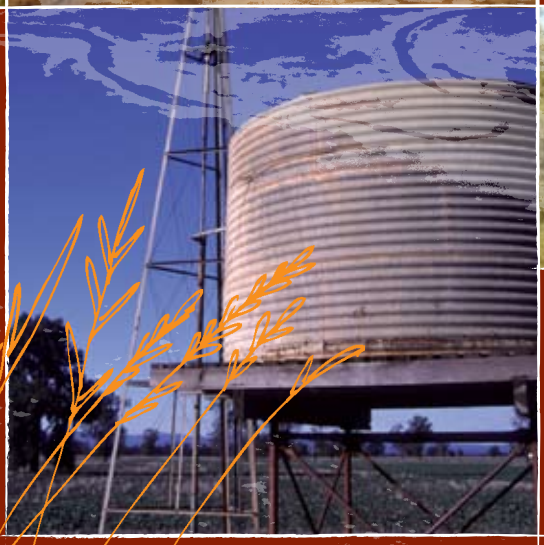
Australian Government
Land & Water Australia

# partnering with rural industries for sustainable production



# Foreword

Land & Water Australia has been investing in research and development for sustainable production and natural resource management for more than 15 years. Along with other rural research and development corporations (RDCs), Land & Water Australia was established in 1990 under an Act of the Australian Parliament. Since these early days, it has had a strong emphasis on collaboration with agricultural industries.

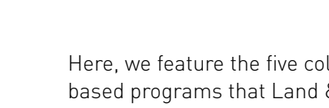
Our mandate is to buy, broker and manage research aimed at the productive and sustainable management of the land, water and vegetation resources underpinning Australia's primary industries and regional communities.

We cannot achieve this brief by working in isolation, and so, collaboration is a primary element of our investment approach. The rural RDCs have been particularly important collaborators, providing a link to Australia's commodity producers who are managing much of our land, water and vegetation resources.

Here, we feature the five collaborative industry-based programs that Land & Water Australia manages under its Industries Arena. These programs bring together investment from the rural RDCs, the Australian and state governments, and private companies. They create a direct connection between research and on-farm application, with many of the programs working directly with farmers to tap into their wealth of experience.

This collaborative approach to issues that cross the boundaries of commodity, industry, region, production and natural resource management has delivered long-term returns to industry and government. Significant improvements in understanding and practice have been made on issues such as sustainable irrigation, climate variability, farming systems, salinity and riparian management. Ongoing investment through collaborative approaches will enable Land & Water Australia to continue to play its role in securing a sustainable future for our rural industries.

Collaboration does not occur without considerable goodwill and the shared vision and commitment of our partners. On behalf of Land & Water Australia, I wish to emphasise our appreciation and acknowledgement of the substantial investment made by all partners in our collaborative programs.



Bobbie Brazil
*Chair of Land & Water Australia*



# Land & Water Australia

Land & Water Australia is a national research and development organisation dedicated to promoting and supporting sustainable agriculture.

**VISION**

The sustainable use and management of natural resources for the benefit of primary industries and the Australian community.

**OUTCOME**

Knowledge, understanding and informed debate to inspire innovation and action in sustainable natural resource management.

**MISSION**

To invest in knowledge, partnerships, innovation and adoption to underpin sustainable natural resource management.

**OBJECTIVES**

1. Generate new knowledge useful to the sustainable management and use of Australia's natural resources.
2. Develop productive partnerships and undertake strategic analyses to support improved R&D investment in natural resource managment.
3. Improve adoption of the outputs of R&D

**STRATEGY 1** Research Investment

**STRATEGY 2** Collaboration & Strategic Analysis

**STRATEGY 3** Knowledge into Practice

**CORPORATE ENABLING FUNCTIONS**

Our core business is investing in research to gain knowledge for managing Australian landscapes. We act as a leading research broker, coordinator and collaborator in natural resource management.

We work to increase knowledge and understanding, and to inform debate. We want to inspire innovation and action in sustainably managing our natural resources.

