Inside

Highlights

FinewoolOutwest

The Newsletter of The Condobolin Fine Wool Project

Volume 1 · Issue 1 · October 1999

Why grow fine wool?

Fine wool bloodlines are consistently more profitable.

Analysis of Australia - wide wether trial results has identified the relative genetic performance of over 190 bloodlines. The analysis removes environmental effects between trials and years, leaving only genetic differences between bloodlines.

Large differences in production between bloodlines have been identified by this analysis (Figure 1).

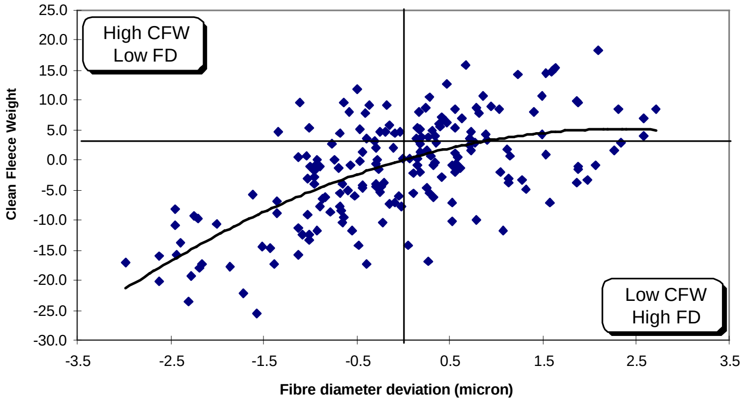

Figure 1: There are large differences in production between bloodlines.

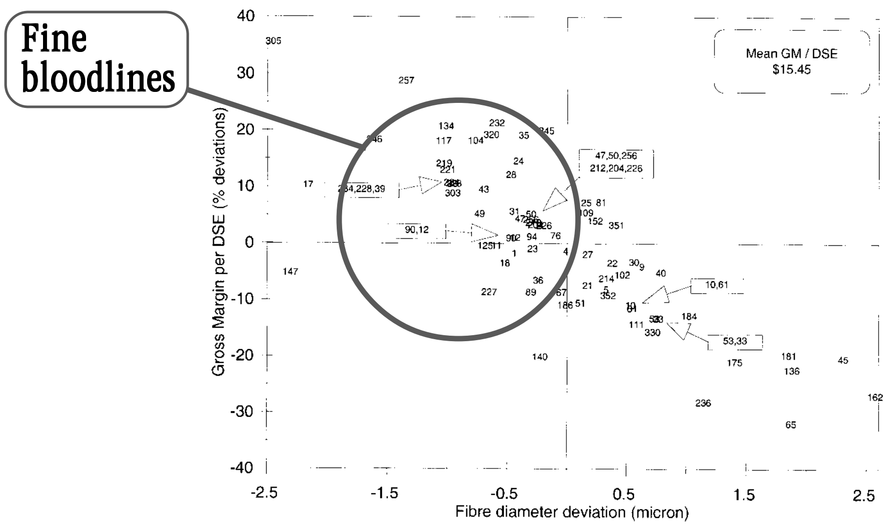

Figure 2: Finer bloodlines are more profitable

The curved line of best fit through the bloodlines shows a varying trend for different sectors of the industry:

- for fine to medium bloodlines there is a large increase of 10% fleece weight for an increase of one micron in fibre diameter.
- for the medium wools there is only a moderate increase of 5% fleece weight per micron.
- for the medium to broad wools there is little or no increase in fleece weight with a micron change.

For the 192 bloodlines analysed, the finer bloodlines generally had superior style, shorter length and better colour.

The economic value of all traits were used to calculate gross margin values for each bloodline. These gross margins show substantial variation, ranging from 35 per cent above the average gross margin to 30 per cent below the average return (Figure 2).

The finer bloodlines, those towards the left of the figure consistently have higher gross margins and hence are more profitable.

The full results of the Australia-wide wether trial analyses is available in the Merino Bloodline Performance package produced by NSW Agriculture's Merino Breeding Group.

If you would like a copy of the package contact the group on

phone: 02 6391 3812, fax: 02 6391 3922 or email: abs@agric.nsw.gov.au.

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Moving fine wool sheep west

Are wool production and quality affected?

Most fine wool grown in New South Wales is produced by a small number of bloodlines located in the northern, central and southern tablelands. If fine wool production is to increase, it will most likely occur through the use of these fine wool bloodlines in other 'non-traditional' fine wool environments.

Fine wool bloodlines will be introduced into these new areas mainly through a combination of the use of fine wool rams over existing bloodlines as well as the actual transportation of fine wool sheep, be they ewes or wethers, from their traditional areas into these "new" environments.

A recent analysis using data from the Condobolin Fine Wool wether flock, looked at the effect of moving sheep between environments on traits important to profit.

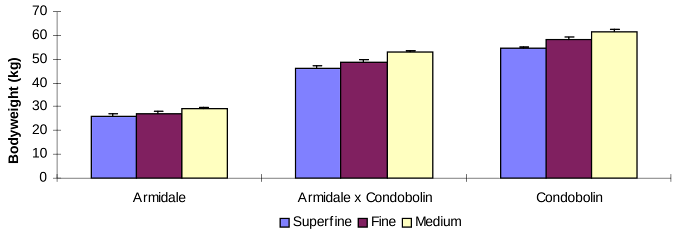

Figure 1: Large increases in bodyweight occurred for all micron groups.

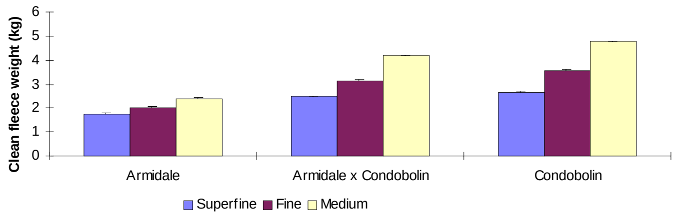

Figure 2: Clean fleece weights increased for all three micron groups.

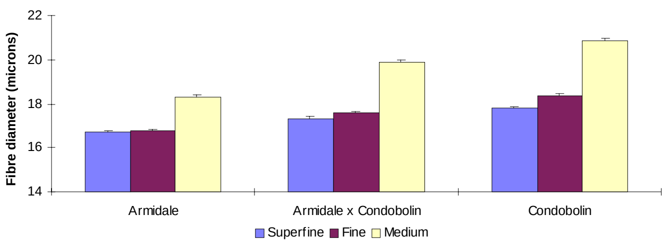

Figure 3: There were only relatively small changes in fibre diameter

The 11 bloodlines which make up the wether flock at Condobolin were grouped into their respective micron categories - superfine, fine and medium. The data was then grouped into location categories - Armidale (hogget shearing), Armidale x Condobolin (first Condobolin shearing) and Condobolin (3, 4 and 5 year old shearings).

For all three micron groups there was more than a 100% increase in body weight between their hogget shearing in Armidale and their 3 year plus shearings at Condobolin (Figure 1). At each shearing the medium wool group were always the heaviest, followed by the fine and superfine groups.

Based on their body weights at Condobolin fine, and even superfine, wethers will achieve an acceptable carcase weight of 22kg (assuming a dressing percentage of 40%) when sold as 3 year olds or older.

Therefore producers shifting to fine wool production in these environments will not necessarily lose revenue as a result of selling fine or even superfine wethers as store sheep compared to traditional medium and broad wool types. This result will be confirmed in the future using slaughter information from fine wool sheep born into the Condobolin fine wool breeding flock.

Not surprisingly, the percentage yield of the wool decreased in the Condobolin environment. This was largely due to the differences in land usage and soil types between the tablelands areas, which are a predominantly grazing system on trap, granite and basalt soils compared to the Condobolin environment which is a typical cereal/sheep system based on red soils.

The clean fleece weight of each micron group increased at Condobolin (Figure 2). The increases between the Armidale and Condobolin shearings were 59, 80 and 100 per cent for the superfine, fine and medium groups respectively.

Despite these large increases in clean fleece weight, there were only relatively small increases in average fibre diameter of 1.1, 1.6 and 2.6 *u*m for the superfine, fine and medium groups respectively (Figure 3).

These changes in fleece weight per unit change in fibre diameter are very large compared to what we would have expected from the Australia-wide wether trial analyses (see the "Why grow fine wool?" story).

As the large increases in wool production were associated with relatively small changes in fibre diameter and body size, it was surprising that there was little difference in staple length between the three environments, regardless of micron group. Therefore, there must then be some underlying change occurring in the wool follicles in the skin to affect wool production and quality to such an extent. We will be investigating this using skin samples taken from the wethers at different ages.

In conclusion, the movement of fine and superfine Merino sheep to non-traditional environments, led to a dramatic increase in wool production accompanied by only relatively small changes in fibre diameter and virtually no change in staple length.

The benefits of this are two-fold:

- Firstly, despite the increase in production, producers of superfine and fine wool in these environments will not suffer from price penalties for producing over length wools.
- Secondly, even though the yield and style of superfine and fine wool may suffer in non-traditional environments, this would be largely overcome by the additional production being achieved in Condobolin-type environments.

Fine wool fleece best at Condo show

During shearing, a number of fleeces were selected to be used at field day displays. Three of these fleeces were entered into the Merino fleece competition at this years Condobolin show.

One of the fleeces was judged to be the "Best Commercial Fleece" of those entered with a point score of 80 out of a total of 100. The fleece weighed 3.8 kg, and was appraised to have a yield of 73%, vegetable matter content of 0.9% and a fibre diameter of 18.0 *u*m.

Based on these results the fleece has an estimated value of $33.75. This was about $6.00 more than the second placed fleece which weighed nearly 9 kg! However, the appraised fibre diameter of the fine wool fleece was a little off the mark. At the 1998 shearing, the midside sample taken from this wether measured only 15.97 *u*m!

From wethers to ewes and lambs

Since its inception, the Condobolin Fine Wool Project has been focussed on the wool production and quality of fine wool wethers in non-traditional environments and has answered basic questions on the ability of fine wool sheep to survive and produce wool in "non-traditional" fine wool environments.

However, this is only part of the story. If commercial wool producers are to make the switch to finer bloodlines in western environments, we need to determine the reproductive performance of fine wool ewes in these environments as well as growth, survival and the suitability of fine wool lambs as breeding flock replacements or to the lamb and/ or store sheep markets.

In response to questions and feedback from producers the emphasis of the Condobolin Fine Wool Project is shifting strongly toward a breeding flock. Results from the breeding flock to date as well as an outline of future work will appear in a future issue of "***Finewool* Outwest**"

Merino breeding and selection workshops

This is a course for commercial Merino breeders who want to:

- understand breeding principles for better Merino breeding.
- achieve better selection skills for more profitable Merino breeding.

"Merino Breeding & Selection - A Commercial Focus" is a practical course that will put you in control of your breeding program.

This workshop aims to bring you up to date with the latest breeding technology and to develop selection skills that will significantly improve the production and profitability of your flock.

The presentation method of the workshop is very flexible and can be organised to suit the requirements of any interested groups. It can be run as a single day workshop or spread over several sessions to suit your requirements.

The workshop consists of six modules and is supported by a detailed manual. The six modules are:

- Meeting your market needs
- Key features of a profitable Merino enterprise
- Developing a breeding objective to increase profit
- Benchmarking genetic performance
- Strategies for change
- Merino sheep selection

Many of the modules involve hands on sheep selection exercises.

This workshop is a joint project of the wool sub-program of NSW Agriculture and The Woolmark Company through their Rampower program. There is no cost to woolgrowers participating in this workshop before 30 June 2000. All you need is a group of about 20-25 wool growers.

For further information contact:

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Sheep coats

Can they protect the fleece from the environment and improve wool style?

One of the reasons for fine wool production in New South Wales being largely confined to the tablelands region have been concerns about the deterioration of wool style and increased vegetable matter and dust contamination which was thought to occur in "non-traditional" fine wool environments.

In these environments sheep coats could be used to protect the fleeces of fine wool sheep and improve style and decrease the amount of vegetable matter and dust.

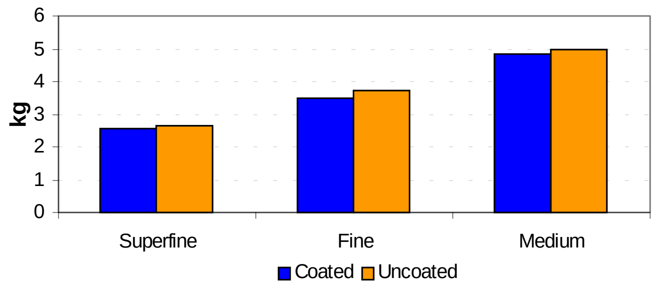

Figure 1: Coated sheep had lower greasy fleece weights

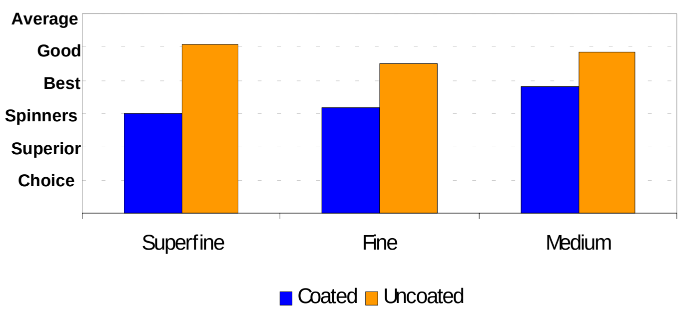

Figure 2: Coated sheep had better style

The use of sheep coats is not new. Since the 1930's, a number of trials have been conducted to assess the effect that coats have on the fleece of sheep. The earliest sheep coats used in Australia were made on-farm from fertiliser or grain sacks. Today, the coats are made from a high tensile UV stabilised nylon material.

It is highly likely that this 'evolution' in sheep coat design and manufacture has contributed to the varied and sometimes conflicting reports on the benefits or otherwise of using coats and the impact they have on wool production, wool quality and processing performance of the fleeces they are protecting.

A proportion of the 1996 drop wethers at Condobolin were fitted with sheep coats to determine whether the coats are a viable value adding option for fine wool in non-traditional fine wool environments in terms of both wool quality and economics.

Some preliminary results from this study are:

- the greasy fleece weights of the coated sheep were lower than the uncoated sheep. This is due to the uncoated sheep having a higher dust and vegetable matter content than the coated sheep (Figure 1).
- the coated sheep has better style than the uncoated sheep, with little dust penetration, tip weathering and low vegetable matter contamination (Figure 2)

Each sheep coat costs between $3.75 and $5.00 and should easily be able to be used for 2 years. During this time it is likely to cover about 10kg of wool. Therefore, to cover the costs of using the coats, the coated wool needs to increase in value by between 38c and 50c per kg. Depending on the micron of the coated wool, the improvements in style alone, should lead to increases in value of this magnitude.

The midside samples from the coated and uncoated wethers have been sent to AWTA for measurement. A full analysis of the results will appear in a future issue of "***Finewool* Outwest**".

For more information...

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"***Finewool* Outwest**" is compiled and edited by Sue Hatcher. The design and layout is by Belinda Gersbach.

Inside

Highlights

Finewool Outwest

The Newsletter of The Condobolin Fine Wool Project

Volume 1 · Issue 2 · March 2000

Fine wools generate higher returns

You can make money from growing wool.

Can you claim to have averaged 899 c/kg clean for the fleece lines from your last shearing?

The Condobolin Fine Wool Flock can. This was the average clean price received for the 4,705 kgs of fleece wool from the wethers shorn in August 1999 and sold in November/December at sales in Goulburn (R01) and Sydney (S15). This represents an average of $30.57 per head for the wether flock.

The wool from the wethers had an average fibre diameter of 19.3 µm, a yield of 67.4%, 1.7% vegetable matter, 88 mm staple length and was 31 N/ktex in strength with 92% midbreaks.

