

Tomato SAP Report 2002

Australian Pilot breaking new ground, environmentally ...



Unilever

Unilever Australasia

The first phase of a two year pilot study was successfully concluded in June 2001. The environmental indicators monitored during the 2000/2001 growing season gave valuable insight into the environmental impact of processing tomatoes.

The two year study known as the Sustainable Agricultural Project (SAP) was made possible by the combined support of Unilever Australasia, Horticulture Australia and the Australian Greenhouse Office.

Mr Tim Dyer, Project Director and Supply Manager - Food Ingredients & Agriculture, Unilever Australasia said, *"This initiative will provide a sound and practical basis to resolve an environmental monitoring system and help develop the management technology to grow processing tomatoes more sustainably."*

"The 8 clusters of sustainability indicators examined in the first year monitoring program were: Soil Fertility & Health, Soil Loss, Nutrients, Pest Management, Water Management, Biodiversity, Energy and Product Value".

Mr Dyer said, *"This project is all about finding a way to select, evaluate and screen potential sustainability indicators; once this phase is completed we aim to develop practical management tools to grow tomatoes more efficiently and sustainably."*

One of the highlights from the first season was the strong grower and industry support

for SAP as shown by excellent attendance and positive feedback received at the field day held in January 2001 and the workshop conducted in June 2001.



Growers, government advisers and industry all agreed about the importance and timeliness of the SAP initiative.

"Unilever's International Sustainable Agricultural Advisory Board has given strong support for the direction and recent progress in the Australian SAP initiative", Mr Dyer said.

The 16th of January 2002 marked another significant milestone for this initiative with the Second Wallenjoie Sustainability Field Day held in the Wallenjoie Swamp, Corop Victoria. The aim of the field day was to give key grower, Unilever, government and community stakeholders an opportunity to review recent SAP progress and to help plan the next steps for the project.

"Unilever's Global tomato agronomy managers and senior leaders came to Australia to attend the field day, inspect first-hand the progress of the SAP initiative, and to participate in a tomato agronomy workshop", Mr Dyer said.

The Australian Greenhouse Office partnership in the SAP initiative has for the first time allowed all Unilever growers to benefit from a review of farm energy and emissions as part of a wider initial environmental review. This will position Unilever growers to benefit from the outcomes of the SAP and implement the management technologies developed as a result of project outcomes.

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OUTSOURCED ENVIRONMENTAL

S.A.P. TIMES

Little Wallenjoe Field Day January 2001

Out of Little Things Big Things Grow ...



Sara Glenie, Cellist for Wallenjoe Field Day 2001.

17 January 2001 heralded a new day environmentally for agriculture with the summit of key tomato growers, Unilever and the scientific community and the development of the Little Wallenjoe Protocol.

This historic day focused on crucial sustainability factors for tomato crops, elements of biodiversity and consideration of environmental and sustainability indicators.

Field day participants worked in teams to workshop several key issues relating to sustainability.

Participants put forward the following key statements to summarise what they believed sustainability involves: *Continuity, Profitability, Making-a-“Quid”-now without degrading the Farm Natural Asset Base, Use of Renewable Resources*

as Inputs, Sound Stewardship of Soil, Water and Biodiversity, Commitment, Work, Long Term Viability, and “Healthy Worms”!

The Little Wallenjoe Protocol

As an industry we collectively believe;

- Processing tomato production can be both economically and environmentally sustainable in Australia,
- We can learn from knowledge of past practices and environmental impacts,
- Although we are within top 10% of World’s Best Practice we have significant room for improvement environmentally,
- The Unilever SAP will accelerate the process of change within our industry.

Together we will;

- Invest the necessary time, funding and resources at all levels within industry to achieve what we believe,
- Evaluate and quantify our impacts on the environment,
- Take action to reduce our negative impacts,
- Leave a more sustainable tomato

processing industry for the next generation.

Our vision for the Future involves;

- A high yielding (tonnes and solids), internationally competitive, environmentally sustainable Australian industry that young people will be proud to join.
- Developing export markets for sustainably produced and labelled tomato produce grown in Australia.
- Developing management practices that assist in working towards “no-net-environmental-loss”.
- A global level playing field for tomato production.



