



Precision Pays

Producer profiles on how precision sheep management is achieving accuracy, confidence and on-farm profitability.



SHEEPCRC



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Our vision

The Australian Sheep Industry Cooperative Research Centre (Sheep CRC) is focused on improving the profitability of the sheep industry by moving towards greater precision and optimisation of the enterprise structure, breeding, management and marketing.

Included in the Sheep CRC's research is a combination of new and existing technologies that change the current practice of managing 'the flock' to managing individual animals or selected groups of animals.

Our vision has been for a more integrated production system based on measurement, management and marketing of animals according to their individual merit. Selection on merit allows management according to potential, and selling based on market specifications.

The application of more intensive measurement and making use of this information in selection and management is the first step in a precision production system, or Precision Sheep Management (PSM).

Where are the benefits?

The sheep industry has an enormous opportunity for productivity gain because of the measurable variation within a flock. While large differences exist between the top 25 percent and bottom 25pc of animals in fleece weight, fibre diameter, growth rate and reproduction, the differences in dollar value can be extreme – three to five times between the upper and lower quartiles.

PSM uses selection, management and marketing strategies to increase the value of the top 25pc of the flock and minimise the costs of the bottom 25pc. These new management approaches will only be realised if animals are measured for their potential level of production.

We have analysed PSM strategies that use on-farm fibre measurement (OFFM) for extracting benefits from wool enterprises and repeat body weight and fatness information in growing lambs. The Sheep CRC has also tackled the complex issue of managing both wool and growth data in an integrated production system producing both wool and meat products.

More recently, we have concentrated on documenting the benefits that may arise from genetic improvement, grazing management, reproductive management and nutrition as PSM options.

What is involved?

New measurement tools are emerging to complement traditional tools. Automated data capture to more effectively collect information not previously possible has delivered new capabilities.

Practical application of electronic tags, or radio frequency identification (RFID), as a means of recognising individual animals has improved the efficiency and accuracy of data capture, and improved the use and re-use of information for selection and management decisions.



Dr Kevin Atkins

“Our vision has been for a more integrated production system based on measurement, management and marketing of animals according to their individual merit.”

More importantly, this research has identified new possibilities for animal-activated data capture. Walk-over weighing (WOW), where an animal's identity and weight are captured remotely without the need for mustering and labour-intensive weighing, has been developed.

Using the physical association between (tagged) ewes and their lambs provides an opportunity to record lamb survival and assign maternal pedigree without undertaking costly mothering-up procedures.

Remote drafting without human intervention has also been developed. And the ability to link abattoir carcass feedback with on-farm data for individual animals is likely to improve production and deliver benefits along the lamb supply chain.

The Sheep CRC has developed simple yet effective technology and management options for all sectors of the industry, from those producers who favour systems that do not depend on identifying individual animals to those keen to introduce electronic data management as quickly as possible.

K D Atkins
Program Leader

PROFILE 1

David Strong
'Coolbaroo'
Wagga Wagga, NSW



David Strong uses PSM in both his Merino and crossbred lamb flocks.

AT A GLANCE

- 950 hectares
- 1150 ewes joined to Merino rams, 1150 ewes joined to terminal sires
- Marketing 1000 crossbred lambs per year

KEY POINTS:

- **Large volumes of performance data are easily handled, and can be re-used in multiple facets of livestock management.**
- **Data collected on individual animals enables accurate culling decisions – individual measurements revealed fleece values varied from \$15 to \$90 per head.**
- **Auto-drafting before shearing, based on current and/or historical records, means wool can be baled according to specific target markets.**

Performance data on the pulse

There was a time at 'Coolbaroo' when sheep classing was a long and drawn out process that involved pots of paint and sometimes pots of frustration at the race.

Not any more thanks to the use of precision sheep management (PSM) and particularly the advent of RFID tags.

'Coolbaroo' manager, David Strong, says his 'old' classing system involved being at the race with a lot of books, tins of paint – and a lot of people.

"My finger is right on the pulse. In a drought for example, we will know very quickly where to start culling."

"Some one would call out a tag number, some one would retrieve the hard copy of the information and then the sheep would be marked accordingly. We always had errors with that system," David says.

"That's all in the past now with the advent of the RFID tag and we can readily access the data on the computer in the yards or at the race."

David's first experience with RFID tags was in 2003 but the family had been recording individual animal performance for many years prior to that.

"We had the book work on fleece weights and micron for pretty much the entire ewe flock so it was great to be able to combine the data."

"It means we can easily re-use the information and importantly, the data can be accessed at the race and used in our classing decisions."

David has been involved in RFID tag trials and 2005 was the first time that all the Merino ewes were RFID tagged.

'Coolbaroo' is a family property located at Ladysmith, near Wagga Wagga in southern NSW, which has been in the Strong name since the 1950s.

Apart from the livestock, crops of wheat, canola and oats are grown. The sheep flock comprises 2300 Merino breeders, 500 wethers and 900 hoggets. Of the ewe flock, 1300 are joined to Merino rams while 1000 are joined to terminal sires such as White Suffolks or composite breeds.

The aim is to turn off around 900 first-cross prime lambs per year as well as 450 Merino wether hoggets. The target specification of the prime lambs is a trade carcass weight of 18 kilograms or 40-45kg liveweight.



"Our notional fleece values range from \$15 - \$90 a head ... this huge variation is largely hidden unless we capture and access the data."

printed off and placed above the shearer. When the fleece is picked up, the label goes to the electronic scales with the fleece. The number is scanned and the fleece weight is recorded as well as classer notes.

All micron and fleece data is compiled for the sheep as hoggets and a notional fleece value (on a dollar basis) is allocated to every animal.

Hoggets are then ranked according to fleece value and that information is combined with bodyweight to decide what management option will be taken, that is, whether the animal will become a crossbred dam or Merino dam.

"The RFID tags are a great selection aid that undoubtedly helps the genetic advancement of our Merino ewe flock," David adds.

While he cannot calculate the actual return on investment from using the RFID tags, David points to just one aspect of the tags and PSM that is making a huge difference to flock management on 'Coolbaroo'.

The Strongs also re-use the RFID tags, so they are a one-off cost apart from the male part of the tag, which costs around 20 cents each.

David has no doubt that PSM and RFID tags will play a big part in the future management on 'Coolbaroo'.

"It definitely makes running the enterprise much more interesting. My finger is right on the pulse. In a drought for example, we will know very quickly where to start culling.

"I am very enthusiastic about it."

Lambing is in August. Lambs are sold through the saleyards and some over-the-hooks direct to the abattoir. The average lambing rate (at marking) is 93 percent (but 85pc during the 2006 drought).

Lambs get their RFID tags at marking.

"So from lamb marking onwards, the computer and we know which mob that lamb was born into. Lambs are then weighed at various stages throughout the year to generate growth rate information that is used for genetic comparison and selection."

The crossbred sheep are sold at certain target weights, as are the Merino hoggets. An auto-drafter is used to ensure slaughter sheep are at their target weight prior to selling.

At crutching in October a mid-side sample is taken and, at the same time, the RFID tag number is read, and a barcode printer prints a label.

The label goes on the bag with the mid-side sample that is sent off-farm for wool testing. The wool testers can read the barcode and then all the matched data is e-mailed back to David.

David can then run the hoggets, for example, through an auto-drafter (which he has on loan from the NSW Department of Primary Industries) prior to shearing according to micron to achieve specified bales of wool.

"This means we can very accurately target a specific market," David says.

The RFID tags are also utilised at shearing. Typically the hogget's tag is scanned as the sheep comes onto the board. A label is



RFID tags are a one-off cost.

