse health and environmental effects that are caused by agricultural chemicals.

A shift to organic farming would see increased employment, economic stimulation, an improved environment and better health outcomes in rural communities.

Introduction

The current paradigm of industrial agricultural production is clearly failing the farmers and the communities they support. Most rural communities are in decline, with high unemployment, decreasing population, loss of essential services, environmental problems and lower than average health expectations.

This seems to be consistent in the major commodity production countries of the world such as the USA, Canada, Argentina and Australia.

In Australia the main solutions to these problems from governments and industries is a push for greater market deregulation and for increased production through genetically modified organisms. (GMOs)

However experience shows that corporate agriculture with the large economies of scale will benefit the most from these policies. The small and medium size farms and the towns they support will continue to decline.

The soybean industry in Argentina is a good example of what happens when a country pursues the policies of market deregulation and GMO crops as solutions to rural decline.

Argentina is the third largest producer of GMO crops with 28% of the world's production. By the 1999/2000 season, more than 80% of the total soybean acreage or 6.6 million hectares had been converted to GMOs. These are some of the results.

- Declining profit margins: Prices for soybeans declined 28% between 1993 and 1999.
- Farmers' profit margins fell by half between 1992 and 1999, making it difficult for many to pay off bank loans for machinery, chemical inputs and seeds.
- At least 50% of the acreage is now managed by corporate agriculture.
- A 32% decrease in producers: Between 1992 and 1997, the number of producers dropped from 170,000 to 116,000. 54,000 farmers were forced to leave the industry.
- Increasing role of transnational companies in the agricultural sector:
  Industrialization of grain and soybean production has boosted dependence on foreign agricultural inputs and increased foreign debt.
- Removal of import tariffs led to the bankruptcy of domestic farm machinery manufacturers and a loss of employment.
- The commercial seed sector has become increasingly controlled by subsidiaries of transnational corporations. [1]

I firmly believe that we stand on the crossroads. We can continue down the path of corporate agriculture and continue the decline of the family farm and the regional communities that depend on them, or we can take a new direction.

Reversing the decline

There are many reasons for rural decline and it will take numerous strategies to reverse the current situation. I would like to propose that **Organic Agriculture** should be one of the major strategies needed to reverse rural decline and outline some of the benefits of the shift to this form of sustainable farming.

Increasing yields

One of the important issues in reversing this decline is to make farming more financially rewarding. Most children leave the farm as they know they can make more money, working less hours in numerous other careers.

The joke goes: What do you call giving the farm to your children? Child Abuse.

Increasing yields and productivity is one method of generating more income. The present trend most governments and agribusiness corporations are taking to achieve this is genetic modification. This is being pursued as the silver bullet to all the agronomic problems.

However recent advances in the agronomy of organic farming are demonstrating significant increases in yield, far in excess of those being achieved in GMO trials, and at a fraction of the research and development costs of GMOs.

Studies in Africa, the Americas, Asia and Europe show that the best organic farms can have higher yields than conventional farms. [2] [3]

The editorial of New Scientist February 3, 2001 stated that low-tech sustainable agriculture, by shunning chemicals in favour of natural pest control and natural fertilisers, is pushing up crop yields on poor farms across the world, often by 70 per cent or more. [4]

A long term study conducted by the Washington State University, published in April 19th issue of the science journal Nature, compared the economic and environmental
sustainability of conventional, organic and integrated growing systems in apple production. One of the researchers, Professor John Reganold concluded
"The bottom line is that organic outperforms the others." [5]

Last year I traveled across the United States of America, meeting with researchers and organic farmers to learn about the current methods where best practice organic farmers are getting higher yields than conventional farmers.

Universities and research institutes, such as the University of California Davis and the Bio-Ag Learning Centre, Wisconsin are running long term trials that are demonstrating that well run organic agriculture can achieve consistently higher yields and better environmental management than conventional agriculture.

In Iowa, Wisconsin and Michigan I visited biological and organic farms that are being run on the principles of re-mineralisation and microbial activation. The yields from these farms were significantly higher than the averages for conventional agriculture in surrounding areas. [6] [35]

Professor George Monbiot, in an article in the Guardian, 24th August 2000, gave the following excellent examples of higher organic yields. [7]

In trials in Hertfordshire, in the United Kingdom, wheat grown with manure has produced consistently higher yields for the past 150 years than wheat grown with artificial chemical nutrients.

Professor Jules Pretty of Essex University, UK, has shown how farmers in India, Kenya, Brazil, Guatemala and Honduras have doubled or tripled their yields by switching to organics.

Cuba has adopted organic farming as policy, because it improves both the productivity and the quality of crops. [7]

One consistent piece of information that is coming from many of these studies is that organic agriculture performs better than conventional agriculture in adverse weather events, such as droughts or higher than average rainfall. [8] [10]

There is more than enough evidence to show that best practice organic agriculture can be the highest yielding form of agriculture.

Small farms

The current paradigm of industrial agriculture is towards larger farms in an effort to get the benefits of economies of scale. One of the major casualties in this restructuring of agriculture has been a loss of employment and rural families in the local communities. The flow on effects of this loss of income has meant the closure of services in rural towns.

Small farms employ more people per hectare, especially family members.
Research also shows that small farms produce higher yields per hectare than large monocultures – and are more efficient in terms of use of inputs. Professor Monbiot states that a study in the United States showed that small farmers growing a wide range of produce can make up to ten times as much money per acre than larger farmers growing single crops. [7]

A good example of a successful small farming economy is France. France is the third largest producer of agricultural products in the world and it has an agricultural sector that is largely based on the family farm. Their production per hectare is much greater than the two largest agricultural economies, the USA and Canada, which rely on huge areas of land to achieve their gross yields.

Growing market

Organic produce is now the fastest growing market in the world. Whereas most agricultural products are in oversupply and are facing low world prices, the supply of organics cannot meet current and projected demand.

While many agricultural commodities are going through an extended period of historically low prices, the growing demand for organic products has seen good premiums paid for many commodities. [9]

One of the advantages of being part of an expanding industry, is better long term viability for farmers and their communities.

Farm income

Published studies comparing the income of organic farms with conventional farms have found that the net incomes are similar, with best practice organic systems having higher net incomes. [8]

A study in the USA by Dr Rick Welsh of the Wallace Institute has shown that organic farms can be more profitable. The premium paid for organic produce is not always a factor in this extra profitability. Dr Welsh analyzed a diverse set of academic studies comparing organic and conventional cropping systems. Among the data reviewed were six university studies that compared organic and conventional systems. [10]

The recent study into apple production conducted by Washington State University showed that the break-even point was nine years after planting for the organic system and 15 and 16 years respectively for conventional and integrated farming systems. [5]

Environmental

A report released by the International Food Policy Research Institute stated that only 16% of the world's farmland is free of problems such as chemical contamination, soil loss, acidity or salinity. [11]

Dr Tim Flannery writes in The Future Eaters that 70% of Australia's arable land is degraded. [12]

According to a study from the University of California, agriculture will be a major driver of global environmental change over the next 50 years, rivaling the effect of greenhouse gases in its impact. [13] "The global impact of agriculture will be at least as great as climate change," writes lead author David Tilman, a visiting researcher at the National Center for Ecological Analysis and Synthesis at the University of California at Santa Barbara

The study authors believe that the use of fertilisers and pesticides as well as habitat destruction have caused a major extinction event and predict that this trend will continue to lower the world's biodiversity and change its ecology.

Examples of this are the current degradation of the Great Barrier Reef and the large dead area in the Gulf of Mexico. Both of these are caused by the run off due to poor land management practices. [14]

"Neither society nor most scientists understand the importance of agriculture," said lead author David Tilman. "It's grossly misunderstood, barely on the radar screen, yet it is likely as important as climate change."

> *He stated "We have to find wiser ways to farm."*

Numerous studies in Australia and around the world have consistently found that organic agricultural systems are the most environmentally sustainable and have the least off farm impact of any agricultural systems. [15] [16]

These studies show, due to not using soluble fertilisers, building high soil humus content and soil conservation techniques, that there is minimal soil and nutrient run off from organic farms. [5] [8] [10]

Also because organic farms do not use synthetic toxic chemicals, no residues and breakdown products of these chemicals enter the environment.

Germany pays farmers living in the catchments of cities such as Munich, to convert to organic agriculture. This guarantees the quality of drinking water. Changing to organic agriculture could rapidly restore the current degradation of the Great Barrier Reef, the Gulf of Mexico and other areas on the planet.

Organic farms have greater biodiversity and biological complexity than conventional farming systems because they are required to have nature strips to encourage beneficial species and do not use toxic chemicals that can kill these species.

Organic farmers do not use chemical warfare on nature, destroying their enemies, the pests, diseases and weeds, with synthetic polluting poisons. Organic farmers work with nature and consequently successful organic farmers have to be aware of the importance of keeping a healthy environment in order to continue farming.

The recent study into apple production conducted by Washington State University showed that the total environmental impact of conventional farming systems was 6.2 times higher than organic systems. In other words conversion to organic agriculture would see a greater than 500% improvement to the environment. That is a spectacular result and for this reason alone, governments around the world should be actively encouraging all farmers to convert to organic agriculture. [5]

Greenhouse gas abatement

Organic agriculture helps to reduce greenhouse gases by converting atmospheric carbon dioxide (CO2) into soil organic matter.

Conventional agriculture has caused a massive decline in soil organic matter, because of oxidising organic carbon by incorrect tillage, the overuse of nitrogen fertilisers and especially from topsoil loss through wind and water erosion. Most of it ends up as CO2 or as Methane when it eutrophies aquatic environments. Both of these are greenhouse gases. [6] [15]

On the other hand organic agriculture deliberately builds up soil organic matter, which largely comes from atmospheric CO2 fixed by plant photosynthesis.

Each 1% increase of soil organic matter equals over 20,000 kgs of carbon dioxide per hectare. In other words a 100 hectare farm that had a 1% increase in organic matter would be removing 2000 tonnes of CO2 from the atmosphere.

On a worldwide scale, if we had hundreds of millions of hectares of organic farming it would equate to removing billions of tonnes of CO2 from the atmosphere.

Conversely, the hundreds of millions of hectares of conventional farming, continuing the ongoing destruction of soil organic matter, are contributing many billions of tonnes of CO2 and methane into the atmosphere.

This destruction of soil organic carbon into greenhouse gases should be factored into any agricultural project that is trying to say that it is greenhouse gas neutral or that is producing renewable energy in the form of ethanol or by burning biomass to produce electricity.

The conversion to organic farming should be an integral part of all future greenhouse gas agreements and treaties.

Health

Research has shown that rural Australians generally have lower health outcomes than urban residents. There are many reasons for this, however one that seems to be ignored by health authorities is exposure to agricultural chemicals. [17] [18]

Research from around the world, has shown that rural communities are exposed to these toxic chemicals, through spray drift, in rain water, volatisation after spraying, from groundwater and drinking water contamination and in food. [18] [19] [20] [21] [22]

A recent study by the U.S. Centers for Disease Control found a cocktail of many toxic chemicals in the blood and urine of most Americans that they tested. [23]

Other studies show that most living organisms carry a cocktail of synthetic man made chemicals, and only now are scientists beginning to understand the detrimental effects of these artificial toxins.

This is an issue that now affects everyone on the planet, however a number of studies have documented that people in farming areas have some of the highest exposures to these toxins, due to their closer proximity to the source.

Peer reviewed published research has demonstrated that many of these types of chemicals are known to disrupt the hormone, nervous and immune systems. The escalating increase of certain types of cancers such as lymphoma, leukemia, breast, uterine and prostate cancers are linked to agricultural chemicals.

Similarly a good body of scientific research also links these chemicals to the dramatic increases in auto immune diseases such as asthma and chronic fatigue syndrome.

Many rural areas of Australia have some of the highest asthma rates in the world. Similarly cancers such as Non Hodgkins lymphoma have gone from being one of the rarest cancers to one of the fastest growing cancers amongst people exposed to agricultural chemicals. [18][24] [25] [26] [27] [28] [29] [30] [31]

Organic food

Organic food has health benefits for all Australians because it has no toxic chemical residues and higher nutrition values.

There are many studies that show that most conventionally farmed food has pesticide and other chemical residues. Repeated tests show that many of these foods can carry a cocktail of synthetic poisons. [18] [19]

There is a growing body of science that is showing that repeated exposures to cocktails of small amounts of synthetic chemicals have a range of adverse health effects. Many scientists believe this is very significant for children. The United States Environmental Protection Agency is now in the process of reducing current chemical residue levels in food to one tenth of the present levels to lessen childhood exposure. [18]

Another significant factor in poorer health is poor nutrition. Research also shows a major decline in the nutritional value of conventionally farmed foods.

A recently published study shows that current fruit and vegetables in the USA have about half the vitamin and mineral content of their counterparts in 1963. This study was based on comparing published US Department of Agriculture figures. [32]

It is no coincidence that the consumer demand for food supplements has grown as the amount of minerals and vitamins decline in conventionally farmed food. Many people cannot get the necessary quantity and quality of nutrition from food grown from synthetic chemicals.

Two recent independent studies, one in the USA and the other in Australia had consistent results that showed that organic food contains much higher mineral contents than conventionally farmed food. [33]

Employment

Organic farms employ more people than conventional farms. This is because they tend to use cultural methods for control of weeds pests and diseases, rather than chemicals. These methods are more labour intensive than spraying.

Also as organic farms tend to be family farms, they provide employment for all of the family members. [34]

This income is mostly spent locally. The flow on effects of this income means more employment is created in rural communities through the provision of services. [35]

Community benefits

Presently a large proportion of the value of farm production is going to multinational corporations as payment for toxic chemicals, synthetic fertilisers, seed license agreements, expensive farm equipment and other costly inputs. The money spent on these items tends to go out of the rural community and out of the country as most conventional farm inputs in Australia are imported.

In an organic system much of the money earned through production goes to the local community or to nearby regional communities. Apart from some machinery, very little is spent on imported inputs

Most soil nutrition inputs are local. Manures, mulches and compost materials are usually sourced on farm or nearby.

Some mineral inputs, such as lime, dolomite, rock phosphate, ground basalt and powdered granite can come from further distances. Generally the extra costs of freight ensure that they are purchased as close as possible to the farm.

Nitrogen, which is a costly import in conventional systems, is usually sourced on farm in many organic systems through nitrogen fixation by legumes, green manuring or through nearby organic wastes.

The multiplier effect of this money in the local community means that that other people are employed in providing services such as repairs, transport, fabrication, building, teaching, health, retail, roadworks, local government and more.

In other words the family farm, labour intensive nature of organic farming is an important, integral part of ensuring a distribution of the production dollars throughout the local community. In classical Keynesian and also in Supply Side economics it means an increase in the wealth and standard of living of the community.

Contrast this to the current paradigm of industrial agricultural production that is forever removing large proportions of the value of production from the local community by purchasing mostly imported inputs.

This is one of the fundamental reasons why rural economies are continually declining, leading to the loss of services, banks and finally the smaller towns. Rural communities are in decline in all countries where the corporate agribusiness ethic of ‘get big or get out’ is the dominant paradigm of production.

The recent market deregulation of the Australian dairy industry is an excellent example of this process. Various estimates suggest that 40% of families will leave the industry. A high percentage of the families in the towns that have traditionally depended on these farms by supplying labour, products and services will also have to leave or close down businesses.

Only the large dairy, processing and supermarket corporations will benefit by these changes by paying lower prices to the farmers and selling to consumers for higher prices. Our dairy industry is clearly following the path taken by soybean farmers in Argentina.

The present model of agricultural production drains the money out of the community. It is clearly failing the farmers and the communities they support. [1] [2] [3] [4] [5] [6] [7] [8] [10] [35]

Sustainable farming

To reverse the current decline and begin revitalising rural communities, it is important that the main industry that supports these communities, agriculture, is sustainable.

The Washington State University study, funded by the United States Department of Agriculture compared organic, integrated and conventional farming systems.

Co-author Professor John Reganold said in the report published in the science journal Nature, April 19, 2001, that to be sustainable, a farm must produce adequate yields of high quality produce, be profitable, protect the environment, conserve resources and be socially responsible.

"The organic system was more energy efficient, it was better for the environment, it had better soil quality, its yields were as good as the other systems, it was more profitable and its apples were slightly sweeter and firmer. The bottom line is that organic outperforms the others when you talk about sustainability." [5]

Researched and Authored by Andre Leu 31-07-2001

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26. Health and Nutrition
You Can Be Both Hungry and Well Fed

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This paper sets out to address a number of areas. Firstly, it explores the notion of 'foodways' as a way of understanding food methods which are culturally and environmentally appropriate. Secondly It examines organic food as a method of food production which is eco-friendly, nutritionally beneficial and importantly socially beneficial. Thirdly, it looks at the links between social structures and health. Fourthly, it asks whether organic food production can be regarded as an attempt in Western culture to regain its 'foodways'. Lastly, it suggests ways in which organic food may be healthy not only in terms of its ecological and nutritional effects, but also though its ability to engender social coherence.

The recognition that different societies have developed systems of food production, different means of food processing and culinary skills which draw on tradition and cultural traits is foundational to understanding of the notion of ethicity. 'Foodways' is a term often used to refer to these culturally-specific means of food production. Foodways may be understood as ways in which food is sourced and processed in traditional, environmental and culturally appropriate ways. Because these ways are familiar to a culture they are often trusted and respected. Religion has an important role to play here. Examples of foodways in the 21st century may be the different cuisines in the Mediterranean based on a number of key ingredients, like olive oil. The various foodways in Asia, despite their differences, share a number of common ingredients, eg rice, noodles, fermented foods. In the Americas, foodways would be represented by squashes, beans and tomatoes.

Foodways are usually regarded as health promoting, mainly because they have developed over many generations which allows them to stand the stand the test of time. Any nutritional deficiencies that were inherent in foodways must have been corrected to allow for nourishment over the eons. Foodways are also considered to be friendly to the environment since, following a similar argument, they have had to evolved over long periods of time during which appropriate horticultural techniques have been developed. It is true that in some cultures, food taboos prevent certain groups from eating foods which would be nutritionally beneficial. In some parts of Africa and Asia, for example, many children suffer from vitamin A deficiency because of a taboo on eating leafy green vegetables.

The notion of foodways is strongly linked to exotic cultures (ie non-western). Indeed, the whole idea of ethnicity often evokes longstanding traditions in 'other' cultures – here other means not western (eg Australian). Much has been written about the importance of preserving foodways in traditional cultures when they migrate to the 'west'. Some see foodways as a method for 'exoticising' food. It is generally regarded that modern western culture has lost foodways of its own. Tradition, authenticity and longstanding food savvy have all been swept aside in the modernisation of food systems. The term 'gastro-anomie' has been used to register the parlous state of consumers who are confronted by over-processed foods produced by anonymous multinational food companies who source ingredients from all over the world. The rapid changes in the food basket which modern food systems encourage leave consumers feeling unanchored, anxious and uncertain. This process has destroyed any notion of foodways as we currently define them.

However, even within a western context some investigators have shown that it is possible to encourage food production methods that have regained some of the characteristics of foodways. Community food systems, for example, have been developed in the USA and Europe. Such systems are often described as

eco-friendly because they benefit the local physical environment (by using organic methods) and the local economy. Moreover, because such systems often (proudly) promote local, seasonal and fresh produce – and are retailed and distributed in ways which foster co-operation and reciprocity – they are seen to support a positive social environment. From a health point of view, therefore, we can see that community food systems are environmentally appropriate, nutritionally superior (especially when they promote fresh, seasonal and palatable foods) and engender trust and cooperation. These last components (trust, cooperation) are especially important in view of the recent research on the social determinants of health, and it is to these that we now turn.

Throughout the human sciences there is growing interest in the beneficial effects of social cohesion, trust and social norms. Recent work in health area has demonstrated that there are powerful correlates between social organisation and population health. Trust, positive social interactions to overcome social isolation and reduced income inequalities have all been shown to promote social cohesion, health and wellbeing. The exact mechanisms are not well understood. There is some evidence that stress caused by social disharmony, mistrust, and social isolation may have an effect at the cellular and immune level.

Organic foods in Australia, especially fresh minimally processed varieties, tend to be produced and retailed in ways that promote trust and cooperation. Indeed, one of the reasons given for a large rise in the sale of organics over the past few years has been consumer distrust of conventional food (in for example, the genetic modified food debate). Farmers Markets, local outlets, and community co-ops may all play a role in fostering trust, cooperation and reciprocity: three ingredients that appear to be beneficial to human health.

In conclusion, the beneficial effects of organic foods have traditionally been recognised at the level of the environment, through eco-friendly methods of production, at the level of nutrition, through the production of fresh, minimally processed foods. The benefits of organic food through the social cohesion that is engendered should also be recognised. Indeed, the organic food industry should exploit the possibility that its *modus operandi* is tantamount to reconstructing appropriate foodways for western societies.

27. Health, Food and The Right to Choose

By Professor Stuart B. Hill
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In the mid-1970s, when I established a resource centre on organic farming (Ecological Agriculture Projects [EAP]: www.eap.mcgill.ca) at McGill University in Montreal, Canada, I listed the following key debates that were going on in the organic movement at the time:

- regional self-reliance *vs* an export focus,
- growing your own and bartering *vs* commercialisation,
- raw, unprocessed and fresh *vs* cooked and processed,
- certified organic *vs* contaminated produce,
- design-based prevention and benign problem solving *vs* symptom-based disruptive controls,
- small *vs* large scale, and
- community systems (nourishment, quality of life) *vs* industrial (productivity, profit).

It is interesting that these are still some of the dominant issues being discussed nearly 30 years later. Progress has certainly been made, but not as much as I had hoped for at that time.

I will start my discussion of the topic "**Health, Food and The Right to Choose**" by sharing some of my preliminary thoughts on each of these three areas. The best definition I have of **health** is from Williamson and Pearce (1980), who were responsible for the Peckham Experiment, which ran from 1926-1950 in a suburb of London. They said "health is seen in a progressive mutual synthesis participated in by both organism and environment. It is a wholeness" (i.e., it is an active relational quality, not just the absence of disease). The people involved in this Experiment were closely associated with Sir Albert Howard, the 'father' of organic farming. With respect to most **food**, one of the problems is that it does not come labelled with its full range of nutrients and contaminants. So when we sit down to eat, we do this with enormous trust. The problem is that this trust has been betrayed repeatedly -- through the contamination of food with toxins, the removal of nutrients, and other changes with unknown effects (as with bio-engineered foods). Consequently, we are rarely in a position to make an informed **choice**, and often there is no healthy option available. Furthermore, the choice needs to be about more than just nutrients and contaminants.

In 1990 our group at EAP published a hypothetical example of a comprehensive label for instant baby food (MacRae et al 1990). Ratings for each of the criteria were out of 10, and covered the following: certified organic [8], under *processing*, excessive heat from milling [5], no supplements [10[, recycling of milling waste [7], local distribution [8]; under *food analysis*, it received [6] for medium levels of fibre, trace minerals and vitamins, [8] for fat and [10] for no added sugar or salt; and under *social justice* it received [8] for safe working conditions, preferential local purchase of raw materials and level of pollution, [5] for wage level, and [0] for donations to charities. I have gone into this in this level of detail to illustrate how uninformed are most of our choices. The point is that most of the time we only see and engage with a very small part of the picture.

It may help to view the food system as occurring in the middle of a triangle, with the three points representing the human condition, resources and the environment. The history of this system has been one of increasing dependence on fossil fuels and non-renewable resources, and in the process converting an energy producing system into an energy sink; increasing impact on the environment; and displacing people

from the land and from being connected to food, and exposing them to an increasing array of toxins. Another image of the food system pictures it at the centre of issues relating to culture, consumption and our identity. People often forget that we have our most intimate relationships with food (not with sex! – more often and more trusting).

Most industrial food systems are still designed as monocultures, highly simplified, vulnerable to pests and resource dependent. So, it is not surprising that the organic field shown by the speaker from Heinz on the first day of this conference was also a classic 'bare-soil' monoculture. Such simple designs do not occur anywhere in nature; they will always suffer from a diverse, and worsening with time, range of pest, disease and weed problems; and ranked in a similar way to that applied to the baby food above, they could only ever receive a very low score. In fact very little of the food produced in such systems directly nourishes people. Much of it goes to feed livestock in feedlots, and some of it is fabricated into 'neo-foods' (some of which, for example, make a noise when you pour milk on them!), all of which we have zero requirement for. If you go into most supermarkets you will notice that the elemental foods are usually located around the perimeter. In the middle are shelves upon shelves of over-processed and excessively packaged commodities, most of which we do not need. A nutritionist friend used to say that best piece of advice he had for consumers shopping in supermarkets is to 'keep out of the centre aisles'.

Returning to the inevitable pests within monocultures, these are conventionally sprayed with non-specific poisons, which should therefore be referred to as biocides, not pesticides – because they kill life, not just pests. Pesticide-use inevitably results in the pests becoming resistant, the producer is also likely to be negatively affected, and eventually the system will break down. The primary approaches that have been proposed to deal with this situation are the **efficiency** approach (get a better nozzle on the sprayer, etc.), and the **substitution** approach (release biological control organisms). What we have to eventually do is to **redesign** that system so that it favours the crop and the natural controls of any pests, and is inhospitable to any potential pests. This requires the substitution of deep knowledge and skills for the usual purchased inputs like pesticides (Hill et al 1999). This 'design' focus is foundational to our shared vision of a sustainable, ecologically managed resource base capable of meeting local needs, nourishing people and giving meaning to the lives of those involved.

This contrasts with all visions of industrialised systems, whether they are producing food with or without pesticides and chemical fertilisers. These will always eventually destroy the planet and the human spirit. Sooner of later we must realise that we have to be able to work with highly complex designs. Unfortunately most scientists, because of their habit of working with simplified and highly controlled systems, have little to offer with respect to the design and management of complex systems. There is sadly also an enormous arrogance in science, so it is hard for scientists to be humble enough to ask organic farmers to teach them how to work with complex systems. I say that as a recovering scientist! In earlier papers the EAP group elaborated on the above ideas (Hill 1991, 1998, Hill & MacRae 1995, MacRae et al 1989, 1989a, 1990, 1993).

It is important to realise that there is a fundamental difference between approaches that try to solve problems by endeavouring to make the existing systems work – by making them more efficient or by substituting one input for another, and being willing to engage in fundamentally redesigning the system, and doing this at every level, from the personal to the social, political, economic, technological, educational, spiritual and other levels

Let us recall the words of Sir Albert Howard from 1940: "Medical investigation should be deflected from the sterile desert of disease to the study of health". He was what I call a 'front-end' (health promoting) person, not a 'back-end' (problem-obsessed) person. He continued, "agricultural research should start afresh from a new baseline – soil fertility – and so provide the raw material for the nutritional studies of the future – fresh produce from fertile soil…. At least half of the illnesses will disappear once our food

supplies are raised from fertile soil and consumed in a fresh condition." In a later (1947) book he wrote "In all future studies of disease we must…begin with the soil. This must be got into good heart first… many diseases will then automatically disappear…. Soil fertility is the basis of the public health system of the future and of the efficiency of our great possession, ourselves." I was 'heartened' to read this many years ago, as I was yesterday as I listened to John Ikerd describing organic agriculture as a philosophy and a system of farming. In 1989 in *Advances in Agronomy* I also defined organic agriculture as "a philosophy and system of farming[the definition continued:]. It has its roots in a set of values that reflect a state of empowerment, of awareness of ecological and social realities, and of one's ability to take effective action. It involves design and management procedures that work with natural processes to conserve all resources, promote agroeosystem resilience and self-regulation, and minimise waste and environmental impact, while maintaining or improving farm profitability" (MacRae et al 1989). Many blame lack of progress in this direction on lack of government funding and various other external factors.

My experience, however, from years of working with producers, and people in government, is that the main limiting factors are internal -- how awake we are, how aware we are, and how much we are willing to dare to be human. These qualities are what empowerment is about. In addition to the above, I would also argue that the goal of the whole thing must be, in addition to sustainability, the "nourishment, meaning and fulfilment for all involved". Part of the problem is that in agriculture, as in all other 'industries', we have come to almost exclusively reward productivity at the expense of maintenance and rehabilitation. This forces producers to adopt practices that erode the natural, social and personal capital of the systems involved and destroy their integrity, and so eventually productivity declines or has to be propped-up with imported, purchased inputs.

