

Building & Implementing Grow Sustainably™ for Processing Tomatoes

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Abstract

The context for developing the Grow Sustainably™ system to monitor and improve the Environmental footprint of tomato growing is described. A set of 10 indicator clusters designated by Unilever provided the framework for the Grow Sustainably™ EMS consistent with ISO14001. The resulting EMS integrates Occupational Health & Safety and Food Safety requirements via an integrated risk assessment process and a risk assessment calculator. The methodology for developing the Grow Sustainably™ system is outlined. Competency based training modules were developed along with a client server web tool to allow farmers remote access to key management information. The main drivers influencing EMS development and key learning's are discussed. It is concluded that the Grow Sustainably™ system provides a holistic framework for industry initiatives to reduce environmental impacts and provide supply chain assurance.

INTRODUCTION

In the quest for increased food production and higher yields through the development of land and water resources, there is growing community concern about the environmental footprint agriculture is leaving on the landscape. In common with other food producing countries, Australia has seen a net environmental loss in areas such as biodiversity soil erosion and water quality decline.

Although such environmental losses were unintentional, the effect has been to bring pressure upon all land users around the world to be more caring of the environment and to find ways to use natural resources in a more sustainable way. In January 2000 Unilever Australasia and Horticulture Australia Limited began a joint initiative for the Australian processing tomato industry called the Sustainable Agriculture project (SAP)..

Working closely with tomato farming families spread across Northern Victoria and Southern NSW, with input from a range of government agencies, the SAP initiative sought to: 1) Find ways to monitor environmental sustainability at a farm level, 2) Develop a farm-based management system to satisfy sustainability and food safety standards and farm safety considerations and, 3) Implement a change-management process to farm more sustainably.

A wide range of indicators collectively describing the bio-physical environment holistically were monitored on tomato farms. The results of four seasons of monitoring and subsequent project work, show that there are ways for growers to improve environmental management and increase their profits at the same time.

An outcome of the Project has been the development of a farm management system, called "Grow Sustainably™". Grow Sustainably™ brings together the key learning's from recent monitoring and best management practices while integrating food

safety, farm safety and environmental management considerations into one simple management tool. The system is supported by an on farm training system.

This paper describes the journey and key learning's along the way and presents the challenges and issues associated with developing and practically using an integrated farm management system such as Grow Sustainably™.

METHODOLOGY

Variables believed linked to sustainability were specified by Unilever as a result of field research with vegetable crops; these variables were classified into ten sustainable indicator "clusters" including: Soil Fertility & Health, Soil Loss, Nutrients, Pest Management, Biodiversity, Energy, Product Value, Water, Social and Human Capital and Local Economy (McMaster, 2003) - they formed the template for the development of an environmental management system (EMS) now called Grow Sustainably™.

A framework consistent with the International Standard ISO14001 (Figure 1) was used to develop the EMS. An initial sustainability review and environmental risk assessment was conducted by the project team to identify the key elements of the EMS. This information was then presented to a project steering group consisting of the five pilot tomato growers in Australia, Unilever and Horticulture Australia Limited representatives for consideration and fine-tuning.

A key design requirement of the system from the tomato growers perspective was the integration of environment and sustainability with existing occupational health and safety (OHS) and food safety (FS) system requirements. To this end, an exhaustive review of existing international standards, environmental, FS and OHS systems was conducted using the continuous improvement process – Plan, Do, Measure and Improve (PDMI) and the framework expressed in Table 1. Further filtering and analysis of existing systems was made on the basis of Unilever's 10 Sustainability Indicators. A comprehensive analysis of existing systems and standards then occurred, including; ISO 14001, EurepGap, Freshcare, SQF1000, SQF2000, Australian Processing Tomato Research Council Approved Supplier Program and Australian OHS Standard AS4804. The framework and key system and operational requirements of Grow Sustainably™ were then resolved.

