Breaking Ground — Key Findings and Research Outcomes from 10 Years of Australia's National Dryland Salinity Program

An Overview

National DRYLAND SALINITY Program

Know-how to tackle salinity

Breaking Ground — Key Findings and Research Outcomes from 10 years of Australia's National Dryland Salinity Program — An Overview

INTRODUCTION

Over the last decade, Australians have gained a much greater awareness of dryland salinity — its extent, the damage it has caused and the risks it poses — and a much better understanding of the causes of salinity and what we might do to manage or prevent it. Between 1993–2003 Australia's National Dryland Salinity Program (NDSP) has been a leader in both this awareness raising and knowledge generation.

The great strength of this national program has been its capacity to bring together many of Australia's leading hydrogeologists, soil scientists, agronomists, economists, social scientists and policy advisers — all contributing to our greater understanding of salinity and its implications for the nation. It has done this by forging a collaborative partnership between Australian and State Government agencies, CSIRO, the Murray–Darling Basin Commission and industry Research and Development Corporations. Alongside this research effort, the NDSP has implemented an effective communication and knowledge brokering strategy, informing and engaging stakeholders, and culminating with the three synthesis documents developed here.

The NDSP ran over two five-year phases, commissioning, coordinating and managing around 50 major research projects with an investment value of almost $25 million. In that time, it harnessed the skills and experience of nearly 300 researchers, technical assistants, consultants and policy advisers.

BRINGING IT ALL TOGETHER...

An NDSP forum in 2003 provided an opportunity for all the research teams to report on their achievements during the second phase of the program. This forum conveyed an unmistakable message that the NDSP really had dramatically advanced our knowledge and understanding of dryland salinity. Not only had it challenged and overturned many of the assumptions of a decade ago, it had unlocked doors to understanding the processes and managing the outcomes, and had put into perspective the relative impacts that salinity has on different aspects of the economy, the environment and society.

Perhaps the most significant conclusion to be drawn from the 2003 forum was that the NDSP has been far more than 50 research projects. The outcomes of these projects are interrelated and add value to each other. They also add great value and derive further value from research done outside of the NDSP. In this context, overall outcome of the research conducted by the NDSP is much more than just the sum of its parts.

Recognising the value of its research, the NDSP Management Board proposed that a further year should be dedicated to harvesting this new knowledge and making it readily available to the diverse range of stakeholders who stand to benefit from it — the policy makers, the strategic planners particularly at the regional and catchment level, those organisations and individuals who advise farmers and other land managers and indeed the farmers and land managers themselves.

...AND MAKING IT ACCESSIBLE

There were two major challenges inherent in this communications proposal. First, like other natural resource issues, dryland salinity is a function of many interacting biophysical and biochemical processes, and our response to salinity is influenced by social, economic, cultural and policy factors. How do we bring all this together in a coherent 'story' that is useful to the reader? Second, much of the research that has been conducted over the past decade is already 'out there'. There is a great deal of information available about salinity, much (but not all) of it reliable and useful. The problem is that it is seldom accessible – how do we find the information that is relevant to our situation, at the level appropriate to our needs, and how do we even know where to begin in our search for the right information for our particular circumstances?

The NDSP confronted these basic questions by establishing **three teams** to draw together all significant available information on:

- The key findings that have emerged from 10 years of the NDSP;
- Dryland salinity and catchment management; and
- On-farm decisions and catchment outcomes.

A fourth team was set up to road test these materials with salinity management networks nationally and regionally and advise on any changes that would improve the accuracy, comprehensiveness, relevance and accessibility of the material.

These teams brought together the technical skills of specialist technical writers, the NDSP Operations Committee along with communications skills from the NDSP Communications Coordinators. Their brief was to gather all the available research into a one-stop-shop, but being aware that a document that looked like a doorstop would probably be used as one.

Each team has distilled the information from the relevant NDSP research and integrated this with known research from other sources. The result is three documents designed specifically to assist busy people who need to access the right information quickly.

The first of these documents, *Breaking Ground*, summarises the six key messages that emerge from this decade of research. These messages provide a broad sweep across the evolution of our understanding in that time, the options available to and the limitations imposed upon salinity managers, and the important remaining gaps in our knowledge.