Paradoxically, by rewarding the rehabilitation and maintenance of systems we would be supporting the build-up of these sources of capital and integrity, and in doing so would establish the basis for sustained productivity, and even higher levels of productivity. Within our society, the greatest institutional challenge that we face is finding ways to support 'maintenance and recovery processes'. Sustainability is about systems maintenance. Those that are unsustainable are simply those that are not being adequately maintained.

Because I was a replacement speaker for Vandana Shiva, I would like to honour her by making the following statement in the area that I'm sure she would have spoken about. Because we must all consume a variety of foods to survive, we are daily faced with numerous decisions that are made within a context that is increasingly influenced by market processes that de-emphasise the nourishing functions of food and over-emphasise convenience, superficial appearance, stimulation and cheapness. The standards for what is normal in most of the world are now determined by a handful of transnationals whose primary aim is to maximise profit; and they are willing to do almost whatever it takes to achieve this. In this process of global homogenisation, cultures, natural environments and human health are impacted and degraded, with increasing costs for both present and future generations. Although there have been attempts to assess the costs of these impacts, they have mostly been confined to just one of the affected areas (e.g., only the environment, or just health). None have assessed the full range of impacts or their synergistic interrelationships. Most people make their food purchase decisions irresponsibly being largely unaware of the extent of those implications. And because these transnational conglomerates have greater economic power than most governments, it is naïve to believe that regulations can be established that have the best interests of cultures, the environment and human health at heart.

Thus, all such regulations are, in fact, negotiated compromises, not so much between transnationals and governments, but between the transnationals themselves. Because of this, efforts to improve the situation need to be focused on consumers and transnationals, rather than on governments. Such work involves raising awareness, developing sustainable visions, personal empowerment, developing and implementing alternative methods of production, handling, use and waste management, and the facilitation of a co-

evolutionary process of fundamental personal and social change. There is an aching need in our society for individuals who are capable of carrying out this facilitation function. If I asked you to point to the politicians, the academic leaders, the religious leaders, the technology leaders, the business leaders who are leading us in that respect, most of us would have a very difficult time pointing to somebody. I encourage you to assume that you are that person, because without such leadership we will never be able to fundamentally change our food system in the ways that we would like to.

Often people talk about sustainability in terms of taking into account the needs of future generations. In addition to thinking about future generations, it is important to think about who each of us is right now, and who we were when we started out as small babies. When you are making decisions, think of how your still undamaged "core" being might decide. Other powerful images can help us make wise decisions.

I once lived on a tropical coralline island. It had a little lens of fresh water about a meter underneath the surface. This was the population's primary source of fresh water for drinking, irrigation etc. It was very clear on that tropical island that one could not use a toxic chemical, or a concentrated fertiliser, or grow a monoculture, because this would destroy that island for hundreds of years. I had to learn how to manage and work with that system according to nature's rules. The earth is just a large version of that island. The fact that we can sometimes get away with irresponsible behaviour does not mean that it is okay. It just means that most of the negative outcomes will be experienced at some other place or at some other time. The island was so small, and the feedback so rapid, that there was no other place or time.

We have got to engage in collaboration with nature, in 'eco-laboration'. We have got to give up our deceptive simplicities and be willing to be confused for a while as we engage with the complexity that is always there, being alert always for the profound simplicities that emerge when we are ready to recognise and receive them. One profound simplicity that has been powerful for me is the idea that at every moment we have a choice of acting on fear or acting on love.

We must stop denying and postponing; clarify our values and expand our perceptions; and deepen our understanding of nature, of community and of ourselves. We must learn to design and work with natural processes, and get started with what I call small, meaningful initiatives that one can carry through to completion, and then celebrate to make them contagious. It involves effective relating and communicating. This is all about authenticity, honesty, paying attention, listening well, connecting and working together. It is also about doing things collaboratively, knowing that you can only guarantee your own contribution, which must support collaboration, not postponing, knowing that you have already been working on this from the beginning, validating what you have done up to now.

It requires clarification of one's passions, worldviews, values and priorities, developing one's big picture visions and specific imaginings with respect to the needs of local situations – designing, redesigning, planning, acting, monitoring and learning from outcomes. It requires continual movement between the known, which we need to be in contact with to act with confidence, and the unknown, which we need to be aware of in order to discover and create and find new ways, and working with both similarity and difference. It means letting go of obsessions with safety and feelings of having no choice. It involves radical redesign, and redesign, and again redesign, and reframing and lateral thinking and deep understanding, and realising that deep understanding in any one area can be used to deepen your understanding in every other area. You cannot do this if you are only half committed. Indeed, both the soil and people need more fibre!

Finally, remember that buying organic food is an opportunity to give five gifts. 1. To your body, mind, heart, spirit and soul. 2. To the farmer and his or her associates. 3. To your community, society, culture through your clarification of values you want to live by and acting on them. 4. To your local and global environment by caring for it and its rich biodiversity. 5. To future generations, to the psychosocial

evolution of our own species, and if you are religious, to God. Yes, you can do all of this by buying and or growing organic food, or you can choose to not buy or grow organic food and give one gift -- to the multinationals and transnationals –- it's your choice!

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(Additional references on organic farming by Prof. Hill and other members of the EAP group are available at the web site mentioned at the beginning of the article).

28. Opportunities for Collaborative Organic Research & Development

An Organic CRC?

by Dr Roger Edwards & Robert Jordan
CRC for International Food Manufacture and Packaging Science

Introduction

It is reported that within 15 years, 30% of food consumed in Europe will be organic. For the Australian organic industry to gain a part of this market, it needs to establish a coherent and integrated research and development strategy now. This strategy needs to include research into many of the hurdles still to be overcomed to achieve consistent quality. In particular, collaborative initiatives are required if the Australian organic industry is to shake off its niche status, and build the critical mass, capability and communication networks necessary to deliver the ecological, economical and social benefits that organic food and farming is increasingly being recognised as delivering.

Isolated from the main demand centres and with a production base spread across six states and two territories, there is an urgent need and a huge opportunity to form a collaborative mechanism that can drive sustained domestic and export growth. Without a concerted and cooperative approach, Australia will continue to take a back seat and be seen as a prime target for high value organic food exports from more consumer aware nations, resulting in a corresponding economic, ecological and social cost to Australia.

Fortunately we have a golden opportunity to develop a collaborative mechanism through the Federal Cooperative Research Centres Program. The Program provides an opportunity for Australia to establish a world class organic research and development capability. The strength behind the program is its emphasis on collaboration. The Program does not only provide a mechanism where industry players, research providers, state agencies and RDCs can cooperate to realise nationally important goals, but up to 30% of the cost of doing so.

This paper is aimed at those interested in collaborative research & development, from government agencies, research institutes, community groups, industry associations as well as individual industry participants, from growers to retailers. In three parts, the paper profiles the CRC for International Food Manufacture and Packaging Science, outlines the Federal Program and the criteria required to establish a Centre and investigates the opportunities for an Organic CRC.

The Cooperative Research Centre for International Food Manufacture and Packaging Science

The Food and Packaging CRC was established in 1995 after a successful 4th round bid which provided funding for 7 years through to July 2002. The Centre is currently heavily into the commercialisation phase of its life cycle with a number of research outcomes either being transferred to industry or assessed for domestic and international market release. Table 1 below indicates the Centre's key research areas and outcomes:

Research focus	Research outcomes
Biodegradable packaging	Starch packaging technologies
Smart packaging for food enhancement	Export grape packaging & controlled permeability films
Process optimisation & life-cycle analysis	Efficient food factories
Food Safety	Food safety guidelines for the fresh cut vegetable industry & HACCP training
Bio-extraction & processing	Organic cold pressed oil & fat free flour processing technologies

Table 1: Food & Packaging CRC Research areas and outcomes

The Centre has fostered the development of over 20 Ph.D. students in its highly acclaimed education and training program that is fully integrated into its industry led research programs. These students will significantly contribute to the scientific capability of the food and packaging industry and therefore underpin the sustained growth of the sector.

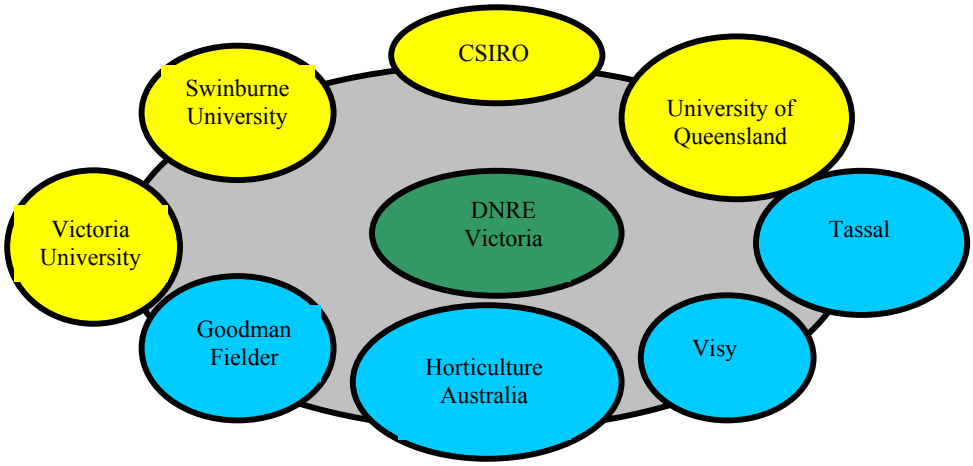


Diagram 1: Core Participants in the Food & Packaging CRC.

The Food and Packaging CRC is made up of research users (mainly industry players) and research providers (mainly university departments and CSIRO or Commonwealth Scientific and Industrial Research Organisation). Diagram 1 illustrates the Centre's Core Participants. The Department of Natural Resources and Environment (DNRE) of Victoria is both a research user and a research provider as it commissions research within the Centre's programs and also provides research through Agriculture Victoria, the Department's research body.

The food & packaging CRC's activities in organics

The Food and Packaging CRC has been active in investigating the needs of the food and farming sector in Australia for organic research and development. A major finding was the need to establish a cooperative environment as a precursor for organic R&D and to this end the CRC has endeavoured to foster linkages between industry, government and researchers.

It was found that main stream industry was aware of the opportunities in organics but were often faced with 'too many barriers' to consider an organic alternative. These barriers included the need for segregation through the chain and the storage and processing needs this would entail. Lack of certified infrastructure particularly in the post harvest sector was also a key impediment to growth. There was reluctance by

retailers to push organic products unless there was continuity in supply and quality, likewise growers were often reluctant to convert unless they were guaranteed a market for their produce and support through the conversion period.

However many companies were very interested to address these barriers with their colleagues in the supply and value-adding chain. A series of sector specific workshops, supported by the relevant Research & Development Corporation was recommended as one way in which these barriers could be turned into opportunities. The encouraging aspect of this initial investigation was the apparent willingness of businesses to collaboratively investigate the opportunities with supply chain partners. There seemed to be recognition within industry that organic food would move from niche to mainstream but for it to happen, companies would need to work together. The need for collaboration on a national scale was also expressed by many within State agriculture and development agencies as essential for industry growth.

The needs of industry were not however taken to be the only needs that were important. These needs were seen within the context of societal and ecological needs. For instance the need to better understand and develop appropriate production systems capable of sustaining food production within the Australian eco-system for generations to come. The need to develop retail diversity and regional production and marketing initiatives to reduce unnecessary transport and improve communities access to the food that it produces. These complimentary needs were seen as perhaps best addressed through integrated programs as provided by the CRC model.

The Federal Cooperative Research Centres Program

The Federal Cooperative Research Centre Program was established in 1991 to bring industry, government and research providers together to realise the following key objectives:

- Improve health & well being of society
- Improve ecological sustainability
- Boost industry competitiveness
- Create a coordinated national research effort
- Initiate research & development that would not have otherwise been possible

The Program has bipartisan support and currently supports 63 Centres across 6 different sectors from agriculture to medical science. Since the Program was established in 1991, over 200 companies have participated as core participants in CRCs and over 600 others have had involvement in the Program. Of the current CRCs, 24 are in areas of relevance to organics and are listed in Table 2 below.

Agriculture / Food etc	Environment
• CRC for Food & Packaging	• CRC for Renewable Energy
• CRC for Viticulture	• CRC for Waste Man' & Pollution Control
• CRC for Sustainable Rice Production	• CRC for Greenhouse Accounting
• CRC for Sustainable Sugar Production	• CRC for Weed Management Systems
• CRC for Cattle and Beef Quality	• CRC for Catchment Hydrology
• Dairy CRC	• CRC for Bio Control of Pest Animals
• CRC for Aquaculture	• CRC for Freshwater Ecology
• CRC for Quality Wheat	• CRC for Tropical Rainforest Ecology & Management
• CRC for Sustainable Production Forestry	• CRC for Sustainable Development of Tropical Savannas
• CRC for Legumes in Mediterranean Ag	• CRC for Water Quality & Treatment
• CRC for Tropical Plant Protection	• CRC for Sustainable Tourism
• CRC for Premium Quality Wool	
• CRC for Bio-Products	

Table 2: Current CRCs in areas of interest to Organics

Who participates in a CRC?

There are two types of participants in a CRC; research users and providers. Table 3 indicates the types of organisations that fall into these categories.

Research Users	• An industry sector, enterprise or industry association (e.g. OFA) • A rural Research and Development Corporation (e.g. RIRDC) • A Government Department or Agency (e.g. DNRE, Victoria)
Research Providers	• A CISRO or University Department (e.g. CSIRO Land & Water) • A state research institute (e.g. Agriculture Victoria) • A private sector R&D Department or Company

Table 3: Research Users and Providers

Who funds a CRC?

A CRC is funded primarily by core participants (research users and research providers) and Federal CRC Program funds. The CRC Program currently provides an average of $2.2m per year to each of the existing CRCs. This contribution is based on the amount of funds (cash & in-kind) brought into the Centre by the participants. Therefore the more funds brought into a centre the greater the potential contribution from CRC Program funds. Diagram 2 below illustrates how a Centre's funds are generated and utilised.

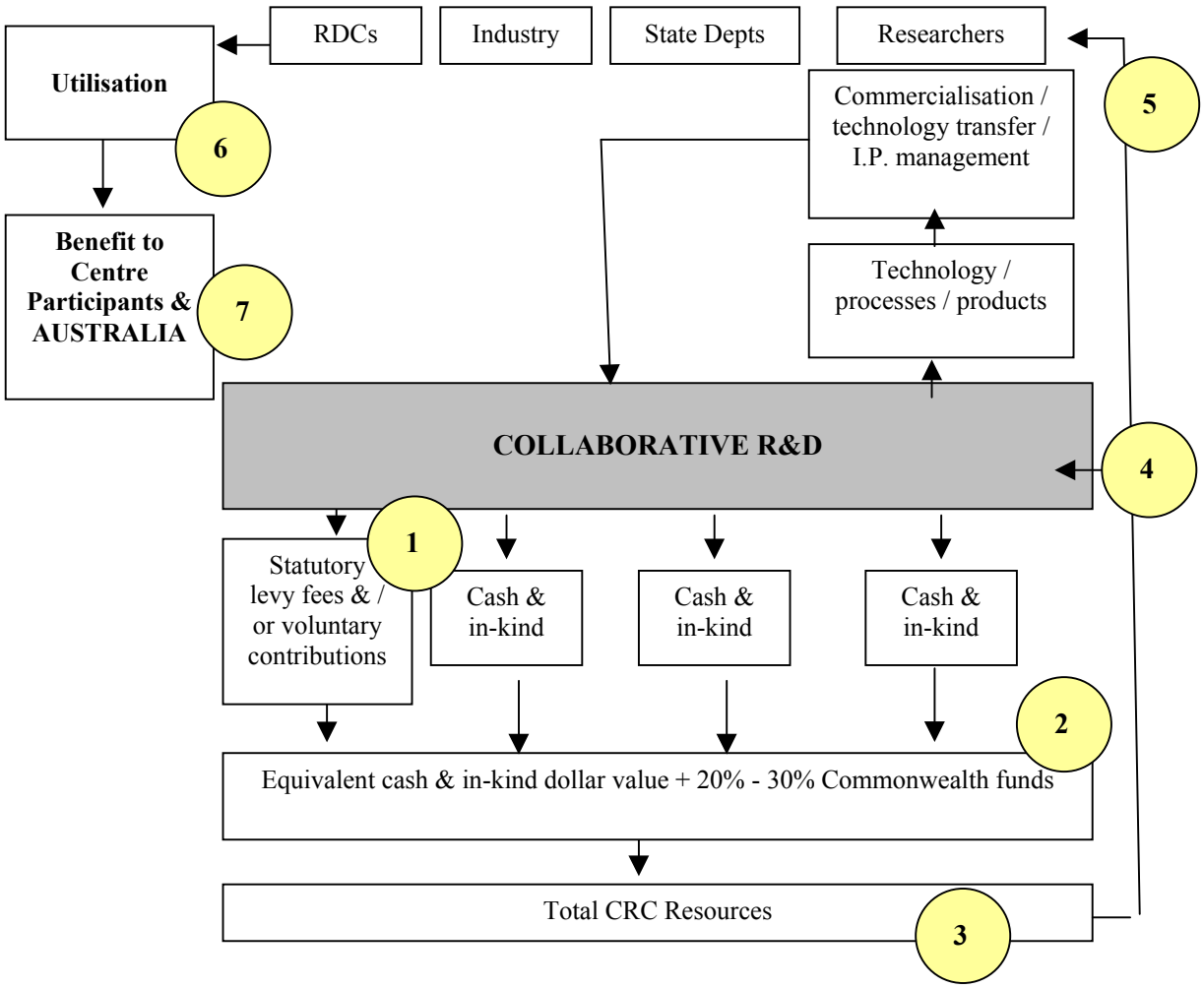


Diagram 2: Seven-point basic guide to how a CRC works

1. Core participants provide cash and / or in-kind contributions as agreed in contract with Commonwealth
2. A total dollar value is placed against all contributions that the Commonwealth then matches at a rate of 20%-30%
3. All resources including Commonwealth funds are then used for running the Centre
4. Majority of resources used by researchers for collaborative R&D to meet objectives of Centre
5. R&D outcomes require funds for commercialising, managing intellectual property & transferring to users
6. The outcomes are utilised by research users / consumers / society & creates Centre equity
7. The adoption and utilisation of the outcomes provides benefits to the participants and Australian society

Research users

Research users such as industry players contribute up to $250,000 each year over the seven-year life of a CRC. However this figure is generally less for small to medium sized enterprises (SMEs) with an entry level of $10,000 - $20,000 potentially possible. The Federal government is trying to encourage the involvement of SMEs in CRCs and lowering the cash contribution is one way to make CRCs more accessible to them. Industry players can come from any part of the chain i.e. input suppliers, growers, processors, manufacturers, distributors, retailers or exporters. Indeed, if sufficient growers commit time and effort to husbandry research on their farms they may be able to participate in a centre for a minimal cash commitment. Research users also provide in-kind contributions to CRCs. In-kind contributions can range from the provision of intellectual property through to the allocation of key personnel to the centre either on a full or part-time basis. A dollar value is placed on this contribution and is used for leveraging Program funds from Government. The provision of key personnel is often one of the most important contributions or factors of success in a CRC.

Rural Research and Development Corporations (RDCs) who collect levies from some producer groups for research and development (R&D) purposes are another potential source of industry funds into a CRC. Horticulture Australia Limited (formerly HRDC) for example, collects levies from horticultural producers based on tonnes produced. These levies are then matched dollar for dollar by the Federal Government and are used by the Corporation to fund R&D activities. Another way for RDCs to utilise the funds for R&D is to participate in a CRC. However only voluntary cash contributions and statutory levies from industry can be used by RDC for matching funding within the CRC Program.

Research providers

Research providers such as Divisions of CSIRO and Departments of Universities generally provide contributions in the form of in-kind resources. Such resources include the provision of research facilities and intellectual property. As part of the commitment to the Centre, research providers must commit key personnel to the Centre in order for R&D programs to be executed. In the most recent CRC funding round a precedent emerged for research providers to provide a united cash contribution in addition to the in-kind contribution.

Federal Government

The Government, through the Program provides about 20%-30% of the total cost of operating a CRC. Therefore for every dollar contributed by the Commonwealth, three to four dollars worth of cash and in-kind contributions from participants are required. When considering applications, the CRC Committee examines the proposed leverage on the Program funding that is being sought. This leveraging is expressed as a ratio of the total contributed resources budgeted for the proposed CRC to the level of program funding sought from the Commonwealth.

Ways to participate in a CRC?

Generally there are four ways in which to participate in a CRC; as a core participant, an associate participant, a supporting participant or as a project participant. The greater the commitment and contribution to a CRC the greater the beneficial ownership of any intellectual property created and equity in the outcomes of the centre.

Core & associate participants

Core participants enter into a contract with the Commonwealth for the seven-year duration of the CRC. While the contact is severable with 12 months notice (24 months in first year) the contract commits the participant to provide the resources to the Centre as defined in the application. Likewise the contract commits the Government to funding the CRC for the same period. Normally 3-6 core participants each contributing in the region of $250,000 is required to establish a centre.

However due to the Prime Minister's recent Innovation Statement, the level of resources and time period that core participants must commit to may be reduced to better enable smaller companies to fully participate in a CRC. One option for SMEs is to participate as associate participants. However associate participants are not entitled to a seat on the Governing Board and any share in Centre equity is based on their contribution and what is agreed in the Centre Agreement - the contract that states the Centre's operating arrangements.

Supporting participants

Supporting participants need not enter into a contract with the Commonwealth. However Supporting Participants are expected to show a strong commitment to the Centre. An example of a supporting participant could be a body interested in conservation or social issues that feels strongly enough about the objectives of a CRC to lend its support to the Centre and its participants. This support could extend to the provision of steering advice or endorsement for example. Supporting Participants don't as a matter of course share in intellectual property ownership benefits or equity created by the activities of the Centre.

Project participants

Project participants participate in the Centre on a project by project basis. These activities are generally not an integral part of a Centre's research programs but are an important service provided to in-sector players who require R&D on an ad hoc basis. This service builds up the Centre's ability to quickly respond to the needs of the sector and provides research users with access to a national research team specifically assembled to service the sector. Project participants can have the option of joining a CRC at anytime as a core participant and therefore sharing in the equity that is developed and contributing to the way the Centre is managed. However it should be stated that a CRC cannot be established off the back of project participants alone - core participants are required for a centre to become established.

Selection rounds

Selection Rounds normally take place every two years. The next Round (Round 8) is expected to be announced in September 2001 for commencement in July 2003 and Round 9 in September 2003 for commencement in July 2005. The timetable for the next rounds is expected to be as indicated in Table 4 below.

Stage	Round 8	Round 9
Round announced by Commonwealth	3rd Quarter 2001	3rd Quarter 2003
Indication of interest	**Dec 2001**	**Dec 2003**
Bids received by the Commonwealth	**July 2002**	**July 2004**
Interviews etc	Oct / Nov 2002	Oct / Nov 2004
Successful CRCs announced	Dec 2002	Dec 2004
Commencement of successful CRCs	July 2003	July 2005

Table 4: Anticipated application & funding round timetable (subject to confirmation)

Selection criteria

The CRC program provides clear guidelines (see Table 5 below) relating to the criteria that must be met and clearly defined in any application for funding.

Topic	Criteria
Theme & focus	• Well defined & address specific industry or community need • Outcomes of the CRC to make a significant contribution to Australia's sustainable economic and social development.
Management structure	• Must have scientific, business & management skills • All core participants to be represented • Governing Board with independent chair & director • Board is accountable for the management of the CRC
Collaborative arrangements	• Collaboration must benefit sector rather than individual firm. • Include arrangements for new participants to join at any stage • The Centre should interact effectively with in-sector SMEs • Programs to be integrated, all projects collaborative & multi centred • Industry associations should be encouraged to participate • Overseas companies & universities are encouraged to become formal participants provided funds are used within & to the benefit of Australia
Resources & Budgets	• Clearly demonstrate ability to support proposals to achieve outcomes • Clearly define allocation of key personnel, cash & in-kind resources
Quality & Relevance of Research program	• Clear & achievable outputs (within capability of the Centre) • Strategic focus on long-term world class research • Consider employing overseas leaders to lead specific programs • Perceived benefits to Australia must be based on realistic projections
Education & training	• Very important component in order to build industry skills & capability • Must be fully integrated into research program with research user focus • Joint industry supervision of Scholars • Consider SME sponsorship of post graduate students
Performance evaluation	• Appropriate internal R&D monitoring & evaluation strategy • Meet Commonwealth reporting requirements
I.P. / commercial' & utilisation plan	• Realise maximum benefit to Australia • Should be industry or research user driven • Facilitate continuous diffusion / application of new knowledge & outputs

Table 5: Overview of selection criteria

An Organic CRC?

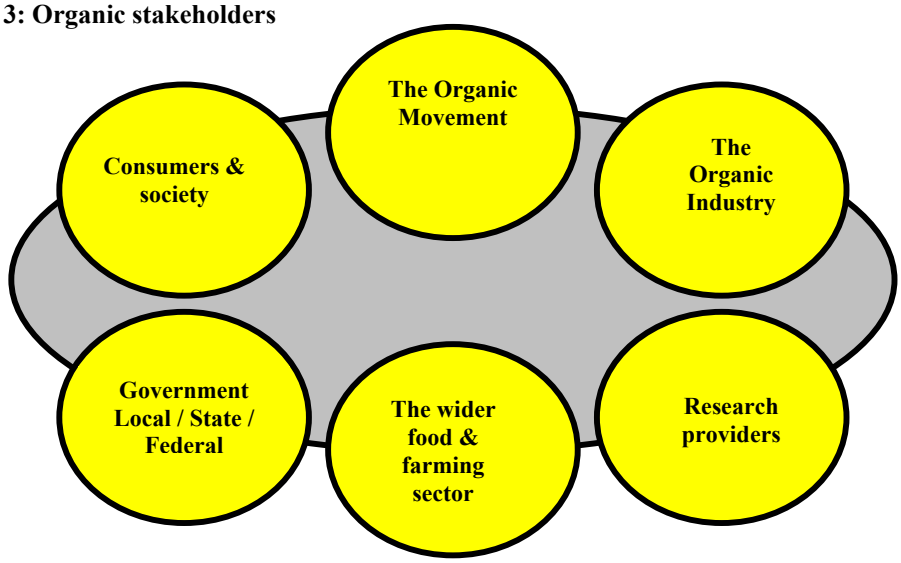
Why have an organic CRC?

The development of an organic CRC, driven by and focused on the strategic scientific needs of the organic industry is a potential vehicle for sustained industry growth. By providing a framework where Industry, Research & Development Corporations and State Departments can come together, a CRC has the potential to diffuse organics into the mainstream and optimise resources and facilitate the development of initiatives that would be otherwise out of reach. A CRC would provide the mechanism by which to coordinate and disseminate these activities and establish a national R&D effort capable of incubating new organic industries, processes and products and delivering social, ecological and economic outcomes to Australian society.

What focus should an organic CRC have?

CRCs generally either have an industry or public good focus. Industry focused CRCs are established with the intention of delivering innovative new industries, processes and products whereas public good CRCs are established to enhance the understanding of key issues and deliver decision support systems. A CRC for Organics would seem to fall between the two. Organics is increasingly being recognised for its environmental qualities but also for its role in stimulating regional development initiatives and for delivering products that are in demand.

Diagram 3: Organic stakeholders



The Organic sector is made up of significantly different types of stakeholders but has generally evolved from a group of pioneers who formed the basis of today's 'organic movement'. The organic movement consists of a wide spectrum of people from growers to consumers all whom share the principles of organic food production and environmental management. The Organic Industry however refers to those that are actually involved in the business of organic food and farming. The industry therefore includes those that follow the principles of the movement and are perhaps more 'society' focused together with those that may primarily be involved for economic reasons and are perhaps more 'consumer' focused. Table 6 below illustrates how the focus of a potential Organic CRC could change depending whether it is industry or movement driven.

