australian wool innovation limited

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BEYOND BALE

THE SUPPLEMENT

LAND, WATER & WOOL

FIVE YEARS OF RESEARCH SHOW THAT PROFITABLE WOOL PRODUCTION AND IMPROVED ENVIRONMENTAL MANAGEMENT CAN BE HIGHLY COMPATIBLE

LandWater&Wool
Shaping the future
Australian Government
Land & Water Australia
another australian wool innovation limited

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INTRODUCTION

The national Land, Water & Wool program, the wool industry's most significant investment in natural resource management research and development, has revealed profitable wool production and improved environmental management can be highly compatible.

Five years of research findings and outcomes from Land, Water & Wool have been consolidated into the *Managing for Sustainable Profit* report for the benefit

SUSTAINABLE MANAGEMENT OF AUSTRALIAN LANDSCAPES

By Tom Dunbabin Tasmanian woolgrower and chair, Sustainable Wool Advisory Group

Investment through Land, Water & Wool has put the Australian wool industry at the forefront of world knowledge on sustainable grazing-land management.

Land, Water & Wool is the wool industry's nationwide natural resource management program. It has developed better ways of managing for profit and a healthier environment. If you were not directly involved in the program, you may be familiar with many of our trial sites and products detailed throughout this publication.

Initiated five years ago by AWI and Land & Water Australia, the program recognised that the wool industry, in common with most agricultural industries, was facing big environmental challenges.

(Left) Tom Dunbabin, chair of the Sustainable Wool Advisory Group, with Ian Rogan, AWI's wool production general manager.

PHOTO: CURRIE COMMUNICATIONS

Woolgrowers were also faced with the difficulty of finding relevant information on sustainable natural resource management techniques that were applicable to their industry, as well as balancing the commercial realities of running a complex grazing business.

In many ways, Land, Water & Wool has now filled that gap. The program worked with more than 4200 woolgrowers to identify and pursue the natural resource management research questions of most importance to them.

The program has tackled topics that are at the heart of profitable and sustainable land management for woolgrowers in Australia:

- living with dryland salinity;
- sustaining native vegetation and biodiversity;
- managing our waterways and associated land;
- maintaining and improving the rangelands used for pastoral production;
- developing tools to help woolgrowers manage our variable and changing climate; and
- exploring what the industry's future could be in the next 25 years and the associated environmental issues.

Uniquely, much of the research was undertaken during a period of extreme drought, which has resulted in important new natural resource management information for woolgrowers looking to improve business resilience and decision-making in times of low rainfall.

The program's findings emphasise that profitable production and sound environmental management are achievable, and highlight ways that woolgrowers can make more money while improving the environment.

I thank everyone involved with this tremendous program and commend its findings to anyone interested in the future of the wool industry and the environment of Australia.

"No one has asked me before what I want to know about. That's the great thing about this project – it is looking at things I want answers to."

– MALCOLM SCHAEFER, woolgrower, Kangaroo Island

Product number: MA071303

of woolgrowers and their advisers. The report outlines the key findings and implications from the program as well as providing clear links to relevant products and more information.

This *Beyond the Bale* supplement looks at what Land, Water & Wool discovered, and how its research findings can help you manage your wool business for sustainable profit.

Mike Wagg: improved land and water resource management can result in bigger returns for woolgrowers.

SHIFTING BASELINES: how wool can be the environmental leader

By James Street Walcha, NSW, woolgrower and member of the Sustainable Wool Advisory Group

Politicians, entrepreneurs, farmers, scientists and a few popular luminaries are vigorously debating the future of our national and global natural resources.

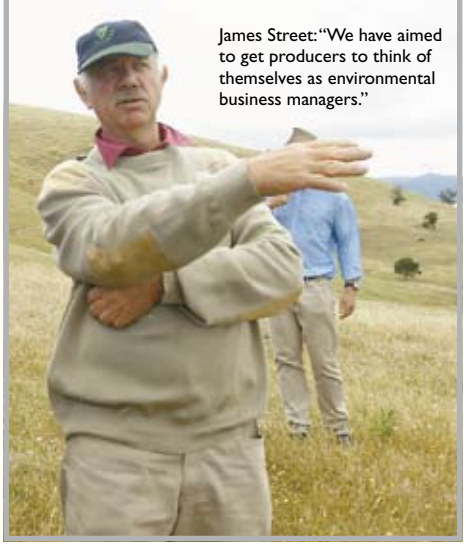
Over the five years that Land, Water & Wool has operated, topics such as native vegetation regulation, climate change, carbon sequestration, water restrictions, drought, global warming and desalination plants have commanded front and centre stage.

Clearly communities are becoming concerned about how industries such as agriculture impact on our natural environment.

Land, Water & Wool has given many wool producers the confidence to have a go at improving the natural environment on their property: we have aimed to get producers to think of themselves as environmental business managers and consider environmental implications in all their business decisions.

The program has worked hard to get wool producers and their families to think about 'their' environment and not just about 'the' environment.

We can all do something to make a difference – wool producers really do have a duty of care in this matter to look after and enhance the resource base.



James Street: "We have aimed to get producers to think of themselves as environmental business managers."

PHOTO: CURRIE COMMUNICATIONS

WOOL PRODUCTION AND OUR NATURAL ENVIRONMENT

By Mike Wagg program manager, Land, Water & Wool

Probably the biggest message to emerge from Land, Water & Wool is that improved land and water resource management can result in a healthier environment and more money for woolgrowers. Land, Water & Wool found that sheep farmers can play an important role in the sustainable management of Australian landscapes by:

- enhancing the biodiversity of native pastures;
- improving the overall return on investment in rehabilitating damaged or degraded landscapes, such as saline scalds; and
- benefiting whole-farm production (sheltering sheep and pastures) and the environment (providing shade and habitat for aquatic and terrestrial fauna).

These outcomes rely on controlling the timing, duration, intensity and frequency of grazing to ensure it works with the environment as well as the grazing enterprise.

Whether they are managing saltland pasture, riparian land or native pastures in the high-rainfall or pastoral country, successful woolgrowers are essentially good land managers that have:

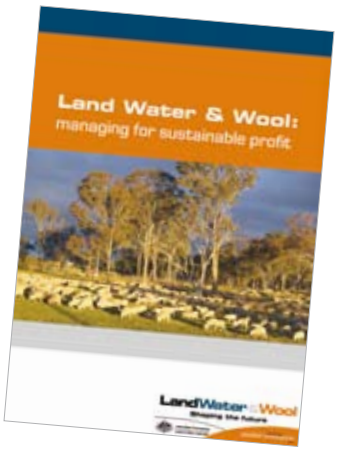
- a well thought-out property plan, carefully matched to the farming system and land capability;
- well-placed fencing and watering points that serve multiple needs; and
- a good fit between the grazing of less arable lands and other activities on the property.

Good land management can result in increased productivity, improved 'whole-of-farm' performance, enhanced local and catchment environments and additional habitats for native fauna populations (including beneficial insects and birds), and can boost woolgrower pride and social wellbeing.

Land, Water & Wool also looked into the future with the unique Future Woolscapes sub-program. Growers and technical experts explored likely changes in technology, markets and industry structure over the next 25 years, resulting in four possible scenarios based on emerging trends and issues.

Australia's woolgrowers will continue to make changes in the way they manage their natural resources. Land, Water & Wool has focused on finding management actions that benefit both environmental health and a business's bottom line, resulting in the new management resource *Managing for Sustainable Profit*.

