

2022 Coorong Saltland Redemption Pasture Report

2021-22 Saltland Redemption Monitoring Program

Monitoring of key long-term demonstration sites has continued in 2021-22. The rainfall received in the 2021 year was well below long-term rainfall (310mm compared with the long-term average of 378mm at Cooke Plains) making the transitional areas difficult to manage. Given that though, the groundcover across sites continued to be maintained (particularly where grazing was restricted or excluded) and groundcover levels further improved. This is highlighted in the NDVI (Normalised differential vegetative index) data from the Cooke Plains demonstration site on Gypsum Road where the spring NDVI (captured between 30th August- 15th September each year) continued to show a decline in areas with a low NDVI value suggesting that from over 50% bare ground in 2018, the site is now almost fully covered (Figure 1). This can be observed in the field and is shown in the photos in Figure 2. Puccinellia has continued to thrive at this site (Fig 2b) and has largely colonised with some Neptune Messina still regenerating and nodulating after 5 years (Fig 3).

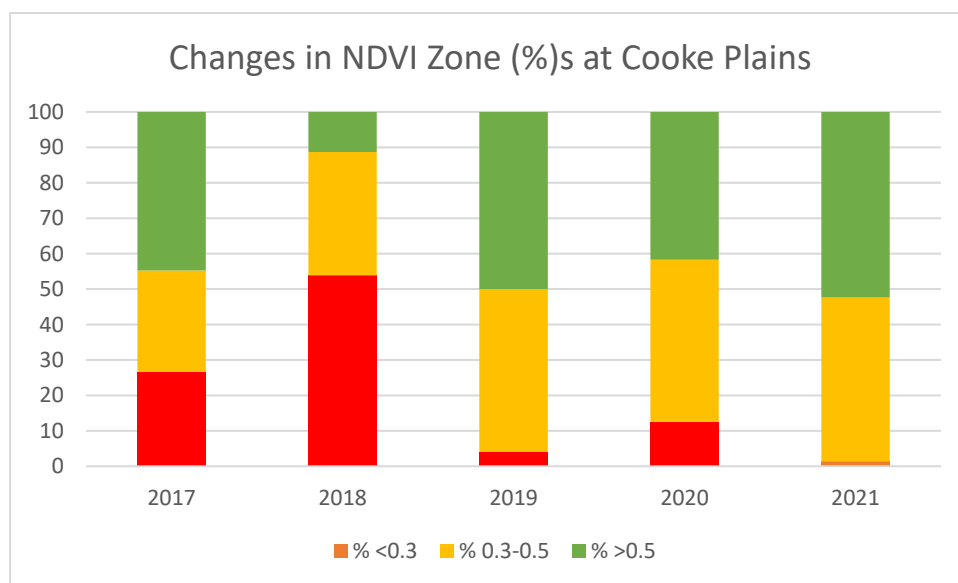


Figure 1. Changes in NDVI at Cooke Plains demonstration site (2017-2021)

Figure 2 (a-b) Site photos in early winter



Figure 2a. 2019



Figure 2b. 2022



Figure 3(a-b) Messina regeneration, June 2022.

Seasonal changes in salinity levels have continued to be monitored to determine the impact of rainfall and seasonality on soil salinity levels and the subsequent ability of plants to germinate in these saline environments.

Previous monitoring has seen a focus on monitoring areas with bare ground vs. ground cover. The results have been fairly consistent over the monitoring period (2018-2021) so in 2021 the decision was made to focus more on seasonality on those transitional areas. The site that was focussed on was the site at Roby Downs where an automated weather station, soil moisture probes and automated depth sensor are looking to provide more information around what is happening below the ground and correlate that to what is happening above the ground.

Soil samples were taken in early Spring and again in Autumn at the same location and the results were as expected with a lower soil surface (0-10cm) salinity (Fig 4) and soil chloride levels (Fig 5) in Spring (after rainfall had washed some of the salts from the surface) and an increase in the soil surface salinity over the summer period as evapotranspiration occurs. over the summer period and a lower salt concentration after winter rainfall events. The changes are reversed in the sub-surface (10-30cm) layer. This result was as expected as the salts appear to wash through the surface into the sub-surface layers during the winter period increasing the concentration slightly in the topsoil, and then they move back up through the summer period through evapotranspiration to the soil surface. Reducing the amount of movement through groundcover and vegetation has been the key to success in remediating these soils and the soil test results reflect what the farmers think has been occurring in this landscape.