Greg Dalton, Consultant, Outsourced Environmental explaining the importance and significance of Biodiversity to field day participants, January 2001.



The distinguished participants of the Wallenjoe Field Day, 2001: Phillip Pike, Robert Hosking, Lew McMaster, Peter Butcher, Stuart Holland, Geoff Spencer, Leigh Sparrow, Graeme Ashby, Neil Repacholi, Ray Sellwood, Adrian Orloff, Bruce Wehner, Greg Dalton, Flavio Lacota, Chris Browne, Peter Howard, John, Sue & Rodney Pike, Megan McMaster, Tim Dyer, John Blitt, Nick Gugliotti, Carita Spencer, Kerry Spencer, Cosimo Gugliotti, Jack Portia, John Blackstock, Philip Michelsen, Garry West, Louis Chirnside, Geraldine Chirnside, Pat Kennedy, John Kennedy, Sean Kennedy, Gerard Kennedy, Hamish Chirnside, Dave Chirnside, Barry Horn, Sze Flett, Mark tSharke, Andrea Smith, Jamie McMaster.

I love a sunburnt Wallenjoe

I love a sunburnt Wallenjoe,
A land of juggling balls,
A soil full of healthy worms,
Where you hear the Warbler Calls.

I love a green and wet Wallenjoe,
Where the possums and roos go,
Where the croak of frogs and song
of kookaburras,
Join the swamp melody as it echoes.

A healthy whistle gathers all,
The day has come for us to change our ways,
to create a plan,
Open our minds and look forward,
We can do it, we can do it, yes we can!

The gauntlet of the greenhouse challenge has been thrown
Now's the time to make a move ...
To meet the challenge of the future
So that we can change the mindset of our culture.

We want a bank full of wealthy terms,
To grow the perfect tomato high in solids and lycopen
To keep the natural environment, pristine clean and green
What a wonderful world it will be, if we believe!
Future generations will be proud of us and what we have achieved.

I love a sunburnt country, but I really hate burnt crops
That's why the Little Wallenjoe Protocol is for me the tops!

*Written by the distinguished participants of the
Unilever Australasia Wallenjoe Protocol Field Day,
17 January 2001
Corop, Victoria, Australia*



Unilever Australasia



Horticulture Australia



Australian
Greenhouse
Office



environmental
Working Today & Tomorrow

Introducing 5 of the Best



John & Pat Kennedy

John & Pat Kennedy manage a 633 hectare property at Corop, Victoria. Mixed production includes processing tomatoes, cereal, sheep and hay. John & Pat have been growing tomatoes since the early 1980's and in the past ten years have converted to drip irrigation, realising savings in water use and increased yields. Recent farm improvements have included the introduction of irrigation scheduling techniques, development of new chemical storage facilities, acquisition of new chemical spray equipment to improve efficiency and effectiveness of pest control sprays. The Kennedy property has a significant % of land dedicated to biodiversity.

Graham Lehmann owns a 640 hectare property at Boort, Victoria. Mixed production includes processing tomatoes, cereal, sheep and lucerne hay. The Lehmann family have a long standing association with agriculture and have been farming in the Boort district for many years. A combination of furrow and drip irrigation techniques are utilized on the Lehmann properties to grow tomatoes. The Lehmann property borders the Leaghur State Park, providing a useful reference for benchmarking biodiversity, soil fertility & health sustainability indicators.



Graham Lehmann



Jo, Bree, Ray & Codie Sellwood

Ray & Jo Sellwood run a 146 hectare property at Undera, Victoria. Mixed production includes processing tomatoes, maize, orchards (peach, plum, apple, pear) and chick peas. Ray is the fourth generation to have operated from this farm, with his forebears establishing the property in the late 1800's. Drip irrigation has been used to grow tomatoes for the past 6 years. Ray is conducting research into the use of permanent beds for production of a range of crops including tomatoes. He is also evaluating techniques to incorporate organic matter for improved production.

Sergio, Glenn & Allan Rorato manage a 2,464 hectare property at Jerilderie, New South Wales. Mixed production includes processing tomatoes, cereals, rice and onions. The family also operates a food processing plant, supplying a range of value added products to domestic food retail outlets. Sergio and his brother Lou immigrated to Australia in the 1960's and together with their families have established several successful mixed cropping properties in the Jerilderie district. Sergio was one of the first to furrow irrigate crops such as tomatoes and onions in this region. His sons Glenn and Allan are some of the first to trial precision farming technology in the tomato processing industry.



