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SALTLAND REVEGETATION – PRODUCTION AND DIVERSITY FARMER CASE STUDY

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Who:	Ian and Joan Walsh
Property:	Merilden
Location:	North Stirlings, Western Australia
Area:	1,457 hectares
Mean annual rainfall:	450 mm
Enterprises:	sheep (wool, prime lambs); cereal cropping
Landform and soils:	saltland - flat valley floors with sand over gravel/clay
Arable area:	gently undulating loams with some dolorite

The Farm

Joan and I farm 1457 hectares in the North Stirlings area of Western Australia, near the town of Cranbrook. Our family purchased the original 1000 hectare property in 1957 and at that time 200 hectares was bush, whilst a further 260 hectares was saltland with the groundwater measuring about 18 decisiemens per metre (dS/m). In 1974 we bought an adjoining property on higher land without any salinity.

We now run about 2500 ewes plus lambs and hoggets, a total of 5000 Dry Sheep Equivalents (DSEs), mainly for wool, and we sell prime lambs. We also crop about 400 hectares in a rotation of one year annual pasture and one year crop.

The Problem

Back in the late 1970s and early 1980s, as more and more of the original farm became saline, we realised that we really needed to take some action. Some puccinellia had been planted on the saltland but was not growing particularly well and the water tables were continuing to rise, in some cases to within 0.9 metres of the surface, putting more land at risk. The soil structure was also starting to decline, and aside from the loss of production, we noticed the trees were dying and native birds and animals disappearing.

By the mid 1980s we were running nearly 6000 sheep, a total of 7000 DSEs, and cropping 90 hectares. The pressure on the pastures was immense, and with more land going salty our assets were declining, the remnant bush suffering and we could see that we were becoming unprofitable and unsustainable. We realised we had to turn the salinity problem around.

The Beginning of the Way Back

In 1984 I read about the work that the Department of Agriculture was doing with saltbush, trialing different varieties, establishment techniques and grazing management. It sounded exciting so I rang the author, Clive Malcolm, to find out more.

Initially Clive was cautious, as most of the work had been done further north in the warmer areas of the Western Australian wheatbelt, and he thought it might be too cold and wet down here. However he agreed to come and talk with us.

Getting Started

The local North Stirlings Land Conservation District Committee (LCDC) agreed to a direct seeding trial of various saltbush species suggested by Clive, including *Atriplex amnicola*, *A. nummularia, A. semibaccata, A. lentiformis and Maireana brevifolia*. Eventually six of us collectively bought a direct seeding machine to sow saltbush on our properties. Initially, we didn't see any need for drains, because we believed the saltbush would take care of the water. However with the mounding in the direct seeding process we could see ponding occurring, so we installed 'W' drains to manage the surface water.

The saltbush did eventually lower the water table from 0.9 metres to about 2 metres in some places, which of course has allowed better growth of the clovers and grasses. We had planted balansa clover back in the early 1980s and the saltbush really helped that along.

The saltbush paddocks now provide good feed during autumn when it is scarce, and make a significant contribution to the total feed on the farm. Like most farmers, we now crop a lot more and run a few less sheep, but those sheep are concentrated on a smaller area than before, thanks to the extra production from the 180 hectares of revegetated saltland.

What we have Achieved

Seventeen years down the track the water table is significantly lower and we are ploughing out some of the older scraggly stands of saltbush and planting cereal crops. Last year one of these yielded 2.5 tonnes per hectare, something that would have been impossible before. We are also re-sowing some of the older saltbush areas with more saltbush, whilst some areas near the shearing shed have been really hammered and need renovation.

As our system has evolved, we have gone away from block plantings of saltbush to alley arrangements, allowing vehicle access for top dressing and mustering. There may also be opportunities to extend this further to allow seeding machinery between the rows in some parts of the farm.

Joan and I were also concerned at the loss of biodiversity due to the salt, so we have fenced off the natural bush and direct seeded native trees and shrubs to improve it. The revegetation of the saltland and management of the scrub has meant less wind erosion, protection for the sheep from cold winter winds and the return of native animals.

Looking Ahead

We knew little about saltland management when we started and we have learned a lot by trial and error - and there were a few errors! Starting again now we would have much more information to guide us, but there is still a need for more research to develop better systems.

The wool industry went through a trying time in the 1990s, but having the saltland pastures to run the sheep on has enabled us to increase the cropping and still keep a good sheep flock. It also helped us to manage wool quality by having a better supply of feed in the autumn.