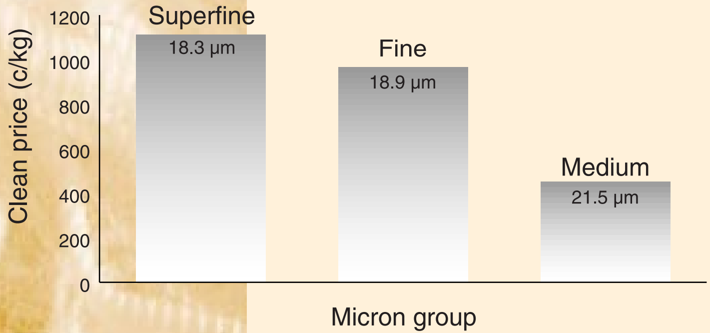

Figure 1: Superfine wool from the wether flock made the highest price.

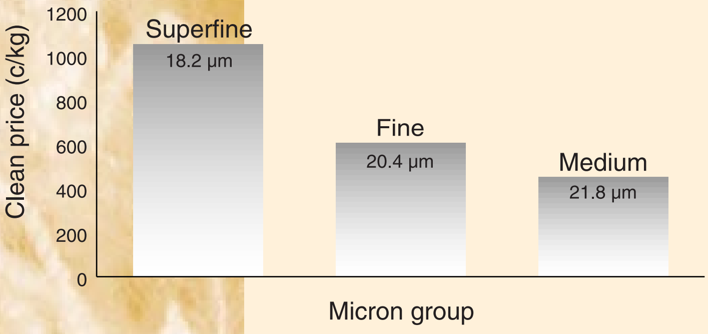

Figure 2: Superfine and fine ewes' wool produced higher returns.

How does this compare to your returns from your wool clip? As an example, the average fibre diameter of Merino fleece wool grown in the Condobolin district (WSA N35) in the 1998/99 wool selling season was 22.0 µm and the average clean price was 481 c/kg.

But the average returns from the wether flock do not tell the whole story. When the fleece lines are grouped into micron categories (superfine ≤ 18.5 µm; fine 18.6 - 20.5 µm and medium ≥ 20.6 µm), further price differences were evident (Figure 1).

The superfine wool was 18.3 µm and averaged 1,112 c/kg clean, the fine wool was 18.9 µm and made 966 c/kg clean, while the medium wool was 21.5 µm and not surprisingly fetched the lowest price at 452 c/kg clean.

The wool from the breeding flock followed the same trends as the wether flock. It had an average fibre diameter of 20.3 µm, a yield of 69%, 1.5% vegetable matter, 79 mm staple length and was 34 N/ktex in strength with 66% midbreaks.

The average clean price received for the ewes in the breeding flock was flock 652 c/kg. Again there was a substantial variation in the prices received for each micron group (Figure 2).

The superfine wool averaged 1,051 c/clean kg, the fine wool 605 c/clean kg and the medium wool 451 c/clean kg. The hogget wool, which includes fleeces from both the wethers and ewes born in 1998, was 18.3 µm and sold for 1,189 c/clean kg.

Is your bloodline giving you returns like these?

NSW Agriculture

Fibre curvature

Do you need to include it in your breeding objective?

The development of Laserscan and OFDA have made the measurement of fibre curvature available to the wool industry. It has been shown that fibre curvature, or the rate at which a fibre bends, is closely related to crimp frequency (i.e. the number of crimps per unit length).

The ability to objectively measure crimp frequency using fibre curvature has resulted in many Merino breeders, both stud and commercial, beginning to think about including fibre curvature into their breeding objectives.

Any extra benefits resulting from including fibre curvature into a breeding objective will depend on:

- its heritability (how much of this variation is caused by the animals genes),
- the degree of variation of the trait (between and within animals or bloodlines),
- its relationships with other traits,
- its impact on profit, and
- the cost of measurement.

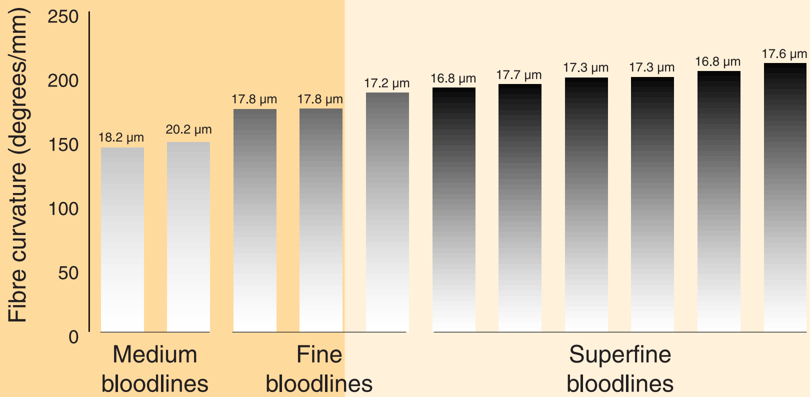

Figure 3. Fibre curvature increases as the average fibre diameter of the flock decreases.

Fleece test results from the wethers in the Condobolin Fine Wool Flock were used to find out more about each of these areas and to determine whether any extra benefit will result from selecting for fibre curvature in a breeding program.

Heritability

For the Condobolin flock, the heritability of fibre curvature was 0.35. This is similar to that of fibre diameter (0.39) and fleece weight (0.32), which are the two major wool traits which drive profit in a Merino wool growing enterprise. Therefore, fibre curvature is under a similar degree of genetic control as these two important traits and will respond to single trait selection in much the same manner.

Variation in fibre curvature

There was a large amount of between bloodline variation in fibre curvature (Figure 3). In fact, the separation of the bloodlines on fibre curvature was more pronounced than the separation on fibre diameter.

The fibres of the superfine bloodlines were the most highly curved with flock averages ranging from 190 to 209 degrees per mm. The fine bloodlines had slightly lower fibre curvature, ranging from 174 to 187 degrees per mm. The medium wool bloodlines had the least curved fibres of the three micron groups, with values of about 145 degrees per mm.

This indicates that it is possible to make significant changes in fibre curvature by changing bloodlines. But, the value of doing so depends upon relationships between fibre curvature and other wool traits of importance in the breeding objective.

Relationships with other traits

The relationships between fibre curvature and the major traits influencing the value of wool in this flock were generally favourable.

Selection to improve fibre curvature (i.e. decrease fibre curvature leading to smaller degrees of curve per mm) will lead to increased greasy and clean fleece weights, while only slightly increasing fibre diameter and decreasing bodyweight.

As a result there would be no real need to include fibre curvature into a breeding objective. A breeding objective which has emphasis on decreasing fibre diameter and increasing fleece weight, will lead to a decrease in fibre curvature as required.

Why is it desirable to decrease fibre curvature? Research into fibre curvature and wool processing performance has identified that high fibre curvature results in poor processing performance.

Wool with high fibre curvature produces higher processing wastes, shorter hauteur, poor spinning performance and increased yarn faults during spinning.

Cost of measurement

The cost of fibre curvature measurement will not impact on your decision to include it in your breeding objective as fibre curvature is reported for no extra charge when fibre diameter is measured on either the Laserscan or OFDA.

In conclusion, it is not necessary to include fibre curvature into your breeding objective if you are currently selecting for decreased fibre diameter and increased fleece weight. By doing this, the genetic relationships between fibre curvature, fibre diameter and fleece weight will ensure that fibre curvature will be decreased

Western fine wool style

Does the environment adversely affect the style of fine wool?

'Style' is used by the wool industry to describe the visual and tactile properties of wool. Assessed style, whether based on the old AWC wool typing system or its successor AWEX-ID, is a composite trait influenced by a number of other traits including crimp definition and frequency, greasy wool colour, brightness, handle and fleece structure.

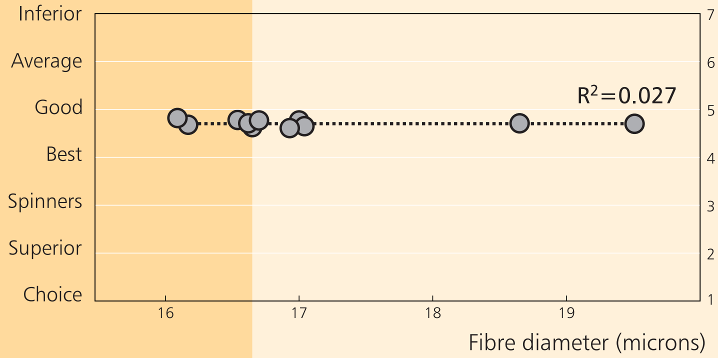

Figure 4: Assessed style and fibre diameter are not strongly related.

There is a strong belief among wool growers that the style of fine and superfine wool will deteriorate in 'non-traditional' fine wool environments.

A recent analysis of the style of the wool grown by the wethers in the Condobolin Fine Wool Project found that there was only a weak positive relationship between assessed style and fibre diameter (Figure 4).

Each of the bloodlines were assessed as having wool in the range of MF4 to MF5, or good to best topmaking.

This demonstrates that the environment affects the style of the bloodlines comprising the wether flock at Condobolin equally. There was no evidence to suggest that the style of the superfine or fine bloodlines was any worse than the style of the medium bloodlines.

Our research with sheep coats will tell us whether they will adequately protect the fleeces of superfine and fine bloodlines in western environments. Sheep coats may become a viable management tool to add value to a portion of your wool clip and take advantage of the premiums which exist for style in fine wool.

Are western fine wools discounted by wool buyers?

Fine wools grown in 'non-traditional' fine wool environments are not discounted by wool buyers at auction.

This is one important result from a recently completed analysis into the prices received for fine (18.5 - 20.5 µm) wool grown in NSW. We used actual wool sale data from the past 10 wool selling seasons (i.e. 1989/90 - 1998/99).

The aim of the analysis was to determine whether fine wool produced in western areas was discounted by buyers because of the area in which it was grown.

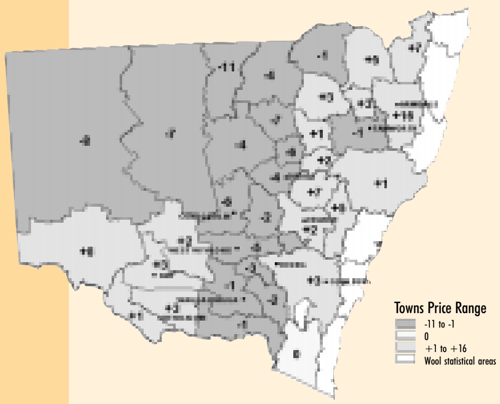

Figure 5: Price differences between WSA's are small.

When we analysed the data we took account of the year of sale, week of sale, where the wool was sold, where the wool was grown, the weight of each sale lot and the wool traits of each lot (fibre diameter, staple length, staple strength, vegetable matter - burr, seed & shive, hardheads, style and assessed colour).

We found that when the variation in each of these traits was included in the analysis, we could explain 92% of the total variation in the clean price of fine Merino wool grown in NSW.

The map of NSW shows the price differential between different WSA's remaining after the variation in each of those factors was accounted for (Figure 5).

Each of the numbers on the map represent the price difference (in cents) from an average price of 951 c/kg clean.

This map proves that 'traditional' and 'non-traditional' fine wool environments do exist.

There was a general trend for the tablelands (northern, central and southern) and western Riverina areas of NSW to receive above average prices with other regions receiving below average prices.

But more importantly, it shows that when sale lots of fine wool are fully specified the price differential between areas in which the wool was grown is unimportant. The range of price differentials was only 27c / kg clean which is less than 3% of the average price paid for NSW fine wool over the 10 year period.

The rams are out!

The establishment of a fine wool breeding flock at Condobolin Agricultural Research and Advisory Station (ARAS) has been completed.

Rams and ewes have been sourced from two superfine (Europambela and Ledgerton), two fine (Mirani and Merryville) bloodlines as well as two local bloodlines (Centre Plus and Roseville Park). The superfine and fine bloodlines were based on their performance in the wether flock and industry significance.

We now have at least approximately 120 ewes from each bloodline which will be mated to two rams.

The ewes were split into their bloodline groups for mating and the rams put out on 19th January. After a six week joining period the rams will be taken away from the ewes in early March and the ewes run together as one mob until lambing in July/August.

The ewes will be scanned for pregnancy in April/May. These results will be reported in a future edition of '***Finewool*** **Outwest**'.

The processing performance of western fine wools

The most important factors which determine the value of a wool top are fibre diameter and hauteur (the average fibre length in the top). Other factors of significance are the fibre length distribution (CV(H) and short fibre content), contamination and the efficiency at which the wool is processed.

The aim of the game is to maximise the amount of top produced and minimise the amount of processing wastes from the raw wool input.

We have done a preliminary comparison of the processing performance of fine wool from fleeces grown in Armidale and Condobolin. We matched the batches as closely as possible for diameter, length, strength, midbreaks and crimp and processed them using the CSIRO Division of Textile and Fibre Technology mini-topmaking mill.

Tops produced from Condobolin grown wool were shorter, more variable in length and had more short fibre in the 15 and 30 mm classes compared to the Armidale grown wool (Figure 6).

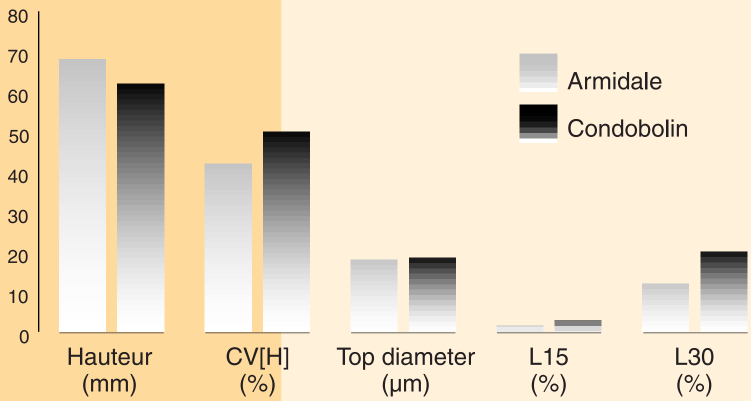

Figure 6: Condobolin wool tops were shorter and more variable in length

In addition, the processing efficiency of the Condobolin wools was less than that of the Armidale wools. From the same amount of raw wool input, Condobolin grown wools produced less top and more card waste.

The differences in processing performance can be partly explained by the raw wool inputs from both Armidale and Condobolin. Despite trying to match the characteristics of the fleeces selected, the Condobolin grown wools had slightly lower staple strength, a higher percentage of midbreaks and higher VM content than the Armidale wools.

Low staple strength combined with high midbreaks results in a high number of fibres breaking in the middle during carding. This produces high card waste, shorter hauteur, higher short fibre content and lower top yield. High VM content, particularly if it is predominantly burr, also contributes to increased fibre breakage during carding.

The Condobolin grown wools were more weathered by ultra-violet (UV) light than those from Armidale (4% compared with 0.1%) and had a higher dust content. Weathering increases the short fibre content and thus also contributed to the difference in processing yields.

Further details of the processing performance of western fine wools will appear in a future issue of '***Finewool*** **Outwest**'.

For more information...

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The Newsletter of The Condobolin Fine Wool Project

Volume 1 · Issue 3 · June 2000

Fine wool bloodlines are more profitable

Current market conditions are widening the profit gap between fine and broader wools.

Under current market conditions, the heavier cutting finer bloodlines are the most profitable of those in the Condobolin Fine Wool wether flock. The large production differences identified between the bloodlines in fleece weight and fibre diameter (see figure 3) have resulted in a large amount of variation existing between the bloodlines in relative profitability.

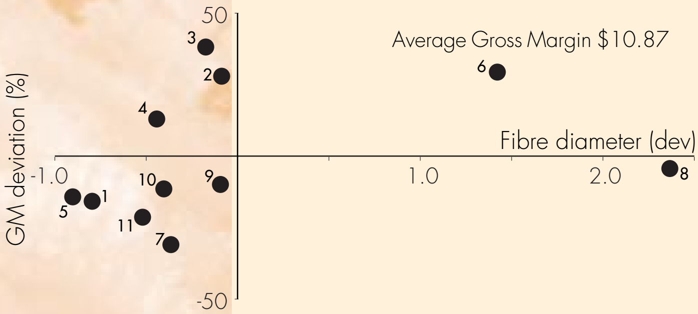

Figure 1: Finer bloodlines tend to have higher gross margins per DSE.

