

Meat industry signs on to the salinity challenge



Meat and livestock producers across Australia now have access to the latest baseline data, new technologies and practical solutions for managing dryland salinity, following confirmation of Meat and Livestock Australia (MLA) as the newest partner in the National Dryland Salinity Program (NDSP).

MLA provides services to Australia's livestock producers and offers support to the cattle, sheep and goat industries in strategic planning. The grower-owned company also provides services to other industry sectors, such as meat processors and live animal exporters.

As a partner in the Program, MLA now supports the best science, research and development currently available nationally for understanding and managing the dryland salinity risk to our land and water resources.

MLA Commercialisation and Delivery Program Manager, Dr Ben Russell, will represent the organisation on the NDSP Board of Management, while MLA's Feedbase and Natural Resource Management Project Manager, Cameron Allen, has been appointed to the NDSP Operations Committee.

Dr Russell said one of MLA's key missions is to help the industry enhance the natural resource base.

"Creating, and making available, the tools and information that will enable producers to improve their enterprise and sustainability of the industry as a whole is a priority for MLA," he said.

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Salinity training begins in the Sunshine State



Queensland Department of Natural Resources and Mines Senior Hydrologist, Bruce Pearce, Senior Land Resources Officer Bruce Forster and Hydrologist Justin Lane prepare salinity training near Rockhampton.

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“MLA has an ongoing commitment to improving the social, environmental and economic performance of the meat industry through research and development and the formation of sound partnerships with industry.

“The NDSP has had close ties to MLA programs in the past, including the Sustainable Grazing Systems program. Being a part of the NDSP will cement these existing relations and connections to this Program and others that MLA supports.”

Dr Russell said as part of its commitment to innovative dryland salinity research and development, MLA will invest \$1.5 million over five years into the NDSP-managed Sustainable Grazing from Saline Land (SGSL) initiative.

The new partnership follows the commitment to targeted research by the wool industry and Australian Wool Innovation Limited (AWI) through the NDSP-managed SGSL project late last



Dr Ben Russell will represent Meat and Livestock Australia on the NDSP Management Board.

year. SGSL is part of the wider Land, Water and Wool joint venture between AWI and Land & Water Australia.

In welcoming MLA to the Program, NDSP National Manager Richard Price said the new partnership provided the livestock industry with direct access to significant work currently being undertaken to help develop the most

appropriate management decisions and solutions for dryland salinity.

“Dryland salinity management must be planned at both a local and catchment scale and implemented at the landscape, regional, farm and paddock scale as appropriate,” said Mr Price.

Mr Price said through the NDSP, people involved in land and water resource management were recognising that innovative solutions to salinity will come from a combination of increased and strategic use of perennial plant species, new management systems, productive use of saline land and water and engineering options.

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PUR\$L delegates to see the salt face



The Eighth National PUR\$L Conference, to be held in Western Australia this September, will combine sessions in Fremantle, the historic port city for Perth, field trips showing problems and solutions, and a workshop at Katanning, one of the State's most salt-affected rural towns.

PUR\$L or 'Productive Use and Rehabilitation of Saline Lands' will begin with a welcome reception on Monday evening, 16 September and continue to Friday 20 September. It will be possible to attend the whole conference or just individual sessions.

Australia's National Dryland Salinity Program, and the Co-operative Research Centre for Plant-Based Management of Dryland Salinity, are major sponsors of this year's conference.

A range of leading advocates on the themes of pastures, environment and new industries will speak on the first day.

Wesfarmers chairman Harry Perkins will lead the debate on the second day.

An updated edition of 'Saltland Pastures in Australia - a Practical Guide' by Ed Barrett-Lennard, which aims to provide farmers with information and guidance for the productive use of saline land for grazing across Australia, will also be launched during the conference.



Plans for the new national Sustainable Grazing from Saline Land project will also be unveiled.

Optional field trips on 19 September will convey delegates south from Fremantle to Kojonup via a choice of routes and

themes. A western route will showcase use of salt-tolerant pasture in farming systems or a more easterly route will pass through cropping country.

Other choices include a tour that will cover oil mallees, community drainage schemes and the search for profitable new native plants.

Delegates will spend the Friday at a workshop in Katanning, arguably WA's salt problem capital.

Full details of the program, including costs, are available from the conference web-site at <http://www.promaco.com.au/conference/2002/pursl/index.htm>

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Western Australian farmer Garry English has won the prestigious 2001 McKell Medal in recognition of his landmark property management philosophies and his contribution to natural resource management.

The McKell Medal commemorates the contribution of Sir William McKell, a former NSW Premier and Governor-General, to soil and land conservation.

Announcing the award prior to the ceremony, Federal Minister for Agriculture, Fisheries and Forestry, Hon Warren Truss MP, commented on Garry English's huge achievements.

"In partnership with his wife Jan, Mr English has built a profitable, mixed cropping business on previously degraded land at their property near Gibson while managing to protect, and even enhance, the fragile vegetation and wetlands of the Esperance sandplain," said Mr Truss.

"He pioneered the use of 'alley' farming in Australia in the 1980s using wide-spaced belts of trees to create



2001 McKell Medal winner Garry English (left) with 2000 winner, South Australia's John Berger.

windbreaks to help control erosion and manage rising water tables, give shelter to stock and crops, and provide a potential timber crop to harvest.

"Mr English has also developed direct seeding of native vegetation species, trialed perennial fodder shrubs, grown an oil mallee plantation to control salinity and produce future carbon credits, and made commercial use of an

Australian wildflower growing on a part of his property formerly considered to be wasteland.

"For nearly 20 years, his property has been a site for scientific trials and monitoring and, with nationwide interest in his work, he has adopted an 'open door' approach to visits from economists, school students, community groups, dignitaries and foreign delegations."

More Focus, more often

The frequency of *Focus on Salt* newsletter has increased to four, quarterly editions in 2002. Due to sustained interest in the work of the National Dryland Salinity Program (NDSP) and its partners, the circulation of *Focus on Salt* has also expanded to include a number of new and diverse subscribers in recent months.

