Precision Sheep Management

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How precision pays

The Sheep CRC has a vision for integrated sheep production systems based on measurement, management and marketing of animals according to their individual merit. It is combining new and existing technologies that enable change from the current practice of managing 'the flock' to managing individual animals or selected groups of animals.

These technologies, and the decisions they inform, make up what is known as *Precision Sheep Management*.

Modelling shows that adoption of precision sheep management will deliver significant profit increases to Australian sheep producers and industry over the next 10 to 15 years:

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

Industry profit/annum			
Fine wool	Dual Purpose	Pastoral	Lamb
$38 million	$22 million	$2 million	$20 million

SOURCE: Sheep CRC

Tony Thompson,
'Prattenville', Bourke, NSW

Lamb breeder and finisher trialling walk-over-weighing and auto-drafting.

"By using precision sheep management 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."

The simple facts

- Precision sheep management tools are more time and labour efficient and accurate than traditional flock management options.
- RFID ear tags are fully retrievable and reusable, so the upfront cost can be spread over a number of generations.
- Large volumes of performance data can be easily handled and re-used in multiple facets of livestock management.
- Historic data can be incorporated and used more efficiently.
- Individual animal information can be collected and tailored to meet specific needs.
- Accurate monitoring of individual animals allows identification of the best and worst performers.
- Precision sheep management tools can ensure lamb and wool market specifications are met.

Latest applications

- Walk-over weighing systems that remotely capture an animal's identity and weight without the need for mustering.
- Remote drafting on multiple criteria that allows animals to be separated for supplementary feeding, later treatment or slaughter, without being mustered.
- Link abattoir carcase feedback with on-farm data on individual animals and bloodlines.
- Walk-over technology that enables lambs to be accurately linked to their dams without having to conduct labour intensive and potentially inaccurate mothering-up.

Find out more

Visit the Sheep CRC website: www.sheepcrc.org.au

This site has links to industry and staff contacts, from suppliers and specialist manufacturers, to those working with PSM in the field.

Sheep CRC staff have been instrumental in identifying, evaluating and communicating to industry information on software, hardware and service providers for precision sheep production, as well as providing service support for contractors and consultants.

Specialist advisors and commercial service providers are being trained by the Sheep CRC through its MasterClass program in 2007-08.

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Introduction

Precision Sheep Management

Increasing on-farm profitability by measuring, managing and marketing sheep on individual merit.

Identify animals that make most money

Sheepmeat and wool producers have an enormous opportunity to achieve major gains in productivity and profitability because of the measurable variation within each and every flock (see Table 1).

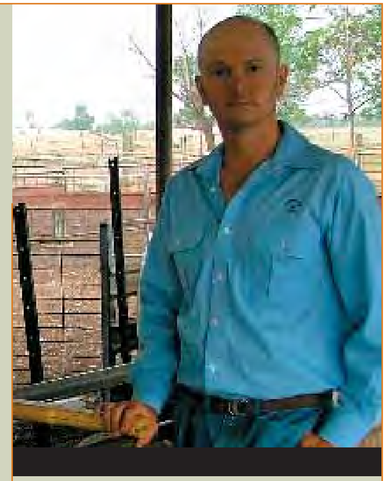
The large differences that exist between the best and worst performing animals in fleece weight, fibre diameter, growth rate and reproduction can mean significant differences in dollar value.

Precision sheep management enables the capture and use of individual animal records in selection, management and marketing strategies to identify the top 25 percent of the flock and minimise the costs of the bottom 25pc thus increasing overall farm profitability.

Table 1. Variability within a flock of Merino sheep.

Trait	Production level of flock		
	Average	Top 25%	Bottom 25%
Wool traits			
Fleece weight (kg)	4.6	5.3	3.9
Fibre diameter (µm)	20.4	18.9	21.9
Staple strength (N/ktex)	35	42	28
Meat traits			
Growth rate (g/day)	284	357	200
Fat depth (mm)	10.6	8.9	12.5
Reproduction			
Lambs weaned per ewe joined	0.86	1.43	0.2
Profitability traits			
Fleece value per ewe ($)	$54	$82	$37
Carcase value per ewe ($)	$33	$56	$12

SOURCE: Sheep CRC



Mark Mortimer,
'Devondale', Tullamore, NSW

Stud Merino breeder using RFID tags and automatic weighing and drafting systems.

"Just for body weighing, for example, we used to have three people and could do 180 animals per hour flat out. Now with precision sheep management auto-drafting and weighing, we can run a minimum of 250 sheep per hour with just two people. Plus, the tag reading errors are virtually non-existent."

Accurate data

Precision sheep management measurement tools complement traditional management tools.

For example, On-Farm Fibre Measurement has proven invaluable for many specialist wool enterprises, while body weight and fat cover information can be used by lamb and sheepmeat producers. New Software programs can also integrate and manage wool and carcase data in a dual-purpose Merino production system.

In all enterprises, gathering accurate data gives an opportunity for selection on individual merit and allows for grazing management, reproductive management and nutrition according to potential, and selling strategies that better meet market specifications.

Accurate data on individual animals is best captured through the practical application of electronic ear tags or radio frequency identification devices (RFID). The high labour cost required to read and record animals with visual tags can be significantly reduced by using RFID tags.