I encourage you to include *Managing for Sustainable Profit* and its key findings in your decision-making in the future.



For instructions on how to order your free copy of *Land, Water & Wool – Managing for Sustainable Profit* – see back page or visit www.landwaterwool.gov.au

Genesis of Land, Water & Wool

Land, Water & Wool is a collaboration between AWI, Land & Water Australia and 39 other research, educational and extension partners.

It comprises six major areas of research and development based around some of the major issues facing sustainable wool production:

- Sustainable Grazing on Saline Lands (SGSL);
- Native Vegetation and Biodiversity;
- Rivers and Water Quality;
- Managing Climate Variability;
- Managing Pastoral Country; and
- Future Woolscapes.

The program invested $20 million of AWI funding, and $20 million from contributing partners, into targeted research and extension activities, underpinned by Land & Water Australia's significant research investment in natural resource management over the past 10 years.

WOOLGROWERS AS ENVIRONMENTAL STEWARDS

Wool producers manage about 12 per cent of the continent and play a big part in keeping it healthy for the benefit of the community

Woolgrowers are the custodians of a large proportion of Australia's natural resources. Australia's 37,000 wool producers manage 85 million hectares of land – about 12 per cent of the continent.

The industry plays a huge role in managing water quality, soil erosion and habitat protection for the benefit of the community. Improved natural resource management can lower water tables, improve water quality, promote biodiversity and improve the appearance of the landscape.

A Land, Water & Wool survey showed that 90 per cent of woolgrowers regard natural resource management as important. It showed that dryland salinity affected 40 per cent of all woolgrower properties, 78 per cent had waterways (rivers or creeks) on their properties and 77 per cent had areas of native vegetation.

"Woolgrowers with hill country can improve profits by 10 per cent and avoid bare hills, erosion and weed problems in winter."

– JIM MOLL, researcher, Native Vegetation and Biodiversity sub-program

The survey showed that:

- 70 per cent of those affected by salinity had introduced practices to improve the land;
- 55 per cent of those with waterways had adopted practices to improve water quality; and
- 55 per cent of those with native vegetation were using improved management practices.

There are many environmentally focused activities that woolgrowers undertake on-farm for the benefit of the wider community. For example, woolgrowers fencing out riparian land or isolating and managing a salt scald are often driven more by duty of care than by short-term profit, but provide great benefits to the wider community in the longer term.

More information: See back page for Land, Water & Wool publications, and see www.landwaterwool.gov.au for more resources.

Australian production zones

Fast-tracking catchment management goals

Land, Water & Wool identified many opportunities for woolgrowers and regional Catchment Management Authorities (CMAs) to work together in a mutually beneficial way. It has given such bodies direct experience of the wool industry's particular needs and the benefits it can offer for improved landscape management on a vast scale.

In Victoria, the Goulburn-Broken and North Central CMAs, with help from Australian Government funding, are incorporating Land, Water & Wool vegetation and biodiversity research findings into 'Green Graze', a new project for graziers.

Land, Water & Wool has also enhanced the scientific rigour and economic analysis for aligning natural resource management goals at both the farm and catchment level. For example, by using economic models based on data from 14 wool properties, it was found that up to 15 per cent of the land area of hill-country farms in Victoria could be revegetated for environmental benefits without great effect on farm profitability.

This is useful information to bring to the debate on the proportion of the landscape that needs to be revegetated for environmental reasons; some CMAs have 30 per cent of their area as a target for revegetation, which Land, Water & Wool research suggests is unlikely to be economic.

Land, Water & Wool has also targeted results, tools and guidelines to regional natural resource management bodies, state agencies and producer organisations.

Pasture planning makes production profitable

Adopting planned grazing has regenerated native grass pastures and substantially boosted stocking rates for South Australian woolgrower Chris Heinjus.

Chris owns a 1420-hectare farm in SA's mid-north, with an average rainfall of 400 millimetres, and runs a self-replacing Merino flock of 2400 ewes.

Since making the change, Chris has seen an improvement in the land's condition, stocking rates have increased from an average of one to 1.5DSE per hectare to three to 4DSE/ha and the average lambing percentage has increased from 78 to 100 per cent after changing his farm's yearly production calendar.


Chris Heinjus

PHOTO: KYLIE NICHOLLS

Researchers and woolgrowers: partners in climate risk

Melissa Rebbeck, a climate researcher from South Australia, and her team looked at the value to pastoralists of using the Southern Oscillation Index (SOI) in their management decisions. She says that from a research perspective, ongoing contact with woolgrowers was essential.


Melissa Rebbeck

"Hearing from woolgrowers that they would consider changing the timing of important decisions to fit with climate forecasts was extremely rewarding," she says. "The interaction with the other researchers from across Australia has also been excellent for each of us, resulting in improved research and delivery to woolgrowers."

Environmental 'health check' for woolgrowers

Woolgrowers from the Traprock Wool Association (TWA) in south-east Queensland and Land, Water & Wool researchers have developed an online 'health check' for their natural resources.

The TWA participated in the project 'Integrating paddock and catchment planning: a wool producer-driven approach to sustainable landscape management', which led to the development of the internet-based environmental-management toolkit.

Program provides credible resource

Promoting Tasmanian wool's environmental, sustainable and natural qualities has been an important marketing strategy for Tasmanian woolbroker Roberts Ltd.

Roberts marketing manager Eric Hutchinson says Tasmanian wool is rare, under-marketed and meets the quality demands of its discerning customers.

However, the ability to back up environmental and sustainability claims with independent, reliable information has also proved vital, and is where work by Land, Water & Wool has been important.

Mr Hutchinson says Roberts saw the program and its researchers as a knowledgeable and credible resource. "They were able to provide substance to the claims we were making about Tasmanian wool, which we found very valuable."

Roberts' marketing strategy has drawn a lot on the natural attributes of Tasmania, which has helped to meet customer demands such as those of the North American activewear market. Mr Hutchinson says this market is a wealthy demographic and Tasmanian wool fits well with it.

"This segment includes people who play in the outdoors and like natural products. Wool is a nice match because it fits with their environmental and sustainable ethos."

Land, Water & Wool has also helped increase customer knowledge of Tasmanian wool's attributes, he says.

"Using material from the project we were able to help show potential and existing customers exactly what it meant to source wool from Tasmania. And from our point of view, as marketers, there's value in that.

"It's always better to have independent, credible experts available to back up any environmental and sustainability claims we make. That's very important and we found real value in that."

– REBECCA THYER

For the first time, woolgrowers can, collectively or individually, monitor their farm's environmental performance (for example, pasture and habitat condition) and compare their property against regional benchmarks.

Over time, the website and its monitoring results will actively demonstrate the adoption of sustainable and environmentally friendly practices by woolgrowers.

The biodiversity toolkit, which can also be adapted to regions outside of the Traprock, is accessible via the www.traprockwool.com website.

SUSTAINABLE PROFIT: ON-THE-MONEY SOLUTIONS

Good natural resource management can lead directly to greater financial returns – a unique win-win situation for woolgrowers

Driven by woolgrowers' needs and wishes, the research carried out by Land, Water & Wool has given the Australian wool industry a special advantage: the ability to improve financial returns while enhancing the way it looks after natural resources such as land, water and vegetation – all under a changing climate.