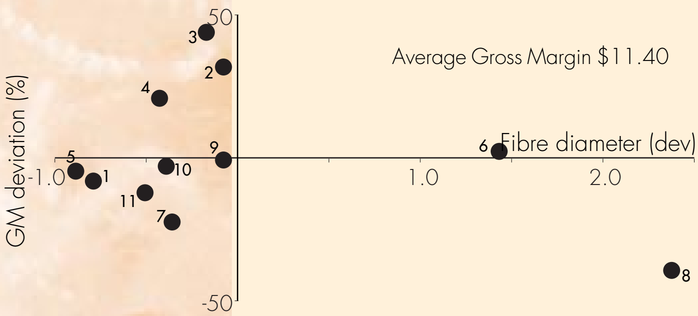

Figure 2: Under current market conditions, the difference in gross margin between the fine bloodlines and the others increases.

To evaluate the economic performance of the 11 bloodlines in the Condobolin flock we calculated the production of each bloodline (clean fleece weight, fibre diameter and bodyweight) and derived a price for each bloodline based on wool market prices from 1996 to June 2000.

The price for each bloodline was adjusted to account for style, length, colour and staple strength and was then further corrected to allow 25% of the fleece to be classed into non-fleece lines (10% bellies and locks, 15% skirtings). The non-fleece lines were valued using market prices for the same period.

Income per wether for each bloodline was calculated as the product of clean fleece weight and corrected price less current levies and wool selling charges. Variable costs (i.e. shearing, crutching, jetting, dipping, drenching, cost of wether replacement etc) were assumed to be the same across all bloodlines.

We then estimated the gross margin per head as the difference between net income and variable costs and converted the result to a DSE basis to allow for differences between the bloodlines in expected food intake.

The finer bloodlines tended to be more profitable, in that they had a higher gross margin per DSE, over the past five wool selling seasons (Figure 1). Over this market period, the average gross margin for the 11 bloodlines was $10.87, with substantial variation occurring between bloodlines. Individual bloodlines ranged from 40% above the average to 30% below the average.

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The highest performing bloodlines were the three fine wool bloodlines which had below average fibre diameter and above average fleece weights (numbered 2, 3 and 4 in Figures 1 and 3). Bloodline 6, which is a fine/ medium type, also had a high gross margin per DSE largely due to its having the highest fleece weight of the 11 bloodlines.

However under the current market scenario of very high micron premiums for fine wool (i.e. the first half of 2000/01 wool selling season), the gross margin for bloodline 6 was closer to the flock average of $11.40 per DSE (similar to the superfine types), while those for the fine bloodlines were at least 20% above the average (Figure 2). The continuing high value the market is placing on finer wools is largely being driven by continuing consumer preferences for lightweight, soft and comfortable clothing. As fibre diameter is the key wool trait affecting these three major consumer attributes it is likely that the high value placed on fine wool by wool buyers and processors world wide will continue. As a result heavy cutting, fine bloodlines will continue to be more profitable relative to broader types.

The fleece weight versus fibre diameter trade-off

Careful selection of a finer bloodline can minimise fleece weight loss.

The major issue raised regarding the production consequences of making a change to a finer bloodline, particularly in "non-traditional" fine wool environments, is the trade-off between fleece weight and fibre diameter.

Issue 1 of "***Finewool* Outwest**" contained a summary of the Australia wide analysis of wether trials which quantified the trade-off and found that it differed for the fine, medium and broad sectors of the industry. Data from the last 7 shearings of wethers from the Condobolin Fine Wool Project has supported the trends identified in the Merino Bloodline Performance analysis.

The average clean fleece weight of the medium wool bloodlines at Condobolin was 4.38 kg with an average fibre diameter of 20.5 µm. Comparing these figures to the average of the fine and superfine bloodlines at Condobolin, shows that changing to a finer bloodline will decrease the average fibre diameter by just over 2 µm with a corresponding 23% decrease in fleece weight.

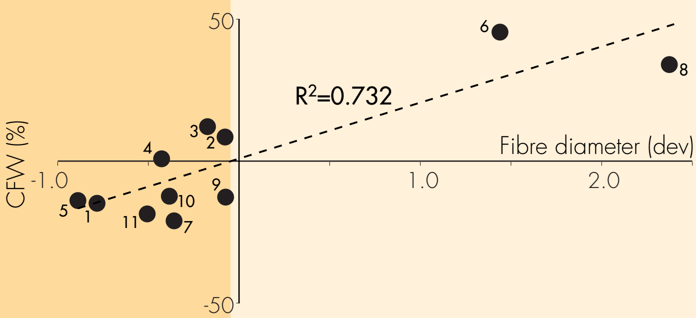

Figure 3: There is more than 30% variation in clean fleece weight among the fine wool bloodlines at Condobolin.

However, it is important to note that these fleece weight/fibre diameter trade-offs, from both the Condobolin Fine Wool Project and the Merino Bloodline Comparisons, were calculated from the average clean fleece weight and fibre diameter of the medium versus fine and superfine bloodlines in the analyses.

The production data from the Condobolin fine wool flock shows more than 30% variation in clean fleece weight among the fine and superfine bloodlines (Figure 3). A similar, or even higher variation in clean fleece weight occurs among the fine wool bloodlines in the Merino Bloodline Comparisons.

Therefore, a careful selection of bloodline has the capacity to successfully reduce the average fibre diameter of a flock with only small decreases, if any, in clean fleece weight. It is possible, through selecting a highly productive fine wool bloodline to minimise any loss in clean fleece weight well below the averages quoted above.

The extra value of finer wool needs to be considered in conjunction with the trade-off between fleece weight and fibre diameter. Micron premiums are an easy way to represent the extra value of finer wool. A micron premium is the percentage improvement in value resulting from a one micron decrease in average fibre diameter.

At present (May-June 2000) the micron premium for 18 micron wool is 65 per cent - this means that 17 micron wool is worth 65% more than 18 micron wool. In fact the 21 and finer micron premiums are all currently above 30% and for finer types they are up to 56%. These current high micron premiums are being achieved at the same time as the supply of these finer types of wool is also increasing (see figure 4).

So if a change to a finer bloodline will decrease your fleece weight by say 15%, but the extra value of the finer wool is 20%, the finer wools will generate higher returns.

Condobolin Fine Wool Project Open Day

From 1.00 - 4.00 PM on Tuesday 15th August 2000 the Condobolin Fine Wool Project will be hosting an Open Day. This will be a great opportunity for those with an interest in the project to view the sheep first hand in full wool and hear the latest results arising from the project.

The sheep displays will include animals from the 11 bloodlines which comprise the wether flock as well as ewes and lambs from the breeding flock. Wethers involved in the sheep coats trial will also be on show. It is certainly worth viewing for yourself the magnificent fine and superfine wool that can be grown under coats in the west!

During the afternoon, time will be set aside for short presentations of results from the Condobolin Fine Wool Project. In addition information on different strategies you can use to fine up your clip, whether this is through improving your own flock or making a bloodline change, as well as the production consequences on other wool quality traits of producing finer wool.

For more information on the Condobolin Fine Wool Project Open Day and to RSVP, please contact Sue Hatcher by phone (02) 6391 3861, fax (02) 6391 3922 or email sue.hatcher@agric.nsw.gov.au

Will increasing the supply of fine wool decrease its value?

The answer to this question is a resounding no! A comparison of the production statistics of fine wool (19.5 µm) over the past 30 years with micron premiums for fine wool over the same period clearly show that despite a staggering increase in the production of fine wool, the value of the fine wool is maintained (Figure 4).

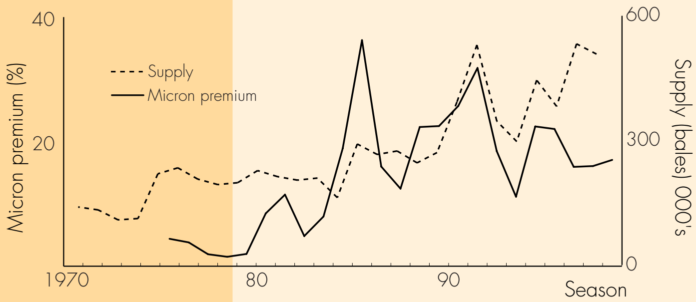

Figure 4: Micron premiums for fine wool continue to increase despite massive increases in supply.

Micron premiums are an easy way to represent the extra value of finer wool. A micron premium is the percentage improvement in value resulting from a one micron decrease in average fibre diameter. The micron premium for 19 µm is shown in Figure 4 and is compared to the production in bales of 19.5 µm wool. The supply of 19.5 µm and finer wool increased from 132,000 bales in 1971/72 to over 500,000 bales in 1998/99 after reaching a peak production of 524,934 bales in the 1996/97 season.

Over the same time period, the micron premium for fine wool has steadily increased. In fact, there is a reasonable positive correlation between the supply of and micron premium for fine wool ($r^2 = 0.56$). This means that as the supply of fine wool has increased, so has its value compared to broader wool.

In past 15 years alone, the production of fine wool has increased by nearly 300,000 bales (or 176%) with the micron premium for 19 µm increasing to the current level (1999/2000 season) of greater than 50% despite a more than doubling of supply.

Maximising returns for fine wool

Fine wool is worth more than broader wool with the same fault levels.

Fine wool with a particular level of fault, will produce greater returns than broader wool with the same fault levels. We used data from the analysis of prices paid by woolbuyers for fine wool across NSW reported in Issue 2 of "***Finewool* Outwest**" to determine the premiums and discounts that are applied to fine wool, with various fault levels, at auction.

Style

The price paid for different style grades varied with fibre diameter (Figure 5). For wool between 19.5 and 20.5 µm there was no extra benefit, in terms of price received, for improving the style of wool beyond MF4 (Best Topmakers).

However for 19.0 µm and finer wool, improving style will generate increased returns. Although this analysis was based on fine wool only, the price lines for each style grade in Figure 5 continue their decreasing trend for fibre diameters greater than 20.5 µm and move closer together. Given this, it is clear to see that fine wool of a lower style grade, MF5 or MF6 (good or average topmakers) will still produce higher returns than medium or broader wools with better style.

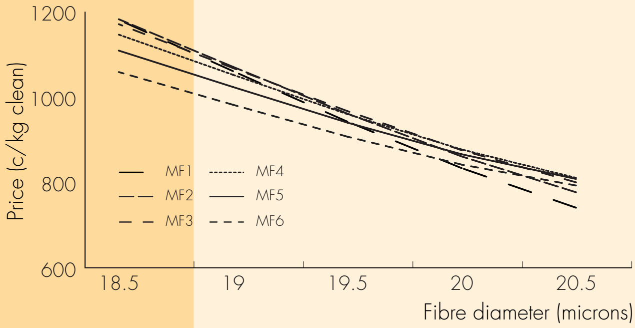

Figure 5: Price discounts for style decrease as fibre diameter increases.

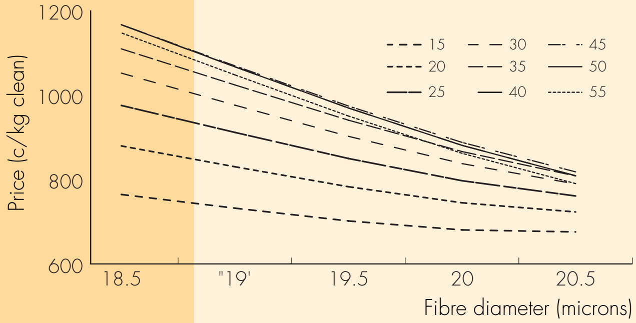

Figure 6: Discounts for staple strength decrease as fibre diameter increases.

Vegetable matter

The trend of price discounts for vegetable matter was similar to that for style. A change in fibre diameter from 20.5 µm to 18.5 µm will attract a premium of about 300c per kg clean for wools that are FNF or contain B or C levels of vegetable matter fault.

Staple strength

Staple strength is the one trait where the discounts are substantially different across the fibre diameter range (Figure 6). For wools below 35N/ktex, the premiums for finer wool start to become smaller. So management practices, and genetic strategies, to maintain or increase staple strength when moving to a finer bloodline will ensure that any discounts for low staple strength are minimised.

For each of the wool quality traits discussed above, as well as staple length and colour, the general trend is for fibre diameter to have the greatest impact on price with other quality attributes having only a relatively minor effect. For each quality trait, fine wool with a particular fault will generate higher returns than broader wools with the same degree of fault.

Superfine Merinos Strike Gold at Kalgoorlie

Pastoralists and Industry personal who attended a field day in May at Hampton Hill Station, 78 km north-west of Kalgoorlie in WA were astounded at the performance of 140 22 month old wethers representing five strains of superfine Merinos. The superfine fine wethers had been running with a comparable group of Hampton Hill Goldfields animals for the previous 12 months.

Depending on the strain, the superfine sheep produced fleeces worth an average of between $53.40 and $67.30 each. This was between 200 and 250% more than the station wethers whose wool was estimated to average $27.36 per head. Overall, the 140 fine wool wethers had fleeces valued at $59.26 each.

Burchell Jones, the owner of Hampton Hill station, commented that the previous 12 months had been a particularly good season for the region which was reflected in a heavy cut of wool. The fleece weights of the superfine sheep averaged 6.24 kg, compared to the station wethers 8 kg. It is interesting to note that this small difference occurred despite the Hampton Hill wethers being among the most productive in the current Goldfields wether trial.

Another important point was that the survival rates (recovery rate at mustering) was identical for the local and superfine sheep. This indicates that survival of the superfine wethers in the Goldfields pastoral country was not the problem some sceptics predicted.

The Hampton Hill trial is part of a series of linked trials run by the WA Superfine Woolgrowers Association in conjunction with Agriculture Western Australia and The Woolmark Company through its PIRD scheme.

For more information on the trials, please contact Bevan Taylor on (08) 9842 5097 or by email bmt@iinet.net.au

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The design and layout is by Belinda Gersbach.

Inside

Fine wool fleece best at Condo show — again!

Highlights

Strategies for breeding finer wool

Measurement and profit in commercial flocks

Finewool Outwest

The Newsletter of The Condobolin Fine Wool Project

Volume 1 · Issue 4 · September 2000

Strategies for breeding finer wool

What can a commercial wool producer do?

Reducing your flock's fibre diameter can give you a major increase in income and profit. The updated Merino Bloodline Comparison analysis shows clearly that the average fine wool bloodline has a 28% higher gross margin/dse than the average medium wool and 38% higher than the average broad wool (Table 1).

Table 1: You can choose the best bloodline for more income.

Bloodline/wool type	Income (GM/DSE)			
	Average %	Range %		
Fine	+24	+17	to	+35
Fine/Medium	+6	-24	to	+22
Medium	-4	-25	to	+19
Broad	-14	-21	to	– 7

Clearly, your choice of a bloodline can have a large impact on the profitability of your flock. But, in order to take advantage of the improvement in profitability that can be achieved through changing bloodline you must have a sound strategy for change.

Without a sound strategy in place you can lose money in the process of making a bloodline change. A sound strategy for change will almost certainly result in an increase in income.

To be sure that you will obtain an increase in income you must have:

- A clear understanding of the present performance of your flock relative to the range of industry options;
- A clear breeding objective based on solid commercial information; and
- A strategy to achieve the change targeted, that is cost efficient and can be achieved in the right time frame.

Benchmark the performance of your current ram source

For the majority of commercial woolgrowers the first step is to benchmark the performance of your current bloodline. The best way to do this is to use the information in the Merino Bloodline Performance package. The Bloodline Performance Agnote in the package has recently been updated and now contains a contact list for the breeders of each bloodline.

You will need to identify your ram source in the bloodline list contained in the package and use this information to locate your bloodline on the CFW and FD graph. You can also do this with the GM/dse and FD graph.

Further work can fine tune your benchmark. If you have entered a team in a wether trial, your team's performance can be benchmarked against the Merino Bloodline Performance data. Alternatively you can enter a team into a wether trial or get together with other woolgrowers to establish a trial.

