sustainable HORTICULTURE RETAIL

Green Thumbs & Green Goods

Byron Region Community College
Greenskills Research Project
2009

Acknowledgements
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For information about the Soil Health Card documents in the appendix please contact info@soilcare.org or see www.soilcare.org.au

We would like to get feedback on any ways this booklet has been useful for readers.
Contact: Sustainability Education Coordinator Katrina Shields on katrina@acebyron.org.au

See our ongoing general community education and accredited VET programs for Living & Working Sustainably at www.acebyron.org.a
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"Sustainable Development calls for additional and different processes than those traditionally thought of in education. The quest for sustainability demands new approaches to involve people, rather than convey just a body of knowledge."

Tilbury, D., Coleman,V., Jones, A, and MacMaster, K., A National Review of Environmental Education and its Contribution to Sustainability in Australia: Vol 3: Department of the Environment & Heritage and Australian Institute in Education for Sustainability, 2005

Section 1: Project Overview

Overview

Byron Region Community College was funded by the NSW Department of Education and Training (DET) to undertake research and trial new material on sustainability for the Retail and Horticulture Training Packages.

This project supports DET's Green Skills Strategy, the aims of which are to:

- Increase the availability of training that allows business to respond to environmental pressures, develop green strategies and take advantage of green market opportunities
- Increase the take-up of training and upgrade green skills

Our initial intention was to research and trial training at Certificate II and III level. However, feedback from our industry stakeholders in the research phase and from participants during the trials caused our focus to shift towards Certificates III and IV level training.

Early in the project we decided to integrate our two pilot projects – in retail and horticulture – as closely as possible by focussing on the high priority areas of food production and food retailing. While two working groups conducted separate trials in the two subject areas, there was considerable overlap in the working groups' personnel and in the research phase.

Through our research and industry stakeholder consultations we identified a food retail and wholesale business in our region – Santos Trading Pty Ltd – that is achieving benchmark-setting outcomes in sustainability transition. We made the judgement that a closer examination of this business' operations would be a priority for our project as its experience represents a somewhat unique working model for the sector. As a result, the Santos Ethics Co-ordinator joined our project team and several employees from Santos participated in the retail trial.

Methodology

The project was conducted as a collaborative action research project that involved a number of stages and drew on a wide range of primary and secondary sources.

Our methodology was as follows:

1. Project Team

We formed a core **project team** consisting of the project co-ordinator, Katrina Shields, and Bec Talbot who is involved in both the horticulture and retail industries. Our Certificate III Retail trainer, Susan Germein joined them to form the retail trial sub-group and our Certificate III Horticulture trainer Lisa Barnes, for the horticulture trial sub-group. The College Director, Richard Vinycomb, was responsible for project overview and supervision, the setting of parameters and the

"To understand the green skills we need now and into the future, we need to have some idea of what employment in a sustainable Australia will look like. Sustainability will become central to business strategy. Integrating sustainability into all aspects of their business – into the products they make, into their operations and processes, and into their accounting practices, they will increasingly demand green skills and knowledge. Are we up to it? As and education and training community can we do it?"

Sharan Burrow, ACTU President, media statement 4 March 2009

selection of industry representatives. The project team's post trial reflections and report writing was aided by Industry Reference Group member Kenneth McLeod.

2. Industry Reference Group

The project team convened a local **Industry Reference Group** (IRG) of nineteen members to assist in the gathering of information, industry contacts and advice to keep the project grounded in industry realities. The IRG consisted of people involved in the local retail and horticulture industries, plus experts in sustainability [see Appendix 1].

3. Research and Information Gathering

The **research and information gathering phase** of the project consisted of several concurrent streams of inquiry:

- We undertook **qualitative interviews** with the IRG members, both in their workplaces and by phone, and with other industry stakeholders suggested by IRG members
- Project team members attended several **industry related forums** in retail and horticulture/agriculture for networking opportunities and to discuss sustainability training issues with additional industry stakeholders [see Appendix 1]
- We liaised with personnel in relevant **Industry Skills Councils** to obtain information on ISC positions on sustainability
- We conducted extensive **desk research** using published materials and the Internet to survey other initiatives in sustainability training in the retail and horticulture/agriculture sectors and to review available teaching and learning resources
- Our retail and horticulture trainers **reviewed the Certificate III units** they teach, plus other relevant units they don't currently teach, to assess what changes to content and delivery they consider necessary to more adequately address sustainability issues. They also reviewed other training packages that might include relevant units [see Appendices 4 and 7].
- Throughout the research phase **the project team met to reflect** on such questions as:

  What feedback are we getting?
  What leads are worth following?
  What principles are emerging?
  What are the implications for the design and delivery of training?

- This iterative workshopping process sometimes seemed slow but helped the team keep alert to emerging learnings, continuously refocus its work, and ensure that all team members shared an evolving understanding of what sustainable practice might mean in each industry.
- To focus our learnings and collective thinking the team developed some principles of sustainable retailing and sustainable horticulture and used these as a framework for designing the trial training. We asked for feedback on the applicability of these principles from the IRG members and others, and redrafted them several times until we achieved general agreement within the project team on their suitability.

4. Our Mental Models

As a result of our interviews and research, we were challenged to apply a more systemic approach to learning for sustainability - one that puts the emphasis on a transformative, rather than transmissive, teaching approach that was highly participative. We also saw the need to distinguish between weak sustainability, that gives equal weight to economic, social and environmental considerations (usually applied with the economic dimension being dominant and non negotiable), and a strong sustainability model that sees the economy and society as constrained by, and totally

dependent on, the environmental constraints.

We also were influenced by feedback from our reference group members who emphasised the need to equip students with an understanding of sustainability that starts with the big picture. This would mean developing understanding of fundamental principles and putting emphasis on the relationships between things; rather than just teaching them to comply with mandated standards or how to make some environmental improvements. An exploration of these ideas and why we think they are important, can be found in Appendix 2.

5. The Retail Trial

The retail sub-group designed a course in sustainable practices in retail with particular emphasis on the food retailing sector. The group decided to trial material that could be the basis of new unit(s) rather than adapting existing units. The trial consisted of four sessions conducted on Saturdays between 8th August and 12th September 2009. It incorporated field trips to a best practice food retail business and a newspaper that had implemented energy efficient measures.

Fourteen participants were recruited from local retailers (both owner operators and employees), previous Retail Certificate III students and some community members with a strong interest in sustainable food issues.

5. The Horticulture Trial

The horticulture sub-group designed a sustainable horticulture course run over two weekday evenings and one full Saturday field trip from 17th-24th September, 2009. Its emphasis was on the links between testing for and building soil health, plant nutrition and enhancing pest resistance and related to three Certificate III units. The field trip was conducted at an organic market garden and involved practical soil testing and compost building.

Thirteen participants were recruited from local grower's networks, ads in a local paper and word of mouth.

6. Evaluation

Evaluation of the trials was undertaken by group reflection and discussion at each session, participant feedback sheets, and post-delivery review and reflection by the trainers with the project team. Some participants provided additional written reflections after the trials.

7. Report

This report was compiled by the core project team, augmented by a member of the IRG. The retail project was more extensively documented than horticulture, though much of the discussion in Section 2 on the retail project is also relevant to the horticulture project reported in Section 3.

Section 2: Retail Trial

Research and Information Gathering

1. Stakeholder Interviews

During the project's research and information gathering phase the project team conducted interviews with members of our Industry Reference Group (IRG) and other industry stakeholders. This process continued right through the retail trial.

The questions that were asked were:

- What are you currently doing to improve the sustainability practices of your business? What is working well for you? What isn't?
- What do you see as the priorities for food retailers in terms of putting sustainability principles into practice?
- How could training help to strengthen sustainability practices in your business?
- How, for example, could training change people's mindsets around sustainability?
- What sustainability practices are changing [in your business / in your industry?] and which are not?
- Where are you 'stuck' with implementing sustainability?
- Who or what is your inspiration for all this? Who, in your opinion, is doing best practice?
- What have you thought you'd like to do but haven't been able to? What are the barriers?
- What are the education/training issues embedded in that?

We began our interviews with the intention of gathering input from a range of retailers, from those making a serious effort to integrate sustainability thinking and practices into their business model to those doing very little. However, the retailers we talked to who had done little or nothing in a sustainability direction were not particularly illuminating and tended to be vague about what actual barriers they had encountered. We therefore decided our time would be better spent finding out more from those who could articulate their practical experience, both good and bad, and so focussed on businesses aiming for best practice or at least significantly better practice.

The following points summarise the feedback we got from the interviews and discussions with industry stakeholders including participants in the trial.

2. Industry Trends

Some relevant trends in the food retail industry mentioned by our informants were:

- There is a steadily growing proportion of better informed customers with higher expectations for sustainability standards of the products they buy.
- The proliferation of green product claims offers greater choice but requires more careful scrutiny by both the retailer and the customer.

"Skills policy cannot focus merely on the development of green jobs; sustainability principles will need to be diffused throughout all sectors of the economy that influence greenhouse emissions"

NSW Department of Education and Training Greenskills in VET.p22

- Growth of the LOHAS demographic (Lifestyles of Health and Sustainability) – "a marketplace for goods and services that appeal to consumers who value health, the environment, social justice, personal development and sustainable living" *LOHAS Journal*
- Relocalisation of products and services in response to sustainability concerns, energy costs, etc. More businesses are making this a selling point and others are doing it anyway.
- More employees are willing to "push the envelope" on sustainability which can present challenges for management.
- Pressure from customers for improved labelling standards, such as information on origin, food miles, carbon footprint etc.

"Employees, consumers, suppliers and clients will all demand better corporate responsibility performances from companies, who will respond by instigating environmental initiatives to enhance their positioning with these various audiences"

Retail and Consumer Outlook Australia 2007, Changes in Play, 3 Annual Edition, Price Waterhouse Coopers

3. Emerging Industry Action Priorities

Observations about priorities for improving sustainability practices in the retail sector:

- Start from where you are and proceed step-by-step to avoid the dangers of over-reach and overwhelm.
- Clear goals, consistency and momentum are important success factors – keep moving, don't do a few things then stop.
- Establish transparent and viable pathways for improvement – planning, goal setting, building commitment and celebrating successes.
- Highlight the link between environmental sustainability, social equity, and resilient communities.
- Attention to procurement policies – develop value chain partnerships to facilitate sustainable and ethical procurement and to share the learning.
- Encourage an ethic of sustainability within the business – green cleaning, recycling, energy and water conservation.
- Make use of the sustainability knowledge and skills within the local community for advice and support.
- The need to preference renewable resources and establish a values base within their business to support this.
- Packaging and all aspects of waste management – the reduction and where possible the elimination of waste.

4. Barriers and Assumptions

Several of our interviewees mentioned barriers they have encountered in pursuing sustainability improvements:

- Translating policy decisions into employee buy-in can be difficult – without the staff on board, policy can be irrelevant.
- Often hard to implement necessary on-the-job training, particularly in small businesses.
- Insufficient front line manager understanding or support for sustainability practices can result in a lack of employee support and discouragement of employee initiatives.
- The time and skills needed to properly research more sustainable products and practices and to verify 'green' claims. The 'obvious' is not necessarily the best.
- Difficulty in maintaining accurate, up-to-date and informative product labelling unless all staff members are trained and willing. Requires continuous attention.
- Sometimes hard to adequately value employee input and voluntary initiatives within the constraints of business viability.

From the interviews and other research, we identified some assumptions that often underlie current practice in the retail sector and represent significant impediments to progress on sustainability:

- That consumers are motivated by price/quality/feature considerations only

- That retailers cannot influence suppliers ethics or practices
- That plastic bags are necessary and the public could not cope without them
- That green products are always more expensive and most people don't want to pay for them
- That current levels of packaging are necessary to make products safe and attractive and these practices cannot be influenced by retailers
- That employees lower in the hierarchy cannot influence higher-up decisions and policies

5. Engaging Stakeholders

Some of the experience reported of engaging stakeholders with sustainability included:

Employees

- Make demonstrated commitment to sustainability a criterion for hiring, particularly for employees in supervisory positions. Sustainability practices should be written into job descriptions.
- Include the business' sustainability policy and practices in employee induction. Show the systems already in place.
- Keep staff up-to-date with new policies and practices in the business and those of sustainability leaders in the industry.
- Provide opportunities for staff to become more informed about sustainability issues in general. Make resources available for them to learn more.
- Create opportunities for regular staff feedback on what's working, what's not, and emerging opportunities. Have meetings to discuss sustainability issues and encourage staff led solutions. Involve all staff members in planning and implementing improvements and reward initiatives.
- Engage staff in triple bottom line accounting processes. What do WE need to achieve to be a socially responsible business? Are WE achieving our environmental, social and economic benchmarks? How did this year compare to last?
- Implement competitions between branches e.g. reduction in power usage or waste reduction or less plastic bag use, etc. Introduce staff awards that relate to sustainable practices. Give staff some freedom to pursue their pet concerns e.g. eliminating plastic bags.
- Allow staff some paid time to be involved in other sustainability initiatives, for example tree planting days.
- Encourage communication on enjoyment of their role. Managers should lead by example.

Customers

- Communicate to customers about the business' sustainability initiatives, goals and outcomes.
- Use signs to communicate the sustainability credentials of products. Tell the product story, e.g. who made it and where they are. Highlight local suppliers.
- Tell customers why you have ceased stocking a certain product.
- Survey customers about their concerns. Give feedback on their responses and act on their concerns.
- Use the Internet to tell your stories – both successes and challenges. Utilise social networking sites.
- Use loyalty cards and discounts to encourage green shopping.
- Laminate and display the best articles on sustainability issues.
- Display information about community projects, campaigns, petitions, etc, on sustainability issues most relevant to your store and encourage customers to care and act. Sponsor green events and encourage customers to participate. Provide opportunities for customers to donate to causes e.g. labelled coin jars on counter.
- Show optimism!

Suppliers

- Talk to suppliers about your concerns about the sustainability of their products. Explain why it is important to you and ask what measures they can put in place to meet your needs.
- Be clear about the criteria products you need to meet, write them down, develop a policy and make this available in written form for suppliers to refer back to. Support suppliers who are meeting your criteria and those that are working to do so.
- Create a system where products can be assessed against these criteria. Allocate time for staff to ensure products are meeting the criteria.
- Give product companies/producers positive and negative feedback on their products. Pass on customer concerns and feedback. Reinforce your needs by sending back products that don't meet your sustainability standards.
- Encourage product companies to communicate the sustainability merits on their packaging or directly on their product e.g. GM free.
- Pass on information, resources and links about issues relevant to your suppliers and encourage them to share product information with you.
- Encourage suppliers, whatever stage they are at, to take the next step. Keep raising the bar.

Managers

- Educate managers on sustainability issues and their relevance to the business. Tell them about other businesses already taking action.
- Present the business case for sustainability. Is it financially viable? What are the benefits?
- Make it easy for managers. Do the research first and ask them to take ownership of the project.
- Let the managers take the credit and acknowledge their achievements. Nominate those achieving your goals for sustainability awards to motivate them more. Communicate your passion and concern for key issues.

6. Training Implications

While it may be unrealistic to expect every employee in the retail context to be a "sustainability expert", some of the desirable capabilities of the retail team in a business with a substantial sustainability commitment would include:

- A holistic understanding of sustainability; that it is a journey not a destination; its relationship to social equity and community resilience, and; its relevance to the industry and business they are part of
- An understanding of the business' sustainability policies and practices
- An understanding of the concept of triple bottom line accounting and an ability to participate in its implementation
- An understanding of the relevance of sustainability practices to building the business' brand value
- An ability to research and understand product information and labelling, and analyse and verify product claims
- An ability to communicate the business' sustainability goals to suppliers and customers and be able to explain the benefits to them
- An ability to inform and educate the customer and encourage ethical consumption (without preaching)
- Good team communication, participation and collaboration skills
- Front line managers must be able to motivate employee's active engagement in the sustainability transition

Sustainable Retailing Principles

From our stakeholder interviews and research, the project team developed its own table of sustainable retailing principles. This was used as a reference framework for designing the pilot program.

PRINCIPLE	SUMMARY	PRACTICE EXAMPLES
Build a Culture of Sustainability	Create a culture that motivates staff, customers and suppliers toward sustainable actions	• Integrate community, economic and environmental sustainability into your business model and mission • Setting the scene - create a place where people desire and are supported to be proactive on sustainability • Bring meaning and values back into the marketplace • Build a team culture, get everyone on board • Foster collaboration and good communication • Provide incentives and rewards for better practice
Shrink your Ecological Footprint	Build in business practices that minimise energy, water, and non-renewable inputs and waste outputs	• Introduce energy saving in production, lighting, heating, cooling, refrigeration etc. • Investigate embedded energy and water in the whole lifecycle of products and services including transportation • Introduce water saving measures • Minimise packaging – particularly plastic bags and wrappings and non-recyclable containers • Reduce, reuse, refill and recycle • Reduce food and product miles • Practise responsible waste management • Green cleaning and pest management • Energy efficient store design
Source Eco Friendly	Seek out and preference suppliers, products and services with the best eco credentials	• Learn about certification schemes – organic, biodynamic, non GMO, fair trade, FSC timber, carbon neutral etc. • Develop an ethical/sustainable procurement policy • Practise product auditing and sustainable procurement • Look for fair trade alternatives • Seek longer lasting products • Low embedded water and energy products • Low waste products • Preference local suppliers • Highlight green products
Go Green Marketing	Create a competitive advantage through both the message and way of marketing – walking the talk and talking the walk	• Create specific green marketing devices and campaigns – build a green brand • Take first mover advantage – lead from the front • Quantify green credentials through devices such as certification and point of sale information • Embed a sustainability mindset into marketing • Consider impact of marketing activities – short and long term • Be alert to green washing – yours and others
Communicate Eco Choices	Educate suppliers, staff and customers to choose eco friendly products	• Value and highlight your role as a retailer in educating and influencing others – the ripple effect • Ongoing two-way communication and co-learning with all stakeholders • Encourage community participation and feedback – active customers are conscious consumers • Build an eco aware market base • Highlight your eco-product stories • Give customer advice and information to support ethical buying decisions • Make choosing the right thing easier – accurate and informative labelling and discounts
Keep Raising The Bar	Encourage feedback loops to improve the eco outcomes. Monitor and build on triple bottom line outcomes.	• Practise triple bottom line auditing – environmental, economic and social benchmarking • Conduct energy, water and waste auditing • Seek suggestions from customers and staff and act on them • Reward initiative and support innovation • Use complaints and problems to improve the system • Celebrate sustainability achievements

TABLE 1

The Sustainable Retailing Trial

The retail trainer of Retail Certificate III at Byron Region Community College undertook a preliminary review of these units. This involved, first, a broad brushstroke look at which content areas could benefit from an injection of sustainability principles. One unit – SIRXLS004A Build Relationships with Customers – was then selected for more in-depth scrutiny. This review addressed what additional content might be required, and estimated levels of rewriting needed from minor adjustment of its content or the way it is written to a substantial rewrite (See Appendix 3). Our conclusion was that even with the adaptation of the units there was a need for an introductory unit that set up the understanding of the principles of sustainability in retailing.

The project team considered the option of adapting the Guideline Competency Standards for Sustainability to the retail context. The most relevant units seemed to be in the Business Services Training Package: BSBSUS201A and BSBSUS301A – Participate in and Implement Sustainable Work Practices respectively or BSBSUS501A Develop Workplace Policy and Procedures for Sustainability. Our interpretation was that these units did not have as wide a scope to address all our Sustainable Retailing Principles in the way we wanted to (but this needs further investigation – see Section 4).

Our team therefore decided to develop and trial original material that could provide the basis for a new unit in the Retail Training Package at the Certificate III/IV level.

Trial participants were drawn from local retailers - both owner operators and employees, previous Retail Certificate III students, a few participants in the process of setting up their own small eco-oriented businesses, a job seeker in the retail industry and a community activist involved in retailing issues. In all, there were fourteen participants.

Word of mouth and networking proved the most effective ways of recruiting participants, though we did place an advertisement in a local paper. We also approached a local IGA supermarket and a 'green' branded local fruit barn type retailer but they were unable to send staff to the trial.

Based on our industry consultations, research and Sustainable Retailing Principles, the project team developed a trial course of 16 hours in four sessions of equal duration. The session topics were:

- Sustainability Thinking and Principles
- Eco Business Practices
- Sustainable Sourcing
- Green Marketing and Customer Engagement

Learning activities included:

- Powerpoint presentations
- Expert guest speakers
- Case studies
- Video clips
- Brainstorming
- Small group work; and
- A lot of participatory discussion

Pilot Program Outline

SESSION	CONTENT
1. Sustainability Thinking and Principles	• Introduction and rationale • 'Changing the story' • Explore concept of sustainability – What would a sustainable retail paradigm look like? • Personal, community, economic, environmental dimensions • What do the principles mean in practice?
2. Eco Business Practices ***Minimising detrimental impacts of the business on the environment***	• Refuse, reuse, refill, recycle, reduce • Long and short term perspectives, carbon footprinting • Eco fit-outs • Energy efficiency and waste issues • Embedded energy and water awareness • Packaging • Waste management
3. Sustainable Sourcing ***Taking responsibility for the product lifecycle – a hands-on approach***	• Life cycle analysis • Certification • Sourcing
4. Green Marketing and Customer Engagement ***Communicating sustainability to customers***	• Refresh on eco principles • What is green washing? • What hats does the sales person wear? – educator, communicator, advocate • Focus on marketing, selling, customer service in a sustainability context • The emerging LOHAS demographic and other industry and market trends • Building loyalty with your demographic

TABLE 2

Our aim was to facilitate transformative rather than transmissive learning and keep students relating content to their own retailing context and experience.

Due to the non-accredited nature of the trial it was not considered relevant to include structured assessment tasks. These could be developed in a future Green Skills project.

For more details of these sessions and supporting resources, including PowerPoint presentation thumbnails, see Appendix 3.

Evaluation and Reflection

Fourteen participants engaged with the workshops. Some missed one session, and one participant didn't come back after the first session (the job seeker).

Feedback from the course participants was very positive. Though a majority of the group already had a high degree of eco-literacy and commitment, they reported high satisfaction with the opportunity to get a bigger picture on sustainability in their industry, gain inspiration, have access to resources and engage in the very lively discussions.

A number of the participants mentioned that it was very affirming and motivating to engage with others and use the material presented, even if they were already doing a lot. There was also appreciation of the mix of activities, with the power point presentations as frameworks for the ideas. The five presenters and their methods got very favourable feedback.

"The Story of Stuff" video got a particular mention as being very powerful. The opportunity to engage in discussions and critically reflect on general practice in the retail industry was rated highly by nearly all participants on the evaluation forms.

Some of the written comments on the evaluation sheets about the overall value of the course are worth quoting:

- "*This is an important aspect of retailing and should be compulsory in any retailing course*" Michelle Higgins
- "*Invaluable, foundational information and ideas to get us into a future that continues positively beyond our own lives…*" Mario Castillo
- "*Although there may have been a bit of preaching to the converted here … this course would be a real eye opener for those who have not considered these things before*" Verity Harris
- "*This course is a very valuable resource for people involved in retail. We live in a consumer society and it is very important that people involved in all aspects are aware of the consequences and processes of production and all parts of the life cycle*" Nick Inlay
- "*Even though our shop is seen as a good model, it definitely inspired me to implement more changes at Santos and I see the need for educating staff and customers more*" Evelyn Vandera
- "*What came home to me was how important it was to research what suppliers tell you and not just accept it. The interaction was a very good way to expand the ideas*" Leila Sinclair
- "*As a small shop owner the ability to conduct my own simple carbon footprint audit and also waste audit was very good*" Paul Maderos

There was a move by the group to create an email network for people who would like to stay in touch and informed about sustainability developments in the retail sector. They also all subscribed to the sustainability@byron e-list that keeps people in touch with local initiatives and opportunities, including further training offers.

1. Successes

- **Collaborative practice in applying transformative learning strategies**

The trial was successful for the facilitators in enabling them to develop, then test in action, their own principles of sustainability and to experience the opportunities and difficulties of a transformative learning approach in this context. As noted in a recent Victorian report on sustainability training *"There remains widespread and significant levels of uncertainty about how to*

creatively integrate information with process, to achieve collaborative transformative actions and outcomes" (The Guide Beside: Key Principles for Effective Collaborative and Transformative Style Sustainability Training http://www.vaee.vic.edu.au/guidebeside/about.htm)

If the degree of animated discussion and sharing of stories and examples could be considered an indicator of transformative learning, the trial scored well.

The three people in the retail working group worked well as a team and the action research process proved a valuable tool for building shared knowledge. We brought different strengths and experience of industry, VET and non-VET training, and sustainability to the project.

- **Localisation of resources**

In the spirit of sustainability, we were able to access and mobilise local experts and practitioners, both as go-to people, as case studies and as participants. So although the profile of our participants presented a problem (see below) it was also a benefit. We believe that any training on sustainability needs to 'walk its own talk' in that it must relate to local issues, local people and local solutions.

Catering for the course was also used as an opportunity to showcase 'sustainability oriented products' and discuss their merits.

2. Problems

- **Variable attendance**

Six people missed one or more of the sessions. Several factors were probably relevant to this – there was swine flu about and people were being careful, the long sessions (4 hours on a Saturday afternoon), and the level of commitment required for a voluntary participation program all, no doubt, played a part.

- **Participant profile**

The group was not fully representative of a typical Certificate III group, either in age, background or skill level, although two were recent Certificate III graduates. The project team was unable to get local supermarket employers to send staff participants, so the scope of the recruitment was broadened. The participant group included some owner operator retailers (green grocery, wood products, herbs), retail managers (whole foods), retail staff (whole foods) and community activists involved in retail issues. The level of pre-existing eco-literacy was high in the majority but not all participants.

- **Pitching of the content**

Flowing on from the mixed profile of the participants, it was a challenge to pitch the content and the facilitated learning experiences at a level that would satisfy everyone. Although we advised the group that they would need to put on the hat of a Retail Certificate III student, inevitably the level of material and discussion defaulted, at times, to suit the nature of the group.

