

STATE SALINITY COUNCIL

Newsletter of the Western Australian State Salinity Council

March 2001

Welcome to the new 'SALINITY MINISTER'



I'm very pleased to introduce myself as the Minister with special responsibility for salinity. I have taken a close interest in the problems of salinity and the methods that have been used to manage salinity for a long time – in fact I had first hand experience of the issues while growing up on my family's farm near Beverley. I remember my Grandfather warning me about the devastating effect that clearing could have on the land.

Since then I have been active in environmental

issues, particularly spending time working on local environmental projects. In my electorate of Maylands I have been an active community member for the past 10 years, and was the founding chair of the Bayswater Integrated Catchment Group – the first urban catchment group.

Given this area of interest, I look forward to my responsibilities as Minister for Environment, Heritage and Water, and in particular the special responsibility for salinity that was given to me as part of Labor's election policy to ensure that salinity management in WA is better coordinated.

The Labor Government supports the broad aims of the State Salinity Council and the Strategy it has developed, and is committed to improving this to support work already being done and to provide the best protection possible for those of our State's resources that are at risk of, or already affected by, salinity.

Our first priority in the area is to initiate a short term, high-powered taskforce to review the State's salinity management. The taskforce will be asked to recommend improvements to the State Salinity Strategy and to suggest the best way to allocate the \$20 million from the sale of Alinta Gas, which has been set aside for salinity measures.

The Government is also committed to putting more resources into the strategy – providing an additional \$10 million for a range of drainage and rehabilitation schemes. This includes \$4 million to develop pilot engineering projects to examine the effectiveness of drainage and ground water pumping in a wide variety of salinity stricken areas.

I look forward to working closely with the State Salinity Council, and to meeting the Council members and others in the 'salinity community'.

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NDSP/PUR\$ TRAVELLERS ANNOUNCED

Two Western Australian farmers are the recipients of the National Dryland Salinity Program (NDSP) travel subsidy to attend the Productive Use and Rehabilitation of Saline Lands (PUR\$) conference in Launceston in March.

Ashley Lewis from Wickepin has been involved in regeneration of saltland for over 10 years after noticing an alarming increase of salinity on his family farm.

Ashley is a qualified Community Landcare Technician and has vast experience with direct seeding of saltbush and wattles through his seeding contracting business. He is keen to meet other farmers with saltland to discuss mutual problems and explore solutions.

Tony York has lived with salinity on the family farm at Tammin all his life, and has noticed the benefits of the natural bluebush and saltbush stands on the property, particularly in harsh seasons.

These observations led Tony to investigate new ideas, such as different species of saltbush, various methods of establishment and new fodder plants. Tony believes that we have only started to see the potential of our saltland.

Ashley and Tony will share the \$1500 allocated to WA farmers to attend the PUR\$ conference in Launceston from 20 to 23 March 2001. The conference is the seventh since the first one in 1990.

Dr Judy Edwards

Minister with Special Responsibility for Salinity



Salinity Management to benefit from new CRCs

The Federal Minister for Industry, Science and Resources, Senator Nick Minchin, recently announced funding for a new Cooperative Research Centre for Plant-Based Management of Dryland Salinity, to be based at the University of Western Australia.

Professor Phil Cocks of UWA's Faculty of Agriculture will lead the CRC, with other partners from WA (AGWEST and CALM), SA, NSW and Victoria, including Charles Sturt University and the University of Adelaide.

The CRC will consider the management of dryland salinity through the use of profitable, perennial plant-based farming systems. Its objectives are to:

- Develop farming systems that mimic natural ecosystems
- Select suitable woody and herbaceous perennials
- Develop, test and demonstrate farming systems that reduce ground water recharge
- Rehabilitate and use salt-affected land
- Develop policy options based on understanding the socio-economic constraints to the adoption of new farming systems
- Conduct education and technology transfer programs that enable users to apply the CRC's outputs.

The programs within the CRC are outlined in the diagram opposite.

The CRC will receive \$22 million from the Federal Government over seven years from July this year. Funding will also be contributed by the State Government, participants and industry (see funding diagram).

The other WA-based CRC will also have an impact on salinity management. The CRC for Landscape Environments and Mineral Exploration (CRC LEME) has been funded for a further seven years.