The other two documents are resource directories – they are not 'how to' manuals and they are not designed to be read from cover to cover. Rather, they have been designed to allow us to dip in and out, accessing just what we need at the level we need it.

The power of the *Catchment Management* and the *On-Farm Decisions* directories comes from the summary of information extensive referencing that brings users to the level of detail they need. These references range from brief *TechNotes* for readers who, at least initially, want little more than a project summary, through to medium length workshop papers and finally to comprehensive project reports.

It is one thing to have a reference cited, it is another to have that reference material provided. This is the great strength of the CD-ROM that features all three documents, covered by a search engine, with links to the vast majority of the cited material as downloadable reports or as relevant web-sites. The length to which the NDSP Communications Team has gone to obtain digital versions of this reference material has highlighted just how important this contribution will be.

Both the *Catchment Management* and the *On-Farm Decisions* directories carry a comprehensive 'help' section (with web-links to the web-site of each 'helpful' product, agency or organisation) and a glossary.

All three documents and the CD-ROM have been thoroughly reviewed by focus groups in six States and redrafted or edited in response to this feedback. Gathering and incorporating informed comment from almost 150 stakeholders from State government agencies, local government, catchment management authorities, researchers, industry, Landcare groups, farmers and farmer groups across all States has been a huge undertaking for the NDSP, but has built further confidence into the final products.

Importantly, research into salinity continues after the NDSP. The CRC for Plant-based Management of Dryland Salinity has a significant portfolio of research projects and will continue to maintain several of the NDSP's successful communications tools: the national newsletter *Focus on Salt;* the landholder case studies, *SALT Magazine*; and the e-mail listserv, *Saltlist*.

KEY FINDINGS

In its second phase, the NDSP invested in research across seven themes:

- Audit and Monitoring.
- Policy and Operating Environment.
- Industry Solutions.
- Use of Saline Resources.
- Environmental Protection.
- Infrastructure Management.
- Regional Initiatives.

Breaking Ground — Key Findings from 10 years of Australia's National Dryland Salinity Program (NDSP) reveals that the more you know about salinity the more you realise you don't know. A decade of NDSP research has provided many answers, but also demonstrates that there is still much to be done if we are to confidently identify the best management strategies for salinity in diverse situations. Tension still exists between farm and catchment-scale outcomes given conflicting national cost/benefit decisions made in respect to the options available at the respective scales.

Over the period of this research the focus has shifted from salinity as largely an issue for agriculture, to an increasing awareness of the impact on infrastructure. While the research has given us valuable insights into the causes and the impacts, practical and economic solutions are still elusive and their effects may not be felt for decades. This highlights the importance of integrating salinity management with other natural resource management strategies, but also points to the likelihood that in some cases we will have to live with salinity and we need to find ways to make that practical and acceptable.

In the light of this research, added to that of the first phase, **six key messages** emerge to guide our future response to salinity:

1. Salinity costs are significant and rising, hence responses must be strategic.
2. Profitable options for reversing the trend are lacking, but under development.
3. There is no one salinity problem: It challenges us to look beyond traditional policy instruments.
4. Integrated catchment management must be seen as only one approach to deal with dryland salinity.
5. Vegetation management remains the key to managing water resources, although the benefit:cost ratio of revegetating catchments requires careful analysis.
6. Lack of capacity is an important, but secondary constraint to managing salinity.

Many R&D priorities are identified in the Breaking Ground report, but the three highest priorities are:

