



GROWING FOR THE FUTURE

TOMATOES: FOR A SUSTAINABLE FUTURE



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WHAT THIS BOOKLET IS ABOUT

The processing tomato is one of five key crops that Unilever is testing under its sustainable agriculture initiative. This booklet explains why the initiative is necessary, Unilever's sustainability principles, and the ten broad sustainable agriculture indicators which are being refined and tested on tomatoes in the light of learnings. It looks in detail at established tomato growing projects on farms in Australia, and also at new projects in Brazil and California, and indicates the challenges ahead for Unilever's tomato suppliers.

WHO WE ARE AND WHAT WE DO

Unilever is a truly international company, with operations in more than 90 countries spanning every continent. Unilever products fall into two main categories: home and personal care, and foods. The Unilever portfolio includes a balanced mix of local, regional and international brands that take account of the differences as well as the similarities in consumer needs worldwide. Some of our food brands are Annapurna, Hellmann's, Knorr, Lipton and Magnum. Our international Italian style brands Bertolli, Ragú in the USA, Europe and Australia, and Knorr, Arisco in Latin America are tailored to local tastes using processing tomatoes as a key ingredient.

OUR CORPORATE PURPOSE STATES:

"Our purpose in Unilever is to meet the everyday needs of people everywhere – to anticipate the aspirations of our consumers and customers and to respond creatively and competitively with branded products and services that raise the quality of life."

"We believe that to succeed requires the highest standards of corporate behaviour towards our employees, consumers and the societies and world in which we live."

MESSAGE FROM THE CHAIRMEN

Since the mid-1990s Unilever has been consulting with experts and engaging with suppliers, customers, consumers and business partners to find a sustainable way forward for agriculture. Unilever's chairmen explain.



Antony Burgmans

Niall FitzGerald

As one of the largest consumer goods companies in the world Unilever is highly dependent on agricultural raw materials such as tea, vegetables, including tomatoes, and vegetable oils, and therefore on the future of agriculture. This has led us to develop the sustainable agriculture initiative.

We have experienced a growing interest and willingness to participate in finding ways to make agriculture more sustainable. However, a dramatic acceleration of efforts to develop more sustainable practices is still required. We still face many issues with an adverse affect on farm productivity. For agriculture to become truly sustainable and able to feed fast-growing populations, matters such as soil fertility, biodiversity, water resources and the quality of rural life must be addressed.

We believe there needs to be a greater diversity of approaches to farm and plantation management. All agricultural systems have something to offer, and we want to find out what works best in different local circumstances.

Our earlier experience on fisheries has confirmed our belief that market mechanisms offer the way forward in the long term. They can stimulate performance improvement and efficiency along the supply chain and raise quality standards to meet consumer needs and expectations.

Ultimately we want the market to work for sustainable development and to encourage fully sustainable agricultural systems. We wish to contribute to this development and benefit from it.

We are starting to make progress on this long journey, but we need the continued help of others. We are committed to engage with our stakeholders and share our work with them in our projects. We urge them to make contact if they wish to contribute in any way.

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Antony Burgmans

Niall FitzGerald

UNILEVER, AGRICULTURE AND SUSTAINABILITY

Agriculture provides more than two thirds of the raw materials for Unilever's branded goods. We are among the world's largest users of agricultural raw materials and a major buyer of agricultural goods, including tomatoes, for processing on world markets. We are thus in a position to make a difference.



Unilever relies heavily on the natural raw materials such as vegetable oils, vegetables, tea and fish for use in our various products. As well as being major buyers of these materials on world markets, we are also involved in agriculture, both directly through our contracted growers, and indirectly via third party suppliers. It is therefore in our business interests to ensure sustainable supplies of these materials.

We judge that our Corporate Purpose will only be achieved and maintained in the long term if our actions are determined by the broader principles of sustainable development: ensuring we meet the needs of today without jeopardising the ability of future generations to meet their needs. This means we must align our economic goals with the social and environmental consequences of our work.



For many years Unilever has worked closely with farmers to develop agricultural best practice guidelines which maximise yield while minimising environmental impacts. These guidelines are incorporated into our contracts with growers. Current best practice is mainly based on integrated farming principles, and involves judicious use of fertilisers and pesticides to maximise yield while minimising environmental impacts.

Our position in the market gives us some influence on how the materials are produced and considerable social responsibility to use that influence wisely. We also have a clear obligation to our shareholders, employees and business partners, to ensure continued access to agricultural produce.



But as agriculture has come increasingly under environmental pressure it has become clear that if we are to meet the aims of our Corporate Purpose we need to do even more.

Our consumers trust us to supply them with high-quality products that are produced in an environmentally and socially responsible way. We therefore have a responsibility to act as agents for our consumers, ensuring their expectations are understood along the supply chain.



Bringing in the harvest (from top) - oil palm, peas, spinach and tea. The sustainability pilot projects started with peas in eastern England in 1997, quickly followed by oil palm in Malaysia, and in 2001 in Ghana. Spinach projects started in Germany in 1999, and in Italy in 2000. Tea projects have been running in Kenya since 1999, in India since 2000, and in Tanzania since 2001. Tomato projects began in 2000 in Australia and Brazil, and in 2002 in California.

UNILEVER'S SHARE OF KEY CROPS

Percentage of world volume



Globally, agriculture is under environmental pressure. There is growing competition for land, not least because land is being lost through soil erosion and salinity. There is increasing agricultural impact on water supplies. Mounting environmental and social pressures challenge our supply chain, and growing consumer concerns about the food chain challenge our markets.

For all these reasons we have begun to work with a broad range of stakeholders on a Sustainable Agriculture Initiative.

The sustainable agriculture programme began in 1998. The aim is to develop guidelines for sustainable farming practices that will ensure Unilever continued access to key agricultural raw materials. In addition, with some crops it is already clear that more sustainable farming practices also generate greater productivity and better product quality, leading to benefits throughout the supply chain.