CRC LEME will provide assistance to environmental management groups through research into and use of airborne geophysical methods drawing from its experience in mineral exploration research.

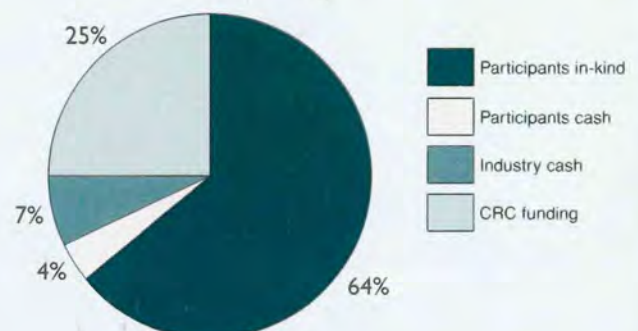
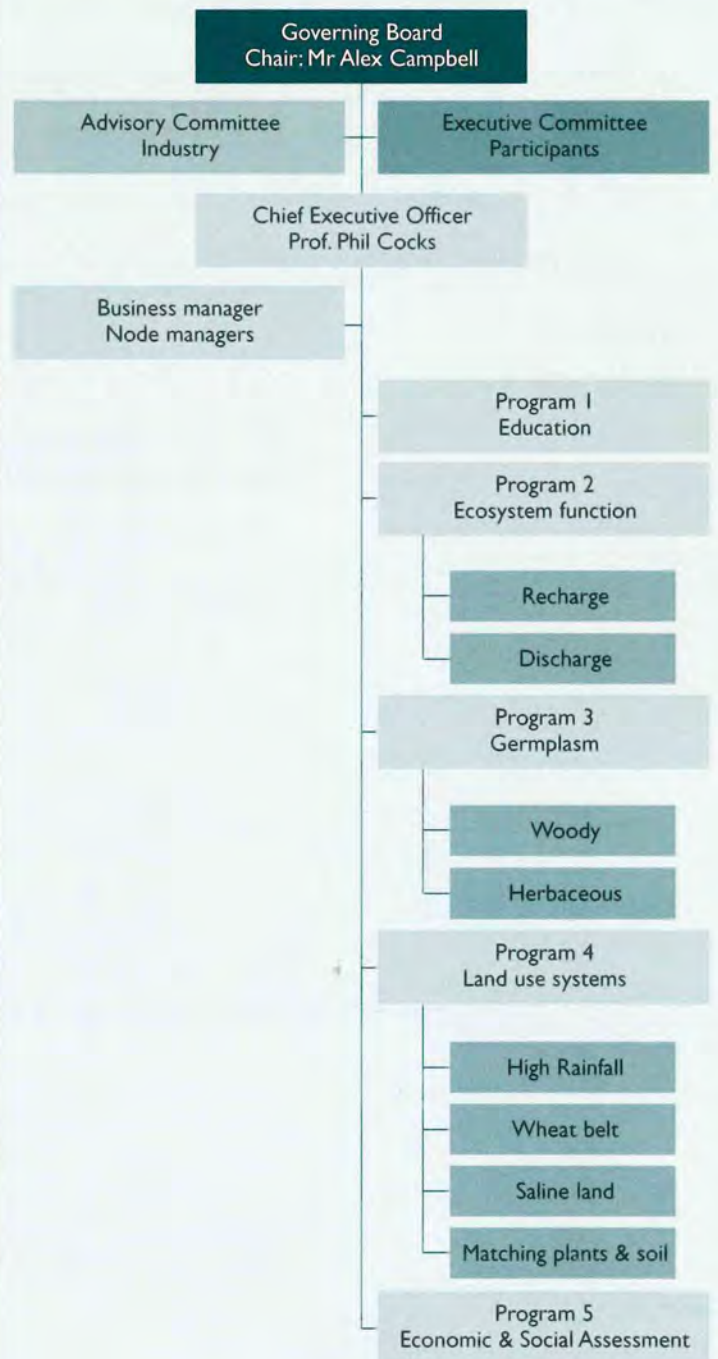
CRC LEME's approach involves integration of geology, geophysics, geochemistry and hydrology, field studies including drilling, together with geophysical modelling.

