A summary, in poster form, of all the 70 SGSL Producer sites in Western Australia.
Preface

Sustainable Grazing on Saline Lands (SGSL) Producer Network was set up to help livestock producers better understand and manage their saline land through a range of activities.

This book contains a complete summary, in poster form, of all 70 SGSL grower trials in WA.

These posters were prepared and presented at the 2004 SGSL spring field days and represent each of the individual grower projects and their progress as a snapshot in time and record of progress.

They were compiled to allow all the growers involved view what others are doing.

Each site summary can be referenced by page number as shown in the Index: Once you know the page number, turn to the correct page.

SGSL was an initiative of Australian Wool Innovation Limited and Land & Water Australia. It included financial support from Meat and Livestock Australia, as well as CSIRO and the Department of Agriculture and Food, Western Australia.
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NB: there are 70 sites listed.

Niche seeder mounding and seeding saltbush.
METHODS OF ESTABLISHING OLD MAN SALTBUSH ON A HARD SETTING CLAY SOIL TYPE.

RESEARCH OBJECTIVES

• To determine the most effective method of establishing saltbush on a hard setting clay soil type.
• Examine the suitability of a range of perennial grass species to compliment the saltbush.

Outcomes

• Site had a very good saltbush establishment
• A poor season in 2001, saw mounded lines having greater success than ripped.
• Late sowing (Aug) of River with ripped lines appears to be the most effective.
• River tends to be more waterlogging tolerant than Old Man.
• Old Man does better on mounds
• Old Man on average recorded higher FOO than River saltbush

FAST FACTS

| Location: | Approx. 10 km South of Mingenew. |
| Soil Type: | Alkaline red/brown non-cracking clays and alkaline shallow loamy duplex |
| Annual Rainfall: | 380mm |
| Pasture Base: | Barley grass, bare land, doublegees |
| Landscape: | Long gradual slope 1% from small hill. |

WANT TO KNOW MORE?

Host Farmer
Ben Cobley, (08) 9928 101

NRM Coordinator
Rachel Bagshaw, Tel (08) 9928 1645

Database Website
Perennial grass growth kickstarted with good Autumn rains

What are the site details?
- **Location:** 20 km east of Wubin
- **Rainfall:** 300 mm annually
- **Site description:** Broad valley floor
- **Area:** approximately 35 ha
- **Soil types:** red sandy loam, acidic sub-soil in some areas

What are the project objective?
- To make use of land that is at threat from salinity by establishing a mix of sub-tropical perennial grasses and saltbush
- To make some use of a shallow water table if the plant roots can access it
- To increase grazing value of the paddock by adding annual legume pastures to the perennial mix

What are the outcomes?
- Bambatsi panic, signal and rhodes grass have good drought tolerance (survived on 130mm of rain from Nov 2001 – Feb 2003)
- Saltbush seedlings seem to have higher survival rate than direct seeded saltbush
- Roly Poly can be controlled with 2,4-D Ester and Garlon
- Perennials achieved excellent growth after heavy opening rains of 2005
- Annual legume pastures have set seed this year and should provide a good pasture base with the perennials for 2006

More information?
- Keith Carter 96643051
- Brianna Peake 96642030
FITZGERALD BIOSPHERE GROUP

INTEGRATING PERENNIAL AND ANNUAL PASTURE RESEARCH INTO A SALTLAND GRAZING SYSTEM

OBJECTIVES
- How well does the perennial pasture species puccinellia, tall wheat grass and saltbush establish?
- What is the impact of perennial pasture species options on groundwater rise?
- Can the perennial pasture species be incorporated into the current farming system?
- Are these perennial pasture species economically viable?
- Can farmers easily establish these saltland pastures without specialist equipment?
- Can the barriers to adoption be reduced so that more perennial pastures are sown on saline soils?

OUTCOMES
- Saltbush alleys of varying success
- Inter-row perennial (Lucerne, Tall wheat grass and Puccinellia) and annuals of varying success
- Balasa clover sown in Autumn 2004
- Groundwater levels less than 1 metre from soil surface
- FOO on offer varies over site from 500 kg DM/ha to 1500 kg DM/ha (Aug 04)
- Aim to graze in Autumn 2005.

FAST FACTS
- Location: 60 km east of JErramungup
- Soil Type: Sandy duplex
- Rainfall: 350 mm
- Pasture base: Balrey grass, some bare salt scalds
- Landscape: Low lying; adjacent to Susetta River

WANT TO KNOW MORE?
Host farmer:
T & L Lee Ph: 08 9835 6010
Support Person:
Katrina Sait Ph: 08 9835 1127
Raised beds = Production increases on waterlogged land

**BACKGROUND / AIMS**
- Former vegetation - Melaleuca & Coastal Blackbutt.
- Rainfall 550 - 600 mm, mostly in winter.
- Soil type is sand over clay; is flat, summer moist.
- Crop and pasture production < optimum due to salinity, waterlogging and winter inundation.
- Aim to manage surface water, rehab unproductive land.
- Turn a negative (summer moist soil) into a positive.
- Design high productivity farming system.

**ACTION TAKEN**
- April 2002. SGSL application – raised beds for pasture and cereals.
- May 2004 - Further earthworks, raised beds installed.
- July 2004 – 70ha wheat planted following weed kill.

**OUTCOMES**
- 2003 - Clover and ryegrass highly productive.
- 2003 - Barley yielded ~ 2 t/ha.
- Sub-tropical grasses planted too late.
- 2004 – Wheat now on previously unproductive land.

**LEARNINGS**
- Raised beds prevent waterlogging
- Raised beds increase productivity & profitability
- Earthworks and bed design is crucial
- Time and depth of sowing is critical for sub-tropical grasses

**Want to know more:**
Host Farmer
Gary Peacock
Ph 9652 9030

Support Person
Bill Lullfitz
Ph 9651 4008

0 - 50 mS/m Fresh
50 - 100 mS/m Slight
100 - 200 mS/m Moderate
200 - 300 mS/m High
> 300 mS/m Extreme
**BACKGROUND**

- The West Arthur LCDC was formed in 1990 with the goal of addressing land degradation issues in the shire.
- There are currently 10 members of the group.
- Historically, farmers in the shire have had mixed success with establishing Balansa clover. The critical issue seems to be the management of Balansa clover to maintain its longevity.
- To improve the knowledge of grazing management of Balansa clover, the group sought assistance from SGSL to do a trial.

**SITE DETAILS**

- **Area:** 50 ha
- **Soil type:** heavy grey clay
- **Rainfall:** 600 mm
- The site has been divided up into several treatments (see aerial photo). There is a proposed area where Balansa clover will be set stocked and rotationally grazed (rested in spring and heavy grazing in summer).
- There is also a separate area where Tall Wheat Grass and Persian clover will be evaluated.
- The site gets quite wet in winter so the trial was sown fairly early in 2003.

**OBJECTIVES**

- Encourage adoption of sustainable grazing management and moving away from set-stocking.
- Encourage more perennials in local farming systems (not widely adopted in this area).
- Monitor the persistence of Balansa clover in the pasture.

**OUTCOMES TO DATE**

- The EM 31 and EM 38 survey has been completed.
- The trial has been sown and the site remained fairly wet throughout winter.
- Early observations suggest that the initial germination of Balansa clover is good.

**Who to contact:**

**Landholder**
Peter Nuske 9593 4455

**Support Person**
Justin Hardy 9892 8408

**EM 38 Salinity to Colour Conversion**

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<td>green</td>
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<tr>
<td>red</td>
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**An area of successfully established Balansa clover on the West Arthur LCDC SGSL trial.**

**Aerial photo of site with treatments digitised.**

**EM 38 map of trial site.**
Salt tolerant forestry and perennial pastures - a productive combination?

**BACKGROUND**
- **Rainfall:** ~ 400ml / year winter dominant
- **Landscape/Soils:** Beaufort River ancient floodplain - shallow duplex loamy sand (5-60 cm) over massive gray clay.
- Mild-moderate salinity and moderate waterlogging
- Pasture production on the flats is currently below average due to waterlogging, salinity and stock management.

**OBJECTIVES**
- Assess farm forestry potential of winter waterlogged & mildly saline valley floors on the Beaufort Flats
- Assess saltland pasture species for production potential and pasture / trees combination effect.

**ACTION TAKEN IN 2004**
- July - Forest Products Commission planted salt tolerant seedlings in mounded riplines
- 20 October - strips between seedlings sown according to plan (see opposite)

**MORE INFORMATION**
Brian Leach (group agronomist) on 94750753
Sally Thomson (support person) on 98612222

Grazing potential for Mixed Saline Pastures
Tin Dog Creek Catchment Group

OBJECTIVES
• To increase productivity of land currently at a low productive level,
• Reduce the amount of water in the soil profile,
• Measure the effect of applying lime, gypsum, potash and fertiliser to saline areas on the growth of Lucerne
• To increase grazing potential through the use of perennial grasses, Lucerne and saltbush.

SITE DETAILS
• Rainfall: 350 mm
• Area: 35 ha
• Soil type: Heavy clay ("Sunday Soil")
• Salt scalds have been appearing since flooding over the paddock in occurred in 1999
• Soil pH over the site ranges from 5.3-7
• 9 ha of the trial site on the northern side has been limed (1 t/ha) and received 2 applications of gypsum
• 5 kg/ha of Lucerne (L69) was planted over the site in Sept ‘02. There were up to 32 plants/m² in the northern part of the paddock, with patches from bare through to 10 plants/m² in the southern part of the paddock.

Key Learning's
• L 69 lucerne has survived on the better part of the paddock (least affected by salinity/waterlogging)
• Using the pastures for silage for ewes and hoggets has been beneficial in removing weed seeds from the paddock,
• Have found the perennial grasses hard to establish,
• There is a crucial time for planting perennial grasses,
• Have had problems this year with Lucerne flea.
• Are getting more production from the paddock through extra grazing and silage.
• Grazing has been very good- site was crash grazed when required and it has been a useful site as a holding paddock.

Who to contact:
Host Farmer
Phil Pickering 9631 1250

Support Person:
Vanessa Malcolm 9631 1464

Acknowledgements to the Tin Dog Catchment Group for undertaking this trial

EM 38 map of trial site

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DISTICHLIS -
A NEW SPECIES FOR BARE SALTLAND?

RESEARCH OBJECTIVES

• Establish and trial the establishment and productivity of rainfed Distichlis (nyP a grass) with current recommended district practice (tall wheat grass, balansa and saltbush) and untreated saltland (control).

ACTION TAKEN

• Sowed the trial in August 2003. All have germinated.
• TWG struggled throughout the summer of 03/04 but has managed to survive.
• Saltbush sown in alleys on the TWG plot in August 2004.

Pasture measurements on 30-7-04 show 2.9t/ha DM on the Control plot, 0.12t/ha DM on the distichlis and 0.12t/haDM on TWG.

FAST FACTS

Location: 30km east of Wickepin in the Avon catchment
Soil type: Sandy duplex and loamy duplex, (depth to clay, 8-30cm)
Annual rainfall: 350mm (winter dominant)
Pasture base: Barley grass, some clover, cotula, samphire, bare land
Landscape: flat at the base of a slope draining into a creekline.