Improving access and frequency to the activities of the NDSP through *Focus on Salt* will ensure all subscribers are up-to-date with Australia's lead knowledge broker for dryland salinity research, development and extension efforts to combat the risk of dryland salinity to our land and water resources.

The NDSP also has a new-look **web-site** to improve on-line access to baseline data, new technologies and practical solutions for dryland salinity.

The improved NDSP web-site has a powerful search engine, easier access to NDSP projects and project findings, a bulletin board featuring a comprehensive listing of upcoming events, links to partner sites, newsletters, and other communication products and direct links to major NDSP projects from the front page.

Visit the NDSP on-line at www.ndsp.gov.au





Photo: Mark Warnick

Agency staff undertaking dryland salinity training in Queensland.

Dryland salinity training – an insider’s view

The sight often stops farmers in their tracks...

Thirty official-looking types sitting on logs, stones and on the ground, all writing on thick sheets of paper and all looking intently at the local landscape.

Generally it is at the farmer’s back paddock. A vehicle approaching will stop, with a question from the driver as to what is happening. The answer always goes over very well.

The intent writers are departmental staff involved in real-life dryland salinity training. Its purpose is not only to help them to carry out their natural resource management roles better, but to increase the body of knowledge about salinity, for landowners, special interest groups and the community in general.

Departmental officers across Queensland have been receiving a first-hand look at dryland salinity examples for the past six months - and getting judged on their merits for doing so.

Natural Resource and Mines (NR&M) Queensland Dryland Salinity Training Officer and National Dryland Salinity Program Communications Officer (Qld), Mark Warnick, has been facilitating

training throughout the State with a team of regional and science staff.

“The course is a Level One Dryland Salinity Course and officers receive certification if they successfully complete it,” Mr Warnick said.

Mr Warnick said training modules include:

- Understanding dryland salinity principles and processes;
- Identify and evaluate dryland salinity occurrences and risks in the dominant landscapes in the local region; and
- Demonstrate ability to assess the landscape for protection against increased salinity or waterlogging.

The training team includes senior soil scientists, senior hydrogeologists, natural resource information officers and hydrologists and is facilitated and co-ordinated by a trainer.

The course covers two days with up to eight field sites visited and analysed. There is also a theory segment covering:

- The scientific background and basic processes of dryland salinity;
- Data and information sources; and

- Groundwater flow systems and their applications.



Assessment includes:

- Looking for and noting visual indicators of current salinity;
- Landscape indicators of potential salinity including notations on geology, topography, soil attributes;
- Conductivity test results for surrounding water;
- Examinations of satellite imagery and aerial photos;
- Identification of discharge and recharge areas within the catchment; and
- Identification of principal salinity types operating in the region.

“NR&M is committed to ongoing training and recognises the importance and benefits of training for all sectors involved in dryland salinity,” Mr Warnick said.

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A seminar in Adelaide recently brought agribusiness managers 'up to speed' with the latest knowledge and understanding of the threat posed by dryland salinity in South Australia.

Improving their understanding of the nature and extent of the salinity threat enables investors to better appreciate the risks and also the opportunities associated with salinity. To address this, State program managers from banks and from agribusiness corporations were invited to the high level seminar presented by the South Australian Dryland Salinity Committee.

The program was a collaboration between Primary Industries & Resources SA (PIRSA), Australia's National Dryland Salinity Program (NDSP) and the Murray-Darling Basin Commission (MDBC).

Phil Dyson and Darrel Brewin (NDSP/MDBC 'Tools for Improved Management of Dryland Salinity' project) provided up-to-date information from the National Land and Water Resources Audit on the national extent of salinity, the groundwater trends and the most likely future scenarios.

Glen Walker (PIRSA) then brought the issue 'back home' with a summary of the major South Australian groundwater systems and their predicted response to various management options. Trevor Dooley (PIRSA) then outlined the steps already underway to manage the problem at the catchment scale and the help that is available to farmers and to community groups.

"Knowledge and understanding are essential foundations for sound investment," said South Australian Dryland Salinity Committee chairman, Rob Smyth. "It is in everyone's interest to know the risks rather than to guess.

"Guessing often assumes the worst, and it can be quite wrong to assume that because a farm has some salt it will inevitably get worse and spread," said



Photo: J. Smyth

Seminar success: Chair of the SA Dryland Salinity Committee, Rob Smyth.

Mr Smyth who farms at Cooke Plains in the Upper South East of the State.

"Speakers at the seminar clearly demonstrated that the nature of groundwater systems varies from region to region, and even within regions. As a result, the salinity problem and the way in which it will play out is also highly variable. We need to know this if we are to deal with it effectively."

Those attending the seminar identified as serious consequences for landholders affected by salinity:

- Reduced cash flow;
- Increased maintenance costs;
- Reduced real estate values; and
- Reduced asset equity.

"Knowledge and understanding are essential foundations for sound investment"

This then flows through the rest of the rural community, impacting on businesses that provide goods and services to farmers.

"The National Land and Water Resources Audit has given us a good measure of the extent of salinity and the areas at risk," said Mr Smyth. "But the really good news is that recent research has led to a much better understanding of what we should be doing to best manage salinity and in some cases how to live with it.

"PIRSA has a very well targeted program working with local catchment groups to develop solutions tailored to their specific circumstances. This is well supported by national R&D projects such as the 'Tools' and Catchment Characterisation work that provided valuable input to the seminar."

Along with a better appreciation of the risks, the seminar also introduced the findings of another NDSP project, *Opportunities for the Productive Use of Salinity* (OPUS). Presented by Stephanie Bolt, this session highlighted significant opportunities for agribusiness through enterprises actually based upon salinity.

The audience was also particularly interested in a case study presented by Yorke Peninsula farmer Wolford Parsons. Mr Parsons has pioneered much of the saltland management practices in his region, but like farmers in other salt affected regions, he has never found it easy to persuade banks and other rural lenders that saltland has genuine investment potential.