An integrated risk assessment process was resolved (Figure 2) and a risk assessment calculator (Table 2) was established to enable a numerical spreading and sorting of farm environmental, sustainability, FS and OHS risks.

10 Main system implementation steps were resolved to guide the on farm implementation, including: 1) Understand, Assess and Manage Farm Risks, 2) Comply with the Law, 3) Get Back to Basics - The Golden Rule, 4) Quality and Farm Management, 5) Knowledge Management - Documentation and Records, 6) Training and Awareness, 7) Manage the Transition to Improved Sustainability, 8) Monitor Sustainability, 9) Audit & Continually Improve and 10) Management Review. These steps were designed to facilitate a process consistent with ISO 14001's continuous improvement approach.

A sustainability score card was developed after an exhaustive review of farm best management practices and sustainability standards including: Leaf Marque Self Assessment Farm Audit (UK), Australian Cotton Best Practices Manual 2000, EnviroVeg Program 2002, Lodi Winegrowers Workbook 2000, Farm*A*Syst 1999 Self Assessment Tools, FarmSafe Australia Risk Assessment Tools 2002, Outsourced Environmental Farm Audit Tool 2000, Eurepgap Control Points and Compliance Checklist 2003, Agsafe

Industry Code of Practice 2003, The Code of Sustainable Wine Growing Workbook 2002, Ben and Jerry's Dairy Self Assessment 2004. For a range of areas of processing tomato production this scorecard describes four categories of farm practice: Category 4 (Best Practice), Category 3 (Minimum Practice), Category 2 (Undesirable Practice) and Category 1 (Immediate Action Required). Best practices are classified with the sustainability score card into 4 categories using the Unilever 10 Sustainability Indicator Cluster Framework. Practices are also given a significance rating of Major Must Do (***), Minor Must Do (***) and Recommended (*). The scorecard has been developed into an internet online self assessment tool enabling farmers to score their current practices remotely.

A range of sustainability indicators and parameters have been resolved to monitor the ongoing performance and improvement for key areas of tomato farm operations over time.

Six Competency-based training modules were developed to facilitate implementation of the program, including: 1) GS Management System, 2) Soil Fertility & Health, 3) Nutrients, 4) Pest Management, 5) Water Management, 6) Biodiversity Management.

A client server web tool was developed for farmers to remotely access key information about tomato pests and diseases, best management practices and various components of the management system.

RESULTS AND DISCUSSION

Emerging Drivers for Environmental Management Systems

Research and consultation across agricultural industries in Australia and overseas has identified a wide array of industry and company based EMS systems under development. Drivers influencing the development and implementation of these systems include;

1. Consumer Markets: End consumers or retailers requiring information on the sustainability and environmental footprint associated with production of agricultural raw materials (food and beverages).
2. Market Niche Identification: Where food and beverage processing companies or farmers identify potential market benefits associated with food grown according to recognized sustainable and environmental management standards.
3. Eco-Labeling: The establishment of consumer product labels and icons, reflecting the adoption of farm practices and systems.
4. Regulatory: Where government authorities require step change improvements in farming or industry practice resulting from the identification of environmental risks such as surface water contamination, leaching, air quality impacts.
5. Supply Chain Assurance: Where companies such as Unilever require assurance regarding the production and supply of raw material ingredients. Assurances can relate to issues such as the safe use of pesticides, management of nutrients and water, protecting biodiversity and sensitive ecosystems.

The Grow Sustainably™ project was initiated by Unilever primarily in response to driver 5. Other drivers may become of value to Unilever and their farmers in time. Globally, Unilever are facilitating Lead Agricultural Programs (LAP's) in many cropping sectors to establish minimum sustainable agricultural standards.

Grow Sustainably™ Implementation to Date

This project has to date been facilitated in two progressive phases. Phase 1 (January 2000 to July 2002) identified and evaluated sustainable indicators and parameters in the context of tomato processing farms in Australia. The results and key learning's of phase one were summarised in the Horticulture Australia Project Report 30 August 02 and published on the Grow Sustainably website (www.growsustainably.com).