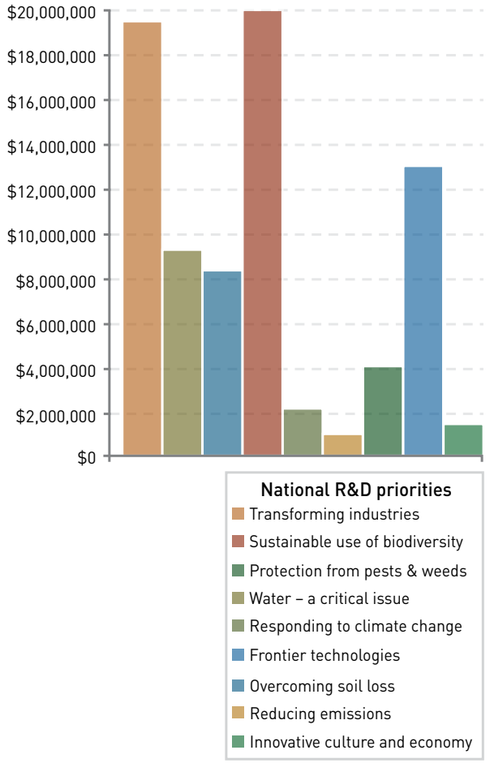
We have a national mandate that is not constrained by any particular commodity, region, discipline or research provider. Our research investment ranges across biophysical and social sciences.

We actively build and maintain collaborative partnerships with industry, government and communities to ensure that our research portfolio is relevant, produces useable results and avoids duplication. Most of our research is conducted within national research programs, supported jointly by several partner organisations. These programs bring resource managers and researchers together to identify priorities and implement research findings.

Land & Water Australia is one of 14 rural Research and Development Corporations (RDCs) within the Australian Government's Agriculture, Fisheries and Forestry portfolio.

The rural RDC model encourages the inclusion of natural resource management issues with production issues to ensure that profitable and environmentally sustainable management practices are adopted. Each RDC invests in high priority issues for its commodity and in collaborative efforts that address generic issues.

*RDC spend on natural resource management 2004-05*




# Rural Research and Development Corporations working together

The RDCs' Natural Resource Management Working Group was established in 2004. It created a forum that has enabled the RDCs to establish a consistent approach to reporting on their investment in natural resource management.

The Working Group has designed a common reporting framework that allows the RDCs to analyse and rank their investments in natural resource management against the National Research Priorities. The framework also enables the RDCs to plan strategically for investments in the future.

The Working Group also helps to identify opportunities for collaboration in natural resource management across the RDCs. It reports regularly to the Rural Research and Development Chairs Committee and the Australian Government.

## Farmers raising the bar on sustainability

The SAGE Farmers Group is an independent initiative of Land & Water Australia. Its objective is to work with a small group of leading farmers from a range of agricultural enterprises to:

1. expose elite Australian farmers from different sectors to ways other farmers operate their business
2. identify and assess benchmarks (financial, environmental and social) that elite farmers use or would like to use, and who they benchmark themselves against
3. understand how elite farmers define sustainable agriculture
4. gauge the potential to develop tools that assess farm-scale sustainability, irrespective of enterprise
5. obtain leading farmers' perspectives on current research and development in Australian agriculture and identify research opportunities

# Partnering with rural industries for sustainable production

More than 60 per cent of the Australian continent is managed by farming and grazing industries. Farmers are under continuous pressure to find productivity gains and maintain business viability. Coupled with this are natural resource management issues such as dryland salinity, nutrient loss, soil acidification, biodiversity loss, climate variability and change, and competition for water resources.

Land & Water Australia (LWA) has been investing in research and development for production and natural resource management outcomes for more than15 years, maintaining a strong emphasis on collaboration with agricultural industries.

LWA's core source of funding is the Australian Government Department of Agriculture, Fisheries and Forestry which provides $12.5 million per year. LWA manages additional investment of approximately $20 million per year through collaborations with other RDCs, the Australian Government, state agencies and private organisations.

