Improving Merino production with AgTech and Precision Livestock Management (PLM)

Focus Farm case study

Keyneton Station has improved productivity through data-based decision making using electronic identification (eID) tags, an autodrafter, management software and precision lambing.

Enterprise Snapshot

Owners: Georgie Keynes, Toby Rosenzweig and family
Property name: Keyneton Station
Location: Keyneton, Eastern Mt Lofty Ranges, SA
Size: 2,000 ha
Brief enterprise description: Self-replacing Merino flock with some ewes mated to Border Leicester rams
Number of employees: 2 full-time equivalents
Average annual rainfall: 400-500 mm

Background

Georgie Keynes and Toby Rosenzweig, together with Georgie's parents Joe and Sally Keynes, farm at Keyneton, SA, in the eastern Mt Lofty Ranges approximately 100 km north-east of Adelaide. Their enterprise, Keyneton Station, focuses on wool, meat and first-cross ewe lamb production. The flock comprises 2,700 Merino ewes – 1,700 mated to Merinos and 1,000 to Border Leicesters – grazing phalaris, clover and annual and native grass pastures. The Merinos at Keyneton Station are plain-bodied sheep, with mature ewes averaging 65 kg.

What improvements was Keyneton Station looking for?

- Ability to distinguish 'passengers' from 'performers' in a commercial Merino flock – especially during drought, when numbers have to be reduced
- Ability to select sheep with best wool and fertility traits to drive genetic gain
- System for monitoring individual body weight changes of ewes in containment or lambs as they grow out
- Better records of animal health treatments on a farm with multiple staff for efficiency and industry compliance.

What management practices have been implemented?

- Three-way autodraft
- Pregnancy scanning
- Use of eID tags in all Merino lambs
- eID records of sheep live weights and wool cut
- Containment feeding and use of external nutrition consultant to optimise nutrition
- Rotational grazing and pasture plate meter to refine rotational grazing
- AgriWebb farm management software to better record stock numbers, movements and treatments.

Integration of technology with sheep management

Pregnancy scanning

Pregnancy scanning has been integral to the Keyneton Station production system for over 10 years and occurs each year in late March. Ewes are divided into mobs of multiples, singles, and drys following scanning. Ewes bearing multiples are then given preferential treatment during gestation and lambing (see below).

eID performance recording of traits, and automatic drafting

To enable individual performance recording, eID tags are used in ewe lambs, and have been for the past five years. This year, wether lambs have also been given eID tags. This allows the following traits to be recorded against eID:

1. weight change, particularly with weaned lambs
2. fleece weight as hoggets
3. visual 'class' based on wool type and body conformation.

The process for recording wool data is as follows. Firstly, a wand (handheld eID reader) is used to read the eID tag number as the sheep enter the board. A portable barcode printer is used to print out a paper copy of each eID, with the printout attached with a clip to the catching pen. The fleece is collected with the paper copy of the eID and weighed (on load bars connected to an XR5000 scale head), as the paper copy of the eID is scanned with a barcode reader. A similar process is used when wool quality data is collected every few years, with the paper barcode put into a sample bag with each wool sample. Wool quality data had been collected every year, however the process required extra labour and the Keynes family is only looking to maintain current wool quality.

Visual classing of hogget wool quality and body conformation is also conducted by a professional sheep classer, with class entered against eID on the wand. Ewes to be joined to Border Leicester rams are also given a red eartag for easy visual identification over their lifetime.

An autodrafter – a Pratley 3-Way, fitted with eID panel reader – enables sheep to be drafted automatically based on wool weight, body weight or class (Merino breeder or crossbred). Data management is all done on the XR5000 scale head.

Pregnancy scanning data is automatically recorded against eID at the time of scanning, allowing scanning data to accumulate over time, and opening up the option of keeping the most productive ewes for an extra year. If flock reductions are needed, it is also possible to select under-performing ewes based on wool cut or pregnancy records, allowing only the most productive sheep to be retained.

Management software

Georgie and Toby use the livestock management program AgriWebb. All sheep movements and treatments are entered into the program. Georgie finds this system particularly useful when filling out vendor declarations at point of sale. Paddock treatments are also entered into AgriWebb to help keep track of grazing withholds.

Fig. 1. Georgie Keynes with ewes being held in containment over summer and early autumn.

Other management practices used

Grazing management

Georgie and Toby are active members of the Barossa Improved Grazing Group. They have completed a Pasture Principles course through the Group and try to apply what they've learnt in their management of grazing. Sheep are rotationally grazed across the property except when set stocked at lambing. Feed on offer is assessed with a pasture plate meter to help with feed budgeting and working out rotations, particularly in sown annual pastures. Pastures are grazed when they are at leaf stage three (annual grasses) or leaf stage four (perennials).

Ewe nutrition and containment feeding

Particular attention is paid to ewe condition score during early summer. In recent dry years, seven containment pens were built. Ewes are brought into containment in late January. Crossbreds are generally brought in first, with the potential to bring in lighter condition ewes first if necessary.

An external consultant is used to help interpret feed tests and formulate rations for sheep. Containment feeding retains cover on paddocks, rests perennial pastures and allows feed to 'get away' in autumn. It

also offers the advantage of having sheep located in one spot near the yards for convenient feeding, scanning and pre-lambing treatments.

Ewes are released from containment approximately five weeks before lambing (late April) to avoid stressing animals too much in late pregnancy. Georgie finds that putting sheep into containment earlier allows them to be released earlier, reducing issues in late pregnancy. Some ewes are also agisted out onto bean stubbles if possible.

A final advantage of containment infrastructure is that it enables some lambs to be lot-fed too, giving marketing flexibility.

Lamb survival

Having completed a Lambs Alive course, Georgie pays particular attention to lamb survival. Strategies include lambing twins down in the best lambing paddocks with the best feed, trail feeding barley right up to lambing, and reducing mob size for twins. Mob size is currently less than 200 ewes for multiples and approximately 350 ewes per mob for singles. Georgie would prefer smaller paddocks and mobs and will try to re-fence some paddocks over time.

Eight-monthly shearing

Adult sheep are shorn every eight to nine months to optimise staple length and quality, and for associated animal health benefits.

Future initiatives

- Stock water at Keyneton Station is provided by a mix of dams and mains water to the homestead and feedlot. Mains water is now being piped to more paddocks, due to the run of dry seasons. Georgie and Toby are investigating the installation of water meter monitors sensing minimum and maximum use, with text alerts. Tank or trough monitors may also be installed in troughs in the containment pens.
- The sheep yards at Keyneton Station are due for renewal, with Georgie and Toby looking into designs to allow them to leave the autodrafter and a sheep handler set up and still allow manual drafting.
- Having had experience using a Combi Clamp sheep handler in the past, Georgie and Toby are keen to purchase one soon, for some animal health treatments and occasional crutching jobs.
- Georgie and Toby are taking part in a University of Adelaide trial on lamb survival in Merinos, with 130 twin-bearing ewes selected and condition scored. Lambs (including dead lambs) will be matched to ewes using DNA to investigate the effect of ewe condition score on lamb survival and performance.

Take-home messages

- Scanning and tailored ewe nutrition aids lamb survival and overall productivity.
- eID allows wool production data to be assessed at the level of the individual animal, making selection of ewe replacements easier.
- Keeping lifetime pregnancy scanning data on ewes allows easy culling of twice dry ewes.
- An autodrafter is used to sort sheep based on weights or data linked to eID.
- Recording stock movements and treatments on AgriWebb helps with day-to-day management, as well as marketing.

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