It will develop subsurface three-dimensional structures of the regolith to depths of 100 to 200 m where appropriate. District studies will be chosen across Australia through discussions involving the Plant-Based Management CRC, State government organisations and other collaborators.

Contacts for the two CRCs are:

CRC for Plant-Based Management of Dryland Salinity
Prof Phil Cocks – 08 9380 2505

CRC for Landscape Environments and Mineral Exploration
Dr Ray Smith – 08 9333 6272



Management structure and funding sources for the new CRC for Plant-Based Management of Salinity. Images courtesy Prof Phil Cocks, UWA.

Taking to the Air on Salinity

Mapping salinity from the air has attracted much interest and Commonwealth funding recently with new WA wheatbelt areas to be flown in April as part of a \$5 million project.

The State Salinity Council provided the site recommendations through its Airborne Geophysics Technical Advisory Group (AGTAG) chaired by Richard George from AGWEST.

Valley areas around Dumbleyung and Beacon were chosen because of strong interest from local groups and existing investment in engineering solutions.

Dr George said the results from the airborne electromagnetic surveys could help locate major palaeo-channels (underground water courses) which might be pumped out to reduce salinity.

The new project should help gauge if the technology has relevance for WA conditions.

In the 1990s areas around Broomehill, Carnamah and Chapman Valley were flown with limited success. Very detailed work has also been undertaken at Toolibin.

With airborne electromagnetics, a wire circuit which sets up a primary electromagnetic field is connected to the outside of an aeroplane. This 'pulse' is directed into the ground from which a secondary field is monitored by a sensor dragged behind the plane.

This enables depth and conductivity of saline areas to be measured.

Because the aeroplane drags a sensor, high altitude is required and line spacing is about 400 metres. This results in comparatively low resolution mapping compared to ground surveys and requires much skillful interpretation, involving data from other sources.

Dr George said the cost of the new surveys is about \$1-2 per hectare flown, at least double the rate for low altitude radiometrics which is beginning to be used for soil surveys.

AGTAG and the State Salinity Council recommend that the cheaper radiometrics and magnetics are more appropriate for broadscale WA conditions, while targeting electromagnetics in specific areas.

In February more than 200 people debated the technologies in Bendigo including Dr George and Russell Speed from AGWEST's Geraldton office.

Russell described his experiences, concluding that it had limited application around Carnamah because salinity was at equilibrium, but had good prospects in the Chapman Valley at sub-paddock scale including identifying niche horticultural opportunities.

'Management within a catchment depends on understanding the hydrology and appreciating the environmental limitations not just the geophysics,' he said.

WHAT DOES IT ALL MEAN?

Magnetics: measures subtle variations in the earth's magnetic field caused by the relative abundance of magnetic (iron rich) minerals, providing a map of the geological structure of the crystalline basement rock (e.g. faults, dykes, granite plutons etc). Geological structure influences catchment evolution and groundwater accumulation and movement and hence influence salinity.

Purpose: to map structures likely to affect the flow of groundwater.

Radiometrics: measures gamma radiation from the radioactive decay of isotopes, in general probably only from the top 10 cm of the soil surface. Radiometrics measures the spatial distribution of the relative abundance of Potassium, Uranium and Thorium which are associated with the physical and chemical properties of the soil and can indicate the source of the soil. Radiometrics measures the spatial variation of soil properties but cannot measure actual soil type.

Purpose: to map soils at a paddock scale to help on farm 'tactical' decision making and regional 'strategic' mapping.

Electromagnetics: measures the conductivity of the regolith (the zone between soil surface and the underlying fresh, unweathered basement rock). It indicates regolith thickness and the spatial variation of salt stored in the regolith. Of all the geophysical tools, electromagnetics provides the most insight into hydrological processes and hydrological evolution of a catchment. It works by directing a pulse of 'radio' waves into the ground and then measuring electrical currents generated in the ground by the 'radio' pulse. The stronger the generated currents are, the more conductive the regolith and, approximately, the more salt it contains. Note that a 'thin' highly saline regolith may generate the same signal strength as a much thicker, but less saline regolith.

Purpose: to map the distribution of salt at various depths to help locate treatments and assess risk.