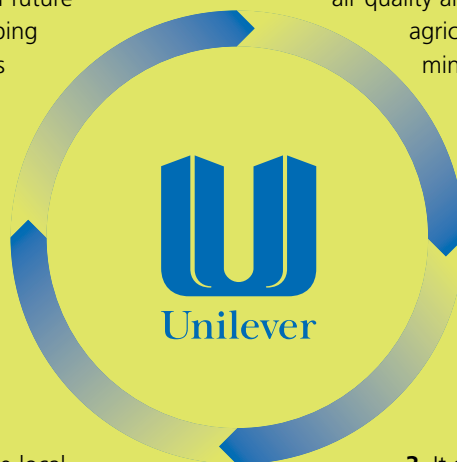
The foundations of our programme include a definition of four principles of sustainable agriculture (right), and the identification of ten broad indicators of sustainable development (pages 8-9). These indicators encompass environmental protection, economic progress and social development.

After worldwide consultation with sustainability specialists, we arrived at the following definition of sustainable agriculture:

SUSTAINABILITY PRINCIPLES

Unilever believes that sustainable agriculture should support the following principles:

1. It should produce crops with high yield and nutritional quality to meet existing and future needs, while keeping resource inputs as low as possible.
2. It must ensure that any adverse effects on soil fertility, water and air quality and biodiversity from agricultural activities are minimised and positive contributions are made where possible.
3. It should optimise the use of renewable resources while minimising the use of non-renewable resources.
4. It should enable local communities to protect and improve their well-being and environments.



“Sustainable agriculture is productive, competitive and efficient, whilst at the same time protecting and improving the natural environment and conditions of local communities.”

STEPS TOWARDS SUSTAINABLE TOMATO PRODUCTION

Tomatoes are an important crop and ingredient for Unilever Bestfoods. Some thousand growers on four continents are responsible for supplying UBF's requirements for processing tomatoes, as part of their annual crop rotations. Attention to local good practice is the key to success.



Unilever became involved in tomato products with the acquisition of brands and manufacturing operations in Australia and Italy in the 1960s. During the last decade North and Latin America have become Unilever's most important tomato producing regions. Unilever Bestfoods (UBF) operations are present in all major growing regions, and the company is now the third largest processor of tomato products in the

world, supplying branded products to consumers in over 50 countries.

UBF growers have an estimated total agriculture area of 15,000ha, with the Americas having an 80% share of the total targeted production of 1.35 million tonnes annually. UBF is self-sufficient in around 70% of its tomato requirements. In Europe most of the tomato product ingredients are bought from third party suppliers.

Between five hundred and a thousand growers on four continents are involved in supplying UBF's tomato needs on farms ranging from 10ha in Greece, and up to 6,000ha in California. All UBF growers operate with full family commitment to their businesses, whether large or small. In addition, in many cases adult children are actively involved in farm operations with the anticipation that they will take over the farm in the future.

Unilever Bestfoods has suppliers in all the world's tomato-producing regions. They include the Sellwood family (above) who farm 146ha at Undera, Victoria in Australia. Ray is the fourth generation to have operated the farm. Here with his wife Jo he is discussing a disease prediction programme with Jamie McMaster of Outsourced Environmental.

UBF processes an average of 1.3m tonnes of tomatoes annually. A further equivalent of more than 300,000 tonnes is supplied by third parties as paste, dice and final products. The end result is over 300,000 tonnes of tomato-based and branded products which find their way to consumers in over 50 countries. Popular brands include Ragú (above right).

UNILEVER PRODUCTION AREAS

Tonnes of tomatoes processed in 2002



CHALLENGES FOR THE PROCESSING TOMATO SUPPLY CHAIN

Consumers look to tomatoes to add texture, flavour and colour to foods, and increasingly to contribute health-giving properties to their diet as well. They are increasingly voicing their concerns about issues such as food safety, human health, agricultural production methods, and the impact of agriculture on the environment and communities. Our research also suggests that many consumers want local communities to have a fair share in the economic benefits from the food they produce.

Since 1999 our operations have been working to improve the understanding of sustainable production techniques through various agricultural pilot projects, including tomatoes. Tomato crops that are grown to our guidelines enable growers to perform well for many years. The land on which tomatoes are grown will also remain productive, providing food and income for growers and their families for generations to come.

As part of the supply chain, our tomato growers have a shared aim to satisfy current and future needs – to produce tomatoes sustainably. A wide-range of factors contribute to sustainable tomato production. We have built flexibility into our framework to allow for a balanced trade-off between agriculture, social development and conservation.

The use of the ten sustainability indicators and subsequent assessment has enabled growers to prioritise activities for their individual environments.

ADDRESSING THE ISSUES

Bringing together good practices from several tomato growing regions with very different climates and soil conditions has shown us new areas where we can learn from each other to improve sustainable production.

Each of our pilot projects is contributing in terms of:

Improving soil fertility

Minimising erosion

Tuning nutrient applications to crop requirements

Implementing Integrated Pest Management (IPM)

Enhancing the biodiversity value of the farm

Improving fruit quality, avoiding fruit loss

Increasing efficiency of water use and energy utilisation

Involving local communities and supporting the local economy.

We are now publishing our guidelines for the sustainable growing of processed tomatoes and sharing these with our third party suppliers as well. All processing tomato production areas have different challenges to face due to climate, geographic, social and economic circumstances. To aid communication, regional operations are developing their own practical manuals and educational programmes for farmers, agronomists and fieldsmen to introduce more sustainable methods of production and improve on current practices.

MAKING TOMATO SUSTAINABILITY HAPPEN

Of course there are dilemmas to face in dealing with short-term business issues and longer-term sustainability concerns. There are no easy answers, but we have identified pointers to the way ahead.

The route to a profitable sustainable supply of tomato-based products is complex, still largely undefined. Working in partnership with growers, processors, agro-product suppliers, authorities and non-governmental organisations (NGOs), we will continue to introduce and improve sustainable production methods.