Industry focus	Movement focus	Industry & movement focus
• Steered by industry for industry • May be limited to specific stakeholders • Maybe sector or region specific	• Steered to meet movements principles • Potential for any stakeholder to participate • Potential to benefit any stakeholder current or future	• Synergistic mix of public good & commercial outcomes • Mechanism for cross sector & inter regional collaboration • Provision for SME & grower participation • Capability growth across industry through education & extension programs

Table 6: The link between Centre drivers & focus

If the CRC is driven by industry there is the possibility that it could be weighted towards a particular industry sector or region - especially if one region takes a strong leadership role at the expense of another.

Unless well managed this pathway risks setting in concrete divisions within the organic sector. Moving the emphasis towards bridging divisions may provide more long-term benefits to the sector. To this end perhaps the most beneficial way forward is to consider a 'dual focus' CRC that retains the principles of the organic movement (including the engagement of all stakeholders) while delivering commercial outcomes both of which provide real benefit to Australian society. This approach could be argued to reflect the move within corporations towards 'triple bottom line' initiatives and reporting.

Who should drive an organic CRC?

A cross-sector organisation such as the Organic Federation of Australia (OFA) or the Rural Industries Research and Development Corporation (RIRDC) has the impartiality and mandate to steer a bid to obtain the optimum long-term benefit for the industry and Australian society. The OFA has established itself as the industry peak body and as the main proponent of the organic movement. RIRDC has a charter to foster emerging industries and to support cross-sector issues. RIRDC has supported the OFA to become the industry peak body in order to provide the industry with one voice especially when negotiating with government. This policy is in line with most established rural industries that develop national peak bodies and strategic plans.

The establishment of OFA led to the successful receipt of funds from the Commonwealth's Rural Plan Program to support the development and implementation of a strategic plan for the Australian Organic Industry. Item three of the strategic plan sets a planning framework for facilitating the development of research and development capacity within the Australian organic industry. The Final Draft Strategic Plan calls for a three-pronged approach as indicated in Table 7. The table clearly shows that the OFA have taken prime responsibility for facilitating the development of organic production system research and development capacity within the Australian organic industry. It also indicates that the strategy involves close consultation and collaboration with research and development corporations and State agencies.

Goal	Indicators	Respon-sibility	Collaborators
3.1 An integrated industry approach to identifying and prioritising research & development needs	• Process for priority identification developed • Broad stakeholder involvement in priority setting • Industry priorities identified	OFA & RIRDC	All stakeholders
3.2 RDCs aware of the potential of the organic industry and committed to funding R&D	• RDCs aware of the industry's growth, direction and potential	OFA	RDCs
	• RDCs aware of industry priorities	OFA	
	• RDC funding in proportion to organic industry levy payments	RDCs	
3.3 State & private industry funding R&D on industry priorities	• Industry priorities communicated to state governments & private industry	OFA	RIRDC & State agencies

Table 7: Extract from the OFA Draft Strategic Plan (adapted from a table by the Virtual Consulting Group)

Potential organic CRC business models

A key goal of the CRC program is to bring together players to achieve outcomes of strategic importance. Part of the challenge is to optimise the collaborative arrangements in order to maximise the benefits a Centre can yield. This process would include considering potential roles of different types of stakeholders. For instance engaging certain players on a project by project basis may turn out to have a greater long term

benefit than the engagement of less active core participants. Therefore the grouping of participants and the arrangements by which they collaborate (the 'business model') should be considered holistically.

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Box 1

Potential Core & Associate Participants

- Australian farming, food and fibre enterprises
- Input suppliers to Organic Industry
- Australian retailers & supermarkets
- RDCs
- State Govt Agriculture / Primary Industries & Regional Development agencies
- Research providers (incl. other CRCs such as Sustainable Tourism CRC)
- Organic Federation of Australia & other relevant bodies (e.g. ORGAA)
- Overseas companies, associations & research institutes

Potential Supporting Participants

- Organisations interested in conservation, environment & social issues
- International organic organisations & others

Boxes 1 and 2 provide an indication of the type of organisations that could potentially participate in an Organic CRC.

Box 2 Potential Project Participants

- Local government
- Employment, education & training authorities
- Regional Development Associations
- Regional Catchment Authorities
- Regional Waste Management Committees
- Community groups
- Landcare / Bushcare etc
- Any individual / organisation in Box 1

One of the greatest opportunities is to engage diverse players on a project by project basis (see Box 2). Using the collaborative mechanism as a framework it would be possible for example to encourage regional groups to cooperate to realise organic initiatives such as regional organic action plans or specific business initiatives.

An Organic CRC would provide a conduit to a national network of scientists that could assist regional development agencies, catchment authorities, waste management groups and others develop organic strategies & projects. Local governments for instance are aware of the needs and opportunities for development in their regions and can work with local business to develop sustainable food & fibre industries & communities – a link into a dedicated scientific facility would be a great resource for such regions.

Potential program areas

The programs areas developed within an Organic CRC will depend on the needs of the stakeholders, the ability of the Centre to meet the expectations of Australian society and the social, ecological, economic & legislative environment within which the Centre is to operate.

However the needs of the stakeholders will depend on which stakeholders are involved. If the Centre has a holistic approach then it could be assumed that a series of integrated programs would synergistically

address a range of issues facing the industry. Diagram 4 outlines some potential programs that might be included within an Organic CRC - although not fully comprehensive it does provide a reasonable coverage of the key issues.

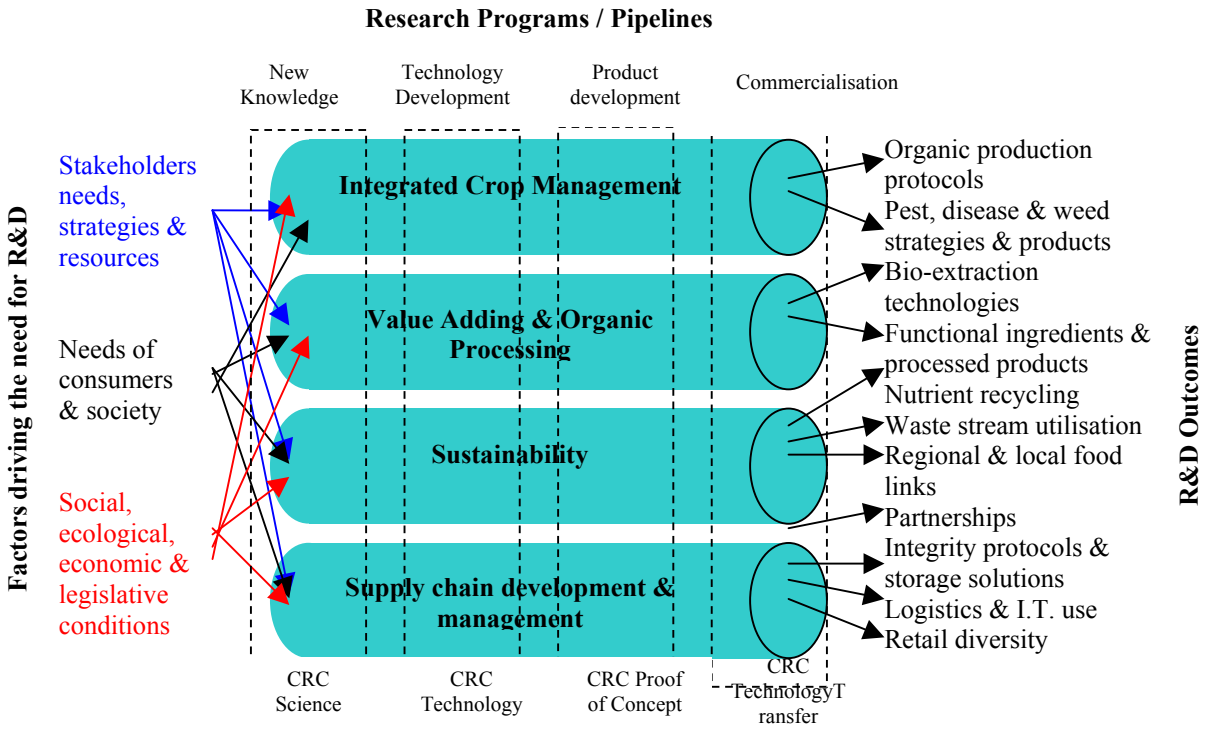

Diagram 4: Illustration of a hypothetical series of integrated Organic R&D Programs (adapted from a diagram by L. Fitzpatrick – Birubi Innovation Pty Ltd)

Towards an organic CRC

The OFA Strategic Plan includes a strategy and action plan for the development of an organic industry R&D plan. The proposed strategy (see Box 3 below) emphasises consultation with industry to determine needs followed by the communication of evaluated findings to researchers and research organisations.

Box 3
The proposed OFA strategy

Through a broad consultation industry stakeholders would be asked to identify production system issues & challenges where research could benefit the industry. The issues would be prioritised on the basis of expected benefit, likely cost, benefits to non-organic farmers & probability of success. The outcomes of this process would be documented and communicated to R&D corporations, state agencies, research institutions and researchers.

The implementation of this strategy could form the first step in evaluating industry needs within the development of a bid for an Organic CRC. However the OFA R&D plan does not consider an option for an Organic CRC. To this end stakeholders other than industry would need to be consulted. The needs of State agencies, RDCs and research providers in particular would need to be considered especially in terms of how they could effectively collaborate and best meet industry and societal needs. For instance how can participation in an Organic CRC assist State Governments to realise their own organic development plans? Furthermore industry players may stake their needs but will they be willing to participate in a CRC and commit resources including cash & key personnel?

It is also necessary to consider that the needs of industry may need to be weighted against the needs of the movement or society. To this end research providers may be able to provide input and direction that may be overlooked by industry especially if that synergistic mix of industry and public good outcomes is being sought. Perhaps in the first instance the OFA could consider what type of CRC business model would best deliver outcomes to industry and society. This could be investigated in conjunction with RIRDC and a specialist CRC consultant aware of the special needs of the organic sector. This process would involve the identification of participants able to contribute significant resources into a centre.

Once a potential business model or appropriate collaborative environment and framework has been established the needs of industry and the other stakeholders can be superimposed onto the framework and a series of draft R&D programs proposed. The development of research programs would include the novel grouping of industry, state and research providers considered to provide the best collaborative team to meet industry and societal needs.

Conclusion

The Federal CRC Program provides an ideal opportunity to create a collaborative mechanism capable of sustaining the Australian organic industry well into the future. The creation of an Organic CRC can provide the competitive edge that Australia requires to effectively compete in the rapidly developing global market for organic products. It is also a vehicle for delivering social, ecological and environmental benefits to Australian society.

If an Organic CRC is to optimise the benefits to Australian society it will need to ensure that industry and public good objectives are balanced and integrated within the R&D programs. An open and holistic approach is required to developing a business model that facilitates the participation of stakeholders in the most synergistic and appropriate manner. Achieving this will require strong and thoughtful leadership from a cross-sector, national body such as the Organic Federation of Australia and possibly RIRDC. It will also be necessary to secure the commitment of core participants capable of contributing significant cash and in-kind resources.

For a CRC to be truly effective the participants must participate as a Centre and not merely seek to maximise the benefits to their particular organisations. Therefore potential participants when developing a bid for a CRC need to shift their focus from self-interest to Centre optimisation. Perhaps the most important goal should be the creation of a truly collaborative environment and a framework that can persist well after any funding expires or even if a bid is unsuccessful. The Federal CRC Program is designed to increase industry capability - how much is achieved is down to the participants and how they interact within the context of the Centre.

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29. The Growing & Marketing of "Clean, Green" Wool

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Abstract

There is an increasing world-wide interest in producing and marketing of environmentally friendly products and this is not limited to food but to clothing and other products.

Australia is the largest produced of apparel grade wool and thus is in a premier position to supply a growing market for "clean green wool" products. To-date the main marketing interest has come from niche markets but more interest is developing from larger retail groups such as Marks & Spencer in the UK.

This paper discusses the current chemical status of Australian wool and some of the issues associated with the production and supply of "environmentally friendly wool" along with some of the market issues.

Introduction

We have come along way in the wool industry' towards a wool industry which is seeking a "clean, green" image. Gone are the days when sheep were washed in creeks and rivers before being shorn. We are reminded of this as we drive around country Australia and cross bridges named "Sheep Wash Creek" etc.

Similarly, the processing industry has altered many of its practices. Russell & Christoe (1996) reported that a government official in 1843 describing Bradford in England then the centre of the wool and cotton textile industry as the most filthy town he had ever visited and that it was a popular pastime of the town's "lads" to set fire to the Bradford Canal with its putrefying wool scour effluent and grease deposits providing a superb medium for such activity.

We do however still have the opportunity to go the next step to supply both the low residue and certified organic wool markets. In some circles the terms 'eco-wool' and 'ecological wool' are used in a generic sense however the branding or description tags used are important points of differentiation. *Eco-wool* is a product a European retailer created for low residue wools to meet price points and to create an environmental image for the customer. In this paper, the term *eco-wool* is used in a generic sense to represent ecologically friendly production and product, unless stated otherwise.

It is also important to differentiate between low residue wool and Certified Organic Wool. They are significantly different and as a consequence should be thought of conceptually as 2 separate markets:-

- Low or nil residue wool is of particular interest in the push to providing environmentally friendlier wool to processors, and
- Certified Organic Wool on the other hand is a product that has been actively targeted for niche markets.

Australian apparel wool production totals 637mKg; 65% of the worlds apparel wool market and originates from 37,000 woolgrowers throughout the whole of Australia. Under normal growing circumstances growers need to be able to control internal and external parasites and thus chemicals do play a part in the production of greasy wool.

Australia has had chemical monitoring in place since 1988 when the then Australian Wool Corporation introduced regulations banning tile sale of wool that had been treated with arsenical and OC products. Since that date, there have been increasing pressures for growers to reduce the use of pesticides and the current situation (Dorber, 2001) is as follows:- OC's have been banned in Australia since 1962 and Arsenic use since 1986. OP use is declining, down from 10.2 to 1 .8 ppm and SP's, down from 5.8 ppm 1.7ppm IGR's however are increasing slightly.

It is interesting to note that approx. 40% of Australia's fleece wool has no or almost no chemical residues that could be sourced into low residue batches to meet the needs of the most residue sensitive markets, particularly in Europe. Most of this wool originates from the pastoral zones of Australia where extensive husbandry practices exist and chemical use is either extremely low or non-existent. As a consequence of this there is a latent supply of nil chemical treated wool that would satisfy requirements for "eco-wool" labeling but would not satisfy requirements for “certified organic” labeling unless farm accreditation procedures are undertaken in accordance with the Commonwealth standards.

Most of Australia's greasy wool is processed offshore, with China, Europe and India being the major offshore players. Approx, 40% of the clip now undergoes the early stages of processing (scouring & combing) in Australia. As environmental legislation tightens in overseas markets there are more pressures for the removal of unfriendly wastes to occur in the country of origin.

It is one thing to be producing low or nil residue wool but it is another to be a certified producer of organically grown wool, and further it is yet another to carry the certified organic ‘tag’ through the processing chain. Under the National Standards for Organic Production (Anon.1998) some processing aids are listed. This list however is quite restrictive and there are limited detergents or soaps that are acceptable to the scouring industry. Some carding and combing lubricants do not really pose too much of a problem as most of today’s formulations are vegetable oil based, but there is a need to go through a certification process to be classified as n ‘allowable input” under the Australian Standard. However the dyeing sector has significant problems in complying, as they will be limited to vegetable dyes which are well known for their inefficiencies in modern production systems and their lack of vibrant colours. There are some heavy metal free dyes that are acceptable but again they must go through the accreditation process.

There is also an issue with industrial waste and the wool industry is particularly sensitive to this aspect of wool processing and product requirements.

Whilst Australia is capable of producing commercial quantities of what might loosely be called "clean green wool" the identification and preparation of specific blends to meet product requirements for “certified organic” labelling remains a challenge. A normal commercial consignment is made up from wool of differing wool attributes combined together to meet both technical specification and price and is typically drawn from some 3 - 20 sale lots of an average of 8 bales / lot and from 10-20 farms and comprises 20,000 kg of greasy wool.

Many of the niche market products being sourced today however are for superfine wool <18.5urn especially for the "next to skin" market to avoid the so-called "prickle' associated with all textile fibres which have a proportion of fibres >30um which cause nerve end responses. The supply of these wools is very seasonal and geographically constrained. This in itself provides its own marketing difficulties in terms of quantity, continuity of supply and the ability to meet tight technical specifications for finished product (and garment) attributes.

Australian Departments of Agriculture all have programs designed to reduce the use and dependence of chemical use and The Woolmark Company has for many years funded work on research and development and in monitoring programs to reduce the need for chemical used and inappropriate chemical application.

Many woolgrowers seeking to produce "certified organic wool" do suffer reduced productivity per unit area of production and thus require a market price that reflects higher production costs to compete with traditional growing practices. There are restrictions on chemical use in pasture growth, animal paraciticides and certain vaccines are unacceptable. This leads to lower productivity and thus profitability. In addition for a farm to become certified there is a 3-year “chemical free” transition (in conversion) period and an 18-month “chemical free” status requirement before the wool can be labeled “organic” under Commonwealth standards. The Standard also requires an attitude of care and a minimisation of pain and suffering of animals in such husbandry practices as castrating, marking and mulesing – animal welfare is paramount. The maintenance of animal health through husbandry practices rather than chemical use is sought. It requires consideration of animal wellbeing and living conditions such as free movement, food, water, shelter and shade with access to pasture at all time.

The wool market is not unlike other industries and processors are reluctant to pay premiums to source niche market products. This leaves the grower or grower group with the decision to enter post farm marketing which increases their risk exposure and requires marketing skills that many do not have.

The best chance for supply of chemical free wool is though direct marketing initiatives by individual or grower groups who seek marketing chain connections through companies like Maverick. One such commercial alliance is that of the Australian Organic Woolgrowers group and Maverick. They do however seek price premiums for these wools and processors in general are loath to pay premiums.

One initiative to overcome this impasse is for supply chain arrangements that are closely linked to well known brands such as the *Woolmark*. The Woolmark Company is at present actively pursuing particular market links to bring a branded product through to market from greasy wool into finished garments, with European companies.

Eco-labels

The European Union Ecological Label (Eco-label) is awarded to products which meet specified ecological specifications, and wool from non-European countries call now be used in Eco-labeled products thus opening up opportunities for Australian low residue wool as opposed to “certified organic wool” to increase market share in these areas. Raw wool, from many producing countries throughout the world, does not have the low residue status of Australia and may find it difficult to meet these or the more stringent “certified organic”standards.

The Eco-label allows consumers to recognise garments made from clean, low residue wools that have been processed using clean production methods. The requirements cover all processing stages of scouring, spinning, dyeing and finishing.

Australia, however, has little experience with eco-labels, (Russell, 2000) who reported pesticide limits for the EU Ecolabel for Textiles for raw wool of 0.5 mg/kg organochlorines, 2 mg/kg organophosphates and 3 mg/kg synthetic pyrethroids, and this wool is readily available in Australia. The Ecolabel system is based on life cycle analysis and assessment of overall environmental impacts of products. The thrust of the EU Ecolabel system for Textiles is the certification of a clean production pipeline. Again the targets are

achievable, and there are moves to establish supply chain networks tied to brands, to market environmentally friendly products.

Small but increasing supplies of certified organic wool are available from Australia, but there are some problems in defining, certifying and maintaining an organic processing pipeline that can produce a wool garment with performance characteristics expected by consumers.

Australian woolgrowers R&D funding, administered in the most recent past by The Woolmark Company, has over a long period, targeted research in endeavors to reduce the environmental impact of chemical use in wool processing. These have included more efficient scouring and scour waste treatment systems, which reduce chemical loads in effluent, scour water treatment and re-cycling to reduce water usage and costs. Composting of scour solids and waste are being converted into such products as "Soil Conditioner", by companies such as Geelong Wool Combing. Considerable efforts and work has gone into more efficient use of dyestuffs, and thus reduced chemical loads in dye wastes along with investigations into more "friendly" dyes and finishing agents. Low temperature dyeing techniques have been developed to reduce energy requirements for dyeing. All of these projects make good business sense in that they not only actively reduce chemical use and waste disposal problems but also can reduce costs to processing mills.

Market signals

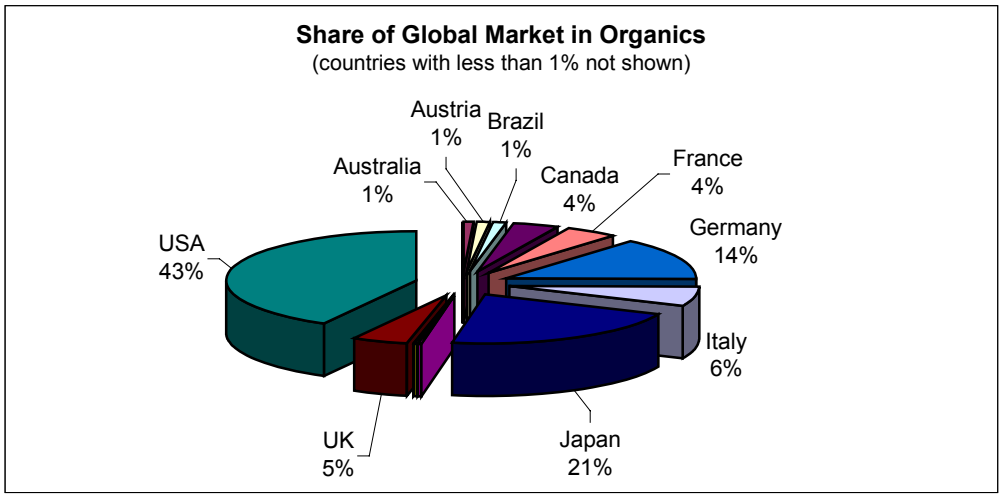
At present, there are no market signals from processors to tell growers to reduce pesticide residues on greasy wool. When the EU Integrated Pollution Prevention and Control Directive, (IPPC) legislation comes into force in Europe, the wool market will become segmented as both processors and growers become more selective in sourcing wools to meet both legislative and marketing requirements. This will see the commencement of price or market signals flowing through to growers and this will result in developments in better raw product specification (of chemical status).

Despite the lack of clear market signals to growers, there is empirical evidence that some Italian processors are reducing combing tariffs (combing charges) if the wool has been scoured in Australia before its further processing, i.e. combing as any chemical load has been removed at source and they do not have the high cost of waste treatment to cope with to meet environmental standards being set in Europe.

It is important to understand that the production base alone is insufficient to ensure marketability of the product. However organically savvy a potential customer is garments are still required to meet design requirements and price constraints.

Ethical concerns regarding animal welfare, farmers' health, employment in impoverished rural communities, and local purchasing (both to encourage local growers and to reduce the environmental effects associated with transport) are also important for some buyers (Betteridge, 1997; Aitchison, 1998). Environmental considerations are the highest priority for organic buyers in Europe, to the extent that German consumers will often go beyond questioning how the product was grown and query aspects of production such as manufacturing inputs, energy consumption, packaging and retail practices (Greuff, 1998).

If one takes the organic food market as an indicator of organic awareness and consciousness then the following data is an important market indicator target for other organic products. Ref:



There is little hard data on market size and growth in the textile sector. Trade comment regarding hemp clothing retail sales in the USA, however is interesting, with values of approximately US$10m in 1995 whereas the figure today is being quoted around US$200m. How much of this is truly an organic market and how much is a "rebellious" youth market is unclear. It does however provide food for thought.

Certification of "Organic"

There are a number of features which are important in the production and certification of an organic product. There must be:-

- **An audit trail**

The operator must establish procedures and operations aimed at establishing full control of certified products in storage and transport to enable traceability of all certified materials to the point of sale. These procedures shall consider such aspects as packaging, labeling and transport as well as relevant documentation that may accompany certified products to maintain authenticity of the product through to the end consumer. Documented procedures are a preferred means of outlining the steps required to maintain the authenticity and traceability of certified products.

- **Labeling & packaging**

All products marketed as certified require specific packaging and labeling details. These include levels of certification, supplier contacts, validation of the status of the product and certified use of appropriate logos & brands. Packaging should be able to maintain the organic integrity of the product.

The future for wool

Production base

The Australian Organic Woolgrowers (AOW) formed over 4 years ago so as to be able to deliver critical mass to a potential world market for certified organic wool. Early into their developments they formed an alliance with Maverick International Exports to maintain a commercial presence for the group around the world.

At present potential supply of wool types and volumes also restrict development. Broadening of the supply base may allow some existing (and future) customers to focus on products that cannot currently be developed due to inadequate/sporadic supply.

The two major production weaknesses are: poor supply continuity and small diversity of types on offer; but these can be offset with expansions made to the supply base.

Processing chain
The wool textile demand chain is well positioned to be able to take on organic processing standards without causing major interruptions to work or management practices

Wool processing is “batch driven”, thus each processes is very well identified and kept from cross contamination, some of the major requirements of certified organic processing standards are close to being met with conventional processing practices.

As for allowable ingredients in processing, there seem to be a range of processing aids and dyestuffs available that can be readily allowed in certified organic processing. Most quality management systems would already have work processes well documented, and these organisations would be very well positioned to most easily attain certified organic processor status with appropriate use of processing additives.

All textiles suffer the problems identified in this paper, not just wool. There are a number of processes that rely on chemical treatments especially for dyeing and finishing. The challenge for the textile industry is to be able to develop these processes that satisfy environmental requirements for “eco-wool" or low residue labeling. The world is watching and in fact making changes outside the textile industry sphere of influence and the industry is responding.

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30. A New Zealand View of Plant Protection Challenges in Organic Apple Production

by Max Suckling, Jim Walker, Howard Wearing Steve McArtney, and Peter Wood
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Organic fruit exports (mainly apples and kiwifruit) comprise ca. 80% of total organic exports from New Zealand, which were around NZ$100M in 2001. The fruit industry is highly focussed on export to distant markets. This export focus presents unique challenges for organic fruit production, due to the need to achieve phytosanitary standards for market access.

As organic apple production has expanded to meet a growing international market, the requirements of continuity of supply, consistency of quality, and market access have demanded an increasing role for novel technology to meet production and marketing problems. The tension between "low-input" organic concepts and the need for new technology has created some unique problems for plant protection in organic production.

Organic growers need to be: the best fruit growers and financially secure, accepting of higher pest and disease risks, able to manage higher margins of risk, and committed to the ‘Organic’ philosophy.

Organics has a future – but opinions differ as to the significance of organics to New Zealand’s future.

Just how sustainable are the margins?
What is the role of new varieties and how easy are they to grow organically?

Significant technical challenges still exist, but research is likely to solve these problems and give a high return on the R & D investment.

31. Functional Diversity, Pest Management & Restoration Ecology

By Dr Paul Horne
IPM Technologies Pty Ltd

Introduction

This paper describes the elements of agricultural ecosystems and their role in agricultural production. Rather than consider farms as crops and insects as just pests, we need to view crops as habitats for a vast range of insects and mites. Current farming practice is to grow most crops as monocultures, but even so, they are agricultural ecosystems with a range of resident and transient inhabitants. Pest species usually comprise a small percentage of the total species composition of most crops, and there are more beneficial and benign species.

Once it is accepted that there are beneficial species (predators and parasites of pests), then there is a link between pest management and conservation. Instead of farming being viewed as the opposite of conservation, farms can foster and use the natural biodiversity to help control pests and maintain populations of native species.This concept has recently been recognised, and McIntyre *et al.* (1992) state, "The struggle to maintain biodiversity is going to be won or lost in agricultural ecosystems".

Diversity and pest management

Agricultural ecosystems have for many years been monocultures and have low diversity. There can be large numbers of a very few species (often pests), and the low diversity also means low stability. Conventionally grown crops are typically protected from insect and mite pests with a range of synthetic pesticides. Organic crops may also be treated with pesticides within the guidelines of the various associations, but in general these are less potent and shorter residual. Where broad-spectrum insecticides are used (organic or conventional) then effects on non-target organisms means that diversity is lowered. When beneficial insects are killed, then the result is that pest control becomes even more reliant on further applications of pesticide.