Technical Officer:
Arjen Ryder, Department of Agriculture, Abany, Tel (08) 9892 8531

Host Farmer:
Raymond Matthews
Wickepin, Tel (08) 9888 6101

NRM Coordinator:
Vannesa Crisp, Facey Group
Wickepin, Tel (08) 9888 1223

Database Website:
Niche seeding saltbush versus hand broadcasting saltbush

**SITE DETAILS**
- **Location:** 20 km north of Moora
- **Rainfall:** 320 mm annually
- **Site description:** Prye Brook (or its tributary) dissects the lower third of the property. Intermittent flows and flooding
- **Geology:** Basement rocks are chert and orthoquartzite with minor siltstone, sandstone, claystone and dolomite
- **Area:** 30 ha
- **Soil types:** Loamy duplex, cracking clay, loamy earth and loam over sand

**OBJECTIVES**
- Establish a mix of saltbush, perennial grasses and aerial seeding legumes
- Run 20 DSE/ha for 60 days in autumn
- Compare germination of niche seeded saltbush with hand-broadcast saltbush seed
- Reduce the impact of annual ryegrass toxicity

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**EM 38 Map**

**Colour** | **EM 38 Salinity** | **Salinity Class**
---|---|---
Dark blue | 0-50mS/m | Fresh
Light blue | 50-100 | Slight
Green | 100-200 | Moderate
Yellow | 200-300 | High
Red | >300 | Extreme

Brad’s technique of broadcasting saltbush and perennial seed onto cultivated ground

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**WHAT ARE THE OUTCOMES?**
- Poor establishment in '02 has triggered the group to compare the broadcast method with the commercial niche seeder
- Some Rhodes grass germinated in patches
- Deep ripping and gypsum will be tried on the cracking clay soil types

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**MORE INFORMATION?**
- Brad Tonkin on 96518011
- Tania Sundra on 96511302
- John Paul Collins on 98213249
Saltwater couch can be integrated in with other saltland pastures

**What are the site details?**
- **Location:** 8 km north-west of Miling
- **Rainfall:** 300 mm annually
- **Site description:** Located within a saline drainage line, which is a major tributary of the Moore River
- **Geology:** Situated on the Darling Plateau and the dominant basement rocks are granite and migmatite
- **Area:** approximately 50 ha
- **Soil types:** soils consist of alkaline duplex, sand over hardpan and duplex over hardpan soil types

**What are the project objective?**
- To establish a mix of saltbush, perennial grasses (including salt water couch) and aerial seeding legumes
- To run 20 DSE/ha for 60 days in autumn
- To reduce the watertable on the site
- To reduce the impact of annual ryegrass toxicity (ARGT)

**What are the outcomes?**
- Saltbush seedlings will be planted in future rather than direct seeded
- Salt water couch measured in June ’04 had 1.8 t DM/ha and analysis revealed it had a DMD of 59% and a CP of 5%
- TWG had 64% DMD and 8% CP but germination was patchy

**More information?**
- Tony White on 96541122
- Tania Sundra on 96511302
- John Paul Collins on 98213249

www.landwaterwool.gov.au
Finishing Prime Lambs in Autumn on Saltland

Yerecoin-Piawaning LCDC

Todd Duggan¹, Caroline Chadwick², Justin Hardy³, John Paul Collins³ and Elizabeth Tierney⁴

¹. Host farmer, “Yerewaning Springs”, Yerecoin WA and President of Yerecoin-Piawaning LCDC
². Host farmer, “Yerewaning Springs”, Yerecoin WA
³. Research Officers, Department of Agriculture, WA
⁴. Shire of Victoria Plains Landcare Coordinator

OBJECTIVES

• Investigate the economic potential of finishing prime lambs on saltland pastures
• Reduce the length and amount of supplementary feeding required in Autumn
• Improve the skills of the Yerecoin-Piawaning LCD members in grazing management and feed estimation

SITE DESCRIPTION

• 11 ha site last cropped in 1997, subject to seasonal waterlogging and soil acidity. 1.5 t/ha lime applied across site.
• Sandy valley floor adjacent to creekline, with sandy duplex and sand over hardpan soils

CURRENT TREATMENTS

Area 1: Remnant balansa clover and lucerne pasture
Area 2: Lucerne with barley cover crop (sown 2003)
Area 3: Saltbush alleys (Old Man, River and Wavy Leaf), inter-row bare

TRIAL NOTES

• May 2002 – sown to balansa clover. Reasonable establishment in area 1, patchy in area 2 and poor in area 3
• August to Oct 2002 – saltbush planted in alleys (area 3)
• Oct 2002 – sub-tropical perennials mix sown in areas 2 and 3. Poor germination and no survival over summer. This may have been due to the dry season and the seed being sown too deep.
• Autumn 2003 – rams grazed for 3 weeks in area 1.

2005?

Identify site constraints affecting perennial germination and survival. Re-seed area 3 using more appropriate techniques and / or species.

Aerial photo of trial with treatments

Key
Fence line
Reverse interceptor bank
Saltbush Rows

EM 38 Map of site

mS/m = Salinity Class
0 – 50 = Fresh
50 – 100 = Slight
100 – 200 = Moderate
200 – 300 = High
> 300 = Extreme

Host farmer Todd Duggan speaking at SGSL field tour in April 2003
Saltland Pasture trials in Bonnie Rock

Ningham Farm Focus Group

Background

- The Wodjil soils of the trial are acidic (pH 4)
- The site is located on a saline seep. The site ranges from fresh saline to moderately saline.
- Annual rainfall averages 250mm, predominantly in winter but with significant summer storms

Objective

Identify the most adaptable, productive and grazable perennial or annual pasture species for establishment on moderately to highly saline lands in the Shire of Mukinbudin

Outcomes

- Old man and wavy leaf saltbush were planted in August ‘03 on the contour across the site
- Capeweed, wild turnip and wild radish have been abundant in the spring of ‘04

For further information...

- Contact Phil and Caroline Smith on 90470030

www.landwaterwool.gov.au
Saltland Pasture trials in Mukinbudin

Ningham Farm Focus Group

Background

• Site is located on a heavy salmon gum clay on the valley floor
• The site ranges from extremely saline to moderately saline.
• A drain has been installed to lower the watertable on the site.
• Annual rainfall averages 275mm, predominantly in winter with some summer storms

Objective

Identify the most adaptable, productive and grazable perennial or annual pasture species for establishment on moderately to highly saline lands in the Shire of Mukinbudin

Outcomes

• Saltbushes were planted adjacent to the deep drain on the red and yellow areas and all failed
• The site was too saline and saltbushes will be planted on the green area in ’05
• Establishment may have been more successful if mounds were created with a ‘niche’ depression

For further information…

• Contact Robey Jones on 90471174

Colour EM 38 Salinity Salinity Class
Dark blue 0-50mS/m Fresh
Light blue 50-100 Slight
Green 100-200 Moderate
Yellow 200-300 High
Red >300 Extreme
GAINING PRODUCTIVITY FROM RAISED BEDS ON SALINE LAND, MECKERING

Research Objectives
To test the ability of raised beds to:

• produce profitable fodder crops on mildly salt-affected land
• reduce the level of salinity on the site

Background
• Paddock has been poorly productive and degrading from waterlogging and salinity despite WISALT banks, surface drains and tree and saltbush plantings.

• The soil is a granite-derived sandy loam over clay.
• The site is at the toe of a slope of about 1%.
• The average annual rainfall is around 325mm.

Want to know more?
Research officer
Greg Hamilton, Department of Agriculture South Perth, Tel: 9368 3276

Host farmer
Colin Pearse, Tel: 9625 1202

WANTFA Coordinator
Tracey Gillam, Tel: 9622 3395
JERDACUTTUP GRAZING GROUP

CAN PERENNIALS DOUBLE OR EVEN TRIPLE CARRYING CAPACITY?

**OBJECTIVES**

- To show that perennials can use up the water and double or triple the grazing capacity of saline land. Also that both plants and animals benefit from rotational grazing.
- This will be achieved by measurements of water use by an observation well, plant counts and feed quality tests, grazing days and sheep weights in and out of paddocks.
- In year 2 the site will be fenced into 3 paddocks and managed by rotational grazing.

**OUTCOMES TO DATE**

- Germination of perennial mix very successful
- Rhodes grass by far the most dominant perennial
- Gatton Panic, Setaria and Tall wheat grass also established well
- Site has been grazed continuously since March 2004 (No grazing data)
- FOO varies. Majority >1000 kg DM/ha
- Water table levels < 2 m below soil surface

**FAST FACTS**

- Location: 60 km se of Ravensthorpe
- Soil Type: Deep sandy duplex
- Rainfall: 550 mm
- Pasture base: Annual pastures (did support annual crop in 2000)
- Landscape: Level to gently undulating

**WANT TO KNOW MORE?**

Host farmer:
P & A Bell Ph: 08 9075 1118

Support Person:
Jenny Chambers Ph: 08 9838 1018

www.landwaterwool.gov.au
Lucerne establishment on semi-saline ground and successful direct seeding of saltbush

What are the site details?
- **Location**: South – east Ballidu
- **Rainfall**: 325 mm annually
- **Site description**: Relatively flat area running into the edge of a creek
- **Soil types**: red loam
- **Previous crop rotation**: wheat, legume, volunteer pasture

What are the project objective?
- To determine where various saltland pasture species (Lucerne, Sub-tropical perennials, Saltbush, Balansa clover and Safeguard ryegrass) are able to establish on a sloping saline valley
- To gain increased grazing value from this site
- To reduce the impact of annual ryegrass toxicity (ARGT)

What are the outcomes?
- The Lucerne had a successful germination and is growing well
- The saltbush germinated in the moderately saline areas (100-200mS/m) but failed in the highly saline areas
- Bernie has direct sown saltbush and safeguards ryegrass on other areas of his farm
- Safeguard Ryegrass had good germination, but is out-competing the ‘Balansa’ clover

EM 38 Salinity

<table>
<thead>
<tr>
<th>Colour</th>
<th>EM 38 Salinity</th>
<th>Salinity Class</th>
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<tr>
<td>Dark blue</td>
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<tr>
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<td>&gt;300</td>
<td>Extreme</td>
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</tbody>
</table>

More information?
- Bernie Driscoll 96744012
- Brianna Peake 96642030
Establishment of Saltbush and Perennial Pastures Over Drains

Contour bank

‘W’ or spoon drains to control surface water (2005)

Twin niche-seeded saltbush rows with spinner drains in between (2005)

Drains 2–3m deep: currently being covered over

Sump: water pumped from here to river

Road and railway acting as dykes to constrain natural water flow to Moore River

SGSL trial site at Peter Kelly’s

KEY OUTCOMES TO DATE

• Preparation of surface water management plan for sub-catchment
• Tree planting in upper catchment and at site boundary
• Salinity of water in deep drains decreased from 1300mS/m to 800mS/m (summer level)

Want to know more?

Host Farmer: Peter Kelly, Gillingarra
SGSL Officer: Justin Hardy 9892 8408
Local Support Person: Elizabeth Tierney 9628 7004

Peter Kelly EM38

mS/m = Salinity Class

0 – 50 = Fresh

50 – 100 = Slight

100 – 200 = Moderate

200 – 300 = High

> 300 = Extreme

www.landwaterwool.gov.au
Direct seeding versus seedlings?

Establishing saltbush in the Yilgarn shire

Background

• The trial will aim to determine the best establishment of saltbush in the Yilgarn shire.