Many organisations and other players in the food industry are also beginning to embrace sustainable production techniques. By encouraging openness and transparency across the industry we can help each other make a positive impact faster, gain real practical



Addressing some of the sustainability issues (from top): sticky pheromone traps are an effective way of trapping insects in Australian tomato fields (1). In California (2) water supplies and quality are of increasing concern to growers. In Brazil (3) drip irrigation combined with minimum tillage for erosion prevention also helps combat disease and ensures nutrients are directed accurately at the roots of each plant. In all UBF's operations, such as these in Brazil (4), growers work closely with UBF fieldsmen who inspect fields weekly or even more frequently during the growing season.

experience in the supply chain, and develop market mechanisms that favour and secure a sustainable future for tomato production.

These are some of the steps we have taken so far:

We drafted Sustainable Agriculture Standards

We are phasing in a commitment from third party suppliers to measurable criteria for Good Agricultural Practice

We are building expertise through pilot projects or lead agricultural programmes

We are quantifying sustainability indicators

We are developing Environmental Management Systems (EMS) aiming for ISO 14001 standard approval

We are building operational confidence

We are communicating with the wider food industry, and tomato product suppliers in particular

We are encouraging market mechanisms for sustainable agriculture

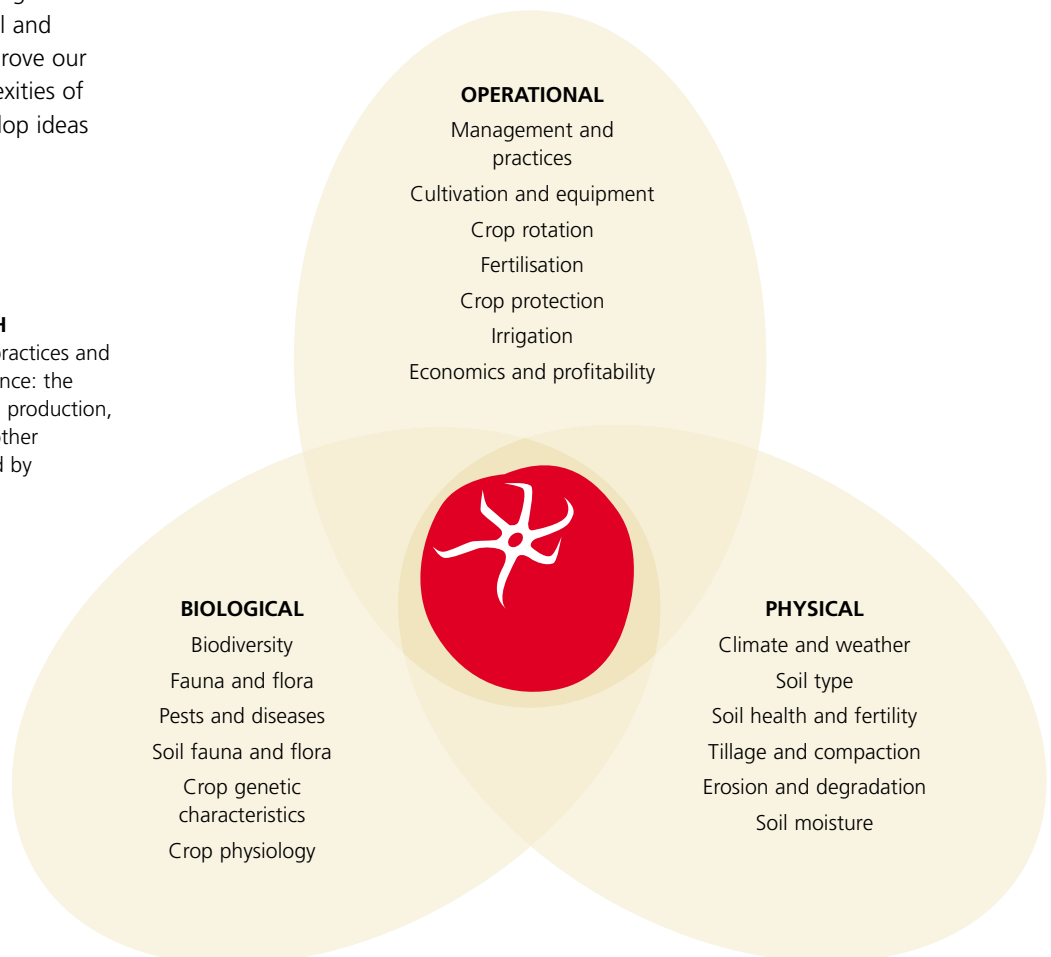
UBF pilot projects in processing tomato agriculture in Australia, Brazil and California are helping to improve our understanding of the complexities of sustainability as well as develop ideas for use with our objectives.

THE SUSTAINABLE APPROACH

This means the use of farming practices and systems which maintain or enhance: the economic viability of agricultural production, the natural resource base, and other ecosystems which are influenced by agricultural activities.



UBF's plant in Greece is in the heart of its tomato growing area in the far west of the Peloponnese. Tomato growing conditions here are good, with excellent water supplies even in the intense summer heat. Some 300 farmers, many with not more than ten or 20ha of land, each truck their own crop to the factory (above). Field trials (left), including these in Greece, are a key aspect of successful tomato farming, with on-going programmes to refine varieties to suit local conditions.



THE GROWING APPEAL OF TOMATOES

The cultivated tomato is a general adopted food crop that has achieved prominence and popularity since it first originated in South America, probably on the northern edge of the Andes in Peru, Ecuador and Chile. Although the tomato is technically a berry – and thus a fruit – it is treated today as a vegetable. It is the world’s second biggest ‘vegetable’ crop, with more than 80 million tonnes, of which one third is currently processed.

Neapolitans were some of the first to cook with tomatoes, gradually followed by other Mediterranean communities and the British and Americans. Wide appreciation of tomatoes and tomato-based products began in the early 20th century with the growing awareness of the attributes of colour, flavour and texture that this adaptable fruit brought to food. Mediterranean and Latin American diets in particular are heavily dependent on tomatoes to give taste, aroma and flavour to their meals.

Tomatoes are regarded as healthy as well as delicious. Tomatoes and tomato-based products are a recognised source of lycopene (an anti-oxidant and the natural carotenoid which colours the fruit red) and other carotenoids. Interestingly, research has clearly shown that tomato processing improves the bio-availability of lycopene. Carotenoids, vitamins A, C and E, plus other beneficial

ingredients present in tomatoes may explain the benefits associated with a higher tomato consumption, including increased UV-light resistance, and cancer and heart-disease prevention.