Once you have benchmarked your performance using the Merino Bloodline Comparison data you will need to source further information to update your benchmark. This is because the Merino Bloodline Comparison data represents the performance of the bloodlines over the past 10 years.

PREMIUM QUALITY WOOL COOPERATIVE RESEARCH CENTRE

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Strategies for breeding finer wool

What can a commercial wool producer do?

You will need to ask your ram source what genetic progress they have made over the last ten years. Ask your ram source:

- What is their future breeding objective?
- How much change have they made recently and over what time period?
- How are they going to achieve their breeding objective?

Most importantly, ask for proof of their genetic progress. Can your ram source provide you with information about changes in their stud's performance over the past 5 or 10 years?

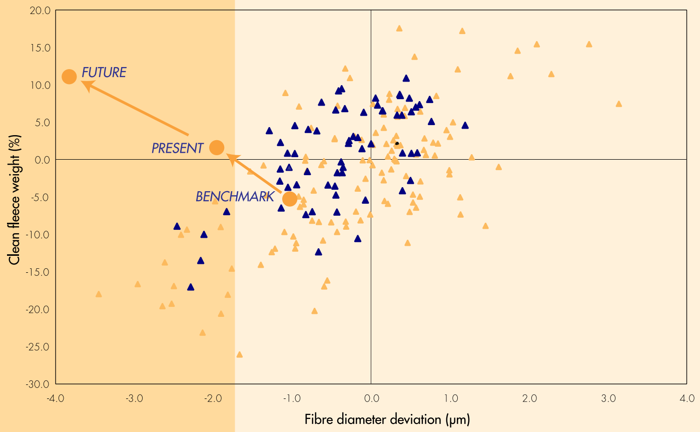

Figure 1: An accurate benchmark will identify whether money can be made by changing ram sources.

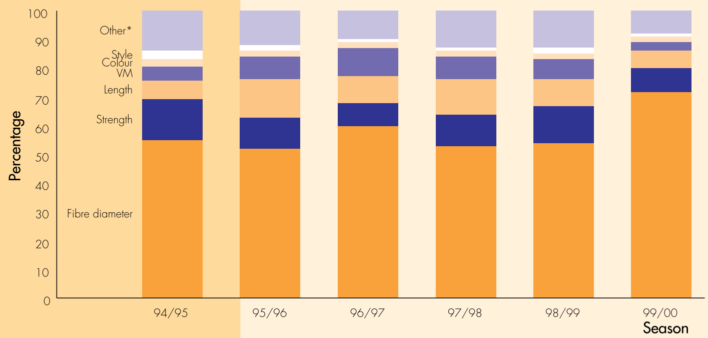

Figure 2: Fibre diameter has the greatest impact on returns for your wool.

The answers to these questions are very important as once you are using rams from a particular ram source your future progress is largely determined by the progress that the ram source is making.

The information from your current ram source will allow you to update your benchmark. You can now compare this updated benchmark to other ram source options and your breeding objective (Figure 1). Can you make more money by changing ram sources?

If your benchmarking results indicate that you can expect an advantage from introducing a new bloodline it is normally an advantage to monitor the performance of the new bloodline via an on farm ram or ewe evaluation.

Develop a breeding objective

A breeding objective is a description of the performance of your flock at some point in the future. It needs to be:

- Profit driven and have a commercial focus;
- Well defined in terms of the traits included and the emphasis placed on each;
- Measurable in terms of microns and kg (not 'finer' and 'heavier');
- Practical so that you can accurately select for traits;
- Cover a specific time period such as 10 years; and,
- Realistic or achievable.

Make sure that the traits in your breeding objective impact on the profit of your flock, such as fibre diameter and clean fleece weight. If you already have a flock with reasonable performance for traits of lesser economic value, such as wool colour, putting a lot of effort into improving them will not significantly improve your profitability (Figure 2).

Choose the right strategy

Which strategy you choose will depend on how much change you wish to make in your flock's performance. For example:

- **Small change** eg up to 0.5µm finer
  To achieve a small change you can either purchase more productive rams from your current ram source or choose the same grade of rams and rely on your ram source to make progress.
- **Moderate change** eg up to 1.5µm finer
  To make moderate change your current ram source must be making major progress or you should change to a ram source that is finer than your current one.
- **Large change** eg more than 1.5µm decrease
  A large change will always favour a bloodline change, particularly if you want the change to occur now and not later.

Strategies for breeding finer wool

What can a commercial wool producer do?

There are also various short term strategies you can use to improve your flock's performance. You can buy in ewes and wethers as well as rams from the new bloodline. But make sure you consider all the relevant issues such as your short term cash flow, the possibility of introducing disease or weeds onto your property and the performance of the animals you are introducing.

The rewards from identifying the most profitable bloodline can be high and immediate. There is no single recipe for all wool growers. However genetic gains can be achieved by all woolgrowers through choosing the right strategy.

This article was been based on a presentation made by Allan Casey at the Condobolin Fine Wool Project's Open Day. For further information, please contact Allan by phone 6391 3812, fax 6391 3922 or email allan.casey@agric.nsw.gov.au

Fine wool fleece best at Condo show — again!

A number of fleeces were again chosen during this years shearing to be used at field day displays. Some of these were entered in various classes of the Merino fleece competition at this years Condobolin show.

For the second year in a row, one of our fine wool fleeces was judged to be the winner of the "Best Commercial Fleece" section and finished second to the champion fleece of the show. This 4.4kg fleece was estimated to be valued at between $57 and $82. Interestingly, the second placed fleece had an estimated value of less than $30!

Measurement and profit in commercial flocks

Commercial flock returns can be increased by a single hogget fibre diameter measurement

For commercial wool producers, using measurement to identify the most productive and profitable sheep in your flock can lead to large increases in productivity. Three options are available:

- Selecting sheep for the length of their productive life according to their genetic merit;
- Accounting for measured performance in the preparation of sale lots of wool; and
- Identifying groups of animals on genetic performance level for differential management according to genetic merit.

Selection for length of productive life according to genetic merit

Manipulating the age structure of your flock can decrease your average fibre diameter. The reason is simple, all animals tend to get broader with age. Therefore it is reasonable to conclude that having fewer age groups in your flock will lower fibre diameter.

Table 2: The impact of changing age structure is small.

No. of age groups	Average fibre diameter
6 (2-7 years)	21.1
5 (2-6 years)	21.0
4 (2-5 years)	20.9
3 (2-4 years)	20.8

But the impact of altering age structure is only small. For an average 21 micron flock, altering the age structure can lead to about a 0.2 micron decrease in the flocks average fibre diameter (Table 2).

A much better strategy to use is to select replacements for your flock based on their measured fibre diameter as hoggets. This strategy can lead to a decrease in your flock's average fibre diameter of up to 0.5µm in adult ewes and up to 1µm in adult wethers. There is also a small spill-over effect in hoggets.

Potential responses for an average 21µm flock can be seen in Figure 3. Remember that these gains are additional to those that might be achieved in the ram source.

This change occurs because fibre diameter varies between animals, and is the most highly repeatable (a single measure is very accurate) and strongly heritable (largely influenced by the animal's genes, not the environment) of all traits in Merino sheep.

Within each flock, there is a range of animals with varying average fibre diameters:

- A 17 micron flock contains individuals ranging from 14 to 20µm.
- A 21 micron flock varies from 17 to 25µm.
- A 24 micron flock varies from 19 to 29µm.

The challenge is to use hogget fibre diameter measurements to select the most profitable replacements for your flock. You want to identify those sheep which are finer than average and keep them for longer in your flock.

Measurement and profit in commercial flocks

Commercial flock returns can be increased by a single hogget fibre diameter measurement

The actual amount of change in average fibre diameter you will achieve as a result of selecting animals based on their hogget fibre diameter measurement will depend on:

- Requiring few animals from many available. You will need to maximise the reproduction rate and optimise the age group structure in your flock to make sure that you have enough hoggets to select your replacements from.
- Minimising classing out on traits that are not related to economic performance. Make sure that your classer is culling animals with obvious structural or conformation defects. If your classer is culling more than 15% of your flock on a visual basis only, your fibre diameter change will be small.
- Matching measured performance with the animal. By tagging each animal and recording its fibre diameter measurement, information from this one hogget wool test (costing about $1.50) can be used in future decisions about each animal.

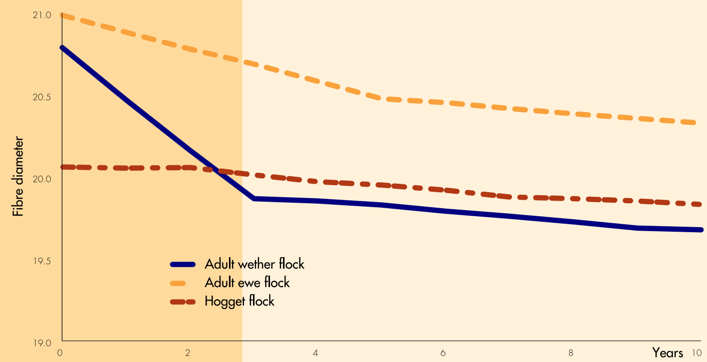

Figure 3. Using hogget fibre diameter to select replacements will improve productivity.

Accounting for measured performance in the preparation of sale lots of wool

Tagging each hogget and recording their fibre diameter measurement has the added benefit of allowing you to use this information to class fleeces into lines during shearing to maximise price.

The benefits of doing so will depend upon the average fibre diameter of your flock and relies on the substantial micron premiums for finer wool. For example, instead of having 10 bales of 21 micron wool you may now have one bale of 19µm, a couple of bales of 20.5µm and the reminder 21.5µm.

Under current market conditions the average price received for the differentiated lines based on average fibre diameter will be dollars ahead of lumping all your wool into one line.

A computer optimisation program is currently being developed by NSW Agriculture's Merino Breeding Group and can be used to minimise the number of lines created during shearing while maximising the price.

Identifying groups of animals on genetic performance level for differential management according to genetic merit

The third option is to use that same hogget fibre diameter measurement to divide your flock into sub-flocks according to their performance level. You can then manage these groups differently according to their genetic potential.

Some options for sub-flocks are:

- Allocating superior rams to superior ewes at mating;
- Producing wethers to keep as woolgrowers from the most productive sub-flock and selling those from a lower sub-flock as store sheep;
- Differential pasture management for the superior part of the flock by allowing these sheep access to better levels of nutrition or by restricting their exposure to paddocks containing high levels of vegetable matter or dust; and
- Using sheep coats for those animals producing the most valuable fleeces.

Clearly, measurement within the commercial Merino flock can have a large pay-off. Most importantly, the reductions in fibre diameter and improvements in profitability can all be achieved through a single fibre diameter measurement on each hogget in your flock.

At a cost of about $1.50 per head, can you afford not to make this investment?

This article was been based on a presentation made by Dr Kevin Atkins at the Condobolin Fine Wool Project's Open Day. For further information, please contact Kevin by phone 6391 3816, fax 6391 3922 or email kevin.atkins@agric.nsw.gov.au

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'***Finewool* Outwest**' is compiled and edited by Sue Hatcher.

Inside

Fine wool further out west

Fibre diameter and wool production efficiency

Highlights

The Condobolin Fine Wool Flock—up to industry standards

The new member of the team

FinewoolOutwest

The Newsletter of The Condobolin Fine Wool Project

Volume 1 · Issue 5 · December 2000

The Condobolin Fine Wool Flock

Up to industry standards

When the Condobolin Fine Wool Wether Flock was established by sourcing sheep from CSIRO's Fine Wool Project, we were careful to ensure that the wethers were representative of the performance of each of the 11 bloodlines. Since then, we have strived to manage the flock in as close to 'normal' commercial conditions for the Condobolin area as possible.

So how does the performance of the Condobolin Fine Wool Wether Flock compare to industry?

The performance of the fine (bloodlines 2 , 3 & 4) and medium (6 & 8) bloodlines in the Condobolin Fine Wool Wether flock is very close to the performance of their 'source' bloodlines in the Merino Bloodline Performance package. This indicates that the performance of the wethers at Condobolin ARAS is a good representation of the relative performance being achieved by commercial wool producers using these bloodlines in their flocks.

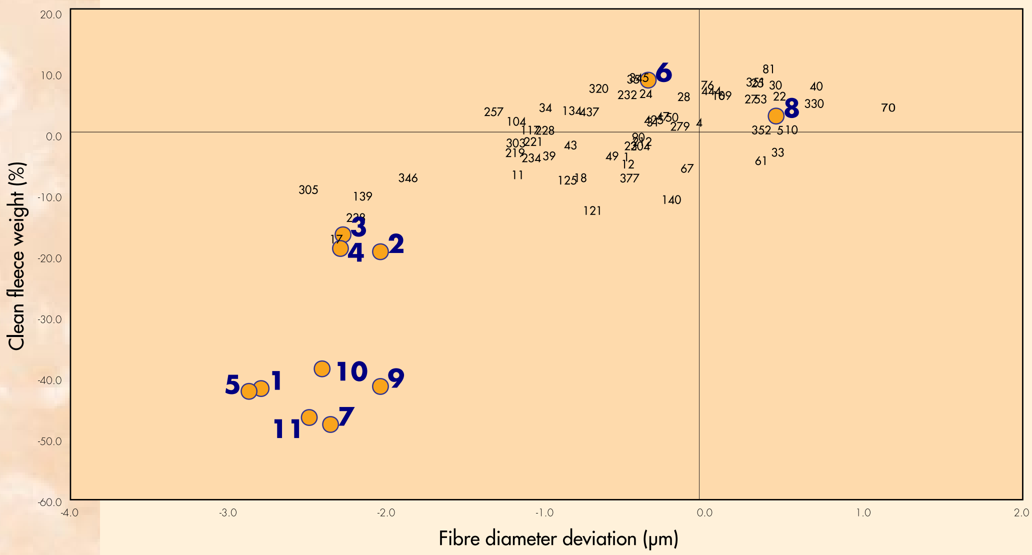

Figure 1. The bloodlines in the Condobolin Fine Wool flock are up to industry standards.

We used the past seven years of shearing and sampling data (fleece weight, fibre diameter, bodyweight, length, strength and style) to benchmark the performance of each of the 11 bloodlines in the Condobolin flock to the latest Australia-wide wether trial results contained in the Merino Bloodline Performance package (Figure 1).

Fine wool further out west

Fine wool wethers shine west of Hay

Fine wool wethers run at Nap Nap Station west of Hay in NSW, have returned more than $10 per head higher wool values than the 'traditional' medium wethers on the station. This on-farm comparison provides further evidence against the belief that fine wools are only suited to tablelands environments.

In response to the low prices received for his 22-24 micron wools, Tony Cullen-Ward at Nap Nap Station decided to investigate the potential to run finer wool type sheep in his western environment.

Wethers in the comparison

In October 1998, 100 wethers were purchased from the Yalgoo Merino Stud at Walcha in northern NSW. These were a random draft from the 1997 drop taken from the commercial section of the Yalgoo flock. These wethers were not castrated rams, nor were they 'selected' from the wether portion of the drop. A 10-15% cull had occurred in this flock to remove the obvious physical and severe wool faults. The wethers were bare shorn at the time of delivery.

At delivery, 100 wethers were randomly drafted from the 1997 drop Nap Nap flock which was based on the Willurah bloodline. This flock had been subjected to a similar culling, removing 10-12%.

The 'comparison mob', comprising the Yalgoo and Willurah wethers were shorn in early March 1999, during the general station shearing. This was the 'even-up' shearing for the comparison and brought the Yalgoo wethers in line with the rest of the Nap Nap flock. The comparison group has been run as one mob from the time of arrival of the Yalgoo wethers to the present.

The Nap Nap environment

Nap Nap Station consists of approximately 36,000 hectares (89,000 acres) and is located approximately 70 km west of Hay in NSW. The soils are predominantly grey clays with vegetation ranging from timbered flooded country to open saltbush and grass plains. Sheep graze the plains country and cattle are run on the timbered river frontage and flooded country.

During the wool growing year from March 1999 to February 2000 there were strong contrasts in feed growth. The break of the season occurred in September 1999, with the period from March until then being particularly tough. However, following a very good spring, the remainder of the wool growing year was especially good.