There was an upside to this, however. The more 'sophisticated' participants were able to share their experience and knowledge with the rest of the group and to critically reflect at a meta level on the content – all good adult education principles. Their passion, and at times even vehemence, on the need for change in the industry added a 'real-life' flavour to the learning.

The participants were asked about gaps and other topics that would have been relevant. Some of

the ideas mentioned were: the use of games as a teaching tool, more on water efficiency, strategies for refrigeration, adapting the resources for youth, more examples of green marketing and first mover advantage (being the first in a sector or area to introduce something new).

3. Areas for Further Work

- **Longitudinal survey**

A follow-up email survey is needed to build a picture of the transformative impact of the workshops. Evaluation to date has focused mostly on content and the immediate workshop experience.

Questions could include:

- *How has this experience changed your sustainability thinking and/or practice at work?*
- *What are the distinct sustainable retail training needs of owners/senior managers, front line managers and employees?*
- *How well does our content (as it is so far) meet these needs? What else would be good?*
- *What learning activities are the most effective in bringing about changes in your workplace?*
- *How much formal training is enough? How much do you need to start the process of change?*
- *How can formal training be better integrated with on-the-job learning?*

- **Professional development**

While sustainability principles can be written into training packages, as always their application in a business setting depends on the effective transfer of learning from the training room to the workplace. This is particularly challenging in this case, as our research indicates that trainees must be equipped with a different way of thinking about retail business and the skills of continuous collaborative learning. We have suggested that a transformative learning approach is appropriate to this task.

Generally, current VET trainers are not well equipped to design and facilitate such programs. So, in our view, professional development is a prerequisite for a sustainable retailing program that can meet the needs of the industry stakeholders as revealed to us. The focus of such professional development would be on transformative learning methodologies, program design, facilitation, learning assessment and program evaluation.

- **Teaching and learning resources**

We have painted a picture of sustainable retail training using broad brushstrokes. It is a canvas needing a lot more work – integration of sustainability concepts and practices into all of the Retail Training Package units, determining which units require small changes and which require fundamental intervention and integrating a pedagogy that fosters transformative learning.

The production of teaching and learning resources to support the shift in emphasis in the units is badly needed – we searched in vain for suitable material. We believe the material provided in this report and in the appendices could be used as a basis to develop resources that would help busy trainers incorporate sustainability into their teaching in a meaningful way.

Section 3: Horticulture Trial

Research and Information Gathering

1. Stakeholder Interviews

In our industry consultation phase, we interviewed horticulture-connected members of the Industry Reference Group and other industry people identified by them as local pacesetters in the industry.

The interviews focussed on small-scale food producers such as orchardists growing subtropical fruits and low chill stone fruit, macadamias, vegetable growers and an integrated vegetable and aquaculture producer. We also interviewed some nursery operators and consultants working in the industry (see Appendix 1). Our interviews did not cover amenity horticulture and floriculture or other non-food horticulture, although our training team included two landscape contractors.

Some of the most useful information was gleaned from people who were teachers as well as growers, as they were more easily able to make the link between industry trends, practices and sustainability training needs.

Our focus on food production meant the overlap between horticulture and agriculture was considerable. As a general rule we found that what applied to sustainable agriculture was also applicable to sustainable horticulture.

Concurrent with the stakeholder interviews, the project team worked on the development of Sustainable Horticulture Principles. We were thus able to show drafts of this document to some of the interviewees and incorporate their feedback.

Prepared questions were used to structure our interviews, though often a more free-flowing conversational style was considered more appropriate. These guiding questions were:

- What aspects of the horticulture industry are changing and what are not?
- What are the barriers or challenges to more sustainable practice in your part of the industry?
- What are some of the best practice examples of businesses implementing sustainability in your industry?
- Where do you look for information or inspiration on these issues?
- What are the training issues to support more sustainable practice that affect you or your suppliers?
- What are the important sustainability principles that need to underlie any training for students in the horticulture industry?
- What non-accredited training elsewhere might be usefully brought in to the VET sector? What good resources are you aware of?

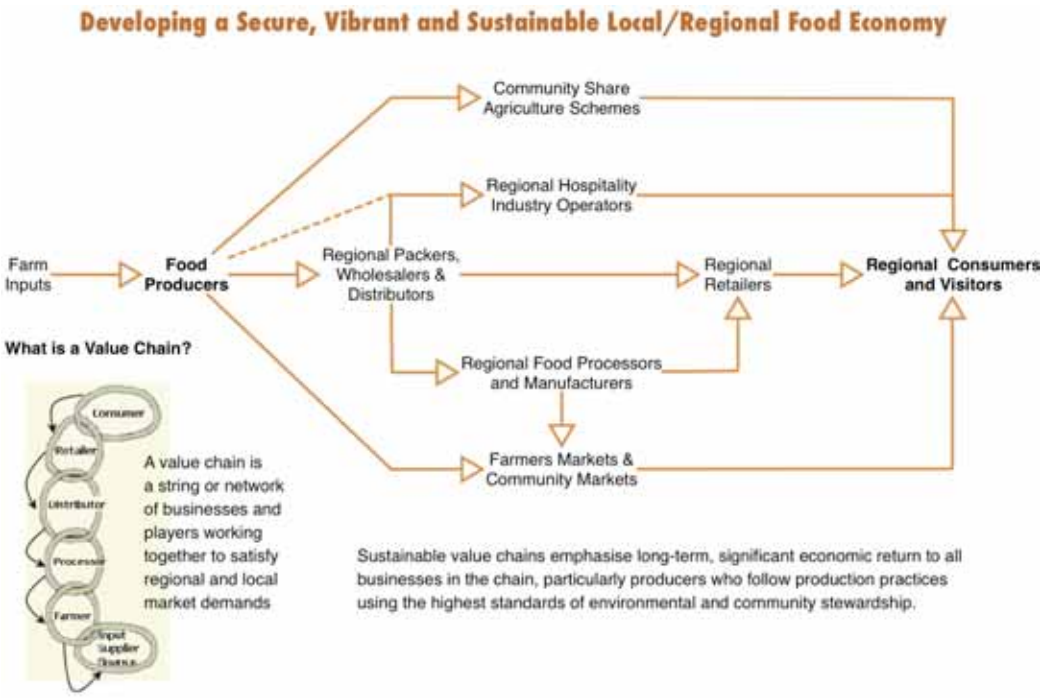
See Appendix 1 for a list of the interviews/ consultations that took place.

Members of our project team also attended a number of industry related forums with an emphasis on sustainability. These provided

"Sustainability is essentially an on-going learning process that actively involves stakeholders in creating their vision, acting and reviewing changes. As a result, education in the context of sustainability is now understood as a change process rather than a message or level which must be achieved."

Tilbury, D., Coleman,V., Jones, A, and MacMaster, K., A National Review of Environmental Education and its Contribution to Sustainability in Australia: Vol 3: Department of the Environment & Heritage and Australian Institute in Education for Sustainability, 2005

valuable opportunities to collect additional information. The most useful of these forums was the Biological Farmers of Australia Roadshow held at a macadamia plantation in Rosebank. The Northern Rivers Food Resilience Roundtable, convened jointly by North Coast Health Promotion and North Coast TAFE, provided opportunities to connect with sustainability oriented farmers from across the wider region and with consultants working on two major regional food projects.



The Local Food Value Chain from the Food Resilience Roundtable, July 2009

2. Industry Trends

Some relevant trends in the horticulture industry mentioned by our informants were:

- The industry is facing greater uncertainty, eg. increasing climatic variability, rising costs of crucial inputs like energy and fertilisers, etc.
- Increasing interest in intensive food production in urban and peri-urban areas ranging from hi-tech controlled environment production through to nurseries and community gardens and specialist niche producers.
- Horticulturalists are increasingly attracted to local "alternative" retail outlets like farmers markets and community share agriculture schemes where they are price makers, not price takers.
- Big growth in opportunities for urban horticulture services/consultants mirroring strong consumer demand at nurseries, backyard food growing is a big trend.
- When customers can be confident of what they are getting, many are willing to pay the real cost of production. More consumers are willing to pay a premium for products that are "clean and green" and locally produced.
- There is a trend in marketing to tell the stories of the product and the producer, so restoring a direct link between producers and consumers.
- Some larger scale producers are now converting to organics, and conventional growers are employing "low hanging fruit" strategies from organics, for example, composting and using ground covers instead of herbicides.
- Greater awareness in the industry of practices such as spraying. Ten years ago farmers were just defensive. Now they know more about the implications and the effects.
- Growing awareness of water and resource management issues and interest in water efficient plant varieties and technologies.
- Strong demand for organic produce in export markets.
- Sustainable agriculture professional networks and representative bodies are getting stronger and more confident.

3. Emerging Industry Action Priorities

Observations from our interviews about emerging action priorities for sustainability in the horticulture industry included:

- Producers need to have a whole range of strategies to deal with problems so if one thing

doesn't work something else will.

- Economic viability will increasingly depend on high standards and certification.
- Look for opportunities to integrate consumer education in marketing, eg. community share agriculture (CSA) schemes and farmers markets.
- Understand your soil – its specific strengths and weaknesses – and focus on conserving and enhancing topsoil and on building and retaining soil carbon and other carbon stores.
- Make the most of every drop of rain that falls on your land.
- Be very aware of effluents and run-off.
- Develop a more integrated ecological approach to horticulture – eg. building habitat to encourage owls for rodent control at Brookfarm
- Become more conscious of reliance on non-renewable inputs and outputs (and relevance to GHG emission mitigation) and consider alternatives to reduce this vulnerability.
- Consider strategies to mitigate risk and infrastructure costs associated with increasing weather variability and the likely increase in severe weather events.
- Look for ways to differentiate and add value to your products – tell the stories.
- Preserve the integrity of open pollination and heirloom plant varieties in order to increase resilience to climate change impacts and control input costs.
- Understand and strengthen biodiversity through whole farm management planning.

4. Barriers and Assumptions

Our interviewees identified barriers to sustainability transition in the horticulture industry. These included:

- Soil erosion remains a problem that is seen by many as too big to handle. It is capital intensive to fix and needs to be done on a big scale.
- Policies that subsidise non-resident landowners through, for instance, tax rebates. The result is often that nobody takes responsibility for the land, giving rise to problems that spread to adjoining properties.
- Total Catchment Management is an idea accepted at the bureaucratic level but is not matched by action on the ground.
- Practices not based on valuing natural resources. An example is the amenity horticulture practice of burning prunings and then buying mulch, rather than chipping and mulching.
- Industry research is focused not on sustainability, but on short-term solutions and

"We teach an integrated approach where we talk about 1-star systems that rely on fossil fuels. They are polluting, expensive to run and vulnerable to weather, input costs, market conditions, etc. A 2-star system relies on cultural practices and you make some changes and still do a lot of the work. A 5-star system has sustainability built into the design. You work with the ecology so that they system largely looks after itself."

Rob Fenton, Head Teacher Organic Agriculture, Riverina TAFE, speaking at the BFA Roadshow

consumer preferences, for example food buying habits that perpetuate unsustainable production practices.

- A widely held view in the industry that the soil is an inert medium to exploit or that the physical properties of soil are all important (rather than including the biological activity level) and nutrients can just be added.
- Lack of access to effective sustainability training for the industry.

- Difficulty in finding necessary resources such as good compost.
- Lack of a coherent whole of government approach to sustainability transition. Some agencies are supportive and others are not.

Some of the common taken-for-granted assumptions mentioned in interviews as impediments to needed changes in the industry were:

- That inputs like phosphate are an inexhaustible resource and that you could not operate effectively without using chemicals such as Glycophosphate; that NPK, etc, in chemical form has the same effect as in an organic form; that most chemicals just break down in the soil quickly.
- A naïve belief that government policy and advice is neutral and represents the farmers/ community's best interests.
- The ideology that productivity can increase indefinitely and that there will always be new technologies, like GM, that will keep boosting productivity.
- That bigger is always better and that monoculture is better/easier/more productive.
- That all other vegetation and wildlife not related to the crop you are growing are either weeds, pests or irrelevant.
- A naïve environmentalism that says planting trees, any tree, is always good; so long as

"There might be 50 landholders in one valley and it is hard to get them all to cooperate and see the connections between what they are doing and what the effect is further down, eg. if a dairy has run off into the creek or someone overuses fertiliser, etc. These issues can be difficult to manage on a catchment level but it needs to happen. Individual farmers need to see where their farm fits into the whole ecology of the catchment and have the skills to get together to solve problems. We need to give students that perspective. The environmental context of the whole catchment - this needs to happen in the education of the individuals, be put into the whole farm plans and be promoted through and by the farmers' organisations. There are a lot of operations doing some good things which is a start, but they are not best practice. Sometimes it tends to be a bit token – It needs to go further."

Hogan Gleeson, Riverdell Organics and EcoCity Farms, phone interview

something has been recycled that makes it OK; if something says it is 'green' it is.

- If the customer wants to plant it in their garden we should sell it.

5. Training Implications

Our interviewees shared their thoughts on the training implications of sustainability transition in horticulture:

- Students need to understand the relationships between different components of the whole ecological system they are working with – why it matters to build or protect habitats or increase soil carbon.

> ***"If students get the understanding that everything is a living system – and thus how their activity fits into this larger picture – they will know that what they do matters. It gives meaning to why we do it this way and not that way. They will value the decisions they make and know that they are contributing to changing the world for the better. It is very disempowering to just get told what to do."***
>
> Hogan Gleeson,
> Riverdell Organics and EcoCity Farms,
> phone interview

- A holistic unit is needed up front to provide an understanding on which everything that follows can be hung. This should aim to give students an understanding that everything is part of a living system and how what they do fits into this.
- Shift away from a one-size-fits-all approach to training. We need to teach horticulture students to think so they can see what is needed in specific situations. The industry needs proactive practitioners at all levels – "It is very disempowering to just get told what to do."
- We need to teach students how to deal with uncertainty and manage resilience on their land and in their business.
- Students need an understanding of the drivers and impediments of sustainability and the fundamental connection between their activities and the environment, often over extended time periods.
- Integrate the social and economic aspects of sustainability within an ecological model.
- Students need an understanding of total catchment management principles and to be given the skills of collaborative problem solving. They need to understand the connection between operational practices such as tractor use and what happens over a span of years.
- Trainers need up-to-date information on sustainability best practice in the various sectors of the industry. Helpful publications are available from the various industry associations.
- Students need to understand and be able to skilfully manage the characteristics of particular soils they are working, not just soil 'types' in general.

Sustainable Horticulture Principles

From our interviews, we distilled some principles for a sustainable horticulture enterprise that incorporated the relevant principles of organic agriculture, including some that relate to the social and business aspects of a sustainable business enterprise. We realised this process could go on indefinably so we stopped when we had something we could use for discussion that would give students a picture of what a holistic approach to sustainable horticulture might involve.

We also formulated some guiding strategic questions that may be useful when faced with making a decision:

- What are the natural systems at play here?
- How can I work with them?
- What are the consequences of working against them?
- What are the best options in this situation?
- What loops can we close in this system?

PRINCIPLE	SOME PRACTICES ON HORTICULTURE
Build soil health and biodiversity using low input, organic methods	• Increase soil carbon content • Keep the soil covered with mulches and cover crops • Use composting, worm culture and slash cover crops • Use natural minerals sourced from ethical sources • Minimise importing soil, nutrients and other inputs from offsite • Maximise onsite closed cycles by turning wastes into resources
Value and preserve water resources	• Capture and store water onsite with tanks, swales, fauna friendly dams, ponds, etc • Minimise run-off and ensure the water quality of any run-off into catchments • Recycle grey water and run-off from irrigation • Select appropriate species for the climate and conditions to lower water demands
Eliminate chemical use for weed and pest management	• Use Integrated pest management practices • Increase diversity of flora and fauna species with habitat creation, e.g. bush regeneration areas, frog-friendly edging, toad proof ponds, etc • Select resilient species – maximise local indigenous plants and match planted species with soil type • Use non toxic, natural sprays with awareness of ecological impact • Design for weed and pest suppression • Don't plant or sell local environmental weeds
Use energy efficient methods and materials	• Use ethical suppliers and sustainably sourced products – local where possible • Redesign – for lower energy consumption, e.g. proximity to source, solar pumps and lighting, etc • Reduce – fossil fuel and off-farm electricity use • Reuse – pots, bags, materials • Recycle – construction materials, containers, etc • Renewable supplies with low embedded energy, e.g. coco peat rather than plastic
Create places and businesses that benefit people, indigenous fauna and local communities	• Support biodiversity through all operations • Exercise the precautionary principle when introducing new technology, eg. GMO • Follow principles of justice and fairness for staff and customers • Where appropriate use open pollinated, organic seed and local heirloom varieties • Boycott unethical and environmentally/socially harmful products and practices • Maximise community building in design and all other processes • Consider intergenerational equity in decision making
Create a business culture that encourages sustainable actions	• Encourage ownership by the whole team of the move towards sustainability • Educate the whole team on eco outlook and practice • Motivate staff – reward good practice and innovation • Eco marketing – highlight your eco credentials • Build in continuous improvement and measure results – keep lifting the bar • Seek to influence suppliers and customers to improve environmental performance

TABLE 3

See also:

IFOAM Principles of Organic Farming, IFOAM is the International Federation of Organic Agriculture Movements. It is an 'umbrella' organisation for the organic industry, made up of nearly 800 organisations from 104 countries – www.ifoam.org/about_ifoam/principles/index.html

Principles for Organic Farming, Tim Marshall – www.natsoc.org.au/html/papers/marshall.pdf

The Training Package Unit Review

The following unit analysis covers three units:

- RTF3503A Sample Soils and Analyse Results
- RTF3012A Implement a Plant Nutrition Program
- RTC3404A Control Plant Pests, Diseases and Disorders

From our consultation with sustainable horticulture practitioners, we learned that an integrated approach is central to sustainable horticulture. As such, we saw it necessary to trial the integration of key units in the same way (refer to workshop plans for more information).

Adaptations to the above units have ranged from increasing general environmental awareness on site and the flow-on effect, developing an awareness and consideration of soil biology, and developing an understanding of wider sustainability implications such as climate change and resource depletion.

The terms "environmental" and "sustainability" used within the analysis are distinct and not interchangeable. "Environmental" relates to the immediate site and sites where there may be a direct flow-on effect, for example, releasing pollutants into a waterway or clearing land that leads to erosion elsewhere. "Sustainability" is applied to a much broader, global context and encompasses issues such as resource depletion, climate change, loss of biodiversity, as well as considering the health of communities and their local economies.

The term "linking sub-element" refers to elements, new or adapted, that highlight the relationship between the elements of different units. The "linking sub-elements" below are limited to the three units on which the trial focussed. Examination of numerous other potential "linking sub-elements" showing the connections between these units and other units not examined here would more comprehensively highlight the interconnectedness of all horticulture units and result in a better understanding of sustainable horticulture practices.

"Key Questions" have been included beside some new and adapted sub-elements to demonstrate what the unit might look like.

Issues that focus on unit adaptations for sustainability are primarily related to the nature of sustainability. Sustainability is a fast evolving field that is difficult to define (see Appendix 2). While suggestions such as "with consideration of the environment" have been made below, further elements are needed to assess students' understanding of sustainability. Understanding sustainability will allow students to make informed decisions in horticultural contexts beyond those outlined in the units.

The Australian Industry Skills Councils' (ISC) report: *Environmental Sustainability – An Industry Response* mentions the initiatives by AgriFood Skills Australia and states that the agriculture and food training packages already include "a large number of units that specifically address environmental sustainability skills". The report lists a number of units including "Treat Weeds."

It is hard to tell whether what the ISC is referring to as "environmental sustainability" is going as far as we would argue is urgent and necessary. Will these units be interpreted by RTOs and individual trainers in a way that helps bring about a shift in thinking and practice to support holistic sustainability, or will they be read primarily in terms of compliance driven "environmental improvements"?

Just because a unit such as "Treat Weeds" has an environment related title does not mean it contributes to sustainability skills in students. In fact, it is likely that, in many cases, the approach taught would assume herbicide use as a given

and not necessarily encompass alternatives including a redesign of the whole land use system and use of resources that might eliminate the need for “treating weeds”. These are the basic outlook questions that we believe should continue to be addressed if training for sustainable development is to be supported by VET training.

Lack of access to the Horticulture Training Package review process was a problem. We constantly had the feeling that someone had already done the work or there was something that we were missing. When the Agrifoods Skills Council did respond, it was with a copy of their newly published “Environmental Scan” which referred to sustainability objectives but not how it would be implemented in the revised training package. Despite attempts to communicate further, we were not able to determine what the plans were or generate interest in our work. In the end, we decided to just focus on running the trial and making our own contribution. The proposal to merge the Agriculture, Conservation and Land Management, and Horticulture training packages to allow more flexibility seems a good idea, though this will not, in itself, necessarily shift the training in a more sustainable direction.

The Sustainable Horticulture Training Trial

1. Rationale

From our consultation with sustainable horticulture practitioners, we learned that an "integrated approach" was seen central to sustainable horticulture (see Industry feedback). As such, we focussed on creating a more integrated training package. This eventually took the form of a trial integration of elements from 3 selected units.

From our review of sustainability education literature we recognised that it was also vital to clarify to students the meaning of "sustainability" as well as **why** it is important in the context of horticulture.

Throughout the unit analysis we tried to identify ways to incorporate features of sustainability into the horticulture units. Ultimately, however, the units only provided scope to explore strategies for implementing sustainability. To address the need to define sustainability and explore the reasons why it is of central importance, we created an outline of an *Introduction to Sustainability* unit that was delivered prior to exploring the integration of the horticulture units. This served to first orientate participants to sustainability. In this orientation and throughout the trial we used our "sustainable horticulture principles" (see above) to simplify sustainability in the complex "integrated approach".

Another consistent message from our reference group members, second only to "an integrated approach", was the necessity of a shift in attitudes towards the soil. This directed our focus to the following three units: RTF3503A Sample Soils and Analyse Results, RTF3012A Implement a Plant Nutrition Program and RTC3404A Control Plant Pests, Diseases and Disorders.

The horticultural context in which we based the trial was the relatively small-scale production of food, rather than other aspects of the horticulture industry. We chose vegetables to focus on as the participants were mostly growing vegetables rather than other crops either commercially or in an amateur capacity, including being active in the establishment of a local community garden.

2. Trial Curriculum Overview

- **Orientation to Sustainability: Giving students not just the "How" but also, the "What" and the "Why"?**

In the first session of the trial, participants were facilitated through an exploration of what is sustainability and why is it important to the horticulture industry (see workshop plan in the Appendix). Developing this understanding of sustainability early on, allowed students to start to make independent suggestions about

sustainability throughout the remainder of the course.

- **The Principles**

The sustainability principles were referred to as often as possible over the course of the trial. They served as a continuous theme providing a framework for students to develop their understanding of sustainable horticulture.

- **Integrated Unit Approach**

The trial did not comprehensively cover the three units but rather focussed on the interrelationships of the three units, largely omitting other elements. Given that the current training package does not integrate units, it was necessary to identify key elements from each unit where the interrelationships were most apparent. These elements were identified following the unit analysis.

Key unit intersections included:

- The relationship between soil health and plant health
- The relationship between plant health and pest resistance (linking back to soil health), *and*
- The relationship between soil inputs ("plant nutritional program") and soil health

- **A New Understanding of Soil for Sustainability**

Sustainability generally requires a greater consideration of ecologies. From the information we received from our Industry Reference Group, it became clear that a better understanding of "soil ecologies", sometimes referred to as the "soil food web", was necessary.

To do this we utilised the soil testing methods related to the Northern Rivers Soil Health Card – Vegetables (see Appendix). This tool is used to assess the biological and physical properties of soil. It was developed by farmers for farmers over a number of years and was documented in 2008.

This method of soil testing is used to establish:

- Diversity of soil life
- State of ground cover
- State of the soil structure using a penetrometer
- Water penetration rate with infiltrometer
- Degree of root development
- Soil structure
- Aggregate stability
- Earthworm activity
- Soil PH
- Plant vigour

3. The Course

The course ran over two evenings for 3 ½ hours in a classroom with a day-long field trip on a weekend in between these two sessions.

The teaching methods involved presentations, video clips, doing practical soil testing, making compost, inspecting plant health and lots of animated discussions (see the session details in the Appendix). We also made a point of introducing the participants to a wide range of books, magazines, charts and fact sheets that we had collected through our research and encouraged them to seek out these and other Internet resources.

Twelve people participated in the trial. The participants were a diverse group in age and experience. Not all of them were employed full time in the industry. Some were passionate amateurs who earned some income from their produce or worked in other aspects of horticulture such as in a business maintaining indoor plants.

The BRCC Certificate II Horticulture trainer participated for professional development and the project coordinator, Katrina Shields, was an additional participant/observer. There were two main trainers, Lisa Barnes and Dave Forrest, and another current Certificate III Horticulture student and experienced landscaper, Michael Rose, who also contributed to the training.

We approached a couple who run a local market garden and nectarine orchard (Robin and Helen Wolf from Fresh & Wild Organics) for the field trip and practical component. These people have been involved in the industry for at least 35 years and had converted from conventional methods to

Pilot Program Outline

SESSION	CONTENT
1. Sustainability Thinking and Principles 3.5 hours	• Explore the concept of sustainability • Why is it needed? • Where is horticulture now? • Principles of a sustainable horticulture enterprise
2. Sustainable Soils – *Field trip* 7 hours	• Soil Health Card testing • Ways to build soil health • Compost making • Observing a market garden that converted from conventional to organic production
3. Dealing with Pests and Diseases 3.5 hours	• Integrating learning from the field trip • Integrated pest management • Relationship of soil building to pest resistance • Revisit principles • Course evaluation

TABLE 4

certified organic production which they now sell through the local farmers markets, as well as through the retail outlet we had focussed on in the retail trial. The trainer, Dave Forrest, (who had also been active in the development of the Soil Health Card) had been a consultant to these growers through the conversion process, so he knew their operation well.