The commodity RDCs are important partners to LWA—without their support most of the work featured here could not occur. Their investment and active participation in these programs provides strategic direction on industry priorities and links to Australia's commodity producers.

The five programs presented here look at current high priority issues for agricultural industries. Two of the programs—Grain & Graze and Land, Water & Wool—are investigating production and natural resource management issues from a commodity base. The others—Sustainable Irrigation, Managing Climate Variability, and Healthy Soils—are tackling significant sustainability issues that affect all agricultural industries.

These programs build on a history of similar programs managed by LWA, such as the National Dryland Salinity Program, established in 1992. This program delivered a better understanding of the scale of Australia's salinity problem and the sorts of solutions required. A cost-benefit analysis estimates that the benefits of the program over the next 25 years are likely to be approximately $297 million for an investment of $111 million—a return on investment of 2.7 to one.

# Grain & Graze

Grain & Graze is a unique collaboration of the Grains Research and Development Corporation, Meat & Livestock Australia, Australian Wool Innovation Limited, and Land & Water Australia. Seeking productivity and environmental gains on mixed farms, the program is working across nine regions in Australia with 13 catchment management authorities, a large number of producer and landcare groups and major research providers.

Photo: courtesy Stock & Land

## Practical research boosts productivity

*David Jamieson and his father Richard manage a 1550 ha mixed-enterprise farm, Bolac Plains, at Woorndoo in western Victoria. Bolac Plains was a commercial wool production farm until the wool market slide. 'Wool production on its own was just not sustainable with the sheep we were running', says David. 'So instead of buying another flock we got straight into improving the pasture and cropping enterprises.'*

*Over time, the changes made at Bolac Plains—improved pastures, raised beds, stubble management—have bolstered stocking rates and lifted average Merino ewe weights. But there's still room for improvement and David is hoping that Grain & Graze will deliver the practical research he needs to boost productivity.*

*'Through Grain & Graze I'll improve the precision of my animal systems, and if I can emulate the precision and business principles used by the dairy industry in my livestock system, it would be phenomenal.'*

Focusing on mixed farming systems through on-farm profitability and sustainability, catchment health, producer well-being and risk management, the program breaks new ground in giving farmers what they want—an integrated approach to whole-farm management.

The program engages participants in a learning model based on awareness, trialling ideas and refining these through adoption. Regional projects are supported by cross-region research (social, economic, biodiversity) that increases the relevance, diversity and rigour of information that producers receive.

## Objectives

Grain & Graze has three targets:

1. a 10 per cent increase in mixed farm profitability, driven by a 5 per cent increase in grain yields and a 10 per cent increase in livestock production
2. improved condition of natural resources on mixed farms in line with regional or catchment targets
3. confident and knowledgeable mixed farmers making decisions and using tools that sustain production and promote biodiversity

## Farmers trial new ideas in southwest Victoria

*The Corangamite/Glenelg-Hopkins region of southwest Victoria is the site of a project that is addressing some of the common problems encountered by producers combining cropping and livestock. The project is looking at managing stubble with grazing instead of burning, without affecting crop yields; using lucerne in crop rotations; and using integrated pest management to manage pests with beneficial insects.*

## BiGG biodiversity goals

*Biodiversity in Grain & Graze (BiGG) is one of four cross-region projects within the program. It is investigating the extent to which on-farm biodiversity is influenced by site conditions and management practices and examining how biodiversity supports farm production.*

*The research team is collecting data from 43 farms by trapping invertebrates, bird-watching and testing soil conditions.*

*'This project aims to answer some important questions', says project coordinator Dr Kerry Bridle. These include:*

- *Will the diversity of enterprises lead to increased biodiversity?*
- *Can farming enterprises be managed to enhance ecosystem services and profitability?*
- *Is there a relationship between paddock management, biodiversity and profit outcomes?*

## Achievements – a snapshot

**Producers get on board**

More than 2,500 producers are involved, with many more aware of Grain & Graze nationally. Forty-three farmers are involved in an on-farm biodiversity study.

**Partnerships**

More than 65 organisations and agencies are participating, with interests across industry, catchment, farming and government.