PROFILE 2

Peter Trefort
'Hillside Meats'
Narrogin, WA



AT A GLANCE

- Single species abattoir
- Slaughter capacity of 1400 sheep/day
- Producer alliance Q Lamb

KEY POINTS:

- **Precision sheep management is delivering gains in product consistency and financial returns for Hillside Abattoir.**
- **Accurate monitoring of individual carcasses identifies best and worst performers, which allows financial margins to be protected.**
- **Variation in carcass yields of 41 to 50 percent can be linked back to breeding and form the basis of management decisions.**



Peter Trefort says PSM is delivering financial benefits.

Precision 'yields' carcass consistency

Precision sheep management (PSM) is helping sheepmeat and lamb exporter Peter Trefort achieve gains in product consistency and financial returns from his abattoir, 'Hillside Meats' in Narrogin, Western Australia.

In just 12 months, PSM has enabled 'Hillside Meats' to accurately identify its best and worst feedlot performers, and link this performance as well as carcass characteristics to sires and sire lines.

"Not only can we see the lamb's performance in the feedlot, we can record carcass traits and how these relate to the animal's breeding."

For Peter, PSM is a logical step forward in his business that exports mutton and lamb to many countries throughout the Middle East and Asia.

"The abattoir was running trials with simple weight records such as live weight into the feedlot and weight out," Peter says.

"But as the drought forced feed costs to rise by about 40 percent, we had to look much closer at the whole feeding system to get the most out of it.

"So we started researching breeding and the use of different sires. And to make sure the trials were accurate, we decided RFID tags were the best option."

The RFID tags were combined with walk-over-weighing technology that provides 'Hillside' with "a lot of very useful performance data," according to Peter.

"Now not only can we see the sheep's performance in the feedlot, we can easily record carcass traits and how these relate to the animal's breeding," he says.

"And we can quickly see the effects of the environment, for example, a hot spell of weather. So we can ascertain the best conditions for the sheep to gain weight."

All sheep that enter 'Hillside's' feedlot are RFID tagged and they are automatically weighed and data logged every time they feed.

"We also get variation in carcase yields of 41 to 50 percent, and most of that is genetic."

Peter says this provides a quick and accurate way of identifying the best and worst performers, and management can then be altered accordingly.

"It's great to be able to identify lambs that are not doing so well. We can draft them out and manage them separately. And then we can look at their breeding, environment or temperament."

Peter also ran a PSM trial weighing and fat scoring sheep every seven days. The maximum growth rate recorded in the trial was 900 grams per day and the average was 460g/day over 300 lambs. It's this type of variance that Peter says will be minimised with more use of PSM.

"We also get variation in carcase yields of 41 to 50pc, and most of that is genetic. So once again, the PSM and RFID tags will be helping us minimise that.

"These sorts of results are fantastic. There are many parameters that go into providing a good eating experience and PSM has taken the guesswork out of much of it."

Even though Peter has been using RFID tags for just a little over a year, he says they have taught 'Hillside' "a hell of a lot".

"The RFID tags and PSM is an on-going trial but they are rapidly becoming part of the every day management. What it is teaching us is just enormous.

"The best time to sell a lamb is when it is ready. The more we know about that, the better. Even if you keep a lamb for a few days more on feed than needed, that could be your profit margin gone."

When lambs are processed in the 'Hillside Abattoir', the RFID tag is kept with the carcase at all times so the carcase history can be fully traced, including its genetics. All tag reading is done automatically by fixed data loggers on the chain.

"Another benefit of the tags and recording the data is that we can tell our customers exactly what is going on. Everything is recorded, right down to the breeds used and the information is easily accessed."

Peter firmly believes the PSM technology will pay for itself in the long term.

"This type of individual animal management represents the future where as much information as possible can be gathered and utilised to make accurate management decisions."

Not surprisingly, Peter has also just started to RFID tag his own sheep where he runs 2700 Merino-Dohne cross ewes.

Fine tuning prime lamb performers

RFID tags have given Rod and Jenny Shaddick, 'Hillbine', Pingelly in Western Australia, an opportunity to fine-tune their prime lamb breeding and finishing program.

Not only do the tags allow the Shaddicks to easily gather weight gain data from their lambs prior to slaughter, they also help provide accurate feedback on carcase performance.

The Shaddicks first used RFID tags in 2005 on 250 lambs. In 2006 it was 2000 lambs.

"We are looking at lamb growth rate in the feedlot and carcase characteristics at the abattoir."

The RFID tags are part of an on-going collaboration between the Shaddicks, the WA Department of Agriculture & Food and Narrogin abattoir 'Hillside Meats', with whom Rod and Jenny are members of a quality assurance producer-processor alliance known as Q Lamb.

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Rod & Jenny Shaddick

Rod & Jenny Shaddick
'Hillbine' Pingelly, WA

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Rod says he is investigating RFID tags as a means of identifying the better performing lambs – on-farm and over-the-hooks – and using that information in selection of the rams used in their crossbreeding program.

"We are seeking as much information as possible on the performance of our rams due to the three-way cross we use in our lamb production," Rod says.

"In particular, we are looking at lamb growth rate in the feedlot and carcase characteristics at the abattoir."

Even though it is early days in terms of testing the RFID tags, the Shaddicks say the trial has already identified huge variation in lamb growth rates. In fact, several lambs from the 2006-drop trial were putting on as much as 900 grams per day.

"You simply would not believe that unless you had the figures in front of you," Rod says.

"But at the same time, there were also very poor performers at the other end of the scale. That means we can streamline our feeding and management of the lambs and also get some feedback on ram performance."

Rod has been able to incorporate the use of an auto-drafter with the RFID tags this year to help better supply lambs to market specifications.

"By weighing more regularly and tracking growth rates closely, we know exactly when lambs will be ready for market."

AT A GLANCE

- 'Hillbine', 17 kilometres east of Pingelly, WA
- 4000 hectares
- 2600 ewes (Merino and SAMM-cross, joined to Poll Dorset and SAMM sires)
- Member of Q Lamb alliance, lambs sold over-the-hooks
- Target weight of 19 to 21 kilograms, finished on grass, grain and pellets

"You simply would not believe that unless you had the figures in front of you."



By tracking growth rates carefully Rod Shaddick knows exactly when lambs are ready for market.

PROFILE 3

Malcolm Peake
'Bogo Merinos'
Bookham, NSW



AT A GLANCE

- 1300 hectares
- 9,000 - 10,000 Merino sheep, including 4500 breeding ewes, balance wethers
- 18.5 micron wool clip
- 6kg/head average adult wool cut
- 700mm average annual rainfall

KEY POINTS:

- Walk-over-weighing (WOW) trial gives exact data on a daily basis to use in flock management.
- WOW provides an early warning system that can deliver information not thought previously possible.
- Huge potential for improving animal performance by monitoring individual animals.
- Plans to fully integrate the system once trial is complete.



Malcolm Peake

A precise early warning system at Bogo

Precision Sheep Management (PSM) is providing 'Bogo Merinos', Bookham, New South Wales, with an early warning system for its sheep management.

Bogo manager Malcolm Peake says the use of RFID tags and walk-over-weighing (WOW) gives them 'a handle' on what's happening to the stud's sheep virtually every day in the paddock.

"Visually we could not tell the difference in weight gain, but the walk-over-weighing set the alarm bells off."

"Normally, weighing might only be monthly. So the WOW is a great early warning system that something may not be quite right," Malcolm says.

'Bogo Merinos' is taking part in an on-going Sheep CRC grazing trial that uses PSM. While the trial is yet to be completed, Malcolm says that the data from it is already being used in Bogo's flock management.

"This year we have the ram weaners trained to walk over scales when they go for watering. Twice a week I go to the scales and down load the information," Malcolm says.

"I can then accurately monitor their weight gain. This data has been very helpful already.

"In January the rams were putting on about one kilogram a week but their weight gain suddenly flattened out. Visually you could not tell the difference so some alarm bells went off.

"We did a worm monitor and that was clear, and it turned out to be a change in their supplementary feeding that was the cause."

The PSM being trialed at Bogo is part of a balanced approach to performance recording.