Key learning objectives of the course included:

- An introductory overview of the ways a sustainable approach to horticulture/agriculture would be different to conventional methods
- Building competency in using the soil health card methods for assessing soil health
- Developing competency in soil building, including making and using good quality compost
- Exploring the interrelationship between integrated pest management, healthy biologically active soil and balanced plant nutrition leading to resilience to pest problems.

For details of the session outlines please see Appendix 7

Evaluation and Reflection

Some comments from the evaluation forms:

"I don't think this course will have the impact desired until it is made the foundation of other horticulture certificates and education. This information changes the content and practices of everything within the industry. Hopefully once what has been demonstrated in sustainable horticulture becomes common practice, all other pieces will fall into place." Luke McDonald (setting up organic market garden)

"I feel it is vital to include sustainable horticulture into educating people in the horticultural industry. I would love this to overflow into schools so that our children get a grasp of this way of thinking from an early age. This knowledge would be priceless." Renae Meadows

"It was important to have an onsite visit and make the compost – to "do something" sustainable." Susan Hennersy Certificate II Horticulture Trainer

"The field trip was great, seeing the practical side of sustainable horticulture... it was well balanced with the science behind it. I will remember how to do a soil test." Malcolm Yusof

"What I found had the most impact was to see that even a chemical farm can be salvaged and returned to a positive chemical free outcome. To appreciate the amount of biology in the soil – with the sheer numbers of life – how can spraying chemicals be anything but a last resort?" Luke McDonald

"I found the Soil Health Card test 10 point system very useful. It was simple, practical and ingenious. This type of course is a necessary part of the future health of our population. Power needs to be taken back from the greed and selfishness of monopolies and monocultures and returned to the grass roots culture" Solvig McDonald (in the process of setting up organic market garden)

"Excellent comprehensive informative talk and practical observation – relevant and impressive. It

gave me greater appreciation of the soil and the soil health tests are a useful tool" Kaye Groves - small organic producer

What could be improved?

All the answers to this question related to doing more on different topics, eg. water efficiency, use of compost teas. This would mean extending the scope of the course. Some wanted more handouts, some needed more visuals, others wanted more time to do some planting or problem solving with particular pests. Suggestions for resources we could have used included: PH chart, chemical symbol list, diagram of macrospores and microspores, and pictures of organisms that may be found in soil.

"If I were to design a training package on sustainability, I think it would need to include water conservation as a corner stone of the subject after soils and botany. On the NTIS website there is a Certificate 1 in Water Sustainability (NPW10107) which would make an excellent companion. Unfortunately its details seems to have been removed, perhaps for the purpose of review" Excerpt of letter from participant, Nigel Morley, who runs an indoor plant maintenance business.

Research team reflections:

1. Problems

A member of our training team had to withdraw at short notice due to a crisis. This created some last minute practical problems for the first session.

It was hard to meet the needs of the group who participated while relating it back to the units we wanted to investigate. In retrospect, we can see that we came down more on the side of running a good introduction to sustainable horticulture than following the unit outlines closely.

As mentioned above, not having access to the review of the training package was a problem.

2. Successes

The fact that there is so much information available on sustainability and organics in publications and on the Internet, was both positive and negative. It meant there was a lot to draw from but it was very easy to get overwhelmed with potentially relevant material.

The process of workshopping and distilling the principles of sustainable horticulture and the guiding strategic questions was useful in giving some coherence to the vast amount of resource material we were gathering.

Seeing how much permaculture and organic agriculture had to offer horticulture was also very useful. One of our team had done a Certificate IV in Permaculture Systems and two of the trainers enrolled in the Certificate IV in Organic Agriculture as a result of our research. Seeing the potential for integration from these other fields based on a sustainability perspective gave us leads on how the Horticulture Training Package could be adapted.

Finding and trialling the Soil Health Card was very positive and received the most positive feedback of any of the activities undertaken. The students, some of whom had been growers for many years, found this a new, practical and empowering set of tools for benchmarking and measuring improvements in their soils. It is motivating to see how the health of soil changes in response to better practice. The advantage of the system is that it requires no fancy equipment or specialist knowledge. The accompanying Best Practice Guide is also a very good resource. We felt they should both be used at the Certificate II, III or IV levels and beyond.

The field trip was a great success despite a very hot day. Having access to a good demonstration site at a commercial market garden that had started out conventionally then converted to organics was a definite plus. Hearing how the growers had changed their outlook and practice was very illuminating. The tutor's depth of knowledge and inspiring example made a profound impact on course participants and contributed a lot to the success of the trial.

The frequency and quality of discussion in all three sessions was also important to the success of the course and was rated highly by participants. These discussions provided opportunities to reflect on and integrate learning, share experience and skills, and critique conventional horticulture practices.

Section 4: Recommendations

To summarise the suggestions and discussion elsewhere in this report, we have drawn together the following suggestions relating to VET training in Retail, Horticulture and some general areas pertaining to RTOs and individual trainers.

Areas for further work and recommendations for the retail training package:

1. We believe there needs to be new units that cover "Implementing sustainable practices in retailing" that has appropriate adaptations for Certificate II, III and IV levels. We suggest that such units at each level should become core rather than elective. These units should be delivered early in the training sequence. This would set up the understanding of why we need to change towards sustainability, explore what sustainability means and introduce the principles of sustainable retailing.
2. We suggest the range of content in the trial course we ran could form the basis for such a unit/s. For real change in this industry, further work is needed to assess whether importing the Guideline Competency Standards for Sustainability, the approved pathway for creating such units, will produce an outcome that adequately encompasses the fullness and complexity of sustainability in the retail context. Please refer to the trial content outlines in Appendix 4 for the range of competencies we explored.
3. The existing units need further review to integrate sustainability thinking and practice into all relevant sections in the same way OH&S was integrated in the past. Training toolboxes with case studies of best practice retailers and wholesalers are needed to support the teaching of these adapted units from a sustainability perspective.
4. There is more work needed to design assessment tools that address sustainability competencies. We acknowledge there are inherent difficulties in assessing transformative learning.
5. For broader industry development, we recommend investigating the efficacy of value chain learning partnerships that involve a range of small to medium businesses sharing information and experience on sustainability transition as a basis for more effective collaboration along the value chain from producer to retailer.

Areas for further work and recommendations for the Horticulture Training Package:

1. There is a need for an introductory unit – perhaps titled *Implement Sustainable Practices in Horticulture* – to be delivered early in the training sequence at Certificate II, III and IV levels. This unit would give an overview of sustainability including, for example, basic ecology, working within resource constraints, taking a systemic rather than a linear view of production including input/output cycles, and an overview of environmental practices. It

"We know that sustainability is complex. It needs systemic thinking and requires a range of responses. This means sustainability demands an interdisciplinary approach and an understanding of the different ways people approach 'the problem' is important in designing and delivering a well thought out 'solution'."

Dept of Environment & Climate Change NSW Guide to using research in sustainability programs, p21, DECC Social Research Series 2009

would aim to build systemic thinking and give students a better picture of how each part fits into the whole, in the context of sustainability transition. The unit could build competency in assessing the ecological footprint of an operation and measuring against environmental benchmarks, while introducing the social/community, cultural and economic dimensions of sustainability as well as environmental. Current unsustainable industry practices would be critiqued to help students understand the urgency of the transition and the inadequacy of a compliance driven approach.

2. With this unit as the foundation, aspects of sustainability need be explicitly integrated into many of the horticulture units. We recommend that this process be undertaken by practitioners who have a deep understanding of sustainability practice in an industry that has many meanings for the concepts "environmental" and "sustainability". We have made the case elsewhere in this report that just because a unit has a title that relates to working in the environment does not necessarily mean it will build competency in sustainability skills. We have also put the case in Section 3 for emphasising the relationships between different units in order to encourage systemic thinking. We also recommend that particular emphasis be put on understanding the soil food web and the role of organic matter (carbon) and biology within the soil.

3. In the official rewriting and review of these units, we recommend that industry peak bodies such as the Biological Farmers of Australia (BFA), whose members have a long history of sustainable practice, be brought actively into the process as their industry experience of applying sustainable practices would provide a sound basis on which to build the new training.

4. In this integration process we recommend looking to other accredited training, such as the organic agriculture courses at Riverina and Wollongbar TAFE, as potential sources of material that could be brought into the horticulture units. There are also accredited Permaculture training units that could be adapted or coopted that give a better understanding in systemic thinking (see Permaculture Units Cert I-IV http://www.permacultureinternational.org/apt/apt-units/). Another source is the Conservation and Land Management Units such as RTC2702A Observe Environmental Work Practices.

5. There is a need for new units that focus on training for emerging industry trends. Some examples include training in intensive urban agriculture, small scale aquaculture, ways to measure, sequester and rapidly increase soil carbon storage (as well as other carbon storage options), undertaking assessments for carbon accounting in horticulture, undertaking the range of organic and other certification processes, predicting and dealing with extreme weather events, waste minimisation in horticulture, and advising clients on more sustainable products and practices. There may also be a need for training in the use of renewable energy systems and technology in the horticulture industry.

6. New training materials and toolboxes need to be developed to support the teaching of units with a holistic sustainability approach. These should include case studies of best practice and innovation in various parts of the industry. We recommend that this also include integrated marketing and support models such as Community Share Agriculture (CSA), and distribution models that support sustainability such as Food Connect in Brisbane (see www.foodconnect.com.au)

7. Horticulture trainers need to be involved in ongoing professional development that immerses them in a sustainability perspective, as they will only communicate to students what they understand themselves. We would encourage the use of more incentives to encourage busy trainers to take up these opportunities.

8. We would recommend the CSIRO (2009) book on Sustainable Gardening by Rob Cross & Roger Spencer as a suitable text for Horticulture students.

9. The process of bringing sustainability into the upgrade of Certificate IV in Training & Development to Training Education and Development 2010 is now underway but too late for us to assess the content at the point of writing this report. However, we recommend that a holistic picture of sustainability, beyond waste and energy efficiency and limited environmental improvements, be designed into the new TED units. Application of the principles of education for sustainability to the VET sector should also be explored if future trainers and students are to be equipped to

cope with rapid change and adaptation to the far-reaching effects of climate change and resource depletion.

General Recommendations for Horticulture & Retail Trainers and RTOs

1. Value and support general non-accredited courses in aspects of sustainable living & working. Experience at our college has shown us that such courses are opportunities to develop and test new ideas and draw out innovators. The bulk of the experts in sustainability are not in the VET system – they don't have qualifications in TAA or even in their industry area – but their life and industry experience in practical sustainability is a rich and vital source for VET. To take advantage of this reservoir of talent, we need to seek out best practice. We found there are many passionate and knowledgeable practitioners who will get involved if they are sought out. Students need to be offered visions for more sustainable alternatives grounded in real life practice.
2. Trainers should be encouraged to take up the many existing opportunities to broaden and deepen their sustainability knowledge and skills. Subscribe to sustainability oriented journals, attend the proliferating non-accredited training opportunities in sustainability, and join organisations that are promoting sustainability (see resource appendices for Retail and Horticulture).
3. Walk the talk at you RTO. Make the training situation an opportunity to engage in better practice. Build up knowledge of local suppliers with more sustainable products and practices. The range of these is expanding exponentially.
4. Beware of green washing. There is a growing tide of green claims and more and more people are jumping on the green bandwagon. We need to keep our own critical faculties and encourage our students to critically analyse the claims being made for so-called green products.
5. Perhaps most critically, we recommend that in order for RTOs to develop the resources, perspectives and assessment tools they need to meet the sustainability challenge, we need to share more. This requires a cultural shift from competition to collaboration between trainers and between training organisations. We would not have been able to complete this project without the enthusiastic support of people we may in the past have perceived as competitors. One readily available tool for collaboration would be to launch an email list focussing on sustainability in VET. Local government sustainability officers in NSW have found great benefit from joining the yahoo list: Sustainability Educators (sustainabilityeducators@yahoogroups.com.au). Horticulturalists have also set up the pest web initiative (www.**pestweb**.com). Such communication tools could help with issues of trainer isolation, promote networking about professional development opportunities, and encourage the sharing of resources.
6. Finally, we recommend the funding of collaborative learning research and development projects specifically related to integrating sustainability into the VET sector and workplace learning more generally. Such projects should actively involve sustainability leaders from outside the sector. They need to be based on an understanding that the sustainability transition will effect a transformation of workplaces with ongoing and unpredictable implications for the VET sector for the foreseeable future. This is not a short-term issue and there are no quick fixes.



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Dept of Environment & Climate Change NSW – ***Guide to Using Research in Sustainability Programs, DECC Social Research Series 2009***

Section 5: Appendices

"Sustainable Development calls for additional and different processes than those traditionally thought of in education. The quest for sustainability demands new approaches to involve people, rather than convey just a body of knowledge."

Tilbury, D., Coleman,V., Jones, A, and MacMaster, K., A National Review of Environmental Education and its Contribution to Sustainability in Australia: Vol 3: Department of the Environment & Heritage and Australian Institute in Education for Sustainability, 2005

Members of the Research Team, the Industry Reference Group (marked *) and other Industry Contacts

NAME	ROLE	INVOLVEMENT	INDUSTRY
Katrina Shields	Sustainability Education Coordinator BRCC	Project coordinator, co researcher, report writing Participated in Transition Leadership Co-Learning workshops and the Northern Rivers Food Resilience Roundtable, facilitated by **Kenneth McLeod**	Program Manager
Bec Talbot *	Santos Ethical Product Auditor Farmers market stallholder Organic market garden grower Ethical shopping tutor ACE	Interview + co researcher + tutor on pilot + report writing Participated in the Northern Rivers Food Resilience Roundtable and the Australian Farmer's Market Association annual conference	Retail/Hort
Susan Germein *	Cert II, III and IV Retail Tutor	Co researcher / tutor for trial + report writing	Retail
Lisa Barnes *	Cert II and III Horticulture VET Co-ordinator and Tutor Horticulture Consultant	Co researcher/ tutor for trial	Horticulture
Rob Outridge	Manager, IGA Maleny	Interview + case study	Retail
John Dolman *	Manager, Santos Wholefoods (Wholesale and Retail), Food Alliance member, Mullumbimby Chamber of Commerce	Interview + involvement in pilot (sent 5 staff) + case study	Retail
Robert Rosen *	Food Links Project Consultant Brunswick Heads Chamber of Commerce, Transition Towns Project Tweed Shire	Interview and sharing of resources + case study	Retail
The Thin Green Line	Thin Green Line staff, Murwillumbah	Interview + case study	Retail
Kenneth McLeod *	Starfish Associates, Facilitator for Northern Rivers Food Resilience Roundtable and process consultant to Byron Shire Sustainable Agriculture Strategy	Multiple meetings/interviews – participation in documentation	Consultant

NAME	ROLE	INVOLVEMENT	INDUSTRY
Ed Ahearn *	Manager, Green Garage store, President, Byron United (Chamber of Commerce)	Interview, discussions re involvement of staff in pilot	Retail
Richard Storie	Manager, Dennett's IGA Mullumbimby	Discussions re involvement of staff in pilot	Retail
Paul Madeiros *	Green Grocer- Eden's Landing, Owner/Manager	Participant in trial, interview	Retail
Adam Valvasori	Values Manager, The Body Shop	Interview	Retail
Jeanie McKillop	North East Waste Forum	Presenter at Trial Workshop – waste management	Retail
Dan Harper	Cool Planet Consultancy	Presenter at Trial Workshop – energy efficiency, eco-fitout	Retail
Hogan Gleeson *	Director, Urban Ecological Systems – Ecocity Farm	Phone interview	Horticulture
Diane Hart *	Horticulturalist, Landscaper, Teacher	Interview	Horticulture
Brad and Jo Green	Mullum Creek Native Nursery	Interview and sharing of resources	Horticulture
Chris Wood	Horticulturalist, Cert IV in Horticulture and Permaculture	Consultant on content development for trial	Horticulture
Graeme Williams *	Sustainability Officer, Byron Shire Council	Sharing resources, involvement with Foodlinks process	LG Officer
Michael Rose	Landscaper, Cert III Horticulture student	Participant/ Assistant Tutor for horticulture trial	Horticulture
Wendy Gibney *	Community Support Officer - Northern Rivers Catchment Management Authority, Bush Regenerator	Interview + involvement in recruitment for trail	Horticulture

NAME	ROLE	INVOLVEMENT	INDUSTRY
Joanne Walsh	Soil Scientist, consultant recycled water on farms and specialist consultant to the Byron Shire Sustainable Agriculture Strategy	Interview	Horticulture
Helena Norberg-Hodge *	International Educator on Food Sustainability, North Byron Farmers Market group, Mullumbimby Food Alliance Member	Overseas during consultation phase	Consultant
Martin Brook	Brookfarm Macadamias	Case study	Horticulture
Rebecca Lines-Kelly *	Education and Extension Specialist, NSW Dept Primary Industries		Horticulture
Annie Kia *	Coordinator, *Resilience: Building Health from Regional Responses to Climate Change* North Coast Health Promotion	Sharing of resources	Health Educator
Dave Forrest *	President of TROPPO – Far North Coast Organic Growers Group, TAFE Tutor in Organic Agriculture	Interview + involvement in trial + co developer of soil health card	Horticulture
Tim Winton	Director, Permaforest Trust - Permaculture training	Interview	Horticulture
Susan Hennessy *	Cert II Tutor in Horticulture	Interview +participation in trial	Horticulture
	Mullumbimby Local Food and Products Alliance	Participation in meetings, establishment of eco market for local food and products with Katrina Shields and Bec Talbot	
	Food chain resilience project	Participation in food chain analysis research consultations	
Bruce Thomson	NR Foodlinks Project	Meeting to discuss collaboration	Consultant

NAME	ROLE	INVOLVEMENT	INDUSTRY
Samantha Muller	NR Foodlinks Project	Briefing on Foodlinks project	Consultant
Michael Shuman	BALLE (Business Alliance for Local Living Economies) US based	Attendance at Lecture and participation in workshop on creating Local Living Economies Seminar at Southern Cross University organised by NR Climate Change Collaboration	Retail
Jerry Colby Williams	Presenter, Gardening Australia Organics Campaigner, Horticulturalist	Attendance at Lecture	Horticulture
AFMA	Australian Farmer's Market Association	Bec Talbot - attendance at annual conference and workshops on creating sustainable farm livelihoods and building local economies	Representative body
BFA	Biological Farmers Association of Australia	Participation in Roadshow Field day	Horticulture
WRAPS	WRAPS – Sustainability Skills seminar	Katrina Shields and Susan Germein attended	Retail
Shane Dowd	AgriSkills Australia	Liaison re horticulture training package	Horticulture
Gilbert Rochecouste	Village Well -WRAPS seminar lecture	Liaison – sent power point	Retail
Prof Stuart White	Institute for Sustinable futures UTS WRAPS seminar lecture	Liaison – send power point	Retail
Jill Robertson	Aspire Publications	Phone liaison and sent us a draft of Sustainability Project	Retail
Karen Banks	Service Industry Skills Council	Phone Contact	Retail

APPENDIX 2

Our Mental Models

Albert Einstein said: *"Today's problems cannot be solved if we still think the way we did when we created them".* This quote rang very true for us in this context of finding ways to integrate sustainability into VET training. Also, as NSW Department of Education and Training Greenskills in VET Manual 2008 points out, *"Many current educational practices are focussed on trying to problem solve our way out of unsustainable development rather than on creating alternative futures".* Throughout this project we were constantly challenged to question our mental models and the assumptions behind the units and methods of teaching. The following discussion is a summary of some of the aspects that were important to us in changing our way of thinking.

1. Weak and Strong Sustainability

In its 1987 UN report, *Our Common Future*, the Brundtland Commission presented a model of sustainability sometimes called the 'triple bottom line' approach that can be expressed by the Venn diagram:

This triple bottom line approach views the three key parameters of society, economy, and environment as a necessarily interdependent triad that must be in balance for sustainable development to occur. The model implies that it is possible to strike such a balance between economic, social and environmental priorities through a process of compromise or trade-offs in which 'sustainable development' is resolved at the centre.

Unfortunately, the model fails to give adequate recognition to the 'non-negotiables' we are now being forced to acknowledge in the form of the biophysical limits of the planet. As the New Zealand Parliamentary Commissioner for the Environment put it in a 2002 report, *"This weak sustainability model fails to acknowledge the ecological constraints that humans, other species, markets, policies and developments must operate within".*

An alternative called the 'strong' or 'Russian Doll' sustainability model offers a more promising approach. It can be represented as a nested hierarchy in which both society and the economy are dependent subsets of the environment.

This model implies the integration of environmental imperatives as the necessary precondition for sustainable social and economic practice.

In its 2009 UNESCO funded report, *Strong Sustainability for New Zealand: Principles and Scenarios,* the non-government organisation Sustainable Aotearoa New Zealand (SANZ) defined strong sustainability in these terms:

1. *Strong sustainability is the prerequisite and foundation of any human development, whether social, economic or technological.*
2. *Strong sustainability means the preservation of the integrity of all ecological systems in the biosphere.*
3. *Ecological integrity means the ability of an ecosystem to recover from disturbance and re-establish its stability, diversity and resilience.*
4. *A strongly sustainable human society lives and develops as an integral part of ecosystems that have ecological integrity.*

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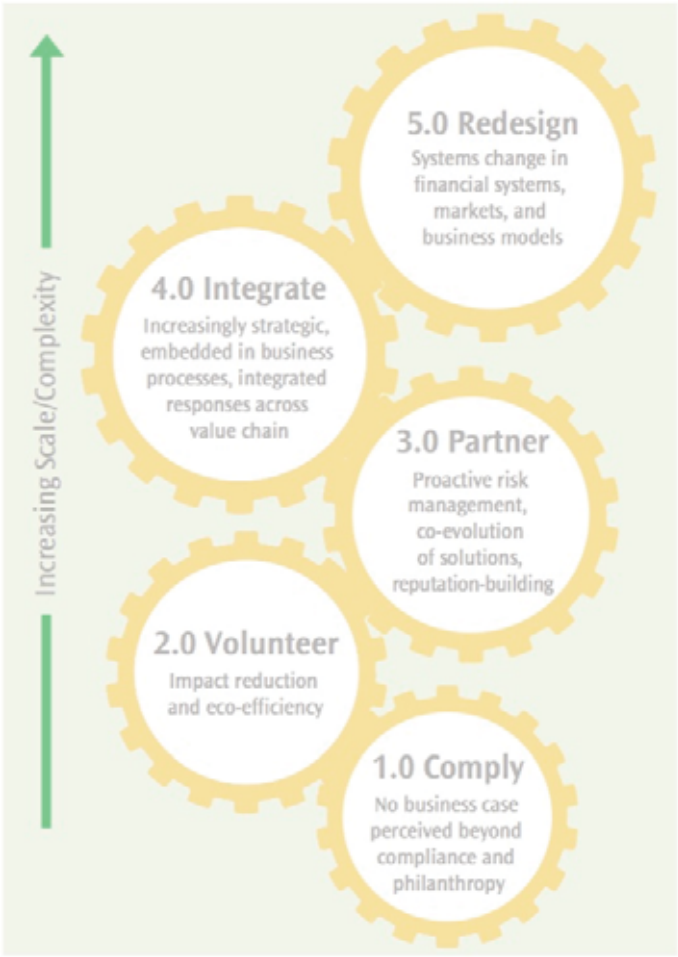
5. *Ethics, values and 'world views' directly support strong sustainability because people know that they are integral with the ecological systems of the biosphere. Therefore, people desire the integrity of those systems.*

The strong sustainability model informed the way in which our project team has approached its review of the sustainability content of the Retail and Horticulture VET units.

The Business Sustainability Challenge

The transition to a society that is sustainable within the biophysical limits of the planet requires the integration of sustainability strategies within every area of life and work, leading to far-reaching systems redesign.

Yet most of our organisations, institutions and communities have so far not ventured far beyond compliance with mandated behavioural changes and voluntary efforts to reduce their environmental footprints (see diagram at right from *Mindset in Action - Leadership and the Corporate Sustainability Challenge*, Avastone Consulting, 2007).



This presents a very big challenge for the business sector generally, and even more so for small and medium size enterprises whose operating margins are often very tight. Making the best possible use of available human and social (ie. community) resources and building value chain partnerships for sustainability with producers, wholesalers, distributors, retailers and customers are therefore critical success factors for businesses attempting this transition.

Training can be an important factor in achieving this goal if it can go beyond a 'lowest common denominator' approach driven by compliance and ad hoc impact reduction to support a process of systemic change in the industry.

Sustainability and Transformative Learning

The transition of human societies from mainly unsustainable practices to more sustainable ways of living and working will require significant paradigm shifts, particularly in the economic sphere. Given the current global situation of rapidly increasing environmental problems, linked inextricably and contributing to deepening social and economic crises, vocational education and training must, we believe, make a significant shift towards transformative learning processes.

ATTRIBUTE	TRANSMISSIVE	TRANSFORMATIVE
Teaching Approach	Focus on transmitting information and behavioural norms from recognised authorities to the learner	Focus on supporting the learner to critically reflect on received information and their own experience in order to respond effectively to a given situation or problem
Teaching Sustainability	Teaching sustainability as content	Uncovering sustainability as a learning process
Behavioural Outcome	Compliance focus	Innovation focus
Power and Influence	Top down	Top down and bottom up
Managerial Style	Command and control	Collaborative team-based
Notions of Best Practice	Mastering the status quo	Changing the paradigm
Mental Models	Improving on what's in the square	Thinking outside the square
Learning Mode	Passivity and compliance	Collaborative inquiry
Strategic Focus	Privileging economic growth within a competitive local and global context	Privileging environmental integrity through value chain, community and customer partnerships

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The project team's approach to both trials was also strongly influenced by the Federal Government's publication *Living Sustainably: The Australian Government's National Action Plan for Education for Sustainability* (DEWHA, 2009).

PRINCIPLES OF EDUCATION FOR SUSTAINABILITY

Education for sustainability is based on the following principles:

Transformation and change

Education for sustainability is not simply about providing information but involves equipping people with the skills, capacity and motivation to plan and manage change towards sustainability within an organisation, industry or community.