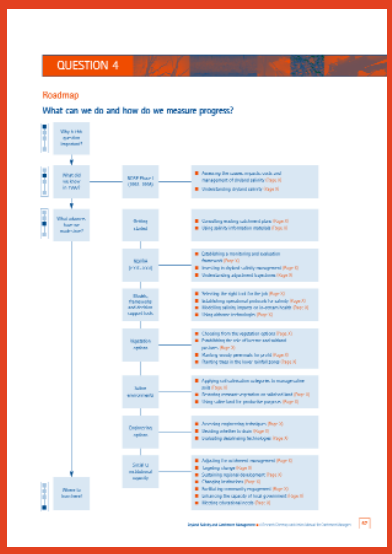
1. **Developing the means to value environmental benefits**: so that decisions based on alternative salinity management options takes into account the full range of value at stake in decisions;
2. **Developing profitable industry solutions**: so that economically, environmentally and socially feasible options are in the hands of those managing the vast majority of Australian landscapes;
3. **Reconciling farm and catchment decision tradeoffs**: so that the potential conflicts in rational decisions at one scale with rationale decisions at another are minimised in the meantime (awaiting the outcomes of priority 2).

DRYLAND SALINITY AND CATCHMENT MANAGEMENT

Dryland Salinity and Catchment Management — a Resource Directory for Catchment Managers was prepared to assist strategic level planning and management about dryland salinity, with particular consideration to integrated natural resource management.

Who is a catchment manager?

- Catchment and regional organisations
- Community-based NRM coordinators and facilitators
- Private service providers
- Governments (local, state, federal)
- Research purchasers and providers
- Non-government organisations
- Indigenous groups
- Industry and infrastructure managers
- Statutory authorities.



This directory is framed around five vital questions for catchment managers, and each chapter starts by addressing why the particular question is important.

- Question 1 — *What is the current extent of dryland salinity and its risk of spread?*
- Question 2 — *What are the causes and processes of dryland salinity?*
- Question 3 — *What are the current and predicted impacts and costs of dryland salinity?*
- Question 4 — *What can we do and how do we measure progress?*
- Question 5 — *How do we integrate with other natural resource management issues?*

Each question provides an outline of what we knew in 1998 at the end of NDSP Phase I. This is drawn from the information presented in the report *Assessing the causes, impacts, costs and management of dryland salinity*[1], together with *Understanding dryland salinity*[2], which summarised the outcomes of some 27 projects, most within the Murray–Darling Basin Commission's Dryland Program for the same period.

The lessons from NDSP Phase II and other significant research and investigations at the national, State and regional scales that contribute significantly to answering the questions are then captured. 'Actions' are highlighted in break-out boxes, suggesting a way to proceed.

ACTION #4.3

Refer to the table on 'Suitability of options for managing dryland salinity' in the 'Tools Regional Information Package' for your region (or as a model to develop your own) to identify broad management options and ratings for each groundwater flow system type.

Each Action uses three indicative codes on 'Cost', Time' and 'Confidence' to further inform the regional decision-making processes. The 'Cost' code refers in very general terms to the cost of implementing the action. The 'Time' code refers to the time to undertake the action, not the time to achieve a result. The 'Confidence' code refers to the degree of confidence in achieving the anticipated result should we implement the action — if the confidence is low, it is generally a consequence of limited examples of implementation or of mixed results.

While the review of information has been extensive, some examples of local and regional research will be missing and we should be careful not to overlook these by consulting local experts and resource libraries. Examples are provided where possible to demonstrate advances in thinking and technology applied at a catchment level. We will see that the answers to these five major questions are inevitably incomplete, and that there are gaps in our understanding to inform regional decision-making. The research findings are therefore used to look forward and ask 'Where to from here?' The ideas and directions provided here are intended to inform planning and management decision-making at the regional level.

R & D TIP #4.1

Consider the 'National Evaluation Framework' project as a foundation from which to build benchmarking, monitoring and evaluation mechanisms at all scales of salinity management, using consistent and transferable approaches, and drawing on adequate and reliable data.

'R&D Tips' are provided to direct us to institutions and programs that are major players in furthering research in the area.

A checklist of the 'Actions' and 'R&D Tips' highlighted throughout Questions 1 to 5 is then followed by a chapter on 'Where to get help', which compiles contacts, information, products and services. The contacts go beyond a list of references to helping us find the specific services we need to support catchment planning and management in addition to the 'R&D Tips'. A full list of references is provided in the concluding chapter.