Malcolm says PSM is combined with wether trials and the use of Australian Sheep Breeding Values (ASBVs) to ensure Bogo sheep are performing at their best.

He adds that PSM fits well into the stud's management and that he cannot wait to implement the technology into the day-to-day running of 'Bogo Merinos'.

"The technology has huge potential, especially in data collection and management. We are using the trial data and

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Phil Graham believes Precision Sheep Management allows production information to be used for better profitability.

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even though it is still in the trial phase as it seems to work exceptionally well over the trial group.

"Once the trial is finished and we have the PSM system sorted out, the potential for improving animal performance and monitoring is huge.

"You could combine walk-over-weighing and an auto-drafting capacity to draft the lowest weight animals off and better manage them. It's the same for the other end of the scale. That is, feeding the higher performing animals better."

Malcolm says another benefit of PSM is that the information is generated electronically, which means it is a lot more accurate and much easier to handle than a manual, or paper driven system.

"A big advantage of the electronic data is that it is very easy to recall. As a consultant to the sheep industry, I am able to do more sheep and focus on the decision making, rather than stressing about recalling data from large volumes of paper.

"If I am classing manually, I need someone else there to help with the ear tag reading and data management. And then the data needs to be manually entered.

"But with the RFID tags, that is done automatically. Data is read and displayed and that increases the accuracy and speed of my classing."

And the benefits don't stop there. Malcolm says the PSM technology fits well when it comes to managing other classes of stock such as monitoring pregnant ewes.

"The accurate monitoring of ewes pre-mating, particularly in a season like this when we are feeding out a lot is vital.

"It gives us the ability to fine tune management, which is very important given the increasing variability in the seasons."

Malcolm believes this fine-tuning of management is the future of sheep breeding.

"As I see it, particularly for producers in the top 20 to 30 percent, there are no real quantum leaps to be made in genetics or the

Major financial gains on the horizon

Nobody needs to convince Phil Graham of the benefits of embracing Precision Sheep Management (PSM).

With more than 18 years experience as an extension and advisory officer, he knows there is enormous potential for PSM at both the producer and advisory level.

"Most farmers and advisers have always had access to production information but I believe that information has only been partly used," Phil says.

"Precision sheep management (PSM) means we can better utilise that information and get extra dollars from it. The industry needs these types of tools so people can quickly assess opportunities and make better decisions according to changing market needs."

For Phil, PSM is one of the few aspects of sheep management left where considerable gains can be made in a relatively short period of time.

"Data management is the key. And it's how the data is linked to other information and what we do with the information that will ultimately make a difference to the bottom line of sheep producers."

As a Livestock Officer with the NSW Department of Primary Industries at Yass, Phil is currently running a trial with walk-over-weighing (WOW) technology. The trial is to monitor the performance of young sheep.

He says that the WOW trial is providing quality information and demonstrating how practical gains can be made on farm with PSM.

"Time is becoming a limiting factor in many farming systems and handling young weaner sheep is not an easy job at the best of times," he says.

Phil Graham, Livestock Officer
NSW DPI Yass, NSW

KEY POINTS:

- To use PSM effectively, you don't have to tag every sheep on your property.
- Walk over weighing is price competitive when taking labour savings into account.

"With the walk-over-weighing system set up in a paddock, and with a bit of training, you can easily obtain important data without having to move or handle the sheep.

"It has great potential in the summer months, for example when young sheep survival is driven in a lot of cases by supplementary feeding and monitoring performance is very important.

"You can easily obtain important data without having to move or handle the sheep."

"It is not good enough to pick up a problem a couple of months too late. You may have lost five percent of the sheep's production."

Phil says that there is a capital cost involved putting in a WOW system, but he believes it is price competitive, just in terms of the labour savings.

"Especially if producers have their own weighing equipment. And you don't have to tag every animal. You can still monitor accurately with a portion of the flock."

"Major gains in the future will be achieved by managing sheep on an individual basis, not as an overall flock or mob."

grazing system. The future will be about getting the most from the individual sheep, not from managing as a flock like we do now."

Malcolm is also a fan of the associated PSM software that is available, such as Selection Assist, Wether Calculator and the On-Farm Fibre Measurement Calculator.

"I use most of the software quite a lot in setting breeding objectives. Using the data effectively is the most important thing, not just gathering it.

"A lot of Merino and commercial producers collect a lot of data and there is no point having it if you can't use it efficiently."



Malcolm Peake

PROFILE 4

Mark & Nadine Mortimer
'Devondale'
Tullamore, NSW



AT A GLANCE

- 4000 hectares (family partnership)
- Centre Plus Merino stud (est. 1981 on AMS bloodlines)
- 1200 Merino ewes
- 17.9 micron adult wool clip
- 6-7kg/head adult wool cut
- 115 percent lambing rate/ewe

KEY POINTS:

- **Classing sheep is less stressful, more time efficient and more accurate.**
- **Flexibility of auto-drafting system allows selection from around 200 criteria on which to draft.**
- **Previously three people could weigh 180 sheep per hour, now two people can do a minimum of 250 sheep per hour.**



Mark Mortimer was one of the first to trial electronic tags through the Sheep CRC program.

Record management a breeze

Mark Mortimer sees his Merino sheep as dual purpose – apart from their desirable wool characteristics, he believes his Merino ewes also make an ideal dam for a first-cross lamb.

How does he know this? He has records to prove it. And there are a lot of records.

The Mortimers have kept individual records on animals since their stud, Centre Plus, started 25 years ago. With the advent of precision sheep management (PSM) and RFID tags, the management of those records is now a whole lot easier.

"When the electronic side of things came along it was a prime opportunity to make what we do much easier," Mark says.

Mark says that the RFID tags provide the Mortimers with a vast amount of data that is used for a variety of management purposes, including matching pedigrees, recording and monitoring weaning body weights, monitoring faeces samples for worm control and fleece measurements.

All adult sheep on 'Devondale', near Tullamore, NSW, have a fleece sample measured every year for wool characteristics along with fleece weight and body weight.

Their RFID tags have been in use at 'Devondale' since 2003 and

Mark sees himself as somewhat of a pioneer, being one of the first to have trialled the tags through the Sheep CRC program.

"I was actually already thinking about it when the opportunity arose," Mark says.

"At the click of a few buttons, you can select from one of about 200 criteria and draft accordingly."

Today the Mortimers have a wireless radio frequency wand that can read RFID tags up to 800 metres from a base station. They also have an auto-drafting race with a three-way draft capability and auto-weighing ability.

Mark is currently using a computer program that takes a combination of visual and performance data to allocate specific ewes and rams for mating.

"Then we will be able to take this predetermined list and use the auto-drafter to sort the ewes into particular breeding groups.



“What used to be a real physical and mental chore is now enjoyable and highly accurate.”

Mark added that the pedigree trial worked so well, he is now looking at measuring mothering ability and possibly selecting or culling for it.

Mark says it is also very interesting looking at the time logs that reveal the sheep's behaviour such as drinking patterns.

He has no doubt that using PSM and the RFID tags has made savings in several areas of their sheep management.

“Just for body weighing, for example, we used to have three people and could do 180 animals per hour flat out. Now with the auto-drafting and weighing, we can do a minimum of 250 sheep per hour with just two people.

“Plus, the tag reading errors are virtually non-existent.”

This is how the system works when classing at ‘Devondale’. A sheep comes up the race and the classer wands it (reads the RFID tag with a wireless wand reader). Then almost instantly they have that ewe's sire and dam, every classing score and comment in its life and all its progeny and comments on those on display.

“You can make decisions with far more confidence and it is an easier job. Not being mentally exhausted from repetitive tasks like visually reading tags means you can focus on decision making and staying fresh.

“It's the same with fleece weighing. What used to be a real physical and mental chore is now enjoyable and highly accurate.”

The Mortimers also use PSM as a selling tool. Mark has written his own software and now he can wand read an animal in the race and voice software will say the performance data out loud.