Education for all and lifelong learning

Education for sustainability is driven by a broad understanding of education and learning that includes people of all ages and backgrounds and at all stages of life and takes place within all possible learning spaces, formal and informal, in schools, workplaces, homes and communities.

Systems thinking

Education for sustainability aims to equip people to understand connections between environmental, economic, social and political systems.

Envisioning a better future

Education for sustainability engages people in developing a shared vision for a sustainable future.

Critical thinking and reflection

Education for sustainability values the capacity of individuals and groups to reflect on personal experiences and world views and to challenge accepted ways of interpreting and engaging with the world.

Participation

Education for sustainability recognises participation as critical for engaging groups and individuals in sustainability.

Partnerships for change

Education for sustainability focuses on the use of genuine partnerships to build networks and relationships, and improve communication between different sectors of society.

Analysis of the Current Certificate III in Retail Units

Suggested adaptations for sustainability:

UNIT: Build Relationships with Customers SIRXLS004A

ELEMENT	SUSTAINABILITY ADDITIONS OR CHANGES? Detail Content	LEVEL OF REWRITE M = Minor adjustment B = Breakout box S = Substantial rewrite	CASE STUDIES/RESOURCES
Element 1 **Establish Rapport with Customers**			
1.2 Maintain professional ethics	Ethics and sustainability Add bullet point addressing the sustainability aspects of ethics	Minor	
1.3 Accurately clarifying customer needs & preferences to maximise sales opportunities	Responsible Consumption Determining preferences, needs & wants in relation to green products Product stories	Minor rewrite 'Determining Product Preferences' section	
1.4 Add-on sales	Up selling to SP product or service	Minor rewriting	
1.5 Give customers time & space	N/A		
1.6 Effective methods to close sales	N/A		
Element 2 **Apply Expert Knowledge**			
2.1 Provide accurate information	Product pedigree, product stories, lifecycle information, including recycling Statutory leg or codes of practice? Store policies & procedures	Substantial rewrite – 2.1 – 2.3 inclusive	The Body Shop – share stories about trade not aid products

ELEMENT	SUSTAINABILITY ADDITIONS OR CHANGES? Detail Content	LEVEL OF REWRITE M = Minor adjustment B = Breakout box S = Substantial rewrite	CASE STUDIES/RESOURCES
2.2 Detailed knowledge of supplier	Product pedigree, as above	Substantial rewrite	
2.3 Demonstrate features & benefits	Sustainable features as benefits	Minor rewrite	
2.4 Negotiating price	N/A		
2.5 Accurately calculate prices	N/A		
Element 3 Provide Post-Sales Support			
3.1 Evidence of ongoing sales support	Evidence of ongoing support with recycling, product use, environmentally friendly disposal Ongoing commitments of store	Minor rewrite	The Body Shop – refill / recycle opportunities Clix Computer Shop – bring back printer cartridges for recycling
3.2 Explain backup service & support	As above	Minor rewrite	
3.3 Contact & follow-up for customer	N/A		
Entering customer details in database	N/A		
Element 4 Plan Sales Presentations			
4.1 Plan a presentation	N/A		
4.2 Select client group	N/A		

ELEMENT	SUSTAINABILITY ADDITIONS OR CHANGES? Detail Content	LEVEL OF REWRITE M = Minor adjustment B = Breakout box S = Substantial rewrite	CASE STUDIES/RESOURCES
4.3 Arrange promotional materials	Reminder to 'think sustainable – minimise paper, use recycled products wherever possible, use low impact contact methods'	M B	
4.4 Select range of products for presentation	N/A		
Element 5 Implement Sales Presentations			
5.1 Brief support staff	Include enviro information and desired sustainability outcomes in briefing	M B	
5.2 Use communication skills effectively	N/A		
5.3 Demonstrate products & services	Include product stories, enviro features & benefits, demonstrate enviro features	M	
5.4 Measure results of presentation	Include self-evaluation aspects of sustainability – reflective practice	M	
Element 6 Maintain & Use a Customer Database			
6.1 Maintain customer confidentiality	N/A		
6.2 Develop & secure customer records	Add bullet points relating to sustainability information captured eg customer participates in green loyalty program. Customer composts!	M	
6.3 Identify & follow up regular customers		M	Case study about contacting a regular re. sourcing information for special enviro friendly product?

ELEMENT	SUSTAINABILITY ADDITIONS OR CHANGES? Detail Content	LEVEL OF REWRITE M = Minor adjustment B = Breakout box S = Substantial rewrite	CASE STUDIES/RESOURCES
6.4 Use customer records to advise on products & services	Enviro friendly communication methods – email not paper Community friendly communication methods – village meeting/shop notice boards	M	
6.5 Customer Clubs & Reward schemes	Green loyalty programs Composting club Customer/Community interest clubs that relate to and strengthen your client base Responsible approach to encouraging consumption	S	Tesco UK
Element 7 Deal with Difficult Customers			
7.1 Acknowledging customer complaints & problems	N/A		
7.2 Using active listening to minimise customer frustration	N/A		
7.3 Developing customer confidence in sales assistant & product/service	N/A		
7.4 Resolving the complaint	N/A		

APPENDIX 3

Units that are currently taught at BRCC include:

Code	Title	Level
SIRXOHS002A	Maintain Store Safety	III
SIRXRSK002A	Maintain Store Security	III
SIRXCCS003A	Co-ordinate Interaction with Customers	III
SIRXSLS004A	Build Relationships with Customers	III
SIRXADM002A	Coordinate Retail Office	III
SIRXFIN001A	Balance Point-of-Sale Terminal	III
SIRXINV002A	Maintain and Order Stock	III
SIRXMGT001A	Co-ordinate Work Teams	III
SIRXMER005A	Create a Display	III
SIRXMER005A	Profile a Retail Market	III

Other units not currently taught through ACE BRCC, but which could provide good avenues for sustainable thinking, include:

Elective: Quality and Innovation

SIRXQUA001A - Quality and Innovation

Elective: Working in Industry

BSBCMN301A – Exercise Initiative in a Business Environment

BSBCMN304A – Contribute to Personal Skill Development

Elective: Food Safety

SIRRFSA002A – Monitor Food Safety Program

Elective: HR Management

TAADEL301A – Provide Training through Instruction and Demonstration of Work Skills

Elective: Product Knowledge

SIRXRPK001A – Recommend Health and Nutritional Products and Services

Elective: Retail Food

THHBKA01B – Organise and Prepare Food

THHBKA03B – Receive and Store Kitchen Supplies

Source:
http://www.ntis.gov.au/Default.aspx?/trainingpackage/SIR07/qualification/SIR30207/rules

APPENDIX 3

Possible sustainability adaptations for current units:

CODE	TITLE	POTENTIAL GREEN CONTENT
SIRXOHS002A	Maintain Store Safety	**Reuse, refill, reduce and recycle principles:** cleaning, waste disposal, recycling practices, chemical usage and storage, risk assessment of hazards inherent in sustainable practice, eg policy and practice for ensuring safe shelf life of foods or cosmetics which are preservative free **Education:** training and coaching for staff on good enviro practice **Information, promotion and inspiration for customers:** turning good safety & hygiene practice into a marketing attractor
SIRXRSK002A	Maintain Store Security	**Recycling:** store surveillance equipment. Safe recycling, reuse or disposal **Energy efficient operation** of equipment & especially of after hours security lighting
SIRXADM002A	Coordinate Retail Office	**Reuse, reduce and recycle:** reduce paper usage towards paperless office, recycle cartridges and other hardware, find energy efficiencies, source recycled inputs (eg paper, cartridges)
SIRXFIN001A	Balance Point-of-Sale Terminal	??
SIRXINV002A	Maintain and Order Stock	**Product Sourcing:** developing policy and practice around sourcing sustainable product. Working with suppliers to minimise packaging and carbon footprint of supply (eg bulk liquids bottled locally to save on fuel costs – done by Tesco in UK with imported wine) **Developing supplier audits** **Safe and environmentally responsible warehousing:** cooling systems, lighting, construction materials **Accurate ordering** to avoid wastage

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CODE	TITLE	POTENTIAL GREEN CONTENT
SIRXSLS001A	Sell Products and Services	**Signage**: sustainable materials **Signage:** sustainability education & information medium (carbon footprint, GE, recycling, reuse, reduce), product lifecycle **Staff education:** sustainability principles as a core component of product knowledge **Staff education:** sustainability as a core component of selling skills **Product tips:** energy efficient cooking, composting etc **Customer education:** building commitment to sustainability status as a primary buying need & benefit **Sales materials:** bags, signage, packaging, props, testers – ensure reduce, reuse, recycle best practice (walking the talk – very important to be seen to be doing this)
SIRXMER005A	Create a Display	**Sustainable Materials:** shop fittings, props & signage **Display design**: energy efficient lighting, materials, cleaning materials **Recycling, reduce and re-use** of materials **Effective Waste Disposal** **Staff & Customer Education:** incorporating sustainability principles and advice into customer product information & marketing materials **Signage:** showing indicators for carbon footprint, recycling, GE content and other sustainability indicators
SIRXMER005A	Profile a Retail Market	**Thought leadership:** what could this look like in terms of sustainability for retailers (could be part of an Innovation Unit)? **Sustainability interests and demands:** incorporate sustainability into market research. Profile public appetite and attitudes towards innovation in sustainable food retailing.

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CODE	TITLE	POTENTIAL GREEN CONTENT
SIRXMER005A *(contd.)*	Profile a Retail Market *(contd.)*	Survey LOHAS demographic What part does environment play in people's decision to shop at a store? What do customers want? What's important to them in terms of the environment – product origins, product lifecycles, reduce, reuse, refill, recycle, buying in to environment and sustainability as values? How wide is their awareness about sustainable practices? What would motivate them to choose sustainable over non-sustainable? What aspects of sustainability would motivate them to adopt store loyalty? Green wash: understand this phenomenon and implement guidelines to avoid green wash **Methodologies could include:** interviews – staff and customers, surveys, observation, secondary research, anecdotal evidence, focus groups This unit includes: 'review image of a store' – include enviro checklist & recommendations for changing image 'research market demands' – identify market needs and wants in relation to sustainable practice 'profile demography of customers' – include enviro awareness & motivators along with other demographic indicators 'use information to attract customers' – recommend and implement environmentally sound practices and policies, and promote this with demographic target group

APPENDIX 4

Sustainable Retailing Trial Course

Sustainability Trial – Session 1 Plan: Sustainability Thinking

Key Learning Outcomes

- Develop ideas about sustainability and what that means in a retailing context
- Identify and describe good practice in retail sustainability
- Identify references, tools, resources and examples
- Develop ideas for a personal way forward with sustainable development

TIME	ACTIVITY	DETAILS	RESOURCES, HANDOUTS, COMMENTS
30 mins	**Welcome & Intros** Housekeeping Icebreaker	Mobile phones Breaks Facilities / Catering	Intro trial, background & who's who Retail III (VET), overview of 4 sessions, Benefits of participation (for individuals & businesses), participants desired outcomes (on chart) **Icebreaker** – interview your neighbour: name, why they are here, one thing they do to look after the environment, intro partner to group
20 mins	**Group brainstorm**	What is Sustainability?	Brainstorm 2 questions on 2 different flipcharts –add to these at the end in different colours to show how much our thinking has changed over the 4 hours. 1. What do you do in your personal/work life that you think is sustainable? 2. So what does sustainability mean to you?
40 mins	**What is Sustainability?**	PowerPoint presentation with discussion Group work Brainstorms Discussion Case studies	Experience based learning What is Sustainability? What is the problem? Sustainability model – 3 dimensions 2 video clips – Judy Wicks (6 mins) & Rob Hopkins (5 mins)– followed by short debrief Why the retail industry? Case studies – Thin green line, Tesco, Business case: what are the benefits and drivers for retailers? Extend to all stakeholders Role of people working in the business & on the business 1 video – Judy Wicks in Mullum 9 mins
30 mins	**Field Trip**	Santos Trading-Observation	Semi-structured cook's tour. Observation & feedback 'What does a sustainable retail operation look like/feel like/sound like/behave like? In other words, what evidence did we find of efforts towards sustainability?

APPENDIX 4

20 mins	**Q&A**	Bec Talbot	Debrief on Santos experience, and joined by Bec for Q&A May need to brainstorm some questions– depends on group
20 mins	**Afternoon Tea**	Catered by BRCC	Browse resource display
10 mins	**Re energise**	Enviro Quiz	Quick – with prize for the winner
25 mins	**What can you do from where you are NOW?**	Small group work – based on own experience	• What might a 'green' retailer look like? • How can you contribute to change from where you are in the organisation? • What are the barriers to thinking and acting in a sustainable way? Large group presentation & debrief
20 mins	**Summary Activity**	What advice would you give to people who want to be sustainable at home or in their (retail) business?	Small groups brainstorm **action principles** like: 'start from where you are' 'think about what you can do, not what you can't do' 'we are all learners and teachers' etc Presentation of flipcharts (prize?) for most creative presentation What can we add to the charts we put together at the beginning? – can visually measure the learning
15 mins	**Homework & Evaluation**	Homework before the next session Fill out Evaluation Form as well as group effective feedback	Evaluation of session as a learning experience (format, activities, facilitation etc) but also on level of knowledge content and relevance to a Cert III learner (or similar) Homework: Check out your own ecological footprint with the online calculator. Do an informal audit in your workplace or at home. What are the positives? What are the opportunities? What's one contribution you can make?
			Next week – Getting the right products – Ethical Sourcing

See thumbnails of PowerPoint presentation in this Appendix.

Scavenger Hunt

Find names to match the items below. You can't use the same name twice! First person to finish wins....

Find someone who…….

- Has a worm farm
- Uses solar power at home
- Can explain carbon credits in two sentences or less
- Uses eco-efficient light bulbs at home

- Grows some of their own food
- Recycles paper in their workplace
- Can explain global warming in two sentences or less
- Rides a bike every day
- Always takes their own bags when they go shopping
- Can name 3 things they do daily to lower their carbon footprint

Sustainable Retailing Session 1: Content & Review

Overview
This session provides an introduction to the issues of sustainability and the paradox inherent in trying to introduce sustainability into an industry that is inherently about consumption.

The purpose of this first session in the context of the whole is to build a framework for thinking about sustainability, a framework which acknowledges the theoretical, ethical and practical issues on acting in a sustainable way. It is also hoped that this exploration will motivate and encourage people to embark or continue confidently in a journey of sustainable development.

Desired learning outcomes
- Develop ideas about sustainability and what that means in a retailing context
- Identify and describe good practice in retail sustainability
- Identify references, tools, resources and examples to light the way on the journey
- Develop ideas for a personal way forward with sustainable development

In introducing the format to the participants, the following points were made:
- Acknowledgement of their different backgrounds and varying levels of exposure to both retailing and sustainability concepts
- The background of this trial and the assumption of audience – being Retail III level and therefore suitable for people working in retail who are moving towards management, and who may have varying levels of knowledge / interest in sustainable practice
- The need for participants at times to take off their own professional or personal hat and put on the hat of a Retail III student
- The interactive and experiential nature of good quality learning and that it might include group work, field trips, case studies, presentations, videos, action plans and other experiential activities

Activity 1: Icebreaker
People were invited to interview and get to know the person sitting next to them, finding out three points:
- Their name
- One thing they do in their personal life to look after the environment
- What inspired them to come along to the trial workshops

Each person then introduced their interviewee, and responses were written on flipchart paper.

Responses to 'what inspired you to come along' included:
- Passing knowledge on to staff
- Learning how to pass knowledge along to staff
- Want to develop my own business
- Learn more about retailing
- Increase my employability
- Develop my interest in the global community

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- Find out what coming up with energy descent
- Make a difference and be the change I want to see in the world
- Pass on sustainable info in my business
- Increase my knowledge and pass it on

What are you already doing to look after the environment?

- Ride a bike
- Energy saving light bulbs
- No bags
- No bottle water
- Lives off the grid
- Planting tree and flowers
- Australian products
- Shop locally
- Purchasing practices
- Water wise
- Composting
- Recycling

Comment: This activity enables people to get talking, start to own the airspace and feel comfortable in the group. It enables the facilitator to understand the motivations for attending and the level of prior knowledge. We are then able to ensure that the session content acknowledges the needs and interests of the participants. It also builds confidence in the participants that they are already taking action – empowerment.

Slide 2 – What is Sustainability and WIIFM?

- What is sustainability?
- Why do we need to think about it?
- Why retail?
- What's in it for retailers?
- What's in it for people working in retail?
- What stops people taking action?

This slide provides an overview of the essential questions around which this session is framed. We start off from where people are (with an assumption that some people will be at the beginning of this journey).

Activity 2: Large Group Visualisation

a) the sort of environment we want to live in – your ideal place to live, work and raise kids
b) the sort of problems that human activity is causing

What sort of environment do we want?

Clean
Friendly
Healthy people & shops
Walking not driving
Reusing, refilling recycling
Cooking at home
Growing vegies
A tram up left bank
Cycleways
Donkeys, horses, carts, bikes
Warm and friendly retail precincts
Roadside honesty boxes
Local food

No 'sugar' areas in shops

What problems is human activity causing?
Over consumption
Deforestation
Things converted to $ value not real value
Not taking responsibility
Depression, mental issues, drugs
Depletion of resources
GMO
Mining
Advertising
MSG – additives, preservatives

The two groups of responses are juxtaposed on a whiteboard, providing immediate visual evidence of the contradiction inherent in our current lifestyles. The need for more sustainable thinking and practice flows from this imagery (activity adapted from Green Skills for VET Professional Development Program v6 March 2009 Page 7).

What does Sustainability mean to you? – Overhead question with responses below
Not using more than you can replenish
Not taking too much so there is continuance
'Bear the weight of'
Starting off from where we are
Encouraging communication
Protecting the environment
Renewable resources
Re-localisation
Conscious of the environment
Goods built to last
Prepare for change

Activity 3: Presentation – PowerPoint
Slides 3-42
Key Concepts:

- Sustainability is the answer – what is the problem?
- A quick introduction to global issues of population, water, global warming, biodiversity, carbon emissions
- Specific challenges for Australia
- Society driven by consumption and the need for a new story
- Consumption case study: a can of coke (Professional Development Kit for Teachers and Trainers – National Centre for Sustainability, Swinburne University
- Definitions of sustainability – a destination towards which we are travelling, and all starting off from different places
- A model which privileges environment not economy, as you can't eat, drink and breathe money
- The story of retail & it's importance in our lives
- Consumption & planned obsolescence (Ref Wikipedia)
- Opportunity to create a new retail story, with meaningful consumption (Ref Village Well)
- Re-localisation, Re-humanising, Eco sourcing, Eco business practice, Community links
- The retailer as part of a network (no retailer is an island)
- Case studies: Village Well & Rouse Hill, The Thin Green Line, Maleny IGA, TESCO
- The business case for sustainability

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- The new demographics (to be explored in final workshop)
- The employee case for sustainability
- Discussion

Activity 4: Video Clip Stimulus

- Judy Wicks: Our Heroes are Green (6 mins)
- Rob Hopkins: Transition Towns (5 mins)
- Debrief

Activity 5: Field Trip

Santos Health Food, Mullumbimby
What does a sustainable retail operation look like / feel like / sound like / behave like?
In other words, what evidence have we found on efforts towards sustainability?
A brief tour by Bec Talbot, Eco Auditing Officer for Santos

Activity 6: Debrief over Afternoon Tea

Activity 7: Enviro Quiz – Re-energise & Refocus

PowerPoint general knowledge quiz, immediate answers and a prize.

Activity 8: Small Group Work

How can you contribute to change from where you are now in your work or at home?

Responses included:
Practise what you preach, so others can follow
Be proactive, encouraging
Rewards for use of own bag & containers
Incentive schemes
Bulk buying
No to false advertising
Spotting spin
Exploring the psychology of consumerism (addiction – msg, sugar, retail therapy - lifestyle release, peer pressure, rewards & compensations, habits)
Be open to feedback from customers
Educate customers
Be prepared to promote what we do
Include community and networks
Offer alternatives to plastic bags – newspaper, paper bags, tissue wrap, boxes
Source local products
Customers – support the retailers and manufacturers who have ethical principles & practice

What are the barriers to thinking and acting in a sustainable way?

Responses included:
Lack of knowledge/awareness
Government regulations
Economic factors
Customer / staff / management attitudes
Overwhelmed
Don't know where to start
Fear of change
People are motivated by different things

Attitudes
Depression
Changing behaviours
Finances & affordability
Access to alternatives

Large group presentation and debrief

Activity 9: Evaluation

- Completion of Evaluation Sheet
- Identifying affective & cognitive impact via quick responses on whiteboard. People can come up and write words or phrases around a heart symbol and a light globe symbol. (Optional)

How did this session leave you feeling? (heart symbol)
Responses included:
Motivated
Inspired x2
Relieved and content
Ready to do more research
Engaged
Excited

Were there any light bulb moments for you? (light bulb symbol)
Responses included:
Appreciating the big picture
Wanting to explore more the psychotherapy of retail
Extended knowledge
Appreciating the great body of knowledge in Byron Shire
Enjoying exploring
"Re-humanising retail"

Further Work might include:

- Follow web links to explore and expand your knowledge
- Create an action plan for small changes over the next week, and report back at the next session. Identify the barriers that make it hard to make changes.
- Informal audit of workplace – opportunities for sustainable practice and attitudes to sustainable practice.

Sustainability Trial – Session 2 Plan: Eco Fit Outs

Desired Learning Outcomes

- Develop ideas about energy efficiency and carbon footprint and what that means in a retailing context
- Identify and describe good practice in terms of retail eco fit out and business practice
- Gain overview of core concepts: sources of energy, sources of GHG emissions, consumption reduction methods, carbon offsetting
- Understand waste minimisation and how to conduct a waste audit
- Identify references, tools, resources and examples

TIME	ACTIVITY	DETAILS	RESOURCES, HANDOUTS, COMMENTS
12.30pm	**Lunch**		Browse resource display
12.45pm	**Welcome &**	Mobile phones	Intro guest speaker: Short intro on Cool

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	Intros Housekeeping Icebreaker	Breaks Facilities / Catering Format – field trips	Planet consultancy, how he works, what's the process **Icebreaker**: eg Eco Scavenger Hunt – find a person who….
1.00pm	**Eco Fit Out & Eco Business Practice**	Presentation from Energy Efficiency consultant Dan Harper from Cool Planet with Discussion Case studies	What they are already doing in terms of managing energy inputs & outputs. **Eco Fit Out – Energy Efficiency** - what is it? - benefits (money, carbon emissions & branding) - areas of major electricity consumption - relevant to retail sector - how to conduct an electricity assessment (measuring, assumptions & outcomes) - reading electricity bills - how to reduce consumption (behavioural change, education, retrofitting, upgrading) - lighting - air conditioning (HVAC) - shop equipment - passive solar design - setting benchmarks and achieving goals **Eco Business Practice – Carbon Footprint** - global warming - sources of GHG emissions - relevant to retail sector - measuring a business' carbon footprint - setting boundaries (embodied emissions) - simple calculations - electricity - staff transport, distribution & air travel - waste, printing and sourcing sustainable products - reducing your carbon footprint - carbon offsetting and being carbon neutral - carbon credits & green power Intro to field trip – observing retrofitting for energy efficiency
2.00pm	**Field Trip**	Santos / Echo office	As per checklist, observing Byron Shire Echo Newspaper office
2.30pm	**Afternoon Tea & Debrief**	Debrief	What did you think? What did you learn? How can you use this info in your own work/personal life?
2.45pm	**Waste Management**	Jeanie McKillop Waste Educator from the North East Waste Forum	Managing Retail Waste – what's good, what's happening around here, where do you start? Case studies, discussion. Doing a basic waste audit.
3.45pm	**What can you**	Small group	Whether you are an employee, a business

	do from where you are NOW?	work – based on own experience	owner or manager, or just thinking about retail, where can you start? What would an action plan be for your practice? Small groups work together, then large group plenary.
4.15pm	**Summary & Evaluation**		Questions for presenters Challenges & Opportunities Evaluate the content of this session in terms of relevance to retail and appropriateness of level of information Completing Evaluation Forms
4.30pm	**Close**		Next week – Getting the right products - Ethical Sourcing

Green Skills Retail Trial – Session 3

Key Learning Outcomes:

- money is power to do environmental good or bad
- retailers largely determine choices available to consumers
- sustainability considerations need to be a part of everyday decision making
- there are ethical considerations at every step of the supply chain
- that if a supply chain is so long that we can't see, or even easily research, the ethical consequences of our purchase, then that alone is grounds for rethinking whether or not we should buy it, *and*
- that purchasing choices have positive and negative feedback

Resources

- *The Story of Stuff* (You Tube saved or played through internet connection)
- *The Chemical Maze* (book)
- *G Magazine* (magazine)
- *Green Pages* (directory and magazine)
- Products for auditing eg imported tin of sardines, packets of chips etc
- Products with organic certification logos, packaging with good product stories explaining where they are from, examples of "green washing"

1. **1. Welcome, tie in, intro** **2. What does a product auditor do?** **Today we're switching hats between retailer and consumer**	10 minutes	12:40 – 12:50
2. Icebreaker Activity **Your name and 1 eco-consumer concern (list these on the board)** **Are there any other major concerns we can add to this list?**	30 minutes	12:50 – 1:20
3. What are we doing? **Relate to session 2 – we looked at "carbon footprint" boundaries, lets look beyond. Not just take responsibility for the impact of our store, but also for what we are offering... What can we do better?**	5 minutes	1:20 – 1:25

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4.	**Intro to the real product stories** **Story of Stuff – You Tube** **Think about what the role of the retailer is? Write down ideas**	30 minutes	1:25 – 1:55
5.	**Video Discussion and PowerPoint** • **key themes/issues on consumption, write on board and tie into next...** • **not just carbon footprint but eco footprint** • **switch hats between consumer and retailer** • **"holistic sustainability" – individuals, communities, enviros...**	10 minutes	1:55 – 2:05
6.	**Who is willing to pay the true cost?** **The SoS mentions externalised costs eco consumers are willing to take responsibility for these costs and pay premium (LOHAS demographic)** **And what are eco-consumers looking for?** • **as local as possible why pp w stats** • **certification why PowerPoint w logos** • **minimal packaging – why (I don't want that on my eco-footprint)** • **green washing**	15 minutes	2:15 – 2:30
Arvo Tea – ethical eg. Fair Trade coffee/tea or local "tea lady" tea, local food – explain term 'locavore' (added to dictionary)		10 minutes	2:30 – 2:40
7.	**Why Local? Activity** **Break into 3 groups** • **Group 1 to discuss the benefits for individuals in shopping locally** • **Group 2 to discuss the benefits for communities in shopping locally** • **Group 3 to discuss the benefits for environments in shopping locally** **Groups to report back, findings written on butcher's paper for all to see.**	30 minutes	2:40 – 3:10
8.	**Audit Process – guiding questions (consumer hat)** • **What does the consumer want?** • **What does the retailer need to consider?**	15 minutes	3:10 – 3:25
8b.	**Small Group Product Audits (product)** **Break into groups of 2 or 3. Each group receives 1 product for auditing** **After 10 minutes, groups to run through the answers they had to guiding questions. Facilitator to mention anything missed, participants from other groups may also make comments.**	10 + 25 minutes	3:25 – 4:00
9.	**What does that mean to you as retailer** **Intro to purchasing power of shop (votes)** • **Policies and Procedures** (Santos case study) • **Limitations** – what the consumer does • **Where could you find more info?**	15 minutes	4:00 – 4:15
10.	**Feedback** – Participants to complete evaluation forms	10 minutes	4:20 – 4:30

2. Icebreaker Activity – Consumer Concerns (participant examples)

- resource decline (eg. fish oil)
- plastic bottles
- plastic bags

- genetic modification (eg. canola)
- irradiation of herbs
- nanotechnology
- health merit/risks of products eg. canola oil?
- food additives eg. oil to currants
- chemicals in body products and food additives
- some ingredients are difficult to understand eg. diethanolamine
- food waste
- over consumption

3. What Are We Doing in this Workshop?

Last week we looked at business operations – energy efficiency and carbon footprints. We drew footprint boundaries around our businesses and looked within.

