

# Groundwater salinity

How to minimise your risks



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**Groundwater can be a valuable source of irrigation supply. It can boost farm productivity by supplementing surface water supplies and, if the water quality is good, can be applied directly to crops or pasture. However management may be required, depending on the water salinity.**

## What is groundwater salinity?

Groundwater contains salt. Depending on the amount of salt in it, groundwater can alter soil structure and interfere with the ability of plants to take up water. Groundwater salinity can pose a potential risk to agricultural productivity if not managed.

Knowing the salinity of groundwater used for irrigation is the first step in managing this risk.

## How salty is your groundwater?

Water salinity is classified according to the concentration of salt. Groundwater salinity concentrations can be measured on-farm using a salinity meter and salinity is expressed as electrical conductivity (EC).

## General salinity classifications

Class	Salinity (EC)	Suitable for Irrigation?
Saline	>15,000	No
Brackish	5,000-15,000	No
Brackish	800-5,000	Yes – with careful management
Fresh	0-800	Yes

To find out more about measuring the salinity of your groundwater refer to:

<http://www.depi.vic.gov.au/agriculture-and-food/farm-management/soil-and-water/salinity/measuring-the-salinity-of-water>

## Can brackish groundwater be used to irrigate?

Most groundwater used for irrigation fits the brackish salinity category. Less than 5,000 EC, this kind of water is suitable for irrigation however some crops tolerate salt better than others. It is important to also understand your soil type and the salinity tolerance of your crops prior to watering with brackish groundwater.

To find out more about crop tolerance to salinity refer to:

<http://www.dpi.nsw.gov.au/agriculture/resources/soils/salinity/crops/saline-irrigation>

The higher the salinity is above 800 EC, the more that careful management and monitoring of plant and soil health is required.

## How can brackish groundwater affect farm productivity?

### Plant health

Plant uptake of water relies on the natural process of water moving from low salt concentrations in the soil, to higher concentrations within the plant roots.

Irrigation with brackish water can lead to salt building up in soil, interfering with this process and making it hard for plants to extract water. Without adequate water uptake, plants lose moisture, growth is slowed and yield is reduced. The symptoms of salt damage are therefore similar to those of moisture stress.

Brackish water applied to plant leaf surfaces can also cause scorch damage, affecting productivity.

<http://www.depi.vic.gov.au/agriculture-and-food/farm-management/soil-and-water/salinity/salinity-and-the-growth-of-forage-species>

### Soil health

Prolonged use of brackish water may result in a build-up of sodium (Na) in the soil.

Sodium tends to replace calcium ions that act to bind clay particles together. Sodium bonds are much weaker and while these bonds can be maintained with continued use of brackish water, when fresh water is applied, the weaker clay bonds allow swelling of the clay soils.

Particles then break apart resulting in a soil with poor cohesive structure. The dispersed clay particles can collapse, especially as the soil dries.

Once the soil structure has collapsed, movement of water through the compacted soil profile is greatly reduced.

These soils are known as sodic soils.

Sodic soils may develop slowly over a number of years. Signs that sodicity is present include increased run-off from pastures, poorer seedling emergence, and increased surface crusting.

Rehabilitation of sodic soils is possible through careful management.

For more information on impacts of brackish water on soils refer to:

<http://www.depi.vic.gov.au/agriculture-and-food/farm-management/soil-and-water/groundwater/effects-of-irrigating-with-saline-water-on-soil-structure-in-the-shepparton-irrigation-region>

## How can you manage salinity on your farm?

Diluting brackish groundwater with fresh surface water to make irrigation water as close to fresh as possible is the simplest approach to management.

Sufficient irrigation, winter rainfall and drainage through the soil profile can help flush built-up salts below plant roots.

During years of low surface water allocations undiluted low salinity, brackish groundwater can be used for irrigation for short periods.

However, careful management is essential to avoid damage of the irrigated soil before returning to fresh water irrigation.

Applying gypsum can help water to leach damaging sodium ions from the soil.

Advice should be sought from a qualified soil scientist or agronomist for evaluating the potential extent of sodicity and the steps required to return to full productivity.

## Who can you talk to at Goulburn-Murray Water?

For more information about how Goulburn-Murray Water manages salinity risks, contact Drainage Systems on 1800 013 357.

To find out more about groundwater resource management, contact Groundwater and Streams on 1800 013 357.