

Final Report for West Australian network for Participatory R&D for Sustainable Grazing on Saline Lands (SGSL)

1. Executive Summary

Background

This final report reflects on the aims, objectives, methods, findings, observations, outcomes and impacts of this participatory research and development project. SGSL is a five-year national project funded by Australian Wool Innovation Ltd. and Land and Water Australia with completion planned for December 2006. Additional partners include Meat and Livestock Australia, the CRC for Plant Based Management of Dryland Salinity, the WA Department of Agriculture, the WA Chemistry Centre and the Saltland Pastures Association Inc. In WA, there are currently 61 grower groups undertaking 69 on-farm trials each of whom are researching ways to increase the profitability of the use of salt and waterlogging affected land through enhancing livestock production. The grower groups represent a significant proportion of the Wheatbelt. They range from sites near Mullewa in the north to the others near Jerdacuttup in the southeast (see map).

Methods

The process used has involved all key stakeholders mentioned, including the farmers, scientists and extension officers. This group of people were represented on a coordinating committee which led the project. All partners were able to participate in the following aspects of the process, from the overall program planning, the specific farm trial designs, measurement procedures, site characterisation and implementation, results, interpretation and extension. Through the process of trial and error combined with the access to technical support and resources the majority of these groups have been able to establish pasture species from saltbush to sub-tropical perennial grasses on what was previously degraded land and unproductive land.

Findings

The project has reinvigorated interest in saline land management by fine tuning the principles of agronomy in a broad range of saline landscapes and rainfall zones. These principles were directly drawn from the producer trials and cover the following categories of site design, establishment, drainage, grazing, perennial mixes and economics. The project findings are linked to the project's contracted objectives.

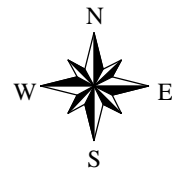
Outputs & impacts

The project has some strategic products (some of which are still in the draft stage) that have been drawn from the findings of the producer sites aimed to meet the needs of growers with different levels of experience with saline land management. Project evaluations have been carried out and are presented using the Bennett's Hierarchy framework to illustrate the wide impact the project has had on reactions, knowledge, attitudes and skills of participants as well as referring the evidence of practice change to the range of people involved in the project.

Conclusions

There have been benefits to the livestock enterprises of the growers involved through increased confidence in establishing adapted plants, increased grazing days (year round & autumn) and good evidence on a payback on investment. There is evidence of growers having an increased feeling/sense of satisfaction and pride as well as minimising further degradation. The project recommends that a continuation should be seriously considered to make full use of the body of information and experience. That a new project should adopt the same participatory process and should involve project participants, farmers and partners in a similar way. This time to experience the 'ongoing management and grazing and the integration into the whole farm' aspect of saltland pastures and therefore to help complete the full picture of the system.

SGSL trial sites in WA



Context

Background

The predicted extent of dryland salinity in Western Australia (WA) is vast and encroaching. The available evidence suggests that more than four million (potentially 6 m) of 18 million hectares of agricultural and public land may be affected by salinity (Salinity Taskforce Report September 2001). Farmers and meat and wool research scientists alike increasingly accept that salinity will be part of our future landscape and will influence the way farm businesses are run and where profits are determined.

This five year project (2002 – 2006) was developed in close consultation with the relevant stakeholders in Western Australia and representatives of Land and Water Australia (L&WA) during September – November 2001. The WA project is a part of the national Sustainable Grazing on Saline Lands Sub-program under the umbrella of the Land Water & Wool Program. It focusses on exploring the opportunities to increase the use and productivity of at risk and saline land.

A relatively unique aspect of the project was that it used a participatory research and development approach involving all key stakeholders, including farmers, scientists and extension officers. This approach encourages connection and relationships between all parties involved in decision making and it has underpinned and contributed to the success of the project.

The WA project provided small amounts of financial support to interested farmer groups. This facilitated the set up research sites on member properties. During the course of the project, 2002 to 2005, there were 69 sites (**see map**) established by participating farmers in Western Australia ranging from low rainfall sites in the north eastern wheatbelt to high rainfall sites in the lower Great Southern and south west agricultural areas. While much of the research involved establishment strategies for saltland pastures, there was a board range of saltland solutions investigated by these active groups

Aims

Within the framework of the overall SGSL (National) objectives, three guiding aims (see below) were developed by representatives of the stakeholders for the WA project. This group of representatives, made up of farmers, researchers and industry formed a state SGSL Coordinating Committee. They provided strategic directions for the duration of the project that influenced all planning and investments. The aims of the committee were:

1. to establish and support at least 60 producer trial sites;
2. to support the groups to ensure information and data gathered from these trials was credible and fit into a productive farming systems context; and to
3. encourage the sharing of knowledge and experience across the network of sites.

Contracted Objectives (see comments: achievement in Research Assessment & Site Results section)

1. To provide producer leadership in participative research processes that lead to shared outcomes in productive and profitable management options for salt affected land.
2. To establish a network of meat and wool producer group managing 67 R&D sites that addressed the key issues identified by these groups in increasing production from salt affected land.

3. To ensure that project sites represent the varying rainfall zones and varying severity of salinity across the agricultural region of WA.
4. To provide financial and technical support to each of the producer network research sites.
5. To facilitate the sharing of information across the range of existing communication networks focusing primarily on grazing systems and management of saline lands.
6. To achieve recognition of the role of the wool and meat industries in initiating and leading the process of working with partner organisations

Milestones

Table 1. The project outcomes were linked to the contracted objectives listed here as milestones for each financial year. Project progress payments were contingent on these being achieved & accepted.

<i>Year 1 & 2. Milestone 1. Date due: 06/06/2003</i>
1 Submission of a Progress Report to Land & Water Australia, covering: <ul style="list-style-type: none"> - the 2002 producer research program, including establishment of 10 demonstration sites, with description of site characteristics and preliminary measurements completed. - preliminary report on feedback gathered from groups engaged in the program at this stage. 2 Submission of the minutes of all SGSL network committee meetings held during the reporting period.
<i>Year 2. Milestone 2. Date due: 31/12/2003</i>
1 Establishment of 2003 Demonstrations program. 2 Completed Communication Plan. 3 Establishment of a minimum of 20 additional group demonstration sites, with site characteristics and preliminary measurements completed. Reporting on-going measurements and analysis of sites continued from 2002. 4 Establishment of a consolidated reporting framework and database of grower network projects including measures on: <ul style="list-style-type: none"> - benefits to individual growers - benefits to the wool industry - productivity gains - numbers of growers involved at each site (group) - response to the project from involved growers - estimate of areas rehabilitated and/or likely to be rehabilitated from the project - overall assessment on on-farm gains from the project 5 Minutes of all SGSL producer network committee meetings held during the reporting period.
<i>Year 3. Milestone 3. Date due: 30/04/2004</i>
1 Submission of a Progress Report to Land & Water Australia, covering: <ul style="list-style-type: none"> - progress of the WA Network Committee in 2003/04 - plans for the 2004/05 financial year 2 Submission of the minutes of all SGSL network committee meetings held during the reporting period.
<i>Year 3. Milestone 4. Date due: 10/01/2005</i>
1 Establishment of 2004 Demonstrations program. 2 Implementation of Communication Plan. 3 Establishment of a minimum of 20 additional group demonstration sites, with site characteristics and preliminary measurements completed. On-going measurements and analysis of sites continued from 2002 and 2003. 4 Consolidated report on grower network projects as per point 4 of milestone 2. 5 Minutes of all SGSL producer network committee meetings held during the reporting period

Year 1 & 2. Milestone 1. Date due: 06/06/2003
Year 4. Milestone 5. Date due: 30/04/2005
<p>1 Submission of a Progress Report to Land & Water Australia, covering:</p> <ul style="list-style-type: none"> - progress of the WA Network committee during 2004/05 - plans for the 2005/06 financial year <p>2 Submission of the minutes of all SGSL network committee meetings held during the reporting period.</p>
Year 4. Milestone 6. Date due: 31/12/2005
<p>1 Establishment of 2005 Demonstrations program.</p> <p>2 Further implementation of Communication Plan.</p> <p>3 Establishment of a minimum of 10 additional group demonstration sites, with site characteristics and preliminary measurements completed. On-going measurements and analysis of sites continued from 2002, 2003 and 2004. Payment of this milestone is contingent upon the group establishment target being met.</p> <p>4 Consolidated report on grower network projects as per point 4 of milestone 2.</p> <p>5 Minutes of all SGSL producer network committee meetings held during the reporting period.</p>
Year 5. Milestone 7. Date due: 30/04/2006
<p>1 Submission of a Progress Report to Land & Water Australia, covering:</p> <ul style="list-style-type: none"> - progress of the WA Network Committee in 2005/06 - plans for the 2006/07 financial year <p>2 Submission of the minutes of all SGSL network committee meetings held during the reporting period.</p>
Year 5. Milestone 8. Date due: 15/11/2006
<p>Final report (using agreed template) to cover the following:</p> <p>1 Establishment of 2006 Demonstrations program.</p> <p>2 On-going measurements and analysis of sites continued from 2002, 2003, 2004 and 2005.</p> <p>3 Well documented research publication concluding detailed analysis of measurements from a minimum of 67 demonstration sites across the wool/wheatbelt.</p> <p>4 End of project evaluation report, including outcomes of grower network projects as per point 4 of milestone 2.</p> <p>5 Minutes of all SGSL producer network committee meetings held during the reporting period.</p>
Year 5. Milestone 9. Date due: 01/01/2007
<p>Submission of the content of the products proposed in the WA Product Plan. The content must be fully edited and ready for layout and printing.</p>

Key people and activities

In WA the SGSL producer network project has a structure based around three key areas of activity and can best be described as a flow of communication. These include a *strategic level* (the funding body and SGSL Coordinating Committee); *on-the-ground level* (SGSL Producer Network includes demonstration host farmers and groups) and an *operational & support level* (SGSL Departmental Team, group support staff and specialists).