Phase 2 (July 2002 to July 2005) is currently in progress and has involved the establishment of the Grow Sustainably system, initializing the implementation of the system and exploring change management areas with ten participating Unilever tomato farms.

Initial farm risk assessments identified a further need to refine the farm risk assessment tool to enable a greater spread of risks and priorities. Table 2 provides the resolved risk assessment matrix used in conjunction with other risk assessment methodology to identify and rank farm risks. Implementing the risk assessment process has been one of the most difficult and challenging areas for participating farmers, third party assistance was required to facilitate this step in the management process.

Several consistent environmental risks were identified by the initial risk assessment process. These risks provided the criteria to develop Grow Sustainably. Several of the dominant risks included;

Water Management:

- Irrigation distribution uniformity variability across drip irrigation systems due to either poor hydraulic design or inadequate maintenance.
- Inefficiencies of furrow irrigation systems resulting in up to 6 to 12 megalitres / ha water used in some cases.
- Poor irrigation scheduling techniques in some cases resulting in over irrigation, excessive runoff and leaching (water and nutrients).

Nutrient Management:

- Inadequate or infrequent use of soil analysis to guide the establishment of nutrient budgets.
- Lack of calibration of fertigation equipment combined with variability in irrigation distribution uniformities to give uneven fertilizer applications.
- Storage of solid and liquid fertilizers in a manner potentially causing environmental harm (high risk).

Pest Management:

- Inappropriate storage and handling of pesticides and associated waste streams.
- Application of pesticides by aircraft with associated off-target impacts to neighbouring land holders, crops, live stock and sensitive ecological areas.
- Lack of biological or non chemical control options to facilitate an Integrated Pest Management Program (IPM).

Risk assessments have been summarised and action plans are under development to manage significant risks as per the process outlined in Figure 2.

So far 2 of the 6 training modules have been implemented. The sustainability score card was released as a draft in September 2003. Subsequent to Unilever and farmer review, a 3-tiered system was introduced to provide a priority ranking for the range of good agricultural practices identified (major-must-do's, minor-must-do's and recommended practices). A web based score card will be available to farmers in November 2004. Further customisation and development of the score card is envisaged in the future.

Implementation Challenges

Drought, capital costs associated with change management, and supply chain instability have contributed to slower than anticipated progress with system implementation and change management across the 10 Australian processing tomato farms.

The globalisation of the processing tomato industry has created pressure on the Australian industry with currency fluctuations and cheaper tomato paste imports threatening the long term viability of small to medium sized tomato processors. While these issues are complex and beyond the scope of this paper, they have impacted in some cases on participating tomato grower's ability to commit to transitioning to improved farming methods, via access to the capital expenditure needed to manage or control environmental risks and adopt the improved documentation systems required for supply chain assurance verification.

Next Steps for Grow Sustainably™

Next steps include further development of risk management plans, implementation of biodiversity enhancement plans, farmer use of the sustainability score card, and implementing the remaining 10 steps of the system.

For the Australian processing tomato industry, Unilever and Horticulture Australia will make the system available to other processors and non-Unilever growers in 2005. Grow Sustainably will be further customised and adapted for use in other Unilever LAP's.

The Grow Sustainably initiative is currently being customized for implementation by Unilever in Brazil and Greece.

CONCLUSION

Improving the environmental footprint and sustainability of the processing tomato industry is a complex and challenging task for all involved. Grow Sustainably™ provides a starting point and a holistic framework for the establishment of industry initiatives to reduce environmental impacts and ensure supply chain assurance.

Grow Sustainably™ will be made available to other tomato processors and industry sectors in time. It has already had application in the Australian dairy and wine industry. Information about the program is available on www.growsustainably.com.