The comparison mob is obviously much smaller than most of the mobs run on Nap Nap and they have been run separately from the main mobs on the station. However their stocking rate and the country they have been running on is not materially different from that of the rest of the sheep on Nap Nap.

Table 1. Results from the first comparison shearing.

Wool & Fleece Characters	Nap Nap	Yalgoo
Number of wethers at commencement of trial	100	100
Number present at shearing (February 2000)	95	95
Greasy Fleece Weight (kg/hd) (unskirted)	7.03	5.35
Fleece : pieces ratio	78%	73%
Bellies (kg / hd) (Ave 3 X 10 random)	0.42	0.35
Yield % (Sch Dry)	71.5	67.3
Clean Fleece Weight (kg/hd)	5.03	3.60
Fibre Diameter (micron)	24.6	19.9
Staple Length (mm)	98	94
CV% (Length)	16	15
Staple Strength (N/KT)	49	45
Greasy Price (c/kg) 'Spot' #	290	600
Clean Price (c/kg) 'Spot' #	405	892

 # NOTE: The spot prices were those realised at Melbourne sale number 31 on 6 April 2000.

Fine wool further out west

Fine wool wethers shine west of Hay

Results from the first shearing

One of the most important results of this trial to date is that the survival rate of both bloodlines was the same. Of the 100 wethers from each bloodline to commence the trial, 95 of each were present at the February 2000 shearing (Table 1). Despite the tough conditions for the first half of the wool growing year, the fine wool wethers had exactly the same survival rate as their broader wool counterparts. Clearly the 'survivability' of fine wool sheep is not an issue in western environments.

As we would all expect the greasy and clean fleece weights of the fine wool wethers were about 28% lower than those of the broader wool wethers. However when we consider the fleece weight fibre diameter trade-off (see Volume 1 Issue 3 of '***Finewool* Outwest**'), the lower fleece weights of the fine wool wethers were accompanied by an average fibre diameter 4.7 µm finer than that of the broader wethers (19.9 µm versus 24.6 µm).

As a consequence, the price received for the finer wool at auction was more than double that of the broader line (892 c/kg clean versus 405 c/kg clean). On a fleece value per head basis, the Yalgoo wethers made just over $32 compared to just over $20 for the Nap Nap wethers. There was very little difference between the two wether groups in the skirting ratio or other wool characters.

But what of the differences between the two groups in body weight and carcase characteristics? Both groups of wethers were weighed and fat scored off-shears. Interestingly, there was less than 1 kilogram difference between the average of the two groups (Table 2). The fine wool wethers had both a higher fat score and estimated dressing percentage. However, their estimated carcase value was 5c per kilogram less than the medium types. This resulted in a lower estimated carcase value for the fine wool wethers ($12.26 versus $13.08).

It is important to remember that the lower estimated carcase value would be achieved only once in their lifetime, but the difference in wool value per head would be realised annually over the wool growing life of the fine wool wethers.

This article was prepared with the assistance of Ian Evans, NSW Agriculture's Livestock Officer (Sheep & Wool) at Deniliquin with data supplied by Tony Cullen Ward from Nap Nap Station.

Table 2. Bodyweight and carcase characteristics of the comparison mob.

Bodyweight and carcase characteristics	Nap Nap	Yalgoo
Body weight (kg/head)	55.3	54.5
Fat score (approx. 30 wethers per group)	3	4+
Estimated dressing percentage	43	45
Estimated carcase value (c/kg)	55	50
Estimated carcase value ($/head)	**13.08**	**12.26**

Reducing fibre diameter does not affect wool production efficiency

But feed intake may decline

The provision of feed (pasture) is a major cost to the grazing industries. Therefore it was important to determine the genetic relationships between the major wool traits and feed intake. Once these relationships are established, a judgment of any potential benefits to be gained through selecting for feed intake can be made.

Measurements of pasture intake and production traits were conducted on approximately 900 weaners in each of two years from CSIRO's Fine Wool flock at Armidale, and approximately 1200 adult wethers over three years from the Fine Wool flock at Condobolin. All 11 bloodlines were represented in the research.

Differences in feed intake between bloodlines

Bloodline differences in feed intake were largely related to body size, and were consistent between the Armidale and Condobolin groups. That is, the largest animals tended to consume greater amounts of feed with the environment not playing a large part in these differences. In addition, the bloodlines that grew the heaviest fleeces were the most efficient at converting feed into wool.

Genetic relationships between intake and wool characteristics

The heritability of feed intake (or how much feed intake is governed by the animals genes) was relatively low at 0.1 (Table 3). In

Reducing fibre diameter does not affect wool production efficiency

But feed intake may decline

contrast, the efficiency of wool growth (measured in grams of clean wool grown per kilogram of intake) was moderately heritable, although lower than that for wool growth (0.25 versus 0.37). Therefore it is possible to influence both pasture intake and efficiency of wool growth through selective breeding.

But the value of including these traits into a breeding program depends on their relationship with other economically important traits.

There was a very strong genetic relationship (0.84) between wool growth and the efficiency of its production. As a result, selection to increase wool growth will increase the efficiency with which pasture is used for wool growth. Provided that liveweight does not also change, increasing wool production will have little effect on the amount of pasture eaten.

Reducing fibre diameter through selection should have no effect on the efficiency of wool production, although feed intake may decline. Although selecting to increase liveweight is likely to lead to lower intakes per unit of liveweight, the efficiency of wool production would not be expected to change as fleece weight will not change substantially by selecting on liveweight.

Given the strong genetic relationship between wool growth and efficiency, little would be gained by including feed intake as a selection criterion if you already select animals based on fleece weight.

In conclusion, using genetics and selection to increase wool growth through selecting for increased fleece weight will produce animals with improved efficiency of wool production but will have very little effect on intake. Selection for fibre diameter should not affect the efficiency of wool production, although your animals may eat a little less.

This research outlined in this article was conducted by Greg Lee. For more information on genetic variation in feed efficiency and pasture intake, you can contact Greg by phone 02 6391 3851, fax 02 6391 3922 or email greg.lee@agric.nsw.gov.au.

Table 3. Heritabilities (in bold) and genetic correlations of feed intake(DOMI), liveweight, wool growth, wool growth efficiency and fibre diameter.

	DOMI	DOMI/LW	Livewt	Wool growth	Efficiency	Fibre diameter
DOMI	**0.12**					
DOMI/LW	ne	**0.10**				
Liveweight	0.57	-0.29	**0.36**			
Wool growth	-0.02	-0.23	0.24	**0.37**		
Efficiency g/kg DOMI	-0.63	-0.63	0.02	0.84	**0.25**	
Fibre diameter	0.40	0.31	0.20	0.18	-0.03	**0.66**

The new member of the team

Or "Why this issue is a month late!"

A new member of the 'Fine Wool' team finally arrived (a little late!) on the 25th October 2000. Baby Jack weighed in at a very healthy 4kg (or 8lbs 13ozs) and has been thriving ever since. Both of us are adapting well to each other, especially now that Jack sleeps through the night.

I have been on maternity leave since the 6th of October and will be returning to work, Mondays to Wednesdays, in mid-March. In the meantime, if needed, you can contact me using my email address listed at the end of this issue—just be patient if it takes me a while to reply!

For more information...

This is the fifth issue of the '***Finewool* Outwest**' newsletter.

Do you have all five issues?

If not they can be accessed via NSW Agriculture's website (www.agric.nsw.gov.au), or you can contact me (see the contact details below) and I will send you a copy of the ones that you require.

For more information on any of the articles in '***Finewool* Outwest**', please contact:

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FinewoolOutwest

The Newsletter of The Condobolin Fine Wool Project

Volume 2 · Issue 1 · March 2001

High micron premiums for fine wool

History indicates high premiums will continue

The price gap between fine and broad wools is continuing to widen. The 'price gap' first appeared in the wool market in the mid to late 1980's and has continued to increase particularly in the past 5 years (Figure 1).

Micron premiums are an easy way to represent the extra value of finer wool. A micron premium is the percentage improvement in the value of wool resulting from a one micron decrease in average fibre diameter.

The increasing trend has continued in the current market period from 1995 to 2001. The average micron premium for finer wool (ie less than 20 µm) wool is now over 30%.

During the current wool selling season the 21 and finer micron premiums are all above 30 per cent. In fact the micron premium for the 20 micron indicator is over 65%. This means that 19 micron wool is worth 65% more than 20 micron wool.

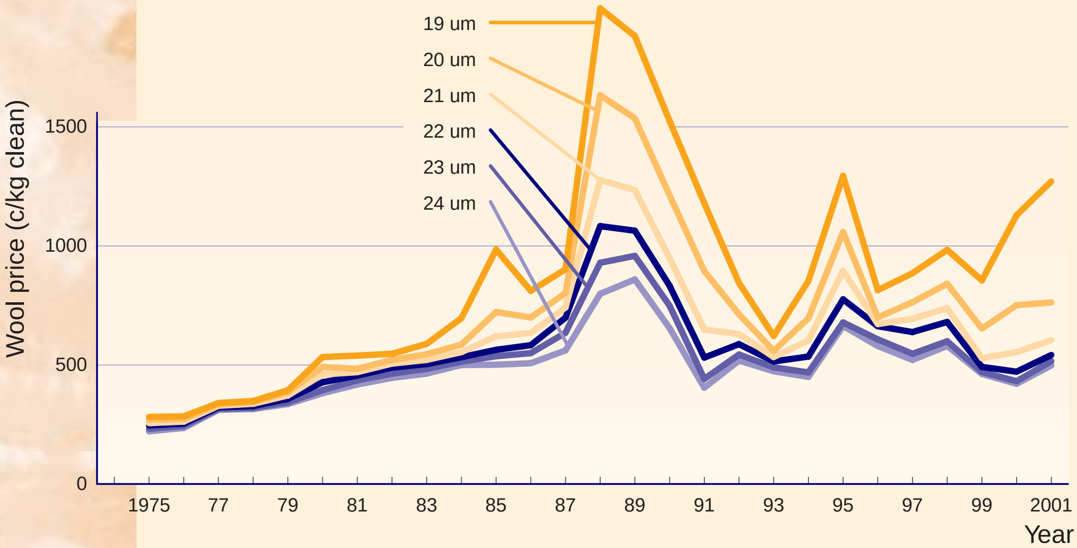

Figure 1. Long term wool prices.

In the late 1970's to early 1980's there was very little variation between the micron premiums for wool of different fineness (Figure 2). The average micron premiums were between 4 and 5%. However this situation changed dramatically in the 10 years from 1985 when the micron premiums for finer wool types began to surge ahead, increasing to over 20%.

NSW Agriculture

High micron premiums for fine wool

History indicates high premiums will continue

These current high micron premiums are being achieved at the same time as the supply of these finer types of wool is also increasing. AWTA's latest Key Test Data Summary shows a 14% increase in the amount of superfine wool tested in the current wool selling season. In fact, increases of more than 10% in the number of superfine bales sampled by AWTA have been occurring yearly since the 1994/95 wool selling season.

So despite the increase in production of fine wool, micron premiums for fine wool continue to increase. Even if a change to a finer bloodline will decrease your fleece weight by say 15 to 20% (and a careful choice of bloodline can reduce diameter with little or not loss of fleece weight), the extra value of the finer wool will continue to generate higher returns.

What are you waiting for?

The quantity of wool tested by AWTA provides an excellent source of information on production trends in the Australian wool industry. You can access AWTA's Key Test Data Report, which is updated monthly, from their website www.awta.com.au

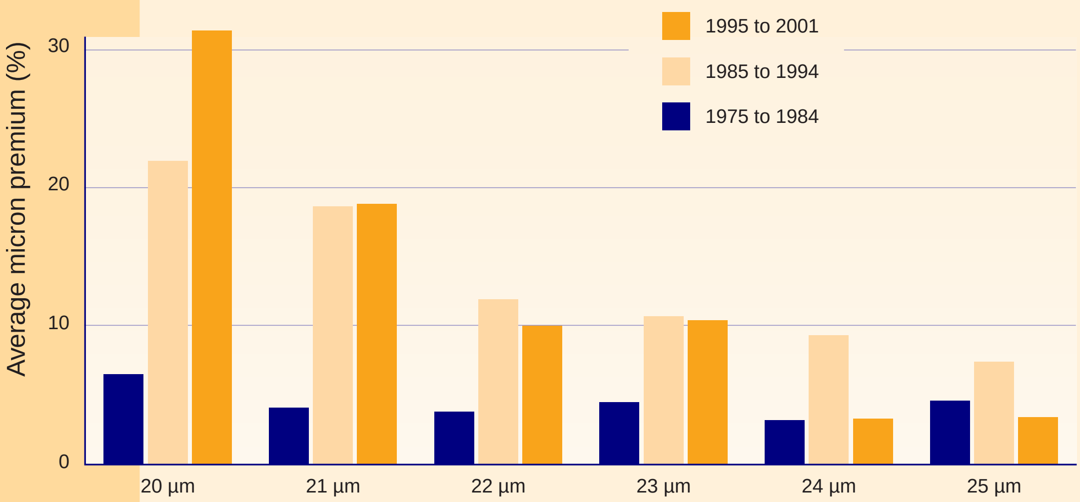

Figure 2. Long term average micron premiums.

Fibre diameter drives ewe flock profitability

Sale of progeny has only a small influence on the profitability of a ewe enterprise

Profit generated by a ewe enterprise is determined both by the value of wool grown by the flock as well as income provided by the sale of surplus progeny, be they ewe or wether lambs, hoggets or cull adults.

The relative profitability of fine wool bloodlines has already been clearly demonstrated by the Australia-wide analysis of wether trials (see *Finewool***Outwest** Vol 1 Issue 1), but wool production from wethers is only part of the big picture when it comes to the profitability of the whole enterprise. Concerns about smaller body size and lower reproductive rates of fine wool bloodlines have stopped some producers from changing to a finer bloodline and restricted the profitability of their flock.

A recent analysis of differences between bloodlines in terms of the profitability of the ewe enterprise has shown that fibre diameter has by far the greatest impact on the profitability of a bloodline for both a ewe and a wether enterprise. Variation between bloodlines in profit from the sale of surplus animals has only a small impact on the profitability of the ewe enterprise.

The analysis used bloodline production levels for clean fleece weight, fibre diameter, style, length colour and tenderness from the most recent Merino Bloodline Comparison. Adult and hogget ewe production levels were estimated from the combined wether trial results using corrections established from other research. Wool market information from 1993 to 1997 was used in all calculations along with lamb and skin values from the same period. Income from sale of wool, cull sheep (both adults and hoggets) as well as enterprise costs were used to calculate gross margins.

Fibre diameter drives ewe flock profitability

Sale of progeny has only a small influence on the profitability of a ewe enterprise

Not surprisingly, the net income from sale of wool was always higher than that generated from the sale of surplus animals (Table 1). Net income from wool sales averaged $13.50 compared with $7.50 from the sale of progeny. The between bloodline variation for wool sales was $8.40, but for progeny it was only $1.40.

Table 1. Sub-enterprise net incomes and enterprise gross margin.*

Sub-enterprise	Performance of bloodlines: Average	Worst	Best	Range
Total wool sales $	**13.50**	**9.40**	**17.80**	**8.40**
Surplus ewe sales $	2.40	2.10	2.70	0.60
Wether lamb sales $	5.10	4.80	5.60	0.80
Total progeny sales $	**7.50**	**6.90**	**8.30**	**1.40**
Enterprise gross margin $	**21.00**	**17.20**	**25.50**	**8.30**

**Sub-enterprise net incomes and enterprise gross margin were calculated for each bloodline by subtracting each sub-enterprise costs from the sub-enterprise income, then dividing this by the DSE rating.*

This clearly indicates that the sale of surplus progeny from a ewe enterprise has only a small impact on the variation in profitability of the ewe enterprise. Fibre diameter remained the single major influencing factor on breeding ewe gross margin as the income and bloodline variation from wool sales was substantially higher than that from progeny sales.