• Soil type is a degraded red morrell prone to erosion

• Rainfall is approximately 300 mm annually, most of which falls in winter.

• Crop and pasture production on the flats is currently below average due to salinity

Objective

• Compare direct seeding of saltbush with seedling establishment

• Promote saltland grazing opportunities in the Yilgarn shire

Outcomes

• Saltbush seedlings were planted in July 2003

• Saltbush and perennial grasses were direct seeded by Ashley Lewis in July/August 2004 on an adjacent site

For further information…

• Contact Andy Unkovich (host farmer) on 90491055
**Objectives**

- Test perennial pastures as viable, productive and profitable options for animal feed & nutrition.
- Reduce wind erosion by increasing ground cover.
- Determine which species of the Evergreen Saltland Mix and Simmonds Seed Mix are most suited to low rainfall, saline morrell soils.

**Action Taken**

**2003**

- In spring two 20ha cells were sown with Evergreen Saltland Mix and Simmonds Seed Mix over two sowings times.
- Rows of Oil Mallees and Saltbush were planted along fence lines to minimise wind erosion.

**2004**

- Due to wind erosion over summer sites did not establish well, therefore saltbush seedlings and seed were planted in alleys across the site.
- Sub-tropical Perennial Pastures were replanted again in poorer establishment areas.
- Rhodes Grass and Lucerne performing well.
- Site was also expanded to another 60ha.

**Fast Facts**

**Location:** 18km north west of Trayning in the Yeelanna Catchment

**Soil Type:** Deep calcareous earths from reworked lake sediment.

**Annual Rainfall:** 320mm

**Landscape:** Flat to very gently inclined slopes bordering Lake Wallambin.

**Salinity:** High to extreme salinity, watertable at 2.0m.

**Want To Know More?**

**Farmer:** Ian & Dianne Haggerty

P: 9681 5022

www.landwaterwool.gov.au
GORGE ROCK SALTIES
PASTURE ESTABLISHMENT AND MANAGEMENT

OBJECTIVES

- To compare a treatment of slashed with non-slashed saltbush and bluebush.
- To introduce a wide variety of other pasture species for small plot trial evaluation.

TRIAL DESIGN

- Small 7 hectare plot of alleys of saltbush with additional perennial mix.
- One half of trial to be slashed when plants are mature.
- Control area - previously established saltbush and bluebush.
- Saltbush alleys planted Sep 03.

OUTCOMES

- Germination in saltbush alleys less than 5%.
- Inter-row species planted in June 2004.
- Varied success of inter-row species.
- Initial medic germination high, but due to seasonal influences, composition is now patchy.
- No Acacia saligna in saltbush alley rows.

Note: Dry season and time of sowing an extremely important factor when sowing on heavier soils.

WANT TO KNOW MORE?

Host Farmer
Robert Rogers, Tel (08) 9063 7001
Support Person
Robin Campbell, Tel (08) 9063 2662

Location: 20 km E of Corrigin
Soil Type: Loamy duplex
Rainfall: 300 mm
Pasture Base: Bare ground, barley grass
Landscape: Gently undulating

www.landwaterwool.gov.au
GORGE ROCK SALTIES

PASTURE ESTABLISHMENT AND MANAGEMENT

OBJECTIVES
To compare:
• livestock production of crossbred lambs on saltland pasture to barley stubble
• differing rates of gypsum on saltland production

FAST FACTS
• Gorge Rock is located 20km SSE of Corrigin
• Site is adjacent to natural salt lake
• The site is a duplex soil - sand over clay
• Annual rainfall is 300mm

WANT TO KNOW MORE?
Host Farmer
Kim Courboles Tel (08) 9063 2422
Support Person
Robin Campbell, Tel (08) 9063 2662
GORG ROCK SALTIES
PASTURE ESTABLISHMENT AND MANAGEMENT

OBJECTIVE

• To maintain or increase weight of merino and merino cross sheep grazing saltland pastures
• To use fresh water coming off a granite outcrop up-slope to support annual & perennial understorey.
• To identify areas where lucerne is the most suitable species using soil tests, EM38 and pasture analysis.

OUTCOMES

• Saltbush establishment very successful.
• Inter-row species of varying success.
• Tall wheat grass prolific over whole site.
• Groundwater levels less than 1 metre from soil surface.
• Aim to graze site in Autumn 2005.

FAST FACTS

Location: 20 km SE of Corrigin
Soil Type: Loamy duplex
Rainfall: 300 mm
Pasture Base: Bare ground, barley grass
Landscape: Gently undulating

WANT TO KNOW MORE?

Host Farmer
Lindsay Smoker, Tel (08) 9065 7074
Support Person
Robin Campbell, Tel (08) 9063 2662

Rob Rogers, Neil Ballard and Lindsay Smoker in the Smokers trial site
The “Moo” Factor
Cattle Production on Saltland Pastures

Objectives
- Determine whether cattle are sustainable in the Wheatbelt when cell grazed on Saltbush.
- Determine whether Balansa Clover or Barley Hay is the best supplement to Saltbush in this system.

Action Taken
- In 2003 two cells of 5ha were fenced off and water points installed.
- Cell 1 – Twin rows of Oldman Saltbush sown every 10m (~600/ha). Balansa Clover @ 4kg/ha sown in between rows with knife points but establishment & survival rate has been poor.
- Cell 2 – Old Man Saltbush sown in plantation (~1000/ha). Cattle to be supplemented with Barley Hay during grazing.

The Future
- In 2005 the trial will be grazed.
- The project will look at weight gain and condition score of the cattle.
- Currently cattle are being grazed on 60ha of existing saltbush plantation.

Want To Know More?
Farmer:
Bart Hulls
P: (08) 9683 1109
Research Officer:
John Paul Collins, Department of Agriculture, Katanning
P: (08) 9821 3249

Fast Facts
Location: 2km South of Trayning in the South Trayning Catchment
Soil Type: Alkaline red shallow loamy duplex & red non-cracking clays.
Annual Rainfall: 320mm
Landscape: Edge of broad valley floor. Slope 1%.
Salinity: Moderately-highly saline, watertable at 2.1m.
SUB-TROPICALS BATTLE TO SURVIVE IN MORAWA

RESEARCH OBJECTIVES
To utilise land around salt scalds by establishing a variety of salt tolerant pastures.
Determine which pastures re-establish with minimal cost after rotational grazing.
To investigate the improvement of soil structure through applications of gypsum, dolomite and lime.

FAST FACTS
Location: Canna, 40km north of Morawa
Soil: Red clay with secondary salinity & scalding evident
Annual Rainfall: Average 325mm, 2004 – about 200mm
Pasture Base: Ice plant, blue bush, barley grass
Landscape: Flat, <1% slope

ACTION TAKEN
• Site established April 03.
• Sprayed in preparation for seeding
• Saltbush planted August 03.
• Pasture sown August 03 – poor establishment due to dry finish.
• Native pasture seed sourced – to be sown with perennials in June 05.

Want to know more?
Host Farmer: Cameron Tubby
(08) 9972 2102

Saltbush establishment October 2004

EM38 Map

Want to know more?
Host Farmer: Cameron Tubby
(08) 9972 2102

www.landwaterwool.gov.au
Will Elephant Grass survive on a Wodgil sand seep?

Koorda LCDC – Badgerin Rock

BACKGROUND
• Situated at Badgerin Rock, 23km west of Koorda
• Vegetation consists of Wodgil and Tea Tree.
• Soil type is yellow sand over gravel, and typically acidic
• Annual rainfall is approximately 250 mm.

OBJECTIVES
• Establish Elephant grass, Saltbush, Puccinellia and Tall Wheat Grass.
• Investigate salt tolerance of Elephant Grass.
• Evaluate other perennial pasture species including Genesis Lucerne, Rhodes Grass and Bambatsi Panic.
• Compare treatments of gypsum and lime applications.

EARLY MESSAGES
• Elephant grass will strike on an acid-wodgil sand but has poor frost tolerance in winter
• The grasses failed to establish due to dry conditions and need to be established following opportunistic rainfall
• Lucerne has germinated in patches across the site

MORE INFORMATION...
Contact Grahme Fuchsibichler on 96841281

www.landwaterwool.gov.au
CAN FERTILIZER INCREASE SALTLAND PRODUCTION?
SALTBUSH WITH PERENNIALS AND FERTILIZER RATES.

RESEARCH OBJECTIVES
• To investigate the response of perennials and saltbush to different rates of fertiliser.
• What is the rooting depth of saltbush?
• What happens to the salt in the soil beneath saltbush?
• What does the variability of the depth to clay have on saltland pastures?
• Will growing Acaciabe enough to reclaim saltland?

ACTION TAKEN
• Treatments established in 2003.
Needed to re-seed part of the saltbush trial due to residual effects of Glean.
• Monitoring bores installed.
• Salinity survey completed.

FAST FACTS
Location: 8 km North of Cranbrook in Hamilla Hill catchment
Soil Type: Shallow sandy duplex.
Annual Rainfall: 450mm (winter dominant)
Pasture Base: Barley grass, bare land, clover and ryegrass
Landscape: Broad flats with a slight gradient.

WANT TO KNOW MORE?
Technical Officer
Arjen Ryder, Department of Agriculture, Albany, Tel (08) 9892 8531
Host Farmer
Ian Walsh, Tel (08) 9826 1034
NRM Coordinator
Kelly Hill, Cranbrook, Tel (08) 9826 1306
Database Website
Using Acacia saligna to reduce water levels and improve a moderately saline area for pastures.

**RESEARCH OBJECTIVES**
- To investigate the impact of growing acacia saligna on moderately saline land.
- To monitor the water level changes.
- Will growing Acacia be enough to reclaim saltland?

**ACTION TAKEN**
- Planted the acacia’s in 2004.
- Installed 6 monitoring bores.
- Site has been grazed with minimal damage to the trees.
- Salinity survey completed.

**FAST FACTS**

| **Location:** | 8 km North of Cranbrook in Hamilla Hill catchment |
| **Soil Type:** | Shallow sandy duplex. |
| **Annual Rainfall:** | 450mm (winter dominant) |
| **Pasture Base:** | Barley grass, bare land, clover and ryegrass |
| **Landscape:** | Broad flats with a slight gradient. |

**WANT TO KNOW MORE?**

**Technical Officer**
Arjen Ryder, Department of Agriculture, Albany, Tel (08) 9892 8531

**Host Farmer**
Ian Walsh, Tel (08) 9826 1034

**NRM Coordinator**
Kelly Hill, Cranbrook, Tel (08) 9826 1306

**Database Website**
SKILLING INDIGENOUS MANAGERS - INSTILLING CONFIDENCE IN ESTABLISHING SALTLAND.

RESEARCH OBJECTIVES
- Establish 3 plots for rotational grazing. Plots are saltbush with temperate species, saltbush with sub-tropical species and saltbush only.
- Determine the production from each plot.
- Train the manager in the use of the saltland pastures.

ACTION TAKEN
- Selected the area for the plots.
- Three monitoring bores have been installed.
- Trial is part of the “Tambellup Noongar Land Association”.

WANT TO KNOW MORE?