Sergio, Silvia, Glenn & Allan Rorato & Daughter Sandra, & Grandchildren Jenna, Marcus Robinson



Geoff & Sandy Spencer

Geoff and Sandy Spencer own a 486 hectare property at Corop, Victoria. Mixed production includes processing tomatoes, legume and lucerne hay, cereals and sheep (wool and wethers). Geoff was one of the first to innovatively introduce drip irrigation to the tomato processing industry some 27 years ago. Apart from consistently high performing crops, the Spencer family have developed improved cultivation and fertilizer management practices. Sandy and Geoff have also experimented with the use of non chemical based (renewable) fertilizers with success.

23 Growers participate in Greenhouse Challenge

A unique opportunity has been made available to growers, thanks to the Australian Greenhouse Office (AGO). As a result 23 processing and fresh market tomato growers are participating in an initial environmental review focusing on energy and greenhouse emissions at no cost to the participants.

The AGO aim to learn about the inputs and management activities on tomato farms that contribute to the greenhouse effect. To this end Outsourced Environmental (OE) is studying fertilizer inputs, vehicle and fuel use, cultivation activities, and trash management practices etc. Estimates of how many tonnes of carbon dioxide and other greenhouse gases are released from farming activities will be estimated. Further research will focus on finding ways to generate offsetting sinks, that is, potential areas of land use and activities that could contribute to a net reduction in emissions.

As a result of this review, several growers not directly supplying Unilever have volunteered to participate in this initiative. An added bonus for each grower is that the initial environmental review process used will provide each farm with a report and recommendations to form a base for the first important step towards implementing an Environmental Management System (EMS). This initiative will be finalised by July 2002.



A roadmap for sustainability emerges ...

The key learning's from the ramp up phase of the project and the first year of monitoring were presented at a workshop held on the 6th and 7th of June 2001 at Tatura, Victoria (see pages 6 to 7).

The workshop held on the 7th of June provided stakeholders with the opportunity to begin to plan the road map forward.

The next steps for the Australian SAP include: **Completion of Phase One** (July 2002), **Development of the EMS** (December 2002), **Implementation of EMS for all Unilever Growers** (August 2003), **Indicator Improvement Research** (three seasons starting in 2002/2003).

Clearly the next steps are critical to realising and harvesting the benefits of SAP progress to date. It is our firm belief that the SAP outputs will position us to achieve tangible improvements in environmental performance and to identify what else needs to happen to achieve sustainability. This view formed the basis of the workshop for the 7th of June which is summarised as follows;

The Road Map to Sustainability: (Workshop Outcomes)

1. Where do we need to go?

- We need to firstly develop a management system blue print for use amongst Unilever growers; this system needs to also link to crops other than tomatoes and provide a blue print for other industries,
- Develop a mechanism to differentiate products grown under this management system (clean/green),
- Develop strategies to realise market/commercial benefits for all key stakeholders,
- Develop the system so that it gains public confidence and acceptance ,
- Have the system certified to international standards such as ISO 14001 &/or other accreditation.

What are the key steps in getting there?

- Distil the key learning's from Phase One of the SAP,

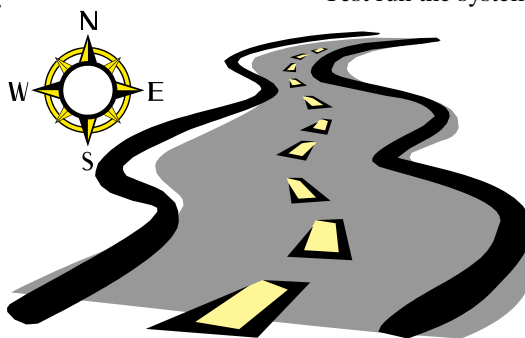
- Network & exchange learning's with other Unilever Pilots,
- Determine management practices to influence and improve sustainability indicator thresholds,
- Contribute to the development of crop-specific standards across all Unilever core products,
- Test run the system on all Unilever grower properties,
 - Conduct market research into the potential for products that can be differentiated based on sustainable production principles.