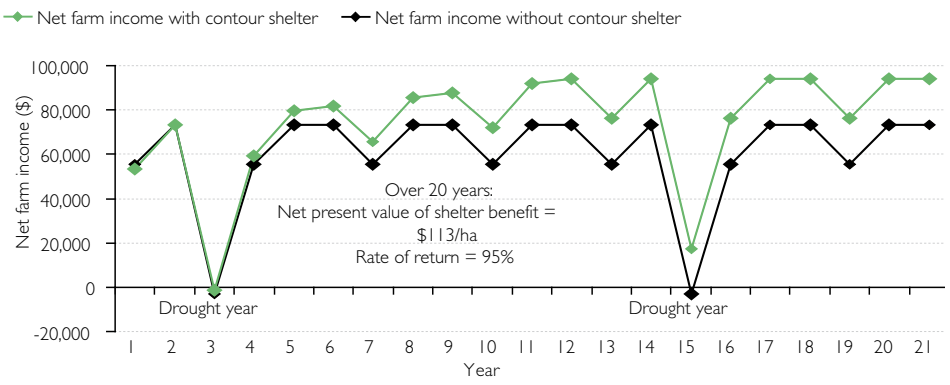
The AWI investment of $20 million in Land, Water & Wool is expected to generate economic benefits of $87.3 million – half from productivity gains and half from environmental improvements. For example, there are important gains to be made at the on-farm level, including potentially lifting profits by at least 10 per cent – sometimes considerably more – by establishing saltland pastures and strategically including them in the whole-farm rotation.

Other economic benefits for woolgrowers have been identified:

- research in South Australia and Victoria found that the strategic management of pastures that include native grasses (for example, planned or rotational grazing according to plant growth rates) could increase stocking rate from 2.3 to 4.2DSE per hectare while promoting native perennial grasses. These findings are applicable to more than two million hectares in the two states.
- planning gully rehabilitation in a whole-property context can provide opportunities to increase productivity and the ease of farm management, through fencing (for example, to permit rotational grazing or to align with land-class boundaries) or establishing new dams.
- seasonal climate-risk assessments can be coupled with historical rainfall and pasture data to predict pasture growth in many regions at particular times of the year. This is more useful to farm planning than merely predicting rainfall: it can be factored into decisions about stocking rates, optimising joining and lambing and so on.
- rehabilitation of riparian land can repay the initial infrastructure outlay through improved pasture growth, better feed utilisation, disease control and shelter for lambs and sheep off-shears.
- woolgrowers on properties with dryland salinity now have more options to address salinity, including simple first steps such as rotationally grazing volunteer pasture and looking at the low-cost option of fencing-off, through to saltland pasture establishment on a large scale.
- research in the Traprock country of Queensland confirmed that thick regrowth in grassy box woodlands of south-east Queensland was of lower biodiversity and production value than more open woodland areas. In more open woodland country, there was a positive relationship between the amount of tree and understorey cover and the diversity of native animals.

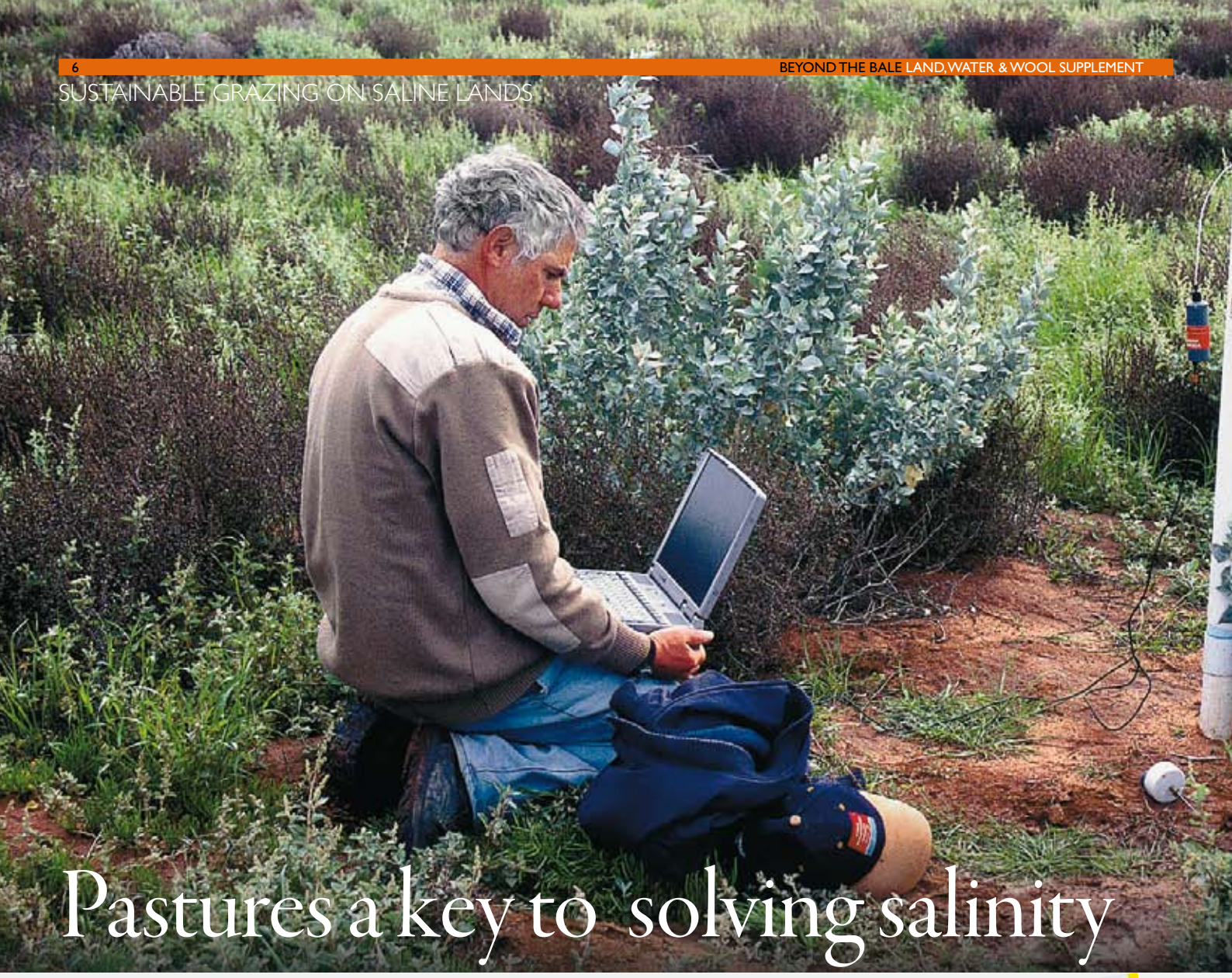
More information: See back page for Land, Water & Wool publications, and see www.landwaterwool.gov.au for more resources.

Whole farm returns from contour shelter belts



Contour shelter-belts can increase net farm income (Northern Tablelands, NSW)

SUSTAINABLE GRAZING ON SALINE LANDS



Pastures a key to solving salinity

Land, Water & Wool has found that moderately saline land is the best place for woolgrowers to make a start on saltland management

More than 8000 woolgrowers who report salinity on their properties now have a range of grazing options to deal with the problem, from planting saltland pastures, which can lift profits by at least 10 per cent, to the low-cost option of fencing-off and rotationally grazing volunteer pasture.

Dryland salinity affects 2.5 million hectares of Australia and continues to grow. About 1.2 million hectares of woolgrowing land is affected by salt, of which about a fifth has been sown to saltland pasture.