Development Officer:
Anthony Witham, NRM coordinator, Tambellup, Tel (08) 9825 1002

Host Farmer:
Charlie Williams
Tambellup, Tel (08) 9825 1195

Indigenous Land Management DO:
Kelly Flugge,
Albany, Tel (08) 9892 8407

Database Website:

FAST FACTS

Location: 5km west of Tambellup in the Gordon-Frankland catchment

Soil type: Shallow sandy gravels over clay (2-30cm).

Annual rainfall: 475mm (winter dominant)

Pasture base: Barley grass, some clover, bare land

Landscape: flat saline valley floor
INCREASING PRODUCTION IN A HIGH RAINFALL ZONE.
SALT BUSH WITH PERENNIALS AND SURFACE DRAINAGE.

RESEARCH OBJECTIVES

• To demonstrate integrated farming systems on a range of varying saline soils which improve productivity and sustainability.
• Implement surface water control using drainage.
• Evaluate saltland pasture species including: Tall Wheat Grass, Puccinellia and Saltbush, Evergreen sub-tropical mix, Lucerne and Kikuyu

ACTION TAKEN

• EM38 and 31 survey completed July 2003
• W drain surveyed and installed April 2003
• Saltland pasture species seeded May 2004
• Saltbush completed Oct 2004

Results

• Best to establish perennial ryegrass on its own.
• Saltbush struggling in the wet environment.
• Evergreen mix did well over the first summer
• Appears to be a slight drop in WT under the perennials

FAST FACTS

Location: 30 km West of Mt Barker.
Soil Type: Shallow duplex and gravelly sands.
Annual Rainfall: 550mm (winter dominant)
Pasture Base: Barley grass, bare land, fog grass and ryegrass.
Landscape: Undulating creekline and mid slopes

High rainfall during 2005 caused some erosion and silting to occur in the drain and creekline.

Left: Field Day participants inspect the saltbush area.
Right: Sub-tropics and TWG sown in between the belts of saltbush have grown well.

WANT TO KNOW MORE?

Technical Officer
Arjen Ryder, Department of Agriculture, Albany, Tel (08) 9892 8531

Host Farmer
Rodney Drage, (08) 9851 1910

NRM Coordinator
Lynn Heppell, Mt Barker, Tel (08) 9851 2697

Database Website

www.landwaterwool.gov.au
TENTERDEN FARMERS - ARE YOUR SALTLAND PASTURES UP TO SCRATCH?

RESEARCH OBJECTIVES
Establish and trial salt-tolerant pastures such as: tall wheat grass, balansa clover, saltbush and puccinellia.

Determine the best performing mix of species for the varying degrees of salinity (slight to extreme) using kikuyu, lucerne, rhodes grass, phalaris, seteria chicory, catton panic, angleton grass and tall fescue.

ACTION TAKEN
• Sowed the temperate species 5-8-04. All have germinated. Tall wheat grass, puccinellia and tall fescue look very promising
• Sowed the sub-tropical species 20-9-04.
• Sowed the saltbush 1-10-04.

FAST FACTS
Location: 5km north of Kendenup in the Lake Matilda catchment
Soil type: Shallow sandy gravels over clay (depth to clay ranges from 2-30cm)
Annual rainfall: 550mm (winter dominant)
Pasture base: Barley grass, clover, ryegrass, bare land
Landscape: mostly flat with shallow depressions

Technical Officer: Arjen Ryder, Department of Agriculture, Abany, Tel (08) 9892 8531
Host Farmer: Mark Jefferies Tenterden, Tel (08) 9851 7103
NRM Coordinator: Shannon McKenzie Mt Barker, Tel (08) 9851 2703

Database Website: http://spatial.agric.wa.gov.au/sgsl/
NUTRITIONAL VALUE OF SALTLAND PASTURES
RANGE RD CATCHMENT GROUP, PINGRUP

Research Objectives
Establish and trial puccinellia and tall wheat grass in combination with old man, wavy leaf, river and creeping saltbush.

Determine
• the longevity and nutritional value of various saltland pastures grazed by lambs
• if different pastures have an effect on the salt content of the soil
• if lucerne can be established across the whole paddock once the salt content of the soil has been reduced by saltland pasture.

Action Taken
• Lucerne was established in June 2003, and saltland pastures in September 2003.

• Pasture and soil measurements were monitored at 16 transect points in November 2003 and February and August 2004.

• In 2004 the site was grazed by 21 lambs for 4 weeks in March, 30 rams for 4 weeks in June and 230 ewes for 9 days in July.

• The condition score and weight of the lambs was measured before and after grazing. Their mean condition score increased by 1.0 and mean weight by 8.5 kg.

Fast Facts
Location: 20km south east of Pingrup in the Range Rd catchment
Soil type: sand over clay
Rainfall: 350mm per annum
Pasture base: barley grass, bare land
Landscape: flat, lower area of landscape

Want to know more?
Technical officer
Nadene Schiller, Department of Agriculture
Jerramungup, Tel: 9835 1177
Email: nschiller@agr.wa.gov.au

Host farmers
Ted, Jenny & Tony Altham, Tel: 9820 4014
Email: ejaltham@wn.com.au

Nyabing-Pingrup Landcare Coordinator
Nicole Davey, Tel: 9820 1004
Email: clckent@wn.com.au
SALTBUSH PROVES ITS SELF ON HEAVY SOILS.

**INCORPORATING SOIL AMELIORATION AND PERENNIAL PASTURES**

**RESEARCH OBJECTIVES**

- To rehabilitate an area known as ‘starvation corner’ through soil amelioration and pasture improvement.
- Learn to manage perennial pastures to maximize production efficiently.
- Evaluate the range of perennials: trees, lucerne, saltbush and sub-tropical species.
- Recognise the environmental benefit of applying a range of treatments and plant varieties.

**ACTION TAKEN**

- Treatments established in 2003.
- Saltbush established very well with the evergreen mix on the grey clays.
- Lucerne established well except for one area where weed control didn’t work.
- Trees had a 75% survival rating.

**FAST FACTS**

<table>
<thead>
<tr>
<th>Location</th>
<th>16 km South East of Tambellup in Lake Toolbrunup catchment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Type</td>
<td>Shallow duplex and gravelly sand, grey clays.</td>
</tr>
<tr>
<td>Annual Rainfall</td>
<td>350 - 400mm (winter dominant)</td>
</tr>
<tr>
<td>Pasture Base</td>
<td>Barley grass, bare land, clover and ryegrass</td>
</tr>
<tr>
<td>Landscape</td>
<td>Mid slope through to creekline.</td>
</tr>
</tbody>
</table>

Left: Importance of weed control before sowing lucerne is evident.

Right: Saltbush and perennial mix did very well right up to the difficult bare scalded area.

**WANT TO KNOW MORE?**

**Technical Officer**
Arjen Ryder, Department of Agriculture, Albany, Tel (08) 9892 8531

**Host Farmer**
Barry Witham, (08) 9825 8286

**NRM Coordinator**
Peter Guazzelli, Tambellup, Tel (08) 98241245

**Database Website**
Monitoring the impact of surface drainage, trees and saltland perennial pastures to halt salinity.

**RESEARCH OBJECTIVES**

- To investigate the impact of salinity on trees planted in 1995.
- To observe changes to the saline area as treatments progressed.
- To monitor the water level changes.
- Will growing Acacia be enough to reclaim saltland?

**ACTION TAKEN**

- Trees were planted in 1995.
- Monitoring bore was installed in 2000.

**Results**

- Some tree deaths occurred after 8yrs due to the increasing levels of salt.
- Casuarina obesa survived and is increasing
- The site is an active saline area with Tall wheat grass being the best suited pasture species

**FAST FACTS**

- **Location:** 8 km North of Cranbrook in Hamilla Hill catchment
- **Soil Type:** Shallow sandy duplex.
- **Annual Rainfall:** 450mm (winter dominant)
- **Pasture Base:** Barley grass, bare land, clover and ryegrass
- **Landscape:** Broad flats with a slight gradient.

**WANT TO KNOW MORE?**

**Technical Officer**
Arjen Ryder, Department of Agriculture, Albany, Tel (08) 9892 8531

**Host Farmer**
Greg Parnell

**NRM Coordinator**
Kelly Hill, Cranbrook, Tel (08) 9826 1306

**Database Website**
Obtaining a Profit Margin on Moderately Salt Affected Land Comparable to that of Non-Affected Land

*Nairibin Saltland Enhancement Group*

- The site is in a 300mm rainfall zone with heavy grey clay soils on flat ground low in the landscape.
- Saltbush seedlings were planted in Winter 2003
- 3 paddocks in the trial will each have saltbush supplemented with feed (oaten hay, wheat stubble or barley straw) and the 4th will be grazed on saltbush only
- Will be taking sheep weights and condition scores, pre and post grazing to determine the best system.
- Economic analysis will be undertaken to determine profit margins on the site.

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<tr>
<td>Red</td>
<td>&gt;300</td>
<td>Extreme</td>
</tr>
</tbody>
</table>

**MORE INFORMATION**

Stephen Wigg (host farmer) on 98642033
Ella Maesepp (support person) on 98634225

**www.landwaterwool.gov.au**
SALTBUSh GROWERS -
IS THERE ANOTHER PHASE IN SALTLAND FARMING?

RESEARCH OBJECTIVES

- Establish 2-3 cereal crops after mulching a 10 year old stand of acacia and saltbush.
- Determine the feasibility of incorporating a short phase of cropping after a lengthy period of saltland pastures.
- Replant the area to saltbush after the cropping phase to begin another phase of saltland pastures.

ACTION TAKEN

- Mulching machine has mulched the acacia
- Area to ripped prior to seeding with a crop in 2006.

Results

- Sheep selectively grazed the mulched acacia
- No significant change in WT since mulching

WANT TO KNOW MORE?

Technical Officer:  
Arjen Ryder, Department of Agriculture, Abany, Tel (08) 9892 8531

Host Farmer:  
Ashley Lewis, Wickepin, Tel (08) 9888 6048

NRM Coordinator:  
Aimee Goulding, Facey group, Wickepin, Tel (08) 9888 1223

Database Website:  

FAST FACTS

Location:  
25km east of Wickepin in the Avon catchment

Soil type:  
Loamy/clay soils in valley floor.

Annual rainfall:  
350mm (winter dominant)

Pasture base:  
Barley grass, saltbush, clover, bare land and acacia's

Landscape:  
flat saline valley floor
South Yoting Catchment Group

Boosting Propagation and Productivity of Saltbush

Background
The South Yoting Catchment Group was formed in 1989 to address the issues of rapidly increasing salinity, wind erosion and increasing soil acidity.
A saltbush seed orchard, including 11 different halophytes, has been established in the Group as a demonstration site.

Objectives
1. Develop equipment to aid seed collection.
2. Gain a better understanding of triggers to increase germination rates of viable seed.
3. Compare establishment cost of propagation of saltbush cuttings against germinating from direct seeding.
4. Compare success of transplanted seedlings to direct seeding methods.
5. Improve growth potential and therefore productivity of preferred saltbush stands.

Outcomes to Date
- EM 31 and EM 38 survey has been completed.
- Saltbush has been sown using the treatments described in September 2003.
- Trial site and existing Saltbush Seed Orchard visited by farmers during a field walk.
- May 2004 Saltbush seeds sown with differing rates of potting mix or seed raising mix planted before rain and after rain.
- August 2004 saltbush seedlings planted between rows.
- August 2004 – preliminary results show that treatments 2 and 4 appear to have a higher propagation rate.