Literature Cited

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For More Information


www.growsustainably.com, www.unilever.com, www.horticulture.com.au,
www.saiplatform.org, www.growingforthefuture.com,
www.outsourcedenvironmental.com.au

Tables

Table 1: The Five Key Principles and Core Elements of ISO14001

Key Principle	Core Element of ISO14001
1) Commitment & Policy	<ul style="list-style-type: none"> • Environmental Policy
2) Planning	<ul style="list-style-type: none"> • Environmental Aspects & Impacts
	<ul style="list-style-type: none"> • Legal & Other Requirements
	<ul style="list-style-type: none"> • Environmental Objectives & Targets • Environmental Management Programs
3) Implementation & Operation	<ul style="list-style-type: none"> • Management Roles & Responsibilities • Training • Awareness & Skills Development • Communication & Reporting • Systems Documentation & Document Control • Operational Control • Emergency Preparedness & Response
4) Checking & Corrective Action	<ul style="list-style-type: none"> • Monitoring & Measurement • Non-Conformance & Corrective & Preventative Action • Records • System Audits
5) Management Review	<ul style="list-style-type: none"> • Management Review

Table 2: Grow Sustainably Risk Assessment Calculator

		Risk Assessment Matrix Consequence – Injury, Food Safety, Environment & Sustainability				
		Disastrous or catastrophic	Critical	Serious	Significant	Minor or negligible
Likelihood of Occurrence	Almost certainly will occur	Very High Risk Score: 25	High Risk Score: 23	High Risk Score: 20	Medium Risk Score: 16	Marginal Risk Score: 11
	Good chance it could occur	High Risk Score: 24	High Risk Score: 21	Medium Risk Score: 17	Marginal Risk Score: 12	Low Risk Score: 7
	Likely to occur	High Risk Score: 22	Medium Risk Score: 18	Marginal Score: 13	Marginal Risk Score: 8	Low Risk Score: 4
	Unlikely to occur	Medium Risk Score: 19	Medium Risk Score: 14	Marginal Risk Score: 9	Low Risk Score: 5	Low Risk Score: 2
	Extremely unlikely to occur	Medium Risk Score: 15	Marginal Risk Score: 10	Low Risk Score: 6	Low Risk Score: 3	Low Risk Score: 1

Figures

Figure 1: Grow Sustainably Management System Framework

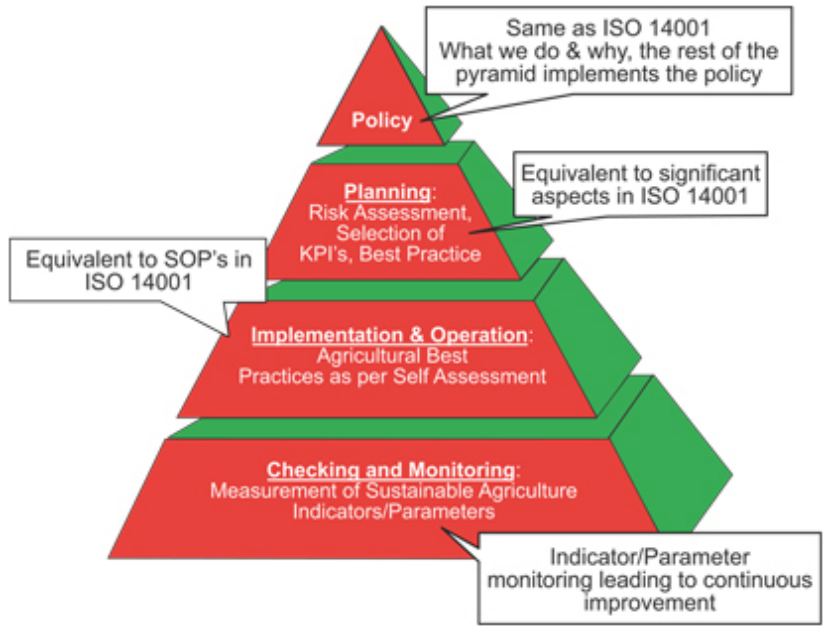


Figure 2: Grow Sustainably Risk Assessment & Management Process