The **SGSL WA Committee** operated as a Board of Management (*strategic level*) and provided direction and critical thinking for the SGSL team. Membership of the Committee was determined, and they met prior to any trials being established. Importance was placed on representation on this committee being geographically spread across the South West of WA. Therefore, membership was determined by the NRM regional zones. The committee also includes experienced agency and CSIRO staff members and the national SGSL Coordinator. Other key organisations involved include the

Saltland Pastures Association (SPA) and the Sheep Research Council. An independent Chairperson was appointed to manage and ensure balance of perspectives and advice from research and producer representatives.

Having set the project aims (see above), the Committee quickly took on the challenge of delivering an outcome for WA woolgrowers with continued input from the National SGSL Coordinator and senior agency staff. The operational direction of the project team was guided by recommendations made by the Committee, - keeping the committee strategic and the team operational. This allowed the project team to focus on and deliver from their strengths and experience within the team. The teams' diversity has been one of the success factors of the WA SGSL project.

Hassall and Associates undertook a mid term review of the national SGSL programme. This review recommended that an evaluation framework was needed to justify decisions made within the project. In a pursuit to ensure best practise and project success, the WA committee undertook to provide discipline to their intentions and decisions by applying them to a Bennett's Hierarchy (Bennett 1976). This framework enabled the Committee to develop realistic outcomes as well as articulate the verification of these outcomes, i.e. identifying those that can be attributed to the SGSL project. The process also identified the main audiences, priority activities (leading to a communication plan), critical items for verification and outcomes that result from several activities (table 3).

SGSL Producer Network and demonstration host farmers (*on-the-ground level*)

The network comprises individual growers and their associated groups putting forward their ideas and resources in response to having a trial of their own and to “join the network” in Western Australia. As a result they are affiliated with a wider network across the WA agricultural area (69 sites from Mullewa to Jerdacuttup) and also part of a national network (approximately a further 51 sites in SA, NSW, Vic and Tas). The Producer Network has developed effective partnerships between the members of the grower group and the members of the SGSL team. Lasting relationships have formed through the interaction, as the trials took shape and measurements collected and interpreted. The process commenced when the growers outlined their trial objectives and developed practical experimental design and measurements that provided the most meaningful data. As soon as the physical site is planned the team facilitates the process of having the site characterised which is outlined in more detail in the methods section below. The intent behind the criteria for the producer network demonstrations is to enhance the three key aims of the project set by the SGSL committee. These criteria include;

- Broader extension/network value of the project;
- Farmer ownership and group and sustainability;
- Accessibility (e.g. near a road) and willingness;
- Credibility as a speaker;
- Monitoring of data is being done routinely;
- Innovation and progress with implementation;
- Gaining livestock data (current & potential).

SGSL Departmental Team and specialists (*operational & support level*)

The SGSL team consisted of 3 full time equivalents that carried out the activities of the project on a day to day basis. These activities are broadly outlined in the methods section below (detail in APEN paper in Appendix). The team worked closely with the host farmers, producer network groups and also locally employed staff, such as Community Landcare Officers (CLCs/NRMOs) associated with these groups. The SGSL team's intent was to always work through these officers with whom they offer

mentoring and training support. This ‘on-site’ training has proven invaluable in building the capacity and linkages of these people supporting the project. The team was responsible for the site characterization (soil, salinity and hydrology appraisals as well as soil chemical and plant tissue analysis) being completed and to facilitate access of other specialists as needed by the growers. They developed methods to empower the growers to carry out “user-friendly” site measurements and records. They assisted with the interpretation of these results, organization of local field days, conducting media and extension events. The SGSL team developed two key tools to assist with the collection and storage of the information from the sites. The first was an **on-site storage box** (letterbox style) complete with rainfall gauge, water table monitoring tape, logbooks and pasture quadrat. The second was the **web-based database** (see methods).

Research and Development (*important partners*)

Operating in parallel to the project is the core research and is being undertaken by the CRC for Plant-Based Management of Dryland Salinity. The interaction between these researchers (specialists in plant ecology and breeding, livestock management and nutrition, hydrogeology, bio-diversity, and economics) and the producers has been a vital component of the producer network project. In addition the WA Chemistry Centre has contributed toward the soil and plant analysis and interpretation.

Methods in a nutshell (see detail APEN paper in Appendix)

1. SGSL committee “called for, & reviewed project applications” from woolgrowers through advertising in the WA rural press, on 4 occasions over 18 months.
2. Approved projects were refined following site visits and input from the SGSL team and other specialists. This developed a plan to prepare the trial, conduct the monitoring and practical ways to measure the trials into the future.
3. Storage box was offered to the host farmer along with a paddock sign highlighting their trial objectives and contact details.
4. Site characterizations commenced - electromagnetic conductivity maps were produced following EM 38 and 31 surveys; soil surveys were completed and the soil sampling included soils chemical analysis. Hydrological site appraisals were also carried out and this involved the siting and installation of shallow observation wells. Plant tissue analysis and stock measurements were also captured.
5. Site information including maps, documents, photographs, site livestock (including grazing days, condition score and stock live weights), pasture (including composition, density, dry matter, and plant nutritional analysis) and other measurements were all transferred from the field visits and storage box to the web based data base.
6. Action learning activities were used to strengthen and share the new and existing knowledge being gained from the trial data and grower experiences such as ‘grower and researcher’ forums held each year both centrally (Perth) and regionally. In excess of 400 people (over 75% were growers) attended these events (see Impacts section). These have been held in conjunction with other organizations, such as the Saltland Pastures Association Inc (SPA is a WA farmer interest group); the Salinity CRC and the local groups themselves have hosted these events when they were held in the regions.

External influences

Seasonal conditions, risk (*also, see economics theme report in Appendix*) **& other key factors**

Many of the SGSL sites during the 2002 to 2005 period were established in less-than-ideal conditions with a lack of spring rain to assist establishment from August-September plantings. The period happened to be drier than normal. While no-one can forecast what might occur post-planting, farmers

should give it every chance by planting as early as possible into good moisture once soil temperatures are satisfactory – and have an exit strategy if conditions are not suitable.

Other Key Factors

One of the issues with partial failures (e.g. poor saltbush establishment) was that subsequent weed control is difficult without affecting the surviving plants, and treatments (e.g. grazing) for the mature plants are held up while the new plantings consolidate. In many cases, it might be best to ignore the survivors and start all over again. The allocation of incentive funds to help farmers set up their SGSL on-farm demonstrations and research sites was significant in attracting host farmers into the project. It was a major factor in assisting them to avoid the risk of using their own funds in an experimental venture – and was a significant ‘bait’ to attract them into a land use which they otherwise would not have considered. The experience has largely been positive.

However, a significant number of the Producer Network sites either failed completely or required on-going attention to get them to a satisfactory establishment. The 2 major reasons for failure/poor results were:

- **Adverse seasons**

It was unfortunate that the SGSL project happened to coincide with a run of abnormally dry springs in Western Australia. Spring rainfall is critical when most plantings are being done in the August/September period once soil temperatures have risen above threshold. Saltland pasture specialists are often quoted that at least 2 rainfall events of at least 10 mm each is required to germinate and establish saltbushes. 2002 was a statewide drought, 2003 was an excellent production year for annual crops but dried off quickly, 2004 & 2005 again did not fulfil potential due to dry finishes. Although most of the site establishment activities were complete by 2006 the rainfall has been extremely deficient (drought) across most the agricultural areas. As a result due the demand for stock feed the sites have experienced more intense grazing than would have normally been expected. SGSL could not have picked a worse sequence of seasons – hence there were problems at a number of sites. Nevertheless, there were successes at the majority of sites.

There will always be this risk of adverse conditions with late winter/spring plantings. But farmers in Western Australia’s wheatbelt are used to ‘playing the season’ and judging when to go and when to hold back should be second nature. On reflection, action on some of the SGSL sites should have been delayed rather than the pastures being forced in under less-than-ideal conditions.

- **Matching treatments to sites**

It was the nature of the on-farm research component of SGSL that farmers wanted to trial a range of different treatments – some of which we might now consider inappropriate for the particular site. But it was the fact that different things were attempted that greater wisdom is gained. *“Success should be measured in terms of the experience gained rather than the result itself.”*

However, it is logical to suggest that the low rainfall sites have had higher risk. They were more hostile (higher salinity), restricted in possible pasture species (e.g. saltbush/bluebush rather than perennial grasses), have less likelihood of rainfall post-seeding, and more severe summers. Alternatively, the higher rainfall sites had ‘softer’ planting environments, were more suited to a wider range of perennials, are more likely to receive extended spring rainfall, and have less severe summers.

Farmers generally view risk in saltland pastures from the perspective of establishment failures rather than in terms of production deficiencies - probably because it is a new enterprise for many. Hence the information obtained through the SGSL project has been important in combating those risk aversions by providing greater surety of successful establishment. There is now a prevailing attitude among

participating farmers that planting saltland pastures is not perceived as more risky than a normal crop or other pasture development program – as long as some guiding principles are followed. However, the uncommitted majority of inexperienced farmers in saltland production probably perceive revegetating saltland as expensive, more risky, and largely not profitable. Results from SGSL will be used to break down those perceptions.