This week we are going to look beyond these footprint boundaries and take into consideration the impact of the products that we sell.

Reasons for having eco-products:

- our customers are asking for them
- it provides opportunities to educate customers
- they are good products

4. The Story of Stuff – 30 Minute You Tube Video

This You Tube introduces many of the issues related to "products". It introduces the key concepts of:

- Life cycle analysis (from cradle to grave or cradle to cradle) and
- Externalised costs

(Participants are to wear their consumer hat)

5. The Story of Stuff Discussion Points:

Consumer Democracy: When we purchase a company's products we are saying to them, we support you, what you are doing is good and right.
By supporting a product we are also supporting the process.

6. Why Local? Activity

The Story of Stuff follows the supply chain and details issues that arise at each step – how are these issues minimised by shortening the supply chain (shopping locally)?

Benefits of shortening the supply chain:

- The local economy supports the local community, keeping local jobs and keeping wealth in our area influences the quality of our schools, hospitals, sports grounds etc.
- When money is spent locally, it stays local.
- Community fosters growth between individuals and groups, working together, supporting local industry.
- Environmentally, shortening the supply chain enables us to better see the consequences of our product choices. If we only used local timbers for construction, there would be a natural limit to how much we could harvest and therefore increase value.
- Less Product Miles

7. Why Local? Activity

Learning Objective: *To understand the environmental and social benefits of shortening the supply chain*

Break into 3 groups:
Group 1 To discuss the benefits for individuals in shopping locally

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Group 2 To discuss the benefits for communities in shopping locally
Group 3 To discuss the benefits for environments in shopping locally

Groups to report back and write findings on butcher's paper for all to see.
Below are the benefits described by the trial group participants (Sept. 2009):

INDIVIDUALS

- fresher goods
- reduced price, less "middle men"
- jobs stay local
- easier to get product info
- you get to know people
- more responsibility for processors (due to short feedback lines)
- more fun
- retail becomes a place of community
- eating seasonal food is better for us

COMMUNITIES

- multiplier effect, money spent locally stays local and is reinvested in local business and community
- localises services, small businesses survive therefore don't have to drive to regional centres for basic services eg. mechanic
- employment opportunities
- diversity of jobs
- supports system of locally grown, locally made, locally sold

ENVIRONMENTS

- smaller carbon footprint
- less packaging
- less preservatives as product doesn't have to travel as far
- seasonal produce, climate appropriate food reduces need for chemicals
- transparency in production = better enviro practices
- products are more able to be repaired if produced locally

8. Product Audit Activity – Guiding Questions

Learning Objective: *To understand a framework for ethical shopping decisions considering individuals, communities and environments impacted and to look for positive and negative feedback.*

Brief: We need to assess the positive and negative ethical and sustainability consequences of our decisions in 3 domains – Personal, Social and Environmental.

Example: *Whiteboard Marker*

Do I need to buy anything?
Could I make do with the things I have?
Are there better alternatives?
Chalk?
Where am I buying it from and from whom?
Local newsagent or large stationery chain store?
Who made it?
Were they fairly paid, safe? Where are they?
How will I use the product?
Am I safe? Will I remember to put the lid back on?
What will I do with the product when I'm done?
Is it recyclable?

Does it have an ethical 'flow on effect'?
Eg. enables teaching of Ethical Shopping workshop?

- Remember: time is a constraint in making everyday shopping choices too!
- If in doubt, Google it
- If you would like to be more conscious of your shopping choices rather than feeling daunted, try assessing 1 product at a time eg. 1 per week and build from there...

8b. Group Audit (produce example)

Learning Objective: *To practise product auditing asking key questions, looking at personal, social and environmental considerations in the decision-making process.*

Break into groups of 2 or 3.
Each group receives a product to audit.
After 10 minutes, groups are to run through the answers they had to guiding questions. Facilitator is then to mention if anything was missed. Participants from other groups may also make comments (see example below). Facilitator to tell the "real story" of the product, further highlighting alternatives available.

NB. Products should be mindfully selected to allow for as many major issues to be covered as possible between the items, eg. toxic ingredients, genetically modified ingredients, Fair Trade, organics, animal welfare etc.

Example Product Audit discussion points:

1. Egg
Key Issues and Discussion Points: GM feed, animal welfare, factory farm breeds, home grown vs factory, chickens fed grain or scraps? High carbon and water footprint of animal products
Eco Alternatives: GM free, certified organic, free range etc.
Real Story: farmers market, local, not sure if GM free? Free range

2. Banana
Key Issues and Discussion Points: Loss leading (KVI's), Nth QLD, food miles vulnerability to local disaster, where was it bought? Green washing "eco-bananas"
Eco Alternatives: certified organic, locally grown, purchased from producer (eg at farmers market) or at local retailer
Real Story: from producer at farmers market, farmer while not certified organic has a certificate IV in organic production and applies organic principles.

3. Rice
Key Issues and Discussion Points: Water use, imported, organic? Health (brown), bulk purchase? Packaging
Alternatives: Australian grown dry land rice, certified organic OR barley (not gluten free) buckwheat? Amaranth?
Real Story: certified organic brown rice, from local store, bought in bulk

9. What does that mean for you as a retailer?

As a retail outlet, to keep all products consistently 'green' and staff on the same page, what is needed is a policy however formal or informal – a set of guidelines setting the environmental and social standards of products (this is a good opportunity to write down green business' practices too eg. green cleaning standards, incentives for riding to work etc.).

Santos Trading of Northern NSW is a business that has gone through this process. Their Ethics Policy (March 2008 edition) specifies (see appendix retail case study):

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- **Non-GMO** – Santos will not stock any product that has Genetically Modified ingredients or packaging, even where it fulfils other criteria. We pay particular attention to products with soy, corn or canola.
- **Palm Oil** – Products containing palm oil must use ethically derived palm oil that is **certified organic**, as the ethical status of 'sustainable palm oil' certifiers are industry funded and dubious.
- **Organic/Biodynamic** – Points are awarded for the organic/biodynamic status of a product.
- **Product Miles** – Whole products and ingredients. Points are awarded within our definitions of 'local' as well as the method of transportation, if known. Products derived from and packaged within a 150 km radius are highly regarded. Where only an imported version of a product is available, those with Fair Trade certification are preferred.
- **Eco Packaging** – We grade packaging within the context of the needs of the product and give preference to packaging made using post consumer material or recyclable product.
- **Health Merit** – A product may gain points if it has exceptional health merit. A product may be removed if it has ingredients, particularly chemicals and additives, that are thought to be harmful to health.
- **Business Conduct** – A product may gain points where the company has a proven ethical business practice (companies are invited to highlight their green and other ethical policies and practices).
- **Biodegradability** – In particular, non edible items, such as cleaning products, must be biodegradable and be non-harming to the environment.

An "ethics auditor" is employed to monitor the implementation of the "Santos Ethics Policy" in Santos' three stores, however all staff are encouraged to participate in ensuring these standards are met in much the same way as all staff are responsible for maintaining OH&S standards.

Where a product does not meet the standards, an alternative is found and the product in question is removed from the shelves. The product company is contacted to let them know where they do not meet the standard and are invited to contact Santos should their product change to meet the Ethics Policy.

10. Limitations and Feedback Loops

Learning Objective: *To understand that there are limitations to Eco Consumerism and conversely, there are ways to increase your influence and further "feedback" on the system.*

As any anti consumerist will tell you, **"consuming" will not save the world**. And while I'd argue that, like it or not, until the day they die, they too will consume – the effect of eco consumerism does have its limitations.

- Consumer democracy being $1 = 1 vote takes away from 1 person, 1 vote
- Supports company regulation and monitoring over government regulations.

- Offering environmental products most often minimises the embodied energy of the product, but the consumer may still use this product in a wasteful manner.

Sustainability Trial – Session 4 Plan: Green Marketing & Stakeholder Engagement

Desired Learning Outcomes

- Develop ideas about 'green' marketing', green wash and the green demographic
- Test out these ideas in relation to current products and your own experience
- Develop strategies for engaging diverse stakeholders
- Identify references, tools, resources and examples to light the way on the journey
- Participate in evaluating the effectiveness of the trial workshops

TIME	ACTIVITY	DETAILS	MUD MAP, RESOURCES, HANDOUTS, COMMENTS
15 mins	**Introductory**	Welcome & Intros Housekeeping Icebreaker	This session in the context of the whole Mobile phones, Breaks, Facilities / Catering Icebreaker: Last session we looked at eco-fit outs & energy management. We all specified something we could change. Share with a partner a step you have taken over the last week. If you haven't done anything, do not fear! Discuss what the barriers are to making changes. Debrief in whole group.
85 mins	**Green Marketing**	Experiential Activity Input on Green wash, Green Marketing, Demographics Videos Experiential Processing Task	Experiential Activity: In groups of 2 or 3, take a product (or a business – would need to print out the website home page), itemise the number of green claims & marketing mechanisms on the packaging. Present back to the group. No evaluation – just count up the claims. The point here will be the extent to which green marketing has gotten out of control and in some cases is almost meaningless! Processing Task: Working in groups of 2-3, take a product or business that you want to promote. Develop a marketing strategy based on sustainable marketing principles. Present back to the group.
20 mins	**Afternoon Tea**		Go for a walk!
60 mins	**Stakeholder Engagement**	Group Brainstorm Guest Speakers – Santos crew	**Small group activity:** Look at key stakeholders – customers, staff, managers/owners, suppliers. 4 groups - each group takes one stakeholder group. Brainstorm benefits & challenges for each group, and also tips for how to get this group on board with sustainability. Present back to large group. **Open Plenary:** Informal feedback from Santos group and others about the challenges and highlights of getting different stakeholder groups on board.
60 mins	**Evaluation**		Small groups then plenary: • Owners/managers, retail staff – what does each of these groups **need** from 'sustainable' retail training? • How well does our content (as it is so far) meet these needs? • What about the level of information? How much information and education

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			is enough? How much do you need to start the process of change (given that it has to be a self-directed process in the end)? • What learning activities are the most effective (ie. brings the realities home, impels you to engage with sustainability)? • What would you like to see included? What would you like to see excluded? • Whose responsibility is change towards sustainable retailing? And how does that fit with traditional reporting structures (this will refer back to Santos experience and about how you empower staff to take the initiative and yet keep an orderly functioning team!)? • Complete the evaluation form
4.15pm	**Close**		Hand out resource guide

Session 1 Presentation

ACE – Byron Region Community College

Sustainable Retailing
Trial Workshop 1

What is sustainability?

Why do we need to think about it?
What does Sustainability mean?
Why retail?
What's in it for retailers?
What's in it for people working in retail?
What stops people taking action?

Why do we need to think about sustainability?

'Sustainability seems to be the answer – what is the problem?'

Today's problems cannot be solved if we still think the way we did when we created them
Albert Einstein

Global Statistics

- Global population doubled from 1950 – 2000, 95% of it in developing countries – over 6 billion
- 1.5 billion people live in severe poverty (less than US$1 per day)
- Over 1 billion overweight people! (US 61% overweight and we've overtaken them)
- Over 1 billion – no access to safe water
- 12% of birds threatened with extinction
- 30% of coral reefs severely damaged
- Lost half global wetlands in last 100 years
- Aquifers depleted worldwide – in some areas 1 metre per year.
- Atmospheric CO2 30% higher than in pre-industrial times

Australian Challenges…

- SE Australia has lost 89% of original wetlands (in last 100 years)
- Agriculture has changed or destroyed half the woodlands and forests since records began.
- More than 2/3 of the remaining forest has been degraded by logging.
- Salinity threatening farming & water quality
- Grazing – sedimentation- fishing depletion
- Biodiversity challenges – 1200 bird species extinct
- Effect of mining & non-renewable resources
- Water & extreme weather events

Climate change, consumption & the need for change

- Climate patterns changing: temperature, rainfall, extreme weather events.
- Effect of human activity on climate and resources
- Society driven by consumption – of finite resources
- Need to create new thinking and behaviour
- Need a 'new story'

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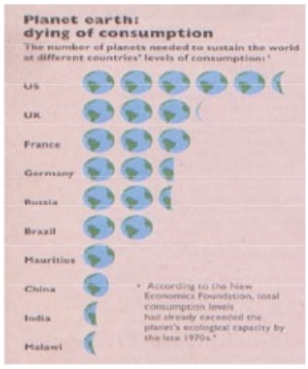
Session 1 Presentation

Before you buy that Coke…

I'd like to buy the world a coke

Mining of one ton of bauxite
Transported to chemical reduction mill
Purified to 1/2 ton aluminium oxide in mill (half hour)
Shipped to smelter
Turned into ¼ ton (2 hours, after stockpiling for months)
Ingots are cured (2 weeks)
Shipped to roller mills, rolled to 1/8th inch
Transported to warehouse, then cold rolling mill - rolled to l/10th of thickness
Punched into cans, washed, dried, painted, lacquered, sprayed inside to prevent corrosion by the drink
Inspected, palletised, fork lifted, warehoused
Shipped to bottler, washed and cleaned
Filled with flavoured syrup, phosphorus, caffeine, CO2 gas
Cans are sealed, packaged in cardboard (forest pulp) printed with marketing graphics
Shipped to distribution warehouse, then to supermarket.
Purchased within 3 days, consumed within 10 minutes, thrown away within 30 seconds.
88% thrown away in England. USA throws away enough aluminium to replace its entire commercial aircraft fleet every 3 months.

New Internationalist November 2006



Sustainable

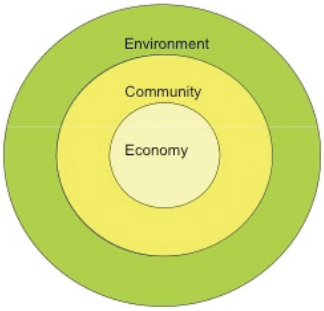
Sustainability is the destination
Sustainable development is the journey

'development which meets the needs of the present without compromising the ability of future generations to meet their own needs'

World Commission on Environment and Development 1987

The old model

The new model



Session 1 Presentation

Why Retail?

Why Retail?

Retailing is the temple of personal consumption

So it's an old story based on 'getting people to buy more and more'

But it's also a theatre where we can make a big difference

A new story of **meaningful consumption**

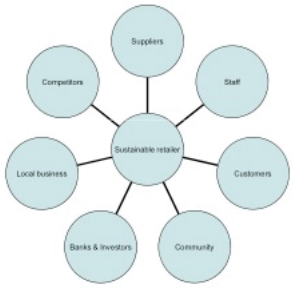
The New Retail Story

- Relocalisation
- Rebuilding community hubs
- Strengthening local growers, suppliers and economies
- Re-humanising retail experience
- Cradle to cradle product stewardship
- Innovating
- Rescripting thinking & behaviour around consumption – meaningful consumption

APPENDIX 4

Session 1 Presentation

The Retail Network



Revitalisation

Putting the community back into retailing, and putting the retailing back into the community

www.villagewell.org

1. Minimise detrimental impacts

- minimise carbon footprint by sourcing local products
- minimise packaging, use compostable packaging
- minimise energy, water and resource use; green retailing, green office programs
- minimise toxic chemicals and processes in products
- create opportunities for the recycling of unwanted products, minimise waste to landfill

2. maximise positive effects

- use local sources of green energy such as wind and solar to power your business
- meet local markets for products, with unique, local products
- fairtrade – support an equitable global economy
- celebrate beauty, invite nature into urban settings
- create pedestrian and public transport friendly shopping hubs
- bring meaning and value back into the marketplace

Case Studies

the thin green line

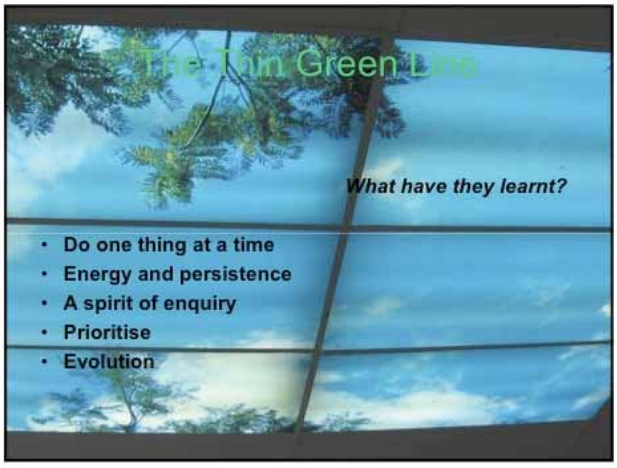
eco-green life sustaining shop

APPENDIX 4

Session 1 Presentation

The Thin Green Line

- Organic, sustainable lifestyle, health & beauty
- Demographic 85% locals
- Eco friendly fitout – eco certified bamboo floors, non toxic materials & paints – and now they sell them!
- Organic cleaning agents, eco friendly lighting
- Source products locally and support local business themselves
- Rewards card system – try to add value for customer
- Community involvement – donations, fundraisers, workshops, research



APPENDIX 4

Session 1 Presentation

Maleny IGA

- Local products (10% from Sunshine Coast)
- Product stories
- Australian owned / produced (blue labels)
- Organic range
- Community Benefits program – 1 % of revenue, 128 groups
- Rebates for bags NOT used – saves 40,000 per year
- Promotes local suppliers on website
- Awarded inaugural National Supa IGA Checkout / Service Department of the Year (2008)
- Focus on Customer Service

'The team at Maleny recognizes that one of the most important points of contact with the customers is the checkout service department, providing both the first and last impressions of the store' Manager Rob Outridge

An eco-friendly Tesco's

TESCO

- Largest British retailer, 3rd largest in world
- Green cards
- Last year customers saved 1.8 billion bags
- Packaging
- Carbon rated products
- Product labelling – GE/Carbon footprint, eco-cooking tips, product lifecycle
- Energy: 50% less by 2010

TESCO

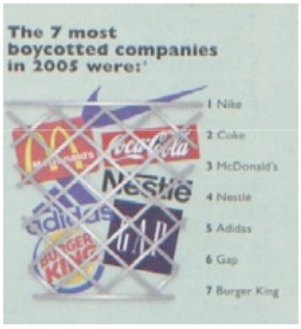
Carbon rated Orange Juice and Green Bags

APPENDIX 4

Session 1 Presentation

Consumer sentiment

according to new internationalist, increasing numbers of northern consumers want their food clothing, cosmetics, energy, travel and finance to have less of a negative impact on people and the planet.



What's the business case for sustainability?

- Reduced cost through eco-business practice
- Reduced OH&S risk
- a growing market for organic, sustainable, eco friendly goods and services
- 'green' or 'LOHAS' (lifestyle of health and sustainability) consumers have solid buying power
- Reputation and brand image: preferred retailer status
- competitive advantage through innovation & new markets
- Increased profitability through decreased energy costs, increased staff retention, increased customer loyalty

Source: Retail and Consumer Outlook Australia 2008, New Choices, Price Waterhouse Coopers

New demographics

- cultural creatives
- ethical investors
- ecological sustainability beyond
- environmentalism
- globalism
- relationship, family
- spirituality
- social conscience
- middleclass
- community service
- professional, high income
- simple, natural elegance

45 million + people in USA
Australian equivalent: 2-3 million

Source: Paul Ray, USA; Hugh McKay, Australia

Ethics & Environment Survey - USA

In the US, 76% of consumers are making more purchasing decisions based on corporate behaviour and ethics than they were 5 years ago, and 43% make those purchasing decisions on a weekly basis.

"The new consumers want to know that the company has treated its suppliers fairly, done its best to take into account its impact on the environment, and that someone has actually benefitted from the sale of that product"

The business case

"Employees, consumers, suppliers and clients will all demand better corporate responsibility performances from companies, who will respond by instigating environmental initiatives to enhance their positioning with these various audiences"

Source: Retail and Consumer Outlook Australia 2007, Changes in Play, 3 Annual Edition, Price Waterhouse Coopers

What's the employee case for sustainability

- 3 million new 'green collar' jobs to introduce sustainability in Australia
- Meaningful & rewarding work
- Opportunity to do something great for your community
- Healthy workplaces
- Building new skill sets
- Self esteem

APPENDIX 4

Session 1 Presentation

Judy Wicks & The White Dog Cafe

Let's talk about what we're for not what we're against

'There's no such thing as one sustainable business. You have to have a sustainable economy.' Judy Wicks

Business can be beautiful!

Rob Hopkins & TransitionTowns

Two of the important stories we tell ourselves are either that someone else will sort it all out for us, or that we are all doomed: I'd like to share with you a very different story, and like all stories it has a beginning.

References

www.villagewell.org
www.thethingreenline.com.au
www.malenyiga.com.au
www.tesco.com
www.whitedog.com
www.transitionculture.org
www.epa.vic.gov.au/ecologicalfootprint/calculators/
www.swinburne.edu.au/ncs/whatissustainability.

Session 4 Presentation

Sustainable retailing
Trial workshops

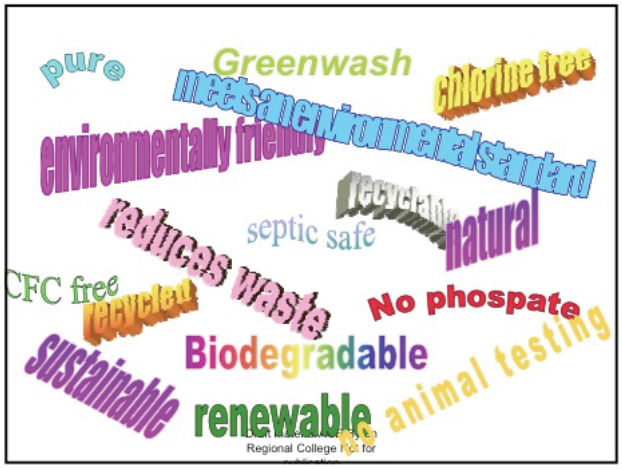
Session 4
Green Marketing and Customer Engagement

Greenwashing

What is it?
Why is it harmful?
What can you do about it as a consumer?
What can you do about it as a retailer / marketer?

Greenwashing

- "Disinformation disseminated by an organization, etc., so as to present an environmentally responsible public image; a public image of environmental responsibility promulgated by or for an organization, etc., but perceived as being unfounded or intentionally misleading."
  —*Oxford English Dictionary*
  "Little green lies."
- —*Lincoln Star Journal* (04/20/2008)



Greenspeak?

'100% naturally based actives'
'We take the environment seriously'
'Up to 40% recycled plastic'
'Chemical free'
'Where possible recycle paper is used'
'Reduces material waste, chemical waste, water, energy use'
'Our fibre supplies are from plantations and sustainably managed forests that meet appropriate forestry codes'
'Only uses suppliers who conform to high environmental standards'
'good environmental management'
'Degradable'
'It's OK to spray'
'Ozone friendly'

Identifying Greenwash

- **1 Fluffy language**
- Words or terms with no clear meaning (e.g. "eco-friendly").

- **2 Green product vs. dirty company**
- Such as efficient lightbulbs made in a factory that pollutes rivers.

APPENDIX 4

Session 4 Presentation

Identifying Greenwash

3 Suggestive pictures
- Green images that indicate a (unjustified) green impact (e.g. flowers blooming from exhaust pipes).

4 Irrelevant claims
- Emphasizing one tiny green attribute when everything else is not green.

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Identifying Greenwash

5 Best in class
- Declaring you are slightly greener than the rest, even if the rest are pretty terrible.

6 Just not credible
- "Eco friendly" cigarettes, anyone? "Greening" a dangerous product doesn't make it safe.

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Identifying Greenwash

7 Jargon
- Information that only a scientist could check or understand.

8 Imaginary friends
- A "label" that looks like third party endorsement—except that it's made up.

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Identifying Greenwash

9 No proof
- It could be right, but where's the evidence?

10 Out-right lying
- Totally fabricated claims or data.

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Greenpeace on Greenwash

"Dirty business"
- Communicating an environmental initiative when the core business is unsustainable. (clean coal)

"Ad bluster"
- Using advertising to exaggerate environmental benefits, spending more on the campaign than the actual initiative. (Mt Franklin)

"Political spin"
- Communicating environmental commitments while lobbying against environmental laws and regulations. (forestry and mining groups)

"It's the law, stupid!"
- Communicating environmental achievements that are required by law anyway. (CFCs)

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Why is greenwash harmful?