In the workshop session that followed there were several comments that ignorance of the real opportunities was an issue delegates would be keen to address following the seminar.

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Just occasionally you find yourself at an event that you feel might mark a turning point. While the 'Getting it Right – Guiding Principles for Natural Resource Management in the 21st Century' symposium held in Adelaide during March might not have altered the tilt of the earth's axis, it certainly assembled a stellar cast of eminent researchers to tackle some really big issues.

The challenge for the researchers was to present a set of papers on the principles that should underpin natural resource management planning. These principles should aim to minimise the investment risk in terms of failure to meet objectives and also unintended consequences. This is particularly timely as the nation commits itself to the National Action Plan for Salinity and Water Quality, the Natural Heritage Trust Mark 2 and various other major initiatives.

David Pannell's paper in particular (*'Loving, Losing and Living with our Environment'*) had strong focus on salinity, sending five key messages:

1. When it comes to protecting the environment, love is not enough. It is unrealistic to expect that the efforts of volunteer Landcarers can be sufficient to deal with problems like salinity, which require radical, expensive and large-scale changes in land-use (although for some other issues the approach of supporting volunteers has made important contributions).

2. Money is not enough either, particularly if we spend it unwisely. Within the array of possible investments in salinity,

there is an enormous range in the potential for those investments to be cost-effective. Pannell argues we should target investments in on-ground works very carefully and tightly. Poorly targeted investment will result in much of the money being wasted, or at least missing much better opportunities.

3. Living with some environmental degradation is the best option. Some salinity is technically unavoidable. Particularly where groundwater systems are regional, even large-scale changes to farming practices will not arrest salinisation for decades (or perhaps centuries). The need to prioritise salinity management options (and even decide between salinity and other pressures on the public purse) means that in some cases we should choose to allow salinisation to continue, and develop 'productive' uses for the salinised resources.

4. Prioritise and plan based on good science and economics. There is great spatial variability in the ecological, social and economic values of assets threatened by salinity. Equally, there is huge spatial variability in the responsiveness of groundwater systems to management practices, in the costs of implementing change, in the capacities of people to change and in the unintended consequences of change. Choosing where to target salinity investments therefore requires high quality scientific and economic information about the options. Without this, there is little chance of good decisions being made.

5. Invest in creating innovative new solutions to environmental problems. The argument that 'we know what to do – we just need to make it happen' might be technically correct, but it is not true in a practical sense. The option of introducing existing perennials into the landscape will not happen on a sufficient scale simply because they fail the test of economic viability. However, the current shortage of profitable perennials reflects the low investment in efforts to develop profitable perennials, rather than any theoretical limit to the opportunities.

Another speaker, Neil Barr, took up some of Pannell's issues in his paper *'Social sustainability, triple bottom line, capacity to change, and the future of rural landscapes.'* This paper drew heavily on Barr's National Dryland Salinity Program (NDSP) research project *'Structural Adjustment in Agriculture and*



Photo Courtesy: Stock Journal

Rural sociologist Neil Barr, Victorian Department of Natural Resources and Environment, Bendigo, Victoria and a guest speaker at the 'Getting it Right symposium - Guiding Principles for Natural Resource Management in the 21st Century' - met with Karen Parny, Land Management Program, South Australia.

Barr made the point that the scale of salinity in Australia is such that solutions will only come at considerable social cost. It follows that these solutions will be achieved only slowly. This raises the concern that few of the catchment plans that have emerged in recent years appear to address such critical questions as:

- How will the social and economic structure of the community change if we do nothing?
- How will proposed changes alter the social and economic structure of the community over time?
- Who will benefit and lose from these changes?
- At what rate of implementation will the benefits of our proposed changes justify the difficulty they may cause some sectors of the community?
- Can we agree on a fair way to compensate the losers?

Barr argued that failure to adequately answer these questions will result in community resistance to the type of change needed to move towards sustainable resource management. On the other hand, answering these questions will allow communities to identify what is achievable, and live with what they cannot change.

Regional case studies

Four regional case studies were presented at the 'Getting it Right' symposium. These experiences were drawn upon to further develop tried-and-true practical principles. The extraordinary richness of the case study experiences should make them compulsory reading for aspiring catchment managers. Two of these regions were Focus Catchments in the first phase of the NDSP.

Getting serious about fixing the environment



Andrew Johnson, PIRSA's Program Director, Upper South-East Dryland Salinity & Flood Management Program, provided a background to this regional program that takes in 680,000 hectares in the Upper South-East of South Australia.

Within the region, 250,000 ha are considered currently at risk to dryland salinity – a figure projected to increase substantially. The region supports significant agricultural enterprises, 140,000 ha of native vegetation and a series of wetlands including the Ramsar listed Coorong.

The program has four major components that are integrated to address both agricultural and environmental issues:

- A co-ordinated drainage scheme, addressing both groundwater and surface water;
- Surface water and wetland management;
- Agricultural production, addressing both recharge reduction and saltland agronomy; and
- Revegetation, including conservation of remnant vegetation.

Acknowledging the guiding principles enunciated by other presenters, the following issues that had emerged as important in this program were also cited, including:

- Partnership and persistence in institutions;
- Competing rights of ecosystems;
- Definition of desired ecosystem outcomes – what do we want to achieve?
- Investment principles – balancing social, economic and environmental needs;
- Evolving community knowledge

- Need for a holistic, transparent approach – formal project management; and
- Complexity of implementation and the associated risks.

Johnson stressed that this program, now at a mature stage, has demonstrated the importance of thorough planning, a formalised management approach that is nonetheless adaptable to evolving circumstances, and transparent processes supported by effective communication.

Getting it right in the Liverpool Plains



In 1992, concern for the threat posed by dryland salinity prompted catchment managers to form the Liverpool Plains Land Management Committee (LPLMC) as an umbrella organisation for Landcare groups in the region. At that time, however, few farmers perceived salinity as a significant issue.