“We are not necessarily getting new data, but managing it and utilising it much better.”

“The system is already very flexible. At the click of a few buttons, you can select from one of about 200 criteria and draft accordingly.

“It can draft to virtually any parameter on the database, for example, date of birth, co-efficient of variation or micron.”

The Mortimers also came up with the concept of pedigree recording with RFID tags and with the help of Sheep CRC were the first to trial the technology.

“We trialled that in 2006, and it was very successful in a small group. It was capable of matching the pedigrees in the paddock to 95 percent accuracy.”

To achieve this, ewes and lambs were ‘trained’ to walk through an auto-weighing unit. At ‘Devondale’, this was done at a watering point where a temporary fence was gradually moved to make the entry point smaller over several days.

The auto-weighing unit is run by solar power. A data logger is set up on the unit and it logs the time and date of each tag read. Mark says the data card is simply down loaded on to his computer and then he has a long list of what sheep are going where.

“From our experience, it takes about two weeks to get the 95pc accuracy. But we can already see other benefits.

“It never occurred to us before but some lambs follow their dams closely and others don't. It appears from our initial work that the lambs that follow their mother closely have a heavier weaning weight. We obviously need to research this further.”



Electronic tags provide a vast amount of data.

PROFILE 5

Rod Peart
'Manoora'
Gilgandra, NSW



AT A GLANCE

- 'Manoora', Gilgandra, NSW
- 1335 hectares
- Cropping and prime lamb production
- 1600 first-cross ewes, joined to Dorset rams
- Target carcase weight of 22 to 23 kilograms

KEY POINTS:

- Meeting market specifications is essential to profitability – precision sheep management ensures this is achievable.
- RFID tag information is combined with ram's ASBVs to ensure selection for growth and muscle is carried through to progeny.
- First RFID trial lambs (2005-drop) highlighted a six kilogram difference in bodyweight at 16 weeks of age.



Rod Peart incorporates weight gain information into decisions for breeding and ram selection.

Carcase feedback meets markets

The more feedback on prime lamb performance pre- and post-slaughter the better as far as Rod Peart is concerned – it's his secret to more accurately targeting markets and streamlining his breeding program.

"Lamb carcasses have to accurately hit specification these days, especially when you are selling direct to end users or processors," says Rod.

"RFID tags have taken targeting specifications to the next level."

Rod, who runs 1600 Merino/Border Leicester-cross ewes at 'Manoora', Gilgandra, in central NSW, tagged his 2005 and 2006-drop prime lambs with RFID devices as part of a trial with the Sheep CRC Precision Sheep Management program.

The successful trial enabled Rod to accurately and efficiently monitor the growth rate of individually identified lambs (from different sire groups selected from Australian Sheep Breeding Values (ASBVs)) and record how the lambs' carcasses performed at the abattoir.

As a seller of lambs over-the-hooks, the information generated from the use of RFID tags is invaluable according to Rod.

"The RFID tags have taken targeting market specifications to the next level."

Rod has also been able to incorporate weight gain information and carcass characteristics data back into decisions for breeding and selection of rams.

"All the information from the carcass measurements by using RFID tags is showing me how well the rams are working," Rod says.

"You just can't rely on visual appraisal of rams any more, so the RFID tag information is combined with the ram's EBVs to make sure your selection of rams for growth and muscle is carried through to the progeny."

It did not take Rod long to see the potential benefits of using RFID tags for information gathering in his prime lambs. The first lot of RFID trial lambs (2005-drop) showed a six kilogram difference in bodyweight at 16 weeks of age.

"To be able to measure that variation is excellent. I did not realise ram selection could make that much difference," Rod says.



"And being able to link that back to the breeding and ram selection is even better. It pretty much takes the same amount of time, feeding and management to run a bad lamb as a good lamb.

"It's like buying a car that has better fuel economy – we have to make sure all our 'lambs' are winners, not just half of them."

Rod says that while the RFID tag trialling is still in its early days at 'Manoora', he will be continue taking a PSM approach to sheep production over the long term.

"It's a longer-term proposition but there are long and short term gains to be made. Everybody should be doing it."

"We have to make sure all our lambs are winners, not just some of them."

Apart from the RFID tags, Rod has also been able to use an auto-drafter (on loan from the NSW Department of Primary Industries), which he says is an excellent piece of equipment.

"The auto-drafter is great for drafting and weighing. It only takes a couple of hours to do 600 lambs – we could not do that if we didn't have the auto-drafter.

"The unit is on loan but we would have no hesitation buying one as it makes weighing and drafting so much easier. Again, that means more accuracy when it comes to selling lambs."

Getting down to basics ...

For many sheep producers the mere idea of precision sheep management (PSM) is daunting. But neither the financial investment, nor computer literacy, need be huge.

In fact, for many it is a case of just adapting the record management that is already undertaken on-farm.

So what does the average sheep enterprise need to take up PSM?

First up, electronic tags and a tag reader.

An electronic ear tag contains a permanent and unique electronic identification number (EID) that cannot be changed. Each tag is made of a female part – which stores all the electronics – and a male part that may be printed with the last eight digits of the 16-digit elect EID and a choice of letters, such as a property name, and the same identification number as appears on an existing visual tag.

The tags are read by electronic tag readers: either a portable hand-held reader or a fixed panel reader that is permanently built into a race, cradle or electronic scales.

To manage electronic data, a computer is essential. A machine capable of running a Microsoft Windows 98 operating system or a later version will be sufficient for most.

Investing in computers may be as simple as using the existing farm computer for data management, although some may choose to buy a laptop computer. Consideration needs to be given to the conditions under which the computer is expected to operate.

A farm's existing electronic scales may well be able to be worked into the system immediately, but automatic drafting and fleece testing machines can all be integrated gradually. All have embedded hardware and associated software with the software provided in most cases is specific to the equipment's tasks. Data is usually collected but not managed or manipulated. Often this data is transferred to another computer to be processed and analysed or sent off farm.

More information: www.sheepcrc.org.au



PROFILE 6

Maurie Stephen
'Warrane'
Armidale, NSW



AT A GLANCE

- 25 kilometres north-west of Armidale, NSW
- 7500 hectares
- 28,000 Merino sheep, joined to Merino and prime lamb sires, 350 stud Merinos ewes
- 16.8 micron (ewe) wool clip, average 3.7kg per head
- 800mm average annual rainfall
- Selling 5000-6000 first-cross lambs per year

KEY POINTS:

- Genetic performance of commercial flock is now matching that of the stud flock a few years ago.
- 'Warrane's' highest ranked stud sire in 1998 would not make the flock now.
- All stud and flock ewes are run as one mob from weaning, so there is no environmental difference.
- Significant genetic gain has been achieved with an investment of less than one dollar per head, plus the tag cost.



Maurie Stephen

Fast-tracking 'commercial' gain

Stud sheep breeders are missing out if they are not using electronic precision sheep management (PSM), according to NSW sheep and wool producer Maurie Stephen.

Maurie says the use of PSM such as RFID tags, software and auto-drafting have saved him and his family countless hours in the yards classing as well as allowed him to make invaluable gains in his commercial and stud sheep flocks.

"We use RFID tags for monitoring and recording at classing, shearing and weaning and they are a huge improvement on the old visual/manual method. They have been an absolute boon for our sheep, especially the nucleus flock," Maurie says.

"With the old visual method, we had up to 15 percent tag reading errors but with the RFID tags, there might be three tags in two to three thousand that are faulty so there is a vast improvement in reliability and accuracy."

The improvement in the accuracy of the information has enabled the Stephen's sheep, especially the stud, to go ahead in leaps and bounds.

Maurie says 'Warrane's' highest ranked stud sire from 1998 would not even make the flock now and that's been the case for three years.

"Now the commercial flock is approaching what the nucleus stud used to be only a few years ago, which is very pleasing," he says.

"And that is all down to our selection and use of PSM. We know it's the data because from the day they are weaned, all the stud and flock ewes are run as one mob, so there is no environmental difference.