- **Animal utilisation results delayed**

The majority of the original farmer trial objectives related in some way to gaining increased sheep production however there is limited information gained on the animal production due to up-to a 3 year lead time to full production and that several sites sustained establishment failures during the period of study so each failure effectively put the assumed production back another year. All analyses of case studies assumed nil production during the year of establishment nor during the first year following establishment. Light grazing (say 50% of full rate) was allowed in year 3 with full grazing in year 4 and thereafter. To explain further – if a site was established in September, there would be no grazing in the autumn immediately following with first grazing occurring in the next autumn – i.e. about 18 months after establishment. So most sites have now just reached a point where livestock utilization of the saltland can be gained which builds a case for continued project support for some sites for another season or two. However following the economic analysis of 16 of the sites it demonstrated that they were profitable in the time available.

Research Assessment & Site Observations

“Success should be measured in terms of experienced gained rather than the result itself” Allan Herbert, Senior Adviser, DAFWA,

Introduction

The SGSL Coordinating Committee had no expectation that producer sites would result in “blue sky type findings or innovations” or undertake rigorously scientific research. The preliminary findings from the 69 producer trials have *reinforced* the key principles in saltland agronomy rather than having broken new ground. The completed individual site and cross site analysis is currently in progress and will be documented in a technical report (see Reports section).

Site Observations, Results & Highlights

Establishment

The growers’ trials were started with an establishment phase with much information generated from a broad range of site characteristics and rainfall zones. Following are some of the findings and the examples. The details are within the site reports. The most important findings were captured by a host farmer’s quote.

To ensure a 90%+ success in direct seeding saltbush need 15cm of course textured soil over clay

- **Dry seeding in late summer/autumn is an option in wet sites.**

“We had good early rains that August and saltbush germinated well – particularly on the loam country as opposed to the heavier country”

- Bernie Driscoll, Ballidu

Seeding observations

- Mixture of saltland plant species are better than monoculture.
- Sites with a history of no cultivation have benefited from full-cut cultivation (direct seeding & perennial mix).
- Winter (July) sown temperate pasture seed remained viable for seven months.
- Precision seeding equipment maximises accuracy (e.g. seeding rate) and success.
- Where there is less than 10% of the site bare salt, it is more successful to hand broadcast Puccinellia.
- Spray out barley grass changed the species mix and increased the rye grass; in another case increased the goosefoot
- Spray out ice plant (year in advance – brought in other useful species)

Soils and site related observations

- Morrel soils are not suitable for direct seeding
- Deep ripping resulted in more vigorous growth in the first year only. In subsequent years, there was no effect. It might be an option for future management.
- Surface drainage prior to seeding enhances establishment & trafficability

- Rapidly expanding sites need a range of species to cater for future changing site conditions and require broader catchment planning.
- Cropping on salt affected land with raised beds gives marginal returns.
- Low input system allows recruitment of adapted species.

Sub tropical species observations

- In general, sub-tropicals are not salt tolerant and are unsuitable (Rhodes grass is not persistent) in the wheatbelt (particularly the Great Southern) due to cold temperature, frosts and lack of summer rainfall. However Kikuyu is an exception but needs more work on its geographical potential.

Shrub based pasture observations

- Bluebush is the cheapest option for the NAR & CAR, but it is generally overlooked. Have the full names of these acronyms been given somewhere earlier in the report???
- Saltbush in high rainfall can be successful
- Existing Puccinellia can be enhanced through soil surface & grazing management
- Saltbush establishment in dry and heavy clay areas is more effective through early weed control and by planting River saltbush on rip lines and Oldman saltbush on mounds.
- Iceplant hinders direct seeding and saltbush establishment. Control options are available (year previous to establishment & over stand).
- Seedlings were successful on acid Wodjil soil.
- Heavy red/grey sodic clays are suitable for seedlings only.
- Need to wait 12mths before planting saltbush for residual chemicals to leach through the soil profile.
- 'Mulch' has increased seedling survival and diversity of species.
- Eyres Green Giant clones of Old-Man Saltbush have been found to be highly successful on clay, sand and morrel soil types where direct-seeding has previously failed

Site Design

- **Apply the 3 key restoration criteria:**
 - 1. Identify the severity of the salinity (fence will not keep it in!)**
 - 2. Match drainage and plant treatments**
 - 3. Assess the costs and benefits.**
- **Design the area so it can be managed as a grazing unit, accounting for plant selection, access to water, drainage, alley alignment, equipment, etc.**

“I intend to sow another 80 ha but this time it will be double rows of saltbush and leave the alley wider than 4m to allow access with the boom spray and airseeder for perennial grass establishment. The Chamberlain combine is not particularly precise when it comes to sowing depth” - Cameron Tubby, Morawa.

Practical & low cost observations

- Bluebush is the cheapest option for the NAR & CAR, but it is generally overlooked.

- Rapid expansion of salt at sites need a range of species to cater for future changing site conditions and require broader catchment planning.
- Proximity to laneways and stubble paddocks for supplementary feeding
- Creative fencing design can allow for access to good quality dam water,
- Sites with good plant under story generally provide a management unit in their own right (**If you don't have to put a fence up – don't**)
- Stick with existing fences for low cost, Don't be limited by just putting a fence around the saline patch.
- The costs of infrastructure alone averaged \$216/ha for those sites studied which required extra fencing and water supplies. While farmers cannot choose where their saltland occurs, it would be wise to plan paddock layouts to minimise these capital costs – at least in the early stages of adoption to avoid increasing the initial higher cost.

Considerations for site observations

- The paddock is managed as a grazing unit accounting for plant selection, especially in confined sites which incorporates the saline area (fence is required for grazing management not as a tool for salinity control, i.e. separate Lucerne from saltbush)
- Fence off areas to the land capability – consider the aesthetic and environmental benefits.
- Identify site in terms of salinity, rainfall, and soil texture. The severe sites are best suited to block plantings of seedlings with the mild/moderate severity areas best suited to wide-spaced alleys and direct seeding.
- Orientation of alleys (NS ideally) and wide enough for equipment

Drainage

- **Broad based beds or widely spaced furrows are more suited to grazing systems**
- **Need to plan and install drainage systems during the summer and sow following this work.**

“My expectation was to put in a ‘Laser level drainage system’ but it had to be commercially realistic and after planning decided on spinners and ‘W-drains’.

Richard Walker, Boyup Brook.

Planning observations

- Need to install the drainage through planning and works during the summer and sow after, both on-site and off-site
- Trafficability is an important aspect of planning.
- Raised beds are more suitable for cropping systems not grazing systems
- Broad based beds or widely spaced furrows are more suited to grazing systems
- Surface drainage prior to seeding enhances establishment & trafficability

Productivity benefits

- Surface drainage can be effective at the establishment stage. It also assist with productivity and use of pastures during waterlogged periods in the season or years

Grazing

- **A larger % understorey in salt pasture system increases the probability of livestock weight gain.**
- **Sites not suitable for understorey need to use the cheapest form of energy to complement the feed.**

“I had seen a lot of saltbush sites and a lot of the plants looked like dead sticks – but since this work I have changed my opinion of them, with the autumn that we just been through, it was like having a hay stack there”

Barry Witham, Lake Toolbrunup

Grazing as a separate unit

- In all situations, sites will need stock water, which dictates usage of the site and limits controlled grazing. A solution to this is to set up cup and saucer water systems or develop a farm reticulation system.
- In most cases where the saltbush is being incorporated there is already existing plant material or a seed bank of understorey (volunteer and planted). The site will have a better balance of energy and protein (saltbush to understorey) to be grazed as a separate unit for a period.
- Requires regular monitoring of stock, condition score a random 25 from the middle third of mob

Livestock production observations

- Maintenance of sheep weight and condition is possible on saltbush-based pastures with an understorey and additional supplementation as the understorey runs out.
- Often understorey is grazed too quickly and supplementation is necessary and not a choice in most situations as it will ensure that the stock do eat the saltbush and maintain or increase condition

Rye grass toxicity consideration

- Where toxicity has been a problem this has often been a deterrent from rehabilitating and utilising these areas but the inclusion of Safeguard rye grass in the understorey mixes is important especially where a previous history of toxicity is known.

Perennial Mixes

- **Essential to have perennials established first and introduce annuals later.**
- **Simply fencing off the saline area to increase cover can work where there are colonizing species such as bluebush, wavy leaf and puccinellia**

“I got sick and tired of myself and others saying the summer rain mucked things up, with the break, if we get a nice early rain and its still warm you get something straight away, where as the annual pastures are still a few weeks away”

– Barry Witham, Lake Toolbrunup,

- Mixture species are better than monoculture for several reasons. Mixes provide for a more robust system and are able to cope with the variable seasonal conditions due the growth characteristics of the different species;
- Perennial mixes suit sites of variable salinity allowing for management as one unit and ensure maximum possible coverage of the landscape;
- Perennials prefer light grazing in first year and then can be rotational grazed;

Economics findings

The project was fortunate to have support from an experienced economist through out the duration. The findings are reported as part of the sub-program Theme 5: Economics (see Appendix). Costs and returns from 21 case study projects were analysed in a discounted cash flow investment analysis framework.