**New knowledge**

Profitable winter wheat grazing systems and integrated pest management systems have been refined to the point where adoption is occurring. The program has identified the social and economic drivers and constraints to improved mixed farming practices across the nine Grain & Graze regions.

**Collaboration**

Insights into establishing and maintaining complex partnerships and working across diverse cultures have been gained. The keys to success are shared objectives, constant communication, and preparedness to take into account alternative perspectives.

## Partners

The program partners are Grains Research and Development Corporation, Meat & Livestock Australia, Australian Wool Innovation Limited, and Land & Water Australia. Together, they have invested $14.5 million over five years, with substantial co-investment coming from regional bodies.

Regional projects are located in Avon (Western Australia), Border Rivers (Queensland and New South Wales), Central West/Lachlan (New South Wales), Corangamite/Glenelg-Hopkins (Victoria), Eyre Peninsula (South Australia), Mallee (New South Wales, South Australia, Victoria), Northern Agricultural Region (Western Australia), Murrumbidgee (New South Wales), and Maranoa/Balonne (Queensland).

# Land, Water & Wool

Land, Water & Wool is a strategic investment by Australian Wool Innovation Limited, in collaboration with Land & Water Australia. It is the most comprehensive production and natural resource management research and development program ever undertaken by the Australian wool industry.


## Making saltland pay

*Michael and Margaret Lloyd from Lake Grace in Western Australia began to notice the effects of salinity on 'Bundilla' in the mid-1970s. Within 15 years, the arable area on the property reduced from 1800 ha to 1000 ha. Something had to be done.*

*Thirteen years later, nearly 600 ha have been planted to salt-tolerant pastures (saltbush) and valuable understorey pasture species. At $52/ha, the annual benefit from treating the saline area has easily covered the cost of establishing the saltbush and is delivering a 300 per cent increase in gross margin. 'Bundilla' now hosts one of Land, Water & Wool's national experiment research sites.*

*'Salinity will remain part of the landscape—we've got to find more productive and sustainable ways to use saltland', says Michael.*

Australia's 35,000 woolgrowers manage more than 85 million hectares of the Australian landscape. Stretching from the high rainfall coastal areas to the saltbush and mulga lands of the pastoral zone, this landscape includes native pastures, bush, wetlands and waterways.

Wool continues to be one of Australia's major export industries, supplying the majority of the world's fine apparel wool and 27 per cent of the world's greasy wool (2004-05) valued at $2.5 billion.

As part of its strategy for securing the long-term viability of wool production, Australian Wool Innovation Limited is tackling environmental issues. This approach improves on-farm profitability and is critical to securing the 'clean-green' reputation of the wool industry in the international marketplace.

## Objectives

Land, Water & Wool is tackling key natural resource management issues through the following sub-programs:

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



## Achievements – a snapshot

**Productive options for salt-affected land**

Salt-affected land is highly variable across Australia due to the interaction of the amount of salt, the extent of waterlogging and the soil type. Land, Water & Wool has identified productive options for approximately half of the salt-affected land in Australia. These include salt-tolerant plants for fodder and new management regimes. More than 120 farmer groups have been supported to test options.

**Grazing sheep and threatened species co-exist**

Research in Tasmania shows that a high diversity of native plant species, including threatened and declining species, can be maintained on-farm along with grazing sheep. Threatened native species such as grassland paper daisy and grassland cupflower were commonly found on well-managed sheep properties.
The sheep grazing regime is thought to be assisting the persistence of some threatened species.

**New climate information products**

Exploring the reliability of seasonal forecasts with woolgrowers in the pastoral zone (excluding Western Australia) has resulted in a range of new climate-related information products, including websites and reference guides tailored to specific wool growing regions.


