



Using technology and electronic identification (eID) to increase merino production and efficiency

Focus Farm case study

The Kellocks are using technology to accurately measure and monitor the production and performance of their merino flock. This has enabled them to make informed decisions on management changes to increase profitability.

Enterprise Snapshot

Owners: Greg, Jane and Sam Kellock

Property name: Kelvale

Location: Farrell Flat

Size: 1,400 hectares

Brief enterprise description: Cropping, self-replacing merino flock, lamb feedlot

Number of Employees: 3 full time

Average annual rainfall: 440 mm

What on-farm technology they're using: Electronic identification, wool testing and weighing, pregnancy scanning, DNA testing, soil moisture monitoring

Background

Greg, Jane and Sam Kellock's property is a mixed cropping and livestock business. They have 700 hectares of crop sown to wheat, barley, oats, beans, lupins and vetch and approximately 80 hectares of



permanent native pasture and 620 hectares of sown pasture consisting of barley, clover, lucerne and chicory with 50 to 100 hectares of pasture sown every year.

The Kellocks manage a self-replacing merino flock of 1,050 ewes with an average 20.5 micron adult and 18 micron hogget fibre diameter. Pastures are rotationally grazed with mobs of 1,000 sheep for up to 7 days depending on the size of the paddock. Paddocks are given between 30 and 90 days rest between grazings to allow pastures to recover, depending on time of year and seasonal conditions.

Merino wether lambs are production fed in a containment area along with other weaner lambs bought from mainly pastoral properties and then sold directly to processors once they have reached appropriate weight.

Why did they decide to adopt technology?

The Kellocks decided to adopt eID, wool testing and weighing, pregnancy scanning, DNA testing and soil moisture monitoring technology to measure production and performance of their livestock enterprise and collect precise data to assess and make informed management decisions. They also wanted to make it easier for their staff to manage the day to day operations of the farm, so in 2014 they put eID tags into all of their ewes.

Ultimately, they wanted to ensure they buy the best performing sheep genetics using ASBV data to help achieve their livestock goals:

1. Increase number of lambs weaned by 10% within 5 years
2. Increase wool cut by 1.5kg for mature sheep within 5 years
3. Increase ewe fertility rates by 5% over the flock in 3 years
4. To ensure that all changes that happen within the business are good for their people, their profitability and their business.

How are they using technology to manage their business?

Pregnancy Scanning: Their ewes are pregnancy scanned and condition scored annually (late March) and are then separated into dry, single and multiple mobs, two to four weeks after scanning depending on feed availability.

'Dry' ewes are sold after scanning and 'wet' ewes that have not raised a lamb are sold after lamb marking (ewe udders assessed as wet or dry).

Ewes carrying multiple lambs are managed in mobs of 40 to 80 (stocking rate of 3 ewes per hectare). This ensures they get additional feed and have greater privacy when lambing, increasing lamb survival. Ewes with single lambs are placed in mobs of 250 to 400, depending on paddock size. Approximately one third of ewes have multiple foetuses with a lambing rate of 140% with the singles having a lambing rate of 98%.



Stick reader and barcode printer

Wool testing and weighing: Ewe hoggets are wool tested and fleeces weighed at shearing in late October. A barcode printer and barcode scanner, used for tracking fleeces and entering data, are hired from a local company, providing significant cost savings compared to owning equipment.

The flock has been unmulesed since 2006 and the Kellocks are achieving a premium of between 30 and 50 cents per kilogram for the wool. Since 2009, the flock has been shorn every 6 months.

DNA testing: Genetic gain is assessed every three years through blood samples taken from a representative sample of ewe hoggets and sent off for DNA analysis. This testing determines parentages, poll status and estimated breeding values for many economically important traits.

Data management: The Kellocks have recently purchased AgriWebb, an agricultural and livestock farm management software product that captures every mob and paddock record on the go. Individual animal data is currently stored and analysed using the Stockbook software program. Livestock data will be transferred to AgriWebb once individual livestock management becomes an option in the software.

What management practices have they changed?

As a result of adopting technology, the Kellocks have been able to make the following changes to ensure best practice:

- Feeding pregnant ewes according to pregnancy status and condition score
- Selecting ewe hoggets on fleece value and body condition with a focus on staple length as shearing is every 6 months
- Preferentially selecting ewe hoggets born as twins. Previously they had been culling a high percentage of twins as they tended to be smaller with a different wool type. Hoggets born as singles and twins are now classed as two separate mobs.
- Grazing management based on soil moisture levels gives control over applying fertiliser when moisture is enough to maximise the benefit
- Measure, assess and change management in response to the production and performance data collected
- Implementation of condition scoring and weighing ewes three times a year
- Buying rams with appropriate meat and wool traits.