Returns were based on valuing grazing days. Number of grazing days was the only ‘production’ measurement available – and even then only for some sites. There were some sheep body weights and condition scoring work done on 3 sites which showed there was effectively no change in either during the period the animals were grazing the new pasture. Animals were being ‘maintained’ on the pasture hence a proxy value of the equivalent feed costs ‘saved’ was derived for the analysis

Economics matter – but are not the top priority

- Highest risk of failure and low profitability occurred in the low rainfall areas – although successes were evident. Best of the successes occurred in the medium and high rainfall districts where there is a greater selection of suitable pasture species and potential for high grazing days production.
- Observation and analysis of the 21 case studies provides strong encouragement that revegetating saltland with appropriate salt-tolerant pasture species is a profitable investment with associated aesthetic and environmental benefits. 12 of the case studies demonstrated a Payback Period of less than 10 years if infrastructure costs were included and 16 were ‘profitable’ if infrastructure costs were excluded.
- “As the project unfolded, it became more obvious with the Producer Network sites that economics was not the primary motivator. Allaying the salt encroachment, aesthetics and environmental outcomes were stated by farmers to be their major influence – refer *Survey of farmer perceptions of barriers and benefits of adopting saltland pastures* – compiled by Anne Jones, Department of Agriculture and Food, Narrogin. While economics was important (they could not sustain the cost of large areas of saltland) and it would be nice if saltland investment could make money, it was more a desire to do something with saltland that started their improved pasture journey in the first place. If it was economic, it would be a bonus.”

Non-economic benefits

- Given the above, it is a source of concern that economists are not yet able to capture the non-economic benefits (aesthetic, environmental, social, externalities) in a standard discounted cash flow analysis. They are left out of the equation as it is too difficult to quantify. It then becomes a cast-off comment – “other benefits will be additional to the financial benefits”, or “you can judge whether the other benefits are sufficient to make up the difference”.
- Valuing these other benefits has been the source of many papers in the scientific literature and the principles of contingent valuation are well understood. However, the application of the technology is not yet sufficiently advanced to incorporate into a discounted cash flow analysis.

Regional differences

- Just as there were noticeable differences in plant species capability and utilisation across the rainfall zones of Western Australia, so too are there differences between the States. The ‘grazing days’ approach used in WA is most appropriate for the low and medium rainfall zones where autumn ‘crash’ grazing will be the most normal system. However eastern states counterparts have developed a sophisticated analysis based on sheep gross margins and capital investment/disinvestment. This approach is appropriate to the ‘softer’ sites where significant increases in year-round production are possible through the introduction of various perennials – and could be easily applied to the high rainfall region of WA.
- The other issue in terms of analytical approaches used is the perceived audience for results. The WA approach has been very strongly targeted to farmers, with the belief that they will understand a grazing day approach more readily. The gross margin and capital valuation approach may be more ‘correct’ in terms of established analytical principles and therefore be more acceptable for peers and colleagues.
- Farmers generally view risk in saltland pastures from the perspective of establishment failures rather than in terms of production deficiencies - probably because it is a new enterprise for many. Hence the information obtained through the SGSL project has been important in combating those risk aversions by providing greater surety of successful establishment. There is now a prevailing attitude among *participating* farmers that planting saltland pastures is of no greater risk than a normal crop or other pasture development program – as long as some guiding principles are followed.

Site Characterisation

As described in the methods section (Context) detailed site characterisation has been completed on every site. This data is in a summarised form and stored in the field storage box. The full written material is entered, stored and retrievable from the SGSL Producer Network database. The site characterization has included the following;

- EM 38 & 31 ATV survey which has produced excellent ‘soil salinity’ conductivity maps;
- Soil report based on field survey & map, full site soil descriptions with sampling taken at 4 depths for chemical analysis;
- Broad spectrum of soil chemical analysis;
- Hydrology appraisal- written report with map locating bores (SGSL installed observation wells);
- 21 sites have an additional economic analysis completed;
- Plant tissue analysis has also been conducted on most the sites where appropriate;

This data is currently undergoing full analysis with the trial site measurements to form individual site technical reports. There will be a further process of cross site analysis of this data.

Reports

The progress on all sites was reported regularly at the annual SGSL forums held (2003 – 2005) using a "poster reporting style" approach. These posters were all presented in a booklet format (see 2004 edition *pdf* attachment in the Appendix) and made available on CD as well as via the SGSL web-based data base. In addition the data gathered from each individual site is being independently analysed and a preliminary technical report prepared.

These individual reports will be available via the SGSL web-based data base and will be a reference for further analysis and research.

A summary of all the aims, findings and observations of all the 69 sites is in the Appendix.

Following the preparation of the individual site technical reports a cross site analysis will be undertaken. It is envisaged that the Farm Notes will be generated from the results of this x-site analysis and add value to those already being developed under the five subject areas described in the section above (highlights) and will have a strong link to the SGSL producer sites. Finally, based on this SGSL experience, a guide book is being developed which describes measurements. This book is seen to be useful for farmers and extension officers who undertake gazing trials.

Contracted objectives

1. *To provide producer leadership in participative research processes that lead to shared outcomes in productive and profitable management options for salt affected land.*

The Department of Agriculture and Food of WA (DAFWA) had no program similar to SGSL prior to the project starting. As a result the SGSL departmental team were wholly responsible for leading this initiative. The formation of the SGSL Coordinating Committee in the initial stage ensured that the principles of participatory research were understood and agreed to and at this point they developed their own guiding principles for the project. The evaluation processes reflect the growers and scientists affirming responses to the participatory approach of the project.

2. *To establish a network of meat and wool producers managing 67 R&D sites addressing the key issues identified by producer groups in production from salt affected land.*

The initial target was to have 60 sites however the strong grower response to the call for projects led this number to be extended to 69 fully supported sites (with two additional 'annex' sites that the groups involved set up but were not part of the overall site characterization support).

3. *To ensure that project sites represent the varying rainfall zones and severity of saline land across the agricultural region of WA.*

The Committee ran a public call for projects 4 times in the initial 18 months this ensured sites had an adequate coverage of the key saline issues and geographic spread (see map of sites in Context) and this was a consideration when projects were initially being approved.

4. *To provide financial and technical support to each of the producer network research sites.*

The Committee allocated funds initially to each trial as deemed appropriate from the project application and consideration. It was also monitored through an audit and project 'health check' process which enabled adjustment to resources (funds and people) as required.

5. To facilitate the sharing of information across the range of existing communication networks focusing primarily on grazing systems and management of saline lands.

This was one of the guiding principles of the committee to nurture the network, share information across it and ensure information presented was always in a practical farming systems context. As a result, the committee invested strongly in communications and developed a communications plan. Part of the strategy being an annual “grower and researcher” forum/s. These were run both centrally and in the regions with over 400 growers participating throughout the project. (see methods section in the APEN paper in the appendix).

6. To achieve recognition of the role of the wool and meat industries in initiating and leading the process of working with partner organisations

The communication plan made a specific goal of regular feature articles in the rural press and other media outlets. In excess of 20 full page articles have been published with another 15 to have been completed by Dec 2006. Strict protocols have been used to ensure that articles adequately acknowledge the funding bodies and their partnership with woolgrowers. Evaluation surveys more than adequately illustrate the positive reactions of both the woolgrowers and the funders to the project.

Table 2 Representing the key Project Outputs during each year of the SGSL producer network project

Key Output	2002	2003	2004	2005	2006	Potential no. of growers with saline land reached with
Rural Press, main and local	3	13	15	10	28	1800
Agmemo	10	11	12	10	8	1800
Newsletter	4	8	8	8	4	300
Forum Handouts	0	1	3	3	0	400
Field day/walk handouts	2	12	11	9	4	150
Fact Sheets	0	1	0	0	0	600
Site Posters	20	0	69	Up-dates	0	400+
Economic Calculator	0	0	0	0	Just published	To be decided
Have A Yarn (case studies)	0	0	0	0	Not published	To be decided
Site Technical reports	0	0	0	0	Not published	To be decided
Farm Notes	0	0	0	0	Not published	To be decided
SGSL Data Base (Web-based)	On-going					
Saltland District Options Compendium	0	0	0	0	Not published	To be decided

Table 3 representing the Impacts and Outcomes broadly following Bennett’s Hierarchy

People Involvement

<i>People involved and their characteristics (see detail in Context)</i>
<p>Host farmers</p> <p>Host farmers showed a range in level of interest, participation and involvement in their SGS L trial site. Around 40 of the 69 host farmers demonstrate what the project team considers to be interest or enthusiasm (the remainder showed less than interest or enthusiasm). It is the host farmer’s trial, therefore they made all final decisions.</p> <p>Host group</p> <p>Host groups showed a range in level of interest, participation and involvement in their local SGS L trial site; a broader range than for host farmers. They were involved in initial decision-making about the trial site, but apart from a small number of interested individuals, had little further involvement. The number of growers in this group in WA is about 700.</p> <p>Group support officer</p> <p>Importantly, contact with host farmers & groups were usually done through an identified group support person, such as the local community landcare coordinator (CLC or NRMO). The support person has many other responsibilities in natural resource management and in some instances other fields such as local government. They are funded in several ways and as a result negotiating their involvement in SGS L has been variable. A person may already, or be developing a special interest in saltland pastures. Due to their location and local knowledge they have been a <u>critical</u> member of the network and <u>special</u> activities have been made by the SGS L team to mentor, train and support them. (There are currently 23 support officer individuals associated with the producer trials, however this numbers have altered with the completion of contracts and replacements.</p>
<p>Other growers with saline land</p> <p>This group included all growers outside host groups with existing or potential saline land on their properties.</p> <p>The number of growers in this group in WA was about 1100.</p> <p>About 400 growers indicated interest via attendance past forums or field days etc, or through other forms of contact with the project team.</p>
<p>Technical Advisers</p> <p>These are the people/organisations that have supported the host farmers, host groups, community-based group support people and project team with technical information and advice, such as:</p> <ul style="list-style-type: none"> • Saltland pasture technical specialists: Ed Barrett-Lennard – Dept Agriculture, David Masters – CSIRO, Hayley Norman – CSIRO, Clive Malcolm, – Independent consultant to assess sites, others (specify who, and what involvement) • Dept Agriculture & Food (DAFWA) provides support through other projects eg soil surveys (Henry Smolinski, Kus Kuswardiyanto, Peter Tille, Angela Stuart -Street), hydrologic appraisal (Shazad Ghauri, Arjen Ryder, Paul Raper Russell, Speed, John Simons, Frank Rickwood, Harry Lauk , farming systems (Tanya Kilminster, Mike Clarke, Kelly Hill), sheep (Ashe Briscoe, Danny Roberts, Tony Albertsen), pastures (Paul Sanford, Phil Nichols, Darryl McClements, Tim Wiley, Roy Butler), drainage (Derk Bakker) and economics (Allan Herbert). • Other govt agencies and organisations – CALM (Robert Huston with Erickson’s site), Dept Environment, Forest Products Commission (Liz Barbour, supplied genetic tree material for several trial sites and advice)
<p>The project team and special friends</p> <ul style="list-style-type: none"> • Committee had a strategic role & was made up of leaders/representatives of the agricultural regions, key grower organisations, experienced agency staff & an independent chair • Project staff (SGSL team), consisted of 4 individuals from DAFWA (2 full time and 2 part time) who were responsible for all the operational activities with all sites, all communications, all monitoring training, and data management and project management and administration.