Tamworth-based Department of Land and Water Conservation Team Leader (Salinity) Sheila Donaldson articulated the lessons learned from:

The planning phase

- There is value in objective planning undertaken by well directed consultants;
- Planning decisions must be based upon good science; and
- Plan first for biophysical objectives followed by negotiated compromise to accommodate social and economic 'realities'.

The implementation phase

- Devolution of investment funds to the catchment group results in a high level of ownership of the program;
- Prioritise investment on the basis of agreed criteria; and
- Institutional funding criteria tend to mitigate against integrated plans that might otherwise meet multiple objectives.

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David Pannell, challenging as ever at the 'Getting it right' seminar.

- funding;
- Productive relationships with government agencies can yield great dividends; and
 - Participation in the prioritisation, co-ordination and communication of research can add great value to this activity (as demonstrated in the first Phase of the NDSP).

Reflecting on the LPLMC's involvement with the first Phase of the NDSP, Donaldson observed that it might be a mistake to become preoccupied with research too early in the life of the catchment group.

On the one hand, this tends to focus networking activities towards the state and federal level of the research organisations, rather than towards the local. As well, it can be difficult to engage the community in research that tends to deliver outcomes only after lengthy investigation and might raise more questions than it provides answers.

The full set of conference papers, including regional case studies, can be downloaded from the symposium web-site: <http://www.plevin.on.net/GIR>

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Merredin pumping trial achieving aims

By Georgina Wilson

Trial pumping to lower water tables at Merredin in the eastern wheatbelt of Western Australia has been very successful despite technical difficulties, visitors learnt at the official opening of the project in April.

Two production bores, 300 metres apart in the town centre, and each capable of pumping 50 kilolitres per day, have reduced water levels considerably. However, when pumping ceased, as it did on several occasions following pump breakdown, water returned quickly to previous levels.

The pumped groundwater has been piped over four kilometres to two evaporation ponds outside the town for disposal and 17 per cent has been diverted to a pilot desalination plant. This aimed to produce 10 kL/day or 10 tonnes of drinking quality water to supplement town supplies as an offset to the cost of pumping. The 1.2 and 0.5 hectare evaporation ponds have shown no problem in coping with the volume of water.

The Merredin Groundwater Pumping and Desalination Pilot Project has been funded through the State Salinity Council's community grants program and cost \$320,000. It is a first for the State and is due to finish at the end of May. Merredin Shire is trying to obtain extra funding, arguing that the scale and duration have been insufficient to demonstrate the long-term viability of pumping and desalination over a significant proportion of the townsite.

Teething troubles such as pump breakdown and high temperatures from moving water in black poly pipe above the ground have resulted in average yields of only 3.5 kL/day rather than the 10 kL expected. Water had to be held in a tank for cooling overnight to prevent damage to the reverse osmosis desalination unit selected for the trial.

WA Water Corporation's Bruce Abrahams told visitors that the desalinated water was costing \$1.80 to \$2 per unit compared with 90 cents for piping from Mundaring Weir near Perth. Costs included leasing for the desalination plant (\$32,000 for six months) and high power demand. In the next six months much more analysis will be done on both cost effectiveness and quality of the water.

Department of Agriculture hydrologist Rosemary Nott said that levels of copper, aluminium, iron, manganese and iodine in the desalinated water were significantly higher than seawater, so aquaculture prospects were not looking good.

Merredin now has 56 piezometers measuring water levels. Production bores were pumping from about 40 m below the town and one had lowered water by 11 m at 100 m distance, and 1.5 m at 200 m. Reductions from the other bore had been inconsistent with different effects in different directions.

Shire President Martin Morris said pilot projects usually had hiccups and it was there for others to learn from. If the technology can be proven successful, it may be applied to about 20 other WA towns where rising water tables are a concern.

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Sustainable Grazing for Saline Land is part of Land, Water & Wool, an initiative of Australian Wool Innovation with Land & Water Australia. The first research site for this major program on using saline land has been selected in Western Australia, and includes additional funding from Meat & Livestock Australia.

“The research for this project ‘*Profitable and sustainable grazing on saline land*’ will be carried out across two properties, with some treatments on Tony York’s property at Tammin, and some on his neighbour’s farm,” says project leader, David Masters (CSIRO).



Photo: David Masters

“The site will be at least 50 hectares, with 20 ha of established saltbush and another 30 ha of unimproved volunteer pastures in c o m m e n s u r a t e landscape positions. The site will be fenced into five areas of approximately equal size.”

Five areas will be treated:

1. Saltbush pasture - established saltbush pasture with a

- significant woody component (> 20 per cent woody plant cover);
2. Modified saltbush pasture - established saltbush pasture modified at the commencement of the experiment to reduce the woody component and increase the proportion of herbaceous plants of high forage value (< 20 pc woody plant cover);
3. Conventional - sown pasture or modified native grass pasture affected by secondary salinity (volunteer salt-tolerant herbaceous plants, primarily annuals, of low forage value);
4. Newly established Best Management Practice - a conventional plot first established late in Year Two of the project to measure changes in water and materials balance; and
5. New forages - a mosaic of plots of new salt-tolerant annual and herbaceous plants of high forage value, also established late in Year Two.

The experimental measurements are described in detail in the individual protocols that have been developed for:

- Site characterisation;
- Soil, water, salt and nutrient balance across the treatments;
- Performance of pastures and shrubs;
- Performance of grazing sheep;
- Impact and implications for biodiversity; and
- Small plots to assess a whole range of different possibilities.

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New salinity officers for NSW

Five salinity advisory positions within NSW Agriculture have been established to assist in providing landowners with land management strategies for salinity.

NSW Agriculture Minister Richard Amery said the five officers would form part of the ongoing NSW Salinity Strategy, designed to ensure departments such as NSW Agriculture work closely with landowners to tackle salinity problems.

