COOMANDOOK SALTLAND REDEMPTION PROJECT – 2018 UPDATE
AN INITIATIVE OF THE COOMANDOOK AG BUREAU AND THE COORONG TATIARA LAP

Project Summary
The Coomandook Saltland Redemption project was initiated by the Coomandook Ag Bureau to investigate the application of new developments in the productive use of saline land across Coomandook / Cooke Plains area. This included testing the suitability of new salt tolerant legume species Messina and complimentary salt tolerant pastures in broadacre farming systems. After consultation, and as a result of the dryland salinity information sessions held across the Coorong District Council area in 2016, it was decided to establish an additional site in the Meningie East area.

Key issues that farmers wanted to investigate were:
1. Does Messina grow in the environment?
2. Can it be productive either as a stand alone species or as part of a pasture mix?

Project Activities
To address these issues, three farmer demonstration sites were established during the 2017-18 season at Cooke Plains, Coomandook and Meningie East. These sites were sown down with Messina – either in mixes with other potential salt tolerant pastures or as a stand-alone species to assess the potential for Messina across not only saline areas, but in the gradational areas surrounding saline areas. All sites were sprayed out prior to sowing and then sown with inoculated Messina plus or minus other companion species.

A replicated trial site was also established at Cooke Plains (in collaboration with SARDI) to look at the seeing rates for Messina in a low rainfall environment, and the impact of fungicide seed treatments (Apron SD™) on establishment and nodulation of Messina.

The results in 2017 were highly variable with the limitations of Messina as a curative plant on salt scalds being observed. 2018 plans were reviewed based on results in collaboration with growers and sites were either resown or left to regenerate.

PROJECT DETAILS

Project ID: 1268C

Funding Body
This project is supported by the South Australian Murray-Darling Basin Natural Resources Management Board, the South East Natural Resources Management Board, The Coorong Tatiara Local Action Plan and the Coomandook Agricultural Bureau through funding from the NRM Levies and the Australian Government’s National Landcare Programme.

Project Duration
2017-2019

Site Locations
- Cooke Plains (K & R Roberts)
- Coomandook (Hansen Farms)
- Coomandook (Simmons)
- Meningie East (S.Willis)
In 2018, the same sites were utilized, with areas either being resown or being left to see what levels of plants regenerated (Table 1).

There was also a shift in focus by the steering committee from looking solely at the remediation of saline scald areas to try and pro-actively identify areas that were potential areas where salt may occur. Unfortunately, this was 12 months too late, with large areas being lost to salt scalds over the summer period and further areas of dryland salinity observed in crops in 2018.

Digital Elevation Modelling (DEM) has been captured for the region, and it is hoped that this may be combined with the Piezometer data and farmer knowledge to see how the relationship in elevation and groundwater depth varies across the region, and to also see if this correlates with areas in which ‘new’ areas of dryland salinity has been observed in 2018.

Historical EM38 data has also been utilized as part of the monitoring / soil testing process on paddocks that were surveyed 8-10 years ago.

<table>
<thead>
<tr>
<th>Site Location</th>
<th>2018 Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooke Plains</td>
<td>Mulching to provide a micro-climate for Messina establishment</td>
</tr>
<tr>
<td></td>
<td>Various pasture mixes</td>
</tr>
<tr>
<td></td>
<td>Use of various liquid fertilisers to try and increase establishment levels</td>
</tr>
<tr>
<td>Coomandook (Hansen Farms)</td>
<td>Regeneration observed and monitored from 2017; some areas resown</td>
</tr>
<tr>
<td>Coomandook (Simmons)</td>
<td>Regeneration observed and monitored (from initial planting in 2016)</td>
</tr>
<tr>
<td>Meningie East</td>
<td>Regeneration of Messina and Puccinellia observed</td>
</tr>
</tbody>
</table>

Table 1. Site Activities for 2018

Preliminary Findings 2018

1. Cooke Plains:

   The site has been monitored since the start of April with salinity tests being taken at the same site every 2 months to see if there is a change in soil salinity due to ‘flushing’ effect. A shift in soil salinity levels over that time hasn’t been observed; possibly due to low rainfall levels (approximately 70% long-term average April-Aug rainfall has been received, with a larger proportion of it falling in August).
Even though germination has been limited at this site, the presence of straw and the organic matter present has assisted in reducing wind erosion over the late autumn/winter period. It is yet to be seen if this assists with wind erosion over the summer months.

Since rainfall in August (100mm), there has been an increase in germination observed across the site however it is yet to be seen if this carries through to establishment and seed set of Messina. Puccenellis appears to be the species that has established the best at the site.

2. Coomandook (Hansen Farms)

Plant establishment counts were taken in late July across the site. In 2017, there was a really distinct difference in areas of establishment based on location in the landscape. This was also observed with the site regeneration in 2018. The regeneration figures at varying levels of soil salinity (measured at time of plant samples) are shown in Table 1. The establishment at the site is shown in Figure 3-4.

Table 1. Plant numbers and soil salinity at Hansen Farms.

<table>
<thead>
<tr>
<th>Messina Regeneration plants/m2</th>
<th>Salinity EC(s.e.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Ground</td>
<td>380</td>
</tr>
<tr>
<td>Low Ground</td>
<td>150</td>
</tr>
<tr>
<td>Resown area</td>
<td>-</td>
</tr>
</tbody>
</table>
3. Coomandook (Simmons)

Some Messina was sown in 2016 and in 2017 good levels of regeneration were observed. A decision was then made to monitor this site in 2018. The areas adjacent to the saline levels were sown down to canola in 2018 and there were large areas that had previously grown crops, that became unproductive in 2018 (Figure 5). Soil samples were taken to depth (where possible) in August 2018 on the hill where there was canola established, in the mid-slope where canola had been planted but had not established and on the flats where the Messina had been planted. The soil cores are shown in Figure 6 and the results from the soil salinity tests are shown in Table 2.

![Fig 5. Simmons site with poor/no canola establishment](image)

**Fig 5. Simmons site with poor/no canola establishment**

![Figure 6. Soil cores at Simmons’](image)

**Figure 6. Soil cores at Simmons’**

### Other observations

Initial germination on established sites appeared to be significantly better at sites (Hansen Farms loamy ground) where sheep had grazed as opposed to a site where the paddock had only been grazed lightly with cattle (Williss’).

![Fig 3. Initial germination, Hansen’s (31st May 2018)](image) ![Fig 4. Initial germination, Williss’ (31st May 2018)](image)

**Table 2. Soil test results – Simmons Farms**

<table>
<thead>
<tr>
<th>Location</th>
<th>Ground cover/Crop</th>
<th>Soil Salinity (EC s.e)</th>
<th>Soil Texture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hill</td>
<td>Canola established</td>
<td>2.89</td>
<td>Sand</td>
</tr>
<tr>
<td>Mid-slope</td>
<td>Poor / no canola established</td>
<td>17.4</td>
<td>Loam</td>
</tr>
<tr>
<td>Flat</td>
<td>Saline area - Messina in patches</td>
<td>30.4</td>
<td>Loam</td>
</tr>
</tbody>
</table>

![Table 2. Soil test results – Simmons Farms](image)
Acknowledgements

Heritage Seeds
Seednet
Landmark, Cooke Plains and Keith
Platinum Ag Services, Meningie