People involved and their characteristics (see detail in Context)

- ***Special friends***, such as the CRC (Mike Ewing, Georgina Wilson, Tim Colmer, Sarita Bennett) with speaking at Forums and x site analysis of data (SGSL Theme Leaders), Saltland Pastures Association (Sally Phelan, Michael Lloyd) partnerships with hosting Forums and field days, WA Lucerne Growers Association (Tom Bailey and Soheila Mokhtari) assistance with lucerne agronomy relating to saltland, Evergreen Group members (Phil Barrett-Lennard) , and groups associated with the Grower Group Alliance (Tracey Gianatti, various executive officers from Liebe, Fitzgerald, RAIN, Facey and Mingenew farmer groups). They have contributed a combination of technical advice and material, field day/event speakers, advice or resources as well as with some project administration and evaluations. The WA Chemistry Centre has provided technical support in the analysis & interpretation of the soil and plant tissue analysis.

Agribusiness/ private consultants who use project information for their clients

This group included nurseryman, technicians, consultants, farm consultants and agronomists who advised their grower, clients in technical saline pasture management issues, such as:

- Seed merchants (Neil & Leigh Ballard), nurseryman (Steven Blythe, Dustin McCreery) and seeding contractors Ashley Lewis, Ian Walsh, salinity mapping (Tristan Campbell, Justin Anning), drilling (Adrian Richardson, Fred Bremner, Keith Jones)
- Landmark, (e.g. Stuart Witham) fertilizer (e.g. United Farmers) and some agronomists (e.g. Chris Robinson in Kojonup, Tony Rosser in Mullewa) have worked cooperatively with the SGSL team, they have attended events to either gather information for transfer to their clients &/ or to contribute time and resources to trials. Farm consultants have attended events (communication via AAAC network)

The \$ Investors

All the people involved (audiences) were investing in the project in some way. This group refers to the dollar investors toward the project.

- The project was initiated across Australia and funded by Australian Wool Innovation, Meat Livestock Association and the Federal Government's Land, Water Australia agency. In WA the project is co-funded, administered and delivered by the Department of Agriculture and Food WA, with financial contribution in conjunction with the CRC Salinity and CSIRO.
- The WA Chemistry Centre has provided a 50% discount in the analysis of all the soil and plant tissue analysis which amounts to around \$50, 000 for the life of the project.

People and Key Activities

<i>People involved and Key Activities</i>
<p><i>Host farmers, Host group members & Group support officer</i></p> <ul style="list-style-type: none">• Assistance with planning, designing & implementing trials with the host farmer and groups• 1:1 in the paddock & training workshops in demonstrating and skilling the trial monitoring techniques & use of the site storage box and log books• Training them in the use of the SGSL web-based data-base for transferring all site information• Supporting them site promotion and extension – provision of paddock sign, with local newsletter articles, poster preparation and local field days, field walks and bus tours.• Involving them in site visits by SGSL team members, team health checks, site audits
<p><i>Other growers with saline land</i></p> <p>Designing wider communication and extension processes including:</p> <ul style="list-style-type: none">• Invitations to annual grower & researcher forums;• Regular stories in the rural press & radio;• Designing extension products to meet their needs, segmenting this group into three audiences;<ul style="list-style-type: none">○ Growers that have advanced knowledge and experience with saltland pastures;○ Growers that are looking for help making the first steps towards incorporating saltland pastures into their enterprise;○ Growers that are still needing to be convinced that they should thinking about incorporating saltland pastures into their enterprise;• Supporting 1:1 advice and group events where demand
<p><i>Technical Advisers</i></p> <p>These people contributed in three keys ways:</p> <ul style="list-style-type: none">• Provided essential information about the site (charaterisation) needed for better understanding and interpreting the trial results, nearly always involved a half day field survey of the site, writing and editing a site report and then later follow up with the SGSL team before the documentation is given to the growers and then placed on the database.• Provided specialist information for specific topics or sites, this generally involved speaking at organised events such as forums and field days. Talks would normally be pre-prepared and given as powerpoint and/or handouts• Provided specialist information, generally involving a half day field visit field visit to assist in the site design, establishment and/or management
<p><i>The project team and special friends</i></p> <p>Committee met between 4 – 6 times per year:</p> <ul style="list-style-type: none">• They directed and reviewed all aspects of the project (including the <u>finances</u> and <u>communication</u> plan) within the guiding principles (see context section) they set out at their outset.• The committee strove to meet at least once a year in the regions and combined this with a bus tour to meet the host farmers on their sites.• The committee hosted all the major Grower and Researcher forums and formed partnerships with other organisation as appropriate. <p>Project staff (SGSL team) who were responsible for the day to day running of the project:</p>

People involved and Key Activities

- All the operational activities associated with the sites from design and monitoring ;
- Support to the host farmer & group, group support officer;
- All communications to all the audiences. Specially nurturing the host farmer network (e.g. newsletter (in partnership with Saltland Pastures Association (SPA) & annual Xmas letter)
- All site monitoring training;
- All data collection and management;
- All project management, administration including executive support to Committee;
- All product development.
- All project evaluation

Special friends,

- Speaking at Forums and x site analysis of data;
- Partnerships with hosting Forums and field days;
- Assistance with plant agronomy relating to saltland, perennials (including lucerne);
- Share communication by piggy-backing on their events (e.g. newsletters (SPA & Evergreen), field days, sheep up-dates, websites);
- Technical advice and material, field day/event speakers, advice or resources as well;
- Some project administration and evaluations.
- Provision of technical support in the analysis & interpretation of the soil and plant tissue analysis.

Agribusiness/ private consultants who use project information for their clients

This group includes nurseryman, technicians, consultants, farm consultants and agronomists who advise their grower, clients in technical saline pasture management issues, such as:

- Assistance with agronomy advice directly to the groups as well as the project team.
- Industry feedback on site results and conditions
- Attending events (Sheep Up-dates) for new information, public relations and contribute information (sometimes as invited speakers)
- Ongoing building of trust and acceptance between SGSL team and agribusiness

The \$ Investors

Policy and senior project staff proactively involved & interested in the WA PN project progress;

- Attended bus tour, part of the SWAG visit
- Provided advise on monitoring and evaluation
- Provided guidance on communications protocols
- Participated in the project up-dates and presentations at national forums
- Regular invitations to AWI WA board member, senior DAFWA and WA Chemistry Centre to events

Evidence of change

M&E mechanisms - see attached documents in folders in the Appendix documents (split into two **key** sections):

1. Impact

- Feedback sheets from participants attending SGSL grower and research forums & field days (questions and results) – *excel files*
- 2 x adoption surveys (one covers 4 shires in the Narrogin area; the second covers 16 shires in the medium rainfall region of the south west and part C of this random survey is specific to impact of SGSL)
- On-line survey Quantified WA only (by Savant)
- On-line survey Quantified the Qualitative data, extension group in WA only (by Savant)
- Savant's phone survey results to "other farmers" associated with the groups hosting a trial
- Host farmer evaluation study – DAFWA team in conjunction with Jessica Dart, Evaluation specialist and trainer
- Health Check evaluation sheet
- Sample *Interim* health check questions and responses
- Site Audit and results
- Project sites and process being adopted by regions (SWCC) and ACC/SPA NLP incentive project

2. Outcomes

- 69 established sites in the on farms & see full project lists (*Technical Report Summary*) and one full example
- Have a Yarn *final draft* (4 different ones in pdf) case studies
- Poster Book and CD (drafts in pdf) – these are all AO sized posters
- Classification (SSS) BL sized booklets (drafts in pdf)
- Farm notes (3 completed)
- WA component of the **SGSL web-based data base**. Please see details to access database in the Appendix. Site characterization and records all on SGSL web based data base (includes photo records, site changes, media photos and aerial photos of all sites).
- Guideline for monitoring on farm-trials (draft) and framework for training courses
- Direct outcome indications from the 21 economic case studies (in database too) and their analyses.

3. Other

- On-going health producer site health checks – see sample questions in Appendix
- SGSL team meeting reviews (reflections)
- Project audits (health) used also for the selection of case studies and technical report. Phone survey responses as per health checks - see sample in the Appendix
- 'Mini surveys' to Host farmer have been undertaken – health check and plans. Financial acquittals.
- Future R,D & E Concerning Saline Land Management within Agricultural Systems - Results from the four Saltland Planning Workshops for growers in WA (March 2006). These were facilitated by Richard Price.
- Stories/vignettes have been collected through the regular media, newsletter, agmemo, economic case studies, generic case studies that have become the "Have a Yarn" series initiative. These focus on the growers experience and are intended for those who are new to salinity management.