GETTING OUR PRIORITIES STRAIGHT

The State Salinity Council has formed a working group to develop a way of setting priorities for public investment in salinity management.

Recent announcements of additional State and Federal Government funding for salinity made the Council aware of the need for a standard set of investment priorities that could be used at State, regional and local catchment level.

"We are concerned about the 'salt and pepper' approach to investment in salinity management," State Salinity Council Chairman, Alex Campbell said. "We felt that it was important that funding should be directed to the areas where it will have the greatest public benefit."

The paper covers investment not only in specific on-ground works, but also investment in broader industry development and delivery

mechanisms such as direct payments, market-based instruments and regulation.

The working party has developed a paper entitled *Setting Priorities For Salinity Investment: A Framework for Decisions on Investment of Public Funds in Salinity Management in WA*, which is now in its final draft form.

The principles and process for setting priorities outlined in the paper will be tested by the Council in a number of areas before being released to the public later this year.

"We feel that the paper will provide a clear set of steps for any group considering investing public funds in salinity management projects," Mr Campbell said. "The Council is looking forward to working with the Government and other groups to implement the ideas contained in this paper."

SURVEY FINDS POSITIVE ATTITUDE TO DEEP DRAINS

Landholders surveyed by AGWEST at Dowerin and Newdegate Machinery Field Days have indicated a generally positive attitude to deep drainage, which is gaining recognition as an important option in salinity management.

Agency drainage coordinator Allan Johns from Narrogin said that of nearly 80 landholders who filled out questionnaires, more than 90 per cent thought deep drains were worthwhile or could be effective in the right situation.

"Our survey attracted those with a special interest in drains and more than 40 per cent had already installed deep drains on their properties," Mr Johns said.

"There is a lot of interest in drainage as a means of overcoming salinity problems and we expect many more to be installed in conjunction with other methods."

Of 33 landholders who had installed drains, 70 per cent thought they were economically worthwhile. Positive results included improved productivity, reduced waterlogging and lowered watertables.

The most common negatives were more difficult access for stock and machinery, costs, maintenance issues and downstream impacts.

Mr Johns said the survey results would be useful to agency teams as they developed drainage extension activities over the coming months.

"There is no one solution to address problems of inundation, waterlogging and salinisation in the wheatbelt, however engineering options can be effective," he said.

"The essence of effective drainage is good design, good placement and good construction," Mr Johns said.

"Deep drainage is a valid option where a drawdown of the watertable for at least 10 metres either side of the drain can be achieved. Greater productivity is needed to justify the cost of installing drains, usually from \$4000 to \$8000 per kilometre.

"We are working with several groups to test drainage options and assessing their economic, social and physical impacts at the local and sub-catchment level. We are linking with other agencies to assess impacts of increased drainage flows into regional systems."

New Rapid Catchment Appraisal process takes shape

AGWEST will assess more than 2.5 million hectares of land for salinity risk in the State's agricultural areas over the next year under a new Rapid Catchment Appraisal process.

Executive Director of Sustainable Rural Development David Hartley said the new process under the State Salinity Strategy would ensure that all landholders in agricultural areas had access to the best available information on salinity management by 2005.

"For this first year, catchments have been chosen based on the risk to farming systems, exposure to risk of accelerated salinity and available information," Mr Hartley said.

"Landholders will be provided with an assessment of risk to their natural resources, options for managing those risks including likely costs, and help in accessing further assistance.

"This information will link with regional strategies and provide the most up-to-date information on salinity management."

Nearly two million hectares of land were estimated as affected by salinity in 1994. This is expected to increase considerably over the next 50 years.

The Rapid Catchment Appraisal teams from AGWEST expect to cover more than a million hectares in the northern region this year, two-thirds of a million hectares in the central region, a third of a million hectares around Katanning and some 700,000 hectares on the south coast.

Information on the risk to farming systems will be made available at information exchange days to be held by April. The presentation of final reports to landholders detailing management options and impacts is expected towards the end of the year.

Other areas not previously assessed under the Focus Catchment process will receive similar assistance by the end of 2005.

"Agency staff will be using the latest satellite images of salinity and other computer modelling tools, previously unavailable," Mr Hartley said.

