

COOMANDOOK SALT LAND REDEMPTION PROJECT

Site Location Species sown (2016)

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.

Table 1. outlines the species sown at each of the demonstration sites.

Sites are to be monitored for establishment, growth and production in 2017, and regeneration and persistence into 2018.

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)
- Meningie East (S. Williss)



Cooke Plains	Messina @ 10kg/ha + Lucerne (SARDI Grazer) @ 3Kg/ha
	Messina @ 10kg/ha + Puccinellia @ 4Kg/ha
	Messina @ 10Kg/ha + Scimitar medic @ 3kg/ha + Phalaris @ 3kg/ha
	Messina @ 10Kg/ha + Persian clover @ 3kg/ha + Fescue @ 5kg/ha
Cooke Plains	Messina Seeding Rate Trial (sown by SARDI)
Coomandook	Messina @ 10Kg/ha
Meningie East	Messina @ 10kg/ha + Puccinellia @ 5Kg/ha

Table 1. Site locations and species being assessed at each site

Project Outcomes (to end of August 2017)

1. Cooke Plains:

Broadacre areas across site were sown between 24th April and 1st May 2017.

The Messina small plot trials (seeding rate trial) sown approximately 25th May 2017.

Soil test results showed an EC(1:5) of 6.3dS/m on the low ground and 2.6dS/m on the high ground.

The Cooke Plains site was monitored at approximately 28 days and 60 days after sowing. Initial assessments (28 days) showed very slow and patchy germination, and so no formal assessments were made. At 60 days the site was still very patchy with good establishment on the 'rising' ground, but almost no establishment on the flats (Figs 1-2).

There was some concern that hard-setting of the soil and the sodicity may have affected initial germination, however this has been ruled out by Brian Hughes, Rural Solutions SA after interpretation of the initial soil test results who believes that salinity at the site is the dominant factor.



Fig 1. Patchy establishment at Cooke Plains site (28th June 2017)



Fig2. Poor/no germination on flats

This issue was raised by K.Roberts (landholder) and Landmark Cookes Plains with Seednet who undertook further investigation; particularly around soil sampling areas where Messina had established vs. those where it hadn't. A delegation from Seednet came to the site in August to learn more about the activities that were being undertaken and also to discuss the poor germination across parts of the site (Fig 3).



Fig3. Seednet representatives visiting the site

On the 4th August 2017, areas where germination had initially failed or been poor were resown to see if a delay in sowing (and potential decline in soil salinity levels through a flushing effect) could result in establishment across these highly saline areas.

These areas will be monitored as the season progresses, and additional soil samples have been taken at a later stage of the season to see if the salinity levels change with winter rainfall events.

2. Coomandook:

The site was sown with straight Messina on approximately 28th May 2017.

The site was monitored approximately 28 days after sowing. There was what appeared to be a fairly even germination of Messina across the site (Fig 4), with initial establishment levels varying from 19plants/m² on the saline flats to 42plants/m² on the rising gradational areas within the site. Fig 5 shows the plant populations across the site.

