



# New agriculture needed to combat salinity

In 50 to 100 years, much of our water will be undrinkable, important wetland habitats will be lost or threatened, current agricultural systems will be untenable, and infrastructure such as roads, water pipes and building foundations will crumble, corrode and decay.

These are just some of the predictions put forward by the Murray-Darling Basin Ministerial Committee in its *1999 Salinity Audit of the Murray-Darling Basin*, a response to the increasing mobilisation of salt through rivers and on land.

Many of the symptoms of increasing salinity are already apparent, thanks to an estimated five million tonnes of salt currently seeping onto the land surface from rising groundwater. By 2100, it is estimated that more than 10 million tonnes of salt will be mobilised to the land surface, with some four million tonnes of that flushed into rivers and streams. As the Murray-Darling Basin is one of Australia's most productive agricultural areas, and a haven for flora and fauna, the implications for Australia's ecological and productive future are dire.

The purpose of the salinity audit was to gather information to help understand the nature of the salinity threat and its impact, and to inform the development of salinity management strategies. Contributing to the audit was the CSIRO Land and Water report, *Effectiveness of current farming systems in the control of dryland salinity*, which considered our capacity to control salinity and strategies for the future.

## Our salty past

There are two sources of salinity in the Murray-Darling Basin: irrigation-induced salinity and dryland salinity. Both have come about because of the enormous changes made in the landscape to accommodate our European style of agriculture.

Before settlement, the basin and other parts of Australia were covered in native vegetation, which used its deep roots to soak up available rainfall. Only 1-5 mm of water escaped this thirsty root zone annually, percolating into the underlying water table, and eventually through sluggish drainage systems into the rivers. This slow but efficient cycle kept the naturally salty water tables shallow.

With the clearing of land for crops and pastures, however, there were fewer roots to soak up the rainfall and excess irrigation water. Deputy chief of CSIRO Land and Water, Dr John Williams, says this led to a situation where too much water leaked beyond the root zone into groundwater, with devastating consequences.

'The Australian landscape has a limited capacity to discharge water to the rivers and sea because it's very flat, and therefore there isn't much flow,' he says. 'So the arteries and veins of the landscape are basically clogged.'

'The drainage system was fine when there was native vegetation on it, but agriculture puts five to 10 times more water into the landscape than it can cope with. It can't discharge the water, so the water table rises, intercepts the land and leaches salt.'

Irrigation was originally thought to be the biggest cause of salinity in the Murray-Darling Basin, and in 1989, a Salinity and Drainage Strategy was implemented in South Australia and NSW. The strategy aimed to improve water quality of the River Murray through salt-interception schemes, and protect irrigation districts against waterlogging and salinisation.

But a recent review of the strategy by the Murray-Darling Commission discovered that the dominant source of salinity came from dryland catchment areas such as grazing pastures, rather than irrigation areas.

'What's driving salinity in the Murray-Darling Basin is dryland salinity,' Williams says. 'Because you've got drainage systems in irrigation you can intercept the water and put it somewhere else, but in the broader landscape, the interception system is the groundwater itself.'

A result of the audit and the CSIRO report was the startling realisation that we can't do much about the salinity problem by altering our current land use strategies. Australia needs a revolutionary approach to the problem, and the CSIRO report goes some way towards offering such solutions.

'We need to redesign our agriculture to suit the Australian landscape and address the cause of the problem,' Williams says. 'We need to modify the system we have to trap water and nutrients and turn that into production. We need to put a lot more vegetation back into the landscape and have our cropping and pastures on smaller areas. And we'll have to learn how to have agriculture on salted land, because in some place we can't stop it.'

CSIRO recently established a program called Re-design of Agriculture for Australian Landscapes, which attempts to find solutions to treat the cause of salinity rather than the symptoms. And the Murray-Darling Basin Commission is preparing a draft salinity management strategy to extend the Salinity and Drainage Strategy to accommodate dryland salinity and consider long term changes to land use.

*Copies of the audit, the CSIRO report and the Salinity and Drainage Strategy are available on the Murray-Darling Basin website: <http://www.mdbc.gov.au>, or by writing to the Murray-Darling Basin Commission, GPO Box 409, Canberra ACT, 2601. Contact: Daniel Connell, (02) 6279 0129 or 1800 027 239.*

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