Functional diversity

"The wealth of native natural enemies and the means to incorporate them into IPM in Australia are only now coming to be appreciated" (Gillespie &New 1998). Integrated Pest Management (IPM) is a means of controlling pests without total reliance on pesticides. Instead, most control is achieved with natural enemies of pests and management methods. Pesticides are only used strategically to support these two control measures. In Australian crops grown outdoors, the biological control agents are mostly native species.

Pest management

This paper discussed the relative role of:

1. Pesticides, both organic and conventional
2. Biological control
3. Predators, Parasites and Pathogens
4. Management techniques

These are the components of IPM strategies, and Organic farming requires IPM as much or more than conventional farming. Pesticides are used by both organic and conventional farmers. What needs to be considered in both situations is the selectivity of the products in targeting only pests, the residual activity

on pests and on beneficial species, sub-lethal effects (and not just acute mortality), and non-target mortality (including secondary poisoning from eating treated prey).

Biological control

The best known examples of biological control are classical biological control programmes, where an exotic pest is controlled by the release of a biological control agent from the country where the pest originated. Augmentative biological control is also widely used, and this means either adding more of an existing biocontrol agent, or encouraging it by manipulating the environment or spray programme. Mass-releases of certain commercially available species such as predatory mites and parasitic wasps are examples of augmentative biological control.

Encouraging native species is another means of augmenting biological control agents. There is an increasing role for resident native species in many cropping systems. Methods to enhance populations of beneficial species include:

1. Habitat manipulation
2. Complexity associated with stability- Structure of habitat
3. Rotation, Planting sequence,
4. Irrigation, soil management
5. Cover crops, inter-planting,
6. Nectar sources

Pest species may be either native or exotic. Native pests include Heliothis (Helicoverpa) spp. and Lightbrown apple moth. Exotic pests include species such as Plutella, potato moth, and many slugs and snails. Similarly, beneficial species can be either native or exotic. Most introduced beneficial species are parasites rather than predators, to avoid them becoming pests themselves.

Restoration ecology

Examples were given of situations where pests became more serious as a result of changed management practices. The time taken for these situations to develop and be solved varied considerably, but all took at least one year. Examples include:

- Cicadas in coffee
- Organic vs conventional
- Conventional tillage vs conservation tillage
- Table grapes & wine grapes
- Mealybugs and mites
- Potato crops

Conclusion

- Organic farming is better placed at present to use native biodiversity to obtain better control of pests.
- Primary control should be biological, supported by management and only then with pesticides.
- Increasing diversity means more species to identify.
- There is a real cost when misidentification of pests or beneficials occurs. Correct identification becomes more important when a diverse range of species are involved in an agricultural ecosystem.

References

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Gillespie, R.G. and New, T.R. (1998). Compatibility of conservation and pest management strategies. Pp. 195 - 208. Sixth Australasian Applied Entomological Research Conference. Brisbane.

32. Phosphorus Management in Broadacre Organic Farming Systems

By Chris Penfold
Adelaide University, Roseworthy Campus

Background

- Environment
  - climate
  - soils
  - economy
- Cropping systems
- Nutrient export from open systems

Why phosphorus?

- A major element
- Low natural abundance
- The main nutritional limitation to production in broadacre cropping
- Essential for legume production
- Limitations of certified P

Genotypic differences - crops

- Semi-dwarf wheats
- legumes vs monocotyledon plants
  - canola>wheat>albus lupin/faba bean/chick peas
- chick peas and organic acids
- lupins and proteoid roots
- canola - rhizosphere acidification, root hairs
- oats/triticale require less P than wheat

Genotypic differences - pastures

- Sub-clover and barrel medic - utilisation of tricalcium phosphate
- burr medic - similar P requirement to wheat
- Yellow serradella - lower P requirement than sub-clover and wheat
- P contained mostly in faeces - not urine

Seed phosphorus

- Important for early root and shoot growth
- Yield benefits in low rainfall years
- Early vigour and weed competition
- High phosphorus seed from:
  - high P paddock
  - early sowing
  - wetter districts

- grading for larger seed

Beneficial microbes

- Mycorrhizal associations
- P solubilising organisms eg. Penicillin spp
- Biosuper - Thiobaccilli spp.
- Commercial inoculums

Soil conditions and P availability

- Neutral pH - liming, legumes
- increasing soil organic matter leads to decreasing soil sorbtivity

Farming systems

- P important for legume rhizobium and their function
- lucerne and perennial (native) grasses
- rotations - wheat following crops with high root C.E.C. (eg. sainfoin)
- Broadcasting vs banding
- sowing date (and weed control)

Phosphate fertilisers

- Mineral rock phosphates – soil pH, OM, particle size, citrate solubility
- Reactive phosphate rock's (RPR's) - > 600mm rainfall, low sorbtivity soils
- calcined rock P
- Guano
- organic compounds - humic and fulvic acids
- Organic fertilisers
  - composts
  - manures
  - pelletised compost
- Green manures

Full report availability

http://www.rirdc.gov.au/reports/ORG/ua-49a.pdf

33. The Importance of Diversity in Organic Weed Management

by Paul Kristiansen, Brian Sindel and Robin Jessop
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Abstract
Weed management is widely reported as a significant constraint in organic production in Australia and overseas. A survey of Australian organic growers regarding weeding management practices and principles indicated that a diverse range of methods are used in organic weed management (OWM) and that diversity is important for individual farmers to effectively control the range of weed types encountered on a property.

In addition to the *diversity of practices* used by organic growers, certain techniques are used to increase the *biological diversity* of plant and animal species utilised on the farm over space and time and these techniques may provide benefits for weed management. Examples reported by Australian organic growers include under-sowing with clover or pinto peanuts, clumping plants as physical barriers against weed roots, tagasaste hedge rows to reduce seed spread, crop rotations to interrupt weed lifecycles and introducing a range of animals into the system. The importance of an integrated, whole-farm planning approach is emphasised as an underlying concept for combining methods effectively to manage weeds and at the same time optimising other benefits such as disease management and the efficient use of inputs.

Introduction

> "*Sustainable farming systems are inherently diverse because nature is diverse and sustainable farming must be carried out in harmony with nature. Thus, sustainability cannot be specialized*." (Ikerd 1999)

Diversity in agricultural systems can be described in different ways. Two main aspects of diversity are considered in this paper. *Diversity of practices* refers to the range or number of physical and cultural methods used by farmers to achieve production goals, and *biological diversity* refers to the number and variety of organisms present on a farm and includes genetic diversity amongst species. Some overlap between these categories exists, for example, introducing a biological control agent is increasing both practical and biological diversity.

At the farm scale, diversity may include the range of activities undertaken through time and space, the number of plants and animals deliberately nurtured as crops and livestock, the presence of supporting infrastructure (e.g. dams, machinery, fences, topographical variation) and the abundance of flora and fauna retained for conservation and other purposes. Another important aspect of on-farm diversity is the variety of invertebrates and microbes present in the soil, the air and in the existing crop and non-crop vegetation.

Diversity does not automatically mean less pest problems, and may even mean more (Norris 1992). Some ecologists argue that increasing species numbers does not provide greater system stability or productivity, rather that functional diversity or key species may have a more important role to play (Grime 1997). Research on the relationship between biodiversity and systems functioning has often been on selected components of ecosystems or simplified systems (Hooper & Vitousek 1997, Tilman *et al.* 1997) without considering the many other elements, processes and functions of systems (Waid 1999). In the context of organic agricultural systems, there may be several reasons, in addition to weed management, for increases in on-farm and regional diversity. The inter-relatedness of farm management activities and the total performance of the farm, as measured by pest problems, economic factors, off-farm environmental impacts

and resource usage efficiency for example, makes a comprehensive assessment of the importance of diversity in increasing stability and productivity quite complex. Hence, organic producers have generally accepted the premise that increased diversity is beneficial to whole-farm performance, at least when compared with the lack of diversity found in conventional agricultural systems.

Diversity of practices and biological diversity have generally declined in most farming systems during the past century as the dominant agricultural paradigm has become more specialized and monocultural (Wynen 1996, Finckh *et al.* 2000, Martinez-Ghersa *et al.* 2000). In organic farming, however, diversity is an often-reported principle underpinning the production methods (Lampkin 1990, Henderson & La Rooij 1992, Wynen 1996, Conacher & Conacher 1998), and is implicitly or explicitly mentioned in many organic standards (OCIA 1998, OPAC 1998, Devrill & Denham 1999, Joint FAO-WHO Food Standards Programme 1999, UKROFS 2001).

Weed management is a major constraint in organic production (Krell 1997, Walz 1999, Burnett 2001). As a consequence, there is a growing body of information and research about the strategies and methods used in organic weed management (OWM) (Kristiansen *et al.* 1999, Kristiansen *et al.* in press). The emphasis for managing weeds on organic farms is on developing ecologically based strategies that aim to reduce the weed seed or propagule bank and prevent weed seed production by disrupting or suppressing weed lifecycles (Kropff *et al.* 2000).

The diversity of weeds present on organic farms, usually greater than that found on conventional properties (Hald 1999, Sadowski & Tyburski 2000), and the lack of any single control method for all weed species or functional types, implies that a diverse range of practices are necessary to manage the weed populations present. The analogy of "many little hammers" (Liebman & Gallandt 1997) exemplifies the principle of OWM. A combination of techniques can provide acceptable control through the additive, cumulative or synergistic effects of several methods that may be less or not effective when used alone, while also spreading the risk and energy inputs required to manage weeds across a greater number of weeding options. A further benefit may be a reduced exposure to mechanisms that promote pest resistance (Liebman & Gallandt 1997). A longer-term, diverse approach to OWM requires a considerable amount of skill for successful implementation (Klonsky *et al.* 1994).

This paper draws primarily on a survey of Australian organic herb and vegetable growers regarding weed management practices (Kristiansen *et al.* 2001) to demonstrate the ways in which organic farmers attempt to use diversity of practices and biological diversity in their weed management programs. Reference is also made to research and industry publications to define and further illustrate the methods used to enhance diversity in order to control weeds in organic production.

OWM survey

The OWM survey was conducted in late 1998 and early 1999 as part of a larger project on weed management in organic herb and vegetable. The target population for the survey was growers of those products, although responses were received from organic growers producing a wide range of commodities including grains, oilseeds, fruit, nuts, flowers, meat and dairy products.

Approximately 750 questionnaires were distributed to members of three national organic certification organisations, the Biological Farmers of Australia (BFA), the National Association for Sustainable Agriculture Australia (NASAA) and the Organic Herb Growers of Australia (OHGA). Other certification organisations were not included in the survey due lack of interest or lack of relevance to the survey target group, herb and vegetable growers. The questionnaires were sent by direct mail-out or inclusion in the organisation's newsletter.

The survey sought information from organic growers about methods used to manage weeds. Growers were given the opportunity to describe their particular OWM strategies in as much detail as they felt appropriate using their own words. Responses to this open-ended question ranged from a few words (e.g. "hand weed, mow, mulch") to a few pages explaining weed management strategies and the underlying principles in considerable detail. Quotes from growers' responses are provided to illustrate some of the results and are presented with the main type of crops grown (herb and/or vegetable) the respondent, the number of years experience with organic production and the location of the farm by State.

A list of weeding methods was also presented in the questionnaire as a scaled-choice question. Respondents were asked to indicate the regularity of use of each method listed on a scale of 1 to 5 ("never" to "always"). This latter question type prompts respondents and makes answering somewhat easier (circling a few numbers versus writing phrases and sentences), although biases are incurred as respondents tend to limit their answers to the list provided and terms used may be unfamiliar or ambiguous (Foddy 1993). A section was included for "other methods", however many responses in this section were reclassified under existing headings. Further information about the design and conduct of the survey has been reported elsewhere (Kristiansen *et al.* 2001).

The overall return rate was 42%, with 326 responses received from all States of Australia. Three quarters (219) of those respondents reported herb and/or vegetable production as their dominant cropping system. Most of these growers (84%) were from the eastern mainland States of Victoria, New South Wales, Queensland and the Australian Capital Territory, with about 5% each from Tasmania, South Australia and Western Australia (Table 1). Almost 80% of the herb and vegetable growers were fully certified organically, a further 16% were either seeking certification or currently in conversion and about 5% were not certified.

Table 1. Percentage of herb and vegetable growers that returned questionnaires, categorised by the State in which the farm is located and the grower's certification organisation (n = 219).

Organisation	NSW-ACT	VIC	QLD	TAS	SA	WA	Organisation total
OHGA	21.9	10.5	6.4	2.7	0.5		42.0
NASAA	11.9	8.2	2.7	2.3	1.8	2.3	29.2
BFA	8.7	4.5	6.4	0.9	3.2	2.3	26.0
Other	1.4	0.9	0.5				2.8
State total	43.9	24.1	16.0	5.9	5.5	4.6	100

Diversity of practices

A number of key methods are frequently used in OWM including manual weeding, organic mulches, tillage, rotations, grazing and cultural techniques (Walz 1999, Burnett 2001, Kristiansen *et al.* 2001). However, responses to the open-ended survey question highlight the importance of diversity of practices in OWM across the industry (Table 2). Some of the categories in Table 2 overlap, for example, rotations are likely to include grazing and/or cover crops, and the integrated nature of organic production makes it difficult to clearly classify individual methods. Other weed researchers have categorised weeding methods in various different ways and acknowledge that such schemes are imperfect (Watson 1992).

Table 2. Weeding methods reported in the open-ended question.

Method	Example
manual weeding	hand pulling, rake, fork, mattock, wheel hoe and various chipping hoes
organic mulch	paper (pellets, sheets, rolls), hay, cardboard, straw, woodchip, sawdust, seaweed, wool, hessian
tillage	numerous plough types such as bed former/potato hiller, brush weeder, chisel/tine, deep ripper, disc, harrow, hydraulic rotating tines, mouldboard, rolling blades, rotary hoe, scarifier, scufflers, spring tine
slashing	brush-cutter, whipper-snipper, hand mower, ride-on mower, slasher
rotation	fallowing, various green manure crops, grazing, cash crop sequence, competitive

	crops before uncompetitive ones
bed preparation	stale seed bed, raised beds
timing	sowing, tillage, hand weeding, slashing, applying inputs, weed and crop lifecycles, lunar cycle
cover crops	cereal and legume green manures, living mulch, weed-suppressive brassicas
inter-cropping	companion crops, under-sowing, hedges, barrier crops, wind breaks, inter-cropping, permaculture
grazing	cattle, chickens, ducks, geese, goats, horses, pigs, sheep,
thermal methods	burning, flame weeder (hand-held and tractor-mounted), steam weeder, solarisation
synthetic mulch	black plastic film, carpet, woven plastic weed mat
sprays/intervention	citrus and pine oils, salt, mustard powder, homeopathic potencies, bio-dynamic "peppers"
hygiene	prevent seed set and spread, composting, clean machinery, buy weed-free inputs
other cultural methods	crop selection, site selection, sowing/planting rate, fertiliser placement, irrigation and water monitoring, soil management, diligence, observation, weed seed bank reduction focus, integration

The wide variety of specific methods or strategies used by herb and vegetable growers illustrates a central principle of organic or integrated weed management, that reliance should not placed on a limited number of control options, and that a multi-pronged, integrated approach is needed to manage the full suite of weeds over time (Morgan 1989, Rasmussen & Ascard 1995, Merfield 2000). The development of herbicide resistance in conventional farming has been partly attributed to over reliance on specialised farming systems with a narrow suite of weed management options that increase selection pressure (Cussans 1995).

Organic growers should not expect to find simple solutions to weed management. As one grower reported in the survey: "weed management is a living changing process utilising combinations of techniques and timing. Thus similar weeds with slightly varying situations may be managed differently" (vegetable and herb grower, 18 years experience, South Australia).

The overall diversity of techniques shown in Table 2 may be related to several factors such as farm size, farm location, years of experience, commodities grown and the various practical and philosophical backgrounds of the respondents. However an analysis of the number of methods reported by growers in the scaled-choice questions provides information about the diversity of OWM practices on individual farms.

The graph in Figure 1 shows the percentage frequency of responses for the number of weed management methods reported by herb and vegetables growers in response to the scaled-choice questions. At least half of the growers were using nine or more methods to manage weeds and less than 20% reported using five methods or less. The average number of methods used was 8.5.

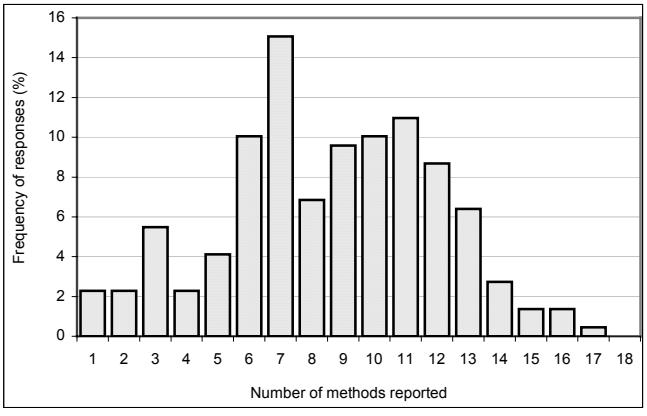

Figure 1. Percentage frequency of the number of weed management methods reported by herb and vegetable growers (n = 219).

Several examples from the survey are presented to demonstrate the diversity of methods used in OWM. Reference to published material is also included to explain the mechanism underlying the techniques used by organic growers and further illustrate the diversity of practices used.

Crop rotation

The success of crop rotation in OWM is based on cropping sequences that vary the patterns of resource competition, allelopathic interference, soil disturbance, and mechanical damage. These effects provide an unstable and inhospitable environment that prevents particular weeds from gaining a longer-term competitive advantage (Liebman & Dyck 1993). As many weeds are adapted to certain crops and cropping patterns (Baker 1974), changing these patterns with rotations disrupts ecological niches and weed lifecycles (Liebman & Davis 2000). A review of crop rotation research reports showed that weed and weed seed densities were lower in systems with rotations than in monocultural systems in about 30 cases, densities were equivalent in 8 cases, and were higher in only 1 case (Liebman & Dyck 1993).

Specific phases of the rotation can be used for OWM, such as grazing and cover crops (reported below). However, examples reported in the survey show the sequential nature of rotations: "1. rotational cropping e.g. cereal crops between cash crops - used as green manure. 2. sheep grazing of crop stubble before seed set. 3. [self-designed] mechanical weeder" (vegetable grower, 8 years experience, Australian Capital Territory), and "rotation - disc plough, green manure, turn in, fallow, hilling, more fallow, prepare seed bed, plant garlic/onion, chipping throughout season, harvest, cover crop, mixed vegetable crop, green manure" (vegetable grower, 2 years experience, Victoria). Rotations are also a means for integrating the various activities undertaken on a farm, as illustrated by this survey response, "a program strategy and long term plan of rotational program is a must" (vegetable grower, 10 years experience, Victoria).

Timing of farming operations.

Various cultural strategies based on manipulating the timing of certain farming operations can assist with weed control. Adjusting the time of cultivation was emphasised by numerous growers in the survey: "timing is crucial in controlling weeds" (vegetable grower, 8 years experience, South Australia), with the general aim of acting "when weeds are least likely to recover" (vegetable grower, 2 years experience, Queensland), usually "as little seedlings" (vegetable grower, 7 years experience, Western Australia). One grower suggested that "cultivation at night (without light) should be trialed in Australia as only overseas trial results are available" (vegetable grower, 8 years experience, Australian Capital Territory).

Adjusting the time of sowing or planting was reported by almost half of the respondents (49.3%). Emphasis was placed on establishing the crop quickly before weeds get too large, "plant as soon as the bed is ready" (herb grower 12 years experience, Tasmania), or on taking advantage of the perceived effects of lunar phases on plant growth; "all small crops are sown/planted by the moon phases" (herb and vegetable grower, 20 years experience, NSW).

Fertiliser and irrigation.

Strategic applications of inputs such as fertiliser and water can be used to favour crop growth relative to weed growth (Rasmussen *et al.* 1996, Liebman & Gallandt 1997). A number of survey respondents indicated that they made deliberate efforts to strategically manage their applications of fertiliser and water. One grower suggested, presumably to encourage greater weed emergence prior to cultivation, “irrigating to stimulate germination” (vegetable grower, 15 years experience, Victoria), while another recommended the use of dripper irrigation because they encourage "less weeds than sprinklers" (herb grower, 5 years experience, Victoria). In regard to fertiliser applications, comments included “spot fertilising” (herb and vegetable grower, 7 years experience, New South Wales), and “raise pH to control sorrel” (vegetable grower, 2 years experience, Victoria).

Soil condition.
Several books on non-chemical weed control refer to the relationship between soil condition (e.g. drainage, calcium:magnesium ratio, pH) and the presence of particular weeds, and suggest that such weeds are an indicator of a soil problem (Pfeiffer 1970, McCaman 1994, Walters 1996). The interaction over time between "balancing" the soil to manage weeds and other weed management techniques is unclear (Bart Davidson, pers. comm.), and it is likely that several factors may be operating to reduce a given weed population. Some growers had observed specific soil-weed relationships, "we have found by balancing the soil a large number of weeds disappear. For example, soil with high potassium and low calcium grows thistles. Low manganese grows ragwort. Low calcium grows blackberries. We have been slowing them by using calcium around the roots and bruising/bleeding the stems" (vegetable grower, 18 years experience, Victoria). Others made more general comments, "soil overall health, e.g. mineral content, microbe content, pH, availability of elements are a major reason for our abundance of one particular weed problem in most cases" (vegetable grower, 10 years experience, Victoria).

Crop density.
It is generally recommended that higher planting or sowing densities (compared with those recommended for conventional systems) can improve the ability of the crop to out-compete weeds for light, water and nutrients. Research reports (Grevsen 2000, Griepentrog *et al.* 2000) confirm the observations of survey respondents, for example, that "growing plants together helps by shading out weeds" (herb grower, 15 years experience, New South Wales).

However, in some situations the opposite is advocated. For example, if weed loads are high, wider row spacings allow better access for in-crop mechanical weed control in organic cereal production (Rasmussen *et al.* 2000a) and organic cotton growers in California often plant less densely in order to minimise competition between cotton plants and maximise individual plant growth and yield, whilst also allowing good access for tillage implements (Swezey & Goldman 1999).

Biological diversity
A number of the practical OWM methods reported in the survey also offer the opportunity to increase biological diversity. Varying the types of plant and animals used on a farm over time and space can have benefits for weed control. A number of examples are presented using responses from the survey and material from published sources.

Crop selection.
A straightforward way to use biodiversity against weeds is to grow a range of crops with different lifecycles and growth habits (Liebman & Gallandt 1997), rather than relying on only 1 or 2 crops. By rotating or alternating crops in a given paddock, the methods and timing of crop production vary and would be expected to interfere with the lifecycle of such weed species (Bastiaans *et al.* 2000). The survey respondents produced about 220 different crops and 6 types of livestock. The most common herb crops were garlic, echinacea, lemon balm, parsley and chamomile, and the most common vegetables crops were tomato, pumpkin, potato, garlic and lettuce. At least half of the respondents reported growing 3 or more crops, 20% of growers reported more than 6 crops, and 10% were growing between 11 and 20 crops. One respondent listed 17 crop varieties and stated that "we don't plant monocultures" (herb and vegetable grower, 7 years experience, New South Wales).

Selecting species or cultivars based on canopy architecture, plant height and growth rate and place in rotation sequence is known to be an effective weed control strategy (Rasmussen *et al.* 2000b). The choice of crop when planning rotations will also depend on the pre-existing circumstances. Surveyed growers reported using "crop selection to suit weed burden" (herb grower, 8 years experience, Victoria), choosing "fast growing, quick covering varieties" (herb grower, 2 years experience, New South Wales) and observed that "crops like shallots have minimal leaf coverage [and are vulnerable to weeds], but plants like beetroot

which have a broad leaf area will not have as many weeds" (vegetable grower, 8 years experience, Queensland). A very quick cash crop such as radish may be grown and harvested without the need for any weeding and before weeds have set seed. This option could provide an alternative to fallowing that generates an income while also facilitating seed bank depletion (Bond *et al.* 2000).

Cover crops.
A large amount of literature is available on selecting and growing cover crops (Gardner & Morgan 1993, Marshall 1994, Porter 1998) and research is continuing (IDRC 1998, SAREP 2001). Cover crops are reported to have a number of benefits for the farming systems in addition to their use as a weed management tool. Commonly cited benefits relate to erosion control, maintenance of soil health, disruption of pest and disease cycles and habitats and increasing biological and economic stability (Smith & McGlew 1994).

Survey respondents frequently reported cover crops as a means of managing weeds. For example, "heavy green manure crops (beans) tend to block out weed growth" (vegetable grower, 6 years experience, New South Wales), "for leeks, grow manure crop first" (vegetable grower, 8 years experience, Victoria), "the open areas are slashed and planted with legumes" (vegetable grower, 6 years experience, Queensland) and "use cover crops such as oats, vetch and clover to reduce weeds …. we plant directly into them …. tilling the earth leads to promotion of weeds" (herb grower, 4 years experience, Queensland). In a different survey, Australian organic farmers reported growing more than 20 different types of cover crops or green manures (Simmons *et al.* 2000).

Intercropping.
Intercropping, or using two or more plant species in close proximity with the aim of optimising their productivity, can be implemented in a variety of ways including undersowing (e.g. legume under cereal), alternate-row cropping, mixed rows, hedges, shade trees and agroforestry. A review of 78 research reports about intercropping found that weed biomass was reduced in an intercropped system compared with a monocultural system in 76% of the cases, weed biomass increased in 7% of the cases and 17% were intermediate or variable (Liebman & Dyck 1993).

About 13% of respondents used some form of inter-cropping regularly and another 30% used it only rarely or occasionally. Examples of intercropping in the survey included "companion planting with berseem clover suppressed most weeds amongst carrots and beetroot" (vegetable grower, 26 years experience, New South Wales) and "we use living mulch, pinto peanuts" (herb grower, 7 years experience, Queensland). Research has also shown that undersowing cereals with legumes, for example, can suppress weeds, particularly annuals (van Elsen 2000).

Some innovative polycultural techniques for weed management were reported by survey respondents. Several growers mentioned the use of hedges to prevent the dispersal or invasion of windborne weed seeds including planting crops "between tagasaste hedges [to] stop windborne seeds of weeds" (herb grower, 15 years experience, South Australia). Other growers used clumping plants to reduce the impact of weeds, for example, using a "weed barrier of lemongrass" (herb grower, 1 year, New South Wales) to prevent invasion of the herb beds by kikuyu, and "planting comfrey in blackberry hoe spots (stops nodulation), but not in cultivated area or it would become a weed" (vegetable grower, 15 years experience, Victoria). It is assumed that this respondent is planting comfrey plantlets or root cuttings into holes left after chipping out blackberry in order to suppress blackberry regrowth. The underlying mechanism is uncertain.

A survey of polycultural practices in Australia found that polyculture (of which inter-cropping is one manifestation) appeared to have a low adoption rate amongst organic and other "sustainable" producers (Geno & Geno 2001). A very low return rate (1.8%) was achieved and less than half of the respondents used complex polycultural systems, whilst the remainder used only rudimentary practices such as alternate-

row intercropping or basic agroforestry systems. The potential of intercropping has been highlighted by recent research on leek and celery alternate-row cropping that found large reductions in weed emergence and biomass compared with pure leek crops, and the total crop yield was also higher (Baumann *et al.* 2000).

Animals.
The most common types of animals used for weed control were chickens, sheep and cattle. In Denmark, there is a trend amongst organic producers to adopt stockless systems, which will mean a decline in the overall diversity of rotations. It is suggested that these changes will reduce the preventative impact of rotations on weeds and that weed control may become more difficult (Rasmussen *et al.* 2000a).

A technique reported by several growers was that of the "chook tractor" (vegetable growers, 5 years experience, Tasmania & 14 years experience, South Australia), i.e. allowing chickens to graze within an enclosure on the herb or vegetable producing field. Other growers reported using poultry, including geese, ducks and chickens, in a less structured way, "allowing chooks in after harvest to 'rotary hoe' the soil" (vegetable grower, 6 years experience, New South Wales) and "letting the chooks loose" (vegetable grower, 13 years experience, New South Wales). Pigs were occasionally used in preparing a paddock with intractable weeds: "graze with pigs for watsonia" (vegetable and herb grower, 4 years experience, Western Australia) and "raise a family of pigs to try to control dock" (vegetable grower, 10 years experience, New South Wales).