Sustainable Grazing on Saline Lands (SGSL)*, a sub-program of Land, Water & Wool, has found that 'mid-range' salinity sites are the best place for farmers to make a start on saltland management (EC [electrical conductivity] 10–30dS/m [decisiemens per metre]).

Sites with moderate salt levels offer greater prospects for better and more reliable returns than badly affected areas (which might fail) and also mildly affected areas (which can still potentially be cropped). On this basis, SGSL has determined that about half of the saline land in Western Australia is suitable for long-term and profitable saltland pastures.

Careful site preparation, species selection and sowing with viable seed are essential. In NSW, even during the severe drought, more than half the trial sites succeeded in establishing pastures on salt-affected land at the first attempt, which was impressive considering the relatively hostile environment being established to pasture. Weed control becomes a critical component of saline land management once work begins.

In South Australia, saltland pastures lowered the water table sufficiently to allow lucerne to be established – an important part of the perennial pasture mix. This approach turned a 725ha property from unviable (losses of $62/ha per year under its existing system) to highly profitable (profit of $77/ha/year). Another farm increased profit from $8 to $147/ha/year, mainly from cropping the rest of the property when the sheep were grazing the saltland.

Researchers are continuing to test native and introduced species for their usefulness as saltland pastures through the Cooperative Research Centre

SALTDeck aims to take the guesswork out of identification and selection of saltland plant species. It provides a fast and convenient way of identifying the 50 most common plant species growing on salt-affected land.

Meir Altman, technical officer with the Department of Agriculture and Food, Western Australia, downloads a data logger attached to a continuous water level recorder.
PHOTO: DR ED BARRETT-LENNARD

(CRC) for Plant-based Management of Dryland Salinity. It has been shown that some plants that tolerate waterlogging – such as balansa clovers – are sensitive to salt, while others can cope with salt but not saturated soil.

In many cases, fencing-off to prevent stock access to a salty site or to permit rotational grazing is the cheapest option, and woolgrowers may apply for grants to help with the cost through local Catchment Management Authorities or other government and non-government initiatives.

More information: See back page for Land, Water & Wool Sustainable Grazing on Saline Lands sub-program publications, and see www.landwaterwool.gov.au for more resources.

*The SGSL initiative is a collaboration between Land, Water & Wool, the CRC for Plant-based Management of Dryland Salinity and Meat & Livestock Australia, and is supported by state agriculture agencies in WA, SA, Victoria, Tasmania

Saltland pastures extend the season in WA

Graziers Rodney and Sharon Drage estimate they are now carrying 200 to 300 more sheep than was previously possible, thanks to the rehabilitation of a salt-affected and waterlogged area of their farm at Upper Hay River in Western Australia.

The water table has been lowered by an estimated 10 to 20 centimetres in just 18 months, and where supplementary feeding would normally have begun in February, it was not needed until April.

The Drages say the site looks much better too, with less surface water lying about. Previously bare areas now support good stands of saltbush and perennial pastures, such as Rhodes grass and setaria. The farm has an average rainfall of 550 millimetres.

Rodney Drage about to seed an Evergreen mix.
PHOTO: ARJEN RYDER

Pride, productivity and pastures

Land, Water & Wool has identified pride as an important motivating factor behind farmers' decisions to invest in saltland management. Two markets have emerged for saltland management information:

- woolgrowers with large amounts of saline land on their properties – mostly in Western Australia and South Australia. For these farmers, the productivity and profitability of saltland pastures is the main consideration, as there is considerable scope for them to contribute to whole-farm income. Amenity and environmental health are important, but are not the main drivers for pasture rehabilitation; and
- woolgrowers with small patches of saline land. Nationally, 54 per cent of farmers with saline land have less than 20ha affected; in NSW and Victoria, 51 per cent have less than 10ha. For woolgrowers with small areas, there is less scope for saltland pastures to generate much profit. Amenity value, personal pride in management and potential for environmental improvements tend to be the major drivers of rehabilitation, with economic returns an important but secondary consideration.

Along with the four major scientific research projects, SGSL supported 120 woolgrower demonstration sites across southern Australia.
PHOTO: CURRIE COMMUNICATIONS

Producer networks unite against salt

SGSL research was bolstered by a national network of more than 1200 producers who carried out pasture and grazing trials and came up with new, practical information about how to keep pastures alive and thriving in saltland.

SGSL had producer groups in South Australia, Victoria, Tasmania and NSW, but it was no coincidence that the greatest participation was in Western Australia. Up to 78 per cent of woolgrowers in WA are directly affected by salinity, compared with 40 per cent of growers nationally.

There were 120 projects in total – 70 in WA and the rest in the eastern states – designed and run by farmer groups who examined their specific questions in relation to pasture productivity, animal performance, system economics and environmental impacts.

Biodiversity boosts the bottom line

Benefits from good biodiversity on farms include higher lambing percentages and stocking rates, but the psychological benefits should not be overlooked

Sheep and their shelter-belt on the Galls' 'Wilson's Creek' property, NSW. PHOTO: NICK REID

Integrating the natural environment with the business of woolgrowing is paying off for graziers as well as meeting community expectations.

Woolgrowers and researchers have worked together in Land, Water & Wool's Native Vegetation and Biodiversity sub-program to develop practical, cost-effective tools to make native vegetation and biodiversity management part of overall farm planning.

Through a series of regional research and development projects, native pastures and bushland have been shown to provide a range of benefits. Research has found that shelter-belts of native vegetation on the New England Tablelands of NSW boosted lambing percentages and profits by $11 a hectare. Two properties that planted 11 per cent and 18 per cent of their farm area to blocks and belts of trees saw no reduction in carrying capacity or wool production.

In Victorian hill country, deferred grazing over the summer months could see carrying capacity increase by 50 per cent and farm profits increase by 30 per cent. If increased supplementary feeding is not required, it also can generate a healthy 25 per cent return on investment.

This was one of four management options explored in this region with a view to enhancing biodiversity within profitable farm businesses.

On trial sites in the mid-north of South Australia, rotational grazing of perennial native grasses, based on the amount of feed available and its growth stage, has expanded the cover of perennial grasses and of vegetation overall. This resulted in a substantial increase in stocking rate, from 1.25 to 3.5 DSE/ha at one site, and from 2.3 to 4.2 DSE/ha at a second. Coupled with a shift in lambing dates, the increased grass production boosted lambing percentages at one site from 78 to 100 per cent.

While profits are important, maintaining biodiversity has other positive effects. Surveys have shown that many woolgrowing properties provide important habitat for native plants and animals, especially when woody vegetation is present. Birds, bats and other species can provide important ecosystem services such as pest control, as well as making properties more enjoyable places to live.

"The psychological benefit of a biodiverse farm is important," says NSW woolgrower Rob Adams of 'Swallowfield', Armidale. "It's good to be able to look at the flowers or trees for a while when things aren't going right."

The importance of 'sense of place' to woolgrowers was captured in a unique study in south-east Queensland using a technique called 'Photo Voice'. This study of woolgrowers' connection to their landscapes showed that sustainable land management is an important aspect of sustaining the quality of woolgrowers' everyday lives as well as the biodiversity underpinning their economic future.

As a result of these regional projects, Land, Water & Wool has produced a range of websites, guidelines and manuals that provide a range of options for managing native vegetation as an integral part of commercial woolgrowing businesses.