“As frontline salinity experts, these staff will play vital roles alongside the Department of Land and Water Conservation within the State’s Salt Action Teams,” Mr Amery said.

“These officers will have a key role to play in getting salinity information to farmers and rural communities, and assisting in farm management plans.

“They will also work with other NSW Agriculture staff to help them translate salinity research into actions for people working in agriculture.”

Two positions have already been filled at Dubbo and Tamworth to cover the central west and northern regions of the State. Another three positions covering the Murray/Murrumbidgee, Lachlan, and Hunter/coastal regions will be filled in July.

The NSW Agriculture Salinity Advisory Officers’ responsibilities include:

- Working with other agriculture advisers to develop training programs including salinity management;
- Liaising with NSW Farmers Association, Rural Lands Protection Board (RLPB) staff and regional community groups to circulate relevant information on salinity; and
- Encouraging tertiary institutions with courses in agriculture, environmental studies, town planning and natural resource management to address salinity issues in their course content.

Mr Amery said a media officer will also be appointed at Wagga, to help distribute salinity information to the community. This position is jointly funded by NSW Agriculture and the Co-operative Research Centre (CRC) for Plant Based Management of Dryland Salinity.

He said salinity requires a ‘whole of government’ approach to ensure all aspects of the community, including farmers, are involved in the implementation of strategies to combat land degradation.

problem in wheatbelt

By Richard George



Secondary acidification may be an emerging problem in many WA wheatbelt landscapes.

Groundwater in the WA wheatbelt is known to be very saline, often exceeding seawater (6,000 mS/m). Its high acidity has been one impediment to the development of drainage disposal systems such as groundwater pumping and deep open drains.

Groundwater in drains has been measured from pH 9 to 1.5. Extremely acidic waters (<pH 3) are apparently common in the northern and eastern wheatbelt where deep open drainage is becoming a widespread practice.

At a recent forum on acid groundwaters in Perth, presenters discussed likely causes and spatial distribution.

Low pH water appears to be the result of either ferrolysis (ferrous iron to ferric hydroxide) and or the weathering of other sulfide minerals such as pyrite. Drainage either oxidises already susceptible and poorly buffered kaolinitic subsoils, resulting in very low pH flows, or is the direct result of existing low pH groundwater. The meeting determined that acidity and groundwater related issues concerning this process be termed 'secondary acidification.

Discharge of low pH waters may affect receiving bodies and related aquatic ecosystems. At very low pH, aluminium and manganese are released as well as creating the opportunity to leach minerals such as copper, uranium, lead and cadmium from soils. In severe cases, mineral concentrations can form hydraulic barriers that may restrict groundwater discharge or cause seepage.

Treatment options may range from prevention of aeration (drainage), to the addition of lime or other neutralising agents. Future research on the susceptibility of receiving bodies, the role of other ameliorants such as high pH mud from aluminium refineries or carbonates from waste treatment facilities, was briefly discussed.

The meeting concluded that relatively little was known of the geochemical processes operating in wheatbelt subsoil and the susceptibility of ecosystems. Research into groundwater chemistry, related drainage designs and changes in permeability attributed to secondary acidification was needed.

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Fenner conference explores future of agriculture

Agriculture is central to Australia's national identity. It's inextricably woven into our history, economy and society. Our success as an internationally significant food producer stands testament to our ingenuity as we build productive systems in one of the oldest and driest continents on the earth.

We've come a long way, but often this productivity has been at a cost to the environment, and there's much to be done if we're to develop truly ecologically sustainable agriculture. Rising salt, declining biodiversity, pests and climate

change all have the capacity to profoundly influence our nation's agricultural systems and unique natural environment.

It's time to take stock – to reflect on our achievements and failures and to weigh up the opportunities and options for designing appropriate agricultural systems for Australia's future.

The Australian Academy of Sciences' 2002 Fenner Conference on the Environment seeks to bring together representatives from government and natural resources agencies, industry representatives, and the farming

community to share views with policy makers and scientists to discuss the way forward. First and foremost in their discussions will be recognising the ecological constraints within which Australian agriculture must operate if it is to be sustainable.

The conference, titled '*Where to now for Australian Agriculture*' will be held in Canberra from 30 July to 1 August 2002.

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The Dumbleyung Water Management Steering Committee in the southern wheatbelt of Western Australia has been working on an integrated water management strategy since January 2000.

The objective of the strategy is to reduce the impact of salinity, rising water tables and waterlogging.

Despite being a small rural community with a low rating base, the Dumbleyung Shire is a strong supporter of the project providing support wherever possible. It has recently undertaken an Aboriginal sites inventory and is keenly watching aquaculture trials using pink snapper.

Co-ordinator Bev Thurlow from Water and Rivers said the Dumbleyung project has a holistic approach to water management, trying to plan the big picture.

“Too often we jump to tools, without asking ‘What do I want to achieve on my land?’ Focusing on one tool such as a deep drain or trees, is not the answer, particularly in this economic climate,” she said.

Ms Thurlow said one of the key components of the work is to assess the feasibility of an arterial drainage for a catchment that covers nearly 2800 square kilometres – a popular idea although cost-benefit analysis is incomplete. Such a scheme would be required to manage ground and surface water in the catchment.

Three preliminary options have been assessed, one being a three-metre deep arterial drain 272 km long designed to convey floodwater, provide groundwater relief and accept drainage inflow at depth. This would cost about \$16 million plus a five per cent annual maintenance bill for

desilting, stabilisation and revegetation.

Another option is an arterial drainage scheme that combines separated surface and groundwater components. This would involve the construction of a central, leveed deep groundwater drain contained between two surface water structures. Estimated cost is \$10.5 million with annual maintenance of at least 10 pc of construction costs.

The third option is an arterial drain to convey floodwater and groundwater within a surface water channel, which



The Dumbleyung project is using a holistic approach to water management.

involves the augmentation of the natural drainage network within the installation of an open arterial channel with tributary local groundwater drains.