"We use RFID tags for monitoring and recording at classing, shearing and weaning - they have been an absolute boon for our sheep, especially the nucleus flock."

"It's a huge result and knowing the variation in parameters and being able to index sheep has made a real difference."

While the Stephens are no strangers to individual sheep management (they have been identifying and recording animals



“With the use of PSM our commercial flock is approaching what the nucleus/stud used to be only a few years ago and that is very pleasing.”

At the end of the shearing, all the labels from a bin are electronically read and from that, the Stephens can generate a style index.

“It’s completely unbiased as all the classer is handling is the bar code. Then we can match sire lines and pedigrees in the stud on that information.”

The top 200 ewes from this index are allocated a colour and those sheep will be joined to other elite Merino rams for the stud.

The Merino replacements (non-stud) are allocated another colour and the balance of the ewes are either mated to Border Leicester rams or culled.

That makes four colour groups. In the yards at classing, this means as a sheep comes up the race, its tag is automatically read, the colour is displayed on a monitor and then it can be drafted accordingly.

This year Maurie will be drafting those sheep according to their colours via an auto-drafter (that he purchased in 2006) and he knows there are further savings to be made.

“The drafting according to colour groups used to take three days to do 3600 ewes and that was hand-reading tags and looking them up in the database.

“We could only fit the information for 30 ewes to a page so you can imagine it was very cumbersome and tiring. And if there was a printing error, there was a lot of wastage.

“But now with the RFID tags, wand reader and auto-drafter, that will be done in an afternoon and with virtually no errors. It’s a very workable system plus we drench the sheep at the same time.”

Maurie has no doubts the move to PSM is a very worthwhile exercise and should be accessible to most studs.

“Most farmers have a computer or laptop and most farms now have wand scanners for cattle under the National Livestock Identification System. We recycle our RFID tags, so there are further savings there.

“We also bought a very good quality barcode printer that has proved invaluable.”

Overall, Maurie estimates he has spent less than a dollar per head on PSM equipment plus the cost of tags.

“And now we have the system in place, we will be able to take advantage of it for many years to come.

“Plus there are other areas we are yet to explore, such as pedigree management. I can see huge potential there as we spend a great deal of time mothering and identifying dams and lambs.”

since 1986) the use of electronic tags was instigated when they first became available in 2002.

Now virtually every ewe on the property and all the animals in the stud have an RFID tag. In some cases the tag will be read six times a year in an effort to obtain as much quality information as possible on the sheep.

For example, the tag will be read at weaning, joining, scanning, lamb marking and at one year of age to generate live weight data. Hoggets also have a micron test and that is recorded via the RFID tag.

If a sheep is still 'in the system' at two years of age a fleece weight is taken and second micron measurement is recorded, again with the aid of RFID tags.

In the shed, the Stephens use an Allflex wand (tag reader) and a barcode printer. The barcode printer can print duplicate tag labels. At shearing, one label goes to the classer and the other goes in a bag with the mid-side sample of wool from the fleece.

The data from the mid-side sample is combined with the Sheep CRC's on-farm fibre measurement (OFFM) software.

The RFID tags also play an important role in 'Warrane's' wool style selection, which Maurie says is vital to their success.

At shearing there are several style bins in the shed and after the fleece has been classed according to style, the classer places the bar code label from that fleece in the appropriate style bin.

PROFILE 7

Tony Thompson
*'Prattenville
Irrigation'*
Bourke, NSW



AT A GLANCE

- 6,070 hectares across three properties in the Bourke/Brewarrina region, NSW
- Average annual rainfall: Bourke 355mm; Brewarrina 412mm

KEY POINTS:

- **Walk-over-weighing is being used to maximise returns from available feed.**
- **RFID tags identified a 500 percent variance in weight gain, initiated tailored management strategies.**
- **Marketing benefits by being able to target much tighter specifications.**



Tony Thompson is fine tuning the PSM system on his three properties.

Individual touch despite numbers

Bourke-based livestock trader Tony Thompson is a big fan of farming by numbers.

Having been in the sheep game since 2001, and with a background in the cotton industry, he knows the value of objective data when it comes to farm management.

"In my cotton production, virtually all decisions are driven by objective measurements and threshold figures that trigger management actions," Tony says.

"There is absolutely no doubt that the technology will pay for itself."

"When we started sheep farming at Bourke in 2001, we thought it should be no different for running livestock."

With that outlook, Tony approached the Sheep CRC and its Precision Sheep Management (PSM) Program. He started trialling RFID tags and walk-over-weighing (WOW) in 2004.

Today he has 2500 sheep RFID tagged and he is fine tuning the PSM system on his three properties, 'Prattenville Irrigation', 'The Angle' and 'Wirricanna'.

"Precision sheep management plays a role in the running the farm today and we would like it to soon be a part of everyday operations.

"Unfortunately one of the worst dry spells in history has somewhat hamstrung our ability to fully embrace PSM," Tony says.

"We are only trading stock at the moment based on the small pockets of feed available."

For the time being, Tony is using RFID tags, automatic data loggers and WOW applications. The remote data loggers are set up on two properties with the capability to record and draft.

The WOW set up includes a set of scales in a curved race with an autodrafter (two way draft) that was developed in conjunction with Prattley (the manufacturer of the auto drafter).

Tony says the drafting system is a work in progress and continually being refined. It uses a combination of electric and pneumatic power, run from solar panels.

Every sheep that comes onto the property is RFID tagged, weighed and fat scored. Tony then sets threshold targets for each animal at certain times throughout the year.



“By using PSM, in one mob we found that the top third was putting on 330 grams per day while the bottom third was putting on just seven grams per day.”

Tony believes PSM will also be great for sheep breeding. “With PSM you can look very closely at ewe performance and progeny performance.

“It allows you to make much quicker gains in selection and by being able to index the breeding flock, benchmarking and managing accordingly.”

Tony says the PSM will also flow into marketing benefits by being able to target much tighter specifications.

“By continually reviewing animals and drafting animals that need assistance onto supplements, we will be able to ensure they all meet weight targets. That should mean extra value for processors and extra dollars for us.”



Every sheep in the operation is RFID tagged.

WOW data is collected and compared to threshold targets. The data is collected remotely as the Thompsons have the telemetry set up to access the information 140 kilometres away in the office.

Sheep that are on target for body weight are left alone, while the animals that are not are identified as either financially viable to stay on the property or they are culled.

Tony says he implemented that WOW management strategy in 2004 to maximise the returns from the available feed.

But when the big dry spell breaks, Tony knows the PSM technology will be ready to go.

“There is absolutely no doubt that the PSM technology will pay for itself.”

And he has some good figures to back that statement up. Two years ago he collected a lot of data using the RFID tags that looked specifically at the variation in body weight gains in his sheep.

“We found up to 500 percent difference just in body weights gains. We did that on six mobs of sheep (11,000 animals) and it was a similar trend for each mob,” Tony says.

“Those animals were on the farm to be finished and sold – by using PSM we found that with one mob the top third was putting on 330 grams per day while the bottom third was putting on just seven grams per day.

“So you can see that gains that can be made just by knowing the variance and being able to identify the animals you will potentially lose money on.”

PROFILE 8

Stuart & Ba Mitchell
'Cashel Vale'
Bollon, QLD



AT A GLANCE

- 15,000 hectares
- 10,000 Merino sheep and 400 cows
- Join 5000 ewes per year, AI 800 ewes
- Member of Queensland Central Test Sire Evaluation
- 450mm average annual rainfall
- 20.5 micron adult clip
- 5kg wool cut (ewes), 7.5kg wool cut (dry sheep)

KEY POINTS:

- **Huge gains are being made in sheep breeding through objective rather than subjective selection.**
- **A two-tooth ewe that cuts a 15 micron fleece of six kilograms no longer gets lost in the averages.**
- **Up front cost of RFID tags is worthwhile as they are fully retrievable, re-programmable and reusable for two generations of sheep.**



Stuart Mitchell debates the benefits of PSM with the other producers.

