integrated forestry on farmland

Prospects for integrated forestry as a management tool in salt-source catchments

How *Integrated forestry on farmland* helps

This publication outlines the prospects for integrating trees profitably into farming systems in the 450–750 mm rainfall zone to better manage land and water salinity. It covers:

- the advantages and disadvantages of integrating forestry into farming systems
- a brief overview of how design, species and management options impact on profitability, the nature and valuing of environmental services and the likelihood of extensive uptake of integrated forestry for salinity amelioration
- an assessment of the prospects for integrated forestry (regional outlook) to achieve dryland salinity outcomes and the evaluation criteria applied
- a region-by-region evaluation of the prospects for integrated forestry
  - South West WA
  - South West Victoria and South East SA
  - Northern NSW
  - Central West NSW
  - Murray Western Slopes/Murrumbidgee NSW and Northern Victoria
  - Hunter NSW
- influencers of future uptake of integrated forestry
- opportunities for further research
- further reading
- species list
- references.

Why this publication is important

There was a time, not so very long ago, when tree planting was promoted as the 'solution to salinity'. This approach no doubt had intuitive appeal because the dryland salinity problem associated with rising water tables was largely attributed to the clearance of trees and other perennial vegetation from the landscape.

Research undertaken by the National Dryland Salinity Program showed quite clearly that salinity will not be solved by any single approach, and certainly not by trees alone, unless we are prepared to turn over a very large proportion of our landscape to this endeavour and match this with the patience to wait in some cases up to hundreds of years to see a result.

Nonetheless, trees can play a very important and effective role and can be an attractive option (often among many) because they can provide both income and flexibility for farmers and environmental benefits for the wider public.

Much knowledge about the opportunities for integrating forestry into farming systems as a tool for managing salinity has been accumulated from research and experience. However this knowledge is dispersed, not always readily accessible, and often difficult to pull together to form a coherent basis for sound decisions.

Responding to the need to assemble and interpret a wide range of important research findings, the CRC for Plant-based Management of Dryland Salinity is developing its series of Prospects Statements for people who need to base natural resource or agricultural management decisions on good science.

Assessing the prospects

Natural resources in Australia are managed largely on a regional basis and this is the approach adopted by the CRC in each of its Prospects Statements.

The authors of the *Integrated forestry on farmland* Prospect Statement, Lisa Robins and Dr Nico Marcar, focus on six regions in the 450–750 mm rainfall zone because it is in this zone that integrated forestry development on cleared agricultural land potentially offers one of the most effective means of preventing dryland salinity or reversing its impacts.

Trees effectively reduce leakage of rainfall to the groundwater, but the timeframe to realising salinity benefits from tree planting is an important factor affecting investment prospects. The type of groundwater flow system and the landscape attributes are critical determinants influencing this timeframe, as short as 5 years for local groundwater systems but as long as hundreds of years for regional systems, and underpin the authors' regional analyses.

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Salinity in the Denmark River of South West of Western Australia has been reduced since 1991, due to groundwater approaching equilibrium following clearing and to the groundwater lowering effects of plantation forestry from 1988. While further reduction in salinity is expected, achievement of the stream salinity target for that catchment will require more forestry integrated with groundwater pumping, saline water diversion, perennial pastures and remnant vegetation protection. The important question is whether this integration of forestry with other salinity management measures can be repeated in other catchments.

What *are* the prospects?

In some areas, a careful balance is needed between controlling excess water with potential to mobilise problem salts and using water that feeds streams (and downstream communities), dams, crops and pastures. As such, integrated forestry needs to be targeted not just to achieve salinity outcomes but also to protect other enterprise and community values. The authors find that together, research and practice have created a significant knowledge base on salinity management, as well as justification for the need to protect high water-yielding catchments from inappropriate land use in critical areas.

The prospects for integrated forestry to tackle salinity are greatest in two regions - South West Western Australia and South West Victoria/South East South Australia - within the 600-750 mm rainfall zone, where some infrastructure to support forestry is already in place. Greater conflict with stream flows arise in the other four regions in this rainfall bracket, and therefore necessitates strategic targeting of plantings. For the 450-600 mm zone in all six regions the prospects are less favourable, largely a function of water availability, even though the opportunities to capture salinity benefits are great.

There is an urgent need to now refine and apply this knowledge at the regional to property scale through focused research and development. As well, a number of areas that need further research have been highlighted in this statement.

A clearer vision for landscape change at the regional scale is needed to guide the advancement of integrated forestry. Targeting sites for tree planting to maximise salinity impacts need to be more accurately identified. To date, third party investors (forestry companies, institutions) have demonstrated little interest in co-investing in lower rainfall areas (450-600 mm), largely for reasons of profitability. However, the 600-750 mm rainfall zone is expected to increasingly attract forestry investment due to the limited availability of land in higher rainfall environments and its comparatively high cost.

The *Integrated forestry on farmland* Prospect Statement follows *Lucerne Prospects* which was published in September 2006. Four other Prospect Statements will be published in 2007.

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Please send me *Integrated forestry on farmland*

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