Despite the tomato’s nutritional significance, its consumption per capita is approximately four times as high in developed countries as in developing and emerging ones. It remains a minor luxury crop in many regions, and substantial opportunities exist to further increase its contribution to human nutrition and well-being.

The tomato is an especially valued crop for growers in sub-tropical zones. So far the main growing areas are California and the Mediterranean, followed by Latin America. China is an emerging country in tomato production. Tomatoes can adapt to a wide range of climates and soil conditions so long as they have a warm, frost-free growing season. Black nightshade, Bathurst burr, spurge and bindweed are some of the most troublesome weeds. Fruit worm, budworm, leaf miner, white fly and tomato fruit borer are the most serious pests, and a number of bacterial, fungal and virus diseases can devastate a crop if it is not well managed.

Today’s tomato varieties all originate from *Solanum lycopersicum*, illustrated (right) in John Gerard’s *Herball* published in 1636.



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UNILEVER SUSTAINABLE AGRICULTURE ROADMAP

1998

- Development of mission statement
- 4 principles of SA
- 10 sustainability indicators proposed
- Choice of 5 key crops for piloting

2000

- Sustainable Agriculture Advisory Board (SAAB) established
- Agreed steps
 - Overall approach
 - Standards
 - Stakeholder engagement

2002

- Sustainable Agriculture Initiative
- Propose
 - Shared learning
 - Knowledge sharing
 - Open to all in food industry

2003-2006

- Evolution of market mechanisms to support raw material sourcing from sustainable agriculture worldwide

SUSTAINABLE AGRICULTURE INDICATORS FOR TOMATOES



1. Soil Fertility/Health



Soil is an absolute fundamental to agricultural systems. A rich soil ecosystem improves the performance of crops and livestock. Sustainable agriculture practices can improve beneficial components of the soil's ecosystem.

Typical measurement parameters include:

- soil organic matter*
- soil pH*
- soil compaction*



2. Soil Loss



Sustainable agriculture practices work to reduce soil erosion.

Typical parameters include:

- soil cover index (percentage of soil covered by crop)*
- soil erosion*



3. Nutrients



Both crops and livestock need a broad balance of nutrients. Some of these, such as nitrogen, can be created locally but others have to be brought in from other sources. Nutrients are lost through activities such as cropping, erosion and emissions to air. Sustainable agriculture practices can enhance locally produced nutrients and reduce losses.

Typical parameters include:

- proportion of nitrogen/phosphate/potassium applied that is exported with the crop*
- proportion of nitrogen that is fixed on site as part of the cropping system*
- losses of nutrients to water*

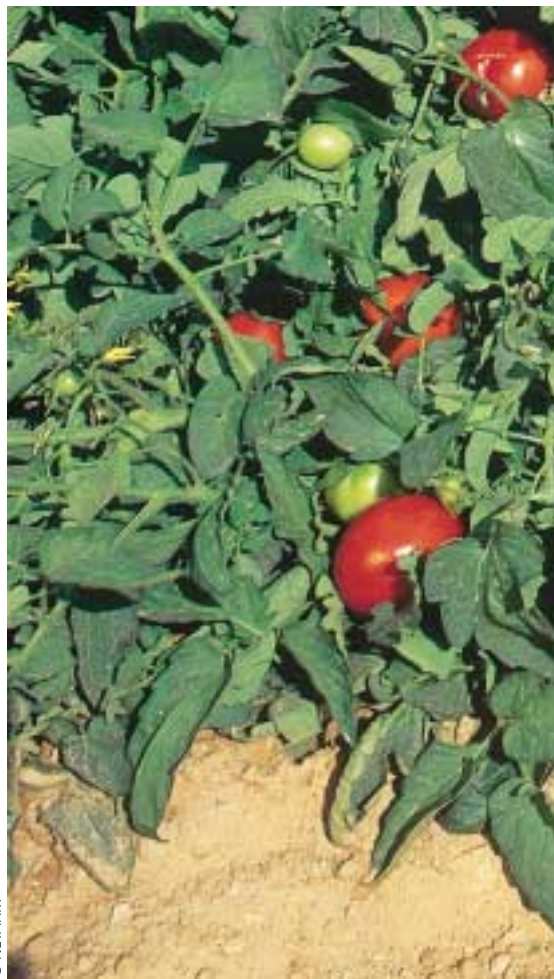
4. Pest Management



A small but significant proportion of pesticides used on crops and livestock can escape to the environment, harming wildlife and accumulating in foods. Sustainable agriculture practices can substitute natural controls for some pesticides, so reducing dependence on externally introduced substances.

Typical parameters include:

- risk to operators and the environment from pesticides applied*
- adoption of Integrated Pest Management approaches*



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5. Biodiversity



Agriculture has shaped many ecosystems in the world, and the diversity of biological systems (biodiversity) can be improved or reduced by agricultural practices. Sustainable agricultural practices can improve biodiversity.

Typical parameters include:

- crop genetic diversity*
- proportion of land managed as natural habitat*
- habitat quality*

6. Product Value



This is the measure of the desired outputs of an agricultural system. Sustainable agriculture practices should be able to maintain or improve the value of the product and reduce wastage between the field and processing.

Typical parameters include:

- total value of the produce per ha*
- ratio of solid waste re-used/recycled to solid waste disposed to landfill*

Sustainable agriculture indicators 1,3, 4 and 5: (from top) soil fertility, nutrients, pest management and biodiversity. Soil fertility and health is crucial for the growing of good quality tomatoes as for other agricultural crops. Careful management of nutrients increases efficiency and reduces losses and water contamination. Finding natural controls for pests, including tomato grub, is a key aspect of sustainable growing. Wide margins with native species between road and field encourage biodiversity on a farm.



Sustainable agriculture indicators 8, 6, and 4: water, product value and pest management. Drip irrigation (left) saves water and increases yields. Speed is the essence in maintaining the quality of a tomato crop between field and factory (top). A Brazilian farmer (above) checking computer field equipment designed to predict disease proliferation.