The innovative online

Diamond firetail. PHOTO: HELEN FALLOW

PHOTO: CURRIE COMMUNICATIONS

Collars get tongues wagging about trees

Victorian farm dogs operating in hill country are keeping tongues wagging about the benefits of biodiversity and native vegetation.

A free dog collar and brochure were developed for woolgrowers (modelled above by two of Victorian woolgrower Debbie Shea's faithful working dogs) to spread the word about the 'Farm businesses, wool production and biodiversity' project, which showed:

- deferred grazing of hill country over summer months can improve stocking rates and profits;
- whole-farm planning allows wool profits and native vegetation management to be improved on different parts of the farm at the same time, by either correcting soil nutrient deficiencies or intensive rotational grazing; and
- establishing stock shelter through natural regeneration is relatively cheap and can increase farm profits in the long run.

'health check' developed by woolgrowers and researchers in the Traprock region of Queensland enables woolgrowers to collectively or individually monitor their farm's environmental performance.

In Tasmania, a template was developed for a biodiversity management plan. It includes the specific management requirements of the native vegetation species and habitats found on the farm, as well as considering the property's production and the needs and goals of its managers.

Both the Traprock and Tasmanian products have the potential to be adapted for accreditation purposes.

To further improve grazing management, the *Quickchecks* manual has been developed to provide woolgrowers with a step-by-step approach to determining the condition of native vegetation, biodiversity and river health on their farm, as well as choosing management options that maintain or improve that condition and meet their goals for the property.

More information: See back page for Land, Water & Wool Native Vegetation and Biodiversity sub-program publications, and see www.landwaterwool.gov.au for more resources.

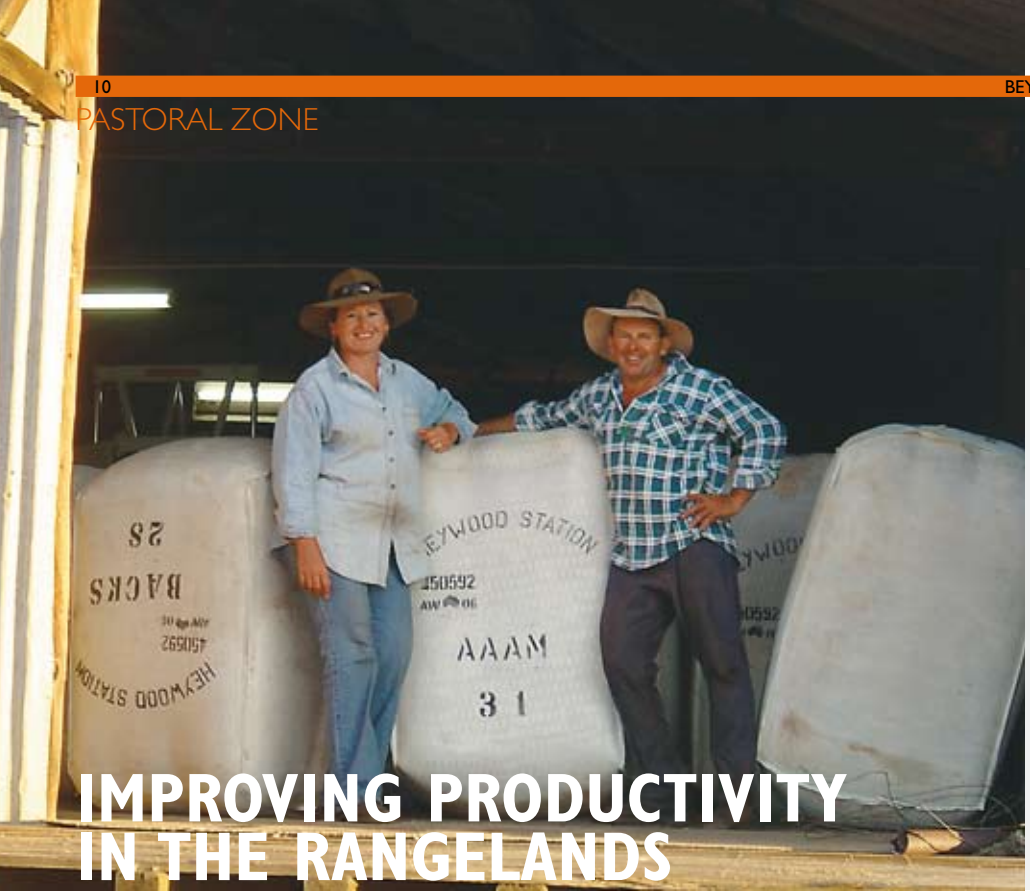
Tony and Janet Gall of 'Wilson's Creek' in the New England Tablelands of NSW. PHOTO: NICK REID

Native species breed success

Tony and Janet Gall, of 'Wilson's Creek' in the New England Tablelands of NSW, are members of the Australian Superfine Woolgrowers Association. They say a lot of the success of their fine wool is due to the native species across the country, in particular *Microlaena*.

"These species are the survivors and they must be nurtured," Tony says. "Overgrazing and over-fertilising these species creates a risk of reducing their balance. Their ability to grow high-tensile strength, bright, stylish superfine wools in this cooler-climate New England region cannot be underestimated.

"My most important message is that we must learn to appreciate the environment. We are so lucky, but we must aim to leave the country in better shape than we inherited it."



Krystyna and Alan Dick of 'Heywood', east of Cunnamulla, Queensland.
PHOTO: NEAL ELLIOT

IMPROVING PRODUCTIVITY IN THE RANGELANDS

Woolgrowers are utilising satellite imagery and remote-sensing technology to assess pasture availability in the rangelands

Getting a handle on just what feed resources are available for the season ahead is a challenge for any grazier, but particularly so for those operating remote rangelands grazing businesses.

Australia's pastoral zone supports 1700 woolgrowing families and produces about 12 per cent of the nation's wool clip. In this unique country, managers have to be expert in assessing the condition of native pastures, and how the season is unfolding, so that timely decisions can be made about stocking rate manipulation – the primary management tool available to pastoral graziers.

The Managing Pastoral Country project 'Wool Producers with Remote Control' looked at how satellite imagery and emerging remote-sensing technology might help assess how much pasture is on a property at any one time.

Project leader Dr Gary Bastin from CSIRO Sustainable Ecosystems in Alice Springs says: "What's now required is for us to put the technology in the hands of grazing families, and help them to develop it in a way that is most useful to them. They need to be comfortable that the imagery is telling them what we think it is telling them."

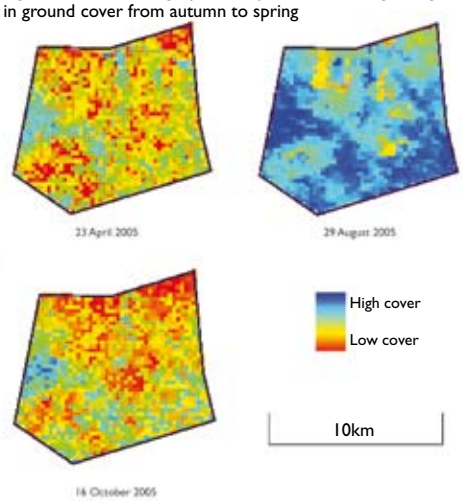
Drought, and the lead-up to drought, are crucial times for making stocking-rate decisions in the rangelands. Poor decisions at these times, more so than at any others, can lead to irreversible decline of the soil and pasture base.