There was a high bloodline gross margin correlation between the ewe enterprise and the wether enterprise (r=0.98). This means that the ranking of the bloodlines based on a ewe enterprise was very similar to the ranking based on a wether enterprise. For the ewe enterprise the variation in bloodline gross margin varied from 20% above the mean to 20% below compared to 30% above and below the mean for the wether enterprise.

The broader diameter bloodlines did have relatively higher incomes from progeny sales as they tended to have both higher bodyweights and estimated reproductive rates. However, these advantages were largely counteracted by the increased DSE of the broader bloodlines due to their higher progeny numbers and energy requirements to sustain the higher bodyweights.

This analysis used prices for both wool and surplus progeny from between 1993 to 1997. During these years the market varied substantially (Figure 3). In general, the income from progeny sales was higher during periods of lower income from wool sales. It was only in mid 1996 (quarter 13) when the profit from wool sales was at its lowest point and profit from progeny sales at its highest that the economic advantage of finer wool bloodlines was reduced.

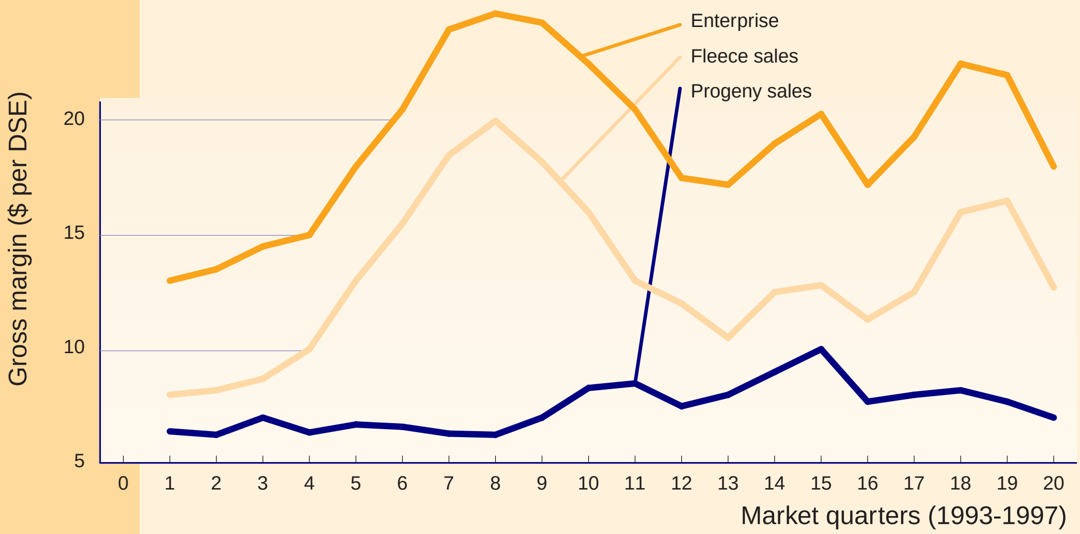

Figure 3. Enterprise gross margins for the 20 quarters between 1993 and 1997.

Fibre diameter drives ewe flock profitability

Sale of progeny has only a small influence on the profitability of a ewe enterprise

Since 1995 the micron premiums for fine wool have continued to increase (Figure 2), therefore the economic advantage of the finer bloodlines for a ewe enterprise is likely to be higher, despite the current strength of the lamb market.

Interestingly, the gross margins for the ewe enterprises indicated a further advantage for the fine wool bloodlines in terms of the sale of hogget wool. The high micron premiums for fine wool will result in the value of hogget wool from the fine wool bloodlines being much greater than that from the hoggets of broad wool bloodlines.

In this analysis, the income from the sale of cull animals did not vary between bloodlines. This was only estimated in order to calculate the overall enterprise gross margin. It is likely that the sale price of cull ewes and surplus ewe hoggets would be higher for the fine wool bloodlines or the most well known bloodlines. In fact, fine wool ewes are currently attracting high prices at sheep sales across Australia.

In conclusion, fine wool bloodlines are clearly more profitable than broader bloodlines regardless of whether a ewe or wether enterprise is being considered. Fibre diameter has by far the greatest impact on the profitability of a bloodline for both a ewe enterprise and a wether enterprise.

This analysis has also shown that commercial producers running a ewe enterprise can look at the ranking of a bloodline in the Merino Bloodline Comparison package, which is based on a wether enterprise, and know that the ranking will be very similar for a ewe enterprise.

A commercial wool producer running a self replacing ewe enterprise and looking to make a bloodline change, should select a few suitable bloodlines from the Merino Bloodline Performance package, then run an on-farm bloodline comparison to determine differences in weaner body weights and reproductive rates. However, it is important to remember that large differences in reproduction rate would be required to have a substantial effect on the relative value of such bloodlines

This analysis was conducted by Kathy Coelli and Kevin Atkins. For further information, please contact Kevin by phone 6391 3816, fax 6391 3922 or email kevin.atkins@agric.nsw.gov.au

Introducing Craig...

Craig Lyons is the newest member of the Fine Wool Project team. Craig is NSW Agriculture's new Livestock Officer (Sheep and Wool) for the greater Condobolin District. As an Extension Officer it will be Craig's role to provide information to farmers and the wider community on matters that relate to sheep and wool. Craig will be able to facilitate workshops, presentations and seminars to pass on the latest research from the Fine Wool Project as well as other wool research and extension activities undertaken by the Department.

Craig grew up on a small property near Bungendore. After leaving school, he joined the Army under the Ready Reserve scheme as an Infantry Soldier. Craig went to the University Western Sydney Hawkesbury and completed a Combined degree in Applied Science (Systems Agriculture)/ Commerce (Marketing) in November 2000. Craig has family in the Central West at Euchareena, Molong, and Eugowra.

Craig looks forward to meeting with as many producers as possible in the near future. He is very keen to hear producers experiences (both good and bad) in fining up their clip. You can contact Craig at Condobolin Agricultural Research & Advisory Station by phone 02 6895 1025, fax 02 6895 2688 or email craig.lyons@agric.nsw.gov.au

For more information...

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'*Finewool***Outwest**' is compiled and edited by Sue Hatcher. The design and layout is by Belinda Gersbach

Highlights

A finer NSW wool clip

FinewoolOutwest

The Newsletter of The Condobolin Fine Wool Project

Volume 2 · Issue 2 · June 2001

A finer NSW wool clip

Reducing fibre diameter in response to consumer demands

The average fibre diameter of the NSW wool clip has decreased by 1.3 µm over the past 12 wool selling seasons. In 1988/89 the average fibre diameter of NSW Merino fleece wool was 22.8 µm. By the end of the 1999/00 season it had fallen to 21.5 µm. On an annual basis, the NSW clip is getting finer by more than 0.14 µm per year.

These statistics are the result of a recent analysis of production changes in the NSW wool clip. The analysis tracked both the average fibre diameter and weight of all sale lots of Merino fleece wool grown in NSW over the past 12 wool selling seasons regardless of where they were sold. The results clearly demonstrate that most NSW wool producers are responding to market signals from both consumers of wool and the wool processing sector to fine up their wool clips.

Table 1. Changes in the composition of the NSW wool clip from the 88/89 to 99/00 seasons.

	Superfine ≤18.5 µm	Fine 18.6–20.5 µm	Medium 20.6–22.5 µm	Broad 22.6–24.5 µm	Coarse ≥24.6 µm
1988/89	0.5 %	8.5 %	34.6 %	40.3 %	16.0 %
1999/00	6.6 %	21.4 %	38.0 %	28.0 %	5.9 %
% Change	↑ **6**	↑ **13**	↑ **3**	↓ **12**	↓ **10**

Average Wool Fibre Diameter Change per year 88/89 to 99/00

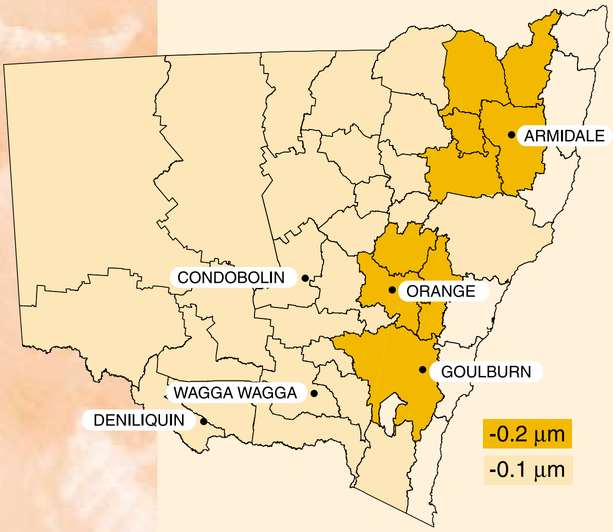

Figure 1. The tablelands are decreasing their average fibre diameter faster than other areas of NSW.

During 1988/89 less than half of one per cent of the NSW clip was classified as superfine (less than 18.5 µm). By 1999/00 this had increased by more than 6 per cent to 6.6 per cent of all Merino fleece wool grown in NSW (Table 1). At the same time the proportion of fine and medium wool increased by 13 and 3 per cent respectively while the proportion of broad and coarse wool fell by 12 and 10 per cent in turn.

The amount of change in fibre diameter over the past 12 years varied significantly throughout NSW. The tablelands, northern, central and southern, are reducing their fibre diameter at a faster rate than the rest of the state (Figure 1). These areas (WSAs N02 to N06, N17 to N19 and N23) are decreasing their average fibre diameter by 0.2 µm per year compared to 0.1 µm per year for the rest of the state.

In addition these WSAs started from a lower fibre diameter (Figure 2). In other words, the finer wool growing areas of the state are getting finer at a faster rate that the rest of the state.

NSW Agriculture

A finer NSW wool clip

Reducing fibre diameter in response to consumer demands

In WSA N03 for example, the percentage of superfine wool is increasing by more than 4 per cent per year. In 1988/89 only 2.9 per cent of wool grown in N03 was classified as superfine. At the end of the 1999/00 season more than 38 per cent of Merino fleece wool grown in N03 was superfine and more than 46 per cent was classified as fine (18.6 - 20.5 µm). Clearly, even growers in the 'traditional' fine wool production areas of NSW are recognising the need to fine their wool clips further.

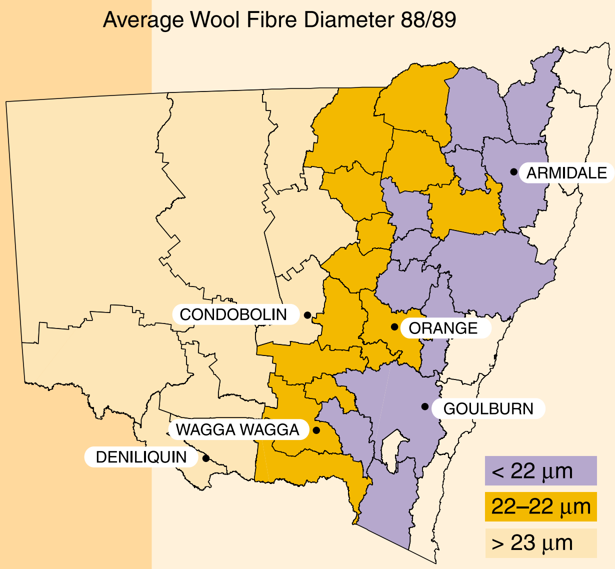

Figure 2. The finer areas of NSW are getting finer at a faster rate than the rest of NSW.

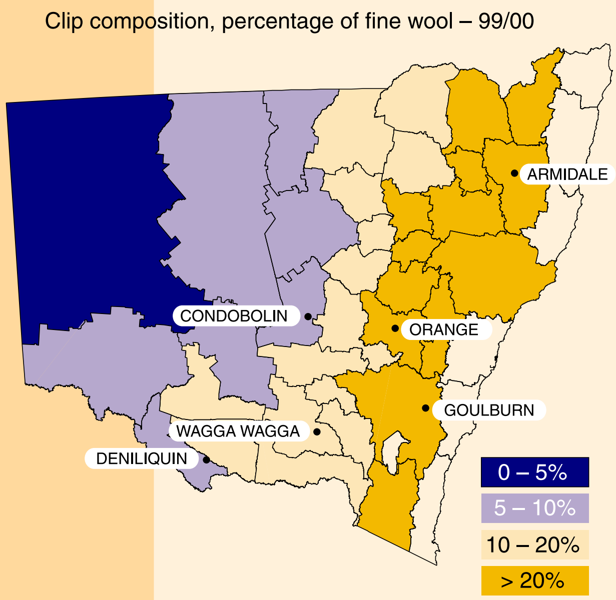

Figure 3. The sheep cereal zone of NSW is also fining up their clip.

But, importantly change is also occurring in many 'non-traditional' fine wool areas of NSW. Throughout the sheep cereal zone the amount of fine wool grown each year is increasing by up to 2 per cent per year. In these areas the percentage of fine wool ranges from 11 to nearly 20 per cent (Figure 3). This is in contrast to levels of generally less than 5 per cent 12 years ago.

The Condobolin region (N35) is a good example of this change. In 1988/89 the average fibre diameter of Merino fleece wool grown in N35 was 23.1 µm. By 1999/00 this had decreased by nearly one micron to 22.3 µm. This change was largely the result of a 6.6 per cent increase in the proportion of fine wool and a 17.6 per cent increase in medium wool production. At the same time there was a 14.7 and nearly 10 per cent decrease in broad and coarse wool production respectively.

Both the Riverina and Western region of NSW continue to produce the state's broadest wool and are reducing their average fibre diameter at a slower rate that the rest of the state. The changes in these two large regions of the state seem to be confined to reducing the proportion of coarse wool (≥ 24.6 µm) rather than any concerted effort to increase fine wool production.

Why is the fibre diameter change slower in the Riverina and Western region? What factors are hindering a change to finer wool production? Are industry beliefs regarding survival, wool production and quality of fine wool sheep in 'non-traditional' fine wool areas continuing to restrict the use of fine wool genotypes in these areas? Are sheep in these areas producing enough fleece weight to offset the high micron premiums for fine wools? Are stocking rates and returns per hectare or per head influencing factors?

These questions need to be answered in order to ensure that the profitability of wool production in these regions of the state is maximised.

At Nap Nap the wethers are fine

Fine wools again on top out west

Fine wool wethers in their second year at Nap Nap Station west of Hay in NSW, have returned nearly $14 per head higher wool value than the 'traditional' medium wethers on the station. The second year of data from this on-property evaluation further proves that fine wool sheep can survive and grow quality wool in western environments.

Data from the second shearing of the trial mob showed little difference in the survival rate of the two bloodlines. Of the 95 wethers present at shearing in February 2000, 93 of the medium wool and 92 of the fine wool wethers were present at the 2001 muster (Table 2). This again demonstrates that fine wool sheep can survive in western environments.

Table 2. Results from the second comparison shearing.

Wool and Fleece Characters	Nap Nap	Yalgoo
Number present at 2000 shearing	95	95
Number present at 2001 shearing	93	92
Greasy Fleece Weight (kg/hd) (unskirted)	7.23	5.14
Fleece : pieces ratio	85%	86%
Bellies (kg / hd) (all bellies were weighed)	0.32	0.31
Yield % (Sch Dry)	76.6	70.7
Clean Fleece Weight (kg/hd)	5.54	3.63
Fibre Diameter (micron)	24.7	19.5
Staple Length (mm)	108	92
CV% (Length)	13	13
Staple Strength (N/KT)	45	41
Greasy Price (c / kg) 'Spot' #	463	761
Clean Price (c / kg) 'Spot' #	604	1076

 # NOTE: The spot prices were those realised at Melbourne sale number 32 on 5 April 2001.

Table 3. Bodyweight and carcase characteristics of the comparison mob.

Bodyweight and carcase characteristics	Nap Nap	Yalgoo
Body weight (kg / head)	55.9	53.7
Fat score (approx. 30 wethers per group)	3 +	4 -
Estimated dressing percentage	44 %	44 %
Estimated carcase value (c/kg)	160	152
Estimated carcase value ($/head)	$ 39.33	$ 35.89

As occurred in the first year of the trial (see Volume 1 Issue 5 of '*Finewool***Outwest**'), the wool production (both greasy and clean) of the fine wool sheep was about 30 per cent lower than that of the local wethers. But the lower production level was more than compensated for by the fibre diameter of the fine wool wethers which was 5.2 µm finer than the local sheep (19.5 µm versus 24.7 µm).

