

Jobs in your lunchbox

Salinity research and rehabilitation

Humanities and Social Sciences

- ACSIS064
- ACSIS231
- ACSSU043



Salinity research and rehabilitation

Lesson overview

Salt affects millions of hectares of farm land in Australia. Students will research the adverse effects that salt has on plants.

Australian Curriculum: Humanities and Social Sciences

Science Inquiry Skills

Year 4 - With guidance, identify questions in familiar contexts that can be investigated scientifically and predict what might happen based on prior knowledge ([AC SIS064](#))

Year 5 and 6 - With guidance, pose questions to clarify practical problems or inform a scientific [investigation](#), and predict what the findings of an [investigation](#) might be ([AC SIS231](#))

Biological sciences

Year 5 - Living things have structural features and adaptations that help them to survive in their [environment](#) ([AC SSU043](#))

The growth and survival of living things are affected by the physical conditions of their [environment](#) ([AC SSU094](#))

Resources

- Wheat seeds (if you have easy access to seeds, this activity can be extended to test salt tolerance of different crops e.g. barley, canola, oats)
- Plastic cups
- Potting mix
- Salt
- Water bottles

Tuning in

View the photographs on the Department of Agriculture and Food Western Australia website:

agric.wa.gov.au/soil-salinity/dryland-salinity-western-australia-introduction

Give students four sticky notes. Ask them to view each image and write a word or comment in response to each photo. Discuss.

Whole class introduction

Dryland salinity is one of the greatest environmental threats facing Western Australia's agricultural land, water, biodiversity and infrastructure. Dryland salinity (non-irrigated land) is defined as salinity at or near the soil surface causing a reduction in plant growth, reduced water quality and damage to infrastructure.

Australian soils have always contained salt which was kept at bay by our highly adapted native species that used the water in the soil profile efficiently and kept the watertable low.

As the native vegetation was removed in the development of agricultural lands and replaced with short rooted crops and pasture, the excess water infiltrates the soil profile and collects as groundwater which over time has risen bringing the build-up of natural salts to the soil surface.

Salinity is usually first noticed when plants grow poorly and yields of farm crops and pastures are reduced by more than 25–30%. In severe cases, bare patches, known as salt scalds, develop with salt obvious on the surface. Where groundwater seepage is apparent, saline areas are referred to as saline seeps or seepage scalds (DAFWA, 2015).

More than two million hectares of broadacre farmland in Australia were estimated to be affected by dryland salinity, with more than half in Western Australia (Australian Bureau of Statistics 2002).



Cereals planted in a salt scald.



Salt affected barley.

Student activities

Exercise 1: Students investigate the effect that salt has on plants.

Assist students to identify the independent variable (What they will change), dependent variable (What they will measure/ observe) and control variables (Things that will stay the same) in the following scientific investigation.

- In five separate cups place five or six wheat seeds into dampened soil. Cover with plastic wrap to assist germination then keep moist and allow the plants to grow until they reach two leaf stage and are approximately 10cm high.
- Fill one 600ml water bottle with clean water. In the remaining four bottles mix water with increasing amounts of salt. Start with 1/2 tsp of salt, 1tsp, 2tsp, 5tsp. Label the bottles and cups.
- Record the effect that different solutions have on the plant through observation and measurement of plants. Taking photo's at regular intervals may help with visual observations.

Teacher notes: Dissolved salts found in water and soil are easily absorbed by the roots of plants and transported to the leaf margins where they 'burn' the leaves. Soils with high levels of salt hinder the plant's ability to uptake water and nutrients resulting in poor growth. Burning occurs on leaf tips and margins — yellowing progresses to brown and then black. Leaf shed and 'die-back' of growing tips can also occur and young plants can become stunted. Plants showing symptoms of salt damage will have thicker than normal leaves and appear a darker green as well as being stunted. Grasses appear dark green with burning on the margins (DAFWA, 2015).

Exercise 2: Year 5/6 students - The Walton family has managed to restrict encroaching salinity on their Yealering broadacre property by planting saltbush. View the following video on their efforts:

youtube.com/watch?v=8UCv_lh-hBw

Exercise 3: Year 5/6 Students - Use pictures and/or words to complete a flow chart to show how dryland salinity has occurred and some strategies farmers use to rehabilitate their land. Suggestions and prompts below.



Reflection

Solving an issue as extensive as salinity requires collaboration between landowners and many other professionals. Can you list some of the people who work in research and rehabilitation?

What sort of tasks or jobs do landowners and professionals need to do to determine if salinity is a problem and the best way to manage that salinity?