Land, Water & Wool researcher Dr Alec Holm and colleagues worked with pastoralists Rob and Kathryn Mitchell from Yalgoo in WA's southern rangelands to develop a user-friendly computer program that assists graziers to overcome the decision-making distractions.

"Making a decision to de-stock can be emotional, and more often than not you are thinking it will be better next week," Kathryn says. "Objective data can greatly reduce the drama of that decision-making process."

Pastoralists have also been given a clearer understanding of how to maintain Mitchell grass, an important pasture species in the rangelands. The sub-program looked at the extent, economic impact and potential for the recovery of Mitchell grass and developed management guidelines to assist persistence and recovery after drought. The sub-program also developed the *ABCD Guide* specifically to help woolgrowers monitor land condition of Mitchell grass and mulga country.

Figure 1 Satellite imagery of one paddock showing changes in ground cover from autumn to spring



'Pasture classing' pays off

Since Alan and Krystyna Dick bought 'Heywood', east of Cunnamulla in Queensland, they have almost constantly been in drought conditions. Eager to learn more about how to improve the property's grazing value, they attended an MLA EdgeNetwork Grazing Land Management (GLM) course.

The course focuses on assessing pasture condition and classing it according to its stock-carrying capacity. Depending on condition, land is classed as A, B, C or D, and Land, Water & Wool helped refine that process.

"The mulga country is a good source of high-protein feed for stock in times of drought," Alan says. "Using it properly for fodder can be the difference between completely de-stocking or just decreasing numbers."

Space stations

David Warwick, a pastoralist from South Australia's Flinders Ranges, has for a number of years trialled remote-sensing technology using satellite information on his station 'Holowiliena South'. "It's got promise as a way to monitor land condition in the longer term," he says. "Pastoralists need to demonstrate that we're looking after the environment, and this might be one tool that we can use to do it."

He can also see the potential for remote sensing as a drought-management tool that would allow an accurate whole-of-property assessment of feed reserves. To do that, David believes it needs to be allied to good rainfall-probability information. But more work needs to be done before he can see a place for it in his day-to-day management.

"It has to be more cost-effective and more easily accessed by computer. If that was the case, I could see it as a great tool for triggering management decisions."

More information: See back page for Land, Water & Wool Managing Pastoral Country sub-program publications, and see www.landwaterwool.gov.au for more resources.

LESS RISK, MORE CONFIDENCE IN MANAGING CLIMATE

"Using climate risk assessment makes you the bookie, rather than the punter," says one climate forecaster

Australian woolgrowers are among the world leaders in the use of seasonal risk assessments (SRAs) to reduce the effect of climate variability on their businesses. Assessing climate risk involves three key factors:

- the Southern Oscillation Index (SOI), which may indicate a drought-associated El Niño effect;
- the 'key date' – the date from which there is a greater than 80 per cent chance of getting the amount of rainfall required for a season break; and
- the 'critical date' – the end of the growing season.

Land, Water & Wool research has found SRAs can help growers match livestock numbers to probable feed availability with greater confidence, especially in some regions and at particular times of the year. As one climate forecaster puts it: "Using climate risk assessment makes you the bookie, rather than the punter."

For many regions, except those in Western Australia, SRAs can be made with confidence at certain times of the year if the SOI is behaving in certain ways. These relationships vary, but woolgrowers now have the ability to know when to – and when not to – look to SRAs for their region.

Producer James Milson, of 'Somerset', Longreach, Queensland, monitors seasonal risk-assessment systems such as the SOI index and 40-Day Wave. He believes that medium-term, region-specific rainfall forecasts that factor in the effect on pastures will be a big step forward for the industry. "If we are told in May or June that it's probable the summer will be dry, we can make management decisions in areas like weaning, stocking rate and stock sales accordingly," Mr Milson says. "If we can get our predictions right 70 per cent of the time, it will make a big difference to profitability."

In parts of Queensland, a comparison of grazing systems indicated that the use of seasonal forecasting could be worth 60 cents a hectare – or $17,000 to a typical pastoral property – and as much as $1.40/ha. This included reducing the losses caused by degradation of resources and better prospects of high incomes in good years.

In large parts of the South Australian rangelands, the three-month SOI risk assessments for rainfall and pasture growth have considerable reliability between June and November, when climate indicators can result in a 70 per cent or higher probability of increased or decreased rainfall or pasture growth.

More information: See back page for Land, Water & Wool Managing Climate Variability sub-program publications, and see www.landwaterwool.gov.au for more resources.

Power to predict pasture is positive

NSW woolgrower Tony Thompson believes he can reach the target stocking rate of 7000 DSE on his 14,100-hectare properties at Bourke and Brewarrina by maximising the pasture growth flushes that occur in the region.

Tony helped Land, Water & Wool scientists refine the 'AussieGRASS' model for north-western NSW, by providing calibrated maps of different land types, monitoring weather stations and taking soil moisture probes.

At the same time, he learnt more about the Southern Oscillation Index (SOI), which climatologists say provides, from the period June to August, a strong indication of the coming season in western NSW.

"If the SOI is able to give a good pointer to the season and the grass model is predicting good growth, we'd be encouraged to stock more aggressively," Tony says. "But if all the indications were negative, we might be persuaded to de-stock more aggressively."

Tony Thompson, NSW, worked with Land, Water & Wool researchers during extreme climate events (such as in 2004-05) to refine the AussieGRASS pasture modelling tool. PHOTO: LAND, WATER & WOOL

Drafting gate sorts out climate risk

Climate variability in Australia is enough to give any woolgrower a headache, but those using Land, Water & Wool's 'Climate Drafting Gate' are heading in the right direction to manage seasonal risk.

The Drafting Gate, on the www.landwaterwool.gov.au website, helps woolgrowers to understand and find the most appropriate climate risk-management tools to apply on-farm.

Specifically, the Drafting Gate looks at:

- how climate outlooks and weather forecasting differ and how they affect on-farm decision-making;
- how to understand local climate variability, through a series of case studies in particular regions;
- the concept of forecast 'skill', which reflects the confidence in climate outlooks in your local area;
- how probability, which is used to deliver seasonal outlooks, is derived and how to put it into practice through a probability tutorial;
- five tools to measure climate variability and how to use them; and
- climate variability resources and website links to more information.

The 'Drafting Gate' online information and decision-support tool homepage.

Riparian repair pays dividends

Practical guidelines have been developed to help woolgrowers manage specific waterway issues on their properties

The Weatherley family, of 'Connewarran', Victoria: "River and waterway management should be a part of the whole farm ecosystem and not a separate issue."

PHOTO: CURRIE COMMUNICATIONS

More than 75 per cent of all woolgrowing properties have frontage to a waterway, be it a river, a stream or intermittent creek. Sheep need access to high-quality water to thrive, and the pastures alongside waterways (riparian lands) are often highly productive with good-quality feed.

They can also present special management challenges – for example, in optimising grazing management if the stream or creek is unfenced, in parasite control on wetter areas, in preventing disease transmission if animals cross the stream onto neighbouring properties and in preventing loss of infrastructure and stock during floods.