This would be the most simplistic scheme to implement and is estimated at \$7m with annual maintenance at 5 pc of construction costs.

In all options, the biggest item is the excavation that would cost \$1.50 per cubic metre. Other ‘big ticket’ items include construction of culverts, road and railway crossings, fencing and

project management.

Downstream impacts are an important part of the project and a number of studies are being undertaken to explore them. Issues such as net impact on downstream nature reserves, erosion, siltation, salt loads, nutrients and flooding are being assessed.

The Department of Conservation and Land Management’s methodology for assessing downstream impact of drainage on nature reserves will also be used.

Demonstration sites for deep drains, arterial drainage and groundwater pumping to test effectiveness in reducing risk of continual road subsidence, are planned for installation by early spring.

While some observers are wondering why it is taking so long, project co-ordinator Bev Thurlow of the Water and Rivers Commission believes it is justified and sees valuable lessons for other similar communities.

Ms Thurlow said bringing together all aspects of an integrated water management strategy was a complicated business.

“A strategy should provide a framework for those that own, plan or manage land and water in the sub-basin to operate within,” she said. “It needs to be flexible enough to provide individual choice and definitive enough to realise agreed outcomes for the area.

“It’s about understanding how ground and surface water moves through the system and assessing, trialing and modifying the tools and techniques available to manage the issues and risks.

“Community and individual values and expectations, as well as economic survival are an important part of the process; it’s as much about sociology as technology.”

of the States supporting NDSP. If you have any information you would like included here, contact your nearest NDSP Communication Co-ordinator listed on the back page.

Queensland

By Mark Warnick

National Action Plan (NAP) for Salinity and Water Quality

The Bilateral Agreement and associated maps are available on-line at www.dnr.qld.gov.au/water/salinity.

Regional NRM groups in the NAP regions have met together to discuss operational matters. They have also had input into guidelines for achieving accreditation of NRM Plans. The Queensland Communication Plan integrates with the National Communications Strategy yet promotes the NAP program at a State level and undertakes projects of significance across a number of areas.

Queensland has also contributed to the Biodiversity Conservation Outcomes and Targets for Natural Resource Management paper.

Regional arrangements are in place or being worked on for the following regions: Burdekin; Fitzroy; Mary/Burnett; Lockyer-Bremer-Upper Brisbane; Border Rivers Moonie; Condamine Alliance; Maranoa-Balonne. The NDSP, as the major source of Research, Development and Extension materials for Dryland Salinity, is assisting with information and knowledge for a number of the regional bodies and science groups.

New South Wales

By Lisa Gray

Catchment blueprints

Catchment management boards throughout NSW are in the process of finalising their catchment blueprints. The purpose of the catchment blueprint

is to set targets for improved natural resource outcomes, including salinity control, and prioritised management actions to achieve the targets. They will guide the future investment of funds in natural resource management in the catchments.

Under the NSW Salinity Strategy, end-of-valley targets have been agreed for all nine major inland rivers. Based on the end-of-valley targets, the boards are now setting within valley targets and determining management actions to achieve these targets, such as tree planting, improved farming systems and engineering works. These targets and management actions are a key component of the catchment blueprints.

Once finalised, the blueprints will provide focus and direction to individual and community initiatives, help coordinate government investment, such as extension work and grant funding, and contribute to the implementation of legislation, such as the *Native Vegetation Conservation Act 1997* and the *Water Management Act 2000*.

For further information on the catchment blueprints please visit the Department's web-site www.dlwc.nsw.gov.au or contact your regional DLWC Office.

Draft water sharing plans on show

The Minister for Land and Water Conservation, John Aquilina, has announced the release of three draft water sharing plans.

Water sharing plans are a major element in the implementation of the *Water Management Act 2000*, which provides better ways for the equitable sharing and management of the State's water resources. Once finalised, the plans will establish the rules for sharing water between competing water users, as well as securing provisions for the environment.

- Environmental water rules;
- Requirements for basic landholder rights;
- Requirements for water extraction under access licences; and
- Bulk access regime for extraction licences.

Copies of the draft water sharing plans on exhibition are available on the Department of Land and Water Conservation web-site: www.dlwc.nsw.gov.au.

Natural resource issues CD-ROM

A new set of CD-ROMs to help students gain a better understanding of integrated land and water management issues in the Murray-Darling Basin have been released.

The Murray-Darling Basin Commission (MDBC) and the NSW Board of Studies have developed the CDs for secondary schools. The resource feature a series of regional case studies targeting the cotton, rice and wine grape industries.

The CDs will help students appreciate the interaction between the three important agricultural industries and the environment. They provide a snapshot of how action at the property scale can influence catchment health and the role agriculture is playing in these communities. The CDs also provide information on best management practices on a number of issues, making them a valuable resource for industry, government and the community alike.

The CD-ROMs are available from the NSW Board of Studies for \$33. For further information contact the Board of Studies NSW GPO Box 5300 Sydney 2001, or Ph (02) 93678178.

'Shakedown on Salt'

May was salinity month in the Murray and Murrumbidgee catchments of southern NSW. This event provided an opportunity to increase community awareness of salinity issues and to showcase efforts and activities in the catchments. Activities included

universities, and launches of salinity-related publications.

Contact: Eastern Murray Dryland Salinity Project, Ph 02 6041 6777,
E-mail "ehumphries@dlwc.nsw.gov.au

Victoria



By Jo Curkpatrick

Salinity Management Plans

The review process for the State's dryland Salinity Management Plans (SMP's) is almost complete. The reviews will provide vital background for the development of Second Generation Salinity Management Plans.

A State-wide forum for those involved in the development of Second Generation Salinity Management Plans was held in Melbourne in mid-April. The first drafts of SMP's will be completed by September 2002. In some regions, plans integrating dryland and irrigation salinity with water quality will be produced.

Native vegetation framework

Following much community and stakeholder consultation, the final draft of Victoria's Native Vegetation Management Framework is nearing release. The report will have significant implications for salinity management.