This directory is available in hard copy and CD-ROM, with a summary version accessible on-line via the NDSP web-site (www.ndsp.gov.au). The CD-ROM provides electronic links to all key reports, including summary reports, technical reports and NDSP *TechNotes*. These links plus a 'search' facility enable us to readily find the level of detail required. Maps, posters and a glossary of terms also feature on the CD-ROM.

DRYLAND SALINITY: ON-FARM DECISIONS AND CATCHMENT OUTCOMES

Dryland Salinity — On-Farm Decisions and Catchment Outcomes — a Guide for Leading Producers and Advisors is intended as a reference document for proactive producers who lead (for example) regional Landcare networks and large-scale (possibly State-wide) conservation farming and grazing groups. These producers influence development of salinity management options, industry research and development programs, and community/government salinity management initiatives.

It will also be useful to experienced extension advisors who facilitate liaison between the above groups and between the groups and State agencies and regional catchment management organisations. These advisors influence agricultural extension and natural resource management programs and community/government salinity management initiatives.

This report adds significant value to other salinity management guides by reviewing actual case studies that indicate the amount or level of farm to catchment-scale outcomes that can be expected from applying different combinations of options in different situations.

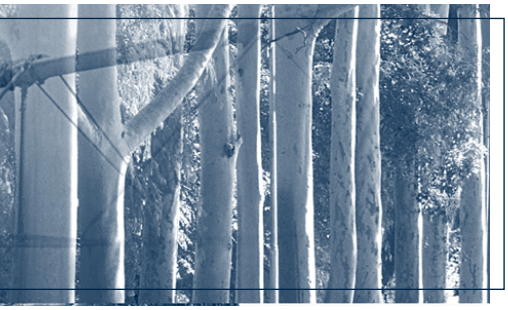
Important points

1. This report is not intended for the broad producer community. Most NDSP and associated research from 1993 to 2003 has been regional to national in scale, and was aimed primarily at providing the science to underpin government and industry-wide responses to salinity.
2. State agencies and catchment management organisations are collating results of on-farm demonstrations and field experiments addressing salinity in their local area, interpreting them in the light of regional to national scale research, and developing salinity management information for the broad producer community.
3. Producers requiring basic information about salinity should:

- Talk with their local advisors, including extension staff in State agencies, catchment management organisations, agribusiness companies, non-government organisations, and private consulting firms; and
- Read some of the comprehensive publications concerning salinity including, for example the book *Assessing the causes, impacts, costs and management of salinity*, the *Salinity Management Handbook* and the *TOOLS Salinity Information Package*.

Within the limitations of regional to national scale studies undertaken by the NDSP and associated research, this report makes as much progress as possible in providing answers to key farm-scale questions:

- Is salinity likely to be severe enough to justify action?
- If action is justified, is there sufficient knowledge about salinity processes, impacts, and management options to decide on the best approach and preferred management options?



- In assisting producers and advisors to obtain answers to these questions, this report guides them through the following decision-making sequence:
  - Assessing salinity risk (and the nature of the salinity problem);
  - Short-listing possible approaches to managing it;
  - Reviewing tactics and management options;
  - Considering possible farm to catchment-scale outcomes from implementing the options;
  - Deciding on the best approach or approaches; and
  - Confirming preferred tactics and options.

A salinity management matrix, based on information from actual case studies, shows how the various factors in decision-making can fit together and the possible outcomes of those decisions. The matrix summarises, for different groundwater flow systems in different catchments and regions:

- The nature of the salinity problem being addressed (i.e. land or stream salinisation).
- Approaches to salinity management being adopted or considered.
- Tactics being employed or researched.
- Management options being implemented or researched.
- Level or amount of change expected from implementing the options.