Who needs to be involved?

- Current industry, grower, government and community stakeholders considered appropriate, however stakeholders including Landcare Groups, Women's Rural Groups and Schools were identified as requiring involvement in the SAP,
- Specific research needs/gaps identified in Phase One may need involvement of Specialist Government Agencies and NGO's,
- Participants identified a role for wider consultation once system was functioning,
- External/Independent Auditors need to facilitate independent auditing of each farm and their management system.

What will be the keys to our success?

- Patience, trust, respect and open communication between all key stakeholders,
- Longer term contracts and pricing arrangements for growers to enable investment into sustainability improvements,
- Thorough understanding of current and potential markets and testing of these markets as to potential responsiveness to sustainably produced and labelled produce.



Unilever International Workshop—Muenster, Germany, June 01

From the 10th to the 14th of June, Tim Dyer and Jamie McMaster attended Unilever's 3rd Sustainable Agriculture Workshop in Muenster, Germany.

This workshop provided an opportunity to review the pilots under way in various countries around the globe and to network ideas and approaches to facilitating the projects. Reports were provided for Fish, Tea, Palm Oil, Market and Frozen Vegetables and Tomatoes.

Strategies to develop crop-specific standards based on indicator research and best management practices were a key

focus for the workshop. ISO 14001 was considered a useful framework for the development of these standards. Further workshop activities focussed on indicator assessment and review.

WWF guest speaker, Richard Perkins also reported on the Global 200 Eco Regions Program.

A field day was scheduled to review a Langnese-Iglo Spinach farm where one of the pilot projects is underway. Results for a range of indicators were discussed. This crop proved to be a very challenging one to monitor given it

grows to maturity in 7-8 weeks, with 3-4 rotations per summer, and 200 kg/ha N applied per crop.



Season One Sustainability Indicator Monitoring In Review

As reported in the last edition of the SAP times, Unilever have identified 10 Sustainability Indicator Clusters believed to relate to sustainable land use.

Eight clusters of sustainability Indicators were examined in the first years monitoring program and included: **Soil Fertility and Health, Soil Loss, Nutrients, Pest Management, Water Management, Biodiversity, Energy and Product Value.**

*Further research is required for the two remaining indicator clusters, **Social/Human Capital and Local Econ-***



Map of Location of the 5 Unilever SAP Study Farms

omy. Five processing tomato farms were selected by Unilever to participate in the two year sustainability indicator monitoring program. For each farm, native reference sites were also established to enable soil fertility and health and biodiversity benchmarks to be established.

For each of the five farms involved, a range of assessments were conducted throughout the season.

Results were compiled and key learning's communicated in June 2001 in Australia and Germany.

Ramp Up Phase Provides Sound Basis for Environmental Monitoring in Season One

With the completion of an initial scoping study in January 2000, a project implementation plan was established, the first step of which involved the Ramp-up. This important step facilitated the conducting of an exhaustive literature review (some 325 references considered), an initial environmental review of each grower property, and a study of the natural resource base for each of the five selected farms.

Some Literature Review Highlights

- Natural Resource Sustainability is on the policy agenda for Governments and Agencies World Wide.
- A lack of uniformity in understanding and interpretation of sustainability, is evident across disciplines and there is a need to establish conventions for methodology.
- While some conventions for sustainability, particularly in the bio-physical sciences, are being established at the "macro" level, the "micro" level issues for monitoring the environment at a specific site and the methods or protocol for doing so are not resolved in most cases.
- The technical concerns and priorities of the tomato processing industry are traditionally in the areas of (in descending order R&D investment as indicated by the number of papers presented) fruit quality, water management, general crop management and nutrition.

- Current tomato industry awareness of sustainability issues appears historically limited as reflected in the absence of research papers in the subject areas of Biodiversity, Energy, Soil fertility/health, and Soil Loss.
- R&D in the tomato processing industry has been *production and fruit quality* driven to date, the sustainability of the commonly accepted commercial yield and quality "targets" envisioned or pursued by industry has yet to be questioned or considered.
- Formal conventions for measuring the different bio-physical aspects of the tomato-processing environment have yet to be agreed upon and a diversity of methodologies are in use.

The Initial Environmental Review

This review was conducted in August 2000 and involved all five growers, their families and employees over a two day period per farm.

