

Research Projects

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Improved Information to Guide the Establishment of Eucalypt Plantations in Saline Regions

Proposals to establish commercial farm forestry and agroforestry over regions known to have shallow groundwater are likely to be an increasingly important issue for catchment management. This is already the case in areas such as the Riverine Plains of the Murray Basin, where there are extensive areas of shallow groundwater coupled with potential salinity impacts on irrigated agriculture.

Commercial tree growing on irrigated agricultural land offers an opportunity for diversified landholder income, development of new and expanded rural processing industries, enhanced stability of rural communities, potential land rehabilitation and

sustainability benefits.

There is, however, a concern that as these plantations grow, the trees accumulate salt within their root zone. This, in turn, limits the growth of the trees, adversely impacting both productivity and groundwater control. It is crucial therefore to site and manage the plantations appropriately – something that will involve community acceptance that trade-offs may need to occur between productivity and environmental benefits.

Salinity concerns have prompted proposals for large-scale engineering and biological schemes in similar situations (for example, saline floodplains and wetlands, dryland agricultural



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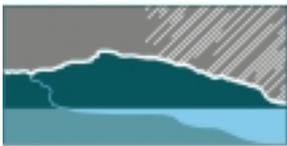
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areas), where vegetation is growing over shallow saline watertables. Suggested solutions have ranged from drainage works in the Murray-Darling Basin to plantations for dryland salinity control in Western Australia.

Several recent studies undertaken by CSIRO Land and Water scientists and collaborating researchers have established that even though similar processes operate under a range of vegetation and across sites, these will cause different, yet predictable behaviour because of site and plant characteristics. As most of the key processes for determining sustainability are now well understood and documented, it is timely to draw on this information to develop guidelines which can be used to assess proposals to establish eucalypt plantations on shallow saline watertables.

Where to from here?

Project partners have identified some key areas that require further research:

- refining the modelling rules for tree growth over shallow saline groundwater
- linking biophysical model output to economic indicators
- ensuring that the models used are widely applicable and tested across a range of site conditions so that the limitations of their predictions are well understood
- developing guidelines for planting trees in saline discharge areas, which incorporate information indicating whether plantation costs are justified with respect to production, water uptake and salt accumulation.

This collaborative project aims to address these issues by building upon and integrating with previous work.

Technical aspects

Key technical elements will involve:

- a review of salt accumulation, root function and groundwater uptake from shallow water tables
- modelling the processes that lead to salinity impacts on vegetation growth and groundwater control
- economic cost-benefit analysis using the FARMTREE and SALTREC models
- production of guidelines for commercial irrigated tree planting in discharge areas.

Project outputs

A practical manual for commercial irrigated eucalypt plantations in the southern Murray-Darling Basin will be produced, incorporating a new biophysical and economic analysis of sustainability and productivity issues in areas of shallow saline watertables.

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