No passengers on 'Cashel Vale'

A self-confessed performance recording fanatic, Stuart Mitchell has embraced precision sheep management (PSM) to get the most out of his 10,000 Merinos at Bollon, Queensland.

At Stuart and wife Ba's property, 'Cashel Vale', 3000 Merino ewes have RFID tags and there isn't much the Mitchells don't know about their performance.

"We utilise precision sheep management to record a vast amount of information on the sheep such as pregnancy rates, fleece data and pedigrees," Stuart says.

"It has enabled us to make quantum leaps by streamlining the sheep breeding and being able to manipulate selection by objective means, not subjective.

"In the past, a two-tooth ewe that cut a 15 micron fleece of six kilograms was being lost in the averages. Now we can identify them and focus on them.

"And it gives us a chance to do some corrective mating. So if a sheep is a light cutter, but otherwise excellent for other parameters, we can choose the right rams to correct that."

Stuart was first introduced to PSM when it started being used as part of the Queensland Central Test Sire Evaluation project – a progeny trial that his ewes were involved in.

"We saw the benefits of PSM in data collection straight away. Prior to the RFID tags, our sheep had any number of ear tags and I was the only one that really understood what they meant.

"It has enabled us to make quantum leaps by streamlining the sheep breeding, with selection based on objective means, not subjective."

"Data management and recovery was very cumbersome and at times, grounds for divorce," Stuart says.

But not any more – today 'Cashel Vale' uses the RFID tags, wand readers, data loggers and auto-drafting.



“By managing our flock as individuals not as a mob, we know the ones that are most productive and give us the most return.”

Those ewes that don't make the cut are classed into micron and fleece weight groups and correctly mated to achieve the operation's aim of reducing fibre diameter to 19 micron.

The Mitchells use OFDA2000 in the shed or yard and read the ear tags remotely by wireless connection, automatically selecting the tag number and capturing data including fleece weight to automatically index the sheep.

They also use a laptop computer in the yard or shed to collate information from both the ear tags and OFDA2000.

“By managing our flock as individuals not as a mob, we know the ones that are most productive, and the ones that are going to give us the most return,” Stuart says.

“For example, before OFFM, a ewe with 15.3 micron fleece worth well over \$100 was getting lost within the \$25 fleeces.

“So now that we treat our flock as individuals, we're able to do corrective mating.”

The Mitchells use the RFID ear tags to draft sheep according to specific commercial characteristics, such as premium-value fleece lines as identified by Virtual Classer software; or identify breeding lines to match ewes to specific sires.



Stuart Mitchell says the data is handled easily.

Stuart and Ba also have their own OFDA2000 fleece testing machine as part of their on-farm fibre measurement breeding and selection program.

This means a lot of data is generated, but it is easily handled with the electronics and software, according to Stuart.

“Once the data is captured, we can sort or draft from that information. We simply set up the drafting parameters in the office, download them into the XR3000, which is like a palm pilot, and then take that with us to the yards. It's very simple.

“Electronic ear tags are the second greatest thing that's happened for us after OFFM. Using ear tags, has saved us a lot on labour and time.

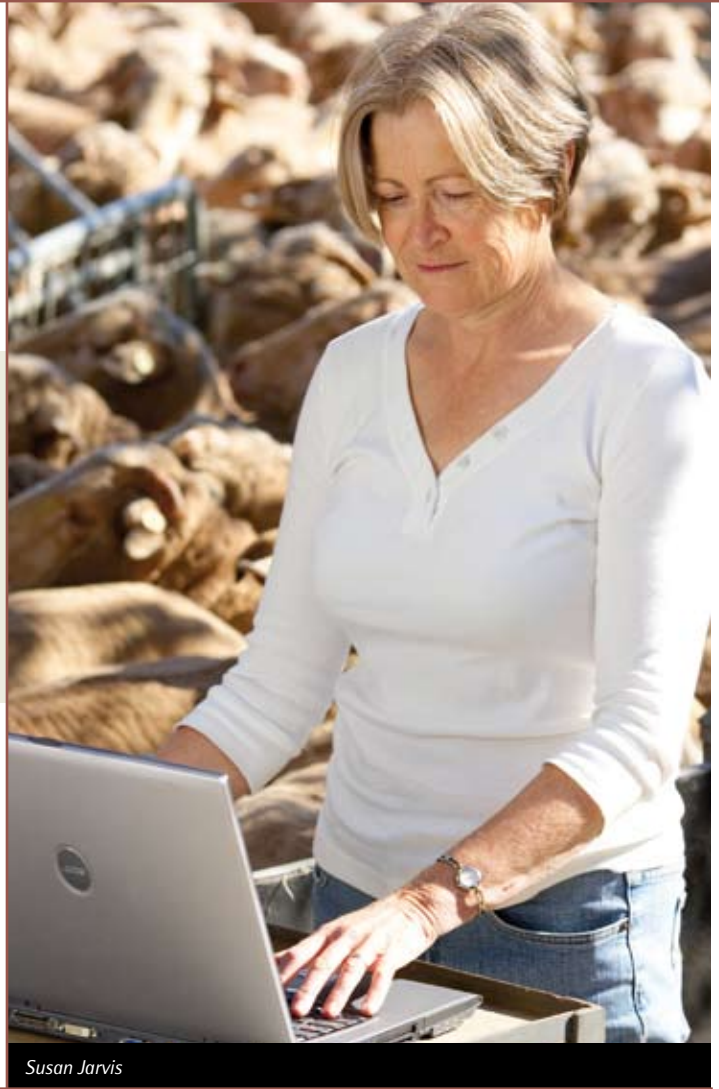
“We've streamlined on-farm fibre testing and achieved greater accuracy,” he says.

The upfront cost of the tags is well worth the investment, according to Stuart, as they are fully retrievable, re-programmable and reusable for two generations of sheep.

All breeding sheep are fleece-tested prior to visual classing. Elite ewes are selected both visually and on objective measurement (finer than 20 micron and average fleece weights greater than 4.8kg) and entered into the artificial insemination program.

PROFILE 9

Susan & Hugh Jarvis
'Merinotech'
Gatum, VIC



Susan Jarvis

AT A GLANCE

- Location: 45 kilometres north-west of Hamilton
- 7000 Merino and White Suffolk sheep
- Consultant (geneticist) to the sheep industry
- 650mm average annual rainfall
- 18 micron adult wool clip
- Wool production target of 60kg/ha (18 micron)

KEY POINTS:

- **Electronic tags make classing and recording easy, and provide savings in accuracy and reduced labour.**
- **The cost per unit of correct data with RFID tags is \$0.20 compared to \$1.06 without.**
- **Data collection has virtually no errors.**

Saving time and labour without error

Sue Jarvis sleeps a little easier these days when it comes to handling the vast amounts of data generated from an on-going Sire Evaluation Trial in Victoria's Western District.

The key to her more relaxed approach is the use of RFID tags.

"The RFID tags have made the trial's data management a piece of cake compared to what it used to be," Sue says.

"The RFID tags have delivered time and labour savings and accuracy – in fact, the error level is virtually zero."

"Before RFID tags, the data handling and collection was a great deal of work with long stressful hours of maximum concentration. With the RFID tags, it is enjoyable and almost relaxing."

The Sire Evaluation Trial involves progeny testing rams on different commercial ewes (and properties) each year. This generates a great deal of information and data which must be handled correctly, Sue says.

"It has to be pretty much spot on."

And Sue should know. Apart from running 7,000 sheep as part of her and husband Hugh's Merino stud and commercial flock, Sue is a trained geneticist and consultant to the sheep industry.

The RFID tags were first used in the Sire Evaluation Trial's 2004-drop weaners. Sue said it did not take long to see the benefits.