7. Energy



Energy in the form of sunlight is absolutely essential to plants and animals, but agriculture also uses energy from non-renewable sources, such as tractors for ploughing and the energy needed to make agro-chemicals. Energy use is usually the major source of polluting gaseous emissions and greenhouse gases. Sustainable agriculture can improve the balance of energy inputs and outputs, and ensure that the process produces more energy than it uses.

Typical parameters include:

- total energy input per tonne of product*
- ratio of renewable to non-renewable energy inputs*
- production of polluting emissions*

8. Water



Some farming techniques require irrigation and other practices can lead to the pollution of ground and surface waters.

Sustainable agriculture practices ensure that water is conserved and possible pollutants are carefully controlled to reduce the risks of pollution.

Typical parameters include:

- amount of water used*
- sustainability of water source*
- pollution of watercourses by factory effluent*

9. Social/Human Capital



Fair employment practices, collective action, the sharing of knowledge, and the intensity of local social networks help ensure that natural resources are conserved for future use. Some conventional farming techniques have undermined local networks and located knowledge outside the farming communities. Sustainable agriculture works to improve both social and human capital. The prime responsibility for this should remain with the local community.

Typical parameters include:

- fair employment practices*
- agricultural knowledge and training*
- relationships with local communities*
- health and education status of employees*



10. Local Economy

Sourcing agricultural inputs (such as goods, labour and services) locally helps to sustain local businesses and livelihoods. Sustainable agriculture practices make the best use of local resources and help to improve the efficiency of the local economy.

Typical parameters include:

- amount of money/profit spent locally*
- employment level in the local community*

TOMATO PILOT PROJECT AUSTRALIA

The tomato lead agricultural project in Australia is the most developed of the tomato sustainability projects initiated by Unilever. In this dry area soil quality, water and nutrient management are three of the most critical issues



Regular meetings of farmers, UBF fieldsmen and other stakeholders take place on farms participating in the Australian pilot project (top). Soil profile moisture devices help in understanding the effectiveness and impact of irrigation on tomato fields (middle). Australian farmer John Kennedy with Jamie McMaster of Outsourced Environmental (above) inspecting a macro invertebrate trap taken from an irrigation channel. Macro invertebrates indicate biodiversity and relate to the abundance of aquatic life in waterways, rivers and streams.

Since 1999 Unilever Australasia has worked in partnership with Australia's federal government agency, Horticulture Australia, to develop a Best Management Practice (BMP) framework for processing tomatoes.

The major focus has been on sustainability indicators and monitoring systems. Five tomato growers on farms that represent a diversity of climate and location, farm sizes and a range of irrigation technologies have joined Unilever on a journey to understand and improve farm environmental performance. The initial study resolved key parameters, which effectively help to measure and monitor farm sustainability.

Soil analysis, integrated pest management (IPM) assessments, farm biodiversity assessments, reviews of chemical use, water management practices, plus technologies such as soil moisture sensors, flow sensors and weather stations have all been useful in data collection.

Variations in parameters including water, pesticide and fertiliser use have been noted. Soil moisture sensors highlight differences in water management practices and efficacy. Findings and plans are routinely shared at workshops, meetings and field days.

It is now established that soil fertility, water management and integrated pest management are the main agricultural issues. A change in environmental performance requires education about best practices.

Key learnings to date include:

- growers with a better production performance tend to cultivate their soil less
- drip irrigation (compared to furrow irrigation) can significantly reduce water consumption while increasing

yields significantly, and with less impact on water table rising and soil salinity increase

growers' pesticide dependency can be reduced significantly by better understanding and monitoring of pest lifecycles, plus habitat management for possible stimulation of beneficial insects for controlling pests.

The Australian project team are developing tools to facilitate BMP implementation for their tomato growers. As of 2003 the EMS is rolled out to the wider Australian processing tomato community throughout the country.

A key challenge identified by this pilot involves financial assistance to support growers who invest in capital-related sustainability improvements.

"Our EMS - part-owned by Horticulture Australia - will be a benchmark for developing EMSs for the whole of the horticulture industry around Australia," Tim Dyer, project director explains. "The project's development phase has brought together many parties with an interest in the sustainability of Australia's natural resource base, including government, semi-government, regional water boards and environmental management agencies, Landcare Australia and the Murray Darling Basin Commission. Growers can talk to government and NGOs who will impact on the way they far, now and in the future. At the end of the day, this project and the EMS will show that Unilever and its suppliers have acted responsibly. And there is no doubt that consumers will get a cleaner, greener product."

PROJECT PARTNERS

Outsourced Environmental
Horticulture Australia
Australian Greenhouse Office
Unilever Australasia

LOCATION



THE KENNEDYS – PIONEERING EFFICIENCIES AND BIODIVERSITY



John and Pat Kennedy manage a 633ha property at Corop, Victoria. Mixed production includes processing tomatoes, cereal, sheep and hay. John and Pat have been growing tomatoes

since the early 80s. "In the past ten years we have converted to drip irrigation, because we realised the huge savings we could make in water use, at the same time increasing yields," says John. "The doubling of our yields is not entirely due to improved water and nutrient management - tomato hybrids have improved too. But in 2003 we particularly saw the benefits of trickle in the most severe drought for a century. We increased consumption from just 3.8 to 4.8 mega litres per ha, whereas those relying on traditional irrigation are regularly using 6-7ml per ha and often more." The Kennedys have made other improvements including the introduction of a surface and tail water recycling system so no nutrient-rich

surface water leaves the farm. They also acquired new equipment to improve effectiveness of pest control delivery. They are improving their soil, especially the magnesium to calcium ratio by spreading lime. "This project has made us more aware of what we are doing. We are monitoring instead of guessing, testing more, tidying up our stores and making other savings and efficiencies. It takes time, but we can already see the benefits", John says. The farm contains much natural swamp country which they are gradually fencing to conserve wildlife. They are planting 50m wildlife corridors around fields, and native trees around the edge of the farm, all part of their drive to change their farming practices to suit the environment.

