

Extract from:

Changes in groundwater balance in the Upper South-East region of South Australia

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2. Can we reverse this change through agronomic measures?

The above changes have been brought about by a change of water balance on the dunes. The annual pastures are not as efficient at using all of the rain when it falls and more moves to the groundwater. Can we reverse the change in water balance?

Walker et al. (1992a, 1992b) showed that the long-term recharge under lucerne was less than 5 mm/yr and may even be as efficient as the native vegetation. Thus, an agronomic tool exists that is capable of reverting the groundwater balance to pre-clearing conditions. However, to reduce recharge to the extent that it can be transported in the aquifer requires recharge to be reduced to 80-90% of its original value (Kennett-Smith et al., 1994b, 1995, 1996). The total volume of recharge is a combination of area and recharge rate (mm/yr). To achieve 80-90% recharge reduction would imply that 90% of the dunes and associated areas to be covered by a low recharge land use such as lucerne. Some areas to the north-east have a terrain similar to that of Cooke Plains. For those areas, the modelling work of Pavelic et al. (1997) would be relevant. This suggested that a 50% recharge reduction would lead to a decrease in land salinisation, although not reversing it entirely. It should be noted that the threshold levels suggested by these different modelling may have changed through the installation of drains. However, revised modelling has not occurred.

Since the Upper South East overlies the one groundwater system, this effectively means that the level of recharge reduction needs to occur over the whole area. This implies that nearly all of a large number of landholders need to be involved, with a significant investment in a change of land use. There are not many regions, where this level of uptake of changed land use for the purposes of natural resource management has occurred over such a large area. One of the exceptional cases is the Coorong and Districts that includes part of the Upper South east region. For this area, it is believed that lucerne represents a profitable alternative. Over recent years, there has also been a larger implementation of lucerne across the general Upper South East region (McEwan et al., 2002). Some of the problems with non-wetting sands and difficulty of establishment have been addressed. Nonetheless, it may take some time for threshold levels to be attained and measurable changes on groundwater levels to be observed. During this initial period, the use of engineering to protect valuable land or environmental areas may be considered.

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