"The RFID tags made a big difference in time and labour savings and accuracy," Sue said.

"The data is 99 percent accurate and it's the cheaper cost of the getting the data that makes a real impact."

Before using the RFID tags, Sue says collecting weaning weights involved one person reading the ear tags at the scales, one person operating the scales and a third pushing up the sheep.

"So it would take three people about four-and-a-half-hours to do 600 sheep that way. With the RFID tags, we only need two people but it's done in a third of the time.

"And more importantly, the data is accurate. In fact, the error level is virtually zero."

The RFID tags are also used to help manage the trial sheep's wool data. Prior to shearing the trial sheep are mid-side sampled, usually in a VE machine.

“The members of our Sire Evaluation Management Committee are keener to use it now – they can see that it works and they have technical support available if they need it.”

A bar code label that corresponds to the sheep's RFID tag is printed and the label is sent with the mid-side sample to the wool tester. Individual visual classing is done then, with the sheep moving from the VE machine into a classing crate.

“It’s the same at shearing,” Sue says.

“A bar code and label are printed and combined with fleece weight information then all the files are merged with the RFID tag number as a common thread.

“It has made data management a piece of cake compared to what it used to be.”

Sue is looking forward to implementing similar technology in her own sheep.

“I love the RFID tags and the precision sheep management. It’s brilliant. I will be using RFID tags on our sheep at home as soon as the drought is over. Unfortunately it is dictating economics at the moment.”

Sue added that local stud breeders can now see the merit in precision sheep management, using RFID tags.

“Most of the members of our Sire Evaluation Management Committee are more interested in using RFID tags now for data collection in their own breeding programs.

“They can see how well the system works and they have technical support available if they need it.”



Accuracy is improved with tagged sheep.

Another word on the financial benefits ...

While there are many opportunities for producers to use precision sheep measurement to improve profit, the benefits are incremental and rely on re-using information on multiple occasions. Therefore to extract highest returns, the cumulative benefits from several potential changes should be considered.

Sheep CRC has used models to look at the financial benefits of adopting precision production strategies in four production systems – specialist fine wool, dual purpose wool and meat, pastoral and specialist lamb.

The benefits come from flock structure optimisation, selection, live weight monitoring, reproductive management and better meeting market specifications. Realistic costs for capital and measurement have been included and the expected outcomes over the next 10 to 15 years are shown below:

Adoption level			
Fine	Dual Purpose	Pastoral	Lamb
34%	16%	13%	16%

Annual profit/business			
Fine	Dual Purpose	Pastoral	Lamb
\$10,500	\$7,500	\$5,000	\$6,000

Industry profit/annual			
Fine	Dual Purpose	Pastoral	Lamb
\$38 million	\$22 million	\$2 million	\$20 million

The projected profits per adopting business are high even though there are costs involved. The level of investment will limit the overall adoption rate, but for those adopting this technology the pay-off is substantial.

Equally, the benefit to the whole industry (over \$80 million per year in the long-term) is attractive financially as well as producing better products from improved animal management systems.

- Dr Kevin Atkins

PROFILE 10

'Croxdale Research Farm'

Charleville, QLD



AT A GLANCE

- 4500 hectares
- 600 Merino ewes
- Selection trial using precision sheep management

KEY POINTS:

- Commercial PSM trial results in labour savings and rapid genetic gain.
- Average hogget fibre diameter reduced by 0.19 micron, hogget fleece weight increased by 0.99kg and hogget bodyweight increased by 7.21kg.
- Breeding gains translate to an extra \$7 per head in wool, and an extra \$10 per head in carcase value.



Guy Newell says using PSM achieved a \$10 premium per head on its wether flock.

Genetic gains convert to cash

The Department of Primary Industries and Fisheries' 'Croxdale Research Station' at Charleville has demonstrated considerable dollar per head gains can be made using precision sheep management (PSM).

'Croxdale' used PSM on a flock of 600 Merino ewes as part of an on-going commercial trial and Charleville Sheep and Wool Extension Officer, Guy Newell, says that not only have substantial labour savings been achieved, it has sped up the ability to meet breeding objectives.

"Precision sheep management makes selection decisions more accurate and increases the speed with which you can advance the productivity of your flock," Guy says.

The breeding objective of the trial was to place some downward pressure on fibre diameter, increase fleece weight and increase body weight.

A selection index of an eight percent micron premium plus bodyweight was chosen as a strategy to select breeding ewes at hogget age from future progeny.

At 'Croxdale', 600 Merino ewes have RFID tags. The PSM trial involved technologies such as automatic fleece weighing,

electronic RFID tags, tag readers and automatic drafting equipment for automating data collection and storage.

Guy says the PSM work reduced tag reading and recording errors to nil when using a wand reader, whereas the manual tag reading errors were previously between five and 15pc.

"With an auto-drafter we were able to achieve weighing and drafting speeds that doubled that of manual weighing and drafting."

And by using PSM procedures and a selection index to select ewe hoggets over two years of breeding, the average hogget fibre diameter of the flock reduced by 0.19 micron, hogget fleece weight was increased by 0.99kg and hogget average body weight was increased by 7.21kg.

Guy says that some of this effect would be environmental due to below average rainfall for 'Croxdale' in 2003, above average in 2004 and below in 2005 and 2006.



“We had zero tag reading and recording errors when using a wand reader, compared manual tag reading errors of five and 15 percent.”

“The auto-drafter also proved valuable when conducting some other flock management tasks on ‘Croxdale’ like marketing surplus wethers and selling our cast-for-age ewes.

“The drafter was quickly able to draft off the heaviest half of our wether flock for sale, which enabled us to achieve a \$10 per head premium on these animals.”

The ‘Croxdale’ PSM trial was run in conjunction with the Sheep CRC’s On-Farm Implementation Trial within the Precision Sheep Production Program.

At February 2007 prices, those breeding gains translate to an extra \$7 per head in wool value (calculated using woolcheque.com.au), and an extra \$10 per head in carcase value (calculated using Queensland light lamb indicator).

And in terms of labour saving, using PSM technologies on the ‘Croxdale’ sheep revealed:

- Tagging and wool sampling: two people instead of three;
- Fleece weighing: one person instead of two (up to four shearers on the board);
- Body weighing: one person, with two/three people still required for good sheep flow; and
- Classing: two people instead of three.

Guy says this represents a saving of \$150 to \$250 per day for these activities depending on whether casual or permanent staff is used.

He added that another benefit of using PSM was increasing the speed of some of the data recording tasks such as drafting.

“The auto-drafter used in the trial was able to achieve weighing and drafting speeds of around 300 sheep per hour, which is double that of manual weighing and drafting,” Guy says.



Using PSM has reduced fibre diameter.

PROFILE 11

'Collinsville Merino Stud'

Mt Bryan, SA



The accuracy and speed of PSM has been a benefit at Collinsville.

AT A GLANCE

- 3000 elite stud ewes and 10,000 stud ewes
- 21-22 micron clip
- Average production of 700 bales

KEY POINTS:

- **Adoption of PSM means historic data can be incorporated and used more efficiently.**
- **Accurate data used as a marketing tool in the stud sheep business.**
- **Investment in electronic tags has paid its way at Collinsville.**

The old and new click at 'Collinsville'

The Collinsville Merino stud at Mt Bryan in South Australia's Mid North is steeped in more than 100 years of sheep breeding.

With such a history comes a vast amount of breeding information – but a somewhat new approach to management means the volumes of stud data can be utilised much more efficiently than in the past.

"By using RFID tags, we can now bring all a sheep's breeding and production information on site to where we are classing."

The new approach is the use of precision sheep management (PSM) and RFID tags that allow Collinsville to readily access its records accurately and quickly according to manager Peter Whittlesea.

"By using RFID tags, we can now bring all a sheep's breeding and production information on site to where we are classing," Peter says.

"For example, an animal will come up the race in the yards or shed to be classed, its tag is scanned and instantly we have all its information presented on a laptop or PDA screen.