THE SPENCERS – INNOVATION AND HIGH PERFORMANCE

Father and son Geoff and Sandy Spencer own a 522ha property at Corop, Victoria. Their mixed farm includes processing tomatoes, clover and lucerne hay, cereal and sheep (wool and wethers). Geoff was one of the first to introduce drip irrigation to the tomato processing industry some 30 years ago. He constructed his own equipment, initially to deliver water direct to the plant roots. He then developed it to add judicious quantities of chemicals. "This way of working means you grow half the area, use half the chemicals you would otherwise, and you double the production of the crop as well." Geoff says. Since those early days, most tomato farmers in Australia have followed his lead.

Drought is a major risk in Australian tomato production in the longer term. If current trends of low reservoirs, rising water tables and resulting salinity continue, the land will become infertile in perhaps only 50 years. "Our water allocation is reduced, and we will only survive in the future if we move towards more sustainable production methods in



all areas," says Geoff. "A drip irrigation system that is well designed and managed is key, and will have significant advantages over surface and overhead irrigation systems in more ways than simple savings of inputs. You can irrigate without wetting the leaves of the plant, which is helpful in preventing disease, and systems can be designed according to crop requirement and soil type. If the soil between plant rows remain dry farmers can work the field at any time. There are numerous other benefits too – uniform delivery, weed control, reduction in soil-borne diseases

being some of the most obvious." Apart from producing consistently high performing crops, the Spencer family have developed improved cultivation and fertilizer management practices. For example, they only cultivate when the soil moisture level is just right, so avoiding either soil compaction or dust problems. Sandy and Geoff have also experimented with the use of non-chemical based (renewable) fertilizers, with success.

"We are constantly trying to work better with Mother Nature. No one can stay in this game unless he is prepared to change and improve all the time. Standing still is not an option. Also, as growers become fewer and farms larger, it is more important than ever to work together with trust and openness, and to be profitable. This applies to manufacturing as well as farming," Geoff says. He adds, "I am no fan of record keeping, but I reluctantly admit it is extremely helpful when it comes to looking back to see exactly what we did, and when. This is all part of securing the future of our industry".

TOMATO PILOT PROJECT BRAZIL

Pest management, the installation of drip irrigation, minimum tillage and improved harvesting techniques are some of the key indicators of particular concern on the 14 pilot farms in the Goiânia area in Brazil.



The Brazil tomato project was initially established in the Rio Verde region, and in the middle of 2002 after the acquisition of a large tomato processing factory in Goiânia, the project was transferred to the larger growing area of Goiás state.



This is an area of high humidity and moderate to large sized farms – from 100ha to 6000ha – where more than 100 growers are contracted to supply UBF. Farming activities within the rotation typically include corn, beans, soya beans, beef and dairy cattle, but for the majority of UBF contracted farmers tomatoes account for approximately half their income. The growers use a wide range of technologies and most of them are dependent on a large labour force for planting and harvesting the crop.



Late blight in Brazil (top), as elsewhere, is a fast, destructive disease that can destroy a tomato field in four or five days as spores are easily spread on the wind to other plants. UBF is helping Brazilian farmers to install drip irrigation (centre), offering savings in nutrients and water and improvements in plant health. Harvesting is done by hand (above) and the moves towards mechanisation are being carefully managed.

In 2003 the project was still in the early evaluation stages where rotation cycles were being monitored through the year to learn more about the main parameters that will contribute to sustainable practices in the longer term. Already the sustainable approach has delivered important benefits, including more cost-effective production methods. For example, the move from pivot to drip irrigation techniques on many farms has quickly proved to be key in such a humid climate. It not only saves water – up to 20 per cent in many cases, but contributes to higher yields – typically 50 per cent higher. Even more importantly, it contributes to a significant reduction in pesticide use. Farmers using drip technology have reduced fungicide applications by 25-50 per cent.

geminivirus. It is essential to increase understanding of these problems with the help of the ten indicators, and to develop further the close working partnerships between UBF, growers and agronomy experts, all of whom are key in helping to defeat these threats through IPM.

Currently UBF is specifically encouraging improved technologies that will benefit growers as well as the environment. In the longer term UBF is identifying the best practices based on the ten indicators, and here an experimental farm at the Agricultural R&D Station is at the heart of our work. We have to understand more about biodiversity, the trade-off between labour utilisation and mechanisation, nutrient and pest management, energy and water use, disease resistant tomato varieties and the overall effect of our activities on the environment.

“The short term challenge of the Goiânia project is to speed up the use of technologies we know well, and support growers as they move to improved practices. UBF’s Technology Improvement Program (TIP), which in 2003 involved 14 growers, aims to implement and guarantee the correct use of technologies and procedures, at the same time improving on activities that have a direct impact on the environment.” explains Luiz Antonio Quevedo Marthe, agricultural sourcing manager. The overall key challenge for UBF is to develop the region in ways that encourage present and potential growers in sustainable tomato farming.



The local climate and cultural conditions, which differ markedly from other more arid tomato growing areas where UBF operates worldwide, bring increased concerns about pests and diseases, in particular, late blight, bacterial spot and

PROJECT PARTNERS

- Research Institutes
- Government organisations
- Local universities
- Supplying companies
- Local NGOs

CARLOS ALVES DE LELES – MAKING IMPROVEMENTS IN GOIÁS



Carlos Alves de Leles (above) with his brother Marco began growing tomatoes for Unilever Bestfoods in 2002 on three farms in Itaberá near Goiânia in the state of Goiás. The farms are 268, 106 and 38ha respectively, with the two larger farms having good water sources as well as several hectares of native woodland. Rice and corn are included in the rotation, and the larger farms also support dairy herds.

Carlos is one of many UBF contract farmers who have benefited not just from technical and scientific support, but also from a range of financial incentives to finance improvements to install drip irrigation, buy new machinery and appropriate chemicals.

“As the farmer, I supply the workers, the electricity and machinery, but Unilever finances part of the crop such as supplying the inputs (seeds, seedlings, fertiliser, chemicals) and the drip system. Growing tomatoes requires more effort than other crops, but it is worth it when you have a contract where you know how much money you will make per tonne. A policy of premiums and discounts means that if you produce a top quality product, you make more

money – but if quality is poor, of course you make less,” he explains.