Biological control was not mentioned by survey respondents even though this option is compatible with organic production. Classical bio-control may be less suited to annual horticultural cropping systems in which the control agent's habitat may be disturbed or completely removed from time to time, or if farming operations (e.g. tillage) interfere with the lifecycle of the control agent (Hartley & Forno 1992). Weeds that were most commonly reported by survey respondents, e.g. couch, kikuyu, sorrel and dock (Kristiansen *et al.* in press), have perennial rhizomatous organs with a strong capacity to regenerate. Bio-control programs for these types of weeds have been persistent failures (Hartley & Forno 1992).

Conclusions

While diversity of practices and biological diversity have generally declined in most farming systems during the past century as the systems have become more specialised and monocultural, organic farming has maintained an emphasis on diversity. Organic producers try to maintain or increase farm diversity over time and space for many reasons, including weed management, a major concern for many organic growers. Reliance on a small number of methods has the potential to promote resistance in targeted weeds.

There is an enormous diversity of OWM practices amongst Australian herb and vegetable growers and there is a large diversity of practices employed on individual farms. Examples of using diversity of methods for weed management include crop rotations, timing of cultivation and sowing, manipulation of fertiliser/water inputs, improving the soil condition and crop density. Examples of increased biological diversity for weed management included crop selection, cover crops, intercropping and animals.

While the range of methods used reported in the survey appears diverse, there are several areas where more diversity could be incorporated for weed management. Selecting and growing a broad range of crops, including cash crops and cover crops and varying the times when they are sown or planted may have substantial benefits for weed control as well as other aspects of farm management such as insect and disease control. Intercropping methods are not well adopted in organics, despite the multiple benefits, which can be obtained. Research and extension activities aimed at developing practical inter-cropping systems for Australian conditions may improve adoption of these methods. Animals are also not commonly used in Australian organic horticulture. Various types of livestock can be used for preparing ground, strategic in-crop grazing and preventing seed set in weed species.

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34. Government and Organics: A Decade of Association and Beyond

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Abstract
Organic farmers have long felt alienated from mainstream commercial agriculture. While some prefer to remain separate and retain their individuality, others believe that commercial agricultural interests have fostered this separation. Government's past limited support for organic agriculture has been due both to the small size and wide diversity of the industry, and agricultural science's reductionist paradigm that is not sympathetic to organics' holistic approach to agriculture.

However, the now widely accepted systems approach to management of natural resources in Australia and the emphasis on integrated pest and disease management has closed the gap between agricultural science and encouraged a more holistic approach, evident in catchment management models and integrated pest and disease management research. Organic farming is no longer regarded as a marginal system, and many of its techniques are being used by conventional agricultural science. One of the challenges is to break down the barriers between the different approaches so that there is a more ready sharing of information.

NSW Agriculture has had over a decade of association with the Australian organic industry. This paper outlines NSW Agriculture's involvement with the organic industry, the progression of the alternative scientific paradigm within the department, and the birth of a new era of mutual co-operation and understanding between government and the organic industry.

NSW Agriculture has dedicated resources to organic agriculture since 1989 when it appointed its first organic farming officer to assist with the development of the organic industry. The new appointment reflected the growing interest in research and development in organic agriculture that occurred in Australia during the 1980s, an interest kindled by international consumer concern about the use of chemicals in agriculture, and the impact of conventional agriculture on soils. The revived interest in organics was not the first time scientists had begun looking at this agricultural system. In fact, the relationship between organics and science has been ongoing during the past two centuries, since the Industrial Revolution.

Historical relationship between science and organics
One of the major impacts of the Industrial Revolution was the aggregation of people into larger cities with the demands they made on agriculture for food and fibre. At the same time, a scientific revolution was developing modern scientific methods and emphasising the importance of technology and engineering. The marriage of these two revolutions resulted in undeniable benefits for agriculture and society. The period between 1850 and 1930 also saw the emergence of the biological, or life, sciences and the earth sciences. While these did not have as visible an impact as chemistry and technology, the findings of individuals such as Darwin (1881), Frank (1885), Rayner (1927), King (1911), Hilgard (1906) and Hopkins (1910), were important for the development of modern organic agriculture.

During the 1930s agricultural practices came under fire as vast areas of agricultural land in the U.S.A. became subject to wind erosion during what became known as the 'dust bowl' period. This led to the establishment of numerous conservation projects and agencies. Researchers found correlations between a decrease in soil health and an increase in degenerative diseases, reproductive problems, and a general decline in health among humans and animals (Wrench, 1938; U.S.D.A., 1939; Price, 1945).

By the early 1940s there were indications that agriculture was beginning to balance its chemistry with biology and its technology with ecology. A more holistic approach began permeating the thinking of both farmers and agricultural scientists. Some of the most significant researchers of the time included Jacks and Whyte, 1938; Howard, 1943; Cocannouer, 1950 and 1958; Hendricks and Alexander, 1957; Kellog, 1957; Russell, 1973; Albrecht, 1975; Balfour, 1976; Leighty, 1938; and Waksman, 1936. The research of these individuals formed the foundation of organic principles, their work highlighting the complexity of soils, particularly in the area of soil organisms and their relationships to plant health and growth and the effects of crop rotations on soil fertility.

During the 1950s there was a definite shift back to a predominantly chemical and technological approach. For the next twenty years, holistic and integrative research declined as scientists lost interest or could not attract research funds. Many attributed this shift to a post World War II surplus of products and technology from petrochemical and munitions industries. It was during this period that the 'organic' versus 'conventional' agriculture debate reached its peak.
The publication of Rachel Carson's *Silent Spring* in 1962 saw the debate shift in favour of organic agriculture. Carson's research highlighted the impact of pesticides on the environment and pointed to the inevitable decline in ecosystem health. Carson stressed the interrelatedness of all life on the planet, that each species has its own ties to others, and that all are related to earth.

By 1977, as erosion and declining soil fertility were reappearing as serious problems, the United States Senate was preparing to hold hearings on the relationships between diet, disease, and health and researchers began re-visiting agro-ecology. At the farm level, organic agriculture emerged as a movement that offered farmers an alternative to expensive biocides and energy intensiveness, minimised the impact of agriculture on the environment, and worked with, not against, nature.

Today, as agriculture struggles to find a balance between feeding the world and managing the environmental problems caused by conventional agriculture, problems such as salinity, soil acidification, declining bio-diversity, pesticide resistance and human and animal health concerns, a renaissance in integrative thinking is permeating agricultural policy and research. Researchers are beginning to investigate organic farming systems, in the hope that they may provide some solutions to improving agricultural sustainability.

Consumer perceptions of agricultural production have largely been the impetus for this renaissance. An analysis of public attitudes to organic foods conducted by the UK based Soil Association in 1999 (Table 1), reveals that freedom from artificial inputs such as pesticides, and the perception that organic foods are healthier and tastier, are the main reasons why consumers are purchasing organic food over conventional food products.

Table 1.

PUBLIC ATTITUDES TO ORGANIC FOOD

MORI Survey 4-7 June 1999

Organic food is perceived as :

• Produced without artificial inputs	59%
• Healthy	53%
• Tastes better	43%
• GM free	35%
• Environment friendly	28%
• High animal welfare standards	24%

Source: U.K. Soil Association, 1999.

As consumers begin to demand food that is produced with minimum impact on the environment and with minimum pesticide application, the organic industry is experiencing an annual growth rate of 30%. This expansion far exceeds that of any other agricultural sector.

Agribusiness is also responding, albeit slowly, to public concerns. Whilst petrochemical products still dominate agricultural inputs, there is a shift in corporate research and development into environmentally benign technologies.

Developments since 1989

Since 1989, NSW Agriculture has been involved with many of the major initiatives of the Australian organic industry. Thanks largely to the surge in interest for organic products, particularly in export markets, the 1990's has seen a re-think by Australian government on organic policy. The Primary and Allied Industries Council report *Implications of increasing world demand for organically grown food*[26] (1989) found that an expanding export and domestic market existed for organic produce and recommended further studies be carried out into certification and overseas quarantine issues. The report also recommended that the Federal government provide more support to sustainable agriculture.

Since the early 1990's the Federal government has provided support to the organic activity in a number of policy areas. The Australian Quarantine Inspection Service (AQIS) in conjunction with industry, consumer and State government representatives, facilitated the development of a national standard for organic produce. AQIS is the authority responsible for auditing Australian organic certification organisations to ensure that the process of certification of producers and processors, and hence product, complies with importing countries' requirements. NSW Agriculture assisted with the establishment of the National Standard for Organic and Biodynamic Produce (1992, 1998), which describes the minimum requirements for production, processing and labelling of organic food destined for export markets. Today, AQIS continues in its role as chair of the Organic Produce Export Consultative Committee, whose mandate it is to oversee the National Standard and maintain export parity with international markets. NSW Agriculture continues to assist as a member of this committee.

The Rural Industry Research and Development Corporation (RIRDC), sponsored by the Federal government and industry, provides research and development support for new and emerging industries, and has provided the impetus for organic research and development in Australia since 1996. NSW Agriculture was represented on the advisory committee of RIRDC's Organic Research & Development Program from 1997 – 2000. The Program is now in its fourth year. The Program places greater emphasis on communication and education of organic production principles, and farm conversion to organic systems. RIRDC states: "As a result, product volumes will rise to meet the strong growth in demand for export and domestic organically certified product now evident. Industry will be in a much stronger position to actively manage and enhance its market position once produce volumes begin to increase".

RIRDC (2001)[27], reports that key issues identified by the Australian Organic Industry include:

- *Research, Development and Extension*

  R&D and the extension of this to industry participants must be a top priority if Australia is to become a global leader in the organic/biodynamic industry. Very little R&D has been or is currently being undertaken by the organic industry. There is limited government funding for R&D available at present to the industry, as there is no formal communication or representative structures to directly access support.

- *Government Endorsement and Support*
  The industry must actively seek government endorsement and support. Departments of Agriculture must possess the technical knowledge to support the industry and foster R&D for organic/biodynamic systems and problems. Education and training must be available to producers already using organic/biodynamic systems and potential users of these production systems. Government support will enable the industry to launch R&D programs into identified priority areas, ensuring Australia a position as a world organic/biodynamic leader. To access this support, though, the industry must indicate to government that it has a clear, united direction and focus.

The challenge for the RIRDC Organic Program has been to encourage collaborative organic R&D with mainstream funding bodies. However, a number of issues appear to be blocking potential alliances.

Many organic enterprises with a multi-commodity focus contribute research levies to a number of industry funding bodies, making the opportunity for targeted projects into organic farming systems difficult. Some conventional producers consider that by showing support for organic systems they may undermine their position as marketers of 'clean and green' agricultural produce. However, others have recognised the opportunities offered by organic systems for reducing reliance on inputs and for improving their terms of trade. Whilst mainstream funding bodies such as the Grains Research and Development Corporation (GRDC) are now beginning to provide limited support to organic R&D, Kinnear (1999), believes that research and development in organic agriculture in Australia will need to be primarily provided by the State departments of Agriculture[28].

State activities in organic agriculture

State directed activities towards organic agriculture, akin to Federal efforts, have focused on determining and improving the industries' market position on the world stage. A number of State coordinated market studies have identified the export potential for a range of organic products[29,30,31,32&33]. These reports also identified issues that impede market access for Australian organic produce.

A series of industry marketing workshops coordinated by NSW Agriculture in 1996 identified a range of issues that would need to be addressed to meet the aspirations of industry. Pearson and Neeson (1996), summarise the findings of the workshops in their paper 'The Marketing of Organic Products in Australia: Unlocking its Potential' [34].

The common theme expressed in the marketing studies is that a significant opportunity exists for Australia to capture export organic markets, but there is a need to increase supply of organic product rapidly to meet this demand. Fundamental to this is the need to increase R&D directed at gaining a better understanding of organic system dynamics.

The response of the States to increasing targeted R&D into organic systems has been slow. The small, diverse and (often) disunited nature of the organic industry has made it difficult to allocate research priorities. The past 10 years has seen a shift towards private and industry funded research, with the States now largely relying on industry co-investment to carry out core research activities. The majority of these projects have been short-term and have aimed to address production issues within a specific industry. Whilst some long-term systems-style (holistic) research has occurred, this period has seen a general decline in this type of project, which has been to the detriment of organic R&D. These factors have contributed to the alienation of the organic industry from mainstream agricultural extension programs. State agricultural extension staff, many of whom have little understanding of organic farming systems, are reluctant to provide advice to organic farmers. Consequently, results of conventional research, many of which have application in organic farming systems, are not being effectively communicated.

The NSW Agriculture model

In its 12-year involvement with the organic industry, NSW Agriculture has gained expertise in understanding industry issues and identifying ways forward. The organic officers' role has primarily been to develop and provide information and advice on organic farming. Through liaison with the peak National Organic body and other alternative farming industry groups the officer also provides advice to the department's senior management on policy matters and correspondence in relation to organic farming systems. During this period, NSW Agriculture has played a major role in assisting industry development through representation on a number of key industry committees. These committees included the Organic Produce Export Committee (now the Organic Export Consultative Committee), responsible for development of the National Standard for Organic and Biodynamic Produce, and the inaugural RIRDC Organic Sub-committee (1997 to 2000), which sets direction and provides funding for organic R&D.

Whilst this role has been relatively effective, the policy environment within NSW Agriculture limited the integration of organic agriculture into core departmental programs. It was soon evident that if organic agriculture was to progress in NSW, a greater understanding and commitment from NSW Agriculture, the States' primary agricultural information provider, was required.

In 1990, NSW Agriculture initiated a project investigating the environmental off-site impacts of a range of vegetable cropping systems, including an organic system. Located at Somersby on the NSW central coast, the nine-year program amounted to a $1 million investment by NSW Agriculture, whilst other contributors to the project included the Land & Water Research & Development Corporation (LWRDC) and the Horticultural Research & Development Corporation (HRDC)[36].

In 1996, a new staff training initiative saw the introduction of organic farming in a Sustainable Agriculture staff training module. This coincided with an influx of new research and advisory trainees into the Department. The Sustainable Agriculture module was one of a number of compulsory training courses provided to professional staff.

In 1997, the Department received funds through the Federal Governments Natural Heritage Trust's National Landcare Program to establish an organic demonstration site at Yanco in the states south-west.

The primary achievements of the Yanco demonstration site have been to show farmers that organic practices could be sustainable and that some practices offered opportunities for conventional farmers to reduce chemical inputs. The site has also increased credibility of organic farming within the ranks of NSW Agriculture. Utilised extensively for staff training, the site has allowed Department staff to increase their understanding, knowledge and, ultimately it is hoped, acceptance of organic farming practices. In July 2001, the site was approved for organic certification.

The opportunity to further involve NSW Agriculture staff in organic R&D projects received a further boost in 2000 with the announcement that RIRDC had approved funding for a project that would provide training for staff in organics, as well as involve them in developing conversion kits for key organic products.

Despite this increased activity there was still little commitment towards organic agriculture from within the Department's core programs. However, this was to change following a study tour of the U.S.A. in 2000, by Helen Scott-Orr, NSW Agriculture's Executive Director of Research Advisory and Education. The purpose of the tour was to:

- Evaluate how U.S. agricultural production systems and regulations are responding to increased use of GM technology and increased consumer and market pressure for GM free and organic food; and

- Examine the use of the Internet and related information technologies for service delivery by major public agricultural organisations in the U.S.A. and understand the supporting structures needed to manage these new delivery systems.

In her study tour report (2000), Ms Scott-Orr reports that during her visit it became apparent that "organic food production is expanding rapidly in the U.S. from a very low base, driven partly by the GM debate, and also by wider environmental and philosophical concerns."[34]

Since then a number of initiatives have been implemented aimed at increasing the level of NSW Agriculture involvement in organic agriculture and at improving communication with the organic industry. Departmental Programs have been encouraged to nominate contact staff with an interest in organic agriculture and research staff have been encouraged to investigate R&D opportunities in organics. In December, 2000, the N.S.W. Minister for Agriculture and Land and Water Conservation, the Honourable Richard Amery, announced the formation of the Centre for Organic Farming to be located in the central-west city of Bathurst. Following the announcement an industry group, the NSW Organic Industry Liaison Committee (OILC) was formed.

The terms of reference for OILC are:

1. Foster communication and feedback between all levels of NSW Agriculture and NSW organic industry representatives, as well as other government Departments as appropriate.
2. Advise on priorities and potential funding opportunities for NSW Agriculture services to the organic industries.
3. Oversight the development, implementation and outcomes of projects to address these priorities.
4. Review the appropriateness of departmental services periodically and reprioritise when necessary.
5. Monitor trends in the area, volume and value of NSW organic production and issues of significance to organic agriculture.

In June 2001, two additional full-time staff, a research officer and an advisory officer, were employed by NSW Agriculture to support organic farming. Both positions are based at the Bathurst Centre for Organic Farming. In July, the Department hosted a three-day organic workshop at Bathurst, coinciding with the formal opening of the Centre for Organic Farming. The benefits of the workshop were twofold. Firstly, it provided an opportunity for practitioners to showcase their activities and secondly, it highlighted research currently being carried out by NSW Agriculture that could be applied to organic agriculture. The success of the workshop guaranteed that it will become an annual event.

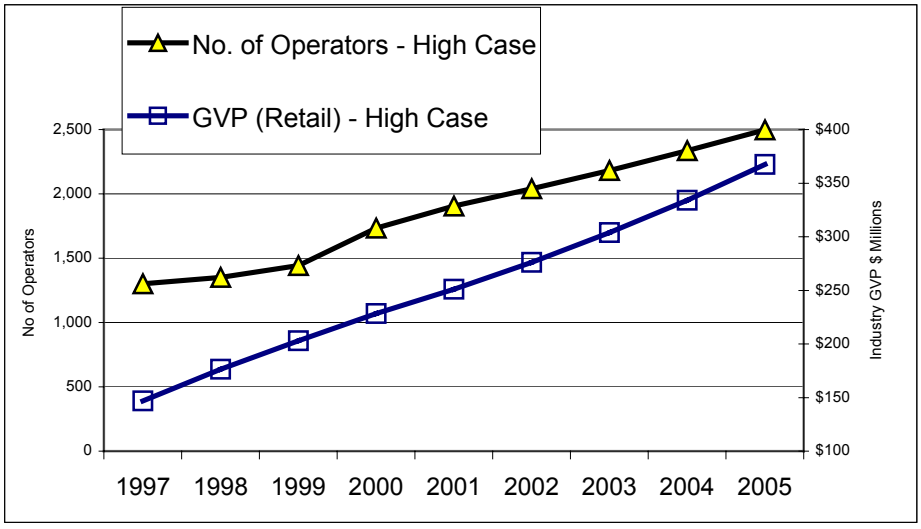
NSW Agriculture has undertaken a number of education initiatives in organic agriculture. The Department's two colleges – CB Alexander Agricultural College, Tocal, and Murrumbidgee College of Agriculture, offer courses in organic farming. A short-course in organic farming is offered by CB Alexander Agricultural College, whilst Murrumbidgee College has recently been successful with accreditation of an Agrifood Quality Management Course which contains the module "Organic Farming and Certification Procedures". Both courses were developed with significant industry input. NSW Agriculture has also been extensively involved with the development of TAFE NSW Organic Farming Course.

Officers of the department are being encouraged to debate, research, and undergo training in organic principles. Policy makers and regulators are now considering the implications of their decisions for organic farmers. New research is targeting both conventional and organic farming, and the benefits of existing research applicable to organic farming are being actively communicated. NSW Agriculture is currently developing a proposal for a Cooperative Research Centre for Australian Organic Farming Systems and is canvassing support from industry and other R&D providers for the proposal.

Conclusion

The adoption rate of organic farming systems within Australia could be considered low by comparison to Europe and the United States. Whilst growth in the Australian retail sector has been estimated at 20-30% annually (OFA, 2000), farm conversion has failed to keep pace with consumer demand for organic products. Traders in organic products report shortages of most lines, although short periods of oversupply have also been reported. Whilst some argue the under-supply of organic products is a worldwide phenomenon, farm conversion in Australia appears to be lagging behind some other nations. Figure 1 illustrates growth forecasts for the number of organic operators and gross value of the Australian retail sector.

Figure 1 Forecast Growth - Number of Operators & Gross Value of Product (retail).
Source: Macarthur Agribusiness, & Quarantine and Inspection Resources Pty Ltd (1999)



Limited studies have been undertaken to determine why the transition to organic farming has been slower in Australia. Kinnear (2000) reports the activity of government and private advisory services and direct financial incentives as the primary reason behind successful conversion rates in Europe.

A number of U.S. reports document extensive government policy barriers to the development and adoption of alternative farming systems[1,2,3]. The number one barrier identified in the reports was the lack of research and education programs related to alternative farming systems. Farmers surveyed in the reports cited that few traditional sources of information such as government extension agencies or private consultants were helpful when they became interested in reducing pesticide use and investigating alternatives. Furthermore, 'once these farmers fully committed themselves to implementing alternative farming methods, there was a tremendous lack of on-farm research focussed on issues of their concern'[4].

The approach by NSW Agriculture to provide effective support to the organic industry could be used as a model for other States to improve their support for organic farming. In summary, a number of key activities have contributed to the process:

- The level of knowledge and involvement of staff in organic R&D has increased due to the provision of targeted training programs.

- Communication with industry has improved through the establishment of the NSW Organic Industry Liaison Committee. This has provided an opportunity for industry input into Departmental R&D in organic agriculture.
- The development of relevant extension and education material facilitating the expansion of organic production.
- Focal points for activity in organic agriculture have been created, with the key centre located at Bathurst in central-west N.S.W.
- An annual organic workshop will be held providing an opportunity to show-case the latest organic R&D developments as well as providing an opportunity for NSW Agriculture to inform industry of research being undertaken that has application to organic agriculture.
- The development of a Cooperative Research Centre for Australian Organic Farming Systems will provide an efficient structure for future organic R&D activities in Australia.

However, successful implementation of an organic program within an agency is primarily dependent on two main factors. Firstly, support from the highest level of management must be obtained in order to ensure the mandate for change can occur. Secondly, it is essential to establish a constructive two-way dialogue between industry and the agency, to ensure that activities are meeting the needs of both.

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35. Seeding a Network for Success

By Viv Burnett,
NRE, Rutherglen, Victoria

Abstract
Active networks are critical to the on-going success of industry-based research and development. The RIRDC funded project "Development of Organic Crops and Pastures in southeast Australia" aimed to establish a network of interested producers. Through the activities of the project, a comprehensive network of certified organic and conventional primary producers from all Australian states was established.

This network included certified organic producers from groups such as the Riverina Organic Farmers Organisation, individual organic producers, as well as conventional producers from farmer groups in southeast Australia. Members of this network provided the knowledge, enthusiasm and commitment to support the activities of the project and actively contributed to major surveys that benchmarked current organic practices and conventional producers' views on organic production.

The network was strengthened through major workshops held at Rutherglen Research Institute where producers exchanged views and information, and participated in group-learning. Producers involved in the project also attended field days and received four issues of the Broad-acre Organic Newsletter. Project activities included farmer participatory field trials where established organic practices were demonstrated. Results from these sites, and marketing information to support commodity production, were extensively communicated through the rural media and in organic industry publications.

Information provided by producers through this project, and the high profile of the project in the rural media, and in Government, resulted in further research and development funding for the organic industry in Victoria of approximately $350,000 per year. This expansion in organic research and development will provide additional information to assist conventional producers to convert to organic production, and will assist organic producers to enhance their production methods.

Introduction
Research into the benefits of organic farming systems began at Rutherglen Research Institute in 1994. This year marked the beginning of a three-year development project funded jointly by NRE and RIRDC to develop interest amongst primary producers for the emerging organic production industry. This project initiated an organic demonstration site at Rutherglen, and formed a producer-driven steering committee to jointly manage the site. This project was followed by a further three years of funding to put into practice research information obtained from it. Collectively, these two projects have achieved a range of scientific outcomes for producers, highlighting the beneficial role of green manuring within crop and pasture production systems, as well as the use of higher seeding rates for effective crop production. The projects have also laid a strong foundation for the way in which further research and development in the organic industry can be conducted. This paper discusses how various networks have been established and maintained within our current research program, the benefits of those networks, and the organic research programs currently operating within NRE.

Definition

> Network:
> " A group of people who exchange information, contacts, and experience for professional or social purposes." *Shorter Oxford Dictionary*

Individual producers

Our industry development projects have provided us with the opportunity to develop working relationships with individual producers. Four farming families contributed their accumulated knowledge of organic systems as case studies, providing specific information on rotations, inputs, yields and methods. The case study families also provided us with the opportunity to do some preliminary on-farm research. We were interested in finding out whether increasing seeding rates resulted in improved grain yields. During 1999, David and Shirley Heather co-operated in a small research project to test increased seeding rates of wheat, oats and barley, at Newbridge in Victoria. We also tested seeding rates, different organic fertilisers and microbial stimulants at producer properties in NSW. Information obtained from these experiments contributed to our understanding of the different environments producers work in, and the challenges they face in their farming enterprises.

During 2000 we expanded these small experiments to on-farm broadacre research with producer co-operators. Instead of small plot type experiments we moved to a paddock scale where we tested seeding rates and organic fertilisers in canola, wheat and oats, and attempted to manage weeds using vigorous pasture species. We learnt that increasing seeding rates in canola can improve yields, whilst maintaining adequate protein and oil contents. We also learnt that vetch and ryegrass are vigorous enough to suppress a noxious weed like Paterson's Curse, and provide a high-quality feed when cut for silage.

The on-farm research and working with individual producers provided them the opportunity to learn monitoring tools like soil sampling, and to interpret those results for best effect.

Producer groups

The industry development projects have enabled us to develop alliances with existing groups and to initiate new groups of interested producers. The first project initiated a steering committee for the Organic Demonstration Site that met regularly at Rutherglen to discuss site management protocols that were consistent with organic farming standards. Significant challenges were presented to this group as the conversion process developed. Some of these challenges included the management of crop stubbles without burning, coping with in-crop weeds, and minimising damage caused by large populations of redlegged earthmites.

Effective alliances have been developed with local organic producer groups, such as the Riverina Organic Farmers Organisation. This group has strongly supported the research projects, and has contributed many hours of time and discussion about organic farming systems and their benefits within the Australian environment. The group is still actively operating and contributing to our weed management project.

There are a number of organic producer groups operating in Victoria, such as the well established East Gippsland Organic Agriculture Association, Gippsland Organic Livestock, the Victorian Organic Dairy Group, and the Central Victorian Organic Farmers. NRE is developing active alliances with these groups to enhance research and development outcomes and the sharing of information.

Within our department

Organic research and development in NRE occurs within the portfolio of Specialised Rural Industries. This portfolio includes a range of other industries that are more discrete, specialised and smaller than Victoria's main agricultural industries such as grain, wool, meat, dairy and horticulture. Organic agricultural research and development, because of its cross-industry nature, has promoted active linkages between some of the other divisions within our department. An example of these linkages includes the active participation of

the Agribusiness Initiative to provide a clear market focus for our research. In addition, the involvement of NRE's Parks, Flora and Fauna Division to start documenting biodiversity values within farming landscapes is also an example of another linkage.

Whilst conventional agriculture has had many decades of research support from government, organic farming systems are just beginning to receive similar attention. Raising the profile of organic production systems with key scientific leaders provides support for the research program within the Department. As part of our industry development project we have hosted NRE's Chief Scientists, Sir Gus Nossal, Dr. Graeme Mitchell, and Dr. John Stocker at Rutherglen for an organic breakfast, which they heartily enjoyed. This event led to the preparation of a position paper on the organic industry in Victoria, thus providing a firm foundation for research funding.