"We can see the pedigree, fleece data and the entire production history of the ewe including what sire it was mated to the year before and how its lamb has performed. We also have pregnancy scanning results included in the data.

"We simply would not be doing that if it was to be done manually."

More than 2000 of Collinsville's 3000 elite stud ewes now have RFID tags.

All the data that Collinsville collects with the aid of RFID tags is fed back into a software package called Woolpack and then combined with the stud's breeding and pedigree information.

Peter said that is one of the best aspects of the RFID tags and PSM.

"The accuracy of the data is a big plus. In the stud industry, traditionally the data gathering was very awkward.

There was visual reading of tags, yelling out numbers, writing information down and paper shuffling. Now all that is removed.

"It has taken us three years to refine the system and there were times when it was quite frustrating. But now it is up and running, I would say the RFID tags have definitely paid for themselves."

Peter says Collinsville has also utilised the PSM technology as a selling tool to generate buyer confidence.

"It's quite impressive, especially when clients come to inspect rams and ewes. We just read the sheep's RFID tag with the wand reader and all the relevant information from that animal is presented quickly and professionally."



Michelle and Paul Cousins

Peter can also see potential in the RFID tags' ability to enhance the accuracy of mothering up of ewes and lambs.

"We mother up about 1000 lambs or so per year, so the accurate management of pedigree information is vital.

The RFID tags have sped up our mothering up process a great deal. They make selection much easier and you can easily group like animals according to the data.

"We are also looking at its applications for lot-feeding and we be trialling that soon to see if it's economical."



Peter Whittlesea

"The accuracy of the data is a big plus. The RFID tags have also sped up our mothering up process a great deal."

Data collection made easy with RFID tags

As consultants to the Merino industry, Michelle and Paul Cousins are constantly looking for ways to improve their business, Cousins Merino Service based at Burra in South Australia.

That's why they jumped at the chance to start using RFID tags in 2004.

Michelle says that she could see potential time and cost savings in terms of data collection and collation (management) with the advent of the electronic tags.

"Dealing with large amounts of data in its raw form can be very time consuming and when it came to reading tags visually, the error rate could be quite high," Michelle says.

"You could have up to five different people reading tags which meant five chances for errors. There was also an issue with reading or interpreting hand writing which again was a potential source of error."

But gone are those days for Michelle and Paul thanks to RFID tags that mean identification of sheep records is virtually error proof and the handling of the data is much less stressful.

Continued next page

AT A GLANCE

- Service provider to the sheep industry
- Services include classing, pregnancy scanning, fat and eye muscle scanning, OFDA 2000 (on-farm fibre measurement), electronic identification and data management

KEY POINTS:

- **Precision sheep management delivers time and cost savings to data collection and collation.**
- **Technical support is easily accessible.**
- **Managing sheep records using electronic identification is virtually error proof.**
- **Auto-drafting reduces stress on animals and requires less labour.**



Paul Cousins uses a variety of software.

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The Cousins can provide Merino breeders with RFID tags as part of their consultancy service or just handle the client's data management. They can also provide a complete precision sheep management (PSM) service, right down to auto-drafting.

"In most cases, the ability to recall the data is just as important as being able to efficiently gather it," Michelle says.

The Cousins utilise a variety of software such as Microsoft Excel (a spreadsheet program), Woolpack and IWG+ computer programming.

"We try and fit in with how comfortable the client is with technology."

Whatever the case, Michelle says that as her clients have become more comfortable with electronic data management, many are making significant gains in their flock performance, not to mention labour and time savings.

"At the very least, by using RFID tags and identifying the most and least productive animals, you can be confident in breeding and selection decisions, not just relying on visual appraisal methods," Michelle says.

"The labour saving benefits of auto-drafting are also significant. One client has reported that drafting used to take four people two days – it can now be done with two people in three hours.

"Auto-drafting is also less stressful on animals, decreasing handling with no error rates," she said.

Michelle and Paul have a number of wand readers (used to electronically read the RFID tags), bar code scanners and printers as well as a three-way auto-drafter.

Michelle says the auto-drafter (like the other PSM equipment) is very portable and fits well with their data management capabilities.

"We can easily collect sheep data such as body weights and fleece information, generate ram indexes from that and then auto-draft individual animals based on the figures."

"Software is much more user-friendly – plus there is technical support available."

Michelle says that while the uptake of RFID tags and PSM was at first a little slow, it is becoming more and more popular.

"As with any new technology there were some sceptics and it was rather costly given the depressed nature of the wool market.

"But more and more people are now using it, especially as the costs of the tags and software are coming down and the benefits can clearly be seen.

"Software is much more user-friendly – plus there is technical support available."

Glossary of Terms

RFID tags

Radio Frequency Identification tags (RFID) contain a permanent and unique identification number. The number can not be changed.

RFID ear tags are made of a male and female button. The male part of the tag contains none of the electronics. The female part has an antenna and a transponder. When it receives a signal from a tag reader it activates the transponder, which in turn transmits the animal's unique identification number to the reader.

The tag reader can be fixed (for example on a set of scales) or portable such as a 'wand' or 'stick' reader that is waved over the tag when the sheep is in the race.

RFID tags can be reused and each tag is designed to be for the life of an animal.

Electronic tags reduce the risk of human error in reading tag numbers and as with most electronic equipment it needs to be set up right the first time, just like the VCR, DVD and stereo equipment.

Tag readers

There are two types of electronic tag readers: portable hand-held readers and fixed readers. Hand-held readers come in various shapes and sizes and provide true portability to read and obtain an electronic identification number. Panel readers can be permanently built into a race, cradle or electronic scales.

Automatic drafting machines

Automatic drafting machines linked with electronic tags provide substantial labour savings for producers. As sheep enter the drafter their tag is read and the animal is drafted based on a field which may include one or more criteria.

Automatic drafters are available "off the shelf" from commercial suppliers.

Barcode printers

Barcode printers are beneficial for processes when the animal ID is needed after the animal is no longer penned (eg. collecting fleece weights during shearing). The printer can be attached to a wand or 'stick' tag reader and print out a barcode of the scanned individual ID. This barcode can be kept with the sample (eg. fleece) until it is scanned into a computer via a barcode scanner.

Computer hardware

To manage electronic data you need to have a computer. A machine capable of running a Microsoft Windows 98 operating system or a later version will be sufficient for most on-farm data management programs.

Some data management programs have the facility to connect to electronic scales, automatic drafters and fleece testing machines. The software provided in most cases is specific to the equipment's tasks. Data is usually collected but not managed or manipulated. Often this data is transferred to another computer to be processed and analysed or sent off farm.

Your computer may be as simple as an existing desktop computer in your office. Or, you may decide to purchase a laptop computer for the yards and shed such as a military standard Tough Book, which is designed for dusty, wet and extreme conditions.

Your choice of a laptop versus a desktop computer is related to when and where the software will be used and consolidated. For example, if you unload data from electronic scales and drafting machines at the end of the working day and no real time number crunching is required, then a desktop computer in the office may be best.

The portability of a laptop is its key feature, however battery life is limited and they don't cope with the elements, especially dirt and water. There is also another option of using a hand-held portable computer that can be used in the paddock and yards.



Each RFID tag contains a permanent and unique electronic identification number.



For more information

The primary source of information on Precision Sheep Management is via the Sheep CRC website: www.sheepcrc.org.au

This site has many links to industry and staff contacts, from suppliers to specialist manufacturers. Look for the link to "E-sheep" as a starting point.

Other direct points of contact are:

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The Sheep CRC is a joint venture between Australia's leading sheep research, education and industry organisations that was established in 2002 under the Australian Government's Cooperative Research Centres Program. The Sheep CRC promotes collaborative scientific research and education at the wool and meat interfaces to ensure the Australian sheep industry has the technology and know-how to deliver, in a profitable and sustainable manner, products highly desired by domestic and export customers.

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