

Risks to infrastructure

High salinity water can lead to increased corrosion of farm equipment.

- Care should be taken when using highly saline water for dairy wash down and cooling plates to prevent corrosion of equipment.
- **Use of high salinity water will shorten the life of channel structures such as doors on checks and outlets.**

Consultation with the equipment manufacturers is recommended to determine the most appropriate water quality.

Other strategies to reduce impact of irrigating with saline water

- Irrigate when it is cooler, such as at night. High temperatures increase the stress on plants caused by salinity.
- Maintain appropriate irrigation frequency to prevent the root zone from drying out.
- Irrigate quickly to avoid excess infiltration of high salinity water.



**For more information on
managing groundwater visit
www.dpi.vic.gov.au/notes**

Contacts for advice on managing your groundwater

Goulburn-Murray Water
Tatura (03) 5833 5500
➤ Ed Thomas

Department of Primary Industries
Tatura (03) 5833 5222
➤ Clair Haines

Other support services available

Drought Response Hotline
136 186 for information on Rural Finance, Rural Counsellors and Drought Assistance.

Department of Primary Industries
Tatura (03) 5833 5222

Kyabram Dairy Centre (03) 5852 0500

Department of Primary Industries
Echuca (03) 5482 1922

Department of Primary Industries
Cobram (03) 5871 0600

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Management strategies for groundwater use in drought conditions

in the Shepparton Irrigation Region

Reducing the impact on your farm

The Shepparton Irrigation Region Catchment Strategy recommends that saline groundwater be reused at a maximum salinity of 800 EC (500 ppm). This 'safe' figure is based on the long-term sustainable irrigation of a ryegrass dominant pasture on a Lemnos loam soil.

In drought conditions, there may be limited opportunity to reuse groundwater at the 'safe' level. Possibly you might have to irrigate with straight groundwater or mix it with a lower ratio of channel water.

Be aware of the **risks** and **impacts** that saline water can have on your farm, and be aware of strategies for reducing the impacts.

Importance of soil type

- Use higher salinity water on lighter soils. Lighter, sandy soils have a better capacity to drain salts deeper down the soil profile enabling crops to tolerate the application of more saline water.
- Try to avoid using saline water on heavier soil types. On heavier loamy, or clayey soils with poor structure, the salinity tolerance of crops is less due to reduced leaching of salts.

Role of leaching

Groundwater pumping creates greater capacity for leaching of salts. If irrigating with higher salinity water on loamy, or heavier soils, do so where the groundwater pump has the greatest impact on lowering watertables. Using the water at or very near to the pump means salts applied are more likely to be leached.

Indicative figures for reduction in perennial pasture productivity considering soil type and applied water salinity are outlined in Table 1.

Irrigation Salinity Perennial EC ($\mu\text{S}/\text{cm}$)	Soil Type	Reduction in Perennial Pasture Productivity
800	Loam Clay Loam	0 - 10% 0 - 15%
1700	Loam Clay Loam	10 - 20% 15 - 25%
3000	Loam Clay Loam	20 - 35% 25 - 45%
4000	Loam Clay Loam	35 - 45% 45 - 65%

Table 1. Expected production losses when irrigating with saline water. After Noble (1987).

Actual reductions in productivity due to irrigation water salinity are site specific, vary with climate, soil conditions and cultural practices.

It is advisable to consult an agronomist for a more detailed assessment of the likely salinity constraints on pasture growth.

Impact of saline water on soil structure

Applying higher salinity irrigation water increases the risk of developing a sodic soil. Groundwater is dominated by sodium salts.

When saline water is used for irrigation, the sodium replaces calcium in the soil. This process tends to reduce soil stability.

- Alternating (or swapping) between saline-water irrigation and application of fresh water results in swelling and dispersion of clay particles. This leads to clogging of soil pores and a reduced volume of water that can move into or through the soil.
- Apply irrigation water at a constant salinity throughout the year to reduce the likelihood of sodic soils developing.

Gypsum, organic matter and soil structure

- Adding calcium (usually in the form of gypsum – but be aware of possible impurities in gypsum) works by replacing sodium in the soil profile. Consider applying gypsum regularly, at least at the end of the irrigation season.
- When using high salinity water irrigate established pasture rather than new pasture or crops on freshly cultivated ground. Soils high in organic matter suffer less structural damage.

Fertilisers

It may be necessary to apply more fertiliser when irrigating with saline water.

- Saline water reduces the growth of clovers (nitrogen fixing plants), due to their lower salt tolerance. As a result lower levels of nitrogen are available for plant growth.
- However, care should be taken as application of nitrogen fertilisers favours the development of grasses at the expense of clover production.