The samples were taken from two locations in close proximity; one on the bare scalded area (which is starting to cover) and the other from a slightly higher elevation (10-15cms higher in the landscape in a transitional salinity area where the soil moisture probe is located nearly at the same elevation).

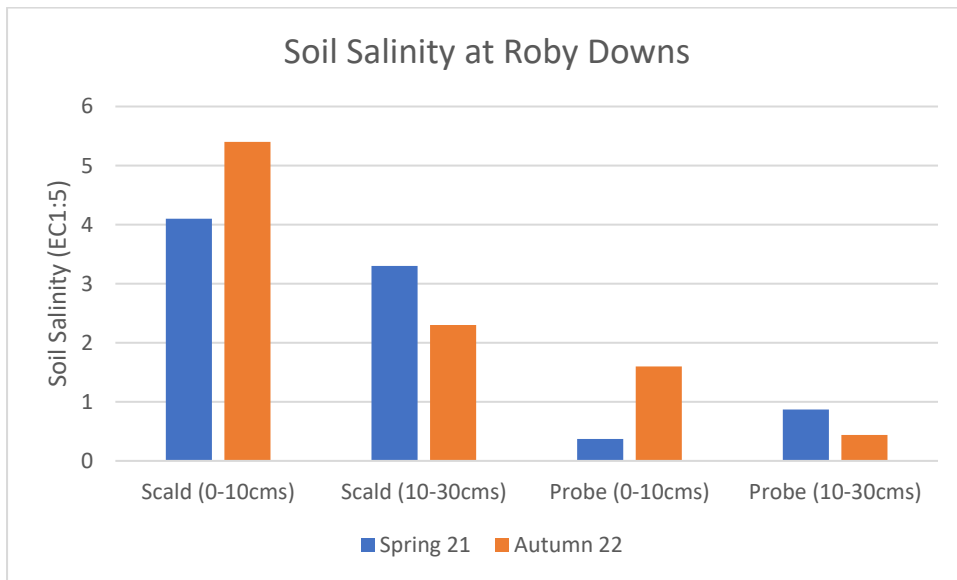


Figure 4. Soil Salinity levels in early Spring 2021 and Autumn 2022

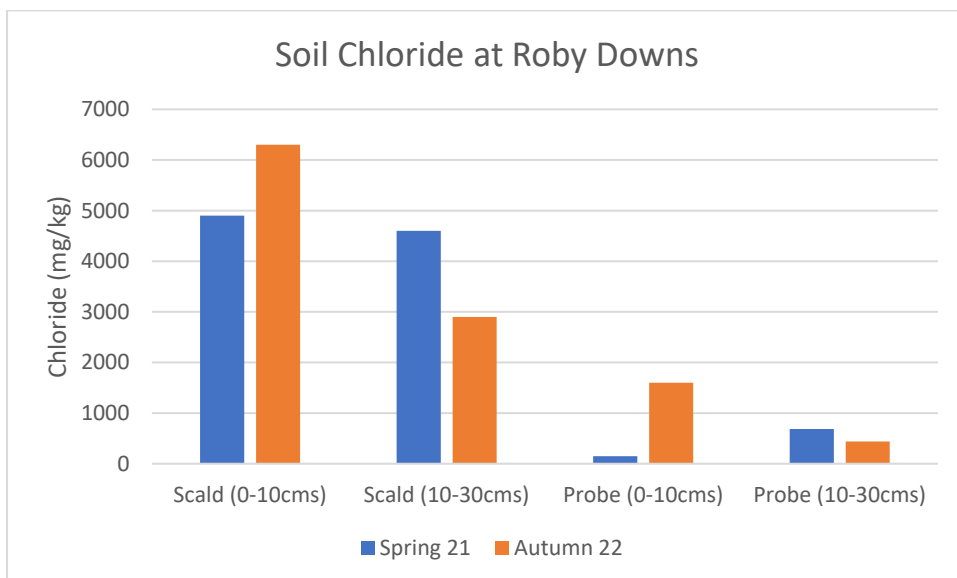


Figure 5. Soil Chloride levels in early Spring 2021 and Autumn 2022

Additional soil data was to be collected in winter, however soil pits were dug at these sites for extension purposes in Autumn and therefore the profile had been disturbed. The soil moisture probe data will be utilised going forwards.

Key Messages from the Saltland Redemption Project remain the same;

- **Know your soil salinity levels**
- **Maximise diversity when sowing into saline land**
- **Maintain Groundcover (especially over the summer period)**
- **Wait until the winter rainfall has penetrated to 30cms and reduced the salt loading in the surface – the winter “flush”**