Other agriculture departments and research corporations

Research and development in the agricultural industries occurs through partnerships between funding corporations, and State and Federal Governments. A key component of our research and development success has been the development of linkages with other State Departments of Agriculture and the funding corporations, especially the Rural Industries Research and Development Corporation. NRE at Rutherglen has developed close linkages with NSW Agriculture at both Yanco and Wagga Wagga to improve research outcomes. We have actively participated in major primary producer events such as the Henty Field Days, Birchip Cropping Group Expos and the more recent GRDC Expo at Corowa. We regularly utilise scientific expertise in specific areas, irrespective of the State border. We have also developed on-going funding partnerships with RIRDC and GRDC to provide research solutions for primary producers.

Industry associations

Along with primary producers, the most important component of our research networks is our association with organic industry certification organisations. We have developed close links with the majority of certification organisations and they, in turn, have provided great support for many of our farmer events. Our Organic Demonstration Site at Rutherglen currently has a 'Conversion' certification with the National Association for Sustainable Agriculture Australia. In addition we utilise expertise within organic industry businesses and they too have contributed to our research projects.

Benefits of networks

There are five major benefits of developing extensive and active networks for our research and development activities. These are:

- Communication - active two-way communication fosters the support of the industry and primary producers.
- Efficiencies - good networks improve the efficiency of research and development outcomes, and reduce the likelihood of duplication.
- Credibility - networks with a range of stakeholders increases the credibility of our research and makes it relevant to our stakeholders.
- Sharing - active networking allows for the sharing of knowledge on a regular basis.
- Learning - through active networks and group facilitation, greater learning outcomes can be achieved.

NRE organic network

Organic industry research and development at Rutherglen has laid a strong foundation for the establishment of the new NRE organic network. In May this year NRE launched its five-year Organic Industry Strategy

which charts the course for our involvement in the development of this industry in Victoria. There are five key components to our strategy:

1. Identify Victoria's capability in organic production - this will occur through regional projects initiated by local government in collaboration with NRE.
2. Identify export markets and provide accurate feedback on trade opportunities.
3. Quantify the environmental impact of organic farming on the Australian landscape, in collaboration with other State departments.
4. Develop alliances with other state agencies and industry organisations.
5. Become a leading source of knowledge for the organic industry based on credible and refereed scientific investigation.

Sustainable organic production systems

This project represents a major investment by NRE in organic research and development within the Naturally Victorian Initiative. Its outcomes will be 'whole-of-chain' information for primary producers on the production of wheat, canola, citrus and vegetables for the certified organic export and domestic markets. It comprises two major research sites at Rutherglen and Irymple, and a minor research site at Donald, where both weed and pest management of each of these commodities will be intensively studied.

This project complements a range of other research projects also being undertaken by NRE in collaboration with their funding partners. These projects include managing weeds in organic systems, organic conversion workshops, best practice for organic wine-grape production, and non-chemical weed management for citrus.

Take home message

- NRE has built effective networks and relationships with the organic industry to support its research and development program.
- Our networks have improved the efficiency and delivery of research outcomes and continue to play a pivotal role in our work.
- Strong networks, which are a feature of the organic industry, achieve results for industry.

NRE Organic Network

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Sustainable Organic Production Systems, ph (02) 60304500

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Wayne Dempsey, Rutherglen, (02) 60304500
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Agribusiness and marketing
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NRE Organic Policy
Sue Titcumb (03) 9637 8491

36. Growing Farmers Through Biodynamic Education

By Cheryl Kemp
Eduction Co-ordinator, Biodynamic Farming & Gardening Association in Aust.Inc

Over past 18 months we have had over 500 participants in our Biodynamic Agriculture Workshops. With a turnover of over $100,000 in last financial year in our Workshops sector we have employed 3 part time staff. Organic certified farmers augment our target group of those interested in converting to Organics/Biodynamics.

The demand for training courses in biodynamics was unmet, as prior to 1999, all our training had to be done by volunteers, and was therefore very fragmented and lacking in many areas. Travel costs and time away from the farm were major issues. With the assistance of FarmBis that has enabled us to level the playing field with other training programs, enabling us to cover our costs and still have a fair price to the participants.

In order to become a Registered Training Organisation, we were required to put our Trainers through Cert 4 workplace training and also either become VETAB Accredited or in partnership. It required an upgrading of our office systems and management in order to be VETAB accredited in partnership with Tocal Agricultural College.

We started with our first Workshop for our Commercial members as a way to get them altogether for the first time to share their experiences. From here, we developed a program for farmers that covered the theory and practical aspects in two days. Sometimes held on biodynamic farms and other times at lecture rooms. Peter Proctor (Veteran NZ B.D.Adviser and Teacher) and Hamish Mackay (Workshop trainer and facilitator) travelled through Queensland from Atherton to Brisbane running nine workshops, with great success. Later in 2000, they covered NSW, Vic, SA, and WA and back to parts of Qld.

Potential is enormous. Farmers no longer scoff, they want to know how to convert and they want support. Many groups are requesting a follow up course in the next year or sooner. We are looking at Industry specific pilot groups eg Sugar Industry Also looking at assisting the processing aspect to make changes suitable for organic / biodynamic certification of their product.

We are also involved with writing the Biodynamic Modules for the NSW TAFE Organic Course (a 40 hour elective) and are developing a program (with OFA Education Committee) for an annual Training and Accreditation Courses for Teachers of the Organic and Biodynamic Modules at TAFE and to bring on more teachers for Practical Workshops.

We will continue the basic biodynamic workshops around the country, as well as a Biodynamic Bus Tour around western and northern NSW to see many types of Biodynamic enterprises, and hopefully a Viticulture Workshop in Nov 2001

By becoming more professional, meeting the benchmarking and best practices of the training sector, biodynamic training has become acceptable and in demand and it has enabled us to work in the marketplace. This in turn produces more educated and successful farmers to produce better organic/biodynamic produce for the industry and Australia.

37. Organic Agriculture and Contemporary Environment Management Systems

By Paul Ziebarth
Chairman, Queensland Fruit and Vegetable Growers Ltd

About QFVG

- **Queensland Fruit & Vegetable Growers Ltd. is the leading horticulture industry body**
- **Charter to increase economic and environmental sustainability of growers**
- **A refocussed organisation representing the agri-political, grower service, research, marketing and promotion, needs and interests of Queensland's 7,000 growers on 3,500 farms, employing 25,000 people**
- **In top three of Queensland's rural industries**
- **Environmental and natural resource management a key activity area**

Current Issues for the Horticulture Industry

- **Environmental care**
- **Access to natural resources**
  - **Land**
  - **Water**
- **Community and government expectations**
- **Consumer and retailer demands**
  - **Food safety**
  - **Environmental management practices**
  - **Price, quality and supply expectations**
- **Market access**
- **Quarantine**
- **Pest management**

Environmental Achievements

- **Farmcare Code of Practice**
  - **Driven by growers**
  - **Valuable guideline for grower compliance**
- **Futureprofit (Property Management Planning) for horticulture**
  - **Gives growers practical business skills**
  - **Helps ensure long term viability and sustainability**
- **Pest Management Strategies for the Queensland fruit and vegetable industries**
  - **Investigate non-chemical alternatives**
  - **Identify industry needs and research priorities for pest management**
  - **Assists growers access chemicals where necessary**

Environmental Achievements

- **Rural Water Use Efficiency Initiatives/Water for Profit**
  - **Financial incentives to improve water use efficiency**
  - **Providing advice to growers on achieving increased water use efficiency**
- **Individual grower activities**

The Way Forward

- **Industry Development Plan**
  - **Grower driven**
  - **Natural Resources and Environment**
  - **Queensland Fruit and Vegetable Industry Environment Strategy**

The Way Forward

- **Taking a leadership position**
  - **Strategy development**
  - **Delivery**
  - **Research**
  - **Nuffield Scholarship**
- **Sustainability Toolkit**
  - **Environmental Management Systems**
  - **Integrated Pest Management**
  - **Life Cycle Assessments**
  - **Eco-efficiency**
  - **Eco-labeling**
- **Seeking co-investors for initiatives**

Challenges for Industry

- **Does organics = good environmental practice?**
- **Marketing organic produce**
- **Consumer perceptions**
- **Community and government expectations**
- **Managing the category**
- **Trade games**
- **'Us Vs them'**

Summary

- **About QFVG**
- **Current issues faced by horticulture**
- **Our experience**
- **QFVG's track record - developing strategies and delivering practical solutions**
- **Challenges to industry**
  - **Meeting challenges of an environmentally and economically sustainable future**
  - **Raising investment to assist delivery of programs to growers**

Conclusion

- **QFVG will continue to deliver on strategies that growers want**
- **Providing the pathways to achieve successful outcomes**
- **Seeking co-investors**

38. Harnessing Diversity for Small Farm Success

By Joyce Wilke
Sunrise Farm

SMALL SCALE AGRICULTURE

- **Fresh**
- **Ripe**
- **High Quality**
- **Locally Grown**
- **Responsibly Grown**

Small Mixed Farms are not Flourishing!

- **Does it matter anyway?**

Yes definitely

By going smaller we reverse the current trend of the industrial food economy

LARGE FARMS
→ **FEED LOTS**
→ **FAST FOOD**
→ **SUPERMARKETS**

VOLUME & "EFFICIENCY"
AT HUGE ENVIRONMENTAL COST

Small Mixed Farms are not Flourishing!

- **Does it matter anyway?**

Yes definitely

Increasing scale is at the expense of diversity

DECLINING DIVERSITY
→ **DECLINING HEALTH**
→ **INCREASED DEPENDANCY**

Small Mixed Farms are not Flourishing!

Advertisers, Governments, Regulatory Authorities & QA schemes proliferate in order to reassure an increasingly sceptical consumer

There is an ever widening gap between consumers and producers

- **Small scale farmers do not need to get involved in this**
- **Organic certification agencies should encourage small farmers not to be involved**

Small Mixed Farms are not Flourishing!

- **Why are they not flourishing?**

There is no strong small farm tradition in Australia.

Debt.

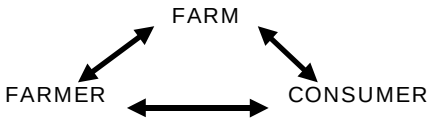
The hours can be long and hard.

Need a high skill base (3 years minimum).

It is easy to be seduced by the wholesale - retail marketing chain.

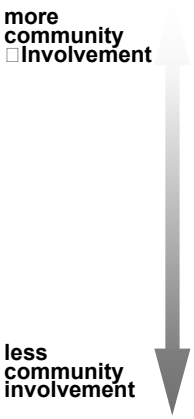
COMMUNITY SUPPORTED AGRICULTURE

- **A new structure for farms which acknowledges that farming is not just a profit making business but a precondition of all human life on earth and a precondition of all economic activity.**
- **A means to re-establish the farm food link**



"Eating is an agricultural act"

THE MODELS FORM A CONTINUOUS SPECTRUM



CSA
A farm owned by the community - employ a farm manager

SUBSCRIPTION FARM
The farmer owns the farm.
Subscribers buy an annual share in the produce and contribute some labour to the running of the operation

RELATIONSHIP MARKETING
The farm is wholly owned by the farmer who also does all the work
The farmer delivers the produce directly to committed families and restaurants

THE BENEFITS

- **City dwellers can be involved in farming - they become aware of what organic farming means**
- **Young people can be given the opportunity to start farming without the burden of having to buy a farm**
- **Established farmers can make more money by eliminating middle men and eliminating crop wastage**
- **Food reaches the consumer in peak condition**
- **A sense of community is established**

39. Organic Agriculture
Sustainable Farming in an Unsustainable Society?

By Rory Eames
Australian National University

What I'd like to do this afternoon is provide you with a bit of a synthesis if ideas about what it might mean to farm organically in Australia, in terms of the 'bigger picture'.

What I mean by 'the bigger picture' is that although the organic industry, if small, is vibrant, is growing and is productive, yet it still operates in a demonstrably ecologically unsustainable society. Instead of seeing this as a negative thing, I'd like to pose a few real scenarios that offer the organic industry the opportunity to expand in some different ways. I'll be talking only partly from my own research on a few organic properties in NSW, the literature, and some of the responses in the online OFA strategic plan discussion forum held late last year, and early this year.

I have three points to discuss. Firstly I'd like to contextualise the organic industry in terms of the environmental debate. Secondly, I'd like to talk a little about the need for an increased "Australianisation" of our organic industry. Last, but by no means least, I'd like to touch on the issue of creating adaptive, and flexible policy for a growing industry.

Much of what is said in the scientific literature, in the media, in public environmental reports about the state of the environment can be fairly disheartening. But if we look closely at where organics fits into this larger picture, some positive possibilities emerge.

Now I wouldn't for a moment want to suggest that organic agriculture is the panacea for all of Australia's diverse ecological problems. But I would like to argue that the environmental debate in Australia is changing, and it's changing in ways that is opening new doors for an industry, which, by and large, remains a niche market industry.

How is the environmental debate changing in Australia?

First and foremost it is no longer a debate. It's no longer a debate about the health or sustainability or otherwise of Australia's agricultural ecosystems. It's about guiding change once the impetus for change has been recognised. It's about where to from here now that we can clearly see the state of the general environment.

I think the case of organic agriculture will provide a little bit of explanation of what I mean here.

In the US, the EU, and Australia, a great deal of the energy behind establishing organic food systems has, over the past 30 or 40 years come from a clear example of what NOT to do. Aside from the many diverse reasons why some farmers farm organically, the consumer driven popularity of organic agriculture, and the food and fibres produced from such systems stem directly from the demonstrated ill effects -personal, ecological or social of intensive, high input agriculture.

This is what I mean by an impetus for change. For the past 40 years the debatable 'badness' of conventional agriculture has played a big role in the popularity of organic produce. It's been a reference point and an impetus for change for alternative farming methods.

But an impetus for change is not a good tool for guiding change. As organic food systems understandings and technology increase, we move further way from the reference point of conventional agriculture. The challenge for organic industries, and in particular small but rapidly developing industries such as ours in Australia, is to develop reference points of our own.

Constant reference to the differences between conventional and organic food and fibre systems keeps the focus on the farm, and limits the ability of the organic industry to exploit wider environmental concerns.

At the moment the organic industry is the only one with the ability to sell, aside from clean food, green foods. The NASAA label has been doing this for years, and I believe the selling of a sustainable, or in the very least ecologically and socially sensitive product will become just as important if not more important than selling clean food.

The 'limits to growth and the growth of limits' debate has slipped considerably from the limelight of public interest over the past five to ten years, but it does remain, and is one that will return as a key player in agricultural policy in Australia over the next 20 years. On this point I take reference and support from Sally Newham, who contributed in the OFA online Strategic Plan Discussion Forum later last year, who made the point that, and if I may, I quote:

Is organic sustainable? If so, how sustainable? How far can organics pragmatically go? Surely we need to go further than mere farming by subtraction: conventional farming minus the chemicals. I think we need to be taking more into our consideration of what organic is. Issues of biodiversity and erosion management come to mind. We should be leading the field in this stuff!

What I would like to suggest is that instead of making this an added burden on the responsibility of organic farmers, the industry as a whole can begin to incorporate these ideas into labelling, marketing and policy. The changing environmental debate is a boat that a dynamic, small and newly organised organic industry in Australia should not miss.

What it means to be involved in the organic industry specifically in Australia

This leads me to my second point: it's about what it means to be involved in the organic industry specifically in Australia. To some extent this borrows on what my research has been about this year. For want of a better word, the Australianisation of the domestic organic industry is something that can provide some of the direction I talked about in the first point.

What do I mean by the Australianisation of the organic industry? I mean that our organic industry is very different from its international state defined counterparts. Its different ecologically, it's different in economically, and it's very different politically.
These differences determine the varying reasons why we farm organically, what keeps organic farmers organic, and why the industry, while expanding, is nowhere near the relative size of those organic industries of the US and EU.

From my research, based on a few qualitative case studies across different sectors in the NSW organic industry, it seems that farming organically is ecologically easier, but remains economically and politically harder.

I would argue that this is due in a large part to the nature of the Australian economy as a whole: while remaining dependent upon our natural resource-base for export dollars, a fledgling organic industry is in a hostile political and economic environment. The reason for the massive uptake of organic farming systems in Europe, and to a lesser extent in the US, is due to a different macro political economy altogether.

I'm sure many of you are aware of the political support organic farming has in Europe particularly, and without such support here, the expansion of the industry remains squarely in the hands of creating greater consumer demand, and supporting those farmers who are already farming organically. Much of what organic agriculture is about in Australia can be traced back to European or US notions of organics. The accreditation of NASAA by IFOAM is a good example here. The increased regionalisation of IFOAM principles needs to be exploited fully so as not to run the risk, a very real risk, of trying to do the same thing with organics here in Australia as has worked in other socially, politically, and ecologically different parts of the world.

I believe these among many others are unexplored reasons why the domestic market makes up such a small target of what Australia produces organically.
It in part explains the severe lack of processing, manufacturing, packaging, and distribution infrastructure for organic products.

Perhaps what I am suggesting is that although the small, fragmented nature of the organic industry, the lack of widely recognizable labels, are secondary reasons for why, the domestic market is so small.

I do not believe it is just about a lack of awareness on the behalf of the consumer, or on reluctance to pay price premiums. It is that Australians have a different attitude to food than other cultures, and at the moment have no foreseeable reason to think that conventional agriculture is anything, bad. Relative to world agricultural systems, this thinking carries considerable weight.

Indeed, one of the results of my research has been to realise that there is a far smaller gap between conventional, and organic agricultural practice in Australia than say, in Europe. In overseas organic markets, where there is a clear demarcation between the two, the health and cleanliness of the produce of organic systems has driven the success of an industry: the consumer's desire for clean food achieves a great deal in terms of developing the market. I recognise that this may be an ageing debate, but not necessarily one that is resolved, or should be lost sight of.

Not least, because here in Australia, we would struggle to sell an entire domestic industry on the differences in food quality between organic and conventional. This point also has, I believe some effect on the prosperity of Australia's organic export compared to Australia's conventional produce export. Though there are differences in taste, freshness and cleanliness, relative to world trade, our conventional produce is significantly pollution free to begin with. On this global scale, our organic export is competing with not only other nations, but also our own conventional produce export.

This point, I think, illustrates that the organic industry, would be ahead of the game to begin establishing real, and nationally recognisable producer, government, and more importantly market based recognition of the agricultural and social systems organic produce comes from.

The purpose of this would be to add to the clean product image, and use the green image to engage the consumer into environmental choices beyond personal health.
I believe the organic industry would be significantly ahead of the game if this were achieved.

Having adaptable industry policy on a range of issues

The last point I would like to make stems from the first two. It's about having adaptable industry policy on a range of issues. By adaptable, I don't mean political fence sitting. This achieves very little, but being able (if I may construct the analogy) to be flexible enough to jump high enough to see what is on the other

side of the fence will be a political advantage when it comes to some of the 'hotter' environmental debates affecting Australia.

This Inaugural Organic Federation of Australia Conference is a good time to consider the *way* policy is developed in relation to issues that will affect the industry nationally over, at least the next ten, twenty years.

Although there are many such issues, two that demonstrate my point well are genetically modified organisms, and agribusiness.

Genetically modified organisms

With reference to the first example, - genetically modified organisms - the need for adaptive policy is based on the *nature* of the issue, rather than what position the industry takes on it. I'd like to suggest that adopting a particular position on GMO's is one thing, but they, can quite understandably be understood as an environmental inevitability. The difficulty of tracing GMO's outside the laboratory is being proven in the US, and with significant effects on the US organic industry. With increasing development of field trials in Australia over the past 24 months, the organic industry needs a dynamic and iterative way of relating to such issues.

Naturally, GMO's will not obey the rules set down by any industry, and if GMO's were to become more widely used, the organic industry needs a position other than yay or nay. The possibility of emergence of unwanted GMO's in organic crops in Australia is a very real one, and one that needs to be thought about at policy level.

Agribusiness

Another, tricker issue in organic agriculture, is the relationship between organic farming and agribusiness. The lines between agriculture and industry have become considerably blurred in the light of the development of the agri-food sector.
Some of the imagery the organic industry in Australia is characterised very much by the producing of food for the consumer, yet the vast majority of primary production is directed toward providing the raw materials used by the processing industry.

This in itself needs not be an inherent problem for the organic industry, but the current heterogeneity of the organic farming sector includes and must recognise the whole spectrum of farming practices from family owner producer, to cooperative value adding to contract farming. The way the organic industry as a whole relates to agribusiness will determine in a large part, the image portrayed to consumers. I don't wish to say at this point whether it is good or bad. I can see elements of both. Nevertheless, the need for the growing organic industry to engage with the agri-food sector will be an important factor in creating a public and market image of the industry over the next twenty years.

These are, I'm sure just a few of the important issues that demonstrate that organic farming is in many respects an attempt to farm sustainably in an unsustainable society. Doing so will call on the organic industry to, in the public's eye, do more than merely farm by subtraction, as Sally Newham put it so well.

Farming sustainably in an unsustainable society is an opportunity to create an ecologically, socially and politically Australian organic industry, and one that, in the process, will challenge the industry to engage with issues affecting Australia as whole by engaging with wider environmental concerns.

40. Towards the Sustainable Botanic Garden

By John Galea
The Royal Botanic Gardens, Sydney, NSW

The mission of the Royal Botanic Gardens is "To **inspire** the appreciation and conservation of **plants**".

The Royal Botanic Gardens achieves this mission through several strategies. Presenting themed living collections designed to inspire the community's appreciation of plants. Interpreting the collections to enhance the community's awareness, understanding, and ultimately commitment to the conservation of plants and environmental sustainability. Implementing and explaining best practice in horticultural management. In addition, the Gardens demonstrate community leadership in environmental responsibility and presenting changing community attitudes.

The aim of becoming a sustainable Botanic Garden is being driven by staff initiative and desire to be seen as a site of best practice in horticulture and environmental management. The NSW Government has introduced a number of policies and programs to improve environmental management to which their departments must adhere. The government introduced policies to control green waste (Greenwaste Action Plan), energy use (Government Energy Management Policy), waste and purchase of recycled products (Waste Reduction and Purchasing Policy). These policies and plans as well as the requirements of legislation are being incorporated into the day to day running of the Royal Botanic Gardens.

The conservation of biodiversity and the protection of the environment are important attributes of the Mission. In this context, the Royal Botanic Gardens Sydney is committed to raising environmental awareness through sound scientific research and partnerships, inspirational living displays and educational public programs. The Gardens also commit to environmental responsibility in all its programs and partnerships. (Taken from Royal Botanic Gardens Environmental Policy).

What is a sustainable botanic garden?

A sustainable botanic garden is one that contains plant collections and greenspace whose horticultural management is based on organic principles. It is also an area of public space with a mandate to interpret environmental issues and to demonstrate and promote solutions. The botanic garden must also be incorporating principles of environmental management in day to day activities. A botanic garden also incorporates a herbarium and various research programs. Most of all it should be a place which values the health and safety of its staff and visitors.

What are some of the issues facing the Royal Botanic Gardens?

Some of the collections are growing out of their optimal range. (For example, Azaleas- which have major pest and disease problems in the Sydney environment).
Collections are long term so there are reduced opportunities for rotations. (The gardens cannot use green manure crops to improve soil health or rotations to reduce disease and pest incidence).

There are limited options for control of pest and diseases

There are competing demands on the Gardens. Roses are difficult to grow well in the Sydney climate but the collection is one of the most popular displays for weddings and photo shoots.

Public expectations of what should be in a Garden. (For example, the public expects a display of azaleas, roses, and other plant groups, which may be difficult to grow in the Sydney climate).

What does organic horticulture mean?

There are many definitions in use, which define organic horticulture in terms of producing products for consumption rather than for managers of a botanical estate.

The Henry Doubleday Research Association has the most appropriate definition of organic horticulture that is applicable to the Royal Botanic Gardens (http://www.hdra.org.uk/garden.htm).

"What is "organic"?

- The whole environment is much more than the sum of its individual parts.
- The organic approach to gardening and farming recognises that the whole environment in which plants grow is much more than the sum of its individual parts, and that all living things are inter-related and inter-dependent.
- Organic growing involves treating the soil and growing environment as a resource to be husbanded for future generations, rather than mined for short term gain;
- Providing plants with a balanced food supply by feeding the many soil living creatures that live with composts, manures and other organic materials;
- Choosing renewable resources, thereby creating a sustainable future; Reducing pollution of the environment, by recycling garden, household and other wastes, rather than dumping or burning them;
- Combating pests and diseases without using pesticides that may prove harmful to human health and that of domestic and wild animals;
- Encouraging and protecting wildlife, by creating suitable habitats and by minimising use of harmful pesticides;
- Creating a safe and pleasant environment in which to work and play; Moving with the times - taking new scientific discoveries and ideas into account, as well as the best traditional knowledge;
- Using good horticultural practices; Recognising the importance of genetic diversity and hence the preservation of threatened plant varieties;
- The whole garden - flowers, trees, shrubs and lawns, as well as vegetables, fruit and herbs."

National Standards of Organic and Biodynamic Produce defines organic as:

"Organic" means produced in soils of enhanced biological activity, determined by the humus level, crumb structure and feeder root development, such that plants are fed through the soil ecosystem, and not primarily through soluble fertilisers added to the soil. Plants grown in such a system take up essential soluble salts that are released slowly from humus colloids, at a rate governed by warmth. In this system, the metabolism of the plant and its ability to assimilate nutrients is not overstressed by excessive uptake of soluble salts in the soil water (such as nitrates)."

Rural Industries Research & Development Corporation, defines organics as:

"Broadly defined, organic/biodynamic production is a system that contributes to healthy soils and/or people. Organic/biodynamic systems do not use synthetic chemicals, promote enhanced biological activity, encourage sustainability and command pro-active management of production systems." *(Taken from Australian Organic Industry - Development Plan.)*

The Australian Organic Producers Advisory Committee has the following widely accepted definition

"Organic Farming means produced in soils of enhanced biological activity, determined by the humus level, crumb structure and feeder root development, such that plants are fed through the soil ecosystem and not primarily through soluble fertilisers added to the soil. Plants grown in organic systems take up nutrients that are released slowly from humus colloids, at a rate governed by warmth. In this system, the metabolism of the plant and its ability to assimilate nutrients is not overstressed by excessive uptake of soluble salts in the soil water (such as nitrates). Organic farming systems rely to the maximum extent feasible upon crop rotations, crop residues, animal manures, mechanical cultivation, approved mineral-bearing rocks and aspects of biological pest control to maintain soil productivity and tilth, to supply plant nutrients and to control insects, weeds and other pests."

Close study of the above charter and definitions, reveals one very important and central theme. This theme is that the health of the soil is of prime importance. This health is improved through increased biological activity promoted by the application of manures, mulches, and composts, and eliminating a reliance on synthetic chemicals to supply nutrients and to control pests, diseases and weeds.

Many of the above principles are already practiced within the Royal Botanic Gardens. Through more change and commitment by all staff, further application of these principles can occur with minimum disruption and modifications to current horticultural practices.
What is a suitable definition of organic horticulture when it relates to a botanic garden? Before a definition can be produced, there is a need to acknowledge that there are significant differences between the horticultural practices on an organic farm compared to a botanic garden. A botanic garden generally presents long-lasting plant collections along specific themes, there is minimal opportunities for crop rotations or green manure crops, there is no integration with animal husbandry, and the product produced is aesthetic not for consumption.

It was decided that the three sites would work to becoming more organic and less reliant on artificial chemicals. Firstly, several workshops were held with several invited guests and all horticultural staff to talk about organic horticulture and the principle of sustainability.

From these workshops, the Gardens developed the following definition to guide our approach.

> *"The Royal Botanic Gardens aims to achieve optimum horticultural vigour and presentation using the most organic and sustainable practices. The Gardens ensures that our soil management is aimed at maximising soil biological activity and eliminating reliance on application of synthetic fertilisers. Water is managed so that we limit nutrient run-off and operate with a catchment approach. Integrated pest management is practiced, incorporating the best new technologies and striving always to eliminate artificial chemical input."*

Ten objectives

To put this definition into practice the Gardens set ten objectives to be met in the medium term:

- Water leaving our lands is of equal or better quality than when it entered.
- No toxic residues are left in the soil.
- Horticultural presentation standards are maintained or improved.
- Integrated pest management principles are applied in all areas.
- All staff are trained in the principles of organic horticulture and environmental management.
- Our environmental principles and actions are actively interpreted to visitors.
- All recyclable organic material is processed on site and reused.

