Using electronic identification (eID) to increase Merino profitability

Focus Farm case study

Maro Creek is using technology to select their most productive and profitable ewes based on wool traits, fertility and body weight. This has enabled them to make informed decisions to increase profitability.

Enterprise snapshot

Owners: Maro Creek and Wilkinson Family
Property name: Maro Creek
Location: Snowtown, Mid North, SA
Size: 5,000 ha
Brief description: 2,200 ewe self-replacing Merino flock and 3,300 ha cropping (including sown pasture)
Number of employees: 4 full-time
Average annual rainfall: 350-380 mm
On-farm technology in use: eID for fast and accurate selection of more productive and profitable ewes (based on fleece weight, fibre diameter, twinning and body weight), eID to separate ewes after pregnancy scanning into single and multiple birth mobs for lambing and feeding accordingly to maintain ewe health and increase numbers of lambs alive.

Background

The Wilkinsons managed and share-farmed the property 'Maro Creek' for more than 10 years, until their recent retirement. Maro Creek extends from the Lochiel flats to the Barunga Ranges in the Mid North of SA, with saltbush on the more saline soils on the flats, cropping on the mid-slope and native pastures on the non-arable hills.

Maro Creek traditionally ran both cattle and sheep, but the cattle were sold in 2009 following economic analysis of the different enterprises, with sheep more profitable. When the cattle were sold, the area of crop was increased, while sheep numbers remained stable.

The business has operated a self-replacing Merino flock of approximately 2,200 ewes. In the late 2000s, eID tags and equipment were purchased through a subsidy scheme for sheep and cattle and have been used ever since.

Motivation to change practices

The sheep enterprise goals were:

1. increase lambing and weaning percentages
2. increase fleece value by reducing fibre diameter from 22 micron to 20 micron or less, while minimising losses in fleece weight. The fibre diameter is now 19 micron but fleece weight has dropped from 6 kg to 5.7 kg per head.

Soon after taking over the management of the property, Martin and Judy Wilkinson engaged a livestock consultant to help undertake a review of their sheep enterprise. They identified an opportunity to increase productivity and profitability through improved nutrition. The consultant highlighted increased lambing percentage as a key profit driver for the business. In 2010 the average lambing percentage was 90-95%.

What management changes were considered?

The Wilkinsons looked at two ways to improve profitability:

1. pregnancy scanning, separating singles and multiples and feeding accordingly with grain
2. wool testing and weighing after visual classing for non-wool traits, selecting ewe hoggets with higher fleece values. Visual classing initially reduced mob size by approximately 25%.

The introduction of pregnancy scanning was the first step. Maro Creek had been testing wool for many years but had not been able to easily or accurately record and manage individual data before the introduction of eID.

Other management changes included:

Rams

- rams are fed with a high-protein diet starting six weeks prior to joining to increase fertility
- ewes are joined from 1 December with lambing starting on 1 May
- rams are only removed at the time of pregnancy testing, as it was too difficult and stressful to muster and remove rams in the middle of summer. However, this extends the length of lambing by two to three weeks.

Ewes

- ewes are placed onto barley stubbles in mid-November to increase ewe condition and ovulation.
- ewes are pregnancy scanned 90 days after the start of joining
- ewes are then separated into single and twin mobs after eID scanning
- on average over the last five years, there have been approximately 130 dry ewes (6%), 800 twin-bearing ewes (36%), and the remainder carrying singles (58%)
- dry ewes are sold immediately after pregnancy scanning due to the drier than average conditions (up until a few years ago they had been kept and given a second chance)
- in the last week of April, ewes are moved into non-arable hill paddocks to lamb. These paddocks are left ungrazed from early October until autumn
- twin-bearing ewes are run as maximum mob size of 250, while single-bearing ewe mobs vary from 300-400, depending on paddock size
- lick feeders were introduced in 2015 after advice from a livestock consultant enabling twin mobs to be fed 800 g of barley per day plus minerals, with the single-bearing ewes fed 300 g of barley daily. Small amounts are fed initially and this is slowly increased over a two to three week period
- ewes are supplementary fed, depending on the season, for 40-50 days
- existing pasture provides sufficient roughage with additional hay or straw usually not required

- lambing percentages in the past five to six years have been 100% for singles and 140% for twins, giving an overall average of 115%.

Lambs

- twin ewe lambs get an eID tag at marking in late June and are then placed with the remainder of the lamb.
- single ewe lambs only get an eID tag at 14 months of age, at the same time as wool testing
- wether lambs are sold in mobs of 200 during February/March with a standard tag
- ewe hoggets are wool tested before shearing for fibre diameter, standard deviation and co-efficient of deviation of fibre diameter, wool comfort factor, staple length and body weight
- at shearing, ewe hoggets have their fleeces weighed. Wool data is sorted and analysed after shearing
- two to three weeks later, ewe hoggets are split into three categories: a top line of approximately 50 (ram breeding flock); a second line of approximately 550 (standard breeding flock); and about 580 culls
- selection criteria are based on fleece weight and other wool characteristics, body weight and twinning history. This is all done using the Datamars/Tru-Test software
- sheep are handled using a V-belt handler with a three-way autodrafter (hired from the consultant) to draft the hoggets
- cull ewe hoggets are sold at the Jamestown market.