As a result of the 5 µm difference in fibre diameter, the price realized by the finer wool at auction was more than one and a half times higher than that of the broader line (1,076 c/kg clean versus 604 c/kg clean). On a fleece value per head basis, the Yalgoo wethers made over $33 compared to just over $28 for the Nap Nap wethers. There was very little difference between the two groups in the skirting ratio or other wool characters.

This year the fine wool wethers were just over 2 kg lighter than the local wethers when weighted off-shears (Table 3). The fine wool wethers again had a slightly higher fat score but this year there was no difference between the two groups in dressing percentage. The estimated carcase value for the Yalgoo wethers was 8c per kilogram less than the Nap Nap wethers which produced a lower estimated carcase value per head for the fine wool wethers ($35.89 versus $39.33).

The entire trial mob were sold direct to live export on-farm. There was no difference between the fine and medium wethers in the actual dollars per head at disposal with $40 paid for all animals in the mob.

Over the two years of the trial at Nap Nap., the gross value per head of the fine wool wethers was $22.65 higher than that of the medium wethers. The fine wool wethers grossed $114.66 per head compared to the medium wethers, which grossed $92.01. The gross value included fleece, pieces and bellies values from the 200 and 2001 shearing and the price paid at disposal.

At Nap Nap the wethers are fine

Fine wools again on top out west

It is clear from this on-farm comparison that over the two years of the trial, the fine wool wethers were more profitable than the medium wool types traditionally run at Nap Nap.

A mob of fine wool ewes is now in place at Nap Nap Station. The performance of this flock will be compared to the existing medium wool bloodline over the next few seasons. The comparison will include reproduction and growth as well as wool quality.

This article was prepared with the assistance of Ian Evans, NSW Agriculture's Livestock Officer (Sheep & Wool) at Deniliquin with data supplied by Tony Cullen Ward from Nap Nap Station.

Fibre diameter, clean fleece weight and style

Using a selection index will not adversely affect style

What happens to wool style when index selection is used to change fibre diameter and fleece weight? Early results from the Trangie QPLU$ project suggest that the use of index selection to change fibre diameter and fleece weight will have little effect on the style of the wool.

But what does the term 'style' refer to? For Merino combing fleece wools, style is currently determined by the subjective appraisal of a number of characteristics which describe the visual and tactile properties of greasy wool. These include crimp definition and uniformity, staple tip weathering and tip length, dust penetration and greasy colour.

Genetic correlations between average fibre diameter and clean fleece weight and various style traits, indicate just how the components of wool style change when index selection is used to improve fibre diameter and fleece weight.

Table 4. Relationships between style traits and fibre diameter and clean fleece weight.

	Fibre diameter		**Clean fleece weight**	
Tip length	0.41	✔	0.02	
Tip weathering	0.26	✔	-0.56	✔
Crimp frequency	-0.44	✗	-0.53	✔
Crimp irregularity	-0.50	✗	-0.21	✔
Dust penetration	0.39	✔	-0.10	✔
Yellowness	-0.09	✗	-0.33	✔

✔ indicates a favourable association, ✗ unfavourable

Using an index to reduce average fibre diameter will, on average tend to increase crimp frequency and irregularity, reduce tip length, tip weathering and dust penetration (Table 4). Only a small change in yellowness would be expected.

In contrast, all of the style traits were favourably and quite strongly associated with clean fleece weight. This means that selection to improve clean fleece weight will produce improvements in all of the style traits. The one exception is tip length, which would not be expected to change.

Importantly, the associations summarised in the table are based on associations with fibre diameter and clean fleece weight individually. The unfavourable associations between average fibre diameter and some of the style traits will be reduced in breeding programs which have the objective of reducing fibre diameter while maintaining or increasing fleece weight. A selection index, which places emphasis on both fibre diameter and clean fleece weight will achieve this objective. This type of breeding objective will increase the profitability of your flock.

For more information on the Trangie QPLU$ project please contact Alex Russell by phone 6880 8049, fax 6888 7201 or email alexander.russell@agric.nsw.gov.au

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Finewool Outwest

The Newsletter of The Condobolin Fine Wool Project

Volume 2 · Issue 3 · September 2001

Sheep coats

A management tool to economically improve the style of western fine wool

Sheep coats can be successfully used to improve the style of wool in western environments. A 12–month trial of sheep coats at Condobolin produced an improvement in wool style of about one style grade, which was largely the result of the coated wool being whiter with less tip weathering and a low level of dust penetration.

In addition the increase in the value of the coated superfine and fine wool was enough to compensate for the additional costs associated with coating the sheep. However, despite the sheep coats improving the quality of the fleeces of the medium wool sheep, it was not economically viable to coat the medium wool bloodlines.

Sheep coats and wool production

Coating sheep did not increase the amount of clean wool grown per head. There was no difference between the coated and control sheep in clean fleece weight. Although the greasy fleece weights of the coated wethers were about 0.2 kg less than the control group, this difference was more than offset by the coated sheep having 4% higher yields across the flock.

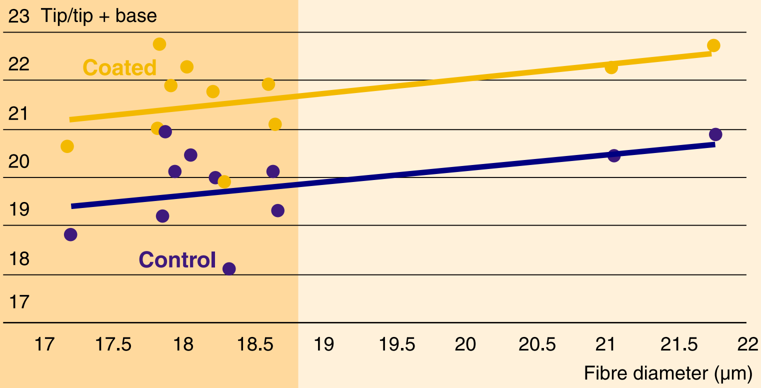

Figure 1: The staple tips of the coated sheep were less weathered.

The coated wethers also had slightly longer staple lengths than the uncoated sheep (87 versus 83 μm), however this was a result of the sheep coats protecting the fleece from the effects of the environment rather than any increase in wool production.

We put dyebands in the fleece of the sheep at Condobolin specifically to look at the effect of weathering on the fleece. We found that the staple tip as a proportion of the total staple length of the coated sheep was nearly 2% greater than the uncoated sheep, indicating less weathering of the staple tip of the fleece grown under the coats (Figure 1).

Sheep coats and wool quality

Sheep coats improved the style of the coated wool by about one style grade (Figure 2). The fleeces of the coated sheep tended to be in the range of MF3 to MF4 or spinners to best topmaking compared with the control sheep, whose fleeces were in the range of MF4 to MF5 (best to good topmaking).

The coated sheep had fleeces which were whiter, with thinner 'pencil-like' staples and less dust penetration. Dust penetrated 18% further into the fleeces of the control group when compared to the coated sheep (Figure 3). The difference in dust penetration between the two groups was not as large as we expected. The coated sheep themselves contained a reasonable proportion of dust in the staple tips.

This was the result of our inability to dip and hence coat the wethers in the trial until mid-October due to problems experienced

NSW Agriculture

Sheep coats

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with the water supply to the dip at Condobolin. This was nearly 8 weeks post-shearing. By this time the wethers in the coated treatment group had already been exposed to some degree of dust contamination and tip weathering. Coating the sheep immediately post shearing would have lead to less dust penetration and tip weathering in the coated group and perhaps even greater improvements in style.

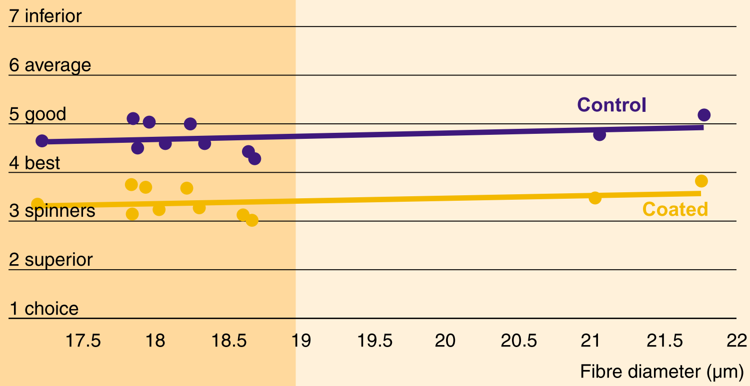

Figure 2: Sheep coats improved style by about one style grade.

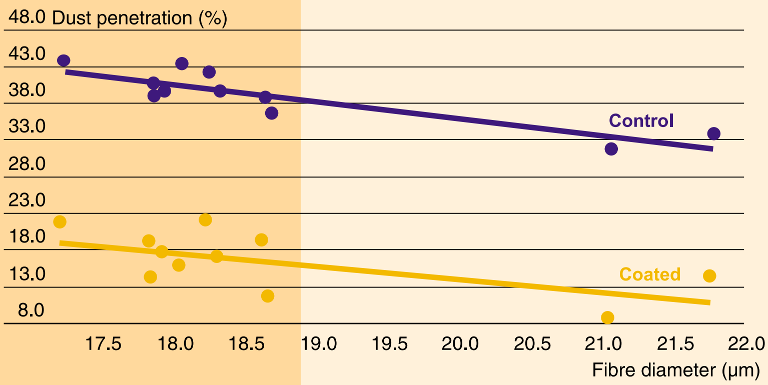

Figure 3: The fleeces of the coated sheep were less dusty.

There was no difference between the coated and uncoated wethers in fibre diameter, staple strength or resistance to compression. Comparison of the vegetable matter level from the coated versus uncoated sale lots indicated that the coated lines had about 0.5% less vegetable matter contamination than the uncoated lines.

The economics of using sheep coats

The cost of coating the wethers at Condobolin was $3.03 per head. This included the initial cost of the coat (which was halved as the coats could be used for two years), the labour cost of mustering, fitting and removal of the coats as well as four checks of the coated sheep during the year.

Wool prices from the last two wool selling seasons (1999/00 and 2000/01) were used to value the wool from this trial. Averaged across the 11 bloodlines in the flock, the fleece of the coated wethers would have received 1,508 c/kg clean compared with 1,409 c/kg clean for the control group. This represents a difference of 98 c/kg clean. When the fleece weights of the wethers were considered, the coated sheep would have yielded $50.83/head compared with $47.12/head for the uncoated wethers, a difference of $3.71 per head.

Grouping the bloodlines into their micron categories makes it clear that the benefits of coating wool were greater for the finer bloodlines (Table 1). Despite the sheep coats improving the quality of the fleeces of the medium wool sheep, it was not economically viable to coat the medium wool bloodlines. The extra value of the medium wool fleeces was not enough to counteract the additional costs of coating.

Most importantly, a sensitivity analysis in which the wool prices were increased and decreased by both 10 and 20% found that the returns from coating superfine and fine bloodlines were always enough to compensate for the additional costs associated with coating the sheep (Table 2). In contrast, the cost of coating the medium bloodlines was always greater than any benefit received from coating.

What else did we discover?

At Condobolin there was no significant difference between the coated and uncoated sheep in weight gain over the 12-month period nor in the incidence of flystrike or fleece rot. Of the small number of incidences of flystrike occurring in the coated sheep at Condobolin none of sites of the initial strike were under the coats, the initial strike site tended to be around the pizzle of the wethers.

Regular monitoring of coated animals was necessary as fly strikes could be initiated on the rear legs where the elasticised edges and rear legs band may chaff the skin and/or cott the wool. This was the case with the medium wool wethers wearing coats at Condobolin. The medium wool wethers were the largest animals in the trial in terms of body size and they also grew the heaviest fleeces.

These two factors combined to make this group of sheep particularly susceptible to the leg straps of the coats chafing and even cutting into the skin around the hind legs. Increased management of coated sheep in the form of periodic checks of coat fitting is required, particularly if the coated sheep are growing in size throughout the time they are wearing coats.

Table 1. The differences in clean price and wool value were greater for the finer bloodlines.

	Superfine	Fine	Medium
Clean price (c/kg clean)			
Uncoated	1,678	1,445	550
Coated	1,816	1,521	564
Difference	**138**	**76**	**14**
Wool value ($/hd)			
Uncoated	48.22	57.44	28.37
Coated	52.50	61.46	29.90
Difference	**4.28**	**4.02**	**1.54**

Table 2: Coating superfine and fine bloodlines compensated for the cost involved.

Sensitivity of wool value per head to changing wool prices

%	-20	-10	actual	10	20
Superfine	3.42	3.85	4.28	4.71	5.14
Fine	3.22	3.62	4.02	4.42	4.82
Medium	1.23	1.39	1.54	1.69	1.85

What does this mean for wool producers

It is important to realise that the effect of sheep coats on the quality of the fleece will vary from season to season. More severe environments or seasonal conditions than those at Condobolin between August 1998 and August 1999 would produce different degrees of damage to the fleece, from either direct UV damage or abrasion of individual wool fibres both within and between staples by dust and vegetable matter contaminants.

Strategic coating of the sheep during times of high potential for fleece weathering and dust and vegetable matter contamination, such as the summer autumn periods, may be a viable option for producers. If for example, coating sheep for shorter periods of time had the same impact in terms of wool quality as coating for the entire 12–month period the need for periodic checks of the coated animals would be reduced. This would reduce the labour required to monitor coated sheep and also reduce the cost of the coats themselves by reducing wear and tear and extending their useful life.

Strategic coating of sheep for various times after shearing has been the subject of a second trial of sheep coats at Condobolin. The results will be included in a future edition of '*Finewool* **Outwest**'.

The economic calculations in this study were all made on a per head basis. Depending upon the size of the mob of sheep being coated significant savings could be made as a result of economies of scale. For instance it may be possible to negotiate discounts for the purchase of a large number of sheep coats and the cost of mustering would be spread over a larger number of animals thus reducing the per head cost.

Coating larger numbers of sheep would also lead to the development of more efficient methods of fitting and removal of coats, thus reducing the time and labour inputs required. At Condobolin we tried a number of methods of fitting and removal of coats. These included the use of a VE machine sheep handler and simply filling a race and fitting coats while moving through the race. The latter method proved the most effective under our conditions.

The finding that sheep coats seemed to provide a physical barrier which prevents flystrike may reduce, or even completely remove, the need to use chemicals to prevent flystrike on coated sheep. This would provide opportunities to reduce the costs associated with coating sheep and may even provide producers with an opportunity to market their coated lines of wool as 'chemical free'.

Conclusion

- Sheep coats can be used economically to improve the style of fine wool grown in western environments.

Sheep coats

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- Both the wool quality and economic benefits of using coats will depend on the environment in which the sheep are run and the prevailing seasonal conditions.
- Sheep coats can be an effective management tool to add value to a proportion of a sheep flock in conjunction with other activities such as fleece testing. For example, identification of the finest portion of a flock, drafting this group of sheep off the main mob, coating them and running them separately is likely to lead to improved returns for wool producers.

The end of an era at Condobolin

An opportunity for more on-farm comparisons

An era ends

In mid-September the research activities associated with the Condobolin Fine Wool Project were wound up. This decision was the result of on-going problems with the resourcing of the breeding flock at Condobolin, which were unable to be resolved.

Although coming to a disappointing end, the 10 years of fine wool research at Condobolin ARAS, has been highly successful and has captured the imagination of many wool producers Australia-wide. We now know that the environment is not a barrier to fine wool production and that quality fine wool can be profitably grown in western environments.

The success of the Condobolin Fine Wool Project owes much to the efforts of the various research and technical staff associated with the project since the early 1990's. The dedication, enthusiasm and participation the Merino Breeding Group (Kevin Atkins, Allan Casey, Kathy Coelli, Kelly Lees, Anne Ramsay and Steve Semple) as well as CSIRO Staff (Lindsay Brash, Dick Farrell, Ian Purvis, Andrew Swan and Grant Uphill) have made the work of sampling and shearing enjoyable.