- Diminishes trust in advertising and business
- Slows down the sustainability journey: people get sick of the 'green' messages and tune out – stop doing anything
- People's valuable time is wasted filtering out green noise
- One offender hurts an entire industry
- Sustainability seen as just a marketing tool

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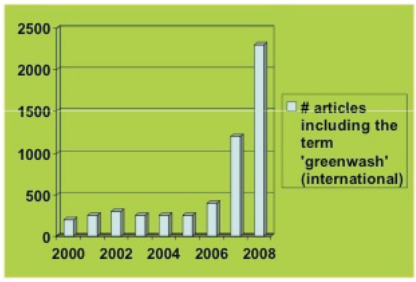
APPENDIX 4

Session 4 Presentation

So where's the upside?

- The media are on to it
  Media loves to expose false green claims
- The government is on to it
  ACCC : Green Marketing and the Trade Practices Act.
- Consumers are onto it
  88% of Australians are sceptical about 'green' marketing messages

Role of media



RAN on Greenwash

In 2008 the Rainforest Action Network posted a weekly Greenwash video on Youtube

What can you do as a consumer?

Ignore the pretty tree-frog pics, and ask these questions:

What's the actual product – is it good for the environment?
Are the claims precise and specific to one aspect of the product?
Is there evidence provided?
Is there access to full ingredient listing in plain English?
Is the whole lifestyle taken into account?
Is there 3rd party verification from a trusted organisation?
Is there accessible contact information?

So where is marketing going?

88% of Australian sceptical
90% say they care: 10% act
Growth of health/sustainability market
Importance of LOHAS and their values

LOHAS - Lifestyles of Health and Sustainability

- Valued @ $500B globally
- $22B in Australia by 2010 (estimated)
- Strong values and attitudes
- They follow through with behaviour (unlike others)
- Skeptical of marketing messages, but want sustainable products
- Trust 3rd party verification by wellknown and trusted organisations
- Trust word of mouth
- Want more than just 'green' – ethical company practices, personal community and planetary wellbeing
- Want transparency, humility, participation

APPENDIX 4

Session 4 Presentation

LOHAS - Lifestyles of Health and Sustainability

Across the six LOHAS product categories of

- **Food & Nutrition**
- **Home-life**
- **Mind & Body**
- **Buildings & Energy**
- **Transport & Leisure**
- **Work & Money**

consumer spending has increased by $3Bn in the past year, and is forecast to grow by up to another $10Bn over the next 3 years.

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LOHAS - Lifestyles of Health and Sustainability

Organic pet food
Green dry cleaning
Alternative fuels
Organic clothing
Carbon offsets
Hybrid cars
Air / water purifiers

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Third party verification

Smart Approved WaterMark
WATER RATING
NP CONTAINS NO PHOSPHORUS
NOT TESTED ON ANIMALS
ENVIRONMENTAL CHOICE AUSTRALIA
PETE HDPE V LDPE PP PS OTHER
ENERGY RATING
FSC

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Life Cycle Analysis

Levi Strauss & Co.

- Levi Strauss & Co. conducted a full LCA on their top-selling products and found that one of the most negative environmental impacts was during use, when users wash their jeans. As a result, Levi Strauss is communicating to customers—through their labels, promotions, and store staff—that the jeans should be washed in cold water. This is a case in which the company is using LCA and communications in order to improve their products' environmental performance.

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Getting everyone involved

Deloitte.

As part of its "Greening the Dot" sustainability initiative, Deloitte invites its offices to choose from 37 different greening projects. In six months, the program engaged more than half of the workforce in more than a thousand greening projects across nearly 100 offices. The result was reduced energy, water, and paper use; reduced travel; increased recycling; and positive feedback from employees.

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BT Virtuous messages

British Telecom has developed a scheme for communicating progress on greenhouse gas emissions called the "Climate Stability Index." This initiative turns traditional reporting, which emphasizes metric tons of carbon equivalents, on its head, by committing to a goal commensurate to the company's share of emissions reduction needed to stabilize the climate, and then states progress in those terms. So they are saying not 'look what we have done' but 'look how far we have to go'

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APPENDIX 4

Session 4 Presentation

Traceability

Marks & Spencer

- Marks & Spencer provides information to customers, not only about their own practices but about the places from where their products are sourced. For example, they have an "egg tracker" website, where a customer can enter the identification number of the eggs that were purchased to learn more about the farm they are from.

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What should business do?

- Is your environmental claim addressing your products biggest impacts?
- Are your other business activities consistent with your 'green' message?
- Are your claims precise, specific and easy to understand?
- Have you made it easy for consumers to contact you?
- Are you being transparent about your progress?
- Do you have independent verification?
- Do you enable / encourage consumers to act?
- Do you understand your customer motivators?
- Are you a leader in your industry?

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Marketing Messages

Devise a marketing campaign for your product. Remember:

Transparency
3rd party verification
Whole of life cycle
Precise and specific claims
Full ingredient listing
Targeted to a demographic
Accessible contact information
Encourage customer participation

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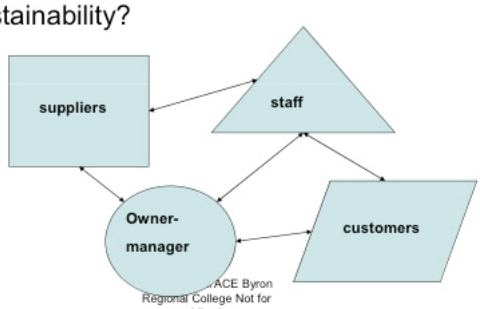
Stakeholder Engagement

How do we get stakeholders on board with sustainability?



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Getting stakeholders on board at The Body Shop

A pioneer in environmentally aware and ethical retailing, The Body Shop made a point of engaging all of its stakeholders.

Against Animal Testing
Fair Trading
Environmentally Friendly
Social Justice

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TBS – engaging stakeholders

Customers

Giving feedback – customer suggestion boxes
Participating in sustainability – refilling bottles, bringing bottles for recycling
Participating in activism – joining campaigns, allowing voices to be heard
Transparency – full ingredient listing with explanations
Encouraging them NOT to take a bag
Give customers fun, warmth and a sense of theatre

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APPENDIX 4

Session 4 Presentation

TBS – engaging stakeholders

Suppliers

Clear guidelines

Regular audits

Business development assistance

Encouragement and promotion

Acknowledge and work with their realities and constraints

Loyalty and commitment

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TBS – engaging stakeholders

Staff

Induction – clear introduction to company values and vision

Community projects – hands-on & store driven

Ongoing information, learning and inspiration

Fun!

Staff become activists and responsible global community members

Encourage and reward initiative

Self-esteem, confidence and leadership through education & participation

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TBS – engaging stakeholders

Franchisees

Stringent screening - getting the right people on the bus!

Demonstration of ongoing commitment

Environmental, social & ethical targets

Sense of international community

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From your experience

How do you get the main stakeholder groups on board with sustainability?

- customers
- staff
- suppliers
- owner / managers

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Sustainable Retail Case Study:
Santos Trading,
Mullumbimby and Byron Bay, NSW

Santos Trading (est.1975) is a health food business with two retail outlets and a wholesale outlet (with online shopping) servicing the NSW Northern Rivers towns of Byron Bay, Mullumbimby and beyond. The business' commitment to *"providing the best possible sustainable food and health products to our community"* has evolved over the years from one focused on personal and environmental health to one that embraces a responsibility for creating a sustainable local economy.

Note: Santos Trading has no association with the Santos mining company or the Santos venture located at various airports

Key Santos Initiatives

- **The Santos Ethics Committee**
- **The Santos Ethics Policy and Product Auditing**
- **Customer Education**
- **Acting as a Lobbyist**
- **Community Donations**
- **Customer Health**

The Santos Ethics Committee

The Santos Ethics Committee is a vehicle for Santos staff to address ethical concerns relating to Santos, in particular, products. The volunteer staff committee meets as needed to discuss, debate and research ethical concerns prior to making a proposal to management for consideration. The Santos Ethics Committee was initiated by staff and has been in operation for several years with the full support of Santos Management.

One of the first major issues addressed was that of "palm oil" and its connection to major deforestation in Indonesia. As a result, Santos formed a policy to cease stocking products containing palm oil with the exception of certified organic palm oil. Decisions such as this have been compiled to form the "Santos Ethics Criteria" that has been adopted as the Santos Ethics Policy.

As a result of this staff initiative, Santos now employs, for one day a week, an "Ethics Coordinator" who audits products to ensure they comply with the Santos Ethics Policy and also researches various concerns raised by management and the Ethics Committee.

APPENDIX 5

The Santos Ethics Policy

Developed by the Santos Ethics Committee, the Santos Ethics Policy outlines the purchasing policy in regards to sustainability and ethics. This entails a zero tolerance to GM ingredients and investigation of products to ensure they meet Santos' Ethics Policy. Preferences are given to products that are sustainably grown, require less freight, have eco packaging, health merit, exemplar business conduct and biodegradability. See below for the policy.

Customer Education

To compliment thoughtful product choices, Santos provides information for customers. An example of this is Santos' *"How Local is your Dairy"* poster which compliments the sourcing of local dairy products. While other dairy products are still available, the poster allows customers to make an informed choice.

Community

Keeping it Local

Santos places a strong value on developing the local food economy. Fruit and vegetables are purchased from within the immediate area as much as possible and are assigned a lesser mark up to support consumers in buying local produce. Santos has a blanket ban on stocking imported fruit and vegetables.

Acting as a Leader

Santos shows clear leadership in the community beyond best practice sustainability. Demonstrating the value that true sustainability is about creating a sustainable local economy, Santos is active as a lobbyist against inappropriate development in Byron Shire, such as chain supermarkets that threaten other local small businesses. This involves not only speaking publicly but encouraging Santos customers to take action, offering car stickers at the check out.

Donations

40% of Santos' profits are donated to charitable causes. This is in addition to major donations of food given to national and local causes throughout the year. Santos also offers staff the opportunity to donate 1% of their income to the staff charity, the total of which Santos matches. Each year staff members choose the charities that are to receive the donations.

Personal Health

In addition to the aforementioned community and environment initiative, Santos still provides the healthiest food possible to the community, a friendly safe environment and good customer service.

SANTOS TRADING
ETHICAL PRODUCTS POLICY

Intention
This document is intended to:

- formalise a coherent set of ethics that Santos Trading can readily apply in its product selection
- assist with the implementation of the recommendations given by the Santos Ethics Committee and Santos management
- provide a purchasing framework to ensure Santos' ethical objectives are met
- provide a procedural framework for amendments to this policy

Scope
This policy addresses the procurement of all that is stocked by Santos Trading and is to be observed for new product lines and during reordering of existing product lines. All staff must be made familiar with this policy and attachments by Santos management on induction or retrospectively.
All employees are encouraged to participate in ensuring that all products meet these standards. It is the responsibility of stock orderers to ensure these standards are met. This policy builds upon the work of the Santos Ethics Committee which collated a key set of ethical principles following a comprehensive customer, staff and shareholder survey (December 2005).

Amendments
Santos Trading recognises that ethical priorities change in response to changing environmental, social and economic conditions. All changes must be in alignment with the "aim" outlined below. New items or categories that may be prohibited must be extensively researched prior to being rejected. Suggested changes to this policy will be accepted from customers, staff or shareholders and must be presented to a Santos Ethics Committee meeting (open to all staff) to discuss changes prior to approval by the Santos Director.

Ethics
With awareness of Santos Trading's unique contribution to the planet – focusing on the interrelations of farmers, manufacturers, retailers and consumers – we value:

- Environmental Progression
  Building of environmental resource capital
- Global Social Cohesion
  Community Capacity Building, within and between communities
- Individual Wellbeing
  Health and happiness of our community's individuals

APPENDIX 5

Aim
To establish Santos Trading as a leader in ethical and sustainable business practices.

Objectives
The objectives of Santos Trading in relation to ethics and product selection are to:
- promote the growth of the organics sector
- foster the growth of the local food industry
- support ethical business practices
- actively encourage ethical consumer decision making
- educate suppliers regarding unethical business practices, specifically those incompliant with this policy

Procurement Criteria

Base Criteria:
- **Ovo-lacto vegetarian goods**
  Sole exclusion of ethically derived fish oil for practitioner distribution
- **Australian Organic fresh produce**
  Local spray-free where Local organic is not available

Preferred Purchase Criteria:
- **Local, Regional, Australian or Fair Trade Products**
  Preference is given to products with the least estimated "food miles". "Food miles" quantify the distance food has travelled prior to reaching the consumer.
  - **Local** refers to the Northern Rivers Region which extends from Ballina to Tweed, preference being given to the most local products.
  - **Regional** is defined as being from the NSW North Coast or Southern QLD.
  - Where relevant, when Australian products are unavailable fair trade options must be sought. All imported produce must be certified organic where possible.

- **Certified Organic Products**
  The regulations surrounding certified organic produce ensure that the land is cared for and, in the case of converted farms, repaired. Grown without petrochemical fertilisers, it is better for consumers and for the health of the soil and surrounding waterways. Organic certification also ensures milk and eggs are produced in accordance with high animal welfare standards. Uncertified products labelled "organic" and not bearing a certification logo must be assumed to be non-organic and scrutinised accordingly.
- **Environmentally responsible packaging**
  Products with minimal packaging will be preferential over more highly packaged alternatives. If no alternatives exist, as may be the case with products such as "ready meals" or snack sizes, it may be appropriate to forgo stocking the line altogether.
  Where products have been transported large distances, lighter packaging is preferential. Glass, for example, becomes a less "environmentally responsible" packaging option when the product is imported.

- **Healthier alternatives**
  A product may be given preference if it is shown to have exceptional health merit. Products catering to food intolerances are promoted where other ethical criteria are also met. Products considered generally healthier, for example those not containing refined sugar, are given preference to equivalent products that do.
- **Products from Ethical Businesses**
  Products can be preferential where the product company has proven ethical business practices. Where products meet few of the above Ethics Criteria they must be invited to highlight their ethical policies and practices. If the company cannot show ethical practice, the product may be discontinued.

Prohibited Stock Criteria

Santos Trading does not stock products containing or products from:

- **Genetically Modified (GM) ingredients**
  Santos will not stock any product that has Genetically Modified ingredients or packaging, even where it fulfils other criteria. We pay particular attention to products with soy, corn or canola.
  GM crops are strongly tied to the use of fertilisers and can transfer genes to non-target species. Due to the lack of GM labelling all products containing **soya, maize, cotton (seed) and canola** must be checked for GM with the product company unless the ingredients concerned are certified organic.
- **Non-Organic Palm Oil**
  Palm Oil plantations are directly responsible for mass clearing of Indonesian rainforests resulting in destruction of habitat and biodiversity loss. RSPO[1] "certified sustainable palm oil" is industry funded and deemed to not meet the standards of Santos Trading. All products containing "vegetable oil" must be checked for palm oil content and status (certified organic or non-organic) with the product company unless the vegetable oil is listed as certified organic, which is deemed to be the only truly ethical palm oil.
- **Multinational Corporations (MNCs)**
  Many MNCs make profit based decisions to operate in countries with lower environmental and social justice standards or in those where the relevant legislature is not enforced. It is exceedingly difficult to trace the ethical accountability of MNCs due to their scale and the global dispersal of their activities. As such, Santos Trading will only stock the products of Multinational Corporations where their ethical accountability has been certified by a third party (eg Organic or Fair Trade certifiers).
- **Unfair Trade**
  Santos Trading will not stock Chocolate or Coffee that does not display a Fair Trade logo unless it is certified organic or is Australian grown or has been deemed to be from fair trade by another third party certifier.
- **Nanotechnology**
  Both *Friends of the Earth* and *BFA* warn that this technology is untested and unsafe and as such the precautionary principle must be applied. This technology is very new to the food industry and must be monitored closely by

[1] **RSPO** (Round Table on Sustainable Palm Oil)

APPENDIX 5

Santos Trading Ethics Committee to ensure ingredients in products stocked are not being replaced with Nanotech ingredients.

- **Toxic Chemical ingredients**
  Where toxicology data is inconclusive, the precautionary principle must be applied. Ingredients considered to be toxic include, but are not limited to, artificial preservatives, colours and flavours, petrochemicals, parabens and sodium lauryl sulphate.
- **Imported fresh produce**
  Santos Trading will not stock any imported fresh produce (all other goods accepted).
- **Non-Biodegradable Cleaning Products**
  All cleaning products stocked by Santos will be "readily biodegradable" see Australian Standard AS4351 ("readily biodegradable" products biodegrade to 70% of their content within 28 days).
- **Bottled Water**
  Santos Trading will not stock any bottled water. Despite the fact that PET bottles are 100% recyclable, most are purchased when people are away from home and without ready access to recycling facilities. As a result only 35% of PET bottles are recycled (ABS).

APPENDIX 6

Sustainability in Retail Resources and References

Retail Industry - Sustainable Retailing Advocates

www.whitedog.com
Judy Wicks and her approach to sustainable communities

www.livingeconomies.org
BALLE – founded by Judy Wicks

Tesco Chain UK -ahead of the pack supermarket chain www.tesco.com

www.thebodyshop.com.au
The Body Shop - Pioneer of business ethics & sustainability

www.malenyiga.com.au
An IGA supermarket doing good things for the environment and community

www.thethingreenline.com.au
A small co-operative based retailer in Murwullimbah being very conscientious about sustainability

www.noco2.com.au
Rob Cawthorne –. Carbon Reduction Institute

www.villagewell.org
Gilbert Rochecouste, Director, rehabilitating and developing sustainable urban environments

www.businessshaper.com
Dan Atkins – building sustainable business practices

www.media.socialchange.net.au/
Interesting approaches to changing mental models around consumption

www.coolplanet.com.au
Dan Harpers - carbon / eco energy management consultancy business

www.northeastwasteforum.org.au
Northern Rivers council co-venture to deal more effectively with waste

www.transitionculture.org
Rob Hopkins initiative to prepare communities for peak oil and energy descent

www.santostrading.com.au
Wholefood retailers and wholesalers, a lot of articles on website

www.neco.com.au
Online green products

www.begreen.com.au
Online green retailer

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Understanding Green Washing

www.choice.org.au
Search 'greenwash' and 'greenwatch' for several clear and practical articles

www.greenbiz.com
Understanding and Preventing Greenwash: A Business Guide

www.stopgreenwash.org
Greenpeace initiative

www.futerra.co.uk/services/greenwash-guide
Are you on the right path? Greenwash checklist for business

www.tec.org.au
Total Environment Centre Inc - The Green Cred Checklist: Best Practice Guidelines for environmental claims in advertising and marketing communications

Education and Training Bodies

http://www.greenskills.nsw.gov.au/resources/tools
NSW DET Green Skills Training Resources

www.vaee.vic.edu.au/guidebeside/index.htm
Professional learning & teaching resource for sustainability educators

www.buseco.monash.edu.au/centres/acrs/research/whitepapers/index.html
Monash University – Australian Centre for Retail Studies

www.epa.vic.gov.au/ecologicalfootprint/calculators/
EPA Victoria – Ecological Footprint Calculator

www.efslearninghub.net.au/Default.aspx?tabid=107&returnurl=%2faskEFS.aspx&language=en-US
NSW DECC – login page for Education for Sustainability Professional Learning Hub

www.swinburne.edu.au/ncs/whatissustainability.htm
National Centre for Sustainability

www.vaee.vic.edu.au/guidebeside/about.htm
Victorian Association for Environmental Education Guide to developing sustainability thinking. Very good, accessible guide to changing thinking models

www.ntis.gov.au/
Where to find all the training packages

www.csl.org.au/index.php
Centre of Sustainability Leadership - run by young people for young people

www.isf.uts.edu.au/index.html
Institute for Sustainable Futures UTS Prof Stuart White

www.greenfinder.com.au/eco/Sustainable-Retailers
Australian Guide to good retailers and other businesses

www.epa.vic.gov.au/ecologicalfootprint/calculators/
Calculate your own footprint

www.swinburne.edu.au/ncs/whatissustainability.htm
Read more about Sustainability concepts

www.greenvehicleguide.gov.au
Eco Ratings for vehicles

www.accc.gov.au/content/index.phtm/itemId/815763
Green Marketing and the Trade Practices Act Feb 2008

www.packagingcovenant.org.au

www.ecodepot.com.au/index.html
Eco resources

www.goinggreensolutions.com.au/docs/GGSInfoSheet.pdf

http://www.powerhousemuseum.com/education/ecologic/bigfoot/bigfoot2007/
Powerhouse Museum interactive ecological footprint calculator on CD-rom

www.ethical.org.au
Ethical Supermarket Shopping Guide Booklet and how to run your own Educational Supermarket Tour

www.retail.org.au/
Australian Retailers Association

www.insideretailing.com.au
National Retailing magazine

Demographics

www.lohas.com.au

www.mobius.com.au
Melbourne based marketing group who focus on LOHAS demographic.

APPENDIX 6

Publications

- *Aligning your Teaching with the Principles of Sustainability* Geraldine Plas, NCS Swinburne Dec 2003
- *NSW Green Skills Strategy* 2008 – 2010
- *Skills For Sustainability*, NSW DEET, February 2009
- *The Money Trail: Measuring your Impact on the Local Economy*. Justin Sacks, New Economics Foundation 2002
- *Plugging the Leaks: Making the Most of Every Pound that Enters your Local Economy*, Bernie Ward and Julie Lewis, New Economics Foundation www.neweconomics.org
- *Professional Development Kit for Teachers and Trainers*, National Centre for Sustainability
- Professional Development Program: *Green Skills for VET,* DET NSW
- *Risks and Opportunities of Climate Change*, Dan Atkins & Bruce Thomas, Sustainable Business Practices, AIG Environmental Management Handbook 2007
- *Sustainable Retailing gets the Green Light,* Stephen Ogden Barnes, Centre for Retail Studies, Monash University 2007
- *Informed and Interconnected: A Manifesto for Smarter Cities*, Rosabeth Kanter & Stanley S Litow, Harvard Business School Working paper 2009
- *Visioning Sustainable Retail*, Reading Innovation Centre, September 2007
- Margaret Wheatley - *Leadership and the New Science: Discovering Order in a Chaotic World* (1999, 2006) – and any other books by her
- *Skin Deep*, Kevin Farrow, www.skindeep.com
- *The Chemical Maze 4th Edition: Your Guide to Food Additive Cosmetic Ingredients*
- Go Green Directory www.derwenthoward.com.au

Magazines

- G Magazine – *Green Living Made Easy*, a lot of product info and research www.gmagazine.com.au
- Green Pages Directory – 'the hub of sustainability'

Video / TV

- *The Business Case for Sustainability* - DVD - Bob Willard, New Society Publishers USA (see www.youtube.com/watch?V=fTLrF19gpt8)
- *Outrageous Waster* (Austar Lifestyle Channel)
- *The Story of Stuff* www.storyofstuff.com
- *Our Heroes are Green 02,* Judy Wicks, YouTube
- Judy Wicks at Mullum on YouTube
- Rob Hopkins' Transition Handbook www.transitiontowns.org.au or YouTube

Horticulture Unit Analysis

Current modules for Horticulture Certificate III taught at BRCC:

- Implement a plant nutrition program
- Control weeds
- Coordinate worksite activities
- Construct brick and/or block structures and features
- Establish turf
- Carry out workplace OHS procedures
- Undertake a site assessment
- Provide information on plants and their culture
- Control plant pest diseases and disorders
- Implement a plant establishment program
- Implement a propagation program
- Sample soils and analyse results
- Install irrigation systems
- Monitor turf health
- Implement a landscape maintenance program
- Implement a paving project

Introduction to horticulture unit analysis and adaptations for sustainability:

The following unit analysis covers three units:

1. RTF3503A Sample Soils and Analyse results;
2. RTF3012A Implement a Plant Nutrition Program; *and*
3. RTC3404A Control Plant Pests, Diseases and Disorders

From our consultation with sustainable horticulture practitioners, we learned that an integrated approach is central to sustainable horticulture. As such, we saw it necessary to trial the integration of key units in the same way (refer to workshop plans for more information). Our suggestions are highlighted in **green**.

Adaptations to the following units have ranged from increasing general environmental awareness on site and flow-on effect, developing an awareness and consideration of soil biology and developing an understanding of wider sustainability implications such as peak oil and climate change.

The terms 'environmental' and 'sustainability' used within the analysis are distinct and not interchangeable. 'Environmental' relates to the immediate site and sites where there may be a direct flow-on effect, for example, releasing pollutants into a waterway, clearing land that leads to erosion elsewhere. 'Sustainability' is applied to a much broader, global context and encompasses issues such as resource depletion, climate change, peak oil, as well as considering the health of communities and their local economies.

The term 'linking sub-element' refers to elements, new or adapted existing, which highlight the relationship between elements of different units. The 'linking sub-elements' below are limited to the three units on which the trial focused, however countless other potential 'linking sub-elements' showing the connections between these units and other units not examined here would more comprehensively highlight the interconnectedness of all horticulture units and result in a better understanding of sustainable horticulture practices.

'Key Questions' have been included beside some new and adapted sub-elements to demonstrate what the unit might look like.

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Issues with focusing on unit adaptations for sustainability are primarily related to the nature of sustainability. Sustainability is a fast evolving field which is difficult to define. While suggestions such as "with consideration of the environment" have been made below, further elements are needed to assess students' understanding of sustainability. Understanding sustainability will allow students to make informed decisions in horticultural contexts beyond those outlined in the units.

Unit Analysis 1: RTF3503A Sample Soils and Analyse Results

Elements of competency:

1. Prepare for soil sampling
2. Determine soil characteristics by performing soil sampling
3. Interpret results of soil analysis

Element 1 – Prepare for Soil Sampling

1.1 The soils to be surveyed and surveying activity and contractors are identified according to site plans and enterprise work procedures in conjunction with an environmental impact assessment.