The woolgrowers involved in the Rivers and Water Quality sub-program have been able to meet these challenges by planning the use and management of riparian areas and waterways as part of their whole-farm plan. They have shown that:

- carefully planned seasonal grazing of riparian pastures can improve species composition and feed utilisation, while also providing a filter to remove soil and nutrients from upslope before they reach the stream;
- retaining or planting native riparian vegetation can provide a valuable windbreak at lambing or for sheep off-shears, while also shading the stream and reducing water temperature and nuisance aquatic plants;
- determining the timing and intensity of grazing to best match the feed available from other parts of the farm and to meet animal demand (for example, to lift lamb weight or finish stock for sale) can increase profits;
- subdividing riparian areas to enable rotational grazing and resting of pastures maintains productive species and increases feed production; and
- controlling stock access to riparian areas maintains ground cover, reduces erosion, improves water quality and promotes natural regeneration of native plants.

By integrating riparian management into the overall farming system, woolgrowers in Tasmania have increased pasture and wool production, while also promoting natural regeneration. In NSW the focus has been on preventing the formation of gullies, or on their stabilisation and rehabilitation. In South Australia the emphasis has been on optimising the use of riparian pastures and control of invasive, unpalatable weeds.

These three regional projects have developed

"It is important to recognise that the battle for water quality is generally won or lost in the small creeks, gullies and streams within a catchment. These waterways make up three-quarters of the stream network length and are generally located on farms, so developing guidelines for woolgrowers to better manage them within the context of a commercial operation is vital to maintain water quality for downstream users."

– DR PHIL PRICE, Land, Water & Wool researcher

Buffalo Brook, Tasmania, before and after rehabilitation.

PHOTOS: BIZ & LINDSAY NICOLSON

practical guidelines for woolgrowers that address these problems, with self-assessment tools and guides on species identification, which plants to put where, control of nuisance woody weeds, who to contact and other practical tips provided.

For woolgrowers such as Mark and Anna Gubbins of 'Coolana' in western Victoria, a river is a valuable asset and they have been managing it as a separate, but integrated, part of the farm. Their story inspires other woolgrowers who want to try something similar,

Six years after completing a major fencing program to close off most of the Hopkins River frontage on his family property, Mark Gubbins is astounded at the regrowth of natural vegetation along the river's banks.

"It's amazing to see how well the river banks have regrown," he says. "Nature has the biggest Band-aid of its own, if you give it a chance. Things have grown in places where we thought they never would, for example, river red gums. I just can't believe how quickly the river has said 'thanks'."

More information: See back page for Land, Water & Wool Rivers and Water Quality sub-program publications, and see www.landwaterwool.gov.au for more resources.

'Five Ps' provide all pieces of puzzle

Trust between woolgrowers, researchers and project staff is fundamental to the success of natural resource management (NRM) programs, and the Rivers and Water Quality researcher and woolgrower team identified five key factors that build it. The 'Five P's' have guided the sub-program by bringing together the economic, scientific, environmental and social factors that influence woolgrowers in deciding whether to adopt recommended NRM practices:

- **profit** is the need for triple-bottom-line return;
- **proof** is solid real-life evidence to underpin decision-making and provide confidence to act;
- **people** looks at the importance of establishing and maintaining relationships;
- **place** considers the connection woolgrowers have to their farm and local community; and
- **promise** is a commitment to listen, empathise, deliver and celebrate people's involvement in NRM.

Field monitoring equipment in a gully.
PHOTO: FLEUR FLANERY, GARY CAITCHEON

Loaded gullies swallow topsoil

Gully erosion reduces the amount of productive land, limits access to paddocks, makes it difficult to muster stock and degrades water quality through the sediment and nutrients mobilised. It is often considered evidence of poor management.

Research on Brendon Lunney's property 'Bogolara', near Yass, NSW, showed that a 50-millimetre rainfall event sent 75 tonnes of suspended sediment, 15 megalitres of discharge (water flow), 20 kilograms of phosphorus and 75kg of nitrogen through a single farm gully within hours. This would substantially reduce downstream water quality to all users and means a significant loss of capital investment from farms.

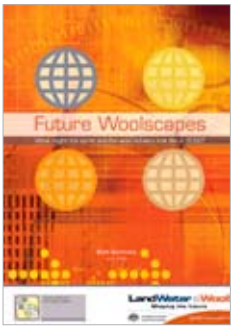
As a result of research through Land, Water & Wool, new easy-to-follow management guidelines are now available to help woolgrowers manage and rehabilitate gullies on-farm.

"Do we have success? Do we have the interest of other farmers? The answer is yes, and that's a strong benefit from Land, Water & Wool. There's more bird life, a greater range of plants in terms of age, species and size, as well as more shelter and shade for stock. It's also a lot better to look at."

– BRENDON LUNNEY, woolgrower, NSW

USING THE FUTURE TO SHAPE THE PRESENT

Panels of experts have come up with four scenarios of what the wool industry may look like in 25 years' time



By 2030, the average woolgrower could face a doubling of synthetic fibre production, a fall of two per cent a year in the real price of wool and consumers who expect farms to have minimal impact on the environment.

Wool competes with cropping for reliable rainfall country. The 'new age farmer' has more business skills, but there will be less labour available, and woolgrowing might be more closely scrutinised by governments, consumers and society. But the application of new emerging technologies may well underpin a vibrant exciting industry.

Science fiction or reality? These are just some of the findings in four alternative scenarios drawn together by the Future Woolscapes sub-program.

Land, Water & Wool asked leading growers and technical experts to explore how the world and the wool industry might evolve in the coming 25 years, in the areas of technology trends, fibre markets, consumer demand, climate change and on-farm management.

Panels of experts created the scenarios based on whether regulation in society increases or decreases and whether wool has one main end-use (apparel) or develops a range of new ones, such as medical and industrial applications.

The four scenarios are not predictions of what *will* happen. They are scenarios of what *might* happen – or what *could* happen if the industry wants it to.

The insights gained from Future Woolscapes are being applied by AWI in its planning, and reveal a number of key factors that will help individual growers prepare for the future:

- synthetic fibre production (mainly polyester) is likely to grow unabated from 57 to 107 million tonnes, and will continue to mimic the properties of natural fibres;
- producers may face increasing scrutiny from governments and consumers, and will need to be able to track fibre and demonstrate the degree of sustainability and welfare in its production;
- the real price of wool could continue to fall by about two per cent a year – productivity improvements and the adoption of new technology will be paramount;
- the woolgrower population will continue to age, from an average of 55 to 60 years, and manual labour will be increasingly difficult to find;
- some specialist wool production may move into less-arable areas, due to competition from cropping in reliable-rainfall country – the scale of the farm and its ownership structure may alter substantially;
- consumers are likely to be even more focused on value for money and health and wellbeing in their purchasing; and
- by 2030 there will be eight billion people in the world, most with instant access to information and keen to follow the 'footprint' of any product they purchase.

As futurist Bronwynne Jones, from LookOut Futuring Services, says: "When thinking about the future, it is not about being right, but about being ready."

More information: See back page for Land, Water & Wool Future Woolscapes sub-program publications, and see www.landwaterwool.gov.au for more resources.

What in the world...? The future of woolgrowing

It will come as no surprise to woolgrowers to find that they will be operating in a different world in 25 years' time, but now there are four very different possible scenarios (or 'worlds') to stimulate debate about just how different it will be.

'World A: the squeeze continues' describes a time where the consumer rules and health and the environment are key issues. Like-minded woolgrowers exploit environmental accreditation and consumer health-consciousness as part of an industry marketing strategy. They are quick to adopt advanced technologies, such as virtual fencing and new reproductive techniques. Specialist growers are still profitable, but woolgrowing almost disappears from pastoral areas.