## Calculating wool profits from biodiversity

*Woolgrowers Rob and Lucy Adams have two farms jointly covering 1335 ha near Armidale, New South Wales. The properties include a 250 ha timbered wildlife refuge, 60 ha of forest and 1200 ha of native pastures. They are just two of 16 properties in the Northern Tablelands that Land, Water & Wool researchers are studying to see how woolgrowers' management decisions affect production and environmental values.*

*'When we hand it on, we want our country to be in as good or better shape as when we took it over, and in the meantime we want to have a reasonable lifestyle', says Rob. 'In the short-term, we hope to get answers to some outstanding questions, like which pastures give us the best return and the most sustainability, and what's the best way to graze our stock.'*

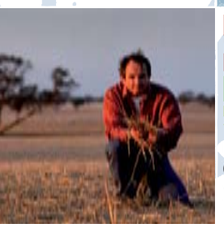
## Future directions

Through the unique Future Woolscapes project, the wool industry has looked at what the future might hold. The project used a scenario planning process to examine the factors that may influence industry success and to foresee risks and opportunities. It found that:

- sustainable resource use and animal welfare will become increasingly important for society, consumers and governments
- there may be significant relocation of wool production, especially into less arable areas

## Partners

Land, Water & Wool is a five-year collaboration between Australian Wool Innovation Limited and LWA. Meat & Livestock Australia and the Cooperative Research Centre for Plant-Based Management of Dryland Salinity have been significant investors, along with many other organisations, agencies and woolgrower groups. Australian Wool Innovation Limited has invested $20 million, with a further $18 million of co-investment in sub-programs and projects. This funding is underpinned by LWA's substantial natural resource management portfolio.



# Managing Climate Variability

Australia is the world's driest inhabited continent and has the most variable climate. It is a land of extremes—of droughts and flooding rains. Climate change is expected to have an increasing impact on Australia's agriculture and natural resources.


## 'Prophetable' cropping using seasonal climate forecasts

*Most input costs for wheat, barley and sorghum are incurred upfront at seeding—the time of the year when seasonal forecasts are not as accurate or timely as they could be. The Birchip Cropping Group in the Wimmera-Mallee region of Victoria provides farmers with a commercial service that aims to take some of the guess work out of cropping.*

*Using Yield Prophet®, a web-based tool developed in conjunction with CSIRO, which provides access to the APSIM cropping systems model, farmers can predict yield, grain protein, currently available water and water stress, and currently available nitrogen and nitrogen stress. Yield Prophet® combines Southern Oscillation Index data and historical data specific to the region with information on crop condition and seasonal outlook to make its predictions.*

The Managing Climate Variability program (MCV) is a strategic collaboration of the rural Research and Development Corporations and the Australian Government Department of Agriculture Fisheries and Forestry. It is supported by the National Farmers' Federation.

The program was established to increase Australia's capacity to capture opportunities and manage risks related to climate variability. It builds on a decade of research by its predecessor, the Climate Variability in Agriculture Program.

Focusing explicitly on decision-making tools for agriculture and natural resource management, a major indicator of success will be an increase in the number of farmers and resource managers who factor seasonal climate forecasts into their management decisions.

## Objectives

1. Improve seasonal forecasting – accuracy, lead-time, and ease of use.
2. Provide tools and services for managing climate risk.
3. Increase adoption of climate risk management.

## Achievements – a snapshot

An external evaluation (2005) of LWA's 10 year investment in climate research and development estimates benefits of $20 million over 25 years for a cost of $10 million (present value). Benefits are expected to grow considerably as farmers gain confidence in the forecasts.

### SOI-based seasonal climate forecasting

MCV has played a critical role in the development of seasonal climate forecasts based on the Southern Oscillation Index (SOI) for agriculture. Connecting scientists with farmers, the program has helped to create a new field of user-focused applied climate science.

### Making forecasts relevant to agriculture

MCV has contributed to the evolution of seasonal climate forecasting by supporting the development and extension of tools that can forecast the impact of climate variability on farm incomes—Australian Rainman, Yield Prophet®, WhopperCropper and AussieGRASS are some examples.

With MCV support, the Climate Risk Management Farmer Association has created a package of tools and services—monthly newsletters, specific forecasts, yield analyses, climate risk workshops—to support management decisions for a variety of industries and regions.