As a sideline, we are now developing specific areas of saltland for commercial seed production, not only for saltbush, but also for other native trees and shrubs. I am on the committee of the Saltland Pastures Association (SPA), that is developing a plan to revegetate 1 million hectares of saltland in the Western Australian wheatbelt. This project, known as 1MPULS>, will need large quantities of seed and the involvement of many other farmers.

We also see the possibility of saltbush lamb as an environmentally friendly, clean green product that could find a niche market, and we are working with a consultant to help develop this. Overall, we believe there is an important future for saltland and we hope that more farmers will see it as an asset.

Table 1: Wool enterprise gross margin before saltland system on "Merilden", 1987. (Powell, Lloyd, Munday & Brewin, 2002)

Enterprise Details			
No. ewes			2,300
No. weaners/hoggets			1,480
No. wethers/rams			2,081
Total DSEs			7,028
Average wool cut / head (kg)			5.2
Total wool clip (kg)			27,965
Total sheep grazed ha (859 winter grazed ha, as 88 ha is cropped)			947
Grazed area salinised (ha)			200
Income			
Wool sales ($)			137,028
Surplus sheep sales ($)			40,303
		Total Income A ($)	**177,331**
Variable costs			
Shearing (including contract labour)			12,685
Crutching (including contract labour)			Included above
Jetting, drenching, dipping, vaccinating, lamb marking (including contract labour)			5,527
Owner labour costs (based on $/day/yr) for above activities and for feeding sheep, moving sheep, checking waters, etc			19,717
Wool and stock selling costs (cartage, commission)			4,415
Fertiliser			11,406
Repairs and maintenance to fences, watering points			6,710
		Total Variable Costs B ($)	**60,460**
Purchases			
Rams ($)			1,600
Replacement ewes/wethers			
Fodder ($)			5,700
		Total purchases C ($)	**7,300**
		Gross Margin (A-B-C) ($)	**109,571**
		Gross Margin/dse	**15.59**
		Gross Margin /ha Grazed	**115.70**
Wool Quality		**DSE grazing days/year on saltland**	~365
Micron *u*	22	**Condition Score**	
Vegetable matter %	<1	At weaning (kg)	28
Schl Dry yield %	68	At joining (kg)	50-60
Length/strength mm/Nm	n/a	At sale (kg)	60-70

Table 2: Wool enterprise gross margin after saltland system on "Merilden", 2000. (Powell, Lloyd, Munday & Brewin, 2002)

Enterprise Details			
No. ewes			2,327
No. weaners/hoggets			1,435
No. wethers/rams			35
Total DSEs			4,977
Average wool cut / head (kg)			6.5
Total wool clip (kg)			24,070
Total sheep grazed ha (774 winter grazed ha, as 400 ha is cropped)			1,174
Grazed area salinised (ha)			200
Area under saltland system – sown salt tolerant pastures (ha)			180
Income			
Wool sales ($)			99,167
Surplus sheep sales ($)			82,000
		Total Income A ($)	**181,167**
Variable costs			
Shearing (including contract labour)			14,624
Crutching (including contract labour)			1,350
Jetting, drenching, dipping, vaccinating, lamb marking (including contract labour)			7,788
Owner labour costs (based on $/day/yr) for above activities and for feeding sheep, moving sheep, checking waters, etc			15,210
Wool and stock selling costs (cartage, commission)			15,161
Fertiliser			9,587
Repairs and maintenance to fences, watering points			8,936
		Total Variable Costs B ($)	**72,656**
Purchases			
Rams ($)			7,100
Replacement ewes/wethers			
Fodder ($)			5,540
		Total purchases C ($)	**12,640**
		Gross Margin (A-B-C) ($)	**95,871**
		Gross Margin/dse	**19.26**
		Gross Margin /ha Grazed	**81.66**
Wool Quality		**DSE grazing days/year on saltland**	
Micron *u*	21.5	**Condition Score**	
Vegetable matter %	<1	At weaning (kg)	28
Schl Dry yield %	70	At joining (kg)	60
Length/strength mm/Nm	88-92/29-44	At sale (kg)	40-60

References

Powell, J., Lloyd, M., Munday, B., Brewin, D. (2002), 'Consolidated Report: Case Studies – Sustainable Grazing for Saline Land', Optimal ICM, Stories p32-35, Producers p17-18.