Measuring gains in biodiversity using the habitat hectare measure to report on revegetation activities will highlight some of the valuable cross-benefits of revegetation works for salinity control. Identifying the conservation significance of remnant vegetation will also assist in prioritising actions to protect biodiversity assets from salinity.

The potential for negative impacts on biodiversity from inappropriate salinity management activities is mentioned in the context of the use of potentially invasive species for revegetation.

NRM R&D strategy

Department of Natural Resources and Environment is currently seeking tenders

Development Investment Strategy to guide research and development investment decisions by the National Action Plan and other potential investors.

The strategy will be comprised of:

- A conceptual framework that integrates the research components of Natural Resource Management related Research;
- Principles of R&D Investment; and
- A National Action Plan Program R & D sub-strategy, within the conceptual framework.

Around the traps in Victoria

National Dryland Salinity Program Communication Co-ordinator in Victoria, Jo Curkpatrick is getting out and about over the next few months to spread the word about NDSP projects to catchment management authorities across the State.

"It is essential as Victoria gears up for the National Action Plan for Salinity and Water Quality that regional groups have access to the very best knowledge generated from NDSP," said Jo. "I am keen to help with the knowledge transfer.

"NDSP has a number of projects complete and final reports in, and it is important that our Catchment Management Authorities have such information to help with their planning—especially where the CMAs are NAP catchments.

"Major NDSP projects such as Engineering Options, Tools, OPUS, Costs, Local Government and the Audit work all have outcomes that can be considered in reviewing regional catchment strategies or planning for NAP work."

Jo will be meeting with Victorian CMAs in the North-East and West Gippsland regions in June, while meetings in the Mallee, Wimmera and Corangamite regions are planned for the third quarter of 2002.

For full details of NDSP projects, visit NDSP on-line at www.ndsp.gov.au

By Bruce Munday

Salinity management by committee

The Soil Conservation Council (SCC) has appointed the South Australian Dryland Salinity Committee, with the following terms of reference:

- Oversee the effective implementation of the SA Dryland Salinity Strategy;
- Advise Council and the Minister on matters affecting the implementation of the Strategy including appropriate corrective actions when necessary;
- Monitor and periodically review the SA Dryland Salinity Strategy, evaluate its outcomes, and amend it as necessary;
- Formally report progress made against the Strategy on an annual basis;
- Liaise with the Technical Advisory Group to the Strategy;
- Communicate the wider implications of dryland salinity (and dryland processes) to the community;
- Foster shared responsibility for salinity management between State, Commonwealth and Local Governments; regional groups, primary industry groups; landholders and the wider community;
- Encourage innovation in salinity management; and
- Ensure that State, regional and local planning authorities are well briefed on salinity management issues.

The committee has now met twice under the chairmanship of Cooke Plains farmer and SCC member Rob Smyth. Further details can be found at www.saltcontrols.com/support

Contact: Glenn Gale,
Ph (08) 8303 0345 or
E-mail: gale.glenn@saugov.sa.gov.au

The FIRSA Rural Solutions Salinity team has recently completed three salinity workshops, one each for Eyre Peninsula, Yorke Peninsula and the Mount Lofty Ranges regions. The workshops targeted service providers within each region, including Wesfarmers Landmark personnel as supporters of the CRC for Plant-Based Management of Dryland Salinity. A further two workshops are being planned for the Lower Murray and the Mid-North.

Salinity management planning for seven SA catchments is currently underway, with final reports due by September of this year. The team is also reviewing three draft regional salinity management plans for Kangaroo Island, the Northern and Yorke Agricultural Districts, and the Mount Lofty Ranges. An Eyre Peninsula regional salinity management plan is also being drafted.

Contact: Trevor Dooley. Ph: (08) 8568 6418,
E-mail: dooley.trevor@saugov.sa.gov.au

'Ultrasound of the earth'

The SA component of the Salt Mapping and Management Support Program is getting underway, having selected the following five areas:

to the SA border as a basis for future planning to reduce salt loads to the River Murray;

- Tintinara: mapping shallow clays as a basis for future planning to minimise salinisation of the groundwater resource in the area;
- Angas-Bremer Plains: detecting 'shoestring aquifers' in the upper aquifer to assist the management of the groundwater system and to prevent rising water tables;
- Jamestown: mapping aquifer properties in relation to land salinity and testing techniques for mapping dry saline land to assist assessment of control options; and
- Bremer Hills: mapping landscape features that impact on stream salinity.

Flying is expected from May to December and interpreted products should become available in the latter half of 2003.

Contact: Glen Walker. Ph: (08) 8303 8743,
E-mail: walker.glen@saugov.sa.gov.au

Economic evaluation of oil mallees to begin

A landscape-scale scientific and economic evaluation of the effect of oil mallee trees on salinity has begun by the Department of Agriculture in collaboration with the Department of Conservation and Land Management and the Oil Mallee Association.

Project leader, Peter Taylor, said that over the next five years research would be undertaken at three locations to measure the impact of oil mallees on groundwater levels and productivity interactions with crops and pasture.

Work has already begun on a property near Esperance and the team is about to select more sites around Kalannie in the northern wheatbelt and Wickepin in the central wheatbelt. Deep-rooted plants such as oil mallees are expected to reduce water tables but much research to date has been inconclusive and on too small a scale.

The Rural Industries Research and Development Corporation will provide



Rivers of green: four-year-old oil mallees cross the otherwise bare wheatbelt landscape.

farmer groups such as the South East Forests Foundation, Liebe and Facey Groups.

Contact: Peter Taylor, Ph: (08) 9777 0000 or
E-mail: pjtaylor@agric.wa.gov.au

Farmers to be 'worth their salt'

Roman soldiers were paid in salt, giving us the modern word 'salary'. Now Western Australian farmers have the opportunity to join a producer network and test their ideas about how to make more money from grazing saline land.

Under the new national Sustainable Grazing from Saline Land (SGSL) program, which begins in WA this month, farmer groups will have the opportunity to start up their own salinity research.