Carlos adds, “Growing tomatoes is a very unstable activity in our climate. Apart from the humidity, many unexpected things can happen, such as hail or drought. There are many diseases, including white fly that transmits the devastating geminivirus, which so far defeats all known pesticides. We are currently experimenting with Actara which at least kills the adult fly, but unfortunately not its eggs.

“But we are making improvements in our growing techniques all the time. For example, on the farm where we have installed drip irrigation we see that it saves water and pesticides and improves yield. There is less wastage of applied chemicals if the leaves are not artificially washed. But the system needs careful management, and we are still learning.” Much of the land is terraced, and the low tillage system of direct transplanting avoids unnecessary ploughing.

Planting and harvesting is highly labour intensive, and involves all Carlos’s 150

men. “Other farmers locally use machinery for transplanting young plants, but so far this would not be a cost effective option for me, but it is an area we will be looking into in future.”

Carlos is especially keen to preserve the native environment. “I’ve registered an area of native forest on one farm (above right), near the water source. Next I want to register another area stretching to the second farm, so making a wildlife corridor where I am planting more indigenous trees. That should make life easier for the native monkey population – I consider it my duty to protect them, and I don’t object at all if they help themselves to my corncobs,” he adds. Alligators, armadillos including the rare ‘leave armadillo’, birds such as the seriemas and anteaters are some of the other wildlife.

Carlos looks forward to better structured farming practices which he hopes the project will bring. “I hope UBF organise more field trips and seminars to increase awareness, less waste, greater care of water resources, health and safety issues. This in turn will improve my production and lead to higher profit,” he says.

TOMATO PILOT PROJECT CALIFORNIA

Soil fertility and loss, water management, IPM and energy are the main sustainability issues that concern tomato growers in California's central valleys. Four growers from the 50 or so who supply UBF have been involved in the initial sustainability pilot project, helping to benchmark current practices and indicating areas for improvement.



Tomatoes are grown in California's Mediterranean type climate in the Sacramento and San Joaquin valleys. The flat, fertile fields vary in size, from 150-acre fields in the arid, practically desert conditions of the south, to 50 to 100-acre fields in the central and northern areas where there may be 450mm rainfall over the winters.



During the pre-pilot phase the team worked closely with a farmer committed to sustainability practices, as well as contributing to a conservation tillage crop project conducted by a University of California, Davis (UCD) group in comparing conventional, low-input and organic management. Current projects with UCD are looking at ways to measure soil and water health to help benchmark the present situation. Communication between government agencies, NGOs, UBF and UBF growers is being developed. An on-going review of programmes is an important step in starting a development and education programme.



Progressive tomato farmers in California are using wide equipment and achieving two different operations with one pass of the tractor (top). Energy saving and the search for alternative sources such as these windmills in the hills near Livermore (middle) are a main issue. California is the world's main growing area of processing tomatoes (above).

"We have much to learn," says Randy Rickert, director, field operations. "Any significant change in environmental performance will require education about best practices and their benefits. Once we have benchmarked where we are, we can prove where we are becoming more efficient, and this will be reflected in our purchasing contracts as we favour growers who switch to more sustainable growing practices."

Experiments have already shown how winter cover crops not only benefit the soil and help prevent erosion, but also provides nutrients for beneficial soil organisms. Nutrient applications are being measured more carefully, and savings are made on those farms where up to 70 per cent of water is recycled back onto the

fields. IPM depends on need and measured pest levels, and spraying is no longer automatic. "Biodiversity has long been a problem," says Randy. "We are encouraging recycling ponds to reuse our water and to bring back wildlife. We have a multi-year project with a local school to analyse pond biodiversity and look at alternatives to the traditional method of eliminating habitat to control economic pest damage in our fields. In one case, we will be erecting raptor poles to tempt hawks to control the rodents that will move into the grass by these ponds."

Experiments are also beginning in drip irrigation that will eventually lead to water savings. Energy savings are high on the agenda too. "We need to discover how many gallons are used per acre and encourage growers to convert to more efficient engines. In this the government is helping. Our own transport miles are down from 85 to 70 from field to plant, and we hope to achieve about 60 within three years," explains Randy.

UBF has recently started awarding multi-year contracts to key farmers. "All my growers are family farmers, they want their grandchildren to continue. Multi-year contracts help them to plan and invest for a more sustainable future, and this is an approach we wish to encourage." Randy says. In addition to work with growers, UBF supports the UCD Sustainable Agriculture practice group's strong, effective collaboration between growers, agribusiness, researchers and farm advisors.

PROJECT PARTNERS

University of California, Davis (UCD)
Sustainable Agriculture Research
Education Program (SAREP)
Yolo County Resource Conservation
District



FRANK MULLER AND BROTHERS – KEEPING ONE STEP AHEAD



Working in partnership: UBF's fieldsman Rudy Lucero and director, field operations Randy Rickert with farmer Frank Muller. They are discussing the biodiversity of grasses and other native species beside a pond that Muller has created to catch tail water (runoff) from his fields. In a farming area where there is almost no native habitat left, the Muller brothers are championing environmental practices to encourage beneficial wildlife on their own and other farms. Frank has invited local schools to participate in developing wildlife habitat in water recycling ponds to demonstrate that agriculture and wildlife can co-exist.

In the heart of Yolo County in the Sacramento Valley, California, the Muller brothers farm 7500 acres which includes production of 42,000 tonnes of tomatoes for UBF. The Mullers, like their father before them, have always considered themselves as custodians of the earth. "Soil health is fundamental to our operations, but taking part in the pilot project has helped us become a lot more progressive in our approach to soil management," Frank Muller says.

Recent innovations include planting a wider range of cover crops than previously, such as vetch, bellbeans and winter peas. "Bellbeans, for instance, grow to five feet and higher, which gives us more biomass to plough back to boost soil health, fertility and water penetration," Frank says. The farm equipment is changing too. Wider machines capable of multiple operations in a single pass can double productivity as turns and tracks are minimised. Conservation tillage is increasingly used.