Results

Pregnancy scanning and the use of eID has enabled the collection of a large amount of accurate data to assist the Wilkinsons with their decision making. Using eID means ewes can quickly be separated into three mobs with an autodrafter – multiples, singles and empties. Pregnancy data for individual ewes was assessed over time, with the most productive ewes kept for an extra year. Pregnancy scanning and the ability to separate single-bearing and multiple-bearing ewes, to be fed accordingly, has enabled the Wilkinsons to exceed their early expectations of increasing lambing and weaning percentages.

Greater selection pressure has been placed on ewe replacements, as eID has enabled more accurate recording of a larger number of traits. Data from the ewe replacements is analysed and the culls identified, animals can be quickly separated using an autodrafter.

By understanding the nutritional requirements of dry, single-bearing and multiple-bearing ewes, each group is provided with adequate nutrition to maximise numbers of lambs alive.

By implementing these management changes:

- the average fibre diameter has dropped from 22 micron to 19 micron over 10 years
- wool cut has been maintained at 5.7 kg/head following selection for lower micron, although there has been a slight reduction in the last few years due to drought conditions
- lambing percentage has increased from approximately 90% to more than 115%.
- the value of lambs has increased. Selecting ewes with higher body weight has allowed lambs to be sold earlier (lambs are an extra 2 to 3 kg heavier at 50 kg live weight or 22 kg dressed weight) and eEwe hoggets have larger frames as a result of better nutrition and selection for growth.

The cost:benefit analysis (Table 1) shows pregnancy scanning and separating and managing single- and multiple-bearing ewes has a return of $3.75 per $1 invested. Increasing wool and lamb value through wool testing, and fleece and body weighing has a return of $5.36 per $1 invested.

Analysis shows investing in scanning and managing singles and multiples separately has a much larger return. However, the high cost of feeding and managing stock reduces the overall cost:benefit. In comparison, increasing wool and meat value provides a much lower return, but the additional investment required is also much lower. The full benefits of improving wool and meat value may take up to 10 years to be realised.

Key learnings

- The investment in eID has enabled Maro Creek to continually collect data on individual animals and make informed decisions to achieve their sheep enterprise goals.
- Old man saltbush plantings have increased the productivity of relatively low rainfall saline areas. Martin considers this a good investment, with hoggets grazing the saltbush area with the addition of some hay.

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Table 1: Cost:benefit analysis of managing single and multiple ewes separately and improving wool and meat traits (based on 2020 pricing)

Benefits	Option 1 Separate single and multiples		Option 2 Wool and meat quality	
Additional income				
Wool	Wool from additional lambs – 2 kg wool per lamb @ 17.5 micron	$7,825	Increase wool value by reducing micron from 22 to 19	$7,938
	Wool from additional hoggets – 5 kg wool per hogget @ 18 micron	$10,350		
Wether lambs	20% additional lambs @ $170/hd	$35,190	Increase lamb value by $10 x 1,830	$18,305
Cull ewe hoggets	207 additional hoggets @ $220/hd	$45,540		
Reduced costs				
Less ewe losses	1% @ $250	$5,175		
Labour savings		$ -	Autodrafting compared with manual drafting	$600
Total benefits		**$104,080**		**$25,643**
Costs				
New variable costs				
Pregnancy scanning	2,200 ewes @ $0.65/hd	$1,430		
Sheep feed	Barley 30 t @ $230/t	$6,900		
Shearing	414 lambs @ $7.50/hd	$3,105	Wool testing @ $1.05 x 900	$945
	207 hoggets @ $7.50/hd	$1,553		
Additional labour	Pregnancy scanning and feeding @ $300/day	$900	Wool testing and fleece weighing @ $300/day x 3 days	$900
Other management	414 lambs @ $4.00/hd	$1,656	Additional tag costs @ $1	$1,000

Benefits	Option 1 Separate single and multiples		Option 2 Wool and meat quality	
	207 hoggets @ $6.30/hd	$1,304		
Sheep and lamb freight	@ $4/head	$1,656		
Lamb and hogget selling charges and levies		$977		
Sheep commission	@ 6%	$4,844		
Wool commission and levies		$776		$119
New overhead costs				
Depreciation	Lick feeders; 50% autodrafter and eID equipment	$1,991	50% autodrafter and eID equipment; 100% barcode printer and scanner	$1,390
Opportunity cost		$679		$430
Total costs		$27,770		$4,783
Gross margin		$76,310		$20,860
Average return over 10 years	50% nutrition and 50% genetics	$57,232	100% genetic	$10,430
Discount rate		2%		2%
Net present value		$51,409		$9,369
Cost:Benefit		**3.75**		**5.36**

Equipment at RRP with electronic equipment 20% depreciation and other equipment 7% depreciation per year.