Want to know more?
Host Farmer
Greg Hughes  Tel (08) 9645 7060
Support Person
Cyndi Mulders, Tel (08) 9645 0236

EM38 map of site

Site design

Colour EM 38 Salinity
dark blue 0-50mS/m
light blue 50-100
green 100-200
yellow 200-300
red >300

Salinity Class
Fresh
Slight
Moderate
High
Extreme

Treatments - replicated 1 time
A - Planting Seedlings
B - Direct Seeding (2 rows for each treatment per replication)
1. Control - no treatment to seed.
2. Seed soaked in water overnight.
3. Seed soaked in boiling water overnight
4. Seed treated with smoked water.
5. Seed put through a small grister to crush bracts.
OUTCOMES

TREATMENT 1 - SALTBUSH ROWS
- Germination of saltbush alleys has varied success. Highest success in bare salt scalded areas.
- Saltbush & puccinellia in scalded areas.
- Weed control critical for pasture establishment.
- 1500 Damara’s stripped pastures and saltbush but Wavy Leaf Saltbush and Tall Wheat Grass avoided.

• CALM - IMPULS PROJECT
- Salt tolerant shrubs & trees direct seeded.
- Golden Wreath Wattle, Salt River Gum, River Saltbush & Soap Wattle most successful.

• SEED ORCHARD
- 2004-05 Saltbush clones flourishing.

FAST FACTS
Location: 17 km South of Corrigin
Soil Type: Shallow duplex
Rainfall: 350 mm
Pasture Base: Scald, barley grass & ryegrass
Landscape: upper catchment creekline

WANT TO KNOW MORE?
Host Farmer
Lawry Pitman, Tel (08) 9065 7074
Support
Robin Campbell, Tel 0429 657 890

www.landwaterwool.gov.au
BULYEE CATCHMENT GROUP
RIVERLINE SALTLAND GRAZING

OBJECTIVES

• Improve production of existing puccinellia using lime and nitrogen treatments at varied rates
• Compare production of grazing on saltland pastures compared to grazing on a wheat stubble

OUTCOMES

• Saltbush establishment of varying success.
• Inter-row species of varying success due to dry season.
• Lime at 1 tonne and 2 tonne spread in April 2004
• Urea at 50 kg and 100 kg spread in June 2004.
• Groundwater levels below 2 metres from soil surface

PLANT ASH (% db) PROTEIN (% db) DM D (% db) ME (MJ/kg)
Puccinella 6.1 4.5 55.9 7.9

FAST FACTS

Location: 25km W of Corrigin
Soil Type: Loamy Duplex
Rainfall: 300 mm
Pasture Base: Bare ground, barley grass
Landscape: Saline flat (the area is subject to frequent flooding)

WANT TO KNOW MORE?

Host Farmer
Kim Sturges, Tel (08) 9065 8040
Support Person
Robin Campbell, Tel (08) 9063 2662

A 50 kg wether to maintain weight requires:
• 7.5-8.5 MJ of Metabolisable Energy
• 55% Digestibility
• 7-8% crude protein
JUBUK KUNJIN WOGERLIN ALLIANCE
SALTLAND CEREALS AND GRAZING

OBJECTIVE
To measure production from a merino-suffolk flock grazing improved and unimproved saltland pastures in autumn compared to a flock grazing a lupin stubble.

NEW SALTBUSH ALLEYS
- Saltbush establishment successful
- Puccinellia dominant species at site.
- Serradella in Oil Mallee treatment very successful.
- New saltbush at the site with tree planter.

EXISTING SALTBUSH
- New saltbush planted on existing site with tree planter in Aug 2004.
- Grazed existing site in Autumn 2004. Maintained 200 ewe lambs on saltland with supplements for 1 month.

PASTURE QUALITY RESULTS?

<table>
<thead>
<tr>
<th>PLANT</th>
<th>ASH (% db)</th>
<th>PROTEIN (% db)</th>
<th>DMD (% db)</th>
<th>ME (MJ/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gatton Panic</td>
<td>15.9</td>
<td>25.1</td>
<td>78.1</td>
<td>11.5</td>
</tr>
<tr>
<td>Rhodes Grass</td>
<td>16.1</td>
<td>17.1</td>
<td>62.0</td>
<td>8.9</td>
</tr>
<tr>
<td>Puccinella</td>
<td>7.8</td>
<td>4.4</td>
<td>55.2</td>
<td>7.8</td>
</tr>
</tbody>
</table>

GREEN = OK
RED = LIMITING TO SHEEP
A 50 kg wether to maintain weight requires:
- 7.5-8.5 MJ of Metabolisable Energy
- 55% Digestibility
- 7-8% crude protein

FAST FACTS
Location: 20 km NW of Corrigin
Soil Type: Shallow duplex
Rainfall: 300 mm
Pasture Base: Bare ground, barley grass
Landscape: Saline flat (the area is subject to frequent flooding)

WANT TO KNOW MORE?
Host Farmer
Harold Poultney, Tel (08) 9065 7074
Support Person
Robin Campbell, Tel (08) 9063 2662

WANT TO KNOW MORE?
Host Farmer
Harold Poultney, Tel (08) 9065 7074
Support Person
Robin Campbell, Tel (08) 9063 2662
**KURRENKUTTEN LAKERS**

**SUSTAINABLE SALTLAND FORAGE AND PATURE**

**OBJECTIVES**

- Compare livestock production on saltland pasture compared to barley stubble.
- Evaluate a range of herbicides for controlling iceplant, cotula & tolerance of saltbush.
- Compare different rate of gypsum to compare soil structure improvement.

**OUTCOMES**

- <5% germination of seeded saltbush.
- Kangaroos grazed forage lines heavily.
- 2004 River Saltbush clones successfully established.
- Best pasture establishment where site has been deep ripped.
- Additional seedlings planted in 2005

**FAST FACTS**

**Location:** 35 km NW of Corrigin  
**Soil Type:** Shallow sandy duplex  
**Rainfall:** 300 mm  
**Pasture Base:** Bare ground, barley grass  
**Landscape:** Saline paleo channel

**WANT TO KNOW MORE?**

**Host Farmer**  
Grant Robinson, Tel (08) 9065 2027  
**Support**  
Robin Campbell, Tel 0429 657 890
BULLARING VALLEY
Forage & pastures on saline clay-flats

PROJECT OBJECTIVES
To investigate:
• the potential for intercropping barley with annual legumes between saltbush
• the effects of increasing the Potassium levels on pasture production

PROJECT OUTCOMES
• Groundwater levels down from 1m to 1.5m
• Saltbush very lush, mostly 2-5m
• Untreated strips feature narrow leaf iceplant, cotula & bare scald
• Excellent production up to 6t/ha autumn 2005
• Condition score increased by 0.5-1.0 over 3 weeks
• Stocking rate 15-23 DSE
• Stock ate all species except Wavy Leaf saltbush and Tall Wheat Grass

WANT TO KNOW MORE?

Host Farmer
Charlie Bell, Tel (08) 9065 7052
Support
Robin Campbell, Tel 0429 657 890

FAST FACTS
• Site is located 20km SW of Corrigin
• The site is a duplex soil with hard pan at 10cm
• Poor barley crops occurred for the past 10 years
• Annual rainfall is 300mm

Italian Ryegrass in Stirling Barley with medics and clovers underneath
Conallan Creek Catchment Group
Saltbush Productivity on Saline Land Trial

Greg and Jo Hayes¹; Kate Robinson²; Nadene Schiller³
1. Host Farmers, Conallan Creek Catchment Group Members  2. Community Landcare Coordinator, Quairading WA; 3. Development Officer, Department of Agriculture, Jerramungup, WA

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**Background**

The vision for the Conallan Creek Catchment Group is “to be an active group working towards enhancing our productive, attractive agricultural environment through sound water and land management”.

**Action Taken**

Previous activities within the catchment include:

- Extensive planting of lucerne, tagasaste, saltbush, wheatgrass, perennial grasses, oil mallees, plus extensive revegetation activities.
- Earthworks for surfage and groundwater management.
- In May 2002, an application was submitted to SGSL for funding and support to carry out the trial.

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**Objectives**

- Utilise saline land to increase its productivity and improve stock profitability with added benefit of a degree of drought proofing.
- Attempt to reduce the spread of salt affected land by lowering water table with vegetation.

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**Experimental Site Information**

A mixture of saltbush seedlings were planted on the 25Ha site in June 2003. The site is located on a hillside in the upper catchment on moist sandy gravel. Average annual rainfall is 300mm.

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**Expected Outcomes**

- Lowering the water table reducing the spread of salt affected land.
- Degree of drought proofing through increased stock grazing days in summer and autumn
- Improved farm viability
- Improved biodiversity
Linking Biodiversity to Saline Productivity

**Research Objectives**

- Promote profitable options for saline areas
- Link biodiversity to saline productivity
- Evaluate the use of native grasses in the pasture system
- Understand the management of saline pasture systems

**Action Taken**

- Project commenced May 2003
- EM 38 AND 31 Survey completed in August 2003
- Seeded small trial pots in September 2003
- Seeded whole plot in August 2004
- Hydrologist visited September 2004

**FAST FACTS**

**Location:** Noman’s Lake Catchment

**Paddock:** The 81ha paddock was planted to a Bluegum alley system in 1995

**Salinity:** Increasing on the site with salt scolds covering approx. 8% of the site.

**Rainfall:** Annual rainfall is 385 mm

**Soil:** Clay/Loam

**WANT TO KNOW MORE?**

**Technical Support:**
Nadene Schiller,
Department of Agriculture
Jerramungup, Tel (08) 98351177
email: nssciller@agric.wa.gov.

**Host Farmer:**
Geoff and Rosemary Ballard
Tel:(08) 9861 6051
grballard@westnet.com.au

www.landwaterwool.gov.au
MORBINNING CATCHMENT GROUP

Profitable grazing whilst alleviating salinity

Background

The Morbinning Catchment Group was formed in 1989 when it became clear to the land managers that resource degradation problems within their landscape needed to be addressed.

Outcomes to Date

Site inspection with all the Morbinning Group Members and Department of Agriculture Staff.

- EM 31 and EM 38 survey has been completed by Landline Geophysics ptty ltd.
- Evergreen mix and saltbush has been sown by Ashley Lewis in September 2003.
- August 2004 – Good Tall Wheat grass and Rhodes grass growth are very evident.
- August 2004 – Lucerne has been a problem to establish, maybe due to residual herbicide in the soil.
- August 2004 – No saltbush growth is evident at this stage.
- Weed growth is high with predominantly Capeweed and Ryegrass
- The bore at A had water at ground level

Site Details

Rainfall: 340 mm

Previous crop rotation: one year cereal followed by two years pasture however the site hasn’t been in crop since 1999.

Site description: low in the landscape.

Objectives

“To demonstrate the grazing system that will give best live weight growth rates and wool growth rates of Merino weaners through the time of year with the least feed on offer while alleviating the threat of salinity to productive land”.

WANT TO KNOW MORE?

Host Farmer
Deane Aynsley, Tel (08) 9646 6246

Support Person
Cindy Mulders, Tel (08) 9645 0236

www.landwaterwool.gov.au
**BACKGROUND**

- Yerapin Catchment Group was a group of concerned farmers that came together in 1990 for flooding and salinity reasons.
- A SGSL site was identified by the group for trial and research due to its bare ground next to high yield cropping areas.

