CSIRO

Finewool Newsletter

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CSIRO

PREMIUM QUALITY WOOL COOPERATIVE RESEARCH CENTRE

WOOLMARK

In this Issue:

Editorial

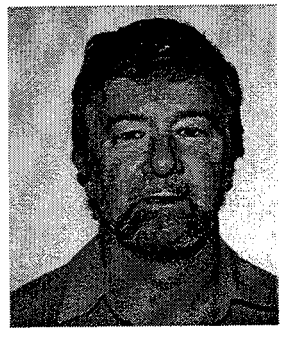
Since our last Fine Wool Project Newsletter, there have been many and varied happenings in and around those associated with producing the goods from the Project - not all of them have been conducive to the conduct of good science.

CSIRO Division of Animal Production has been reduced from roughly 260 staff to approximately 200 in the last twelve months. At the Pastoral Research Laboratory, Armidale, our numbers have been reduced from 80 to 40 and several areas of research have been dramatically curtailed or stopped. Although the Fine Wool Project has been retained, we too have suffered loss of staff, and as a result some of our activities are not being completed as quickly as we had anticipated. However, we have survived and we are grateful for the support received from breeders and growers through IWS, through the Cooperative Research Centre for Premium Quality Wool and other avenues. Our task as staff in the Project is to ensure that the quality of output from the Project justifies this support.

This issue of the Fine Wool Project Newsletter is one of the outputs that is later than anticipated. In part that has been due to our internal problems, but primarily because we were keen to present some results on the objective measurement of components of style and on processing performance. What we have presented here is just the beginning of a whole series of articles focused on results that link raw wool measurements and subjective characteristics to processing performance.

We have also taken the opportunity in this issue of the Newsletter to present two articles that come from outside the Project, but are none the less of relevance to fine wool breeders and woolgrowers. Scientific results are of no value unless they can be put in the context of industry practice and the changing world in which the industry has to live. The article by Kerry McGee is a good example of an industry practitioner providing a basis upon which to digest the results from our scientific programs.

I trust you will enjoy reading the articles in this issue of our Newsletter. If you are in any way confused by any of the scientific jargon (we try to keep it to a minimum) or you wish to seek more detail about any of the issues in the articles please feel free to contact myself or the specific authors.



Ian Purvis

Longford Report

Good spring rain at Longford during 1995 set the scene for an excellent lambing. However, the four months from November 1995 to February 1996 yielded over 28 inches of rain and the weaners in particular had a pretty rough time, as was common throughout the district. With much TLC the 1995 drop animals have grown into very handsome hoggets.

A big effort from staff was put into staging a Field Day on Saturday, 17th February 1996. Although patronage was low, those who attended were looked after by attentive staff and most visitors were keen and eager to learn about our aims and achievements. The feedback we received indicated that they were most impressed.

Shearing of the mature animals was carried out during August. Wool weights appeared to be higher and wool style and colour was excellent. Hogget shearing was done at the end of September, and the very wet year was reflected in the wool.

October-November 1996 has to be recorded as the best ever conditions for lambing at Longford. The feed was just right, the weather was perfect with very little fox activity and the lambing rate was 90% LB/EJ, with 86% of lambs marked per lamb born.

This year the lambs were not mulesed at marking, but will be mulesed in Autumn. Weaning commenced 27th January, 1997 and we experienced slightly better than average weaning weights.

On a sad note, this is the final Longford report as all the sheep from the Fine Wool Project are moving off Longford to their new homes at Chiswick and Arding. No doubt when I next write the Chiswick-Arding report, I will be able to blame the relocation for whatever problems we have, or have encountered.

Dick Farrell

THE KERRY McGEE FORECAST
Blue Skies for the Wool Industry

From a presentation by Kerry McGee to the Wesfarmers Dalgety Wool Seminar, Armidale, May 24, 1996.

Kerry McGee

I think it is a major step forward and in the right direction that a wool grower asks a fashion manufacturer for their views on wool in the garment industry. It automatically causes the supply chain to move closer together, and this is one of the key factors of surviving the 1990s, and the future.

I sincerely believe that the wool industry and the fashion industry will benefit from this type of approach. Now, more than ever before, the consumer is in control, and the consumer is less emotional about her purchase.