RFID tags are re-useable

Flexible options

Simple technology is available to all sectors of the wool and sheepmeat industry. It can vary from a simple system that identifies a mob through to the individual identification, measurement, treatment and marketing of animals within the flock.

On-Farm Fibre Measurement (OFFM) is just one example. Here it has been used in four different selection scenarios – ranging from minimal measurement to a permanent identification system – to calculate profit (per breeding ewe)under market values for 2002-2007.

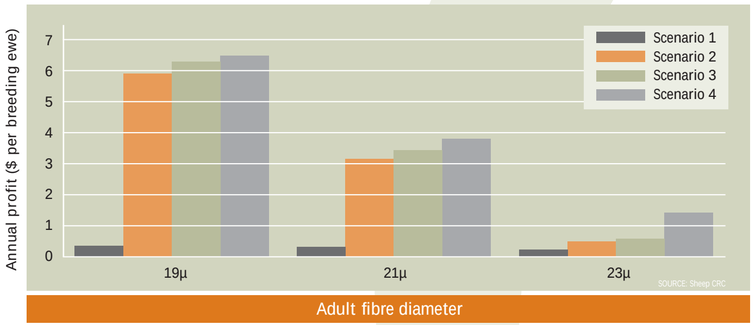
The graph below shows the relative value of fibre measurement and a base-line assessment of the profits that can result from changing identification systems.

Scenario 1: In-shed fibre diameter measurement without individual identification. Benefit from current clip preparation only.

Scenario 2: Pre-shearing fibre diameter measurement and real-time selection without individual identification. Benefit from current clip preparation and subsequent sheep selection using OFFM data.

Scenario 3: Colour ear tag identification in accordance with OFFM. Benefits from current clip preparation, future clip preparation and subsequent sheep selection based largely on OFFM data.

Scenario 4: Permanent RFID ear tag. Maximum benefits from current clip preparation, future clip preparation and optimal selection on OFFM data and other and other measured traits.



Peter Trefort,
Hillside Meats, Narrogin, WA

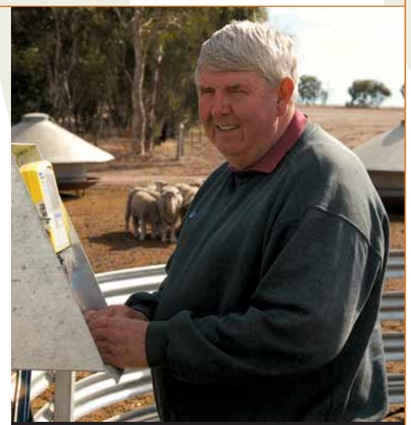
Sheepmeat and lamb exporter using RFID tags and automatic weighing.

"Not only can precision sheep management tell us the sheep's performance in the feedlot, we can easily record carcase traits and how these relate to the animal's breeding.

"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."

"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.

"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."



Implementation

Precision sheep management applications can begin at many points of the production process and at varying cost. You don't have to outlay vast sums of money to get started.

Your individual production goal and target market will determine where you begin.

In some instances it may be feasible to invest in all of the equipment at once, in others it will be easier to spread the cost over a few years or to select only a specific group of livestock you wish to measure.

RFID ear tags, a data capture device or computer with appropriate software is enough to get you started.

Remember that most of this equipment can be used in several situations including with cattle.

1. An (RFID) ear tag houses a computer chip which stores a permanent and unique identification number that cannot be changed. The last eight digits of the unique identification number and a choice of letters (such as the property name or PIC) may also be printed on the tag for visual recognition. Ideally, an RFID ear tag will stay with an animal for life, and with care can be re-used.

2. RFID ear tags are read by either a portable hand-held reader – a wand or stick – or a fixed panel reader that is built into a race, cradle or electronic scales.

3. A good quality smart scale head/control box or data logger and load bars will be required for weighing and/or drafting. Electronic scales are often attached to drafting machines to capture weights on each individual animal. The animals can be drafted on these weights as they pass over the scales. Check if your existing load bars plug into your scale head before buying new bars.

4. An auto-drafter and fixed tag reader may be a good investment at this point. Automatic drafting machines – available 'off the shelf' from commercial suppliers - can be linked with the RFID tags. As sheep enter the drafter their RFID tag is read and the animal is drafted based on single or multiple criteria (eg. micron range, bodyweight).

   Added extras:
   Another option for weighing sheep is a remote system called Walk-Over-Weighing. Electronic scales are located in high traffic areas of the paddock and data is collected as the animals pass through.
   If fleece information is important the only extra piece of equipment required is a barcode printer and scanning wedge. Printers are useful when the individual animal identification is needed after the animal is no longer penned (eg. collecting fleece weights during shearing). A barcode of each identification number can be kept with the sample until it is scanned into a computer.

5. A computer is essential to manage the data. A machine capable of running a Microsoft Windows 98 operating system or a later version will be sufficient for most on-farm data management.
   Your computer may be as simple as an existing desktop computer in your office. Or, you may decide to purchase a laptop computer, specifically designed for outdoor use, for the yards and shed.
   The 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 upload 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.
   There is also another option of using a hand-held portable computer that can be used in the paddock and yards.
   Electronic scales, automatic drafting machines and fleece testing machines all have embedded hardware and associated software. The software provided in most cases is specific to the equipment's tasks. Data is usually collected but not managed and is transferred to another computer to be processed and analysed.