

WATER REPELLENCE

- AN INTRODUCTION



WHAT IS WATER REPELLENCE? ●●●

Soil water repellence (non-wetting soils) is the resistance of soils to wetting, sometimes to the extent that they remain dry even after significant rainfall events or irrigation.

Soil water repellence is caused by the presence of organic hydrophobic coatings on soil particles.

These coatings are commonly waxes, alkanes (paraffins) and long chain fatty acids that are left behind following the microbial breakdown of plant material. Soil organic matter may also be highly water repellent.

The consequences of water repellence are:

- Poor crop and pasture establishment.
- Increased risk of wind and water erosion.
- Poor water and nutrient use.



Poor crop establishment in water repellent deep yellow sand. **Photo. DAFWA.**

BENCHMARK TARGET ●●●

- Improved water repellence condition of agricultural soils across the South Coast NRM region.
- Reduce the impact of water repellence on agricultural enterprises across the region.



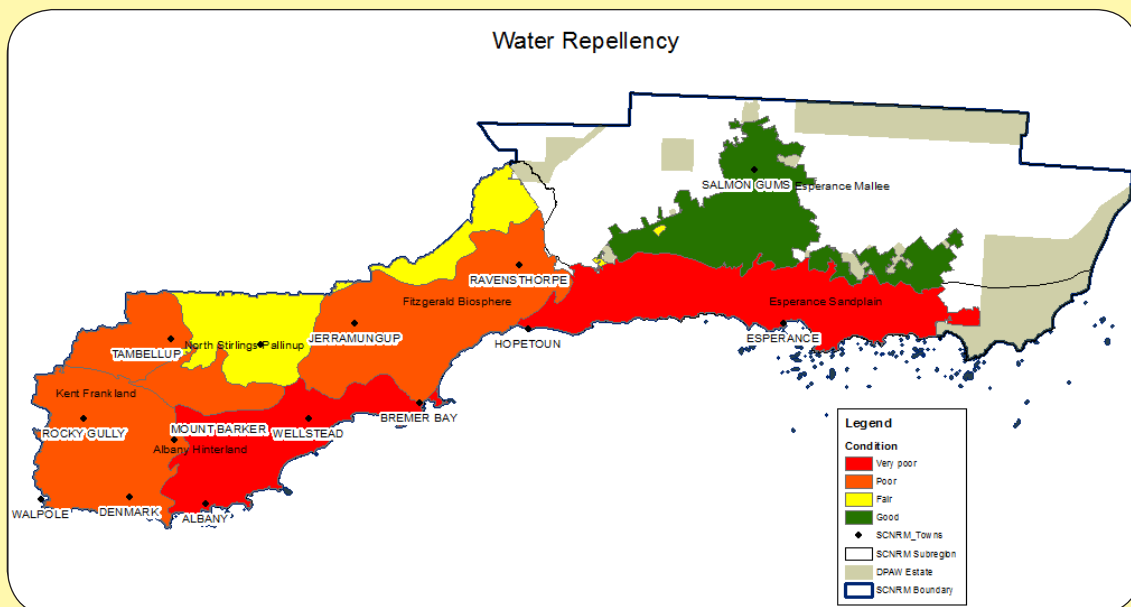
Water ponding on repellent soil with dry soil below ponded water. **Photo. DAFWA.**



Typical convex edged drop suspended on water repellent soil. **Photo. DAFWA.**

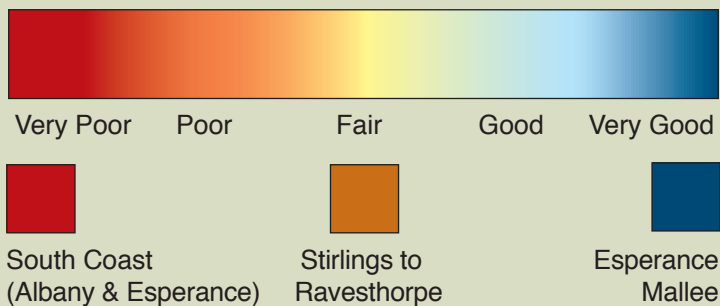
CURRENT POSITION on the SOUTH COAST ●●●

Summary of soil water repellence condition of soils across the South Coast NRM region.



Esperance and Albany sandplain soils generally show very poor condition for water repellence where water repellence is common to widespread. The Kent-Frankland and Fitzgerald Biosphere soils generally exhibit poor condition (water repellence is common) across the South Coast region, with the Pallinup and northern parts of the Fitzgerald considered in fair condition. The Salmon Gums Mallee area experiences only very small areas of water repellent soils.

TREND ●●●



PRACTICES to ACHIEVE TARGET ●●●

Water repellence is mostly an issue impacting on grain growers, where annual germination and crop establishment are affected by the non-wetting soils. A range of management options for cropping are available to overcome this issue including:

- Use improved furrow sowing using precision agriculture technologies.
- Use banded wetting agents, or blanket wetting agent or water absorber.
- Retain full stubble with low disturbance seeding.

- Use amelioration methods encompassing rotary spading, soil inversion through the use of a mouldboard plough. These methods are not recommended on lighter soils as they increase the risk of soil erosion.
- Amelioration through clay spreading or delving.

PLEASE NOTE: Unless specifically referenced, the information in this resource information sheet has been summarised from the *Report Card on Sustainable Natural Resource use in Agriculture by the Department of Agriculture and Food, Western Australia*.

For more information go to: www.agric.wa.gov.au/soil-constraints/report-card-south-west-western-australia.

REFERENCES ●●●

- Carter D, Davies S, Blackwell P and Schoknecht N (2013). 'Water repellence'. In: Report Card on Sustainable Natural Resource use in Agriculture, Department of Agriculture and Food WA.

FURTHER READING ●●●

- Moore G. (2001) (ed) Soilguide: A Handbook for Understanding and Managing Agricultural Soils. Agriculture WA Bulletin no 4343, South Perth.
- Grains Research & Development Corp (www.grdc.com.au/Research-and-Development/DAW00204)
- www.soilhealth.com - soil health website.
- www.soilquality.org.au - soil quality website.