### Taking technology to the people

To realise the benefits of great science, MCV has developed a strategy that puts a human face to climate risk technologies; connects researchers, advisors and land managers; and takes these technologies into new industries and regions.

## Future directions

Farmers and natural resource managers will remain the primary focus of MCV. A new phase of the program, starting in 2007, will continue to focus on climate variability while also including adaptation to climate change.

The program will invest in new science, including exploring the potential of global climate models to reduce seasonal forecasting's dependence on statistical techniques. This work is crucial if forecasting is to incorporate the influence of climate change.

## Partners

MCV is a collaboration of many of the rural RDCs and the Australian Government. Together, they are investing approximately $7.6 million over three years. As a primary investor, the Grains Research and Development Corporation chairs the program.

Partners are: Grains Research and Development Corporation; Dairy Australia; Meat & Livestock Australia; Natural Heritage Trust (Australian Government Department of Agriculture, Fisheries and Forestry); Rural Industries Research and Development Corporation; Sugar Research and Development Corporation; and Land & Water Australia

Australian Wool Innovation Limited's Land, Water & Wool initiative and the National Farmers' Federation are associate partners.

## Mastering the climate

*Since 1980, John Ive and his family have transformed a run-down, salty and bare 250 ha property outside Canberra into a highly productive farm. From the outset, John has applied scientific principles to bring the farm back from the brink of environmental disaster.*

*'One thing I did was develop a daily water balance model to help me understand the biggest determinant of our annual production—rainfall', says John.*

*'The primary inputs for the model are daily rainfall which we record on the property, and temperature and evaporation which we get from the Bureau of Meteorology's website. This gives me a fair idea of how much soil moisture we've got stored and therefore what the pasture growth conditions are like. It also gives me information about the risk of recharge that potentially can add to our salinity situation.'*

DAIRY AUSTRALIA
Delivering for the dairy industry

GRDC
Grains Research & Development Corporation

mla
MEAT & LIVESTOCK AUSTRALIA

Natural Heritage Trust

Australian Government
Department of Agriculture, Fisheries and Forestry
Rural Industries Research and Development Corporation
Sugar Research and Development Corporation
Land & Water Australia

australian wool innovation limited

# National Program for Sustainable Irrigation

The sustainability of irrigation is a key issue for Australian water resource management. Since 1993, Land & Water Australia has been investing in sustainable irrigation research and development. Building on this foundation, the National Program for Sustainable Irrigation (NPSI) was established in 2002.

## Salinity impact on horticulture in the Lower Murray

*NPSI research has identified that horticulture in the Sunraysia and Riverland areas is at greater risk than previously thought from salt accumulation in the root zone.*

*The research shows the leaching fraction required when irrigating to maintain healthy soils and productive plants at the farm level. Thanks to this detailed work, it is also possible to economically assess grower losses across the region under different river salinity scenarios.*

*This information will be of use to policy makers who are investing heavily in salt mitigation works to reduce the salinity levels of both drinking water and irrigation water in the River Murray.*

NPSI focuses research on critical emerging sustainability issues to improve the productivity of irrigated agriculture, protect the environment and maximise community benefits. It works through a unique coalition of 14 investors from the rural RDCs, federal and state governments, and private water companies.

The program has taken a leadership role by investing in critical issues such as water use efficiency, root zone response to precision irrigation and salinity, community engagement processes regarding the future of irrigation in regions, and informing policy on strategic issues such as irrigation in northern Australia.

## Objectives

NPSI aims to substantially improve the environmental performance of irrigated agriculture and horticulture in Australia, while providing long-term economic and social benefits that assure a viable future for irrigators.