Reactions

Target Group	<ul style="list-style-type: none"> Reactions
<p><i>Host farmers, Host group members & Group support officer</i></p>	<p>All 69 <u>host farmers</u> informally agreed to site monitoring adapted & relevant to their site (“it made it a cheap enough way to find out whether it was going to work” of the agreement with the initial grant);</p> <p>60% <u>host farmers</u> showed a minimum commitment to site/trial monitoring & recording their measurements as indicated by log book <i>observation</i> entries in storage box</p> <p>15% <u>host farmers</u> showed a strong commitment to site/trial monitoring & recording their measurements as indicated by quantifiable measurements, plant composition %ages and livestock records (grazing days)</p> <p>5% of all <u>host groups</u> & 25% of members of at least 3 host groups react positively to training and support activities.</p> <p>92% of <u>host farmers</u> felt the SGSL WA Producer Network project was valuable. Positive comments were made about:</p> <ul style="list-style-type: none"> The scientific and technical expertise of the SGSL team The hands-on, practical approach Opportunities to listen to and interact with other farmers Opportunities to source and receive information from the SGSL network The enthusiasm of and encouragement from the SGSL team <p>90% of the local group support people react positively to training and support activities and demonstrate use of the SGSL database to submit site information</p> <p>90% of the group support officers have instigated a minimum of one local field walk or other field event associated with the trial in the period of the project, for other group members and others</p> <p>50% of the host farmers have given a story in the rural press, radio, newsletter or seminar (Forums or Sheep Up-dates)</p> <p>90% of the group support officers have contributed towards the development of their local site extension poster (AO size)</p>
<p><i>Other growers with saline land</i></p>	<p>65 - 78% growers attended the regional SGSL grower and researcher forums (in 2004 and 2005) and rated them 8 (1 = poor; 10 = Excellent) with the field components (visiting SGSL sites) gaining the highest scores.</p> <p>60% of the 400 growers that attended these regional forums were not directly associated with an SGSL trial and they rated the events as good to excellent (1 = poor; 10 = Excellent)</p> <p>Of 17 respondents to group member (not host farmer) phone survey 70%</p>

	<p>reported that they felt the trials had created a more positive attitude as a result of what they had seen and heard from the SGSL activities</p>
<i>Technical Advisers</i>	<p>69 trial host farmers pleased with the level of input from the SGSL project team</p>
<i>The project team and special friends</i>	<p>Often farmers commented on the encouragement and enthusiasm shown by the SGSL team and this personal praise was highly regarded. Furthermore, one farmer who claimed to have very little one-on-one support felt he missed out on becoming “<i>part of the SGSL family</i>”.</p>
<i>Agribusiness/ private consultants who use project information for their clients</i>	<p>On the value of the network and forums - two farmers who weren’t able to get to any field days or forums found the written material about the other trial sites one of the most valuable aspects of the project, further demonstrating the value farmers place on information from other farmers.</p>
<i>The \$ Investors</i>	<p>SGSL team and technical advisers have completed all of the 69 site characterisations with reports and entered onto the database</p> <p>SGSL network contacts database (for all extension information) extends beyond growers involved to the wider industry & funders who participate in the events including the SGSL forums, bus tours and contribute knowledge.</p> <p>The four main ‘products’ have been given the 10 Point (Hanrahan) Test, been peer reviewed, road tested and passed. The products being the Saltland Classification Booklets; the Have Yarn (case study) series and Site Technical reports (and Farm Notes) all in final-draft stage (see Appendix)</p>

KASA Changes

Target Group	<ul style="list-style-type: none"> KASA changes
<p><i>Host farmers, Host group members & Group support officer</i></p>	<ul style="list-style-type: none"> 25 of the 67 host farmers evaluated demonstrated that they had reached a point where their “internal capacity (knowledge, attitude, skills, aspirations and confidence)” where decisions to adopt or not adopt saltland pasture system could be made. The trials and experience from the project had “primed” them for doing further saltland work and the participatory approach used was valuable in achieving this. Although the host farmers varied in experiences with saltland pastures and salinity management prior to SGSL, the majority gained a greater understanding through participation in the project. Areas in which it directly increased the capacity of host farmers included: <ul style="list-style-type: none"> - Awareness and integration of options for salt-affected land - Establishment and management of saltland pasture systems - Confidence to tackle salt-affected land - Attitudes toward saltland – change from wasteland to potential - Desire to improve salt-affected areas and show others that it can be profitable
<p><i>Other growers with saline land</i></p>	<p>47% of growers when phone interviewed were aware of SGSL (116 farmers across 15 Shires - SWCC/Waroona survey) and had either taken part in an SGSL event (14% had attended a field day or event) or had read or heard about SGSL from a range of sources, including rural press, friends and via farmer group networks, which led to;</p> <ul style="list-style-type: none"> 45% of these respondents indicated that these activities had helped them change their thinking or practices to improve the potential use of their saltland 68% of these indicated they were now using better plant species; 38% said they were expanding plantings on their properties; 40% said that they had improved their establishment techniques 24% said they were increasing animal production <p>Of 17 respondents to group member (not host farmer) phone survey 88% said that they had discussed outcomes/activities with other growers outside of the group, 70% said that this was done during other field days and events, however talking to friends at other social/community groups (82%) such as school and fire brigade were also time these things were discussed.</p>
<p><i>Technical Advisers</i></p>	<p>The project team have successfully tendered a further 2 years of funding to continue the same participatory approach with saline pasture extension within the ‘CMA’ region of the South West of WA, starting in 11/06. (see Appendix)</p>
<p><i>The project team and special friends</i></p>	

	<p>APEN accepted a written paper and invited on oral presentation from the WA project team discussing the process, experience and messages learnt from the project at the APEN conference in Beechworth, Victoria (2006).</p>
<p><i>Agribusiness/ private consultants who use project information for their clients</i></p>	<p>60% of the AAAC consultants & agronomists associated with farmers in the groups are aware of the SGSL project and understand information emerging from SGSL (Agribusiness Sheep-Updates) and it's applicability to their clients</p>
<p><i>The \$ Investors</i></p>	<p>All individuals/organisations that have support of the SGSL project with technical information feel recognised/ acknowledged for their contributions.</p> <p>Key seed merchants (pasture seed volumes), key nurseryman 9saltbush seedling numbers), and direct seeding contractors have all indicated a doubling or more of demand for product and service during the SGSL project period and suggest that the demand has been created by the project.</p> <p>47 growers participated in saltland planning workshops in 3/06 at four regional locations expressing demand for a continuation of a similar program for woolgrowers</p> <p>54% of the extension group associated with the project in WA reported that the SGSL activities had been <u>quite to very effective</u> in helping growers and extension officers explore options for saline land</p> <p>58% of the same group above reported that the project had been <u>quite and very effective</u> at demonstrating changes in understanding, attitudes and motivation towards improved management of saline land at the 'farm' level</p> <p>The independent economic study of 21 sites concluded that agronomists now have improved 'intelligence' on matching the appropriate pasture species to the particular characteristics of individual sites. There is no point in trying to establish unsuited species. Farmers can save money by excluding them from the pasture mix.</p>

Practice Changes

Target Group	<ul style="list-style-type: none"> Practice Changes
<p><i>Host farmers, Host group members & Group support officer</i></p>	<p>56% of <u>host farmers</u> interviewed have or anticipated adopting some/all components of their trial site in the future. 24% were unsure, as they were still assessing their trials. Many farmers indicated that, if new areas of salinity appeared on their land, saltland pastures would be their management choice.</p> <p>The following ‘stages of adoption’ were established, based on interviewee responses, with regard to the adoption of the SGSL technologies trialed:</p> <ul style="list-style-type: none"> • Have adopted some/all components of trial site and will continue if possible – 16% • Plan to adopt some/all components of trial site in the future if possible – 40% • Will not adopt technology trialed – 4% • Trial had no influence on future plans/reinforcement of prior learnings only – 16% • Unsure – trial not complete/still assessing trial – 24%. <p>24 of the 25 host farmers interviewed had adopted or anticipated adopting saltland pasture systems (may or may not include technologies being trialed on their own farm). Of these, 10 had no saltland pasture systems on their properties prior to being involved in SGSL. Furthermore, one farmer was looking to purchase salt-affected land in order to apply the practices learnt through SGSL</p> <p><u>Following points relate to group members, but not host farmers:</u></p> <p>Of 17 respondents to group member (not host farmer) phone survey 87% reported that they felt the trials were high or very highly successful, illustrated by this quote: <i>“We were very pleased with the establishment - given a poor season when initially planted. It also gave us confidence and knowledge to "have a go" in other areas of our farm”</i></p> <p>Of 16 respondents to the same group as above, reported that the trials had been of Very High to High benefit to them – individual quotes below:</p> <p><i>“Saw achievements - wanted to do it myself. Encouraged us to plant perennials; Done what was expected; Even the negatives provide learning experience. Learnt from our failures; I have been able to learn what can be achieved on saline land; Ability for available lambs. Aesthetics - look beautiful, used to look dreadful; Since the trial, there has been an increased awareness and use of summer active perennial pastures.; I can now see that salt land pastures have a valuable place in modern farming systems”</i></p> <p>Of 16 respondents to the same group as above, 38% reported that based on their involvement in the trials it had significantly changed their</p>

