

Water for Profit

MANAGING IRRIGATION SODICITY



Salt is present in many irrigation areas throughout Queensland, particularly those that rely on groundwater supplies. Effective salinity management is crucial to ensure both environmental and economic sustainability.

What is sodicity compared to salinity?

Salinity is characterised by high electrical conductivities and low sodium ion concentrations compared to calcium and magnesium. Sodicity is characterised by low electrical conductivities and high sodium ion concentrations compared to calcium and magnesium. Situations that have both high electrical conductivities and high sodium ion concentrations are called saline-sodic.

Effect of sodicity on crop performance

Salts are found naturally in soils, rainfall, irrigation water and groundwater. Sodicity affects soil structure, inhibits water movement and causes poor germination and crop establishment. The sodium in the system causes dispersion of clay soils, leading to soil structural problems such as hard setting layers, reduced infiltration rates and sealing and crusting of soil surfaces. If chloride is present, toxicity can accompany sodicity problems.

Management strategies

Once it has been established that a salinity problem exists there are several management strategies that can be employed.

All management strategies revolve around reducing or removing the sodium from the irrigation system. Once it has been established that a sodium problem exists several management strategies can be employed. Some strategies follow.

- **Change the sodium concentrations in the irrigation water** to reduce the sodicity levels experienced in the soil. Use a less sodic water source if available. Mix fresh water with sodic water either during every irrigation or by alternating the sources during the irrigation schedule.

- **Apply gypsum** to increase the concentration ratio of calcium to sodium. Gypsum improves soil structure by repairing and maintaining clay aggregation and improves soil permeability and infiltration rates. It reduces the potential for water logging, crusting and runoff. Organic matter can also be used as it increases soil water holding capacity and lowers sodium concentrations.
- **Apply a leaching fraction** to reduce the sodicity in the soil. Applying a leaching fraction will remove sodium from the root zone and reduce the sodium's impact on crop growth. Monitoring is required to determine whether a leaching fraction has occurred and to ensure that the leaching is not contaminating groundwater or stream flows.
- **Increase the efficiency of your irrigation system** and reduce the volume of over-irrigation. Inefficient systems have 'dry spots' and 'wet spots'. Irrigators have to over-irrigate to ensure that the dry spots are wet enough. In the process they over-irrigate the wet spots. Applying the water evenly will reduce the volume of water and sodium being put into the soil.
- **Reduce soil surface evaporation.** Keeping the water in the soil will lower the sodium concentrations. Mulching, either with organic matter or plastic mulches is effective. This is particularly effective in shallow rooted crops and during germination and establishment of crops.

For more details contact Growcom on 07 3620 3844.

Disclaimer: This information is provided as a reference tool only. Seek professional advice for irrigation specifics.

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