- Environmental weeds are tolerated only if appropriately managed to curb spread, and interpreted to visitors.
- Procurement is based on the "whole of life" environmental impact of products.
- Organic horticulture practices and environmental management are externally audited on a regular basis.

To drive the required changes in horticultural practices, the Gardens developed a formal framework to assess all organic proposals. An 'organic initiatives' template was developed and work teams now use this template to assess their current practices and to see if they could change current practices in line with organic horticulture or sustainable practices. The initiatives are checked to see if they adhere to the ten key objectives and the teams indicated what resources are required if any. The initiatives that meet the objectives are then incorporated into a team's operational plan for implementation. Some of the plans received so far include strategies to reduce reliance on chemicals for control of pests and weeds. The strategies outlined ranged from the use of lower toxicity chemicals, the use of predatory organisms, and the use of organic fertilisers, mulches, and composts to increase soil health rather than using chemical fertilisers.

What has happened and is going to happen, at the Royal Botanic Gardens in achieving the goal of becoming a sustainable organisation?

An Environmental Coordinator was employed last year to drive environmental programs. This person will ensure that future projects are assessed to their adherence to the Environmental Policy, which was developed last year. This policy outlines the principles to which the Gardens will adhere to in managing its sites.

The Gardens have started Streamwatch groups within the three sites. These groups in conjunction with Streamwatch are testing all waterways and water bodies on the sites to ensure that the water quality of water leaving the sites is not diminished through the Gardens' practices.
Integrated Pest Management (IPM) has been an integral part of Botanic Gardens' pest and disease management for several years. A good example of successful IPM is the control of pests and disease in the Rose Garden in Sydney. Previously this collection relied heavily on an intensive spray regime to control aphids and black spot.

The successful program to introduce the predatory wasp (*Aphidius rosae)* in the collection to control aphids has led to the elimination of insecticide spraying. There is a permanent population of this pest established and there is equilibrium between pests and predator. Black spot is a major disease problem on roses in the Sydney area. The Gardens have been successful in controlling the spread of this disease through the application of bicarbonate of soda and Pestoil.

Other successful IPM strategies include the use of parasitic nematodes to control turf billbug, using predatory insects and traps in glasshouses, and altering turf maintenance practices to eliminate preventative spraying of formal lawns for disease control. As part of the increased commitment to IPM, the Gardens rationalised the amounts of pesticides held in stores. The Gardens decided that any further purchases of chemicals must have an S rating of S5 or less. In 2000, a large amount of chemicals with S6 and S7 ratings were collected and disposed by an EPA licensed contractor.

The Gardens have submitted reports and plans to the Government highlighting strategies the Gardens will adopt to meet the requirements of the Government Energy Management Policy and the Waste Reduction and Purchasing Policy. The Gardens are in the process of analysing energy use and hopes to have in place modifications that will reduce energy use and reduce the amount of greenhouse gases released due to our operations.

At the Mt Tomah garden, it was decided that a better method effluent treatment than that which was currently in place was required. The system previously installed required collection and treatment off site. After an exhaustive search of the technology available, an Ecomax Mound Effluent Disposal System was chosen as the best method of treating effluent. This system allows for on-site disposal and treatment with no down stream environmental impacts. The process involves biological decomposition and nutrient removal within the unit.

The Gardens actively mulch garden beds to reduce water use and apply compost to improve soil health. All greenwaste produced in our horticultural activities is collected for processing into compost on site or by third parties.

As part of complying with the Environmental Policy and to become more sustainable it was decided that the horticultural management of plant collections would be based on organic (low chemical use) methods and systems of horticulture. Before the Gardens could embark on this, there was a need to decide what aspects of organic horticulture where relevant and practicable for a Botanic Gardens.

There are a number of initiatives in the pipeline to help move the Botanic Gardens towards sustainability. There is a submission to build a Vertical Composting Unit in the Sydney Gardens. This unit will be able to compost all organic refuse. It will not only process the Gardens' Greenwaste but it can also process restaurant waste (ie foodstuffs). This unit will help the Gardens to divert a major component of the waste stream from landfill and it will help the Gardens achieve one of the major goals of the government-reducing waste going to landfill by 60%.

A review of the Living Collections Thematic Plan. This will involve critically assessing plant collections that require significant inputs of artificial chemicals. These collections will be reviewed to decide if they can be better grown at one of the other sites. Alternatively, the collections may be presented with a different mix of species or cultivars better suited to the microclimates prevalent at the particular site.

Most collections have maintenance plans. These will be reviewed and updated to incorporate IPM strategies and organic horticulture techniques for collection management.

The range, volume, and toxicity of pesticides will be further reduced with an emphasis on the purchase and use of the least toxic chemical available. The use of chemical controls will be only a last resort with an emphasis on natural and cultural controls in the first instance. The use of artificial fertilisers will also be reduced. There will be an emphasis on using composts, mulches, and approved organic minerals to improve soil health. This will be in conjunction with an increased use of soil tests to assist in planning and monitoring soil health.

The Royal Botanic Gardens will be incorporating all the above initiatives and developing an Environmental Management Program. This program will outline the steps, responsibilities, and the benchmarks to be met. The development of this EMP will also enable the Gardens to gain accreditation by a number of international bodies.

As can be seen from the above the Royal Botanic Gardens is actively pursuing the goal of becoming a more sustainable organisation. With some understanding from the visiting public and the positive commitment of our staff, we will be able to convert the management of the sites, into sites of world's best practice.

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41. Social Justice in Organic Agriculture

Global Trends, Australian Issue?

By Sasha Courville
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Abstract

Social Justice is becoming a hot issue for the organic industry worldwide. Consumers in many countries associate social justice issues with the organic products; if organic practices do not reflect this, the credibility of the movement could be questioned. Leading retail companies are currently looking at creating their own systems for integrating ethical trading guidelines into purchasing policies. Without a unified framework for such initiatives, this could result in confusion, overlap, and a waste of limited resources. Furthermore, for many stakeholders, social justice considerations are integral to the very meaning and definition of organic agriculture. Given the new dimensions of organic regulation worldwide, social justice considerations need to be strengthened and entrenched into organic practice.

This paper explores how the organic industry can effectively address social justice issues, both at a global level, and in Australia. In the first section, the context for integrating social justice into organic agriculture is laid. This section examines why social justice issues are important for organic agriculture. The second section reviews current developments worldwide on strengthening social justice issues within the organics industry, drawing on examples from the author's own activities. These include a joint initiative between IFOAM, Fair Trade, Social Accountability and Conservation Agriculture movements worldwide on social auditing and strategic partnerships, and a project of the IFOAM Trade Forum to develop a code of conduct for organic traders. The third and final section discusses what these developments mean for Australia's organic industry.

Why is social justice important for organic agriculture?

Social Justice is becoming one of the major issues of discussion for the organic industry worldwide. But why should social justice issues be considered critical for the industry to address at this point in time? There are a number of reasons. First of all, rapid growth in recent years has pushed organics from niche markets into the mainstream in many countries. With this transition, organic products become more visible to average consumers, beyond those already committed. Consumers expect organic products to be environmentally preferable and socially just. As the success of organic production-to-consumption systems is based on trust and credibility, if such consumer expectations were to be found untrue, this could seriously jeopardise the future growth of the organic market. Mechanisms are needed to ensure that social justice is applied in practice in organic farms, processing facilities, etc…

Second, for organic movement pioneers and other stakeholders all over the world, organic agriculture is about sustainability. As such, it is conceptualised holistically, balancing environmental, economic and social dimensions. However, the social dimension is the least codified of the dimensions and therefore lacks permanence in an increasingly documented world. If this holistic conceptualisation is to survive the transition from niche market to mainstream, the social justice dimension needs to be translated concretely into the fundamental texts of organic agriculture including IFOAM Basic Standards.

To avoid a possible downward spiral of organic standards by both governmental and non-governmental entities to accommodate new and powerful actors in the organic industry, social justice issues must be addressed decisively within the organic movement worldwide. For non-governmental regulatory bodies

such as IFOAM, this could be a lever to demonstrate a more comprehensive and definitive organic regulatory system vis-à-vis national government frameworks. In contrast, the USDA, the body that is to house the new US organic regulatory system, has stated that social justice issues have no place in organic certification (Mandelbaum 2001). The USDA Final Rule, while not including fair labour practices despite requests by many commentators, does not prohibit "certifying agents from developing a voluntary certification program, separate from organic certification, that addresses fair labor and worker safety standards" (USDA 2000: 32).

Third, many organic producers, traders and retailers are developing their own social justice systems either in response to consumer demand, competition, company philosophy and/or personal conviction, or in anticipation of future trends. Examples abound. The German company, Rapunzel, is one of Europe's leading manufacturer and distributor of organic foods, with over 800 different organic products spanning 28 categories and sourcing from organic farmers in more than 35 countries worldwide (Rapunzel 2001). Rapunzel has developed a code of conduct supported by a premium for products and assistance for social projects in producer communities. Another example is Sainsbury's Socially Responsible Sourcing Code of Practice, developing through working with the Ethical Trading Initiative in the UK (Sainsbury's N.D.). During a recent trip to Costa Rica, I held a number of meetings with organic producer groups and an organic cocoa importer/ chocolate manufacturer who are developing socio-economic indicators to determine the extent to which producer quality of life is improving. This would also be used as a promotional and educational tool in the future. A number of private organic certification agencies in Europe and in Latin America are experimenting with developing social justice and labour certification standards driven by client demand. While these various initiatives indicate that there is indeed both an interest and a market in integrating social justice into organic certification systems, without a united effort to harmonise approaches to social justice within the global organic movement, stakeholder frustration and confusion could be the result.

From the lessons learned with organic certification and international trade, it is foreseeable that without a harmonised approach, producers could have to meet different social justice standards to sell the same product to different markets. It also possible that consumers could have difficulty in differentiating strong social programs that address social cost issues of distribution in the production-to-consumption system and those that only cover buyer sourcing criteria, placing the burden of social responsibility solely on the producer. Finally, codifying social justice into every day activities of organic stakeholders around the world is a new process; as such, human resource and financial investment is required. Significant savings could be made in pooling resources and sharing experiences. For these reasons, an integrated global effort to address social justice in organic production, processing and trading is the only logical solution to these real and potential dangers.

Addressing the social dimension in organics

In response, a number of initiatives to strengthen the social dimension within the organic industry are currently being developed that are both regional and global in scope. Within the USA, in response to the crisis in agriculture caused by the decline of the family farm as a viable agricultural unit, social justice standards for sustainable and organic agriculture are being proposed and discussed (Henderson, Mandelbaum and Sligh 2001). These standards are currently in their second draft with plans for widespread consultation processes in North America in the next 6 months. One of the objectives is to develop "guidelines for social standards that can be incorporated into existing certification programs such as 'certified organic' or to inspire the creation of new, independent labels to accomplish this goal" (Henderson, Mandelbaum and Sligh 2001). The content of the standards focus both on farmers' rights in relation to buyers and farm workers' rights and benefits.

Within IFOAM, there has been a discussion concerning social justice issues spanning a decade. In 1992 in São Paulo, Brazil, the General Assembly decided to work towards the inclusion of social standards into its Basic Standards for Organic Agriculture. Since 1996, the Basic Standards have included a chapter on Social Justice. However, given strong tensions between different actors during this process, the social standards that were passed were weak and intangible. While the recommendations embraced key social justice issues such as social security, non-discrimination, occupational health and safety and indigenous rights, the actual requirements in the standards simply stated that "the certification programme shall ensure that operators have a policy on social justice" and that "the certification programme shall not certify production that is based on violations of basic human rights (in cases of clear social injustice)" (IFOAM 1998: 43). Current debate between IFOAM members centres on how to make addressing social justice issues more tangible and operationable.

At the 6th IFOAM Trade conference in Florence, Italy in November 1999 and at the Biofach 2000 trade fair, the future of a social agenda for organic agriculture was raised. It was generally felt that action towards a comprehensive social framework was necessary. However, a format such as a code of conduct was seen to be a tool that could be put into place in a shorter time span than the longer and more complicated process of revising social standards. It was also felt that such an initiative needed to be driven by those organic actors who would actually use the tool: traders.

At the IFOAM General Assembly in Basel, Switzerland in 2000, an options paper describing possibilities for developing a code of conduct was presented to the IFOAM Traders Forum for their review (Courville and Rijninks 2000). During this session and at the next Biofach trade fair in 2001, a plan was outlined to develop a code of conduct for organic traders worldwide. At an African marketing conference held in Egypt in November 2000, Maarten Rijninks and I were invited to facilitate a workshop on the code of conduct process. A key question to address was whether one code of conduct for all organic traders worldwide would suffice or whether regional codes of conduct would be necessary. It was finally decided after much discussion, that given the global nature of the organic industry and the importance of international trade, there was a need to develop one code of conduct for all organic traders, but that in the implementation of this code, region-specific guidelines for application would be needed. It was also decided that participation of all organic stakeholders was imperative.

Based on this model, a process for developing a code of conduct for organic traders is described below. Interactive workshops are to be held in each region to determine what are the key social justice issues to address and how these issues should be applied to organic systems in different continents. Workshops are currently planned for Latin America and Asia at IFOAM events in September and November 2001. A North American forum will be co-ordinated with the social standards initiative mentioned above. A European forum will most likely take place early next year. Once the workshops are held, a draft code of conduct can be written and circulated for feedback. Regional networks can then elaborate the region-specific guidelines and pilots of companies implementing the code will be monitored for review. It is anticipated that a code of conduct will be ready for initial launch at the next IFOAM General Assembly in Victoria, Canada in August 2002.

The Latin American workshop in September takes place within an international seminar on Social Responsibility and Fair Trade in Organic Production in Latin America. It is organised by the Bolivian Association of Organic Producer Organisations (AOPEB) and will bring together participants from all over Latin America to examine how to strengthen social justice issues within the organic industry in Latin America and within IFOAM. It will also set up a Regional IFOAM group for Latin America and the Caribbean. This group will be a key force in ensuring that social justice issues will be a central focus in

Canada in 2002 and further along the track at the following IFOAM General Assembly in Australia in 2005.

While it is critical to build knowledge and gain experiences within the organic industry on how to address social justice issues, it is not necessary to reinvent the wheel. A wealth of experience in working through social justice standards in agriculture can be found in a number of social certification and labelling initiatives. The organic movement worldwide through IFOAM is participating in a joint project with the other major social and environmental certification and labelling organisations active in agriculture to develop guidelines and tools for the implementation of social audits in sustainable agriculture.

These other participants include **Social Accountability International (SAI)** with its SA 8000 standard that can be used to certify work places (factories, plantations) for compliance with ILO conventions such as freedom of association, non-discrimination, child labour, forced labour and payment of a living wage, among others. To date, transnational corporations and large national companies have mainly been certified by SA 8000. The **Fair Trade Labelling Organisations International (FLO)** is based on developing long term trading relationships between buyers and developing country producers; producers are required to meet certain minimum criteria including commitment to social and environmental improvement and democratic decision-making processes, while buyers are required to offer fair trade contracts including minimum commodity prices. The **Conservation Agriculture Network (CAN)** is a network of mainly Latin American conservationist non-governmental organisations (NGOs) with its secretariat, the Rainforest Alliance, based in New York. Its certification systems standards for tropical agriculture focus on reduction of agrochemical use, treatment of workers, community relations and conservation areas.

The joint project, Social Accountability in Sustainable Agriculture, has two main objectives. The first is to improve how social auditing is conducted at the inspection level and how this relates to standards development. While environmental certification and reporting systems are enjoying a great deal of success in indicator and standards development to measure and monitor performance, the social dimension is fuzzier, especially considering the need for global tools that are sensitive to local cultural conditions. This project will address such questions in drafting operational guidelines for social auditing worldwide.

The second main objective of the project is to strategically examine how these initiatives could work closer together towards harmonisation and mutual acceptance of each other's systems. For IFOAM, this means examining whether it should develop its own social justice standards or whether it should make social certification, by a mutually accepted initiative, a condition to organic certification. This umbrella approach has the advantage of avoiding duplication and repetition by using already established skills and structures elsewhere. Organic certification bodies and their inspectors do not currently have these skills. However, certain organic stakeholders claim that given the particular nature of organic agriculture, social justice standards should be internally developed and implemented. It is also fair to say that no single social certification partner or partner alliance would currently have the skills or size of operations to meet the social certification needs of an incredibly diverse global organic industry, ranging from small holder producer groups to large-scale companies. For IFOAM, the joint project will help to determine what pathway it should take (Beekman and Courville 2001).

Implications for Australia

What do all these developments mean for Australia? Is social justice an important issue for the Australian Organic Industry? I argue that it is very much an important issue for Australia for the same reasons as it is a key issue internationally: supply chain requirements (at least initially for the export market), protection of the integrity of organic agriculture as a holistic concept based in sustainability, and consumer expectations. However, is social justice issue perceived as an important issue by the Australian Organic Industry?

The initiatives described earlier in this paper point to Latin America and Europe as the focal centres for change in social justice. Why not Australia? Are there other fundamental and pressing issues that have priority over social justice? Perhaps. Within the broad scope of corporate responsibility, social justice considerations have tended to develop after environmental protection issues have been addressed. Is there a perception that there are no social justice problems of concern within organic agriculture in Australia? While migrant labour is not a major issue for Australia as it is for Europe and the USA, other topics could be significant. Given that there are fundamental issues of supply chain relationships and management constricting the growth of the Australian organic industry, social justice issues may indeed be very relevant. What are the key social justice concerns and how could these issues be addressed? To answer these questions, the organic community needs to begin discussing what social justice means in the context of Australian organic agriculture.

How can Australian actors take part in the global discussion of social justice in organic agriculture? A regional workshop to ensure Australian input and feedback into the process to develop a code of conduct for organic traders worldwide could be organised. From this workshop, region-specific guidelines for the application of the code to Australia could be developed. IFOAM members in Australia can also participate in discussions at the next two General Assemblies, in Canada in August 2002 and here in Australia in 2005. There will most likely be a workshop immediately prior to the 2002 General Assembly on social justice issues. There are also plans to develop a fair trade labelling initiative in Australia and a major question to be addressed at the first upcoming meeting is whether to only address social justice issues or include environmental issues as well. As an example of this relationship, a significant percentage of fair trade labelled products in Europe and North America is organically certified. This could provide another vehicle for addressing social justice issues in organic agriculture.

Australian actors have a chance to represent their interests and take part in an interactive discussion worldwide that is just starting to take off. I urge you not to miss this opportunity, as social justice is one issue that will only continue to grow in importance over time.

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42. Restoring Fertility to a Degraded Soil using Strategies Consistent with Organic Farming

By Chris Alenson

Introduction

Many advocates of organic farming would suggest that a high state of fertility can be arrived at through organic/biodynamic management utilising a closed cycle of nutrient supply (Podolinsky 1989, Koeopf, 1989, Vereijken, 1985).

It has been reported by (Penfold 1993 and Reeves 1993) that this closed system of nutrient supply often used by organic growers in Australia may lead to problems in the supply of some essential plant elements to crops. The concern of these and other scientists is that organic farming may mine the soil of scarce elements and may not be sustainable in the longer term.

In this paper I describe how a low fertility (Krasnozem) soil could be revitalised using fertility building techniques acceptable under organic production standards. The general fertility level and the mineralogical status of the degraded and the amended soil were assessed before and after the addition of mineral soil conditioners using a combination of soil physical, chemical and mineral analyses.

Soil fertility and geological weathering

An essential component of this study was the utilisation of a geological weathering model (Fyfe et al, 1983) illustrating the association between plant productivity and the degree of weathering of the soil. The use of this model illustrates the extent of weathering that the soil in this study has undergone and together with other soil assessment strategies indicated the need for a remineralisation approach to fertility improvement.

Sustainable soil management

Management strategies employed by organic/biodynamic farmers include crop rotations, crop residues, composted animal manures, legumes, green manure/cover crops, addition of mineral bearing rocks, mechanical cultivation, and aspects of biological pest management to maintain soil productivity and fertility, to supply plant nutrients and to manage insects, diseases, weeds and other pests (National Production Standards, 1998). As a result of increased biological activity plant nutrients would be remobilised from the sub soil thus restocking the soil nutrient bank (Koepf, 1989, Small D.R. and McDonald, J.W. 1993, Reganold, J. 1987).

Nutrient cycling on organic farms

Organic farming systems aim for minium use of external inputs relying on the efficiency of on-farm biological systems and the optimum recycling of nutrients (Vogtmann 1984). This objective of operating with a relatively closed nutrient cycle arises from the objective of optimising on-farm nutrient cycling and studies indicating that amounts of fertiliser such as nitrogen and phosphorus added to farming systems are not being recovered in agricultural produce and are causing environmental problems in many parts of the world (Arden-Clarke & Hodges 1986).

It has been demonstrated in Sweden that alternative farming methods through an emphasis on nutrient conservation and the enhancement of biological activity can operate a farm without recourse to soluble artificial fertiliser (Granstedt 1991). Losses are minimised through good manure management, and

extensive cultivation of green manure crops. Nutrients can be supplied through the use of legumes fixing atmospheric nitrogen, nutrients derived from soil weathering and by the supplementary use of soil conditioners.

It will require extensive research to see whether this approach of minimising fertiliser inputs into the farm system can be adopted by Australian agriculturalists managing different soils in a different environmental and climatic setting. The National Production Standard for Organic and Biodynamic Production (1998) refers to the aim of the production cycle being as closed as possible. There are however a wide list of allowable inputs in the annex of these standards demonstrating that there is recognition that there will be situations where amendments are required to ensure the sustainability of the production system.

It should always be borne in mind when developing the nutrient strategy of the farming system that information is not only required on the inputs and outputs in the farming system but a knowledge of the soil nutrient bank and how it might be possible to access these nutrients for plant nutrition.

Soil quality

One of the key objectives in organic agricultural is the enhancement and maintenance of soil fertility (Lockeretz, 1988). Soil quality has been defined as the "capability of a soil to accept, store and recycle water, minerals and energy for production of crops at optimum levels while preserving a healthy environment." (Arshad, M.A.&Coen, G.M., 1992). To achieve this objective it is important therefore to understand and be able to manage the physical, biological and chemical properties of the soil.

This soil will have such characteristics as a good physical structure, allowing adequate gas exchange, moisture retention, good humus content and an abundant array of macro and micro organisms that assist in control of disease causing pathogens (Baker & Cook,1974).

It is only through this understanding of what a quality soil consists of that a management strategy can be arrived at that will lead to improved quality/fertility which will be reflected in the growth of healthy crops and animals (Pappendick & Parr, 1992, Hornick,1992).

Soil quality/soil fertility should therefore serve as an indicator of the adequacy of the world's soil resource base in relation to the production of food and fibre (Papendick and Parr, 1992, Albrecht, 1968),

The attainment of optimum soil quality/fertility is a key to maintaining a sustainable productive soil resource. It is however well documented that this soil quality can be affected by the degree of weathering over geological time (we cannot affect this outcome),or by the management of that resource by man or by a combination of both of these factors.

Effect of weathering on soil fertility

In Australia it is generally acknowledged that most soils are relatively old in comparison to many European countries and in the USA where glaciation during the Pleistocene geological period (about 10,000 years ago), was a major factor in transporting soil-forming minerals in the form of rock fragments. This enabled soil formation to recommence on fresh rock particles and is the reason for the relatively young age of soils on these continents.

Since there has been only limited glaciation in Australia, in parts of the southern highlands and Tasmania, our landscapes have been exposed to weathering at least since the Late Tertiary period (about 2-3 million years ago).

Australian soils are hence strongly weathered and due to pedogenic soil forming processes often have a range of geological materials in their make-up. They are fragile due to low levels of organic matter, often 1% or less , nitrogen levels less than 0.3% in the major soil groups and have poor aggregation (CSIRO,1983). These soil physical, chemical and biological factors are important attributes when considering soil fertility or soil quality.

Effect of agricultural practices on fertility and food quality

In Australia the introduction of European style agriculture in the late eighteenth century started a process which has threatened the productivity of our soils (Hobbs,R.J. & Hopkins, 1990).

These activities particularly those centred around arable production tend to expose the soil to a variety of climatic and other forces which have lead to soil degradation in the form of salinity, soil erosion, acidification and structural breakdown (Clarke and Russel, 1977).
Soil degradation leads to lower crop yields and increased levels of difficulty in the production process as a result of soil removal.

Direct yield reduction can result from a decreased soil volume, a decline in soil quality or a combination of both. Removal of significant volumes of soil means that the soil loses its ability to provide sufficient moisture and plant nutrients to provide the yield potential of that soil type.

Decline in soil quality may mean removal of part of that soil, loss of its structural components, its chemical and biological components or all of these. It may also mean a decline in the quality parameters of the crop grown (Hornick, 1992, Albrecht, Wm, 1982, Vogtman, 1981, Fuller, 1990).

In an analysis of USDA nutrient data from 1914, 1963 and 1992 , average calcium levels in 12 fresh vegetables declined 29 percent, magnesium 21 percent, potassium 6 per cent iron levels dropped 32 percent; vitamin A levels 21 percent, and vitamin C levels 30 percent. (Bergner, 1997.)

A similar analysis of British nutrient data from 1930 to 1980 found that there was a significant reduction in the levels of Ca, Mg, Cu and Na in vegetables and Mg, Fe, Cu and K in fruits. (Mayer 1997)

In Australia deficiencies of minor and trace elements in both crops and animals has been widely reported (Donald & Prescott, 1975, Anderson & Underwood, 1959).

Continuous cropping of cereals in many areas of south eastern Australia is being held responsible for declining protein levels in wheat (Fuller, P. 1990), while zinc concentration in wheat was demonstrated to increase markedly with additional zinc supplementation in WA (Rengel, Z. et al 1999).

Soil of low fertility

It is the contention of some scientists that global distribution of productive agriculture is related to soils derived from young geological strata where the weathering process has not removed chemically active minerals and clays Where advanced weathering has taken place impoverished kaolinite-gibbsite soils result which are poor in many of the essential and trace elements (Fyfe, W.S. et al 1983, Kronberg & Nesbitt, 1981). This model relating productive agricultural land to the degree of weathering and fertility depletion undergone by a soil profile, and its restoration using organic management is a key component of this investigation.

The soil studied in this paper is a krasnozem soil derived from Older Volcanics of Miocene age (approximately 21 million years) located on a small outcrop to the north of Emerald, Victoria. Krasnozem

soils are recognised in two forms, normal and lateritic. The normal krasnozem soils are very friable clay loam or light clay with strong crumb structure and moderate organic matter content. The A horizon grades into a B horizon containing a higher clay content which can be quite compact. They are generally recognised as being one of the more productive soil groups in Australia.

The lateritic krasnozems are characterised by a concretionary horizon at varying depths with a thick mottled zone consisting of light grey and red heavy clays. This horizon finally grades into a kaolinised rock at depth. They typically have variable to low fertility owing to problems of nutrient content and availability. A variant of the lateritic krasnozems are 'snuffy' lateritic krasnozems. They are distinguished by A horizons with low clay content, fine structure, low bulk density and extremely friable.(Stace, H.C. et al. 1968). Potassium deficiencies have been noted in pastures and potato crops grown on krasnozems in Victoria (Sargeant & Skene, 1970) and trace element deficiencies in cobalt, molybdenum and copper have been noted (Tiller, 1958).

The soil on this property has an uncertain history of management with present and past owners utilising the land for grazing over a twenty year period. Similar soils in the area have in the past been used for the production of potatoes, flowers and pasture supporting livestock. Current owners had significant difficulties in establishing crops until fertility restoration practices had been implemented.

Methodology

The case study approach has been used as a research methodology with the intention that it will provide support for the proposed hypotheses. Any results generated although perhaps indicative of a trend occurring would require follow up work to demonstrate the validity of the hypothesis. (Leedy & Ormrod, 1985)

The trial site located on a 5.2 hectare property at Macclesfield 40km to the east of Melbourne. The area consists of patches of remnant vegetation and open pastures developed on undulating hills on the eastern foothills of the Dandenong Ranges. The property is on the 210m contour. The average yearly rainfall is 1100-1200mm with temperatures in summer averaging 20 degrees Celsius and in winter 10 degrees.