	<p>understanding about saline land management; Of 16 respondents to the same group as above, 35% reported that based on their involvement in the trials it has significantly boasted their confidence in applying new approaches to manage their saline land in the future;</p> <p>Of 16 respondents to the same group as above, 47% reported that based on their involvement in the trials it has significantly stimulated them to try new approaches in the future for managing their saline land</p>
<i>Other growers with saline land</i>	<p>37% of “other” growers that responded to the SGSL Forum’s (example used – Cranbook, October 2004) event evaluation reported the following when asked what would you do differently (from your SGSL experience, including this event) on your saline land/sites, if you were to go and do it again? Illustrates impact -</p> <p><i>“ seed early June-July not after crops are sown and then waiting for paddock to dry out so that can get on it; preplanning; go to the chase - not try and deal with the problem; I now know what will grow where - be more selective; firstly a more detailed overview(know the site); control the ryegrass, in order to give the sown plant a better chance; characterise & look around at others who have done similar; do a lot more planning followed by a good site preparation; still developing our site; less trees more pasture. Seek more advice; include more perennials & grasses; establish a good annual; understory first; look at a broader range of species; deep rip, maybe gypsum; not use direct seeding of saltbush - use seedlings. Get some annual pasture legumes established before sowing other stuff; our site is fairly good as is but would probably try a small percent of other varieties of saltbush; different treatments; seed earlier; weed & insect control”</i></p> <p>Anecdotal evidence also suggests that interest in saltland pasture systems has increased over the last 3-5 years, and 80% of host farmers interviewed suggested adoption/interest outside of the host farmer group. However, it is difficult to attribute this increase primarily to SGSL. Nevertheless, a number of host farmers were striving to influence others to consider these types of management options.</p> <p>Of 17 respondents to group member (not host farmer) phone survey 59% reported that they noticed that people were fencing out saline areas, and 88% reported that they noticed they were planting more salt tolerant trees, shrubs and pastures as a result of the SGSL activities.</p>
<i>Technical Advisers</i>	92% (69 individuals) of the extension group associated with the network project in WA reported that they are incorporating information emerging from SGSL into client advice and information.
<i>The project team and special friends</i>	48% of the above group reported that the network project had been successful in creating actual, on-farm improvements in productivity or economic returns from better management of saline land
<i>Agribusiness/ private consultants who use project information for their clients</i>	.
<i>The \$ Investors</i>	

Outcomes

Target Group	<ul style="list-style-type: none"> Products and outcomes
<p>Impact on Productivity</p>	<p>Saltland pasture systems can be profitable. 12 out of 21 case studies demonstrated payback periods of less than 10 years – even though costs were higher than normal commercial practice.</p> <p>Several sites with saltbush grazed in conjunction with understorey – adult sheep will maintain weight and condition. However, when the understorey runs out, the average weight and condition of the sheep will be maintained with the addition of around 100 g/head/day of oats and lupins in addition to the saltbush</p> <p>In several sites where actual grazing performance was measured provides estimates of carrying capacities of around 400-600 sheep grazing days per ha per year for low rainfall sites, 800-1000 sheep grazing days per ha per year for medium rainfall sites, and upwards of 1000 sheep grazing days per ha per year for high rainfall sites. (There will be exceptions to these ‘standards’ where establishment and production are better/worse than average).</p> <p>The host farmer evaluation study concluded that it is probable that effects of the SGSL WA Producer Network will contribute to adoption of saltland pasture systems and overall management of saline land in Western Australia, which may contribute to improved social, economic and environmental conditions.</p> <p>BCAs on the impact of the PN project have been undertaken by the DAFWA with a the overall project achieving a BCR of 0.96 (break-even) using 3 measures eg:</p> <ul style="list-style-type: none"> The project has impacted on adoption by 5%; It has brought forward adoption by 2 years amongst host groups; 700 growers reduced establishment costs by \$50/ha. <p>Of the 30 producer sites in the 400 – 600mm rainfall zone the mild affected site had a payback period of 6 years while the severe affected areas had a payback of 13 years.</p> <p>6 of the 30 producer sites in the 400 – 600mm rainfall zones clearly demonstrated that by growing a mix of species in a landscape with varying salinity you have:</p> <ul style="list-style-type: none"> the potential to reduce the risk of establishment failure pasture species can find their niche the pasture sward is able to provide production throughout the year despite the seasonal variation (not just an autumn grazing area) <p>3 of the 6 SGSL sites that specifically looked at the impacts of drainage, despite the variable season showed that the effects of drainage on pasture productivity are hard to determine but that it is highly probable that:</p>

	<ul style="list-style-type: none"> • drainage may provide production benefits in the years following establishment • there appears to be no benefit of drains if the establishment year is dry. • pasture germination on raised beds in dry years occurs mainly in the furrows rather than on top of the bed • when determining the effect of drainage treatment on pasture growth a larger quadrat needs to be used which allows for sampling in the furrow and bed <p>Of 17 respondents to group member (not host farmer) phone survey 77% reported that as a result of the project they had already gained and hope to gain from increased pasture production</p> <p>Of 17 respondents to the survey above 71% reported that as a result of the project they had already gained and hope to gain from increased animal production</p> <p>Of 17 respondents to the survey above 5% had over 25 years experience in adapting their management on saline land and reported that they 'view the improved salt affected areas as more valuable than non saline land' they attribute this to the ability to access these areas all year round, that they have more up to 30% total salt affected and as a result feel that they have become better farmers through the better grazing management lessons learnt.</p>
<p>Impact in Environment</p>	<p>October 2006 aerial survey transects and photography of all 69 SGSL producer sites and surrounding countryside demonstrated the severity and extent of salinity across the landscape with distinct trend in the three major rainfall zones:</p> <ul style="list-style-type: none"> • 400-600mm rainfall zone has large areas of salinity affecting not only the drainage lines but also areas within paddocks, these areas appear to be more recent and active. • Areas of salinity in the less than 400mm were smaller and confined to patches in a paddock or a lake. • Salinity in the greater than 600mm areas was not as evident but were concentrated more in the drainage lines. • In conclusion despite the observation described above that the 400 – 600mm rainfall zones is most at threat from further salinity expansion it is here that the 30 SGSL producer sites (of the total of 69 sites) demonstrated that systems are easier to establish and will payback more consistently. <p>69 site characterizations show value of EM38 tool in salinity mapping and has great assisted in the design of the Salinity Scoring & Solutions booklets;</p> <p style="padding-left: 40px;">Accurately determines the severity and spatial distribution of salinity an excellent tool in deciding what type of treatment is needed.</p> <p style="padding-left: 40px;">Linked to the types of plant indicator species has mean't landholders can identify the capability of the area. Once the capability is understood then treatments and expectations can be more realistic.</p>

	<p>Of 17 respondents to group member (not host farmer) phone survey 41% said that they had already gained or hope to gain further <u>improved water table control</u> as a result of the project</p> <p>Of the same group as above 47% said that they had already gained or hope to gain further <u>improved surface water control</u> as a result of the project</p> <p>Of the same group as above surprisingly 65% said that they had already gained or hope to gain further <u>improved biodiversity</u> as a result of the project</p>
<p>Impact on social</p>	<p>Of 17 respondents to group member (not host farmer) phone survey surprisingly 94 % said that they had <u>feelings of satisfaction and prides</u> as a result of the project</p> <p>Of the same group as above 82% said that they felt that what they had now done as a result of the project had <u>improved the appearance</u> of their farm</p>

The following *vignettes* illustrate the impact of the project from some of the growers' perspectives:

Bart Hulls – Trayning, WA

The Hull operation consists of 6,500 ha at Trayning. The major enterprise is cropping – mainly wheat but with some barley and lupins. Sheep are generally the mainstay livestock enterprise in the area but the Hull's are unusual in using their revegetated saltland for cattle. The farm has a number of low-lying broad ill-defined salt drainage systems running through it and they are gradually extending further up the slopes. Cropping along these margins is still profitable in good years but becomes increasingly affected by waterlogging and salinity. It is not unusual to only harvest 50% of the planted area. When these areas bordering the drainage lines become too risky to crop, they are fenced off and planted to close-spaced saltbush seedlings – and are ready for grazing 20 months later. Resale yearling cattle are purchased in January and put onto crop stubbles for 10-12 weeks. They go onto the saltbush around mid-April where they are supplemented with baled barley straw until mid-September. The cattle are then finished on serradella pasture elsewhere on the farm. The system works well in this predominantly cropping operation with about 150 ha now established to saltbush. There is another 150 ha planned for the same treatment. Bart Hull says the saltbush has probably not stopped the salt spreading but it probably has slowed it down – and has provided some valuable production from areas of land which previously would be abandoned.

Phil & Kevin Pickering – Tin Dog Creek

The front 35 ha paddock of Phil and Kevin Pickering's farm at Dowerin is set between a main road and the Tin Dog Creek which runs roughly parallel to the road. In addition, there is water shed onto the paddock from an adjoining grain receival facility. The Pickering's call it "Sunday" country – it can get too wet too quickly with only a small window of opportunity to work their cropping machinery on it. It was becoming too risky to crop with often only 50% of the paddock being harvested with yields fluctuating from less than 1 t/ha up to over 2 t/ha in favourable years. Floods in 1999 and 2001 and the consequent bare scalds that appeared with salt-affected "eyes" finally convinced the brothers to put the paddock down to improved pasture. In 2002, lucerne was planted as a background species then subsequently in 2003 and 2004, other species (tall wheat grass, puccinellia, perennial grasses, saltbush) were introduced into appropriate parts of the paddock. There is now a strong cover of permanent pasture which will only be cropped in the future for renovation as required. 90 bales of silage was cut

from a lucerne area in 2003 and subsequent grazing has been impressive. A 9 ha area is expected to carry 400 sheep for 1 week twice per year. The paddock restoration will cut down on water flows to the creek, give production from an area that was rapidly going bare, and provides a much improved visual amenity to the main entrance to the farm.