In particular both Laurie Barwick and Kevin Thornberry have made outstanding contributions to management and data collection of the flock despite at times some rather difficult circumstances.

An opportunity

The focus of the fine wool in non-traditional environments research will now move to on-farm breeding flock comparisons. Two of these are now under way, one at Hay and the other at Wentworth in western NSW. Moving to on-farm comparisons will allow us to include the data in the national Merino Bloodline Comparisons analysis as well as investigate the performance of fine wool sheep in a wider range of non-traditional environments.

If you are interested in running an on-farm comparison, please contact me for further information.

For more information...

For more information on any of the articles in '*Finewool***Outwest**', please contact:

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'*Finewool***Outwest**' is compiled and edited by Sue Hatcher. The design and layout is by Belinda Gersbach

Inside

Fine wools performing well north west of Bourke

Highlights

Managing fine wool for maximum returns

Finewool Outwest

The Newsletter of The Condobolin Fine Wool Project

Volume 2 · Issue 4 · December 2001

Managing fine wool for maximum returns

Controlled grazing is the key to increase fleece value

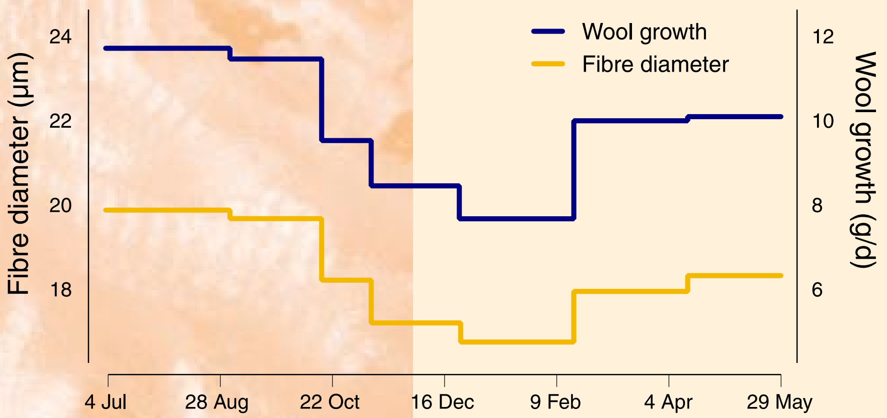

Figure 1: Fibre diameter changes with differing rates of wool growth.

Wool producers can increase fleece value by controlling the wool growth of fine wool sheep when pasture availability and quality are at their highest. The key is to reduce fibre diameter when most of the wool is produced. This allows the additional value of the finer fibre to more than offset any loss in fleece weight — depending of course on the micron premiums for fine wool.

The link between grazing, wool growth and fibre diameter is simple. Pasture conditions vary greatly in both availability and quality throughout the year. This affects the amount of pasture eaten by the sheep and hence the amount of wool each sheep grows. In times of high availability of good quality pasture, sheep tend to eat more which increases their rate of wool growth.

Differences in the rate of wool growth are caused by variation in the volume of fibres. So in times of abundant availability of good quality pasture, sheep will tend to grow broader and longer fibres (Figure 1).

Any increase in fibre diameter associated with an increase in wool growth rate has a negative impact on the value of the fleece. The extent of the impact depends on the price differences between points of a micron and the effect on the overall annual fibre diameter. For this reason, controlling wool growth through grazing management can affect fleece value.

Therefore, instead of managing grazing to maximise fleece weight, fine wool producers need to be controlling wool growth during the pasture's peak production period (ie in winter and spring) to maximise the value of the fleece.

Lets look at four case studies that clearly demonstrate the implications of using grazing management to control fibre diameter.

Case study 1 (Figure 2)

Wool growth for about a third of the year has a median fibre diameter of 19 µm. However for 100 days a year (during spring) wool growth is higher and fibre diameter increases by 10%. Wool growth during late summer and autumn period is lower for 100 days, producing a fibre diameter 10% lower.

Case study 2 (Figure 3)

Grazing management is used to eliminate the trough period of wool growth (ie when fibre diameter is at its lowest).

Case study 3 (Figure 4)

Grazing management is used to eliminate the peak period of wool growth (ie when fibre diameter is at its broadest).

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Case study 4 (Figure 5)

Grazing management ensures that wool growth is uniform throughout the year, eliminating both the trough and peak periods of wool growth.

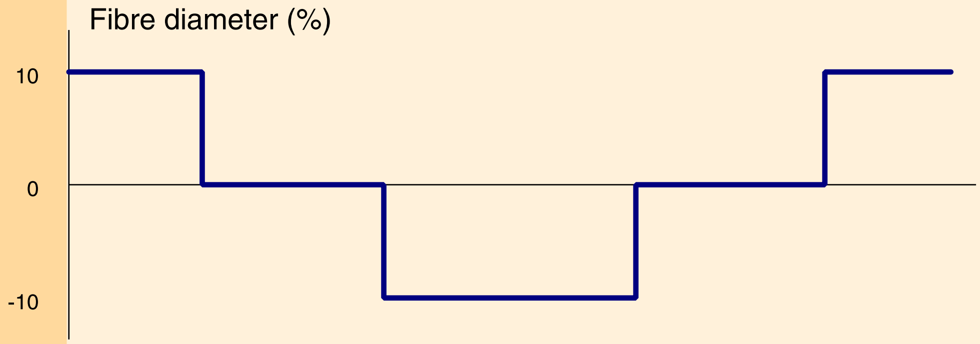

Figure 2: The normal annual pattern of fibre diameter with peaks and troughs.

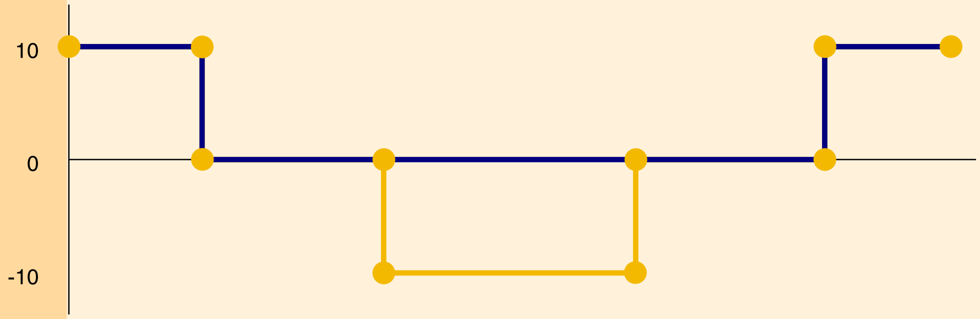

Figure 3: The period of both minimum wool growth and fibre diameter are removed.

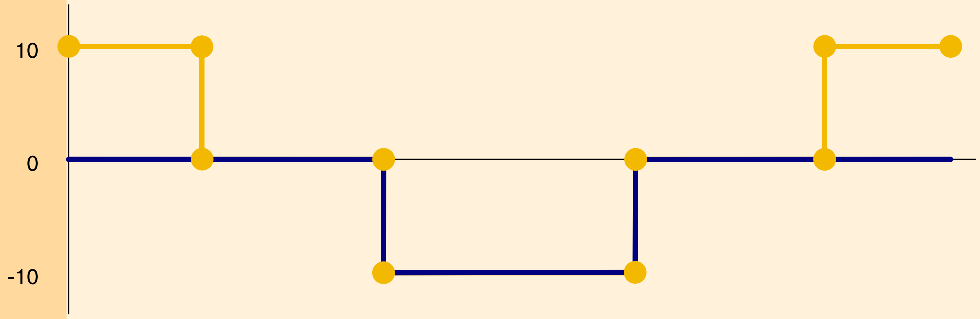

Figure 4: The periods of peak wool growth and maximum fibre diameter are removed.

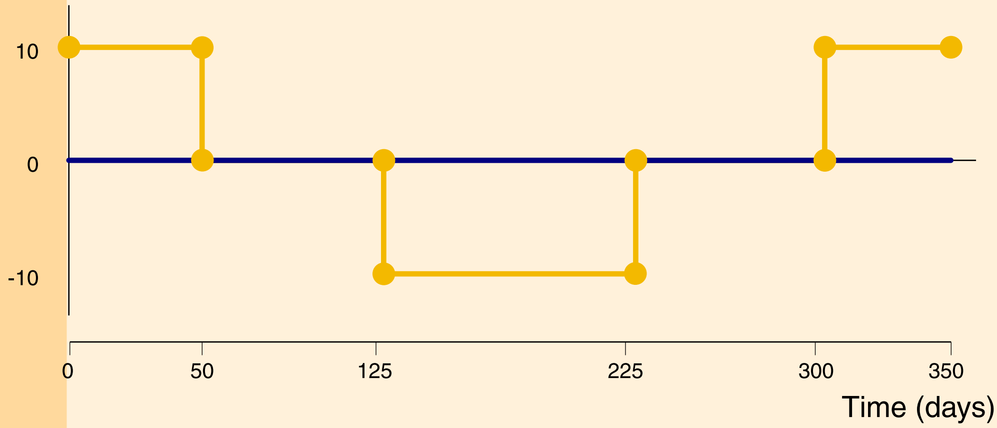

Figure 5: Wool growth and fibre diameter are kept constant (the trough and peak are removed).

Managing fine wool for maximum returns

Controlled grazing is the key to increase fleece value

The annual fleece weight and median fibre diameter of the fleece for each of the four case studies is shown in Table 1. The data in this table is based on changes in a fleece with a median fibre diameter of 19 µm. The table clearly demonstrates the extent to which fleece volume within each of the growth periods throughout the year determines the weight and fibre diameter of the fleece.

Table 1: Clean fleece weight and its median fibre diameter as affected by the pattern of wool growth of fine wool sheep (median fibre diameter of 19 µm).

Case study	**1** Normal	**2** Eliminate trough	**3** Eliminate peak	**4** Uniform
Clean fleece weight (kg)	3.36	3.60	3.06	3.30
Fibre diameter (µm)	19.1	19.6	18.5	19.0
Fleece value ($/hd)	28.51	27.28	31.89	28.98
% in fleece value	–	-4.3	11.9	1.7

Note: The fleece values were calculated using the average AWEX indices for October of the 2000–01 selling season.

Reducing fibre diameter by limiting wool growth during the spring season (Case Study 3) increased the value of the fleece by 12%, even though the fleece weight was 9% less than the normal situation of Case Study 1. This was due to this wool being 0.6 µm finer.

Maintaining a uniform pattern of wool growth throughout the year (Case Study 4) had little effect on fleece value. While eliminating the trough (Case Study 2) increased both the median fibre diameter and fleece weight of the annual fleece but reduced fleece value.

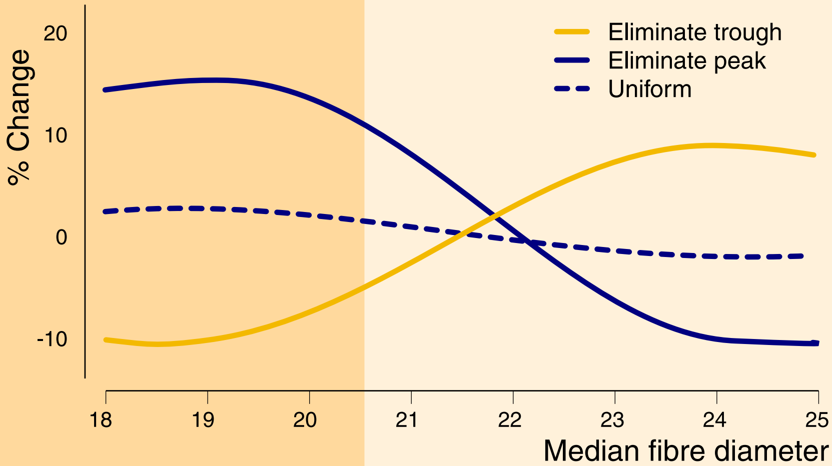

Figure 6: The economic sensitivity of grazing options to medium fibre diameter (2000–01 wool selling season).

As reducing the variation in fibre diameter along the fibre increases staple strength. Using grazing management to increase fleece value has the added benefit of increasing staple strength through minimising variation in fibre diameter along the fibre and preventing the minimum fibre diameter from being extremely low.

The data in the above case studies was determined using a 19 µm fleece. Do these results hold for other fibre diameters? The change in fleece value for Case Studies 2 to 4 were calculated for a range of fibre diameters from 18 µm to 25 µm (Figure 6).

Where there is a significant premium for fibre diameter, such as that for wool finer than 19.5 µm, the increase in wool value more than offsets the reduction in fleece weight associated with eliminating the peak in wool growth. While for wools 20 µm and broader, the return per head was largely driven by the fleece weight rather than fibre diameter.

These relationships will change with differences in micron premiums for fine wool.

What is the bottom line?

Grazing management to eliminate the peak in wool growth occurring when pasture availability and quality are both high can significantly improve the fleece value of fine wool. An added benefit is increased staple strength.

However it is important to recognise that grazing management systems to manage wool quality will be more complex than set stocking. An ability to assess herbage (both availability and quality) as well as animal performance will be essential, as will recognition of the dynamics of the system (including plant recovery and maintenance of the botanical composition).

A great deal of flexibility will be required in any successful grazing system to manage wool quality to accommodate climatic variation and its consequences on the pasture. There will be circumstances where increasing stocking rates could have a negative impact on aspects of livestock health.

Managing fine wool for maximum returns

Controlled grazing is the key to increase fleece value

Wool producers can develop a better understanding of how to control pasture intake to regulate growth through participating in NSW Agriculture's PROGRAZE workshops. These workshops also show producers how to optimise production using pasture and animal assessment skills to make the most of grazing management. To participate in a PROGRAZE workshop, contact your local NSW Agriculture office.

Greg Lee carried out the research on which this article was based. For more information on using grazing management to increase fleece value, you can contact Greg by phone 02 6391 3851, fax 02 6391 3922 or email greg.lee@agric.nsw.gov.au.

Fine wools performing well north west of Bourke!

A recent article titled 'Fining up out West' in The Land (13 December 2001) describing on-farm comparisons with fine wool sheep in western areas inspired Dirk Stevens, a woolgrower from Mt Gambier in South Australia, to relate his experience with fine wool sheep out west.

In addition to his Mt Gambier property, Dirk purchased Koridina Station at Wanaaring in NSW just over 2 years ago. Wanaaring is located northwest of Bourke. Koridina Station currently runs approximately 7,500 sheep, comprising 2,000 ewes and 5,500 wethers.

The ewes and 3,500 of the wethers are the locally bred Undabri (Colllinsville based) and Somerset bloodlines. The remaining 1,700 wethers are from the Grathlyn superfine bloodline. These are bred at Dirk's Mt Gambier property (born in March) and sent to Koridina at approximately 16 months of age.

Dirk reports that in the 2 years he has owned Koridina Station 'the first was the wettest in history and the second has been virtually drought'. In addition, Dirk says that between the wettest and driest years the micron of the fine wool wethers at Koridina has varied by just over 1 µm indicating minimal micron blow-out of the flock. This compares with over 3 µm variation in the local bred sheep over the same period.

Dirk's western fine wool is scheduled for sale during mid-March at the Melbourne sale. The test results are very impressive with 21 bales of fleece lines averaging 17.6 µm and yielding 67% with a low vegetable matter content of 0.5%. The fleece wools have an average length of 70 µm and are sound measuring 37 N/ktex with the majority of breaks occurring at the base of the staple.

Dirk further commented that he 'expected to have to nurse the fine wools at Koridina'. But this certainly was not the case with the fine wool sheep adapting quickly and thriving in the new environment.

Although Dirk has found the fine wool fleece weights to be lower at Koridina, this is more than compensated for by the increased value of the fleeces due to their finer micron. In addition, Dirk can run the fine wool sheep at 1.5 times the stocking rate of the local sheep, further increasing the returns from the fine wools.

Dirk's long term aim is to convert the entire flock at Koridina to the fine wool wethers as well as continue to fine up his Mount Gambier flock.

For more information...

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