"This is a much faster process than was possible under the Focus Catchment system, and we believe it will provide a huge help for individual land owners to help plan their future strategies against salinity."

CONFERENCE WILL FOCUS ON FUTURE OF WHEATBELT VALLEYS

A conference and workshop will be held to discuss the threats and opportunities arising from the effects of salinity on private and public assets in valley floors in the wheatbelt.

The conference/workshop will be held from Monday, 30 July to Wednesday, 1 August 2001.

The itinerary includes a field trip on day one; conference on day two; and workshops on day three.

The conference will also look at what is needed to achieve a realistic yet livable outcome for wheatbelt areas.

The target audience of the conference/workshop includes wheatbelt communities, rural industries, all levels of government, researchers, and the general public.

The conference/workshop will:

- Review existing bio-physical and socio-economic knowledge of the valley floors of the wheatbelt;
- Use case studies to evaluate the effectiveness of land management strategies on catchment objectives; and
- Develop a shared vision(s) for the valleys and identify future steps.

The results of the conference should be integrated into Waterways WA and future Rivercare projects.

The conference is being organised by the Salinity Council's Research and Development Technical Committee and the Avon Working Group whose members include Don McFarlane, Richard George, Tom Hatton, Barbara Morrell, Greg Keighery, John Sutton, and Michele John.

Sandalwood Harvest a Success

Trial plantings of sandalwood (*Santalum spicatum*) to promote revegetation in the wheatbelt, have reached their first harvest, yielding 130 trees.

CALM established the trial plantation in 1987 to demonstrate to local farmers that it is possible to plant sandalwood and see a return in one's lifetime.

The trial harvest took place at Northampton, on a property owned by Roy Routledge who, together with CALM's then sandalwood business unit manager Peter Jones and forester Ben Sawyer, carried out the task.

One of the biggest barriers in persuading farmers to plant sandalwood on a large scale as a crop is the misconception that it takes a long time to grow.

In the semi-arid pastoral regions, sandalwood requires 50 to 100 years to reach commercial size, but given the right conditions in the medium rainfall areas of the wheatbelt, sandalwood can reach the same size within 20 years.

Sandalwood is a root hemi-parasite, meaning it can produce its own photosynthetic products but is dependent on host trees for some of its nutrients and water. At the Northampton site, CALM planted jam (*Acacia acuminata*) seedlings in 1987, then seeded sandalwood next to each jam sapling in 1988 and 1989.

The sandalwood seed germinated quite readily and most survived and prospered. However, the sandalwood to host ratio (1:1) was too high, which caused most of the jams to die between age five and 10 years. An individual sandalwood tree requires at least two to three host trees to ensure good host survival.



Peter Jones (near ute) and Ben Sawyer survey one of their loads of sandalwood.

Due to the low number of remaining host trees, it was decided that most of the sandalwood trees should be harvested to determine the amount of commercial wood at age 12 years.

The exciting aspect of the Northampton trial was that the sandalwood had produced heartwood and oil at an early age and was already a marketable product.

The 0.8-hectare plot produced 520 kg of commercial timber, worth approximately \$1200. Given the correct host ratio, the returns from future sandalwood plantations are expected to be far greater.

HIGH HOPES FOR NEW INDUSTRY IN CATCHMENT AREAS

The Water and Rivers Commission is embarking on a project with CALM, the Forest Products Commission and AGWEST to develop eucalypt sawlog tree crop and forest products industries based in the medium rainfall zone.

The aim of the project is to further reduce salinity in Recovery Catchment areas, in line with the goals of the State Salinity Strategy, while at the same time increasing farm diversity and profitability.

The approach includes developing commercial tree crops for medium rainfall zones of the South-West, particularly targeting the water resource recovery catchments.

The WRC has allocated a total of \$250,000 to develop a business plan and for pilot plantings.

The goal is to help develop industries which would provide multiple benefits for landcare, water resources, and regional economic development.

The aim is for a whole-of-landscape approach, integrated with farming and involving landowners in the design, implementation and management as much as possible. Landowners will also be encouraged to take some responsibility for looking after the trees.

An industry business plan is being developed to evaluate options.

A pilot program is proposed for the upper Warren River catchment this year, with approximately 125 to 150 ha of wide-spaced sawlog plantations proposed. If successful, the industry could assist farmers and resource managers throughout the 450 to 700 mm rainfall zone on the west and south coasts.

