



Have a yarn

talking salt with **George & Dean Hull**

***“By George!
– time and research proves you’re right”***

George and nephew Dean Hull have been dealing with salinity since George first witnessed parts of the farm being affected by salt and waterlogging after buying the property in 1959.

It is one of these areas on the farm which is now the subject of a Sustainable Grazing on Saline Lands (SGSL) trial to compare the effects of different surface drainage techniques, the results from which can vary considerably.

Over the years the 15ha trial site had deteriorated to the point where it was basically unproductive land, varying from growing barley grass to just bare salt scald, and the level of salt in the groundwater varied from fresh through to extremely saline.

Five different bedding techniques have been used on the site since it was implemented between April and June 2004. These include plough-built and grader-built, spinner drains and raised beds with and without prior ripping. They have and continue to be assessed for their pasture productivity, drainage properties

and associated costs, by Dean, George and the SGSL team on a regular basis.

On 16 July 2004 the site was sown to a buckshot mix of perennial pasture species including Rhodes grass, Sequel lucerne, puccinellia, Tyrell and Dundas tall wheat grass, Advance tall fescue, and balansa clover. On the southern strip of the site, where the disc plough mound technique was used, river saltbush, old man saltbush and wavy leaf saltbush were added to the mix. An existing drain and bank situated at the southern end of the paddock provided drainage outlets for the beds. The whole site was fertilised with superphosphate and potash and spray-topped twice.

The Hulls undertook the SGSL trial to complement other unproductive areas that they have renovated, and by increasing grazing land they, in turn, are hoping to increase the stocking rate without buying more land, or losing more country to salt. *“More sheep means more wool from the land we have,”* said Dean Hull.

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An extremely dry 10-month period left Department of Agriculture and Food (DAFWA) staff Justin Hardy, Arjen Ryder and Derk Bakker, and site host Dean Hull concerned that the trial would be a failure.

The biggest rainfall to reach the site between July 2004 and April 2005 was 11mm on 20 July, and sparse falls after that meant the seeds remained in a dormant state.

Remaining confident George Hull said: *“The pasture will emerge when it was ready,”* which it did following 102mm of rain in April 2005, *“transforming the site,”* George Hull commented.

“The Advance tall fescue and tall wheat grass growth following the rain was phenomenal and things just got better, with frequent falls throughout the rest of the year,” commented SGSL team member Mr Hardy.

While raised beds have been more commonly associated with cropping programs, particularly in areas battling waterlogging, the project aims to see whether it could also have benefits for sheep producers.

“It works on the principle that the ground is lifted out of the water, so the water and the salt leaches out into the inceptor bank,” said DAFWA Research Officer Derk Bakker.

“George has actually been a bit of a pioneer in the field over the years, which led to the trial being run on his former property, enabling DAFWA staff to also glean some knowledge from his previous experiments,” said Mr Bakker.

This includes the Hulls finding that raised beds were best done 12 months in advance because there was then maximum leaching of salt from the soil.

Areas on the farm where the disc-plough technique has been used, has enabled the Hulls to heavily graze weaners from their 4700 head Merino flock in conjunction with adjoining pasture paddocks from 1 February to 1 May and give them a mixed diet.

“Sheep do really well, especially weaners, and produce good wool. Sheep don’t require much supplementary feeding, depending on the season,” said Dean Hull.

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“Most farmers with small areas of saltland pastures use them to help fill the autumn feed gap,” said DAFWA Senior Economist Allan Herbert.

Drought proofing

Dry seasonal conditions in many parts of regional WA meant that many saltland sites have been grazed to defer other pasture paddocks when normally stock would be grazing these sites in autumn.

In the Hulls situation this was a 410 head mob of two-year-old wethers. It was decided the progress of the mob would be monitored, and they were weighed and condition scored on 13 February and then again on 18 May.

This could not be followed any further though, because the Hulls were forced to offload dry sheep, which included the wethers, because there had not been a break in the season. *"The grazing that the wethers were able to get from that site was a God-send,"* said the Hulls.

"While some lost weight, they all pretty much maintained condition, averaging around 58kg," said Dean Hull.