In 'World B: fashion police rule' there are strict rules on the use of land, water and vegetation. Agriculture is compelled by consumer demand to operate under environmental accreditation. The sheep industry polarises into wool and lamb specialists. Fine wool is marketed as a specialist 'green' product aimed at rich consumers. and operates mainly in non-arable country due to surging world demand for food.

'World C: accredited crimp is king' predicts a hi-tech, high-regulation world where wool diversifies into many end products. Research is opening up big new markets, especially medical. Growers need a licence to operate and face regular audits. The word 'wool' can only be applied to fibre of 18 micron and finer. Twenty per cent of production is from shedded sheep. The origin of wool is trackable and consumers can identify the property from the garment label.

'World D: wool ain't wool' also paints a future where wool has developed many novel end-uses. A united, aggressive industry develops a whole-of-value-chain approach and a global chain of 'eco' stores to market its certified products. Processing is done in eco-parks close to major markets. Grower focus is on easy-care sheep and strict specification to meet market demands. Sheep and wool products include cosmetics, pharmaceuticals, apparel, industrial and electronic goods.

JIM MOLL

I'll finish the virtual fencing after lunch Russell!

NEXT STEPS FOR THE WOOL INDUSTRY

AWI is committed to investing in projects that develop the profitability of woolgrowing and, at the same time, improve the natural resource base

Well-maintained natural resources are the foundation of profitable and sustainable wool businesses. Business profitability will suffer without diverse, productive pastures and bushland, or clean, fresh water, or healthy, active soil. In addition, beautiful, well-managed, biodiverse properties are a source of pride for their owners and a source of motivation for other producers and the community.

Land, Water & Wool has developed a range of knowledge, resources and practices that will enable woolgrowers to implement sustainable practices and develop profitable wool enterprises into the future.

AWI will continue to invest in projects that develop profitable wool enterprises while improving the natural resource base, and will ensure that the industry's commitment to sound environmental management is demonstrated to the community. Land, Water & Wool knowledge provides the basis for a number of AWI initiatives.

EverGraze and Grain & Graze aim to develop new farming systems that are more profitable and improve the natural resource base in the high-rainfall and sheep/wheat zones respectively. By increasing the proportion of perennials in the landscape, applying appropriate grazing management, or improving the pasture phase in cropping rotations, EverGraze aims to improve profitability and regionally relevant natural resource management outcomes.

Grain & Graze will increase business profitability through integration of cropping and grazing enterprises, while improving resource outcomes on-farm. These projects will work closely with producers to deliver outcomes that are relevant, practical and achievable on-farm.

AWI will invest to deliver knowledge, tools, practices and other resources direct to producers that can be implemented immediately to deliver profitable and sustainable businesses.

A joint investment with Meat & Livestock Australia (MLA), 'Making More from Sheep' is a soon-to-be-released package of information and learning activities designed to help sheep producers lift the productivity, profitability and sustainability of their sheep enterprise. The package details critical procedures that are considered the baseline of best-practice sheep and wool businesses. The package contains modules on aspects of farm management covering business and people, pastures, soils, resource protection and sheep management.

Land, Water & Wool knowledge, resources, products and practices will also be delivered direct to end-users, such as producers and regional NRM agencies, to achieve awareness, uptake and implementation of Land, Water & Wool-recommended knowledge.

Looking further along the pipeline, there is growing awareness and concern about environmental management issues. AWI and MLA have co-invested with the Department of Agriculture, Forestry and Fisheries to develop and trial an environmental-assurance platform for the grazing industries. 'Landleader' seeks to establish a framework that incorporates voluntary demonstration of best practices and a system for accounting for the chemical residue, animal welfare and environmental credentials of Australian wool, and for communicating these credentials to customers.

Landleader aims to help wool producers and the wool industry demonstrate environmental stewardship and high animal-welfare standards to domestic and international markets to secure the future prosperity of the wool industry and the natural resource base on which it depends.

More information: Geoff Saul, National EverGraze coordinator, 0419 328 590, geoffsaul@bigpond.com; Richard Price, national operations coordinator, Grain & Graze, 02 6295 6300, richard.price@kiri-ganai.com.au; Mary Goodacre, project manager, Making More from Sheep, 02 6859 2591, marygoodacre@woolinnovation.com; Russell Pattinson, coordinator, Landleader, 03 5429 1868, 0419 872 684, miracledog@bigpond.com

Tree planting in spring 2006 at 'Raywood', Coolamon, NSW, a Grain & Graze focus farm.

LAND, WATER & WOOL
HOW TO GET INVOLVED

Land, Water & Wool has developed more than 60 research-based practical information products, including fact sheets, case studies, technical manuals, guidelines and websites.

Below is a snapshot of some of the products currently available.

For further information, or to find out more about productive natural resource management research for your farm, go to our website www.landwaterwool.gov.au.

LAND, WATER & WOOL PROGRAM PUBLICATIONS:

Land, Water & Wool: Managing for Sustainable Profit Research outcomes from Land, Water & Wool targeting woolgrowers and their advisers.

The report pulls together management actions for improved environmental performance and whole-farm profitability, numerous grower case studies and a summary of national and regional research findings. *Land, Water & Wool: Managing for Sustainable Profit* also includes a comprehensive product directory listing all information resources currently available from Land, Water & Wool.

LAND, WATER & WOOL SUB-PROGRAM RESOURCES:

Sustainable Grazing on Saline Lands

- SALTdeck – saltland plant species identification cards
- *Saltland pastures in Australia: a practical guide*
- *Insights: case studies on how farmers are successfully managing saltland for profit and sustainability*

Managing Climate Variability

- *Betting on rain: managing seasonal risk in western NSW*
- *Climate risk seasonal outlook pocket guide for wool producers in the pastoral rangelands of SA*
- *Conversations about climate: seasonal variability and graziers' decisions in the eastern rangelands*
- Land, Water & Wool climate website Queensland – www2.dpi.qld.gov.au/climate/14793.html
- 'Land, Water & Wool Drafting Gate' online information and decision support tool – www.landwaterwool.gov.au

River Management and Water Quality

- *Are my waterways in good condition: a checklist for assessing river, stream and creek health*
- *Managing rivers, streams and creeks: a woolgrower's guide*
- *Wool industry river management guide: high-rainfall and wheat/sheep zones*
- *Rapid appraisal of riparian conditions* – technical guides
- *Managing gullies on wool-producing farms*
- *Managing in-stream wetlands on wool-producing farms*

Native Vegetation and Biodiversity

- *Insights: case studies on how woolgrowers are successfully managing native vegetation and biodiversity for profit and sustainability*
- *Tasmanian native pasture guidelines*
- *How to make money out of grass (SA)*
- Farm Business and Biodiversity *Barking up the right tree* – brochure and extension notes
- *Quickchecks: natural resource management monitoring tools for woolgrowers*
- Land, Water & Wool Northern Tablelands project fact sheets

Managing Pastoral Country

- *Insights: case studies on how woolgrowers are successfully managing pastoral country for profit and sustainability*
- *Critical decisions on stocking rate* – instruction and decision-support manual
- *ABCD pasture condition guide for mulga and Mitchell grass regions*
- *Mulga as a feed source* – fact sheet
- *Mitchell grass recovery* – drought information kit

Future Woolscapes

- *What might the world and the wool industry look like in 2030?* – summary report
- Future Woolscapes – commissioned research papers

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