

Profitable and sustainable grazing systems for livestock producers with saline land in southern Australia

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Introduction Dryland salinity affects over 2.5 M ha in Australia, mostly in southern states and is expanding at 3-5% per year (NLWRA, 2001). The prognosis is for considerable expansion of the area affected by salinity and waterlogging (12–17 M ha at equilibrium), because groundwater levels continue to rise and only small-scale land management programmes have been implemented. In addition, many waterways are increasingly saline, especially in the Murray Darling Basin and in Western Australia (WA). Sustainable Grazing on Saline Land (SGSL) addresses the need to make productive use of saline land and water resources. Its research component operates at 12 sites across WA, South Australia (SA), Victoria and New South Wales (NSW) and consists of coordinated activities that have regional relevance and contribute nationally. The programme seeks to develop and demonstrate profitable and sustainable grazing systems on saline land that have positive environmental and social impacts. Whilst there are different priority research issues at each site, data collection is governed by common measurement protocols for salt and water movement, biodiversity, and pasture and animal performance in order to make comparisons and data sharing across sites practical.

The research programme In WA research is spread across seven sites, representing about 4.3M ha of salt affected land. These include two large (about 50 ha) sites (near Tammin and Yealering) that allow comparisons between unimproved land and land improved to current best practice, using a saltbush (*Atriplex* spp.)-based system with and without improved understorey species. Other sites have been established at Yealering, Lake Grace, Wubin, Meckering and Grong Grong (NSW) to examine factors affecting the composition, growth, grazing management, utilisation and value of saltbush-based pastures to sheep. Saline areas in the upper south east of SA are subject to both severe waterlogging and inundation in winter, when rising groundwater brings salt to the root zone and soil surface, inhibiting plant growth, seed set and survival in spring and early summer. Research here is focused on a puccinellia (*Puccinellia ciliata*)-based pasture where the impacts of fertiliser and addition of balansa clover (*Trifolium michelianum*) into existing puccinellia stands are being assessed under continuous and strategic grazing. Maintaining the persistence of balansa clover is a key challenge. In Victoria the targeted areas are characterised by shallow water tables, which are often saline but where winter waterlogging and inundation are an added challenge. The research here is focusing on use of tall wheat grass (*Lothopyron ponticum*) and annual legumes to provide quality out of season grazing compared to unimproved pastures. The targeted areas in NSW, the Lachlan and Macquarie catchments in the central west of the state, are characterised by high and rising salt load and electrical conductivity levels and generally small discharge areas close to waterways. Research is assessing the impacts of a salt-tolerant, perennial grass-based pasture (tall wheat grass dominant), compared to volunteer/naturalised pasture, on pasture and animal production, and water, soil and salt movement off-site. All projects will be assessed for their impact on whole farm economics.

Conclusions This ambitious project is testing current best-bet options for animal production from saline land. Outputs will include clarifying the environmental impacts and quantification of the production and economic benefits of grazing saline land. Extension products to assist farmers to make better decisions about managing these land types will boost their confidence to incorporate more saline land into their whole-farm management plans for environmental, economic and social outcomes. A significant component of this national network of projects and sites is its links with, and the participation of, farmers through the research being located on commercial farms, the involvement of local advisory groups and formal and informal links with a national network of over 125 farmer initiated small-scale projects testing locally relevant options for managing saline land.

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References

NLWRA. (2001). Australian dryland salinity assessment 2000: extent, impacts, processes, monitoring and management options. National Land & Water Resources Audit, Canberra.