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OFDA2000 BRINGS MAJOR CHANGES FOR WOOL INDUSTRY

The classing of any wool clip into lines of uniform quality is a crucial step in optimising the value of the wool. Objective Clip Preparation (OCP) standards and training of wool classers have led to the Australian wool clip being internationally recognised as the best classed and prepared wool in the world.

However, adherence to OCP standards of clip preparation still leads to a substantial range in diameter and crimp frequency of fleeces within the main lines. Therefore, an opportunity has existed to develop improved technology to reduce the variation in quality within any main line, create lines of even greater uniformity, and to better meet the needs of wool users such as the topmaker, the spinner and weaver.

Agriculture Western Australia, in collaboration with BSC Electronics, is at the forefront of developing new technology that can completely change the way wool is classed at shearing. This new technology, namely the OFDA2000, offers a radical improvement to this crucial stage of wool quality management. Andrew Peterson reports.

Wander into a typical shearing shed anywhere in Western Australia and you will normally find large quantities of freshly shorn wool pressed into bales ready for transport to a broker’s store.

Despite the classer’s efforts, most fleece wool is lumped into the same bales with little differentiation, despite the variation between sheep on the farm. The wool is therefore likely to receive the lowest common denominator price when offered at auction.

For several properties in the last 12 months, the process has been very different. As individual sheep have come into the shearing shed, a mid-side wool sample has been taken, spread gently, slipped into a plastic frame and then measured using the commercial prototype OFDA2000.

Less than a minute later, while the animal is parting with its coat on one side of the shed, the classer has been able to use the test result to decide whether the fleece should be separated into the broad, medium or fine line - or even more. At the same time, the animal can be ear-tagged with a conventional or electronically-coded tag for future reference.

The outcome of this testing for the future will be finer wools receiving the premiums they deserve in the market. No longer will fine wool be merged with cheaper, coarser wools, which has in the past depressed the overall returns to the grower.
What is OFDA2000?

The key breakthrough has been the new machine’s ability to measure greasy wool in the shed (or on any other part of the farm where power is available) rather than first having to undergo scouring and conversion to two millimetre snippets in a laboratory. The commercial version of the OFDA2000 also has other advantages when compared with earlier instruments:

- A single portable fibreglass case contains the whole system, including the computer.
- Windows 95 interface allows better handling of visual representations of the data.
- Built-in Ethernet network interface and modem for Internet connection allows for easy data transfer.

Agriculture Western Australia has been working with Mark Brims of BSC Electronics, the inventor of the OFDA2000, for more than two years. The commercial prototype machines are currently undergoing intense use in real situations to improve their reliability under a variety of test conditions.

The best procedures for measuring animals (before or during shearing) are being determined. Once this testing has been completed, commercial machines will be available for purchase or lease by the industry.

Farmer response

Those farmers who have already had the machine working on their properties have been extremely enthusiastic. Wool Strategy Group member Max Watts from Wandering was inspired after seeing the OFDA2000 in operation on his property and praised both the developers and agency staff.
"The trial work has brought home to me the enormous effort that goes into developing new technology in a traditional industry with plenty of knackers."

"There are huge ramifications for the industry in being able to individually identify sheep with attributes or weaknesses and class them into lines ready for shearing. And this is all available in the sheep yard - dust and all - in about 40 seconds!"

Mr Watts suggested one way to make wool production more viable was to estimate a dollar value per head in both ewe and wether flocks. This could be done easily using the OFDA2000, although identification transfer was still an area that needed research. Barcode tags or subcutaneous chips could be used to eliminate human error. Such a method of individual animal identification could be used for other management applications also.

Brookton grower Dougal Young said wool from some 1,000 ewe hoggets had been tested before shearing and then divided into three lines during trials on his property. The fine lines averaged 17.4 microns in diameter, with medium wool 18.9 microns and broader wool 19.8 microns.

"We were particularly amazed at the huge variation among our sheep where the value of individual fleeces varied from $7 to $78 and averaged $29."

"Following this experience, we believe the OFDA2000 could benefit many growers, by both improving prices and helping to remove the poorer sheep."

OFDA2000 benefits already evident

Wool from Badgingarra Research Station, classed in the same way, topped the Wool Agency offerings at Fremantle wool sales in the first week of December 1999. Five bales of superfine wool were differentiated from the main clip by selecting the finest fleeces based on their tested fibre diameter. Without this, the wools would have ended up in a standard AAAM line that would have been broader and less valuable.

The five bales of 18 micron wool received 1,105 cents per kilogram clean and topped the catalogue. This compared with the Western Market Indicator of 476 cents clean at the time, and only 552 cents per kilogram for four bales of 19.7 micron wool from other sheep from the same mob.

Fibre diameter profile

Because the OFDA2000 measures wool characteristics along the total length of greasy wool staples, rather than cutting it into tiny snippets, it can also supply valuable information about the variation along the whole staple. When graphing the fibre diameter along the staple’s length, a 'fibre diameter profile' can be determined.

An example of a spring-shorn fibre diameter profile is shown in Figure 1. The wool is broader at the ends near shearing time with a
diameter of about 23 microns, but falls to less than 16 microns in the autumn when only poor quality dry feed is available.

Recent research by Dr Chris Oldham and Mr Andrew Peterson has proved that fibre diameter profile can be used to predict the processing performance of wool. In at least 60 commercial consignments sent to the CSIRO Textile Fibre Technology mill in Geelong (Victoria), use of fibre diameter profile to predict the hauteur, or average fibre length in top, was better than any conventional prediction system. This research is being further explored with a wider range of wool types.

**Corrections for grease and other matter**

Because greasy wool staples are measured by the OFDA2000, an offset for diameter is required to correct for grease and other matter on the wool fibres. The correction is still being finalised, but an offset of 1.7 microns is currently being used to account for the extra thickness of fibres. While there is some variation in this grease correction between sheep, there does not seem to be much variation between flocks, which allows a fixed correction to be used across all testing situations.

Wool is also able to absorb up to 30 per cent of its weight in water. As a result, the amount of moisture in the air can radically change the diameter as it swells with the absorbed water. Little is known about the effects of humidity and temperature on wool fibre diameter on the sheep’s back, and freshly shorn wool has very little time to adjust to ambient air conditions before it is measured by the OFDA2000.

Trials are continuing to ensure that the diameter differences due to humidity can be standardised using a digital humidity and temperature probe attached to the OFDA2000.