## Achievements – a snapshot

**Six to one return on investment expected**

An external evaluation (2005) of LWA's investment in irrigation research and development puts expected benefits flowing from the program at $86 million over the next 25 years, against an initial investment of $15 million—a return of six to one. Benefits include:

- less water used to achieve the same or higher crop and pasture yields, through new technology and better management
- less waste of water through runoff and evaporation
- less leakage of surplus water into groundwater, reducing salinity risk
- more water available for environmental flows by improved water conveyance systems and increased water use efficiency
- less nutrient loss from farms, reducing waterway pollution
- a high level of awareness, interest and enthusiasm across the irrigation industry

**Recycled water for horticulture**

NPSI research has answered many questions about using recycled water for irrigation in horticulture. Working with Victoria's Department of Primary Industries, it has released guides to using recycled water for both growers and policy makers, and developed practical tools for growers.

Although communities are still debating recycled water use, it offers the potential to increase the security of supply and reduce pressure on drinking water supplies.

**Northern irrigation futures**

NPSI has been instrumental in establishing the North Australia Irrigation Futures project, gaining 'buy-in' from the Australian Government and state governments in Queensland, the Northern Territory, and Western Australia.

The project aims to ensure that environmental issues form the basis of a framework for decision makers considering issues that have a bearing on the future of irrigation in northern Australia.

## Future directions

The next phase of NPSI, starting in 2006, addresses:

- the impact of irrigation-related issues on plant productivity for specific climate areas and commodities
- the ecological information needed to inform policy affecting irrigation development
- making research useable to ensure adoption of better irrigation management
- designing sustainable futures that meet community and irrigator needs

## Partners

The program's 14 funding partners have invested approximately $9.5 million over three years. There are also substantial in-kind commitments at the project level.

Partners are: Natural Heritage Trust (Australian Government Department of Agriculture, Fisheries and Forestry); Land & Water Australia; Department of Natural Resources, Mines and Water, Queensland; Department of Primary Industries and Resources, South Australia; Department of Environment, Western Australia; Department of Agriculture and Food, Western Australia; Cotton Research and Development Corporation; Horticulture Australia; Goulburn-Murray Water, Victoria; Harvey Water, Western Australia; Lower Murray Water, Victoria; SunWater, Queensland; Grampians Wimmera Mallee Water, Victoria; and Ord Irrigation Cooperative, Western Australia.

## Benefits of centre pivot irrigation system

*Dale Hanks' dairy farm in the Harvey Irrigation Area of Western Australia was used by NPSI to demonstrate the benefits of centre pivot irrigation compared to surface or flood irrigation. The demonstration is helping to resolve regional water and salinity issues.*

*Over two seasons, the centre pivot system used 29 per cent and 31 per cent less water respectively. Pasture yields were 54 per cent higher in the first season and double that of surface irrigation in the second season. Pasture quality also improved.*

*'Additionally, there was no runoff of water or nutrients from the centre pivot site compared to the surface irrigated site', says Ken Moore, project principal investigator.*

*'The extra pasture production converts into an extra 8,500 litres of milk production, worth about $2,500 per hectare during the demonstration period (2003-04)'.*

*The potential water savings for the region are substantial and the project has won a Western Australia environment award.*

*Harvey dairy farmer Dale Hanks, with daughter Taylah, checks soil moisture levels on his farm*

# Healthy Soils for Sustainable Farms

Healthy soils are the engine room of sustainable, productive farms. They maintain environmental health and assist in managing water quality. The Healthy Soils for Sustainable Farms programme is a partnership between the Natural Heritage Trust through the Department of Agriculture, Fisheries and Forestry, the Grains Research and Development Corporation and Land & Water Australia.

On-farm experience and research results show that rapid improvements in soil structure, organic content and nutrient performance are possible by changing management practices. The next wave of productivity gains could come from the soil itself.

Healthy Soils for Sustainable Farms is a new programme that aims to build on previous investment in soil health. It brings together leading researchers and farmers to share their knowledge and develop innovative ways to extend that experience out to the wider farming community.

Taking a national approach that links industries and regions, the programme is helping the adoption of a more coordinated, concerted and cost-effective approach to improving soil health.

The programme will develop courses and soil health packages that capture the latest in soil health knowledge. Tailor-made for farmers, these resources will be tested and demonstrated on commercial farms to ensure they are relevant to particular regions and commodities. Farm advisers will also be targeted.