The aim was to review in detail each farm for: *current management practices, current or potential environmental impacts, sensitive neighbouring environments, grower and community concerns etc.* Detailed information was collected to help the project team establish priorities to select indicators and focus



DNRE's Soil Surveyor Mark Imhoff with Unilever Grower John Kennedy describing profile characteristics, March 2001.

the research for the project. In addition, each farmer received a detailed report together with initial recommendations, many of which were implemented immediately.

The Study of the Natural Resource Base

The natural resource base study consisted of;

- a study of existing soil and geology records,
- conducting a detailed grid soil survey for each production and native monitoring site,
- development of a series of natural resource and environment maps,
- detailed soil pit assessment and analysis for dominant soil types associated with each property,
- reconnaissance biodiversity assessment for each farm and surrounding areas,
- establishment of native monitoring sites for benchmarking purposes.

130 Indicators Under Review

In this current phase of the project a range of indicators and methods of assessment are under review. Clearly one season's data is inadequate to evaluate the usefulness and sensitivity of sustainability indicators (at least two seasons' data is needed); the following information provides an initial reference point.

Currently the data from season one is being processed to generate an environmental map (ECO MAP) for each indicator cluster monitored, together with a summary ECO MAP for the property.

Soil Fertility & Health

Indicators including *earthworm density* and *biomass*, *microbial biomass*, *microbial fauna & flora* and *mycorrhiza* are under review for paddock and native reference soils; it is hoped



Cultivating for weed control using Lilliston Bar

this will provide insight into the factors influencing the living component of soil fertility.

Soil properties including *bulk density*, *slaking* and *dispersion* will assist to evaluate soil physical properties.

Indicators including *soil pH*, *soil salinity*, *organic matter levels*, *phosphorus*, *nitrogen*, *cation exchange capacity* and *heavy metals* are under review to assist with a better understanding of soil chemical properties and their link to sustainability.

Soil Loss

Indicators including *number & type of cultivations*, *vehicle traffic movements* and *tonnes of soil exported to factory* are under review. **For example, given the first seasons monitoring, the number of culti-**

vations for the crop ranged from 13 to 17, while total traffic movements ranged from 33 to 44 and amount of soil exported (or kindly donated) to the Rosella factory ranged from 0.28 to 0.71 tonnes/ha.

Nutrients

A range of indicators are under review for nutrients. For each of the five farms involved in the pilot SAP a nutrient budget was developed for season one. The type and rates of fertilizer, frequency, timing and application methods are being studied. Several techniques are being evaluated to consider the potential losses of nutrients to the environment.

Pest Management

Pest profiles and the presence of *beneficial insects* are being monitored along with the *chemicals used*, their *eco-toxicity* and *fate*. Insect traps, soil and ground water sampling are being used to provide some insight into current pest management practices.

Biodiversity

Following the initial reconnaissance survey in September 2000, an assessment system has been developed and 13 biodiversity indicators have been selected for field testing. Biodiversity indicators range from size and shape of native vegetation to macro invertebrates and frog abnormalities. In addition, biodiversity management plans for each farm have been developed.



Phil Michelsen, Consultant, Outsourced Environmental harvesting tomatoes on John Kennedy's property, January 2001.

Product Value

A range of indicators including *yield*, *soluble solids*, *nutrient value* and *chemical residues* are under review. **Grower yields for season one ranged from 49 to 154 t/ha.**