"These sheep had maintained condition grazing the 15ha trial site and an adjoining 14ha paddock with minimal supplementation before being sold. These sheep had been shorn two weeks prior to sale. Two weeks later, another 320 one-year-old wethers

grazed the same area for another month without any supplementation. These two grazings meant an annual rate of 2,450 sheep grazing days per hectare, and it is likely that another grazing will be possible prior to summer. These assumptions were subjected to a 10 year discounted cash flow investment analysis," said Allan Herbert, DAFWA Senior Economist.

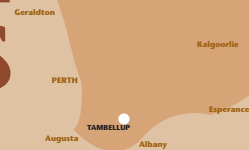
The Hulls continue to renovate unproductive areas on their property and are in the process of draining more land. *"We aim to renovate 10-15 acres a year on existing land,"* said Dean Hull.

"We currently have 5-6 saltbush varieties and many paddocks have perennial grasses already established, and 10 acres has been direct seeded to trees," said Dean Hull.

The SGS project recently started another trial on the site, which will compare and evaluate the performance of NyPa™, a forage grass originally from America, with two new strains of *Sporobolus virginicus*, a native grass commonly referred to as marine couch.

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QUICK FACTS



Location: 5km west of Tambellup on Tambellup West Road.

Rainfall average: 438mm

Enterprise mix: Merino sheep for wool production.

Trial size: 15ha

Trial aim: To establish a practical and cost effective raised bed technique to establish best bet productive, salt-tolerant pastures on saline and waterlogged land. The construction techniques include four types as well as a control.

Treatments: Five different drainage treatments, installed in January 2004. Revegetation costs: \$333/ha (without fencing)

Original vegetation: Paper bark/white gum

Paddock cover before trial started: 75% barley grass, Guildford grass

Soil type: Deep sandy duplex / brown loamy duplex

Watertable: -0.1m below ground

Water salinity: 3640mS/m (two thirds seawater)

Water pH: 6.7

Clearing date: 1970s





A word from the gate...

The drainage of excess moisture from agricultural land can be achieved in several ways. Commonly this is done by means of surface drains. These are designed to drain the water from the surface of the land so as to reduce the time water is ponding on the land.

Typically these are also used to fill stock watering dams. Due to the shallow depth of these drains and the large spacing between them, surface drains are not very effective in improving the internal drainage of the soil which is another pathway for drainage to occur.

Internal drainage occurs when moisture drains out of the largest soil pores and is replaced by air so that the soil becomes aerated. Internal drainage in the topsoil can only occur when a drainage path exist such as an open structured subsoil to channel the water away.

Usually when the problem of waterlogging occurs, it is caused by a poor and impermeable subsoil preventing the topsoil from internally draining, hence the need for artificial drainage paths such as furrows as short intervals. This effect is achieved by using raised beds which are



Derk Bakker

narrow beds with furrows spaced typically at 1.8m intervals.

At Dean and George Hull's trial site a range of different drainage methods has been installed in the form of surface drains and raised beds.

The surface drains have been created by forming mounds with a grader or a disc plough. This form is very effective in shedding surface water but less effective in improving internal drainage but easy to implement and does not create stock obstacles.

The raised beds installed with special equipment are very effective in channelling surface water as well as improving the internal drainage but the presence of multiple furrows creates stock and traffic obstacles.

Pasture assessments on the treatments will clarify whether such an intensive form of drainage is required or whether the mounds are sufficient to improve the productivity by only removing surface water.

Dr Derk Bakker is a Research Officer with DAFWA. His research covers soil physics, remote sensing tools for assessing biomass and yield. He has been researching the application of Raised beds for WA.

"The Sustainable Grazing on Saline Lands program (SGSL) aims to support sheepmeat producers and woolgrowers profitably manage by dryland salinity on their farms.

SGSL involves building a network for testing and exchanging information, providing farmers with useful, timely and relevant information and conducting on-farm research into saltland production options.

The program operates in WA as a producer network of regional farmer groups undertaking individual sustainable grazing projects on local salt-affected farms as well as a Research & Development project through the CRC Salinity of which CSIRO and DAFWA are principal contributors.

The SGSL is a National program initiated and funded by Australian Wool Innovation, MLA and the Federal Government's Land, Water and Wool agency. In WA the project is co-funded, administered and delivered by the Department of Agriculture and Food WA, in conjunction with the CRC Salinity and CSIRO."

Further products in this series available at www.landwaterwool.gov.au

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