**SGSL ACTION TAKEN**

- The highly affected area was fenced off and planted to saltbush and a mixture of salt tolerant shrubs and trees (casuarina obesa, acacia saligna).
- This area, after a year’s growth, will sustain controlled grazing.
- Approx 25 tagged sheep will be monitored for live weight and condition score with comparison to control sheep which are grazed on stubble and fodder outside the fenced area.
- Future action is to possibly extend saltbush and add a specific clover or lucerne to medium to low EC areas.

**OBJECTIVES**

- To determine any variation in sheep condition (live weight, condition score and wool growth) when grazed on a saltbush and stubble rotation as compared to stubble only.
- To determine the feasibility of use of saltbush in whole farm approach.
Perennial pastures with intensive surface drainage

East Woop-Woop Farm Improvement Group (Boyup Brook)

Intensive surface drainage reduces waterlogging and improves productivity. Herring-bone lay-out of shallow ‘spinner-drains’ has been implemented in conjunction with larger surface drains to improve perennial pasture establishment.

Spinner drains are easily implemented with a three-point linkage drain spinner

Drain depth is about 20 cm

Herring-bone pattern of drains feed into ‘W’-drain at the break of the slope

Shallow drains ‘left’ and no drains ‘right’

Contact:
Richard Walker, Boyup Brook. Tel: 9766 1051
Derk Bakker or Justin Hardy: Department of Agriculture, Albany. Tel: 9892 8400

www.landwaterwool.gov.au
Rotational grazing of saltland pastures
Jinka’s Hill LCDC

Objectives

• Test rotational grazing of cells that are direct sown to saltbush and perennial grasses with an improved understorey of annual legumes
• Observe if gypsum can improve soil structure
• Compare Muriate of Potash (KCl) with Sulphate of Potash (KSO₄) with the assistance of United Farmers

Site details

Location: Coomellberup Rd, Badgebup
Soil Type: Shallow sandy duplex and grey clay
Annual rainfall: 400 mm
Pasture Base: Barley grass and Samphire patches
Landscape: Broad valley flat of the Coblinine River

For more information
Host farmer: John Pepall Ph: 0427955619
Support person: Sharon Hausler Ph: 98214327
Research officer: John Paul Collins Ph: 98213249
Increasing livestock production through saltland pastures and surface water management

**Background**

Host Farmer: James & Betty Stokes, Cunderdin WA  
Location: 4km West on Cunderdin on Main Street West. (Can be seen from Great Eastern Highway) in Cunderdin Hill West Catchment  
Annual Rainfall: 320 mm  
Soil Type: Moderately deep sandy duplex soils on Eastern edge becoming shallow loamy duplex on Western boundary. Slightly acid-neutral topsoil generally alkaline subsoil.  
Landscape: Valley Floor adjacent to Mortlock River.  
Previous Uses: Grazing  
Pasture Base: Samphire, Blue Bush, Ice Plant, Cotulla, small patches of ryegrass and a few Tea Tree.

**Research Objectives**

The aim of the project is to establish River and Old Man Saltbush and Blue Bush through seedlings compared to direct seeding. One aspect of the trial will be creating a spoon drain between double saltbush alleys. A saltland pasture mix will be sown between the alleys.

**Treatments**

- Sheoaks provided by Liz Barbour compared to locally grown sheoaks  
- +/- Spoon Drain  
- Direct seeding versus Seedlings.  
- River Saltbush compared to Old Man and Creeping Saltbush, Blue Bush and Swamp Sheoak

**Actions so far...**

- Site surveyed – April 2004  
- Trial pegged and cultivated – 2004 May  
- Site mounded – J une 2004  
- EM 31 and EM 38 surveys taken – J une 2004  
- Herbicide Applied – July 2004  
- Direct seeding completed – J uly 2004  
- Seedlings planted – Early July 2004  
- Spinner Drains constructed – September 2004  
- Perennial Pasture sown – September 2004

**Rainfall 2004**

- Extreme: 300 mS/m +  
- High: 200-300 mS/m  
- Moderate: 100-200 mS/m  
- Slight: 50-100 mS/m  
- Fresh: 0-50 mS/m

**Acknowledgements:**

James and Betty Stokes 9635 1265  
Cunderdin LCDC

www.landwaterwool.gov.au
REPAIRING AN INCREASINGLY ACTIVE SALINE AREA.
LUCERNE FAILED TO GROW, WILL SALTBUSH AND OTHER PERENNIALS WORK?

**RESEARCH OBJECTIVES**
- To re-evaluate a paddock which had a small area going saline.
- Incorporate suitable tree species in a belt to maximise water use and reduce groundwater pressure.
- Evaluate the evergreen mix sown on the affected area.
- Evaluate pig effluent as a form of fertilizer on the site.
- Continue to monitor the effect of a small drain which is siphoned occasionally.
- Incorporate saltbush into the site.

**ACTION TAKEN**
- Treatments established in 2004.
- Monitoring bores installed.
- Salinity survey completed.

**Results**
- Evergreen mix failed to establish on 60% of site.
- Re-sowed area in 2004 with saltbush, puccinellia and TWG, with some success.
- Tree belt is growing well with a 95% strike rate.

**FAST FACTS**
- **Location:** 10km north west of Tambellup in Pindellup Creek catchment.
- **Soil Type:** Shallow duplex and clay.
- **Annual Rainfall:** 450mm (winter dominant)
- **Pasture Base:** Barley grass, bare land, clover, ryegrass, lucerne
- **Landscape:** Flat land on an old floodplain near the river which is cutoff by sand dunes.

**WANT TO KNOW MORE?**
- **Technical Officer**
  Arjen Ryder, Department of Agriculture, Albany, Tel (08) 9892 8531
- **Host Farmer**
  Ian Cunningham (08) 9826 1034
- **NRM Coordinator**
  Peter Guazzelli, Tambellup, Tel (08) 9824 1245
- **Database Website**
Bignell’s Sustainable Grazing of
Saline Land on the Broomehill Tie Line Road

Objective
To realise the grazing potential of saline that has not been cropped for 25 years or produced decent pastures over that time.
It is hoped by introducing perennial pasture species and increasing the application of fertiliser production will be greatly increased.

Action so far
Strips of lime and strips of gypsum applied in April
80 kg of potash applied mid September
1.5 L of Roundup® mid September
Seeded 9th August. Tall Wheat Grass (45% by weight @ 3.2kg/ha), Lucerne (14% @ 1kg), pucinellia (13% @ 0.9kg), balansa clover (11% @ 0.8kg), Rhodes grass (6% @ 0.4kg), river bush (3% @ 200g/ha), old man bush (3%), wavy leaf bush (2.5% @ 170g) and creeping bush (1.5% @ 100g), Acacia saligna (0.5% @ 40g/ha). This made up a total of 352 kg of seed @ 7kg/ha costing $4,800.
80 kg of Ag Star extra went out with the seed
50 L of Flexi N went out with seed
90 mL of Telstar® Sprayed for red legged earth mite 4 days after seeding

Want to know more contact
Craig Bignell on 0408341253
John Paul Collins 0427170035
Anthony Witham 0428253073
ACACIA ALLEY’S REDUCE WATERLOGGING.
INCORPORATING BELTS OF ACCACIA’S WITH PERENNIALS INCREASES PRODUCTION AND WILDLIFE HABITAT.

RESEARCH OBJECTIVES

• To rehabilitate waterlogged, salt affected and bare ground into productive land and at the same time improve the habitat for wildlife.
• Incorporate acacia and other tree species as alleys.
• Evaluate a range of perennials within the inter-row areas (temperate and sub-tropical species).
• Recognise the environmental benefit of an ‘alley’ system.

ACTION TAKEN

• Treatments established in 2004.
• Monitoring bores installed.
• Saltbush seedlings planted Sept 05

Results

• Poor seasonal conditions resulted in poor establishment of saltbush in 04.
• Sub-tropicals established well over 04/05

FAST FACTS

Location: 20 km West of Tambellup in Upper Slab Hut catchment
Soil Type: Shallow duplex and gravelly sands.
Annual Rainfall: 500mm (winter dominant)
Pasture Base: Barley grass, bare land, clover and ryegrass
Landscape: Undulating Mid slopes to creeklines.

An outbreak of salt on the hill slope within the trial is being covered by perennials.

WANT TO KNOW MORE?

Technical Officer
Arjen Ryder, Department of Agriculture, Albany, Tel (08) 9892 8531

Host Farmer
Peter and Wendy Bradshaw, (08) 9825 3032

NRM Coordinator
Peter Guazzelli, Tambellup, Tel (08) 9824 1245

Database Website

An outbreak of salt on the hill slope within the trial is being covered by perennials.
MANAGING SURFACE WATER and PERENNIAL PASTURES.
INCORPORATING RAISED BEDS AND PERENNIAL PASTURES ON SALINE AREA

RESEARCH OBJECTIVES
To compare production and establishment of different pasture species on raised beds and non-raised beds.
To determine “best bet” pasture species for the site, which is regularly subject to waterlogging, inundation and is moderately salt affected.
Evaluate the effects of straw and pig effluent on pasture production.
Compare other alternatives to raised beds through the Spinner machine and the Furrow machine.

ACTION TAKEN
• Raised beds installed May 2004
• Spinner and furrow drains installed in June 2004
• All pasture species sown in August 2004 and re-seeded Oct 2005.
• Saltbush sown by niche seeder in September 2004 with seedlings planted August 2005.

FAST FACTS
Location: 39 km East of Cranbrook in Camel Lake catchment
Soil Type: Duplex soil, sand over clay (Clay layer has pH of 8.2
Annual Rainfall: 350 - 400mm (winter dominant)
Pasture Base: Barley grass, bare land, occasional saltbush
Landscape: Low lying flat area

A lot of water fell in 2005 causing flooding. The drainage works helped in removing the water.

Purple goosefoot covered the site in summer 04/05, a weed never seen before.
The green area above, had been covered with straw and did well under all conditions.