## Objectives

Healthy Soils for Sustainable Farms aims to increase the number of farmers who understand how to manage for improved soil health, how to implement practices to improve soil health and productivity, and how to monitor soil conditions on their farms.



## Monitoring soil health in Western Australia's wheat belt

*Soil health problems can be biological (for example, diseases or nematode infestations), physical (compaction) or chemical (pH levels).*

*Researcher Dr Daniel Murphy is sampling properties across the Western Australia wheat belt to build baseline data for future soil health monitoring.*

*'We want to help farmers identify types of soil health problems that constrain production', explains Dr Murphy. 'We're identifying a set of indicators to help them come up with relevant and economically viable solutions that avoid or improve soil health problems.*

*'The farmers we'll be working with are very enthusiastic about being involved, especially as the work focuses on the areas of their farms that are showing low productivity.'*

*'I'm interested to see the impact that the suggested perennial planting will bring in changing the landscape', says Gary Butcher. Gary, his wife Kerry and their son James run their property 'Elena' in the Pithara region of Western Australia.*

*'It's great to see how we can put semi-saline land to good use. We're going to plant saltbush and caliph in those areas, which our sheep can graze on. The plants will keep the water table down and fix nitrogen for the following year's wheat crop.'*

*'I'm looking forward to finding out more efficient ways of doing things and achieving higher yields', explains Harry Hyde from the Damarosehay property in the Dalwallinu region of Western Australia.*

*'I think there are a lot of little changes we can make that can add up to some good gains. The cost squeeze is getting tighter in agriculture so we need to be very aware of the needs of the farm.*

*'By being involved in this research I'll be able to get quick access to information—I won't have to wait for it to come along in a journal somewhere.*

*'Through the programme, the information promises to be organised and translated from research into results—results that tell me what's already being seen, what is actually working to improve soil health, and on what kind of soils these work.'*

Projects fall under four themes:

- local best management practices
- the relationship between soil health, productivity and profit
- the consequences for the broader environment (for example, runoff, dust, greenhouse gas emissions and carbon sequestration)
- the consequences of variability in climate and commodity prices

## Partners

Healthy Soils for Sustainable Farms is managed by Land & Water Australia. The Natural Heritage Trust (Australian Government Department of Agriculture, Fisheries and Forestry) and the Grains Research and Development Corporation (GRDC) are funding partners. The GRDC brings to the programme its body of knowledge in soil health and biology. Other RDCs, state agencies and research organisations invest substantially at the project level.

## Improving the soil – from your ute!

*Vegetable growers across Australia will have access to a portable free guide to managing soil health. The guide will show growers how to put in place practices to maintain and restore soil health, sustainability and productivity.*

*The guide will then be teamed with a training course to help with the technical aspects of soil management and the wider environmental issues.*

## Land & Water Australia's Sustainable Primary Industries Arena

## Delivering production and environmental outcomes for agriculture

### Partnership programs

Grain & Graze
www.grainandgraze.com.au

Land, Water & Wool
www.landwaterwool.gov.au

Managing Climate Variability
www.managingclimate.gov.au

National Program for Sustainable Irrigation
www.npsi.gov.au

Healthy Soils for Sustainable Farms
www.lwa.gov.au

### Contact

Ms Anwen Lovett

*Manager, Sustainable Primary Industries*

anwen.lovett@lwa.gov.au

Land & Water Australia

GPO Box 2182 Canberra ACT 2601

Level 1 Phoenix Building

86 Northbourne Avenue

Braddon ACT 2612

Ph: +61 2 6263 6000

Fax: +61 2 6263 6099

Email: Land&WaterAustralia@lwa.gov.au

**www.lwa.gov.au**

**Printed on a waterless press using environmentally responsible print techniques and sustainable paper stock supported by a fully certified ISO 14001 environmental standard.**

**Paperstock: Revive Silk**

recycled

australian made

**Publication coordination: Econnect Communication**

**Design: See-Saw Illustration and Design**

**Product code: PK061173**

**ISBN: 1 921253 09 6**