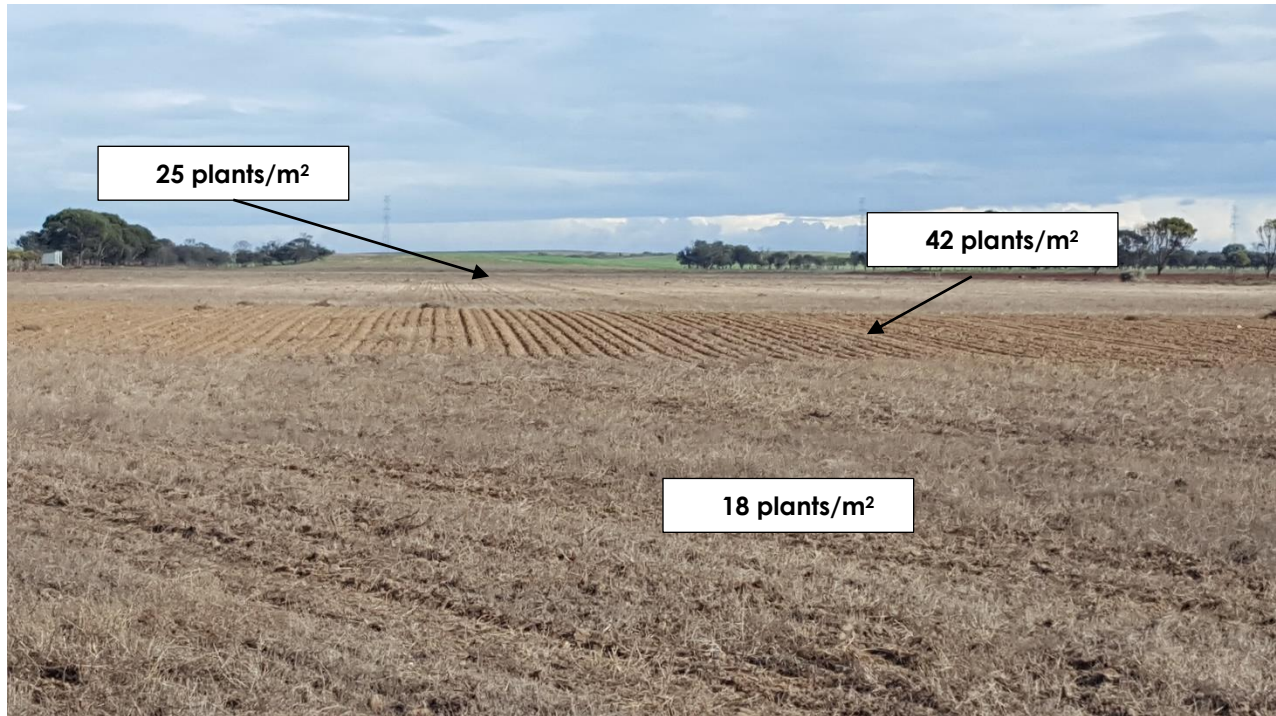


Fig 4. Plant populations across site at Hansen Farms (28th June 2017)



Fig 5. Initial germination at Coomandook site – photo taken in area where germination averaged 25plants/m². There were at least 3 germinations of Messina observed at the site from July through to August. These germinations appeared to occur after large rainfall events. The initial germination had nodulated well, and the nodulation was effective (pink, fleshy nodes) – Fig 7.



- 1st Germination
(Established Messina)
- 2nd Germination
(Messina at 2nd trifoliate stage)
- 3rd Germination
(Messina at spade leaf)



Fig 6. Staggered germination at Coomandook site

Fig 7. Messina Nodulation

3. Meningie East:

This site was sown on 23rd July 2017 with a mix of Messina @ 10Kg/ha and Puccinellia @Kg/ha with the addition of a very light barley cover crop.

Soil ECe levels in the topsoil (0-15cm) were 5dS/m on the mid-slopes.

The area contained some wet scald areas, but had predominantly had tall wheat grass established over the area, and the aim was to establish a pasture mix that was more productive and easier to manage.

Figure 8 shows the site in the Middle of September.

Initial plant establishment of the Messina (6 weeks post-sowing) was 37 plants/m² across the rising, marginal areas of the site.



Figure 8. Meningie East site 14th September 2017

The Messina had established initially in areas that then became inundated with water, and it appears to be tolerating temporary inundation at this site (Fig 9 – 10).



Figure 9. Messina growing while inundated.



Figure 10. Messina inundated in water

Additional Sites/Activities:

Since the sites were established, other Messina sites have been identified and are being included in monitoring to add value to the project. These include a site at Neville and Jan White's, Cooke Plains that is being run by Elders Murray Bridge and Heritage Seeds, and also a site at Paul Simmons' where Messina was established in 2016. Fig 11 shows the regeneration of Messina at Paul Simmons' and Fig 12 show the seed sitting on the soil surface in late August.



Figure 11. Messina Regeneration in 2017



Figure 12. Messina seed sitting on the soil surface

The site at White's contains various legumes and grass species that have been planted around a saline swamp to see how each species performs. As part of the project, feed tests have been taken comparing Messina feed quality to that of Scimitar Medic, Balansa and Nitro Persian Clover. The initial results are shown in Table 2.

Table 2. Feed Test Results from White's site

Test	Messina	Nitro Persian	Balansa
Dry Matter (DM) (%)	12.3	10.9	7.8
Moisture (%)	87.7	89.1	92.2
Crude Protein (% DM)	32.7	26	25.3
Acid Detergent Fibre (% DM)	19.6	18.5	20
Neutral Detergent Fibre (%DM)	25	31	34.3
Digestibility (DMD % of DM)	82.9	80.5	78.1
Digestibility (DOMD) (Calculated % of DM)	77	75	73
Est. Metabolisable Energy (Calculated MJ/kg DM)	12.6	12.2	11.8
Fat (% of dry matter)	4.8	4.5	4.7
Ash (% of dry matter)	13.7	13.5	12.9

Future Activities

Ongoing discussions will continue with the Steering Committee which is made up of landholders, representatives from Agribusiness and the CTLAP. Some ideas that have been currently suggested include:

- Mulching or Manuring scalded areas to provide an improved environment for germination
- Seeding methods – leave sitting on the surface as opposed to dropping in the press-wheel furrow
- Regeneration – can soil disturbance help to improve the germination in Year 2.

We would like to hear any additional ideas that you have and encourage you to share these with Tracey, Felicity or one of the participating landholders.

Acknowledgements

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Elders Murray Bridge

Seednet

Brian Hughes, Rural Solutions SA