For further information, contact John Ruprecht at the Water and Rivers Commission on 08 9278 0300.

INFORM AND BE INFORMED

Salt Pool

People with an email connection who are interested in salinity matters are invited to join Salt Pool, an irregular electronic newsletter circulated within WA to provide rapid circulation about coming events and other news.

It is being organised by Georgina Wilson from AGWEST's Sustainable Rural Development Program who is also the State Communications Coordinator for the National Dryland Salinity Program. Georgina can be contacted at gwilson@agric.wa.gov.au

DRAINAGE-L

A new email discussion list established to provide a forum for drainage professionals and interested parties around the world to discuss issues related to the role of drainage in providing a suitable agronomic environment in humid, semi-arid and arid areas.

The list includes discussions related to the design and management of surface, subsurface, and controlled drainage systems, methods for minimizing drainage water volumes, integrated management of irrigation and drainage systems, drainage disposal options and related topics.

To subscribe send an email message to: LISTSERVE@UNL.EDU. In the message field (NOT the subject field) type: SUBSCRIBE DRAINAGE-L. For questions or problems, contact Evan Christen at evan.christen@grf.clw.csiro.au.

Options for Productive Use of Salinity (OPUS) Database

A database that brings together ways to use saline land and water and minimise environmental degradation caused by dryland salinity while aiming to make a profit.

The 'case study' database is for anyone who is affected by dryland salinity, wants to invest in alternative industries or is interested in approaching salinity from an alternative farming systems perspective.

The database can be found through the website of the National Dryland Salinity Program (www.ndsp.gov.au).

State Salinity Council Newsletter

Produced by the State Salinity Council and published quarterly. Articles from individuals, groups and organisations are welcome. Deadlines for 2001 are 31 May (for June edition), 31 August (September) and 16 November (December).

Send articles (not more than 200 words) and photos to communications officer Liz Yuncken (contact details below).

New State Landcare Awards

Two new WA State Landcare Awards are being announced this month at the launch of the National Landcare Awards.

The Salinity Management Award, sponsored by the State Salinity Council, and the Landcare Professional Award, sponsored by the Soil and Land Conservation Council, join the existing Living Streams Award sponsored by the Water and Rivers Commission to make up the State-only awards. All other award categories are also judged at national level.

The State Landcare Awards acknowledge the significant efforts and achievements of landcarers throughout Western Australia. The awards cover many categories of landcare and can be awarded to individuals, groups or organisations in various categories.

Western Power, a founding partner of the Western Australian Landcare Trust, is a major sponsor of the WA Landcare Awards.

Nominations for the awards close Friday 15 June 2001, and awards will be presented at the WA Landcare Awards Gala Dinner as part of the State Landcare Conference to be held in Mandurah from 11 to 14 September 2001.

Entry forms, judging criteria and other information about the Salinity Management Award, the Landcare Professional Award and other awards are available from the state coordinator, Ben Toric, on telephone 08 9881 0222.

What's On

23 May – ABCs of Groundwater: *Groundwater Resources and the Environment*, Centre for Groundwater Studies, Bunbury. For information phone 08 8201 5632 or visit www.groundwater.com.au

29 May – ABCs of Groundwater: *Groundwater Resources and the Environment*, Centre for Groundwater Studies, Cockburn Wetlands Education Centre. For information phone 08 8201 5632 or visit www.groundwater.com.au

30 May – 1 June – Getting to Know Groundwater: *Cockburn Wetlands*, Centre for Groundwater Studies, Cockburn Wetlands Education Centre. For information phone 08 8201 5632 or visit www.groundwater.com.au

31 July – 1 August – Wheatbelt Valley Floors Conference, Merredin (see article this edition)

11-14 September – State Landcare Conference, Mandurah. Call 08 9535 0000 or see www.avonicm.org.au/avonicm/lconference/ or www.ca.com.au/~keynote/conf_pge/cnf_landcare.html

3-7 December – 22nd Australian Groundwater School, University of NSW. For information phone 08 8201 5632 or visit www.groundwater.com.au

Salinity Council Newsletter – part of WA's Salinity Strategy

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