The Mullers are also paying greater attention to matching nutrient need to specific crop requirements, including the monitoring of 'carry-over' levels. "We are starting a GPS programme as our next challenge, now that the bugs have been ironed out of the system and the costs are coming down, so we will be able to be even more precise with our

inputs. We have begun to move from furrow to drip irrigation and here we have been helped by both UBF and a government programme. UBF is providing an innovative contract that will allow for a quicker payback on the investment." The government's EQIP (Environmental Quality Incentive Program) provides cost sharing for practices that promote environmental quality. "On our test drip field we provided multiple benefits consisting of cover crops, drip irrigation and revegetation of roadsides and non-crop areas," Frank adds.

Biodiversity is an important indicator on the Muller farms. Their team have planted road banks with native grasses, trees and hedgerows, removed non-native invasive weeds and also been involved in environmental restoration work at Cache Creeke as well as habitat restoration in conjunction with gravel companies. These programmes are often in conjunction with volunteer and other local environmental groups.

Innovations such as these are part of the Muller 'whole farm' approach. "On 160 fields I have 70 employees, and every one of them from irrigators to tractor drivers understands what we are trying to achieve. The pilot project has given us clear indicators and goals, whether in terms of safer handling of

chemicals or more economical fuel use. We are proud of our work and links with UBF, and I am always glad to share our practices and aims," Frank says.

Perhaps the single greatest boost to the Muller's farming programmes is that for the first time in 2003 they signed a three-year contract with UBF. "For us this is a tremendous step forward. It is a real incentive to try to do even better because you know there is someone else stepping up the table with you. That level of security encourages experimentation and innovation, and for me enhances what already is an excellent long term relationship I have with Rudy Lucero, UBF site representative who knows our fields and systems inside out, and Randy Rickert, UBF director, field operations," Frank says.

While the Mullers are some of California's most efficient tomato growers, Frank sees new challenges ahead in terms of new local restrictions limiting the use of diesel pumps as well as restrictions on water use and recovery systems. "The way to meet these challenges is by promoting efficiencies and savings, and with the support of our excellent team here I feel optimistic," he says.

SUSTAINABLE TOMATOES: LOOKING FORWARD

Iain Ritchie, Vice-President Supply Chain and Technology, Savoury, urges tomato suppliers to collaborate in sustainable production.



Within Unilever our sustainability journey started out as a voyage of discovery. Since we launched the Sustainable Agriculture Initiative in the mid-1990s we have learned a great deal. To mark our progress so far and to promote further dialogue this booklet has outlined the approach that Unilever's supply chain is taking to safeguard our future tomato supply, while at the same time promoting good agricultural practices and an ecological approach aligned with social responsibility.

Many of our tomato growers hold their own views, and have also experimented with improving practices towards sustainable agriculture. We are encouraging all growers to help implement and improve upon these good practices, as we believe they can give us all a stronger framework for future sustainable tomato production.

It is our sincere wish that through this initiative we can establish long and close relationships with our contract growers. Results from the pilot projects or Lead Agricultural Programmes, such as those we have initiated in Australia, Brazil and California, support our contention that adopting sustainable agricultural practices is a bigger issue than simply conserving soil health or protecting the environment. If such farming practices are managed well, we believe they offer opportunities for significant cost reduction on farms in terms of fertiliser and chemical

applications, and water and diesel consumption, at the same time maintaining or even improving production performance. This is what we mean by Integrated Farm Management. We have already proved this can be realised so long as the appropriate skills are developed. Training, education and knowledge transfer are key elements here. UBF will continue to support this approach strongly in all the growing regions where we are active. This will be our challenge during the next phase of the Sustainable Agriculture programme.

With input from Unilever's Sustainable Agricultural Advisory Board (SAAB) we have developed good practices explained more fully in our Guideline publications. We recognise that these guidelines are not yet complete, but they are an important step on an evolving journey.

We will eventually use these good practice guidelines as part of our sourcing strategies for tomatoes from our suppliers. Our immediate aim is to encourage our suppliers to use these guidelines, and our ultimate aim is to support the creation of market mechanisms that favour and encourage sustainable agriculture.

To make this a credible and successful journey we need your collaboration. We invite you to join us in our endeavours. We are always open to improvements and suggestions.

Text

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Design

Red Letter Design, London

Cover photograph

Holt Studios International

Photographs

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Printing

Scanplus, London



FURTHER READING

UNILEVER SUSTAINABILITY INITIATIVES



Growing for the Future II
Unilever and Sustainable Agriculture (2002)



Fishing for the Future
Unilever's Sustainable Fisheries Initiative (2002)



Our Everyday Needs
Unilever's Water Care Initiative (2001)

UNILEVER SUSTAINABLE AGRICULTURE INITIATIVES



Tea – A popular Beverage
Journey to a Sustainable Future (2002)



Palm Oil
A Sustainable Future (2001)



In Pursuit of the Sustainable Pea
Forum for the Future in collaboration with Birds Eye (2002)



***Growing for the Future Spinach: For A Sustainable Future (2003)**



***Growing for the Future Tomatoes: For A Sustainable Future (2003)**

GOOD AGRICULTURAL PRACTICE GUIDELINES



Sustainable Tea
Good Agricultural Practice Guidelines (2002)



Sustainable Palm Oil
Good Agricultural Practice Guidelines (2003)



***Sustainable Vining Peas**
Good Agricultural Practice Guidelines (2003)



***Sustainable Spinach**
Good Agricultural Practice Guidelines (2003)



***Sustainable Tomatoes**
Good Agricultural Practice Guidelines (2003)

Copies of these publications and further background on Unilever and sustainability, the environment and social responsibility can be obtained from www.unilever.com (click link for environment & society) or can be requested by email on sustainable.agriculture@unilever.com. For specific information on the Unilever Sustainable Agriculture Initiative visit www.growingforthefuture.com.

*Available in English, German and Italian •Available in Portuguese (2004)





“Unilever is committed to making continuous improvements in the management of our environmental impact and to the longer-term goal of developing a sustainable business. Unilever will work in partnership with others to promote environmental care, increase understanding of environmental issues and disseminate good practice.”



Antony Burgmans and Niall FitzGerald, Chairmen of Unilever.