“Farmer groups will have the opportunity to start up their own salinity research”

The new program aims to turn saline land into an asset by using the practical ideas of farmers combined with the technical knowledge of scientists. About 20 projects will be selected in the first round.

Both technical assistance and financial support will be provided with average expenditure of up to \$10,000 for each project.

Individual farmers will not be able to apply for funding to support their own research, but are being encouraged to join the SGSL network so they can share information with other producers.

The SGSL program is part of *Land Water & Wool*, an initiative of Australian Wool Innovation Pty Ltd with Land & Water Australia.

Contact: Justin Hardy, Department of Agriculture WA, Ph (08) 9892 8444, E-mail: jhardy@agric.wa.gov.au

Department
Establishing long-term indicators for salinity change in WA has been a major task for the Department of Agriculture in recent months. Key performance indicators are required by the State Treasury, but have also provided extra context for examining priorities, according to manager Richard George.

He said that one difficulty had been finding aspects of salinity that could be measured readily and reliably, and in developing indicators that could assess each of the physical, economic and social impacts of the strategies developed.

Final indicators include:

- Percentage of non-saline agricultural land for which viable salinity management options (VSMOs) have been identified or developed;
- Percentage of salt-affected agricultural land for which VSMOs have been identified or developed;
- Number of VSMOs identified; and
- Percentage approval of working relationships from target groups including farmers in collaborative R&D, shires in the Rural Towns Program, drainage contractors, community Landcare co-ordinators and others.

Longer-term indicators include the rate of groundwater rise where VSMOs have been adopted compared with areas where they are lacking in both towns and hydrological zones. Others, to be measured every five years, include percentage of salt-affected land, change in remnant vegetation and length of roads at risk of salinity, using techniques developed by the Land Monitor project.

Very long-term indicators would include the percentage change in the net value of agricultural production due to VSMO adoption for particular farming systems and agro-ecological zones, but details are still being defined.

Contact: Richard George, Ph: (08) 9780 6296 or E-mail: rgeorge@agric.wa.gov.au

The latest edition of the National Dryland Salinity Program's publication *SALT magazine* is now available on-line at www.ndsp.gov.au.

SALT magazine features personal stories of Australians combating and learning to live with dryland salinity. Highlights of the latest edition include:

- **Between the salt lakes:** Whole farm planning in Victoria leads to salinity management success;
- **Managing water tables is a profitable business:** making money from saline land in SA;
- **Merredin tackles the salinity threat:** WA community evaluates new salinity management technologies;
- **A tale of two properties:** Two farming families face up to the salinity challenge in Queensland;
- **Monitoring shows impact of perennials on recharge:** SA farmers demonstrate the value of monitoring;
- **Remedial works increase productivity:** on-farm productivity increased in southern NSW;
- **Oil mallees - future money tree or pipe dream?** Analysis of a changing WA landscape;
- **A winning formula for reducing groundwater:** Going green to manage recharge in NSW;
- **High quality fodder from saline land:** dairy farming success through pasture management in Victoria;
- **Healthy catchments and productive farms:** 'how to' guide for smart tree planting; and
- **Murray-Darling salt worth millions -** salinity's potential \$13 million windfall in the Murray-Darling Basin.

Over 60,000 people now receive *SALT magazine* - to subscribe to this free publication, please contact your nearest NDSP Communication Co-ordinator.

Contact: Your nearest NDSP Communication Co-ordinator (see page 16 for details)

4th Queensland Environment Conference

Brisbane, Qld, 30-31 May 2002

Contact: Environmental Engineering Society (Qld), Ph (07) 3510 2114

Salinity Land Management and New Technology conference

Katanning, WA, 29 July 2002

Contact: Greg Street, SKM,
Ph (08) 9268 9672
gstreet@skm.com.au

Australian Academy of Sciences' Fenner Conference - Where to now for Australian Agriculture?

Canberra, 30 July to 1 August 2002

Contact: Conference secretariat,
Ph (02) 6285 3000

8th Productive Use and Rehabilitation of Saline Lands (PUR\$) conference

Fremantle/Katanning/Kojonup, WA, 17-20 September 2002

Contact: www.promaco.com.au/2002/pursl

About Focus

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Partners in NDSP are Land & Water Australia, Grains R&D Corporation, Murray-Darling Basin Commission, National Land & Water Resources Audit, Rural Industries R&D Corporation, Agriculture Fisheries and Forestry — Australia through the National Landcare Program, CSIRO, Australian Wool Innovation Pty Ltd, Meat & Livestock Australia and the State Governments of SA, Victoria, WA, Qld, NSW and Tasmania.

Further information about NDSP can be found at the program's web-site, www.ndsp.gov.au.

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Readers should contact the authors or contacts provided and conduct their own enquires before making use of the information contained in *Focus*.

For further information about *Focus* contact Land & Water Australia on (02) 6257 3379, public@lwa.gov.au, or fax (02) 6257 3420.

Artificial Recharge of

Groundwater

Adelaide, SA, 22-26 September 2002

Contact: www.groundwater.com.au/conf/ISAR4.htm

Prospects for Biodiversity and Rivers in Salinising Landscapes conference

Albany, WA, 21-25 October 2002

Contact: Marcus Blacklow
Ph: (08) 9380 1140 or
www.biodiversityconference.albany.uwa.edu.au

Australian Society of Soil Science Conference

University of WA, 2-6 December 2002

Contact: www.agric.uwa.edu.au/soils/futuress/index.html

11th Australian Agronomy Conference – 'Solutions for a better environment'

A session on "New solutions for salinity" is planned. Deakin University, Geelong, Victoria, 2-6 February 2003

Contact: www.cdesign.com.au/agro2003

The National Dryland Salinity Program is jointly supported by the following organisations



RURAL INDUSTRIES RESEARCH & DEVELOPMENT CORPORATION



National Land & Water Resources Audit

A program of the Natural Heritage Trust



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