



Modelling Irrigation and Salinity Management Strategies in the Ord Irrigation Area

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ABSTRACT

The Ord River Irrigation Area (ORIA) is located within northern Western Australia near the Northern Territory border. Since the beginning of irrigated agriculture in the ORIA the groundwater levels have been continuously rising and are now close to the soil surface in some parts of ORIA in northern Western Australia. The groundwater is now saline throughout most of the ORIA and soil salinity risks are high where the watertables are shallow. This research evaluated irrigation and salinity management strategies for sugarcane and maize crops grown over deep and shallow, non-saline and saline watertables in the ORIA. The LEACHC model, calibrated using field data, was used to predict the impacts of various irrigation management strategies on water use and salt accumulation in the root zone. This study concluded that irrigation application equal to 100% of total fortnightly pan evaporation applied at 14 day intervals was a good irrigation strategy for the maize grown over a deep watertable area. This strategy would require around 11 ML/ha of irrigation water per growing season. Irrigation application equal to 75% of total fortnightly pan evaporation, applied every fortnight during first half of the growing season, and 75% of total weekly pan evaporation, applied on a weekly basis during second half of the growing season, would be the best irrigation strategy if it is feasible to change the irrigation interval from 14 to seven days. This irrigation strategy is predicted to have minimal salinity risks and save around 40% irrigation water. The best irrigation strategy for sugarcane grown on Cununurra clay over a deep watertable area would be irrigation application equal to 50% of the total fortnightly pan evaporation, applied every fortnight during first quarter of the growing season, and irrigation application amounts equal to 100% of total weekly pan evaporation, applied every week during rest of the season. The model predicted no soil salinity risks from this irrigation strategy. The best irrigation strategy for sugarcane over a non-saline, shallow watertable of one or two m depth would be irrigation application amounts equal to 50% of total fortnightly pan evaporation applied every fortnight. In the case of a saline watertable the same irrigation strategy was predicted to be the best with respect to water use efficiency but will have high salinity risks without any drainage management.

KEYWORDS

Irrigation Modelling, Salinity Modelling, Saline Shallow Watertable, Irrigation Management, Ord River Irrigation Area

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