It consists of a .25hectare area fenced off and utilised for the growing of vegetables. This area is a component of a larger area, certified organic.

The site was previously pasture used for the grazing of livestock. It is this soil that has over a ten year period had its quality improved through organic management strategies. Prior to instituting this strategy vegetables grown were stunted in growth and poor in quality. The strategy for soil improvement revolved around the use of remineralisation with rock dust powders, the addition of composts and farm wastes, non inverting cultivation (chisel ploughing) to open up the soil, and a rotation utilising legumes and green manure crops.

Adjacent to this plot is an area of pasture amongst remnant vegetation that would not have been utilised for cropping but would have had livestock grazing on it and hence has had manure additions over the years. The soil from this area is referred to as the degraded soil and is used as the control soil.

A soil description of this degraded soil is as follows:

Horizon	Depth	Description	Munsell	
	pH		Rating	
A1	0-150mm	Dark red brown(4RB 3/2), moderately friable light clay loam, fair crumb structure and high organic matter content. Boundary between A1 and B is diffuse and irregular. Ribbon 3-4cm.	5	4.9
B	150-500mm	Reddish brown moderately friable light clay (4RB 3/3) containing more clay with depth. Soil is moderately plastic, sticky, reasonably structured and fairly friable. Moderate number of soil peds (5-10mm)having dull and porous surfaces.	5	4.9

The profile of the organically managed soil has been interfered with due to cultivation and hence only an approximate depth of the A horizon is given in the results.

Samples of the degraded soil and the restored soil were assessed and analysed by physical, chemical and mineralogical methodologies.

Soil quality improvement

Soil analysis of the remnant soil (table 2.) indicated low pH (4.8) and low level of exchangeable nutrients calcium(5.82), magnesium(2.37), potassium(0.50) and sodium(0.25). As a result a remineralisation strategy was implemented in the initial stages where limestone (calcium carbonate) was added in the proportion of 3.5t/ha and dolomite (calcium, magnesium carbonate) 1t/ha in accordance with cation balancing methodology (Albrecht, 1975, Schrieffer, 1984, Kinsey,1993). Basaltic rock dust was added at the rate of 2t/ha to supply a range of trace elements (Dumitru et al 1999, Peary, 1992, Chesworth, 1983,). A certified commercial complete organic fertiliser containing nitrogen, phosphorus, calcium, magnesium, potassium, sulphur and carbon was used as an adjunct to the other inputs. A zeolite mineral, clinoptilite (sodium, potassium, calcium, aluminium silicate) was added to increase the cation exchange capacity of the soil thus increasing the 'pantry' of nutrients available for plant nutrition(Schrieffer, 1984).

Since the first additions of these inputs the only mineral additions have been basaltic rock dust and dolomite which has been applied in decreasing quantities (dolomite 1.5t/ha, rock dust 1t/ha) every three years together with the complete organic fertiliser. Deep ripping of the soil to a depth of 350mm took place annually for the first two years but as soil quality improved there has been no further need to use this strategy.

A compost made farm wastes is applied at the rate of 4t/ha per annum to selected beds to increase biological activity and to assist in the mobilisation of nutrients from the rock dusts applied (Huang & Kellar, 1970, Chesworth,et al 1987, Fragstein & Vogtmann, 1983).

The management of this area over the time of productive use has utilised an agroecological approach where nutrient cycling was optimised through the use of legumes , green manure crops and the use of mulching materials and crop residues (Altieri, 1987). Other than the addition of the various rock dusts a relatively closed cycle of nutrient additions has been maintained (Lampkin, 1990).

Beds have been typically planted out and rotated with tomatoes, beans, capsicums potatoes, carrots and silver beet. The green manure crop utilised in the rotation has been broad beans and oats.

Soil testing

The importance of soil quality in determining crop yields and quality have been discussed earlier in this paper but the parameters utilised in measuring the quality of this soil have been based on the methods outlined by Reganold, (1988), Weilgart, (1982), and Arshad, & Coen,(1992).

Composite samples were taken in March over a depth of 200mm at a number of sites according to the method outlined by Peverill et al, (1999) from both the remnant and the revitalised soil areas and submitted for soil analysis (SWEP 2001). To assist in the understanding of the degree of weathering undergone by the remnant soil a mineralogical analysis was also performed. This was determined by x-ray diffraction analysis utilising a Phillips X-ray diffractometer using a bulk unoriented sample prepared by depositing a finely ground mineral/acetone slurry onto a glass slide (Klein & Hurlbut, 1993). Diffractograms were obtained using cobalt K beta radiation and run at 40kv, 30MA.

As a further guide to the soil quality, physical assessment was made visually on both soils at three different sites to a depth of 200mm examining soil structure, extent of aggregation, worm numbers (number present in a 200x200x200mm spit of soil) and root development (Lampkin, 1990, Stewart, 1984, Schmid, 1984). Bulk density of the soils were calculated using the method outlined by Handreck & Black (1984). Water infiltration was measured by inserting a cylinder 3cm into the soil and timing the absorption of two litres of water. (modified method after Handreck & Black (1984).

Results

Mineralogical examination

The x-ray analysis of the degraded soil identified quartz (silicon dioxide), the clay minerals kaolinite (aluminium silicate) and illite (potassium aluminium silicate), gibbsite (aluminium oxide), boehmite. (aluminium hydroxide) and the iron oxides goethite, and hematite.

Results of physical, chemical and mineralogical soil testing is tabulated below. Distinct differences between the remnant soil and the revitalised soil is apparent. Physical parameters such as structure, bulk density (.87g/cc to .76g/cc), water stable aggregates, water infiltration and worm activity has been improved in the revitalised soil.

The soil analysis indicates that there has been an improvement in pH from 4.8 to 6.7 with organic matter increasing from 11.6 to 13.7 and total nitrogen from .35% to .49%. The total cation exchange has increased from 22.44meq to 29.29meq with the exchangeable cations increasing significantly. Total phosphorus in the remnant soil has increased from 877ppm to 5223ppm and trace elements manganese, molybdenum, boron and cobalt have also increased.

	Degraded soil	**Ameliorated soil**
Colour	reddish brown	dark brown
Texture	clay loam	clay loam
A profile	0-150mm	0-300mm
Structure	fair	excellent
Water stable aggregates	few	many
Worm activity (numbers)	4	12
Root development	moderate	excellent
Water infiltration (2litres)	90 secs	30secs
Bulk density	.87g/cc	.76g/cc

Table 1. Physical and biological attributes of remnant and ameliorated soil

Soil analysis	Remnant soil	Ameliorated soil
pH (CaCl)	4.8	6.7
Organic Matter	11.6%	13.7%
Total nitrogen	.35%	.49%
Available nitrogen	8.8ppm	11.4ppm
Total phosphorus	877ppm	5223ppm
Available phosphorus	34.8ppm	332.6ppm
Available calcium	1208ppm	3800ppm
Available magnesium	295.2ppm	1242ppm
Available potassium	202.8ppm	553.8ppm
Available sodium	59.8ppm	108.1ppm
Available sulphur	3.2ppm	3.2ppm
Cation exchange capacity	22.44meq	29.29meq
Exchangeable calcium	5.82 me/100g	17.50 me/100g
Exchangeable magnesium	2.37 me/100g	9.53 me/100g
Exchangeable potassium	0.50 me/100g	1.31 me/100g
Exchangeable sodium	0.25 me/100g	0.43 me/100g
Exchangeable hydrogen	14.2 me/100g	1.15 me/100g
Copper	9.60ppm	9.50ppm
Zinc	67.80ppm	76.70ppm
Manganese	20ppm	39ppm
Molybdenum	.40ppm	1.10ppm
Cobalt	.30ppm	.60ppm
Boron	.30ppm	1.10ppm

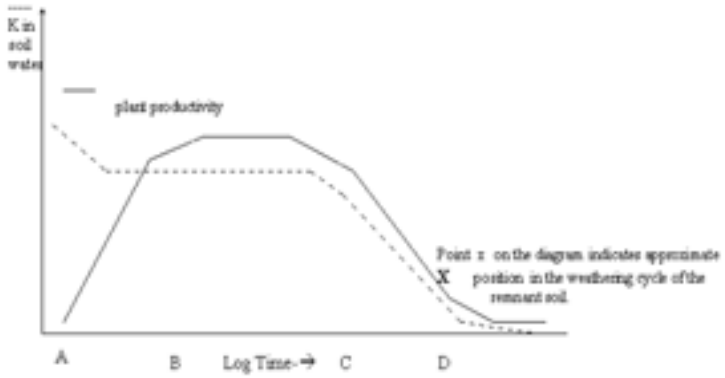
Table 2. Soil analysis of remnant and ameliorated soil

Plant productivity

As a result of soil improvement over the ten year period good crops of tomatoes, capsicums, beans, potatoes, corn and silver beet are now evident. Foliage of leaf vegetables exhibit bright green, glossy leaves, root vegetables are consistent in size and colour, and tomatoes and corn grow heavy crops of fruit and full ears of corn.

Discussion

Mineralogical analysis of the remnant soil indicates a high proportion of iron oxides and aluminium oxides (gibbsite and boehmite) which are indicative of a soil that has undergone pronounced weathering and leaching (Sargeant & Skene, 1970). This information when used in conjunction with the model by Fyfe et al. (1983), indicates how the geological weathering cycle can end in a degraded soil with limited plant nutrient properties. The position in the weathering cycle of our remnant soil is based on identification of the aluminium and iron oxide minerals. The soil would appear to be in the last stages of the weathering cycle.



A Schematic diagram showing weathering progress form fresh rock to bauxite and plant productivity. At time A, fresh rock; at time B, rock + smectite (50:50);at time C, kaolin begins to form; and at time D, gibbsite and aerosols + dust dominates nutrients. (Fyfe,W.S. et al 1983

Soil analysis indicates low pH and a low levels of the exchangeable cations, calcium, magnesium, potassium and sodium. These levels are consistent for krasnozems in southern Victoria as described by Sargeant & Skene, (1970).

Both the soil analysis and the mineralogical analysis supports the contention that the remnant soil studied might possibly be classed as a lateritic ‘snuffy’ krasnozem. and as such the improvement in its quality was a key to it becoming a productive organically managed soil (Stace et al., 1968).

Organic management strategies based on remineralisation and the enhancement of biological activity in the soil appear to have increased soil physical properties such as structure, water stable aggregates, bulk density and depth of top soil and worm numbers, while chemical properties have improved by the replenishment of important plant nutrients in the soil profile. These results are consistent with the findings of other researchers (Campe,1997, Chesworth, 1983)

It is apparent that some elements such as magnesium and phosphorus have increased to the level where future additions should be carefully managed to avoid either imbalance or antagonisms between other elements, for example. excessive magnesium can depress potassium levels phosphorus can depress zinc and copper (Hungerford 1987). Calcium levels are still low and need to be brought up closer to 70% of the base saturation (Albrecht 1975). Given the pH of 6.7 the addition of gypsum rather than calcium carbonate should be considered.

Given that the approach to management is to try and utilise a more closed nutrient cycle it would be useful for a nutrient budget to be drawn up illustrating inputs and outputs to the system that together with the soil analysis might indicate a strategy that required minimal inputs to ‘top up’ the system only required.

Conclusion

Organic agriculture aims to manage the soil resource base in a sustainable manner with minimal environmental impacts. In this study an agrogeological model (Fyfe1983) together with physical and chemical soil analysis has been used to determine the quality of a volcanic Krasnozem soil. The soil identified as being of low quality unsuitable for plant productivity, has been ameliorated using strategies consistent with organic production guidelines. Vegetables produced on the revitalised soil have demonstrated improved growth and of are of high quality. Although it is too premature to draw conclusions that long term soil sustainability can be achieved through organic management, trends are apparent from this study that in the short term soil quality can be improved using organic methodologies. Results in this

study together with results from similar work in Australia by farmers and scientists will help to provide improved direction for managing the soil resource on organic enterprises in a sustainable manner.

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43. Organic Industry - Organisation and Vision

By Rod May
Chair, Organic Federation of Australia

Organisation and hence the aspirations and expectations of the industry will change considerably over the next 5 to 10 years. Or wether it is the changing aspirations and expectations that will change the way industry is organised or a combination of both we will have to wait and see.

I predict that the organization of the industry will be vastly different from what we know it as today.

Will it surprise us - probably yes, as the innovation that has led and characterised the organic industry in the production arena is just as likely to be seen in the process of organization. . Therefore we could expect the vision we have now will change too, although the fundamentals will remain the same.

The organization of the industry will move to being more united but while still retaining the frameworks and processes for comprehensive debate not only with the organic industry but with others in a strategic way that allows sensitive issues to be calmly and sensibly handled for productive outcomes.

The role of the OFA in establishing a vision 2001-2006 can be seen within the OFA strategic plan for the organic industry. This plan which has resulted from consultation with a wide number of stakeholders articulates the means by which the organic industry can achieve a growth rate to see 4% of Australias food and fibre produced organically by 2006 . The Contribution of this conference with over60 presentations is a further contribution to this vision.

Organisation

Current structure reasonably clear at the top but becomes blurred and disorganised as moves towards the grass roots.

- OFA, RIRDC, OPEC, Certifiers – even relationships here will be redefined.
- There will be new components emerge – partnerships and alliances.

Some will succeed: some will fail. The challenge for people establishing new arrangements and relationships is that they don't fail.

As an industry we should look at the broad linkages that will maximise effectiveness and efficiency but each and every person here will somewhere, sometime be critically involved in relationships with the other participants and it is important at the outset to plan and negotiate a position that is likely to be both in the long term and short term interests of the stakeholders.

I forsee in the next 12 months the current organization of the industry will change through the partnerships that will develop with other peak industry bodies and conventional farmer organizations and with natural management resource agencies. Already we have seen strategic and important work done in the production environment which crosses over the boundaries between organic and conventional. This work should continue.

We will position ourselves differently with parliamentarians and the media. And the organization and structure of the industry will change as we address the down line issues of packing, distribution and retail

sales, particularly with consumers wants and needs becoming clearer as we develop closer links with that sector.

I feel we will see an enormous growth in the delivery of education and partnership training and R&D.

At the other end there will be the impact from new participants such as producers entering our industry. What effect will they have on the industry's organisation. Will they be content to work in the current structural arrangements? – possibly not!!

Vision

In terms of vision I believe that the fundamentals - Producers, Consumers, Environment - will stand the test of time but over and above that it is certain our vision will change. Other participants in the supply chain and support services will want to be identified as pillars of the vision.

The OFA's vision for 2001-2006 should be reviewed annually and the OFA is developing a communication network for this.

Already from this conference I believe we will go away with new ideas or stronger views on environmental and social issues not only as they affect the industry directly but also the broader community.

Do people at this conference want to be part of this process?

A few issues that we need to consider when anticipating the new operating environments over the next ten years include the social issues, not only related to agriculture but directly involving the wider community. Trust of consumers and what we need to do to win, maintain and grow their trust.

A fundamental component of this is what we often refer to as domestic legislation, the ability to prosecute people outside the industry that engage in misrepresentation. But securing trust goes further than that. It will come from partnerships and alliances and their public face and in fact the actions of each and every one of us here today.

We are all ambassadors for the industry and what we eat and wear today will walk and talk tomorrow.

We should all remember that of all of these things will form and shape the vision, and the future, we have the ball at out feet.

The future is in our hands.

44. Closing Paper
Organic Farming and Our Low Nutrient Australian Environment

By Dr Tim Flannery
Director, Adelaide Museum; Harvard University visiting professor

Thank you and thank you very much for inviting me to be here today. When I heard about your conference I was very excited because this is the very first time that you people who are pioneering a new and what I believe is a very significant industry for the nation have got together at the continental scale, and that's a very signal moment for us. In a real sense I think that you are the new pioneers, you're the people who are developing a new relationship between this continent and the people that inhabit it in a way that hopefully in the long term will lead to sustainability. So that's the reason I am very pleased as I said to be here because for me personally it's a very exciting and encouraging occasion.

What I'd like to do today, in line with my obligation to wrap things up a bit as the last speaker, is to look at the nature of your industry as I see it as an outsider in relationship to the people that live in Australia and the Australian environment and to look at the bigger issues, really, of how your industry fits in with that growing challenge of how we're going to become truly Australian; how we're going to arrive at a sustainable, healthy and enduring relationship with the Australian land because that really is the challenge that's out there for us all. There'll be many ways we'll do it – through exporting, through growing for the local market and growing many different sorts of things that ultimately that's the sort of challenge we face. And that challenge is a very difficult one because Australia is just inherently a harsh and difficult continent for people to make a living in. It's the smallest and flattest and driest of the continents as I am sure we all know. But it's also the one with the most infertile soils, the most difficult soils to make a living from. Often the soils in Australia are lacking the basic plant nutrients and even the trace elements. They're very ancient soils that have been there for a long time and through leaching they've lost most of their nutrients.

They're also, we're increasingly discovering to our dismay, full of salt and that salt which is there in several different forms, whether it's a salty groundwater or crystalline salt in the soil, is becoming one of the very great challenges to our survival in this continent and I want to come back to that a little bit later on. Australian climate as well is pretty unforgiving. The southern margin of the continent, any of you who are from the south west of Western Australia or from western Victoria or the Adelaide region, you will know that you guys get fairly regular winter rainfall. Historically that's been a very reliable rainfall regime, but for reasons that I'll point out soon, that will almost certainly not be the case in future. But you've been the people who've been privileged up to this point, those living in the winter rainfall zone, you've had reliable annual rainfall.

The rest of Australia has had to get by with the rain that's brought by the southern oscillation – the El Nino effect which really has created across the continent a land of drought and flooding rain, as Dorothea Mackellar called it, a place where productivity isn't necessarily annual, it comes with the rains, and they may come every couple of years, every five years, once every ten years or if you're lucky you might get three or four good years in a row and for people living on the land that have to deliver produce to market at a reliable level and a reliable quality, that's a very great difficulty. It's one of the major problems that we all face here trying to make a living.

On top of that Australia has some of the most unique and abundant biodiversity of any continent on the planet. Among the plants alone there's 25,000 species of plants on this continent, compared with 6000 or 7000 in Europe. Our biodiversity's been here for a very long time, Australia's been isolated from the rest of the planet for some 45 million years and over that time species have co-evolved with each other becoming

ever more intricately interdependent upon each other so that our ecosystems are very vulnerable to disruption because of that high degree of interdependence – you disturb one part of the ecosystem and the effects can be felt ripple like right through the system. To me Australian ecosystems are a bit like tautly strung nets. With a tautly strung net you can pluck on one corner of it and the ripples will run right through the net and back, because everything is so tightly interrelated.

The ecosystems of North America and Europe are much more loosely strung, if you want. There's not as much tension in the net, so if you pluck one corner of it the ripples don't just travel through because the relationships aren't as tightly interrelated. So trying to make a living in a land where biodiversity is so delicate, so abundant, so unique is a very great challenge to all of us because that biodiversity in the long term is what delivers to us the free goods, if you want, the clean water, the clean air and the soils of the continent. The challenges that I see for us in the next ten, twenty, thirty years really directly come out of the nature of Australian soils and what we've done to them over the last century and the changing nature of global climate because that is a particularly big threat I believe.

I'd just like to visit briefly the report that was produced in August, earlier this month by 100 nations on global climate change. It's a report that's produced every five years and I read it because I'm interested in long term climate change and also because I study fossils and know a little bit about how climates changed in the past. The last report that came out in 1996 wasn't a terribly alarming one. I should just tell you a bit how this report is put together to give you a sense of it. One hundred nations get together, they charge their best climatologists with studying all of the literature and whatever else they want to throw into the mix on global climate change. So millions of hours of research effort are collated and then a summary report is written that those 100 nations have to agree to, and among those hundreds of places like Saudi Arabia that have a pretty clear vested interest in fossil fuel technologies and that sort of thing. So they've all got to agree on what they're going to say about global climate change.

You'd expect a watered down document, wouldn't you without many strong statements in it as a result of that process and the 1996 report read pretty much like it sounded as if it might from that description. People were saying that over the next 100 years global temperatures might rise between about 1 and 3 degrees Celsius. And that might sound like a lot but the reason it didn't worry me is that looking back at climate change in Australia, you only need to go back about 5000 years to see what Australia looks like when temperatures are about 1 or 2 degrees warmer than they are at present, and you can see that things do change a bit but the country is at least still livable. For example, 5000 years ago when Australia was 1 or 2 degrees warmer than at present, tropical corals grew in Sydney Harbour. It might have been a different sort of a place, but at least we could still live there. There's also evidence for absolutely massive storm surges, tropical storm surges in the Sydney area at that time that were delivering rocks the size of that table there up on to cliff tops, things like that. So, different, but still livable. Well if you take the long-term view of that sort of thing, you don't worry too much about little things like storm surges.

But the report that was released three weeks ago really worried me very deeply because what that report said in essence was that, instead of the 1 to 3 degree Celsius warming that was predicted just five years ago, the new figures indicated that the global climate would warm somewhere between 3 to 7 degrees over the next century and that sort of increase in global temperature is beyond anything that our species has ever experienced in our half million years of tenure on this planet. And as a result of that this very conservative body characterised global climate change as the greatest threat to the human species that we have ever experienced in our history on the planet. They are fairly strong words for a group like that and you can see I think that in terms of environmental sustainability, trying to make a living in Australia, the implications of that report are very profound.

Various computer models have been produced by the nations involved that look at the implications of that sort of climate change across the continent, and if you look at what we are expecting in Australia, one of

the predictions is that winter rainfall zone will retract so for the first time ever in human experience that very reliable winter rainfall zone that's been there for a very long time will start to become less reliable and retract to the south. I read that report when I was in Perth about three weeks' ago and John Howard happened to be in Perth at the same time and to my great surprise he was handing out drought relief to hundreds of farmers in the south west in the region that has historically been the most reliable rainfall zone on the continent. The Western Australian wheat bread basket has been one of the most reliable areas of production that we have and there in line with what the computer models were predicting was our Prime Minister giving out money to try to get people through what was being called a 'once in a hundred year' drought. Agriculture's only been going there a hundred years in the south west, in the wheat belt zone, so the once in a hundred year drought, I don't know where the name came from, but I'm almost certain we'll be seeing the once in a hundred year drought a bit more frequently in future. So a big problem for us.

To return to soils. I just want to look briefly at what's happening with Australian soils. There is a tremendous work in process at the moment, documenting the nature of one particular threat to Australian soils – that of salt in soils. The book which is in draft form at the moment, it is being produced in Western Australia – it's called *The Salinity Crisis* and it is just about as hair raising as the International Report on Global Climate Change. It suggests for example that at the moment 20% of human made infrastructure in the south west of Western Australia is under threat from salination – that's 20% of towns, roads, railways, houses and everything else and that within the next 30 years the number of places suffering and under threat from salination will rise to about 40%. The cost of remediation in the small towns alone, the 40-odd small towns they've studied suggest there's no way it makes sense economically to save all of those towns. The cost of remediation for transport infrastructure adds up to about half a billion dollars at the moment – just road, rail and other transport costs, airstrips and whatever else. So this is a very severe threat and it's come to us very recently.

Just to give you a few figures. In 1982 people that about 200,000 hectares of Western Australia, all in the south west, would potentially suffer from salination. By 1991 that figure was up to 443,000 hectares – so it had doubled over ten years with the new estimates. In 1996 it was realised that in fact that nearly 2 million hectares was under threat and the total vulnerable figures, vulnerable area now that we're looking at that will be affected perhaps in the next fifty years is something like 6 million hectares of the south west of Western Australia. So that threat is something that's grown very rapidly. Our scientific knowledge is getting much better and we are beginning to comprehend the nature of the threat that traditional agriculture poses to our sustainability, to our future on this continent. So you people, when I said you were pioneers, I believe that you are pioneers towards a new sustainable future and away from a series of very serious threats.

What those threats represent though, when you think about it, is the cost differential, roughly anyway, between what you receive at market and what your traditional producer receives at market because in a sense the environmental free goods that we give to those producers to produce their costs are now being costed in terms of threat to the environment. So just looking at today's *Australian* I noticed that there was a comparison of prices paid for organic goods in supermarkets compared with standard goods. You guys sell apples on average for about $3.50 a kilogram. A normal producer sells it for about $2.00, and that producer may be using irrigation, they may be using pesticides, they may be sitting on a rising salt pan – those things are uncosted, so in a sense there's a great subsidy to other industries that you suffer from in terms of marketing your products that are produced sustainably. Pumpkins are even worse. A standard grower produces them for about 50 cents a kilogram while you charge $2.00, so four times the cost. It's not that you guys are doing anything wrong – it's just that other people are not paying the real costs of production. Other people are getting a free ride on the Australian environment in terms of what they grow. I think that if we are going to realise the potential that you all possess here, a number of things have to change – a number of innovations have to occur before we can develop what I would see as a truly sustainable organic industry in all its manifestations.

The first thing I think we have to realise is that this is as time of great change and uncertainty and experimentation. No one has the answers – not the scientists in the museum I administer or those in the university next door or those at the Waite Institute and CSIRO. They may have parts of the answers, they may have leads, they may have things to offer you, but I think the problems are so multifarious, they are so diverse and so different from region to region, it's going to take a great deal of experimentation and most of the experimentation is going to have to be done by people like you. Call on the experts by all means, but we're in a position now where we don't have the answers. What we do have is the luxury of a little time - and a very little time - because the threats of global greenhouse change and of salination will well and truly be with us in the next 20 years and we do at the moment have some affluence in Australia to deal with those issues. The Federation Fund has been a great thing for getting money into people's hands and letting them experiment. We've got to anticipate that most of those experiments will fail, but that's the nature of experimentation. You only learn through getting it wrong a few times, so I don't think that we're going to be in a position where all of a sudden things are going to be wonderful. If you take that broader view that we don't have the knowledge at the moment, we need to experiment, we're under very great threat. We have a series of problems.

I think what we need to do as Australians is adopt a package if you want, a package of industries, a philosophy that then supports a whole series of industries that will in the end see us as sustainable organic enduring. Everyone in this room and myself included, every time you switch on your lights at home or kick over your diesel pump you are throwing your money away and what's much worse than that you are hastening this incredible greenhouse change that's going to affect us all over the next century. Every cent you invest in renewable energy technology, whether it be solar or wind or something else, is a genuine investment for the future and those industries are the industries that will go hand in hand with your industry to produce a better sustainable Australia. After all, what's the point of us developing a great organics industry here in Australia based on agriculture if we are seen as the great global polluters of the environment, the nation that wouldn't sign the Kyoto accord.

We have to somehow rethink our position in the world, take advantage of the opportunities that exist in these growing industries and yours, renewable energy and other related industries somehow move ahead together to create a sustainable Australia. As I said, there's no point just developing one particular industry – we'll end up shooting each other in the foot unless we develop a wholistic, government-led in large part, approach towards true sustainability. As I said, I think we've got very little time to deal with these issues at the moment – maybe 20 years – and a lot of work to do, but in the end we don't have much in the way of choice as far as persisting in this landscape.

If those estimates that I read to you are even half right, just taking the example of the south west of Western Australia which is better known than any other place. By the time I am 65 and I've lost a bit more hair even than I've lost now, I could visit the south west and find some three or four million hectares of its once productive land as salt scalds if nothing's done, 40% of its towns and infrastructure in decline, rainfall which is chronically below the levels that we know today, possibly so far below that there won't be any sustainable agriculture possible in the marginal zones anyway. And if the backside falls out of the mining industry as it inevitably will because mining is by definition a non-sustainable enterprise, what will there be left in Perth, what will the city itself be like? And those threats are not just imaginary, we have the best people in the world telling us that this is what's ahead of us if we do nothing.

So we must somehow move together and motivate each other, lobby as hard as we can, find allies in related industries and somehow change the nature of our relationship with this land. I'd just like to thank you for inviting me to speak today and say more power to you because I believe you're the people at the pointy edge, you're the people who are risking your dollars in your industry trying to find a way forward to sustainability, and my hat's off to you. So I'll stop there, but I'm happy to take any questions if the time remains. Thank you very much.

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