

THE BENEFITS OF TREES FOR IMPROVING THE VALUE OF GRAZING PASTURES IN THE UPPER SOUTH-EAST OF SOUTH AUSTRALIA

P.J. Taylor and I.K. Nuberg

Department of Agronomy & Farming Systems, University of Adelaide, Roseworthy, SA 5371

The upper south-east of South Australia is an important area for sheep and cattle grazing, with more than 80% of land sown to pasture (1). Land is degrading at the rate of 4-12% per annum, in terms of lost productivity, due to salinity and waterlogging. At present, 37% of the area is estimated to be affected by dryland salinity and a further 26% is at risk. A key recommendation of an Environmental Impact Study was a revegetation program, with a high priority on-farm option being the planting of *interception belts*. These are defined as long, narrow plantings of high water use tree species, strategically placed in the landscape e.g. above the break of slope (2). This study aims to evaluate the potential regional impacts of these belts on soil salinity and water tables.

MATERIALS AND METHODS

Water use patterns of pink gum (*Eucalyptus fasciculosa*) are being investigated using the heat pulse velocity technique (3) at four sites with a range of soil and groundwater salinity conditions. Results from these studies will be used in computer simulations of groundwater levels at each site using the groundwater modelling software package, MODFLOW (4). The configurations of belts and the physical location in the landscape required to produce optimal effects will be determined by simulation for each site. These effects will be scaled up on a regional basis, using mappable parameters such as groundwater salinity and depth and soil salinity, on an existing GIS.

DISCUSSION

The expected outcome of the study is an indication of the regional extent of areas which may benefit from interception belts and the configurations and locations required to optimise those benefits at the farm scale, according to site conditions.

ACKNOWLEDGMENTS

This project is being funded by the Land and Water Resources Research and Development Corporation in the form of a postgraduate scholarship.

REFERENCES

1. USEDS and FMPSC (Upper South East Dryland Salinity and Flood Management Plan Steering Committee) 1993. Upper South East Dryland Salinity and Flood Management Plan Environmental Impact Statement.
2. Bulman, P.A., Cohen, B. and Jensen, A. 1993. Revegetation Principles and Options - A background paper prepared for the Upper South East Dryland Salinity and Flood Management Plan Environmental Impact Statement. South Australian Dept. of Environment and Land Management.
3. Swanson, R.H. and Whitfield, D.W.A. 1981. A numerical analysis of heat pulse velocity theory and practice. J. Exp. Botany 32(126), 221-239.
4. McDonald, M.G. and Harbaugh, A.W. 1984. A modular 3-D finite difference groundwater flow model. Open File Report (No. 83-875), U.S. Geological Survey.