1.2 Tools, equipment and machinery are selected according to site conditions (including environmental impact assessment), testing agency requirements and enterprise work procedures.

1.3 If required, pre-operational and safety checks are carried out on tools, equipment and machinery according to manufacturer's specifications and enterprise work procedures.

1.4 Areas of homogenous soil types are identified for sampling.

1.5 Services are located using site plans and in consultation with the supervisor.

1.6 OH&S hazards are identified, risks assessed, controls implemented and reported to the supervisor.

1.7 Suitable safety equipment and Personal Protective Equipment (PPE) are selected, used and maintained.

1.8 A clean and safe work area is maintained throughout and on completion of work. Environmental impact is minimised and remediation is undertaken to counter any environmental damage.

1.9 There needs to be an element on how to conduct an environmental impact assessment.

Element 2 – Determine Soil Characteristics by Performing Soil Sampling

2.1 The density and depth for a representative sampling of the area are determined according to enterprise work procedures.

2.2 Holes are excavated at identified sampling sites according to enterprise work procedures, OH&S requirements and with all due consideration to environmental implications.

2.3 Samples for off site testing are collected and prepared, packaged, accurately labeled and dispatched according to testing agency requirements and enterprise work procedures.

2.4 The physical, chemical and biological characteristics of the soil are determined according to investigative requirements and best practice guidelines.

2.5 Sampling and testing tools and equipment are cleaned of all residues and returned to storage according to manufacturer's specifications and enterprise work

procedures and with all due consideration to environmental implications.

2.6 Results are recorded in an established format according to enterprise work procedures.

Element 3 – Interpret Results of Soil Analysis

3.1 The soil types of the sample area are classified according to standards for soil classification.

3.2 The acceptable physical, chemical (including residual pesticides) and biological soil parameters for a specified plant are determined from published data and historical records.

Note: 'Biological parameters' refers to both benign biological activity as well as soil biology which form a symbiotic relationship with the plant.

3.3 Collected analytical results are compared with acceptable soil physical, chemical (including residual pesticides) and biological parameters for a specified plant.

Note: Residues of heavy metals and soil contaminants are identified and assessed and compared against Australian standards, certified organic standards and other suggested limits for optimal healthy plant growth and for the survival of beneficial and benign soil organisms.

3.4 Soil characteristics are evaluated to determine whether they can be altered to meet plant needs. Different soil samples are to be evaluated to compare the difference in plant health between different soils. This includes assessing the interrelationship between soil health (or 'soil wealth'), plant health and pest resistance of plants.

Note: 3.4 should act as a 'linking sub-element', introducing the interrelationships between soil health (RTF3503A Sample Soils and Analyse Results), plant nutrition (RTF3012A Implement a Plant Nutrition Program) and pest resistance (RTC3404A Control Plant Pests, Diseases and Disorders).

3.5 Soil characteristics are to be assessed in relationship to plant nutrition.

Note: 3.5 should act as a 'linking sub-element', introducing the interrelationships between soil health (RTF3503A Sample Soils and Analyse Results) and plant nutrition (RTF3012A Implement a Plant Nutrition Program). Key Questions include: What is the nutrient availability of this soil? and What role does the soil biology play in nutrient availability?

Unit Analysis 2: RTF3012A Implement a Plant Nutrition Program

Elements of competency:

1. Prepare for implementation of the plant nutrition program
2. Monitor soil pH
3. Determine nutritional problems in plants
4. Prepare to use fertilisers
5. Prepare application equipment
6. Apply specific products at appropriate rates

Element 1 – Prepare for Implementation of the Plant Nutrition Program

1.1 Goals and target site for implementation of the plant nutrition program, including soils, plant species and varieties, are identified according to enterprise work procedure. Goals are set within natural limits and with consideration to harm minimisation on the environment.

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1.2 Materials for soils and plant treatments available to the enterprise are identified and the storage site or supplier details located. Materials are analysed and selected with consideration to soil carbon content, sustainability considerations (see Key Questions) and localised environmental considerations. Key Questions include: What is the impact of this plant nutrition program on 'global warming'? and How does my choice relate to 'peak oil'?

1.3 Services are located using site plans and in consultation with the supervisor.

1.4 OH&S hazards are identified, risks assessed, controls implemented and reported to the supervisor.

1.5 Suitable PPE is selected, used and maintained.

Element 2 – Monitor Soil pH

2.1 Soil pH in the implementation site is monitored in relation to plant nutrition and according to enterprise work procedures.

2.2 Products useful in changing soil pH are identified, compared, selected and sourced according to enterprise work procedures and environmental and sustainability considerations.

2.3 Product application methods are assessed according to product type, soils, enterprise work procedures and with consideration to environmental implications.

Element 2a – Monitor Miological Activity and Carbon Content of the Soil

2a.1 Soil biology in the implementation site is monitored in relation to plant nutrition and according to enterprise work procedures.

Element 3 – Determine nutritional problems in plants

3.1 Common nutritional deficiency and toxicity problems in plants are identified using visual inspection including soil analysis.

3.2 The supervisor and/or nutritional specialist are consulted, as required, to determine causes of nutritional or toxicity problems.

3.3 Soil ameliorants to improve soil fertility are identified, compared, sourced and selected according to enterprise work procedures and environmental and sustainability considerations.

Element 4 – Prepare to Use Fertilisers

4.1 The fertiliser to be used is selected according to fertiliser type, soils, enterprise work procedures and environmental and sustainability considerations.

4.2 Fertiliser application methods are assessed according to fertiliser type, soils, enterprise work procedures and environmental and sustainability considerations.

4.3 Fertilisers are applied according to the plant growing cycle and the enterprise fertiliser calendar and environmental and sustainability considerations.

4.4 Fertilisers are handled and stored safely in a manner that minimises detrimental environmental impact and according to enterprise work procedures.

Element 5 – Prepare Application Equipment

5.1 Tools, equipment and machinery are selected according to enterprise work procedures and environmental considerations.

5.2 Pre-operational and safety checks are carried out on tools, equipment and machinery according to manufacturer's specifications and enterprise work procedures.

5.3 Tools, equipment and machinery are calibrated according to manufacturer's guidelines and enterprise work procedures.

Element 6 – Apply Specific Products at Appropriate Rates

6.1 Specific products are selected based on their analysis to meet plant needs according to enterprise work procedures and environmental and sustainability considerations.

6.2 Product application rates are calculated to optimise plant benefit and minimise environmental impact according to manufacturer's specifications and enterprise work procedures.

6.3 Specific products are applied at the correct rate, timing and method according to the product type and analysis, manufacturer's specifications, enterprise work procedures and with environmental and sustainability considerations.

6.4 Product applications are recorded according to enterprise work procedures.

6.5 Target plant response to the plant nutrition program, as well as any non-target effects, such as environmental impact or pest responses, are monitored, documented and reported to the supervisor according to enterprise work procedures.

Note: A sustainability approach to fertilising would consider what renewable resources are on site for improving plant nutrition, for example animal manures and sources of mulch. As seen in best practice sustainable horticulture, the training package could acknowledge the fundamental importance of continued plant nutrition and build the development of plant nutrition sources into other units.

Control Weeds, for example, would look at the composting of weeds where necessary and the interrelationship between mulch weed suppressants, plant nutrition and soil biology. Implement a Plant Establishment Program may look at the planting of nitrogen fixers, mulch crops and other plants that create readily broken down biomass to use in sustainable plant nutrition programs. On site plant nutrition sources would be fundamental in the unit *Implement a Landscape Maintenance Program*.

Unit Analysis 3: RTC3404A Control Plant Pests, Diseases and Disorders

Elements of competency:

1. Assess the pest infestation
2. Plan the implementation of control measures
3. Implement control measures
4. Monitor control methods

Element 1 – Assess Pests and Disease Infestation

1.1 Scope and size of the infestation is assessed.

1.1a Assess environmental conditions that may be contributing factors to the infestation. Key Questions include, but are not limited to, the soil health, whether the planting is part of a monoculture and whether the plants are in line with climatic and seasonal requirements.

1.2 Plant pests, diseases and disorders, beneficial organisms and relevant environmental contributing factors are identified and reported or recorded in field notes.

1.3 Levels of pest infestation tolerated by the client, market or environment are identified from the Integrated Pest Management Strategy (IPM).

1.4 Infestation levels, above which plant health or growth objectives are identified.

1.5 Professional advice is obtained as required according to enterprise guidelines and environmental considerations. Key Questions include: How can I minimise harm to

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the environment? What are the resources for organic growers? What are the current non-chemical alternatives?

Element 2 – Plan the Implementation of Control Measures

2.1 Control measures suitable for the infestation are selected from IPM strategy with preference for the most sustainable option. Key Questions might include How can we implement diversity to build resistance?

2.2 Tools, equipment and machinery are selected for each work activity according to enterprise work procedures.

2.3 OH&S hazards are identified, risks assessed, controls implemented and reported to the supervisor.

2.3a Potential environmental impact is assessed and controls implemented and reported to the supervisor.

2.4 Suitable safety equipment and PPE are selected, used, maintained and stored.

2.5 Control measures selected need to give full consideration to OH&S and environmental implications.

Element 3 – Implement Control Measures

3.1 Enterprise work team, contractors and IPM product suppliers are coordinated in a sequential, timely and effective manner in consultation with the supervisor.

3.2 Control measures are implemented according to the IPM standards, industry code of practice and with consideration to environmental implications, both immediate and flow-on.

3.3 Implementation of IPM activities is undertaken according to OH&S requirements and environmental laws and regulations.

3.4 A clean, safe and environmentally conscious work area is maintained throughout and on completion of each work activity.

3.5 Records are maintained as required by legislation and enterprise guidelines.

Element 4 – Monitor Control Methods

4.1 Control methods are monitored to identify side effects to other plants, animals or external environment.

4.1a Preventative IPM measures are implemented to avoid future infestation.

4.2 Effectiveness of control methods are assessed in reference to specified industry, OH&S and enterprise standards.

4.3 Adjustments to IPM control methods are implemented where necessary to meet enterprise specifications and further preventative measures are adopted as necessary (for example diversifying plantings).

Note: A sustainability oriented unit would prioritise prevention over cure, for example "Prevent Plant Pests, Diseases and Disorders" over, and in addition to, RTC3404A Control Plant Pests, Diseases and Disorders.

Relevant Units from Other Training Packages:

We neither had the time nor the scope in this project to investigate the units below; however they are relevant to sustainable horticulture – not all of them are current.

Wollongbar TAFE developed the **Certificate IV in Agriculture - Organic Production.** The units this certificate covers, which would be most relevant to sustainable horticulture, are:

RTA4517A Manage organic soil improvement

RTA44133A Manage biodynamic production

RTE4401A Control weeds, pests and/or diseases in crops

RTF4023A Promote plant health

RTD4406A Implement pest management action plans

RTD4811A Provide information on environmental issues & policies

RTE4027A Develop a soil health and plant nutrition program

RTE4203A Implement and monitor a property improvement plan

RTE4603A Implement an irrigation related environmental protection program

Relevant Units from Certificate III in Conservation & Land Management:

RTC2702A Observe environmental work practices

RTD2022A Carry out natural area restoration works

RTD4504A Monitor Biodiversity

RTD3505A Maintain natural areas

RTD3212A Implement Erosion and Sediment Control Measures (CLM toolbox no 518 from www.flexiblelearning.net.au)

Relevant Content from Accredited Permaculture Training:

Certificates I through to IV gained VET registration in 2003. There is also Diploma level training. Two RTOs – Eltham College in Victoria and Riverina TAFE in NSW – manage them and these certificates are taught through RTOs such as the Permaforest Trust and Djangbung Gardens locally. Some of the units were imported from the Rural and Business Training packages. All the levels have a foundation unit in Permaculture Design which sets up an understanding of sustainability and integrated design systems. We believe these units, in particular the underlying systemic thinking, would be of great benefit for introducing a more sustainable orientation to VET horticulture training at Cert II,III and IV levels (see www.permaculture.com.au).

Other Relevant Material:

We found a workbook late in our project for **RUHHRT520A Implement Sustainable Horticultural Practices** from 1998 which was the most relevant unit for our purposes, though it was at the diploma level and does not appear to be still in use.

The **Water** related units which we found mention of are:

NPW10107 – from Certificate 1 in Water Sustainability

- Investigate sustainable water cycle management
- Review and evaluate water and wastewater sustainability objectives

Green Skills Horticulture Trial

Session 1: Intro to Sustainability in Horticulture

Duration: 3.5 hours

Part 1

Time	Activity	Details	Resources, Handouts, Comments
10 mins	Welcome & Intros Housekeeping Icebreaker	Mobile phones Breaks Facilities / Catering	Introduce the trial – background & who's who • overview of 3 sessions **Icebreaker**: Interview your neighbour: name, why they are here, one thing they do to look after the environment – write on flip chart while they intro each other
15 mins	**Group Brainstorm**	What is Sustainability?	Brainstorm on flipcharts – we can add to these at the end in different colours to show how much our thinking has changed through the 3 hours. 1. What is sustainability? 2. What do we already do that is "sustainable"? Keep charts on wall – people can add things
15 mins **+** **10 mins**	**What is Sustainability?**	Summarise and Define	What is Sustainability in a broader sense? • Intro to holistic sustainability • Personal, social (include economic) and environmental (to reinforce later) Tie in with group brainstorm on sustainability in general
	Why Sustainability?		What is the problem? • Intro to peak oil, climate change, biodiversity loss etc • Brief Powerpoint
20 mins	**Where is Horticulture now?**		Group brainstorm Short Powerpoint of images of different sectors of the industry Outline key issues: • In what ways is horticulture dependent on oil?? • How does horticulture contribute to climate change • How does horticulture contribute to toxic landscapes? • How does horticulture contribute to resource depletion?
20 mins	**How do ecologies highlight sustainability?**		Looking at complex systems, inter relationships David Attenborough DVD 2 videos – The Sacred Balance 3 – Elaine Ingham section on soil – 5 minutes
20 mins	**Supper**		Beautiful organic food, browsing resources

Session 1: Intro to Sustainability in Horticulture *(contd.)*

Part 2:

Time	Activity	Details	Resources, Handouts, Comments
20 mins	**Big Picture on Principles of Sustainable Horticulture**	**Principles of sustainable horticulture** enterprise	Sustainable horticulture can be summarised in these principles Relate these back to an ecological system to see how these principles work
20 mins	**Ecology Activity**	Inputs and Outputs • sunshine • water • fertiliser • mulch • tractor (fuel) • fruit • money	Small market garden Draw diagram on the board of a property (elevation view) – as a group, work out the systems and interconnections Key Questions: what are the inputs and outputs? Are there wastes? What is the energy involved? Relate to sustainability – carbon emissions, mining Is this sustainable? What is the ecological cost?
5 mins	**Sustainable Gardening Aust.**	Look at Guidelines	Look at the points of Sustainable Gardening Australia (SGA) – have images of their logo, from website etc. What are some benefits of subscribing??
15 mins	**What is the direction of sustainable horticulture?**		• Define and introduce certificates in organic, permaculture and ecological agriculture • Trends in the industry – Brief Powerpoint of urban agriculture, community gardens etc.
20 mins	**Summary Activity**		How could horticulture sustainability principles apply to horticulture we are involved in at the moment? Think of 3 ways to improve practices based on these principles
15 mins	**Intro to session 2**		Explain structure of session 2 in relation to unit integration

Session 2: Sustainability in Horticulture Field Trip

Soil Testing & Building Soil Fertility and Resilience – Duration: 7 hours

Time	Activity	Details	Resources, Handouts, Comments
10 mins	Welcome & Intros Housekeeping Icebreaker		Introduce the guest tutor Dave Forrest – background Overview of this session. Group introduces their context in horticulture **Icebreaker**
20 mins	**Presentation**	**Overview of soils**	Physical, chemical & **biological** qualities. Shifting the view of soil from inert medium to living entity (emphasising the difference between more common view and sustainability perspective)
15 mins	**Discussion**	**Environmental impacts of conventional methods**	How might horticultural operations need to change?
10 mins	**Presentation**	**Intro to assessing soil health/biology**	Using soil health card testing for biological activity, worms, etc. Mention links to nutrient availability, plant health and pest /disease resistance.
			Importance of soil carbon, ways of building soil health / soil carbon
20 mins	**Morning tea** **Car pooling/travel**		Browsing resources
15 mins	Visit to Fresh & Wild Organics	Introduction to property	Introduction to farm and its history - shift from conventional to organic production & shift from nectarine orchard to mixed market garden – Robin & Margaret Wolf
1.5 hours	Do **soil tests** – using soil health cards	Students do tests under guidance from tutor	Using Northern Rivers Soil Health Card for Vegetables, 1. Diversity of soil life, 2. Ground cover, 3. Penetrometer, 4. Infiltrometer, 5. Root development, 6. Soil structure, 7. Aggregate stability, 8.Earthworms, 9. Soil PH, 10. Plant vigour
	Discussion/ observation		Ways **to remedy nutritional problems & build soil wealth** using organic methods
30 mins	**Lunch**		
1.5 hours	**Compost making**	Materials ready on site	Build large compost pile using biological activators and ground rock minerals plus material sourced on farm. Discussion on use of compost teas.
1 -1.5 hours	Tour		Investigate other more sustainable features of the farm – use of ground covers, weed suppression techniques etc.
	Q & A from field trip		Discuss Inputs / Outputs and closing loops
30 mins	**Return to classroom**		Final debrief & fill in evaluation forms

Session 3: Sustainability in Horticulture – Dealing with Pests and Diseases

Duration: 3.5hours

Time	Activity	Details	Resources, Handouts, Comments
10 mins	Housekeeping Icebreaker		Wide range of books, charts, magazines and catalogues to browse (see resource list in the Appendix)
40 mins	**Paired discussion then Group Brainstorm**		**Debrief from field trip** – soil tests and compost making etc. What did you learn? How did it change your perspective? Debrief in pairs then compile comments on flip chart for whole group. Review – In what ways are soil and plant health related?
1 hour	**Presentations & discussions**	**Dealing with pests & diseases** **Overview of Integrated Pest Management**	Taking a different view of pests & diseases – what are they telling us? **Management vs Control** Use board diagrams to highlight system/ecological view
20 mins	**Supper Break**		Browsing resources
25 mins	**Podcast Listening** **Video viewing**	Case studies of IPM How integrated is IPM in reality?	**Increasing beneficial insects and other predators**: Brookfarm Macadamias Bangalow ABC radio podcast (habitat restoration and owls to control rats in macadamia orchard, IPM in orange orchards in central QLD – DPI video). Group Critiquing of limited IPM approach – effects of monoculture, importing predators vs supportive habitat creation etc. Diversity v Monocultures
10 mins		Relationship with soil building	**Increasing resistance to attack through nutrition and high biological activity in soils**
25 mins		Revisit the principles of sustainable horticulture	How does this relate to your situation? What are some changes you could make? Quick overview of other aspects of sustainable horticulture practise
20 mins			Final evaluation & discussion on horticulture teaching from a sustainability perspective

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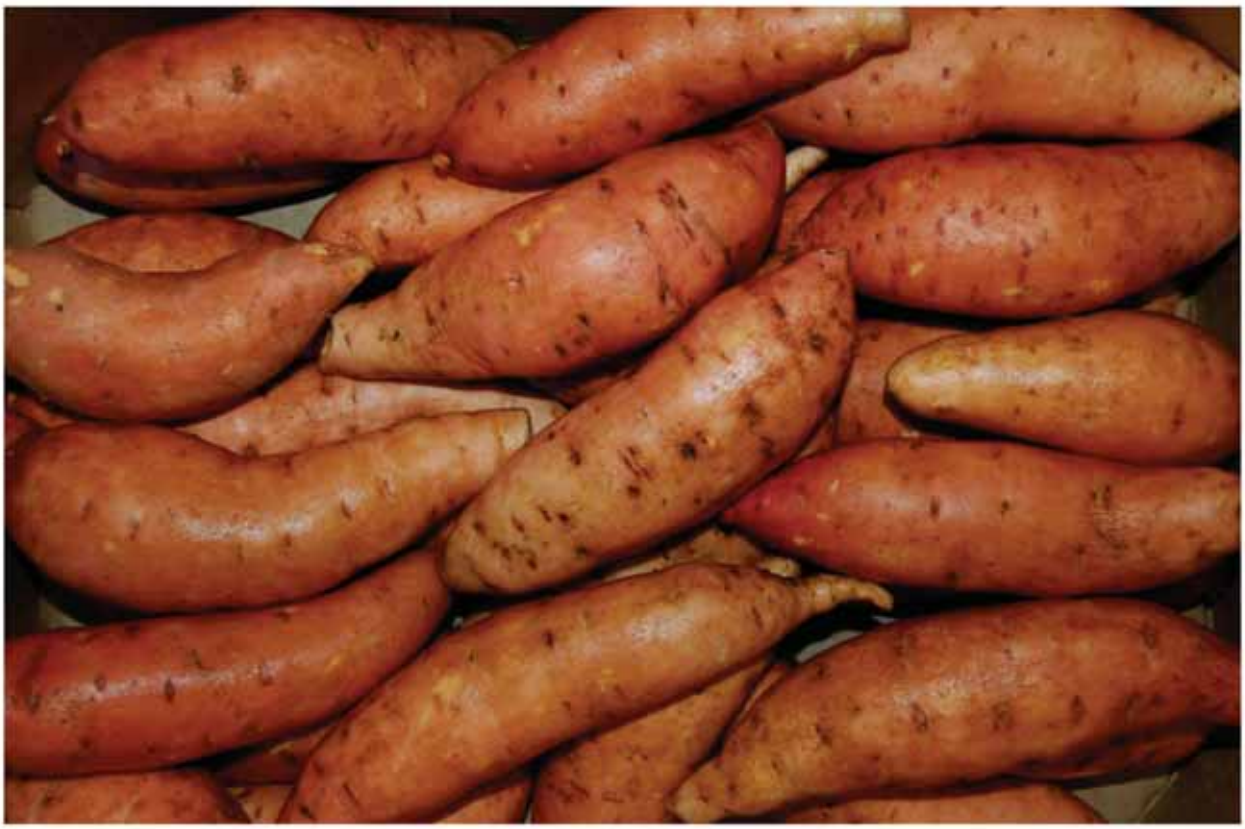


Northern Rivers Soil Health Card

Vegetables

A new technique for farmers to use in assessing the biological and physical properties of soil on their farms

'A basic soil audit is the first and sometimes the only monitoring tool used to assess changes in the soil. Unfortunately, the standard soil test done to determine nutrient levels (P, K, Ca, Mg, etc.) provides no information on soil biology and physical properties. Yet most of the farmer-recognized criteria for healthy soils include, or are created by, soil organisms and soil physical properties. A better appreciation of these biological and physical soil properties, and how they affect soil management and productivity, has resulted in the adoption of new soil health assessment techniques.'

National (USA) Sustainable Agriculture Information Service http://attra.ncat.org

SoilCare Inc thanks the farmers and sponsors whose concern for soil health provided this opportunity.

SoilCare Landcare Inc

Australian Government Department of Agriculture, Fisheries and Forestry National Landcare Programme

Northern Rivers CMA

NSW Department of Primary Industries

TAFE

Richmond Landcare Inc

1. INTRODUCTION

In 2002 the Northern Rivers Soil Health Card was developed as an extension activity of the Good Soil Project, a joint undertaking of Tuckombil Landcare Inc and NSW Agriculture in partnership with the Natural Heritage Trust.

The card was developed through a series of workshops held at Wollongbar TAFE. Primary producers representing a range of industries and one urban gardener attended the workshops. The process was facilitated by staff of Wollongbar TAFE and NSW Agriculture. The aim was to develop a practical tool for farmers in the Northern Rivers Region to monitor the health of their soils.

In 2008 vegetable growers in the Northern Rivers (NSW) area adapted the Northern Rivers Soil Health Card for use on local vegetable farms. The card was adapted in workshops held at Murwillumbah TAFE. This activity was sponsored and funded by the Northern Rivers Catchment Management Authority, the Natural Heritage Trust, SoilCare Inc, Richmond Landcare Inc, NSW Department of Primary Industries and North Coast TAFE.

Participants are acknowledged individually at the end of this document.

The Northern Rivers Vegetable Soil Health Card lists 10 tests and provides space for you to rate your own soils after carrying out the tests. By testing regularly and keeping the cards, you can build up a record of your soil health and understand the effect of management practices on soil health.

Regular testing will show improvements in response to more sustainable management such as additions of organic matter and allow early detection of developing soil problems. Test results can also be used as the basis for discussion about management changes with other landholders and with agricultural advisers.

This card is not intended to replace any soil testing that you may already carry out. It is another tool to help you understand your soils and their productivity. Maintaining soil health in the short term will undoubtedly increase the sustainability of farming into the future.

APPENDIX 9

2. HOW TO USE YOUR SOIL HEALTH CARD

1. READ ALL THE INFORMATION FIRST.

This will help you go out into the paddock ready for action.

2. WHEN TO TEST

Best results will be obtained in autumn, two to ten days after good rain. Preferably sample when the crop is at least eight weeks old or sample a green manure or longer term crop. To allow comparison of results from year to year, sample at the same time of year and under similar conditions. Avoid taking samples from overly wet soils or during drought, at times of extreme high or low temperatures and within a few weeks of fertiliser or lime applications.

3. WHERE YOU WILL TEST

We recommend you start with two sites, one to represent your 'best' soil and the other your 'worst' area. This will give you a good overview of how the tests relate to soil conditions on your land. You can then select other areas to get a broader understanding of the health of your soil. Remember to record the location of each sample site for future testing.

4. DECIDE HOW MANY CARDS YOU NEED

At each site you select, you may want to use more than one card if:

- there is more than one soil type within the selected area
- conditions under row crops are quite different in the inter-row (e.g. light, ground cover, traffic)
- for comparison perform one test in an undisturbed area outside but adjacent to the vegetable plot

5. PREPARE YOUR EQUIPMENT

Make the 3 simple pieces of test equipment, using the instructions on Sheet 4, and gather together all the other items listed on the equipment list on Sheet 3.