Phil & Caroline Smith – Bonnie Rock

Phil and Caroline Smith farm a 1880 ha (1400 arable) property at Bonnie Rock – a very low rainfall area right at the edge of farming country on the far edge of Western Australia’s eastern wheatbelt. A 33 ha area in the middle of a paddock at the top of a drainage line started to cause problems after a neighbour cleared some land upslope. It had been deteriorating for about 10 years with very poor lupin growth and even triticale not yielding well. Floods in 1999 (450 mm in 3 days) made the area bare and developed further with sheep camping on the moist ground. Phil and Caroline reckoned that if it was allowed to go unchecked, the bare salt affected area would progressively creep up the slope and also spill over and move downslope. The area was fenced and planted to saltbush seedlings with other native species volunteering. Ground cover is now complete and sheep are allowed to graze it in conjunction with the surrounding crop stubble. There is another area of about 10 ha also developing elsewhere on the farm now destined for the same treatment.

Upper Hay River Catchment Group (West Mount Barker) **graziers Rodney & Sharon Drage** who has harnessed the specialist services of Department of Agriculture and Food through the Sustainable Grazing for Saline Land program to boost the productivity and health of a previously salt affected and water logged area of his 550 mm rainfall farm. Without this assistance, Drage estimates his program for the saline areas would be two to three years behind its present state, which makes a real difference in dollar terms to his enterprise.

Albany based DAFWA hydrologist, Arjen Ryder estimates there has been a 10-15 percent increase in production so far, due to the implementation of a comprehensive site plan that included drain placement followed by the establishment and analysis of various trials of perennial pastures.

Rodney considers that with the use of the newly established perennial pastures, his farm is currently carrying two to three hundred more sheep than was previously possible, with no supplementary feed likely to be needed until April, where feeding would normally have begun in February. The water table is estimated to have been lowered by ten to twenty centimeters in just eighteen months. Rodney states that the site’s aesthetic appeal has greatly improved, with less surface water lying about and good stands of perennial pastures including Rhodes grass and Setaria as well as salt bush thriving on areas of previously bare salt.

General discussion

The SGSLS producer network project has reinvigorated interest in saltland pastures in WA through the creation of a wide spread and significant number of woolgrowers testing locally relevant options for managing their saline land. The further communication efforts triggered by the SGSLS committee have allowed a large number of other growers to become involved, including a number that previously (past advocates) had experience in adapting saltland areas on their farms to productive management units. As a result there is now an expanding network (bringing together experienced and inexperienced growers) demonstrating a changing attitudes and practices to management of saltland in the WA agricultural area.

The WA SGSLS producer network structure has created a learning environment that focuses on problem solving, that is interactive at all levels (growers and support staff) and is practical and field based. It encourages learning through both failure and success through regular monitoring and dialogue between all parties. There has been a genuine commitment to participatory decision making through the regular flow of good relevant information and the open testing of all ideas.

Evidence clearly shows that individual participating growers are more confident about the best-bet recipe and approaches for their situation and have progressed with other areas on their farms. Also the project's impact has flowed onto the wider farming community as *other growers* have begun changing the way they manage their saline areas as a result of the project network's communication activities.

Grower's (non host farmer) comments during phone survey -

"Scientists thinking/talking adapted so that they relate results well to farmers; Even the negatives provide learning experience. Learnt from our failure; I can now see that salt land pastures have a valuable place in modern farming system; Farmers' involvement means that they realise the extent of the change; Learn how to do real measurement rather than guessing - optimise stocking rate; No simple answer. Still need small areas and support for people starting off. Biggest difficulty is getting people started Which is where the project has really helped."

Importance of productivity

The project has reinforced the principles of agronomy specifically relating to matching the site to the right species and the best bet establishment techniques. The project has illustrated that with the right conditions there is medium term payback and that this will be enhanced where there has been good planning and infrastructure costs minimised. Finally it is important that growers considering spending their money on saltland as an investment initiative should consider all other investment options available to them first. However it is clear that for many growers an immediate return on investment is not the main priority.

Importance of environment

Although difficult to define with a dollar value, the evaluation process revealed that growers involved were determined to continue to prevent the further loss of productive land and therefore achieving improved control of the water table, reducing the loss of surface soil to erosion and improve the biodiversity of these sites. Growers clearly indicated that the project had helped them achieve this and that other growers were also adopting similar strategies for similar reasons.

Importance of social

Although difficult to define a dollar value, the evaluation process also revealed that growers involved rate social considerations as important motivators. They described how the management of saline land has now become a part of ‘general’ community discussion (at social events not just field days). The farmers interviewed (both host farmers and group members) described improving saline areas as giving a personal feeling of satisfaction, especially where the areas improve in appearance. They noticed that through the SGSL network activities there is now clearly a more positive attitude to saline areas and more people attending events as well as asking questions about solutions.

“When living so far away/driving to Perth one notices changes more often. We often go different ways so we can look for what people are doing to improve things in varying areas and as a rule things are progressed.”

“It has been clinically described as good therapy - land care in general has proven to help farmers throughout Australia cope with depression/anxiety etc. So, positive results, visible results, quickly provide optimism.”

WA Committee perspective

The project has more than adequately met the WA Committee’s initial aims by establishing 69 grower sites, supporting them and at the same time nurturing a wider and ever expanding network as the messages of improved productivity, pride, aesthetic appeal and improved environmental outcomes have spread.

A number of learnings have come from the evaluation process, in particular from the detailed host farmer evaluation which concluded items to be considered for future projects of this nature. It is believed that integration of the learnings from SGSL into future projects will increase success with regard to ensuring investment in natural resource management leads to improved environmental outcomes.

There is great value in ‘learning by doing’ to build the capacity of participants – on-farm trials should be a key component of projects if building the capacity of participants in order to effect adoption is an objective.

Farmers value support – support throughout the life of projects is important, particularly support with technical information and options.

Interaction with other farmers with common goals and ‘professionals’ is highly valued – inclusion of opportunities for interaction in future projects should contribute to the success of the project. Farmers placed a high value on information from other farmers and this might be considered when developing projects.

There are a number of factors influencing adoption, and all will need consideration for adoption to occur – ‘other’ factors that may impact upon adoption should be identified in order to anticipate what impact future projects are likely to have.

Unexplained failures can deter farmers from options – it is important to provide feedback to participants on why components failed to enhance understanding of the technology and address the issue of possible unjustified rejection of technologies. In addition, farmers related to and took particular notice of other farmers’ experiences. Incorrect interpretation of factors affecting a site through lack of feedback has the potential to impact on wider adoption.

Funded sites may be disregarded by other farmers – this is not such an issue if the objective is to build the skills and knowledge of the farmers receiving the funding, but does become more important if these sites are to be used as extension tools to provide information to influence others.

Exceeding participant expectations leads to high praise; unmet expectations lead to criticism – clearly express what is expected of participants/what participants can expect from the project, and ensure that resources are available for the life of the project in order to meet or exceed participant expectations.

Funding lessens the risk involved in trialling new technologies – inclusion of funding in future projects will draw in participants whose aspirations are aligned to the projects goals.

Not all activities are of value to participants – for future projects, determine what activities are best to meet objectives and best value for money, and have clear reasoning for inclusion of activities. Ensure resources are available to carry-out activities and provide feedback to/seek input from farmers.

The timeframe of project has not allowed farmers to fully learn all they want to know regarding sustainable grazing – for complete learning to occur, projects should continue until trials have yielded results (e.g. grazing data). However, it is uncertain as to what impact this would have on future adoption, as the majority of host farmers interviewed at the ‘establishment’ phase planned to adopt saltland pastures in the future.

Host farmer comments on the project:

“(SGSL) has improved our confidence in a positive way. You know, we are prepared to have a go now and probably not scared to fail - but we will try and take most of the risk out of it now because we do understand a little bit of what we are doing instead of just throwing it all to the wind and hope something works. So we will go for best bet options now.”

“I feel quite confident that the next job we do we can do 10 times better – and you’d never say you’re going to have better success because it will come back and kick you in the butt, but I have a lot more confidence now that we had that experience.”

“Now have a real awareness of other farmers and other groups and other issues, salt issues. I did have a rough idea of what was going on beforehand, but I probably assumed that everybody else had the same problems as I had. So SGSL gave more of an awareness of different problems and different issues and different techniques. I’d hope that anybody involved, or looking to get involved in saltland pastures, would be able to read the material and start with some real knowledge. We started with no knowledge at all, just trying to grow some seeds and trying to grow some plants and it took us years to work it out. And I guess other farmers would have been exactly the same, and now there is a lot of knowledge that people can tap into.”

Implications for a future project

The raft of information that has been gained (in reports, products, database and alive in farmers management) from such a wide geographic spread of sites, over a five year period and dealing with a broad range of issues needs to be value added to in any future project. This will ensure the momentum continues and can provide improved knowledge, skills and confidence in the *ongoing* management of sites which has been less achievable and evident by SGSL to date. (Only a small number of farmers had progressed beyond the ‘establishment’ stage and commented that they would have to like to see what happens regarding grazing and management of the sites). The project participants, farmers and partners need to experience the ‘ongoing management and grazing and the integration into the whole farm’ aspect of saltland pastures to complete the picture of the system.

A future project should keep these points in mind.

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