WANT TO KNOW MORE?
Technical Officer
Arjen Ryder, Department of Agriculture, Albany, Tel (08) 98928531
Host Farmer
Graham Bradshaw, (08) 98258228
NRM Coordinator
Mark Waud, Gillamii Landcare Centre, Cranbrook, Tel (08) 98261234
Database Website
Evaluating Perennial Pastures for Saline Land in West Cranbrook (600mm rainfall)

Objectives
• Re-establish a moderately salt affected area into a more productive/sustainable area.
• Implement surface drainage and some spinner drains to help ease the waterlogging effects on the area
• Evaluate perennial grasses, legumes, saltbush and Acacia saligna for a 600mm rainfall area

Action taken
• Large ‘W’ drain surveyed and installed in March to relieve waterlogging
• Spinner drains installed in May and Vetiver slips planted
• Pasture species sown in June
• Saltbush and Acacia saligna planted by niche seeder in September ‘04

Site details
Location: Approximately 33 km North of Frankland
Soil Type: Gravely duplex soil
Annual rainfall: 550 - 600mm (winter dominant)
Pasture Base: Barley grass, salt scald, isolated patches of clover
Landscape: Waterlogged valley floor

Want to know more?
Host Farmer:
George Toovey Tel (08) 98268053
NRM Coordinator:
Mark Waud, Gillamii Landcare Centre, Cranbrook, Tel (08) 98261234
Research Officer:
John Paul Collins, Department of Agriculture, Katanning
Tel (08) 98213249

www.landwaterwool.gov.au
Can deep ripping improve the growth of Tall Wheat Grass?
Katanning Creek Catchment Group

**Trial details**
- Tall Wheat Grass will be sown as a pure stand on a barley grass flat
- The area will be deep ripped in strips to investigate if there is a response to deep ripping on a heavy clay
- Puccinellia will be sown into a low lying depression
- The Evergreen Saltland Mix will be sown onto a sandy corner in the paddock

**Site details**
- **Location:** Schulz Rd, 5 km south of Katanning
- **Soil Type:** Heavy Clay
- **Annual rainfall:** 450mm
- **Pasture Base:** Barley grass
- **Landscape:** Low lying flat drained by the Katanning Creek Catchment

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**For more information**
**Host farmer:** Ben Hewson Ph: 0417969975
**Support person:** Sharon Hausler Ph: 98214327
**Research officer:** John Paul Collins Ph: 98213249

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**EM 38 map**

- **Colour**
  - Dark blue
  - Light blue
  - Green
  - Yellow
  - Red

- **EM 38 Salinity**
  - 0-50mS/m
  - 50-100
  - 100-200
  - 200-300
  - >300

- **Salinity Class**
  - Fresh
  - Slight
  - Moderate
  - High
  - Extreme

- **Bush**
- **Creek** (deepened to improve flow)
- **Evergreen Saltland Mix**
- **Tall Wheat Grass +/- ripped**
- **Puccinellia**

---

**Viewing the EM maps on the site**
Coarse textured sands over structure-less sub-soil clays on the Beaufort Flats.

BACKGROUND

• Rainfall: ~ 400ml / year winter dominant
• Landscape/Soils: Beaufort River ancient floodplain - shallow duplex, loamy sand (5-60 cm) over massive grey clay.
• Seasonal waterlogging and transient salinity.
• (left) Tall Wheat Grass established very well along deep rip line where optic cable laid 1m below surface
• Pasture production on the flats is limited due to shallow soils, waterlogging, salinity and grazing management (set stocking).

OBJECTIVES

• Determine if the surface application of gypsum is useful in improving the structure of sub-soil clay and therefore improve pasture production.
• Determine if deep ripping to increase soil depth improves pasture growth.
• Will deep ripping + gypsum give a greater response to pasture production?
• Compare annual pasture, TWG and Evergreen Mix when grown across deep ripping and gypsum treatments.

ACTION TAKEN

Autumn 2004 - soil pits dug and sub-soils examined with Prof. Bob Gilkes. A plan for a gypsum/ripping trial drawn up.
17 Sept. 04 - Gypsum applied at 4 tonne/ha.
20 Sept. 04 - Ripping done using Bob Lilleyman’s ripper from Wagin.
7 Oct. 04 - TWG, Evergreen mix sown at 6kg/ha using DBS bar.

OUTCOMES TO DATE

• Soil pit examination showed a coarse textured non wetting sand overt a structure-less, dispersive clay sub-soil.
• Much difficulty deep ripping!! With 2 passes, still couldn’t rip deeper than 75cm depth.
• 10mL rain mid October 2004 - good germination of perennial's.

MORE INFORMATION

Brian Leach on 94750753
Sally Thomson) on 98612222

Bob Gilkes examines soil profile
Using intensive rotational grazing and salt land pastures for cattle production in the low rain fall North Eastern wheatbelt

Research Objectives
The aim of this project is to increase the productivity of a saline valley by planting saltbush. The fences and watering points erected will help establish a rotational grazing system which will make a more profitable livestock enterprise as well as a control method for salinity.

Actions so far
1. Salt mapping using EM 38
2. Develop fencing and watering plan
3. Sow salt bush and other perennial pasture

Fast Facts
Location: Woongoondy, 40km south on the Mullewa – Mingenew Road from Mullewa
Soil Type: vary from duplex to fertile clay loams
Annual Rainfall: 340 mm
Pasture Base: bluebush, samphire, acacia shrubs and annual grasses
Landscape: Flat Valley floor

Want to know more?
Tim Wiley
Department of Agriculture Geraldton,
Tel: 08 99568 555

Kane Grima
Host Farmer
Tel: 08 99619 013

Aerial photo showing the layout of grazing cells. Watering points are marked in blue.
Will deep ripping boost perennial grass production?
Beaufort Flats Group

**Trial details**

- **Spring 2002:** Strips were deep-ripped using CALM Narrogin multi-tyne ripper then sown to Evergreen mix and TWG/chicory mix
- TWG dominant in both plots. Marked increase in pasture bulk and/or plant density in ripped areas with shallow duplex soils (>~60cm) compared to control.
- No difference in pasture bulk and/or plant density where duplex soils are <~60cm
- TWG, chicory, rhodes grass, setaria, puccinellia & bambatsi grasses have established with varying success.
- Puccinellia well established in marginal areas
- Plots periodically grazed using high stocking rates

**Site details**

**Location:** Beaufort Rd, 25km SW of Wagin

**Soil Type:** sandy shallow duplex with massive clay base

**Annual rainfall:** ~430mm

**Pasture Base:** Barley grass

**Landscape:** old floodplain adjacent to waterway draining into Beaufort river

For more information:

**Host farmer:**
Robert Rex  ph: 0427 626 067

**Support person:**
Sally Thomson  ph: 9861 2222
Brian Leach ph: 0409 121 938

**Research officer:**
John Paul Collins Ph: 98213249
GORGE ROCK SALTIES
GRAZING ON SALTSCALDS WITH CAMBERED BEDS

**OBJECTIVE**

- To establish saltland pastures on a highly saline site using cambered beds.
- To investigate improvements to pasture establishment and production using deep ripping.
- To compare grazing on beds compared to a stubble.

**OUTCOMES**

- Double blade grader used to make 10 cambered beds in Sep 2004.
- Clone saltbush planted 2004-05 is well established.
- Inter-row strips of existing vegetation have been retained as a seed bank and for erosion control.
- Monitoring points have been set up.
- Piezometers installed. Water table is less than 1 metre below soil surface.

**FAST FACTS**

- **Location:** 25 km E of Corrigin
- **Soil Type:** Sandy duplex
- **Rainfall:** 300 mm
- **Pasture Base:** Native perennials & barley grass
- **Landscape:** Flood prone saline flat on paleo-channel.

**WANT TO KNOW MORE?**

**Host Farmer**
Norm Talbot, Tel (08) 9063 2232

**Support**
Robin Campbell, Tel 0429 657 890

www.landwaterwool.gov.au
Perennial Pasture systems on the Beaufort Flats

BACKGROUND

- Rainfall: ~ 400ml / year winter dominant
- Landscape/Soils: Beaufort River ancient floodplain - shallow duplex loamy sand (5-60 cm) over massive gray clay.
- Mild-moderate waterlogging and resultant salinity
- Pasture production on the flats is currently below average due to waterlogging, salinity and stock management.

OBJECTIVES

- Rehabilitation of previously sown Balansa clover
- Understand the management of tall wheat grass and its productivity
- Evaluate other perennial pasture species, including productivity of livestock

ACTION TAKEN

* March 2002 – group formed with the aim of evaluating pastures on old Ag Dept grazing trial site.
* Spring 2002 - range of sub-tropical species strip-sown into plots, as well as Evergreen mix. -TWG / balansa plots rejuvenated
* Autumn 03 - light grazing of rhodes, balansa and control plots
* Winter 03 – grazing to manage pasture growth and plots fertilised
* 17/09/03 - sub-tropical & temperate species sown (DBS) - direct-seeding saltbush mix by A. Lewis - balansa plots set seed
* Autumn 2004 - rotational grazing of rhodes, TWG, balansa and control plots. Sheep condition scored & assessed for white muscle disease
* Winter 2004 - grazed for management
* Spring 2004 - new species sown using DBS seeder

OUTCOMES TO DATE

- establishment of numerous sub-tropical / temperate species – Kikuyu, TWG, puccinellia, setaria rhodes, giant bermuda cooch, lucerne showing promise

Av. FOO counts Nov 03 (all plots fertilised)

Control plots (+ fertiliser) 5.3 t DM/ha
Balansa 3.88 t DM/ha
Tall Wheat Grass 4.91 t DM/ha
Rhodes (sown Spring 02) 5.76 t DM/ha

- sub-tropical grasses est. spring 02 have low persistence Spring 04
- TWG has rejuvenated fairly well – variance between plots
- Saltbush + perennials mix looking great!!
- fertiliser, chemical control and lack of set-stocking sheep has improved general pasture quality, compared to paddock
- Still patchy pasture quality across the plots - variability in soil types??
- Still trying to get enough pasture for meaningful grazing data.

MORE INFORMATION

Brian Leach (group agronomist) on 94750753
Sally Thomson (support person) on 98612222

(above) site + treatments
(left) EM 38 standardised map
RAVENSTHORPE AGRICULTURAL INITIATIVE NETWORK

ESTABLISHMENT OF PERENNIAL SALT TOLERANT SPECIES IN LOW RAINFALL AREA

OBJECTIVES

• Transform a totally unproductive area of a paddock into a year-round profitable resource
• Lessen the encroachment of salt in adjacent paddocks
• Assess the impact of the perennial pasture species options on groundwater rise
• Determine which perennial pastures species establish and thrive in the local environment over time
• Determine which saltbush species and establishment methods are more suitable for the local area over the long term.

OUTCOMES TO DATE

• First treatment - Tall wheat grass/ Lucerne mix
• Second treatment - Lucerne mix.
• Third treatment - Saltbush alleys with “Evergreen Saltland Mix” in inter-rows.
• Monitoring points set up and first monitoring in Aug 2004
• Hydrology survey completed and piezometers installed. Groundwater levels less than 2 metres from soil surface

FAST FACTS

Location: 20 km N of Ravensthorpe
Soil Type: Shallow sandy duplex
Rainfall: 300 mm
Pasture Base: Bare ground, barley grass
Landscape: Low lying/ river system

WANT TO KNOW MORE?

Host Farmer
Marilyn TInk, Tel (08) 9838 0064
Support Person
Jenny Chambers, Tel (08) 9838 1018
BACKGROUND
• South Yarding is a group of highly motivated farmers working from the mid eighties to rectify environmental degradation
• A SGSL site was identified by the group for trial and research due to its bare ground next to high yield cropping areas and the presence of a natural salt river system through the catchment

OBJECTIVES
• to investigate how the spacing of saltbush along the rows, 4 plots from 0.5m to 2m spacings, affects the growth, survival and establishment of a specific clover or medic planted within the rows
• To use current seeding methods to create the spacings along the rows and seed the clover

TRIAL SETUP
• There will be five rows of each spacing and the scimitar burr medic will be seeded at the same rate as a control to display what affect changes in the density of the saltbush will have on the growth and establishment of the medic.
• Seeding was completed on July 5th 2004

Want to know more:
Host Farmer:
John Chapman
Ph 9061 1021

Support person:
Mark Brown
Ph 9061 1677
Enhancing Puccinellia with Lime x Nitrogen
Kojonup LCDC – Lower 54 Creek

Objectives

• Existing puccinellia that is recruiting on the site will be enhanced with lime x nitrogen treatments
• New puccinellia will be sown and lime x nitrogen at varying rates will be applied
• Vetiver grass will be planted to evaluate its nutritional value
• A range of temperate and sub-tropical grasses will be sown in strips to evaluate their potential
• Pasture legumes including strawberry clover, persian clover, balansa clover and burr medic will be tested in strips

Site details

Location: Boscabel (15km north of Kojonup)
Soil Type: Duplex
Annual rainfall: 600mm (winter dominant)
Pasture Base: Barley grass, puccinellia and salt scald
Landscape: Waterlogged valley floor of the Lower 54 Creek

For more information
Host farmer: Jill Mathwin Ph: 98328027
Research officer: John Paul Collins Ph: 98213249

www.landwaterwool.gov.au
Keeping The Salt At Bay: Maximising Water Use Through Rotational Grazing

40 ha trial site fenced into 8 x 5 ha paddocks. Woody perennials in alleys 8-10m apart, with sub-tropical perennials to be sown in between.