6. CARRY OUT THE TESTS

Each card lists the 10 tests and has space on the back for you to draw a sketch map of the site and show the test sites. Once you are familiar with the tests it will take you around 20 minutes to carry out one set of tests. Each card has room for you to record up to five sets of tests at the site. We recommend that you do the five sets of tests as they will provide a broad picture of the soil conditions at the selected site.

7. REVIEW YOUR TEST PROCEDURE

As you become more familiar with the test procedures and your soils, check whether the sites you have selected are the best sites for the information you need. Also review the way you do your tests to ensure consistency. Make notes as you go to remind yourself next time.

8. REVIEW YOUR RESULTS AND FOLLOW UP ON LOW SCORES

Line up your test sheets for areas you wish to compare and look for similarities and differences among your scores for the 10 tests. Can you explain the differences? If you have neighbours also undertaking tests, get together with them and compare notes. Where you have low scores in the results, refer to sheet that lists possible causes; obtain and read the literature linked to those tests in order to find out how you might improve your soil health. Discuss your results with an agricultural adviser or NSW DPI extension officer.

9. MAKE SURE THE TEST DATE IS ON ALL YOUR SOIL HEALTH CARDS BEFORE YOU FILE THEM

10. MAKE A NOTE IN YOUR DIARY TO REPEAT THE TESTS AFTER 6 OR 12 MONTHS

APPENDIX 9

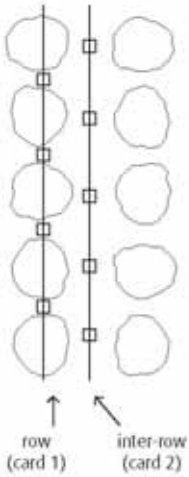
3. TEST PREPARATIONS

EQUIPMENT

- home-made wire quadrant (see Sheet 4)
- home-made penetrometer (see Sheet 4)
- home-made infiltrometer ring (see Sheet 4)
- clipboard and pencil
- one soil health card result sheet for each set of tests planned
- spade
- heavy duty plastic sheet, 1m x 1m (approx.)
- soil pH kit (available from rural stores and nurseries)
- 500 ml measuring cup
- container of water (allow 1 litre of water per sample point if soil is dry or 500 ml if soil is moist)
- watch with a second display or stop watch
- grass clippers
- 10 meter tape measure

SAMPLING PROCEDURE

Suggested layout of sample points:



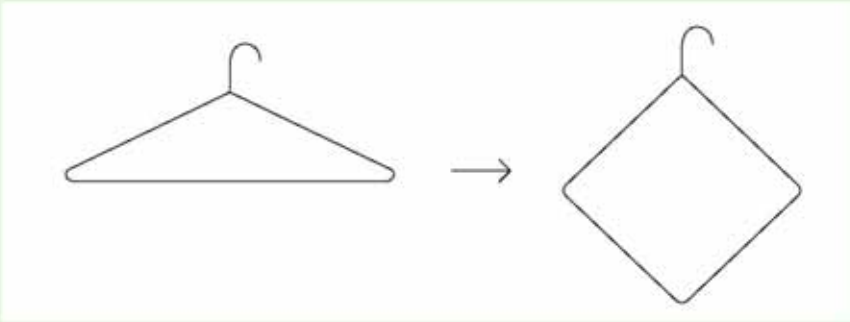
Notes

- Start from an identifiable point.
- Stay within a single soil type for each card.
- Sketch a plan of the sample points on the back of the assessment sheet and mark any soil type boundaries.

4. HOME-MADE EQUIPMENT

1. WIRE QUADRANT (TEST 1)

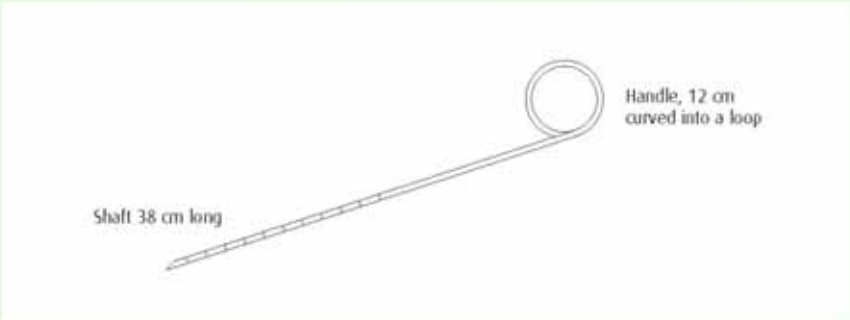
A quadrant is simply a frame that shows a known area when placed on the ground. It is used to obtain an accurate measure of anything found there. You will use it to assess the amount of plant cover and then again to record the variety of animal life in the leaf litter.



Take a wire coat hanger and open it out to form a square (each side will be approximately 24 cm in length.

2. PENETROMETER (TEST 2)

A penetrometer is a device to test the compaction of the soil. While you can buy sophisticated penetrometers for hundreds of dollars, you can make your own inexpensive version. Take a 50 cm length of 3.15mm/10 gauge high tensile wire. Use 12 cm of the length to make a handle and on the remaining 25 cm make file marks every 2.5 cm from the end.

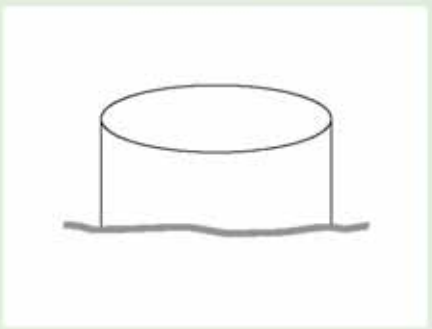


Metal rod (50 cm long, 3.15mm diameter) with file marks every 2.5 cm starting from end of rod.

APPENDIX 9

3. INFILTROMETER RING (TEST 3)

An infiltrometer measures the rate at which a fixed volume of water soaks into the soil. You will need a 150 mm diameter PVC pipe cut to 11 cm length. Bevel the bottom end to make it easier to push into the soil.



5. THE SOIL TESTS

WARNING: SOIL NATURALLY CONTAINS MANY MICROBES, SOME OF WHICH CAN CAUSE INFECTION OR DISEASE. WEAR GLOVES IF YOU HAVE INJURIES OR ABRASIONS ON YOUR HANDS.

1. DIVERSITY OF SOIL LIFE

Carefully throw the home-made wire quadrant to the ground in the area chosen to conduct the test. Examine the soil surface within the quadrant for soil animals and then carefully sift through the litter. Start turning the litter from the outer edge of the quadrant toward the center. This forces mobile soil animals to the center where they will be seen by the observer before they escape

Note how many different varieties of soil animals you see such as ants, beetles, spiders, slaters, millipedes, mites, snails etc. It is the variety that is important, not the numbers – a column of ants counts as one variety. Short term or cultivated crops should be noted in the comments section.

2. GROUND COVER

Starting near the 'diversity of soil life' test site, stretch the tape measure 10 meters down the row. At each 1 meter mark, look down from directly above the tape measure and note (count) if living plant material is present; count '1' if present and '0' if absent. Always read from the same side of the tape and count only what is directly next to the 1 meter mark. Calculate the percentage of ground cover and record your score on the results sheet.

Example: 5 counts of living ground cover out of 10 counts = 50% ground cover.

Living plants contribute organic matter to the soil that will feed soil animals and microbes. Roots of living plants also help maintain good soil structure. Short term or cultivated crops should be noted in the comments section.

3. PENETROMETER

Using ONLY moderate pressure, push your homemade penetrometer into the soil. Record the depth of penetration on the results sheet. If you hit a rock or root, choose another spot. The easier it is to penetrate the soil, the better the deep root development and water infiltration.

APPENDIX 9

4. INFILTROMETER

If the top 7 cm of soil is dry you must perform this test twice in each location and record the time of the second test for an accurate assessment. If the soil is saturated (field capacity) you will need to wait two days for drying before conducting the infiltrometer test.

- Clear the area of residue and trim the vegetation as close to the soil as possible without disturbing the soil.
- Push the infiltrometer ring 2 cm into the soil, avoiding cracks and other holes in the ground. The ring should be nearly level for accurate testing. Use your finger to gently firm the soil around the inside edge of the ring to prevent leakage of water here.
- Carefully pour 500 ml of water into the ring and note the time.
- Stop timing when the surface is just glistening.

A higher rate of infiltration will mean your soil will absorb rainfall more quickly, resulting in less run off and erosion.

5. ROOT DEVELOPMENT

With your spade cut a 20 cm square hole to a depth of 20 cm. Lift the soil out, trying to keep it in one block, and place it on the plastic sheet. Examine the distribution of plant roots in removed soil and on the walls of the hole. Record results on the result sheet. The distribution of fine roots will show whether soil structure is restricting the plants' access to nutrients.

6. SOIL STRUCTURE

Break a small handful of soil away from near the original surface of the block you have dug up and examine the size and arrangement of the soil aggregates or 'crumbs' (discrete clumps of soil particles). Under firm finger pressure, soil should be friable, breaking into crumbs varying in size up to about 10 mm. There should also be evidence of root penetration throughout. Poor structure may be seen either as overly solid soil (hard crumbs, soil layers or clods) or as very loose soil (absence of even small crumbs, as for example in beach sand). Good structure results in easy passage of air and water, an ability to hold water and superior resistance to erosion.

7. AGGREGATE STABILITY

Equipment - a wide mouthed jar with a lid, marked to show 125 ml level.
Select three or four pea-sized soil aggregates from about 5 cm depth, avoiding small stones. Drop the aggregates into 125 ml water in the small wide mouthed jar and allow to stand for one minute. Observe if the aggregates break apart or stay intact. If they are intact after one minute, gently swirl the bottle several times and observe again. If they are still intact, swirl the bottle vigorously and check again. The aggregates of a healthy soil are normally more stable than those of a less healthy one. Poor aggregate stability is associated with greater susceptibility to erosion. Repeat the test with a sample from a depth of 20 cm.

8. EARTHWORMS

Break up the entire soil block you have dug up into crumbs, count earthworms and record on the results sheet. Higher numbers of earthworms indicate conditions are favourable (more organic matter, good, low chemical residues). Mostly these are also conditions favourable for plant growth. Earthworm burrows enhance water infiltration and soil aeration. Their digestion of soil and organic matter cycles nutrients. The presence of earthworms is a good indicator of soil health.

9. SOIL PH

Take two small samples of soil from the side of the hole, one from 10 cm and one from 20 cm depth. Test each sample for pH, following the instructions included in the kit. Acidity has a strong effect on the ability of plants to take up soil nutrients as well as upon the well-being of soil organisms.

10. PLANT VIGOUR

Examining your plants at the soil test site may reveal plant health problems not identified by the completed soil tests. Examine 5 plants for poor leaf colour, canker and sparse canopy.

APPENDIX 9

SOME EXTRA (OPTIONAL) TESTS

CALICO STRIP TEST FOR SOIL MICROBES

Microbes in the soil (bacteria, protozoans and fungi) play a major role in the break down of soil organic matter. Microbial activity can be estimated by measuring the rate of breakdown ('rotting') of calico. Cut unbleached and washed calico into 20 cm squares. Using a felt tip pen draw a line across the square 5 cm from one edge. Make a cut in the ground to a depth of 15 cm with the spade and, again using the spade, insert the calico so that the marked line coincides with the soil surface. Arrange the top 5 cm of calico vertically in the litter layer, if present. Use at least 5 calico strips at each test site and leave in place for three weeks. Gently retrieve and rinse in a kitchen sieve, to remove attached soil. Place over a piece of graph paper and estimate the percentage area of the calico that has completely decomposed. The more the calico has rotted away the healthier the community of soil organisms. This test can also be done with soil in containers in a controlled atmosphere, i.e. the laundry room where moisture levels can be monitored.

EROSION

Take a 50 cm length of 100 mm x 50 mm timber and place it on the ground, across the slope, near the bottom of a long incline. After each major rainfall event check the wood for build up of soil on the upper side.

Also see Soil Erosion Solutions fact sheet; Monitoring soil erosion
http://www.northern.cma.nsw.gov.au/pdf/monitoringerosion.pdf

BIOTURBATION

Bioturbation is the mixing of surface organic matter into the soil profile by organisms. On the side of the hole dug at Test 5, observe the distribution of the darker soil colouration that is due to organic matter in the profile. Note the depth to which you can detect this darker soil and record on the back of your results sheet. Mechanical cultivation will incorporate organic materials lower in the profile.

SOIL HEALTH CARD RESULTS SHEET

Numbers resulting from the different tests are not intended to be combined to give an overall value of soil health.

Date: Location: (draw a sketch map overleaf)

Soil Type: Productivity: Days since 20mm rain: Soil moisture: dry / moist

RESULT▶ / TEST▼	POOR 1 ····· 2 ····· 3	FAIR 4 ····· 5 ····· 6	GOOD 7 ····· 8 ····· 9	TEST SCORES (1-9) 1	2	3	4	5	Av/Comments
1. DIVERSITY OF MACROLIFE	Fewer than 2 types of animals	2 to 5 types of animals	More than 5 types of animals						
2. GROUND COVER (ground plants or mulch)	Less than 50% ground cover	50% – 75% ground cover	More than 75% ground cover						
3. PENETROMETER · From surface · 20 cm depth	Penetrates to less than 5 cm	Penetrates more than 5 but less than 20 cm	Penetrates to 20 cm or more.						
4. INFILTRATION · surface · 20 cm depth	More than 3 minutes	1 to 3 minutes	Less than 1 minute						
5. ROOT DEVELOPMENT	Few fine roots only to 5 cm.	Some fine roots to 10 cm.	Many fine roots to 20 cm.						
6. STRUCTURE · surface · From 20 cm depth	Mostly clods or surface crust, few crumbs	Some clods but many 10 mm crumbs	Friable, readily breaks into 10 mm crumbs						
7. AGGREGATE STABILITY · surface · From 20 cm depth	Aggregate broke apart in less than 1 minute.	Aggregate remained intact after 1 minute.	Aggregate remained intact after swirling.						
8. EARTHWORMS	0 to 1	2 to 3	4 or more						
9. SOIL pH · 10 cm depth · 20 cm depth	pH 5.5 or lower pH 5 or lower	pH 5.5 to 6 pH 5.1 to 5.5	pH 6.1 or higher pH 5.6 or higher						
10. LEAF COLOUR	Stunted plants, leaf discolouration.	Some variation in growth and colour.	Appropriate leaf colour / uniform plant growth.						

SITE PLAN

(Showing a permanent reference point, 5 sample points, soil type changes etc)

TEST COMMENTS

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

The Soil Health Card can be downloaded from the following websites:
www.tuckombillandcare.org.au
www.soilcare.org.au
www.richmondlandcare.org

APPENDIX 9

LOW TEST SCORES: SOME POSSIBLE CAUSES

TEST RESULT	SITUATION INDICATED	POSSIBLE CAUSES
1) Low variety of soil fauna	lack of habitat or food for fauna poor soil structure presence of harmful chemicals	sparse litter, low soil organic matter (OM), lack of soil spaces and channels frequency or intensity of machinery has been excessive mortality from recent use of insecticides or regular use of cumulative chemical(s) such as copper
2) Low ground cover	ground plants absent or growth is poor	unsuitable plant type(s), soil compaction, erosion, shading, herbicide use
3) Low probe penetrability	soil is generally hard hard at the surface only hard layer at greater depth	compacted by over-working, low soil organic matter compacted by traffic, especially if soil is wet at the time compacted by heavy vehicles or 'hard pan' formed by soil inverting cultivators
4) Slow water infiltration	high proportion of clay particles lack of spaces, channels or burrows in soil	naturally high clay content of soil type, possible loss of topsoil soil compaction, poor soil structure, lack of earthworms, surface crusting
5) Poor root development	hard soil lacking spaces poor plant nutrition root disease or attack	loss of topsoil, poor soil structure, soil compaction soil pH not suitable for crop, lack of major or minor nutrients presence of soil-borne pathogen, root-feeding nematodes or root-feeding insects
6) Lack of depth of A1 (AO) horizon	low organic matter low population soil organisms	loss of topsoil, sparse ground cover (see 2) , copper toxicity low variety of soil fauna (see 1), few earthworms (see 8)
7) Poor soil structure	powdery soil, few crumbs excessive clods	lack of soil-binding substances and processes, low soil organic matter (sparse ground cover), few worms topsoil loss, soil compaction, low soil organic matter
8) Low earthworm count	pH unfavourable poor food supply lack of soil spaces predators or parasites present presence of harmful chemical	soil pH naturally low, pH reduced by use of acidifying fertilisers sparse litter and/or ground cover (and roots), low organic content, low populations of fungi and bacteria loss of topsoil, soil compaction, poor structure predators (eg flatworms) and parasites (eg parasitic fly) may occur in 'plague' numbers mortality from recent use of insecticides or regular use of cumulative chemical(s) such as copper
9) Low pH	high level of acidity	5 cm: calcium levels low, excess of nitrogen from inorganic fertilisers, poor drainage, low OM 20 cm: as above; if pH is less than 4 consider acid sulfate soil (grey clay/ sometimes yellow veins)
10) Poor tree vigour	unthrifty trees	soil problem as indicated in tests 1–9, one or more essential nutrients deficient or unavailable (confirm via soil or leaf analysis), low organic matter, disease/Phytophthora

APPENDIX 9

The Northern Rivers Soil Health Card for vegetable farmers was developed in a series of workshops with local farmers, facilitated by TAFE Wollongbar staff, NSW DPI staff, Richmond Landcare staff and SoilCare Inc members. SoilCare Inc thanks all the people who, in their concern for soil health, volunteered their time and expertise to ensure the production of a card that would be useful and relevant for farmers.

Vegetable Industry Participants:
- Rod Bruin, Tyalgum
- Hamish Brace, Tyalgum
- Tony Lattanzi, Cudgera
- Rob Miles, Uki,
- Richard Mitchell, Carool
- Avi Mishtler, Byangum
- Doug Paddon, Cudgen
- Lynne Paddon, Cudgen,
- Michelle Stephens, Cudgen

Facilitators:
- Dave Forrest, TAFE Wollongbar
- Jackie Luethi, Richmond Landcare Inc
- Bonnie Walker, SoilCare Inc
- Abigail Jenkins, NSW Dept. Primary Industries

Sources for information on soil health:

NSW Department of Primary Industries publications available from:
phone 1 800 028 374
NSW DPI http://www.agric.nsw.gov.au

Ag-Facts/Ag-Notes
http://www.dpi.nsw.gov.au/aboutus/resources/factsheets/agfacts_and_agnotes

Prime Fact Notes
http://www.dpi.nsw.gov.au/aboutus/resources/factsheets

TAFE Wollongbar, Sneaths Road, Wollongbar, NSW 2478, phone (02) 6620 4200
Contact the Agriculture Department (Block 'D') for information on soil classes and other agriculture courses.

SoilCare Inc http://www.soilcare.org.au
Tuckombil Landcare Inc http://www.tuckombillandcare.org.au

The most reliable sources of information on-line will be found at university and government sponsored web-sites. Suggested words and phrases for search engines: soil biota; soil organic matter; soil organic carbon; soil organisms; soil ecology; soil quality; soil health; soil fauna; earthworms; nutrient cycling.

Disclaimers: The information contained in this publication is based on knowledge and understanding at the time of writing (2008). However, because of advances in knowledge, users are reminded of the need to ensure that information on which they rely is up to date, and to check the currency of information with the appropriate officer of NSW DPI or the user's independent adviser.

APPENDIX 10

Publications, Websites and other Resources for Teaching Sustainable Horticulture

Industry References:

NSW DET Green Skills Industry Programs
www.greenskills.nsw.gov.au/resources/tools

Acres Australia – The National Newspaper of Sustainable Agriculture
www.acresaustralia.com.au

Biological Farmers Association Australia (publisher of the Australian Certified Organic Magazine and Guidebook) www.bfa.com.au

Key Industry Drivers for the Adoption of Sustainable Practices in Horticulture, Primary Industries Research Victoria, Department of Primary Industries, Knoxfield, Victoria, November 2004
http://www.dpi.vic.gov.au/DPI/nrenti.nsf/LinkView/84AFBC75ADFED1CDCA25750D001384775B65FD3894DB84E6CA2574AC000CF430/$file/Key%20Drivers%20for%20Sustainability.pdf

See the environmental pages of ***Nursery & Garden Industry Australia*** *(NGIA)* (www.ngia.com.au) for:
NGIA Environmental Sustainability Position, September 2009
Nursery Industry Accreditation Scheme Australia – Best management practices for production/growing media businesses
Nursery Industry Water Management Best Practice Guidelines 1997

NSW Soil Conservation Act
www.austlii.edu.au/au/legis/nsw/consol_act/sca1938215

Northern Rivers Soil Health Card – *Vegetables –assessing the biological and physical properties of soil 2008,* Northern Rivers Soil Best Management Practices for Soil Health, Soilcare Inc., www.soilcare.org.au (other volumes available on orchard and nut crops)

Clean Food Organic www.cleanfood.com.au

Going Organic **Journal of the Tweed Richmond Organic Producers Organisation** TROPO www.tropo.org.au
(most regions now have organic growers organisations)

Ecological Footprint Calculators:

http://www.goinggreensolutions.com.au/docs/GGSInfoSheet.pdf

The Powerhouse Museum has produced an interactive ecological footprint calculator on CD-rom to give to local councils. The calculator is at:
http://www.powerhousemuseum.com/education/ecologic/bigfoot/bigfoot2007/

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Useful websites:

Horticulture Australia Limited (HAL) www.horticulture.com.au

Greening Australia www.greeningaustralia.org

Preserve Our Planet www.preserveourplanet.com

The Australian Green Business Guide www.greenfinder.com.au

Organic Materials Review Institute www.omri.org

Greening your garden www.greenterrafirma.com

ABC Gardening Australia www.abc.net.au/gardening

Sustainable Gardening Australia www.sgaonline.org.au a not for profit community group based in Victoria - lots of good fact sheets, subscribe to e-newsletter

Permaculture www.holmgren.com.au or www.permaculture.com.au or www.permaculture.org or www.permaforesttrust.org.au

Seed Savers Group www.seedsavers.net

Composting & Worm Farming www.thecompostguy.com

Australian National Botanic Gardens www.anbg.gov.au

Australian Community Gardens Network www.communitygarden.org.au

The Veggie Lady – a private Sydney based site that has fact sheets and regularly updated info. You can join for a fee for extra services www.theveggielady.com

Sheila's Herb Patch - private Queensland based enthusiast www.uq.net.au/hyperlinked/Herbs

The Canadian government runs an **urban agriculture information** site www.cityfarmer.org

Backyard based **urban agriculture**, California – great inspiration for what is possible in urban agriculture www.homegrownrevolution.com

General Publications:

Sustainable Gardens
Rob Cross & Roger Spencer, CSIRO publishing, 2009

The Holistic Life: Sustainability through Permaculture
Ian Lillington, AXIOM publishing, 2007
The Business Guide to Sustainability: Practical Strategies and Tools for Organisations
Darcy Hitchcock & Marsha Willard, Earthscan Publishing, 2009

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The Green Gardener: Sustainable Gardening in Your Own Backyard
Josh Byrne, Penguin books, 2006

Easy Organic Gardening and Moon Planting (new edition)
Lyn Bagnall, Scribe publications Pty Ltd, 2009

The New Organic Grower: A Master's Manual of Tools and Techniques for the Home and Market Gardener
Eliot Coleman, Chelsea Green publishing, 1995

Queensland Planting Guide: A Basic Guide to Organic Gardening
Brisbane Organic Growers Inc., revised edition 2008 $9.50

The Seed Savers Handbook
Michel & Jude Fanton, Seedsavers Network Byron Bay, 1993

Successful Gardening in Warm Climates
Annette Mc Farlane, ABC Books, 2008

How Can I Be Prepared with Self Sufficiency and Survival Foods?
Written & published by Isabell Shipard

Tropical Food Gardens
Leonie Norrington, Blooming Books Melbourne, 2001

One Magic Square: Grow your Own Food on One Square Metre
Lolo Houbein, Wakefield Press, 2008

Organic Gardening (7th Edition)
Peter Bennett, New Holland, 2006

Soil Food: 1372 Ways to Add Fertility to Your Soil
Jackie French, Arid Books, 1995

Bush Foods of NSW
Kathy Stewart & Bob Percival, Royal Botanic Gardens Sydney (PDF available for download www.anbg.gov.au)

Australian Gardening Calendar
Penguin Books 2005

Organic Gardener Magazine
www.abc.net.au/gardening or Tel: (02) 8877 0361

Warm Earth Magazine
Has a subtropical orientation – from newsagents, website www.warmearth.com.au or Tel: 07 4126 8465 $35 per year

ABC TV Gardening Australia has video clips online – some of which may be relevant for teaching

APPENDIX 10

Organic Seed Suppliers *(a few of the many)*

These catalogues and websites contain lots of useful information especially on suitable varieties. They also have articles and fact sheets.

Green Harvest Organic Gardening Supplies
www.greenharvest.com.au or Tel (07) 5435 2699

Eden Seeds
www.edenseeds.com.au or Tel (07) 5533 1108

Diggers
www.diggers.com.au or Tel (03) 5984 7900

Greenpatch Organic Seeds
www.greenpatch.com.au or Tel (02) 6551 4240

Info on Pests & Diseases:

Chemical Free Pest Control by Robin Stewart, $22

What Garden Pest or Disease is That? 1995, Judy McMaugh, $55

Pest Repellent Plants Penny Woodward, 1998, $20

Organic Control of Garden Pests Jackie French, 2nd Edition 2008

See the Botanic Gardens Trust
www.rbgsyd.nsw.gov.au/plant_info/pests_diseases - you can make email enquiries

www.yates.com.au - good for id of pests

Green harvest www.greenharvest.com.au has a wide range of ecological pest control products