5. CONSIDERING POSSIBLE FARM TO CATCHMENT-SCALE OUTCOMES

5.2 SALINITY MANAGEMENT MATRIX, BASED ON MAJOR CASE STUDIES

GROUND-WATER FLOW SYSTEM (GFS)	GFS DESCRIPTION	REGION OR CATCHMENT	NATURE OF THE SALINITY PROBLEM	APPROACHES	TACTICS	OPTIONS	POSSIBLE FARM TO CATCHMENT-SCALE OUTCOMES
Local	A local flow system in variably weathered rock, Groundwater discharge occurs on break of slope	Kamarooka, North Central Vic	Land salinisation	Probably **containment**, but dependent upon case study results	50 per cent leakage reduction 180 per cent leakage reduction	Conversion of annual pastures to lucerne Introduction of 40 yrs crest tree cover uphill from break of slope	Salinity situation is already at equilibrium. There will be little growth in salinised land with no intervention. 50 per cent leakage reduction would lead to a 50 per cent reduction in area at risk within 20 years and small increase farm gross margin by 40 per cent. 80 per cent leakage reduction reduces the area of high water tables more quickly, but would reduce net farm incomes by 40 per cent. **See case study #1**
Local	Local GFS in fractured volcanic rocks. A self-contained groundwater catchment independent from a regional GFS to the south	Brymaroo, Darling Downs, Qld	Land salinisation	**Containment** and **adaptation**	Leakage reduction, groundwater management	50 per cent leakage reduction by placing the upper part of the catchment under perennial pastures, and a 90 per cent recharge reduction by revegetating the catchment with native trees	The groundwater system is [already] full. The expansion of salinity has largely culminated and further salinisation is expected to be minimal if current land use is maintained. A 50 per cent leakage reduction would see groundwater levels in the upper catchment falling by up to 5m after 20 years. **See case study #3**
Local and intermediate	Local and intermediate regional system in alluvial sediments and deeply weathered rocks	Lake Worden, Esperance, WA	Land salinisation	**Containment** and **adaptation**, recovery dependent upon asset value and risk	Leakage reduction, saltland management, groundwater management	Lucerne, farm forestry, low-recharge farming, saltland pastures, drainage and groundwater pumping for public assets	Relatively poor response to <50 % leakage reduction. At higher levels of intervention (60%+ leakage reduction) the system would stabilise by 2020 and reverse by 2050. **See case study #4**
Local and intermediate	Local and intermediate GFS that typically have low permeability and low gradients	Eastern and central wheatbelt, WA	Land salinisation	**Containment** and **adaptation, recovery** dependent upon asset value and risk	Leakage reduction, saltland management, groundwater management	Some lucerne, oil mallees, low-recharge farming, saltland pastures, drainage and groundwater pumping for public assets	Leakage reduction options result in almost as much salinised land as current practice, but buy 20- 60 years of time. Pumping and deep drains may significantly alter this outcome. Leakage reduction on hillslopes expected to have limited impact. Priority landscapes are valleys with deep water tables at high risk. **See case study #5**
Local and intermediate	As above	Western wheatbelt, WA	Land salinisation, and stream salinisation in >600mm rainfall zones	**Containment** and **adaptation, recovery** dependent upon asset value and risk	Leakage reduction, saltland management, groundwater management	Lucerne, farm forestry, low-recharge farming, saltland pastures, drainage and groundwater pumping for public assets	Relatively quick response to leakage reduction options (<10 yrs). At higher levels of intervention some land would be prevented from becoming saline. Stream salinity unaltered. Targeted leakage reduction throughout landscape. **See case study #5**
Local and intermediate	Local to intermediate flow system in deeply weathered rock	Wanilla, Lower Eyre Peninsula, SA	Land salinisation	Probably **containment**, but dependent upon case study results	50 per cent leakage reduction	All pastures in lower catchment replaced with lucerne; all upper catchment planted to trees	Hydrologic equilibrium almost reached already. The area affected by high water tables would increase from 8.1 per cent to 11.7 per cent over the next 20 years, and to 13.8 per cent over the next 80 years. **See case study #6**
Local and intermediate	Intermediate fractured rock aquifer overlain by a shallow secondary local aquifer	Kyeamba Creek, southern NSW	Stream salinisation	**Containment** and **adaptation**	Leakage reduction, groundwater management	Revegetation/reforestation of upper catchments using perennial pastures, native pasture, and native trees, possibly with some groundwater pumping	High groundwater levels are in dynamic equilibrium, but are well connected to the alluvium and highly responsive to rainfall events. Some outbreaks could be expected to expand and contract according to rainfall. Large-scale reforestation in 800 mm areas would have only local effects on groundwater pressure heads. **See case study #7**
Local and intermediate	Intermediate flow systems in the Macquarie Alluvium overlain by local GFS	Mid Macquarie, central NSW	Land and stream salinisation	**Containment** and **adaptation**, but influenced by case study results	Leakage reduction, saltland management	Farm forestry, saline agroforestry, remnant vegetation conservation, riparian zone conservation, perennial pastures, saline pastures	GFS methodology proved a mixed success. Indications are that local GFS that dominate the region have reached equilibrium. Lack of data prevents estimates of current and future salinity distributions. Proper prioritisation of sub-catchments for salinity management action is [still] not possible. One catchment previously targeted for recharge reduction is providing fresh flows. **See case study #8**
Intermediate	Intermediate GFS where discharge occurs in low-lying areas	Upper South East SA	Land salinisation	**Containment** and **recovery** of salinised land where possible	Leakage reduction, groundwater management	Regional drains controlling surface and groundwater, revegetation, perennial and salt-tolerant pastures, wetland management	Lowered groundwater levels for up to 2.5 km from the drains. Control of surface flows from 27,500 ha. Localised recovery of discharge areas. Productive and profitable salt-tolerant pastures. **See case study #9**
Intermediate and Regional	Intermediate to regional GFS in alluvial deposits	Liverpool Plains, northern NSW	Stream salinisation	**Containment** of salt exports	Leakage reduction	Engineered structures to control flooding, opportunity cropping, perennial pastures and tree planting	Leakage reduction options were not modelled, but a 'no change' scenario results in only small increases in groundwater heads mainly in the upper parts of the catchments, and only minor rises near the [catchment] outlet. **See case study #11**
Regional	Highly permeable regional alluvial plains aquifer with additional shoe-string sand lenses and spill-over sands	South Loddon Plains, North Central Vic	Land salinisation	Probably **containment**, but dependent upon case study results	Groundwater management	Pumping from the deep lead aquifer	While groundwater heads would not be reduced below ground overywhere, up to 10 m of drawdown can be established over up to 300 km². **See case study #12**

