**Abstract**

**Rationale**
Several studies have described the potential for large-scale mitigation of carbon in farming systems either through sequestration or as a bioenergy feedstock. This mitigation may either result in trade-offs such as competition for food and water, or co-benefits, such as improving land and water condition. A key area of interest is how to integrate carbon mitigation with primary production to maximize co-benefits and reduce trade-offs with one approach to use land that has been abandoned to agriculture. This is particularly relevant with the passage of Carbon Credits (Carbon Farming Initiative) Act 2011 and the Renewable Energy (Electricity) Act 2000 and its 2010 amendment, which allows participation of land-based projects.

**Method**
Large areas (~5-7 million ha) of land have become salinized in Australia with impacts on primary production, biodiversity and water supplies. A Natural Heritage Trust/RIRDC/WA Government project established several salt-tolerant species on abandoned, salinized land near Wickepin, Western Australia (350 mm/yr annual rainfall) in 2001. This site is typical of much of the lower rainfall grazing/cropping areas of southern Australia.

The aims of this land treatment were to achieve carbon mitigation via either carbon sequestration, the production of biomass for co-firing for electricity production or feedstock for second generation biofuels, and the stabilization of soils and hydrology in the salinized area.

**Results**
A range of factors significantly affected both carbon sequestration and biomass production on the salinized site. These include hydrological conditions such as salinity, site factors such as slope position and soil properties and a range of silvicultural factors such as species, planting density and age of the planting. High density (2,000 trees/ha) plantings of *Eucalyptus occidentalis* produced a mean of $78.3\pm8.4$ tCO$_2$-e/ha, ten years after planting. *E. sargentii* (1000 trees/ha) sequestered $65.1\pm9.7$ tCO$_2$-e/ha. Saltbush (*Atriplex nummularia*) achieved yields of around 28 tCO$_2$-e/ha and grazing value. Continued mitigation is expected as the stands mature, assuming that growth is not affected by the accumulation of salt.

**Economic Impact**
Economic analysis over the 10-year period, with a carbon credit price of $23$ tCO$_2$-e, suggested that although *Eucalyptus occidentalis* (2000 trees/ha) had the highest carbon sequestration rate, *E. sargentii* (1000 trees/ha) was the most profitable as it is less costly to establish trees at a lower planting density. Here, the return was $1,498$/ha, which translated to a rate of return of 13.4%. This is considered a good investment prospect for the treatment of saline land by farmers.

Few profitable options for the management of dryland salinity, or indeed dryland forestry, have been previously identified and this is a very promising result. Treatment of salinized land is often considered in terms of public funding, and thus represents an option to fund land treatment at a broad scale from private funds.

**Conclusion**
Despite salinity disappearing from the national agenda, this is still a major ongoing problem in the management of Australia’s land and water resources. Clearly, carbon mitigation could provide a self-funding approach to the broad-scale treatment of salinized land. Further work is required in terms of defining carbon mitigation potential across a wide range of sites, variation in mitigation between species and management systems, the long-term sustainability of sites with changing climate and landscape hydrology, valuing co-benefits and tradeoffs and the impact of future policy decisions on carbon pricing.