**Location:** West Gillingarra  
**Rainfall:** 550 mm  
**Soils:** sand; some areas non-wetting

**LEARNINGS TO DATE**  
• Elephant grass has poor frost tolerance, but this can be improved by withholding heavy grazing over winter
• Stock selectively graze certain Elephant grass plants but don’t touch others
• Shallow drains installed in 2001 have reduced surface waterlogging

**Want to know more?**  
**Landcare Officer:** Elizabeth Tierney 9628 7004  
**Host Farmer:** Lex Langridge 9651 5076

www.landwaterwool.gov.au
AMELIORATION OF SALINE LANDS WITH OAT HUSKS

RESEARCH OBJECTIVE

1. To improve conditions for the establishment of salt-tolerant pastures through mulching with oat husks, and to understand the benefits provided by the oat husks

2. To evaluate different pasture types established, in terms of plant growth and secondly in productivity of sheep.

ACTION TAKEN

• oat husks spread on nearby site show good volunteer balansa / ryegrass growth

• 2ha site cleared March 2003

• soil tests show good fertility levels (but poor N) and very high salt loads

• spinner drains installed June 04

• no laying of husk or seeding until 05

SITE DETAILS

Location: 2km E of Wagin
Soil type: sandy loam (5-30cm) over massive gray clay
Annual rainfall: 450mm, winter dominant
Pasture base: scald, samphire
Landscape: Coblinine floodplain, west side slightly higher

WANT TO KNOW MORE?

Host Farmer:
Raymond & Malcolm Edwards
9861 1240

Landcare Coordinator:
Sally Thomson
9861 2222
Increased Production Boosts Conservation Value

**FAST FACTS**

**Location:** 15km west of Bolgart on Solomon Brook  
**Rainfall:** 450mm  
**Soils:** sandy loam over clay

**Area 1**  
Niche sow saltbush with **sub-tropical** perennials in inter-row

**Area 2**  
Niche sow saltbush with **temperate** perennials in inter-row (2005)

**Area 3**  
Salt tolerant specialty timber species – 2000 seedlings planted by FPC

Saltbush planted amongst woodland to lower watertable and encourage regeneration. Can be used as emergency grazing.

**WANT TO KNOW MORE?**

**SGSL Officer:** Justin Hardy, Department of Agriculture, Albany (08) 9892 8408  
**Drummond Recovery Catchment Officer:** Bob Huston, CALM, (08) 9295 1955  
**Host Farmer:** Geoff Erickson erickson@wn.com.au  
**Local Support Person:** Elizabeth Tierney, Shire of Victoria Plains, (08) 9628 7004

**PROJECT PARTNERS AND AIMS**

• CALM + SGSL + Solomon Yulgan Catchment Group  
• Lies within CALM’s Drummond Natural Diversity Recovery Catchment  
• Timber + saltland pastures = production and control of salinity and waterlogging = improved condition of the Recovery Catchment

**FAST FACTS**

- **Location:** 15km west of Bolgart on Solomon Brook  
- **Rainfall:** 450mm  
- **Soils:** sandy loam over clay

**Area 2**, showing couch growing on fresher seep (dark blue area on EM38 map)

mS/m = Salinity Class  
0 – 50 = Fresh  
50 – 100 = Slight  
100 – 200 = Moderate  
200 – 300 = High  
> 300 = Extreme

**Area 3**

Geoff Erickson EM38 with site plan overlaid. Waterway shown is Solomon Brook.

**Location:** 15km west of Bolgart on Solomon Brook  
**Rainfall:** 450mm  
**Soils:** sandy loam over clay

**Area 1**  
Niche sow saltbush with **sub-tropical** perennials in inter-row

**Area 2**  
Niche sow saltbush with **temperate** perennials in inter-row (2005)

**Area 3**  
Salt tolerant specialty timber species – 2000 seedlings planted by FPC

**WANT TO KNOW MORE?**

**SGSL Officer:** Justin Hardy, Department of Agriculture, Albany (08) 9892 8408  
**Drummond Recovery Catchment Officer:** Bob Huston, CALM, (08) 9295 1955  
**Host Farmer:** Geoff Erickson erickson@wn.com.au  
**Local Support Person:** Elizabeth Tierney, Shire of Victoria Plains, (08) 9628 7004

**www.landwaterwool.gov.au**
Comparing the effects of different surface drainage techniques @ TAMBELLUP

Surface drainage reduces waterlogging but drainage techniques can be very different.

Five techniques are compared for pasture productivity, drainage properties and economics.

1. Disc-plough / grader mounds.
   Width: 5 m
   + Cheap, quick, no traffic, stock obstacle and efficient runoff
   - Exposed subsoil, variable topsoil, little internal drainage

2. Single furrows
   Furrow spacing: 6 m
   + Cheap, quick, some internal drainage, even top soil
   - Some traffic/stock obstacle, less surface drainage

3. Raised beds and No-Till beds
   Furrow spacing: 1.8 m
   + Very efficient internal drainage and runoff, even top soil
   - Traffic/stock obstacle, expensive

Contact:
Dean Hull (Host farmer), Tambellup. Tel: 98251119
Derk Bakker or Justin Hardy: Department of Agriculture, Albany. Tel: 9892 8400

www.landwaterwool.gov.au
Extending saline land green feed production

Research Objectives

• Examine the salinity tolerance of perennial ryegrass (*Robust*) over a wide range of soil salinities.
• Examine the use of *Robust* within a saline pasture system.
• Evaluate the mix of ryegrass/TWG and puccinellia.

Action Taken

• EM 38 AND 31 Survey completed
• Seeded saltbush alleys in 2004
• First round of monitoring completed

FAST FACTS

<table>
<thead>
<tr>
<th>Location:</th>
<th>Yilliminning Catchment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paddock:</td>
<td>The site consists of 2 blocks. 4ha was sown with saltbush alleys and 20ha to ryegrass, TWG and pucc mix.</td>
</tr>
<tr>
<td>Salinity:</td>
<td>A 2m deep drain was dug through the area in 2001. Some areas have not been cropped for 40yrs due to salinity.</td>
</tr>
<tr>
<td>Rainfall:</td>
<td>Annual rainfall is 385 mm</td>
</tr>
<tr>
<td>Soil:</td>
<td>Sandy loam - clay</td>
</tr>
</tbody>
</table>

WANT TO KNOW MORE?

Technical Support:
Richard O’Donnell,
Department of Agriculture
Northam, Tel (08) 9690 2246 email: rodonnell@agric.wa.gov.

Host Farmer:
Mike and Kaye Brown
Tel:(08) 9888 1251

www.landwaterwool.gov.au
HOMMAJELLY CREEK CATCHMENT GROUP

Comparing the effects of liming on saltland pastures

RESEARCH OBJECTIVES

• To determine if applying limes has a significant benefit to establishing saltland pastures.
• To determine how much grazing pressure can be tolerated by different saltland pasture species.
• To share information gained by the project with other landholders.

ACTION TAKEN TO DATE

• Site established Autumn 2004
• Deep ripping and liming August 2004
• Saltbush seedlings planted August 2004
• Between rows ripped for weed control October 2004
• EM38 and 31 survey completed by Geoforce Pty Ltd in October 2004
• Pasture seed has been sourced.
• Saltbush growing well October 2004

SITE INFORMATION

• Located 17.5 km’s northeast of Quairading
• Annual rainfall average is 330mm (winter dominant)
• Soil is blue clay soil type, mildly saline to salt scald
• Barley had been grown up until 6 years ago, no longer productive due to increasing salinity

TRIAL DESIGN

An approximately 20 hectare site is sown with a mixture of saltbush alleys with annual pasture legume inter-rows. The trial is split into two sites – one area that is ripped and limed and one that is ripped with no lime. A small plot of no ripping and no liming will also be used as a comparison. A variety of saltbush has been used to also determine the most vigorous and best pasture quality of the saltbush. This includes Ayres Green Giant, K28, River and Oldman Saltbush. Scimitar burr medic, Strawberry clover, Frontier Balansa clover and Puccinellia will be planted in the inter-row.

WANT TO KNOW MORE?

Host Farmer
Eugene Stone, Tel (08) 9645 1214

Support Person
Cindy Mulders, Tel (08) 9645 0236

www.landwaterwool.gov.au
Spiny Rush needs to be controlled before Saltland Pastures are sown

Research Objectives

- To demonstrate management and eradication of the invasive *Juncus accutus* (Spiny Rush)
- To demonstrate the profitable use of saltland pastures on saline and waterlogged flats
- Improve the aesthetics of the Wandering Brook creekline

Process to date

- Spiny Rush control has commenced:
  - Slashed
  - Slashed and sprayed
  - Pushed out with front end loader and heaped and burnt
  - Rotary hoed in
- EM survey, hydrology survey and soil survey have been undertaken
- Photo points have been set up
- First knockdown herbicide applied in Spring '04 for pasture establishment in '05

Site Details

**Location:** 3 km west of Wandering

**Soil type:** Heavy clay

**Rainfall:** 630 mm

**Pasture base:** Spiny Rush

**Landscape:** Valley floor of Wandering Brook creek system

Want to know more?

**Host farmers**

Steve and Marie Watts
Tel: 98841051

**Support person**

Darralyn Ebsary,
Tel: 98841586
0427988415
clchotham@westnet.com.au
Intensive surface drainage techniques with Salt Bush @ Yealering

Intensive surface drainage reduces waterlogging and improves productivity.

Three techniques are compared for Salt Bush based pasture productivity, drainage properties and economics.

Wide grader-built mounds.
Width: 20 m
+ No traffic/stock obstacle, efficient runoff, flexible row spacing
- Expensive, exposed subsoil, variable topsoil

Narrow grader-built mounds with planting strip
Strip spacing: 10 m
+ No stock/traffic obstacle, efficient runoff
- Inflexible row spacing, less surface drainage

Shallow parallel grader ‘V’ drains
Spacing: 6 m
+ Cheap, some internal drainage and efficient runoff, even top soil
- Some traffic/stock obstacle

Contact:
Chris Walton, Yealering. Tel: 9888 7048
Derk Bakker or Justin Hardy: Department of Agriculture, Albany. Tel: 9892 8400

www.landwaterwool.gov.au
productive and sustainable ways to use saltland

THE SUSTAINABLE GRAZING ON SALINE LANDS (SGSL) Producer Network in WA