An appendix provides additional information about impacts, priority areas for action, and recommended management options for producers and advisors who may not be covered by the case studies. A further appendix contains a brief summary of the findings of recent reviews of the effectiveness and possible outcomes of engineering options.

Like the Catchments directory, this directory is available in hard copy and CD-ROM, with a summary version accessible on-line via the NDSP web-site (www.ndsp.gov.au). The CD-ROM provides electronic links to all key reports, including summary reports, technical reports and NDSP *TechNotes*. These links plus a 'search' facility enable you to readily find the level of detail required. Maps, posters and a glossary of terms also feature on the CD-ROM.

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Australia's National Dryland Salinity Program is a collaborative research and development effort that is investigating the causes of and solutions to, the national problem of dryland salinity. It was initiated by Land & Water Australia (formerly LWRRDC) in 1993 and has involved a wide range of funding partners and research organisations. It has been managed by Land & Water Australia since its inception.

Publication data:

Product code: PX 040 646
Designed and Typeset by Zoo
Printed by National Captial Printing
May 2004

FURTHER INFORMATION

This summary document provides an overview of the key findings and management actions featured in the larger synthesis reports prepared as part of the National Dryland Salinity Program's Enhanced Communication Year.

For the complete findings outlined in this summary, read the **full reports** below together with the supporting resources, which can be ordered either as a full resource kit or individually using the order details outlined at the back of this summary:

- *Breaking Ground – Key Findings from 10 years of Australia's National Dryland Salinity Program* (PX 040 645)
- *Dryland Salinity and Catchment Management* (PX 040 649)
- *Dryland salinity: On-Farm Decisions and Catchment Outcomes – a guide for leading producers and advisors* (PX 040 651)
- *Managing Dryland Salinity in Australia – Key Findings, Research Directory and Action Manual from Australia's National Dryland Salinity Program (CD-ROM)* (EC 030 652)

To order a copy of the full reports and other related NDSP information resources you can:

