Using AgTech to improve productivity and labour efficiency in a commercial Merino enterprise

Focus Farm case study

The Pococks have improved enterprise productivity by recording individual animal traits using electronic identification (eID) and by using a sheep handler/autodrafter and farm management software.

Enterprise snapshot

Owners: Robert and Courtney Pocock and family
Property name: Lampata
Location: Lameroo, southern Murray Mallee, SA
Size: 3,000 ha
Brief enterprise description: 2,000 ewe Merino flock and 2,000 ha cropping, contract seeding and harvesting
Number of employees: 4 full-time
Average annual rainfall: 350 mm

Background

Robert and Courtney Pocock's property 'Lampata' is spread over approximately 40 km near Lameroo in the southern Mallee of SA. The farm is equally focussed on sheep and grain production, running 2,000 Poll Merino ewes (stud and commercial flocks), and cropping 2,000 ha with wheat, barley and lupins, plus some contract seeding and harvesting. This case study focuses on the Pococks' use of technology in their commercial Merino flock.

What improvements were the Pococks looking for?

- Ability to distinguish 'passengers' from 'performers' in a commercial Merino flock – especially during drought, when numbers need 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
- Reduced manual effort in sheep handling

What have they adopted?

- eID-based recording of animal health treatments, body weights, fleece traits and reproductive performance
- Pregnancy scanning of ewes
- Use of Te Pari HD6 sheep handler/autodrafter for all animal treatments
- Management software – Agworld, John Deere Operations Centre and Sapien Technology's KoolCollect
- Satellite-based monitoring of crops using AgIntel
- Six-monthly shearing
- Rotational grazing and containment feeding of sheep.

Fig. 1. All animal health treatments at Lampata are conducted through a combined animal handler/autodrafter, allowing frequent recording of weights against eID and reducing manual labour

Integration of technology with sheep management

The Pococks initially used eID eartags to record performance traits in stud sheep. However, the family quickly realised that eID-based records could also offer production benefits and accelerate genetic gain in their commercial flock.

They decided to record the following traits in their commercial flock:

- birth status (single or twin)
- body weights
- ewe hogget fleece weight and micron
- pregnancy status.

To do this, they implemented:

1. eID eartags in all sheep
2. a new animal handler/autodrafter with radio-frequency identification (RFID) panel reader and new indicator
3. electronic scales in the shearing shed connected to the indicator, a wand (handheld eID reader), barcode printer and scanner for fleece weighing at shearing
4. pregnancy scanning ewes to sort into multiples, singles and drys, with scanning data automatically recorded against eID.

Animal handler

The Pococks have found conducting animal health treatments in a sheep handler has reduced manual labour. Now anyone on the farm can drench, vaccinate and backline, but Robert emphasises that "A good lead up and a good dog are essential for it to work as a one-person operation, and it does not necessarily save time".

The approach has also allowed body weight to be collected every time sheep are treated. This is particularly important when managing ewe nutrition and condition score during reproduction and allows slow-growing lambs to be identified during finishing.

Additional benefits include:

- animal health treatments can be recorded against eID, making compliance easier
- lambs can also be weighed up for sale using the handler.

Pregnancy scanning

According to Robert, pregnancy scanning of ewes is critical to flock performance at Lampata. A pregnancy scanning contractor is used to identify dry ewes and those bearing singles and multiples, with pregnancy status automatically recorded using eID in the scanning crate. Knowing the pregnancy status of ewes allows tailored nutrition, with more feed and the best lambing paddocks given to multiples, which are also lambed down in smaller mobs of less than 150 ewes. Older dry ewes are culled, and because lifetime scanning data is available for each ewe, 'twice dry' ewes of any age can also be removed from the flock.

Robert says scanning and more precise management of ewe nutrition is a great tool in sheep management, and he would never consider not doing it.

"It increases the efficiency of the whole operation, increases lambing rate and reduces ewe mortality caused by pregnancy toxaemia (in twins) or dystocia (in singles)," he said.

As singles and twins are run in separate paddocks, birth status can be assigned to lambs at marking, which allows preferential selection of hoggets born as twins, leading to a gradual genetic improvement in flock reproductive performance.

Wool testing

In the commercial flock, wool weighing and testing is only conducted on ewe hoggets (one year old, shorn in April with six months' wool). An extra labour unit is needed in the shed to 'wand' each eartag as sheep approach the board and to manage data collection. The wand is connected to a portable barcode

printer (via Bluetooth). The eID is printed and clipped to a basket at each stand to link the fleece and eID for wool weighing. The printout is then put in a bag with a wool sample for micron testing.

Data management and automatic drafting

The Pococks use a livestock data management specialist and the Sapien Technology KoolCollect program to help with data management and sheep classing (data cleansing, formatting, selection indices). This identifies which hoggets have the targeted wool quality and cut, and body weight, with preference given to twins. Having determined draft groups, files are loaded into the autodrafter to sort sheep in the yards. Visual classing is also used to class out hoggets with body faults.

With mature ewes, any culls (e.g. cast, dries, lambed and lost, or cast for age) can also be drafted out using eID and the autodrafter. Having lifetime performance data available is also critical if a reduction in sheep numbers are required – for example in drought – allowing the most productive sheep to be retained.

Robert has found, however, that setting up computers that work in the yards is a challenge.

"Most people use notebooks, and there was no one to copy in setting up software and equipment in yards that can cope with dust," he said. "For us, the solution was to get away from laptops and get a desktop built which coped better with dust. This gives us the flexibility of looking at raw data and tweaking the draft without having to go back to the office."

Fig. 2. Containment pens at Lampata are positioned along a shared laneway where feed is trailed onto poly belting each day from February to April. Having sheep contained close to the yards works well with February shearing, scanning and pre-lambing treatment.

Other technology in use

Management software

The agronomic management program Agworld is used to assist in the cropping enterprise, with all paddocks mapped into the program and paddock recommendations loaded onto it. Operations are also recorded using the John Deere Operations Centre platform. Robert would prefer to be able to use one platform to keep information on the cropping and livestock enterprises in one place but hasn't found a product yet that can do both.

Remote pasture and crop monitoring

The Pococks have recently subscribed to AgIntel, a satellite-based tool to monitor crop and pasture vigour and biomass. The primary use of the service at this stage is in crop yield prediction – however, there is scope to use the service for assessment of feed on offer in future, which will help monitor feed on offer and rotational grazing management.

Water monitoring

There are 130 water points across Lampata, supplied by six main tanks fitted with either windmills or solar pumps. With water points spread across properties up to 40 km apart, checking water points is labour intensive. To help with water monitoring, the Pococks are planning to employ a water monitoring specialist to fit tank level sensors. Information on tank status will be transmitted via Long Range Wide Area Network (LoRaWAN) to a cloud-based server, allowing tanks to be checked each day via a website. Robert believes troughs will still need to be physically checked every week or two, but that the approach will reduce labour and provide better water security and peace of mind when away from the farm.

Other best practice methods used

- Rotational grazing allows better pasture growth, utilisation and protects pastures from overgrazing.
- Six-monthly shearing is beneficial due to slight improvements in wool production and quality and overall animal health benefits.
- Containment feeding in late summer/early autumn protects perennial pastures from overgrazing, maintains ground cover and allows pastures to get away in autumn prior to lambing. An added benefit is that sheep are close to the yards for February shearing, pregnancy scanning and pre-lambing treatments.
- Vaccination of lambs with Eryvac® greatly reduces the number of arthritic lambs.

Fig. 3. Courtney and Robert Pocock with their family (left), and Robert's parents Bruce and Gaye.

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