How has the technology helped them to achieve their livestock goals?

The Kellocks have experienced the following successes since adopting technology in 2014:

- Number of lambs weaned has increased from 85% to 115%
- Fleece weight has increased from 7kg to 8kg per head from mature sheep
- Number of ewes mated and then rearing a lamb has gone from 60% to 83%
- Number of dry ewes has been reduced from 11% down to 3.7% in 2020.

To analyse the economic benefit of using these different technologies, a cost:benefit analysis was undertaken to compare different options against what they had been doing.

- Option 1 is to use pregnancy scanning to identify dry, single and multiple births and then separate these ewes and feed them according to their nutritional requirements.
- Option 2 is to use eID to measure wool and meat traits of individual animals and only keep the most productive and profitable animals as breeders.

The Kellocks decided to adopt both option 1 and 2 to maximise the benefit of using these technologies. The Kellocks found both options to have a financial benefit to their business as well as a benefit to animals and staff.

A detailed cost vs benefit analysis in managing single and multiple ewes separately and improving wool and meat traits can be found in Table 1.

Looking to the future, the Kellocks are working to build new sheep yards to increase efficiency and reduce stress for both livestock and staff. They are aiming to put eID tags into all lambs coming into the feedlot to enable growth rates to be measured. They will also install a walk over weighing system in the feedlot to increase efficiency and reduce stress on animals and are evaluating the use of an Auto Drafter and whether it will work in combination with their Combi Clamp sheep handler.

Further information

This case study is an initiative of the Red Meat and Wool Growth Program of Primary Industries and Regions SA, supported by Meat and Livestock Australia, SA Sheep and Cattle Industry Funds and SheepConnect SA.

For more information visit pir.sa.gov.au/redmeatandwool or contact the Red Meat and Wool Growth Program via phone 1300 364 322 or email redmeatandwool@sa.gov.au.

Table 1: Example cost vs benefit analysis of managing single and multiple ewes separately and improving wool and meat traits

Benefits	Option 1 Separate single and multiples	Option 2 Wool and meat quality		
Additional Income				
Wool from additional lambs	2 kg wool per lamb @17.5 micron	\$3,780		
Wool from additional hoggets	5 kg wool per hogget @18 micron	\$4,900	Increase wool cut	\$8,925
Wether lambs	30% additional lambs @\$170/head	\$26,775	Increase lamb value by \$10 per lamb	\$9,475
Cull ewe hoggets	155 additional hoggets @\$220/head	\$34,100		
Reduced Costs				
Less ewe losses	1% @\$250	\$2,625		
Labour savings				\$ -
Total benefits		\$72,180		\$18,400
Costs				
New variable costs				
Pregnancy Scanning	1,050 ewes @\$0.65/head	\$683		
Sheep feed	Pasture establishment & management	\$8,000		
Shearing	310 lambs @\$7.50/head	\$2,325	Wool testing @\$1.05 x 500 ewe hoggets	\$525
	155 hoggets @\$7.50/head	\$1,162		
Additional Labour	Preg scanning and feeding @\$300/day	\$600	Wool testing and fleece weighing @\$300/day	\$600
Other management	310 lambs @\$4.00/hd	\$1,240	Additional tag cost 1,200 @\$1	\$1,200
	155hoggets @\$6.30/head	\$976		

Benefits	Option 1 Separate single and multiples	Option 2 Wool and meat quality
Sheep and lamb freight	@\$4/head	\$1,240
Lamb and hogget selling charges & levies		\$740
Sheep Commission	@6%	\$3,660
Wool commission & levies		\$513
		\$134
New Overhead Costs		
Depreciation	50% eID equipment	\$319
		50% eID equipment; 100% barcode printer and scanner
		\$614
Opportunity Cost		\$109
		\$190
Total Costs		\$2156
		\$3,262
Gross Margin		\$50,744
		\$15,138
Average Return over 10 years	50% nutrition and 50% genetics	\$38,050
		100% genetic
		\$7,570
Discount Rate		2%
		2%
Net Present Value		\$34,150
		\$6,800
Cost: Benefit		3.3
		5.64