- Complete and post or fax the feedback form at the back of this summary
- Order on-line from the NDSP web-site **www.ndsp.gov.au**
- Contact CanPrint, Freecall 1800 776 616 and quote the product number (in brackets after each title) for the resources you wish to order

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

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

MEAT & LIVESTOCK AUSTRALIA

CRC FOR PLANT – BASED MANAGEMENT OF DRYLAND SALINITY

GRDC Grains Research & Development Corporation

CSIRO

National Land & Water Resources Audit
An Initiative of the Natural Heritage Trust

MURRAY-DARLING BASIN COMMISSION

LandWater&Wool Shaping the future
another innovation
sustainable grazing on saline lands

State Governments of South Australia, New South Wales, Queensland, Western Australia, Victoria and Tasmania.

PLEASE SEND ME THE FOLLOWING INFORMATION RESOURCES: *(Please tick)*

☐ **Managing Dryland Salinity in Australia** – *Key Findings, Research Directory and Action Manual from Australia's National Dryland Salinity Program (Full Resource Kit – all reports and CD-ROMS)* PX 040 645

☐ **Breaking Ground: Salinity Key Findings and Research Outcomes** – *10 years of Australia's National Dryland Salinity Program* – An Overview (SUMMARY REPORT) PX 040 646

☐ **Breaking Ground** – *Key Findings from 10 years of Australia's National Dryland Salinity Program* (FULL REPORT) PX 040 647

☐ **Dryland Salinity and Catchment Management** – *A Resource Directory and Action Manual for Catchment Managers* (FULL REPORT) PX 040 649

☐ **Dryland Salinity: On-Farm Decisions and Catchment Outcomes** – a guide for leading producers and advisors (FULL REPORT) PX 040 651

☐ **Managing Dryland Salinity in Australia** – *Key Findings, Research Directory and Action Manual from Australia's National Dryland Salinity Program* (CD-ROM) EC 030 652

☐ **PRISM – Practical Index of Salinity Models** – *Information on over 90 tools, models and frameworks for natural resource management and planning at the regional scale* (CD-ROM) EC 030 615

PLEASE MAKE ME A SUBSCRIBER TO THE FOLLOWING FREE PUBLICATIONS (Note: as of July 2004 these publications will be managed by the Cooperative Research Centre for Plant-based Management of Dryland Salinity)

☐ **SALT Magazine** *(case studies of Australians managing dryland salinity)*

☐ **Focus on Salt newsletter** *(update of salinity research and development across Australia and internationally)*

PLEASE SEND ME INFORMATION ABOUT THE LAND, WATER AND WOOL SUSTAINABLE GRAZING ON SALINE LANDS INITIATIVE

☐ **Sustainable Grazing on Saline Lands** – *SGSL (major sub-program of the Land, Water & Wool initiative between Australian Wool Innovation Ltd and Land & Water Australia)* PF 030 608

☐ **Saltland Pastures in Australia – a practical guide** *(the latest information on saline land and saltland pastures)* PR 030 563

☐ **Insights – supplement to Saltland Pastures in Australia** *(case studies on how farmers are successfully managing saltland for profit and sustainability)* PK 040 658

MY DETAILS

Name ..... Position .....

Company/Organisation .....

Address .....

Postcode .....

Tel. ..... Fax ..... E-mail .....

Once complete post to **Australia's National Dryland Salinity Program,** c/- Land & Water Australia, GPO Box 2182, Canberra ACT 2601 or fax to (02) 6263 6099.

NEED MORE KNOW-HOW TO MANAGE DRYLAND SALINITY?

Visit the NDSP website **www.ndsp.gov.au** to find out more about the resources that have been developed by the program from more than a decade of nationally coordinated research to assist communities and individuals access integrated, profitable and sustainable approaches for effectively managing dryland salinity.

Australia's NDSP has synthesised a number of products to help you to:

- Understand the causes, extent and future threat of dryland salinity.
- Connect with networks of people and organisations experienced in managing or learning to live with dryland salinity.
- Access research outcomes to determine which planning tools, management systems and options may be the most appropriate for your situation.

National DRYLAND SALINITY Program

Know-how to tackle salinity

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