Energy & Greenhouse Emissions

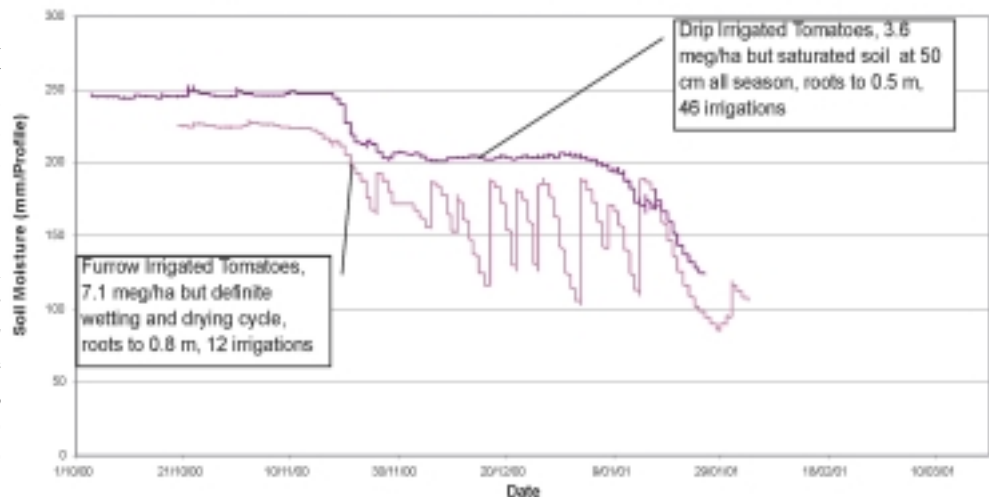
In collaboration with the Australian Greenhouse Office, several energy indicators are under review. *Fuel* and *electricity use*, *soil disturbance*, *tomato trash management* and presence of native vegetation are being considered.

Water Management

Irrigation system method, *application uniformity*, *frequency* and *timing*, *water quality* and *water table depth* are providing the basis for water indicator assessments.

Water use for season one on tomatoes ranged from 3.6 to 7.1 megalitres per hectare.

Comparison of Profile Soil Moisture for Drip and Furrow Irrigation 2000/2001





Next Steps for SAP

In July 2002 the first phase of this project will be completed and a framework (or blue print) for the development of an Environmental Management

System will have been established. On the basis of the key learning's from the sustainability indicator monitoring conducted over the two seasons (on the five properties) a holistic environmental statement for each pilot farm (ECO MAP) will then be available. Despite the incredible investment of time and resources from all key stakeholders, not the least of which have been our five pilot growers and Unilever, there is still some way to go in rolling out the management tools need to improve industry sustainability and to enable net environmental improvements to be measured over time.

Where to from here? In December 2001 the SAP project management executive team met to plan the next steps for the project. Although not yet finalised, the next phase of SAP is likely to consist of 3 components;

1. Development of the EMS and Training Tools

On the basis of research conducted in phase one, an EMS compliant with ISO 14001 will be constructed, incorporating best practice observed in phase one (combined with Unilever cumulative best practice from other pilot projects in California and Brazil). The EMS will also be integrated into a simple (grower friendly) farm management tool embracing food safety and occupational health and safety requirements.

2. Field Application

The output from the two year start-up phase of SAP will be a tentative set of sustainability indicators and a framework for the development of management tools for Unilever Grower use. Once the management tools are developed and have undergone testing they will be made available for wider industry application. There is a possibility that Unilever and Horticulture Australia will make the management tools available to the wider processing tomato industry and other industries also; this may enable these industry sectors to benefit from the key outcomes of this project. The details to facilitate this process are yet to be finalised.

3. Indicator Improvement Research

Partnering with the five pilot farms, the third component of the next phase is likely to involve research into management practices to improve performance of key sustainability indicators. This work will occur over a three year period to fine tune management tools for best practice and enhanced environmental performance. The indicator research over the past two seasons helps to benchmark current environmental performance for the range of indicators studied on the five farms. At this stage we don't know to what extent growers can positively influence and so improve the sustainability of their production systems. Given the significant investment made to date in researching indicators for these farms, further Best Management Practice Monitoring will help to assess the sensitivity of selected indicators to management change; the strengthening of our knowledge of sustainable BMP with the five properties will provide confidence to share sustainability improvement learning's with the wider industry.



Heliopsis is a major pest for Australian Processing Tomatoes



Jamie McMaster downloading a weather station

Contact Us

For more detailed information, to discuss practical aspects of the project, or to arrange a time for a detailed presentation, please contact us as follows.

- Tim Dyer, Project Director and Supply Manager - Food Ingredients & Agriculture Unilever Australasia – Phone: 03 9765 1703 or 0427 912 879, Email: tim.dyer@unilever.com
- Jamie McMaster, Sustainability Project Manager, Outsourced Environmental – Phone: 03 9761 0204 or 0407 317 288, Email: jamie.mcmaster@outsourcedenvironmental.com.au PO Box 169, THE BASIN VIC 3154, Australia

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