What is the McGee business

The McGee business involves the label Kerry McGee, which primarily covers the medium to upper market, but not exclusively, in the weekend and sportswear business. The Robert Burton labels cover the upper market design career-wear and upper market sportswear. Both companies use a wide range of fabrics and designs from fine cool wools to linens and denims, as well as Tencel. Both labels produce women's apparel only.

Tencel has had a strong impact in all classifications of the fashion industry, from jeans to knits and suiting, not only in Australia, but world wide. It will continue to have this impact and I will later discuss this more specifically.

Fashion is often perceived by the consumer to be extreme, upmarket and slightly on the wild side. This perception is only a tool used by the fashion industry to sell basic jeans, shirts, knitwear, suiting and active-wear.

The reality is, that we use the consumer's perception of fashion, no matter what sector of the market we are in, as a tool to continue to sell hard core basics. Survival of any major fashion business depends on it. For example Polo/Ralph Lauren is essentially chino pants, check shirts, polo shirts and men's ties emblazoned with a horse. This is the reality of fashion, and it works well.

The two labels, McGee and Burton, sell to Myer/Grace Brothers, David Jones, approximately 400 boutiques across Australia and New Zealand, four company controlled retail outlets and have been exported to Japan, Malaysia and Singapore. The labels cover a market age group from 25-50, with a reasonable disposable income. Fabrics and accessories are therefore resourced on a global level.

What is the fashion market today

There are three essential major categories of the fashion market today

1. career wear
2. casual wear
3. active wear

1. The first category, career wear, has been on a growth for the previous five years. Career wear is an area where wool has traditionally performed well, in the form of crepe and cool wools. The price pointing of wool in this area, has restricted it to the upper price points of this category, which of course fundamentally restricts volume sales.

During this five year period, polyester, linen and mixes of both of these fibres have made significant inroads into this area. Technology was the prime reason - not price. Polyester traditionally was a stiff, cheap, non-crushable, non-breathable, but washable fabric. It became a luxury fabric with the development of microfiber. It now breathes, and it has the most magnificent touch. It has begun to challenge wool dominance in the upper career-wear market.

Linen /fibre mixes have achieved reduced crushing, and added sand washed finishing, resulting in a softer, beautiful handle, similar to sand rubbed silks.

So it is not only wool under attack in this luxury market, but silk as well.

2. The second category, casual-wear, is the current overnight sensation. The consumer demands have changed. We are now more leisure orientated than ever before. Additionally, many are now working from home and this is an increasing trend, resulting in casual wear being the major and immediate growth area.

It is now acceptable, and an increasing trend, that people wear casual garments in the corporate situation. Major companies road tested mufti-day on Fridays, resulting in increased productivity from their executives. This may well become a

five day a week situation, contributing to the continual growth of casual wear and its ongoing erosion of the career wear market.

The major new player in the casual wear market, is Tencel. Being a rayon, it is a natural fibre based on wood. Not only does Tencel offer all the same qualities as cotton, but it is magnificent to touch, crease resistant, machine washable without distortion, and has 30% more tensile strength than cotton. Tencel can be woven into cloths suitable for jeans, and also fine cloths suitable for career-wear. Further, it can be knitted for T-shirting and possibly knitwear. Tencel corduroy is a reality, marking the beginning of the erosion of the better end of the cotton corduroy market.

Wool in casual wear is available in the form of knitwear and jacketing, and socks. Knitwear has been under attack for many years by the cotton fleece market. Cotton now successfully dominates the active, surfwear, casual wear and designer casual wear markets in tops.

Wool knitwear that you and I wore as children is basically the same as our children are wearing. There have been no real innovations. Prickly knitwear is still being produced. I would consider it is urgent that wool not only addresses the casual-wear market, but that it also becomes a permanent major player in every classification in this category, and pragmatically this means wool mixes.

3. The third major category in the market is active wear. Traditionally a cotton dominated market, and this continues to be the case. As society and the consumer have become more health conscious, this market has grown enormously.

The cotton industry developed cotton-lycra. This gave the consumer a fabric that was lighter, absorbent, machine washable, breathable and flexible, more body hugging and therefore arguably more sensuous. The last quality was why the fashion industry took cotton-lycra and ran with it in all areas successfully. Rayon to my knowledge has not entered this market.

The new player in the active wear market is Polartec, which is a polycarbonate derivative. Some of the garments include a percentage of recyclable component derived from plastic drink bottles. The advantages of Polartec are that it is light, extremely warm for its weight, and wicks moisture away from the body. This fabric was developed for cross-country skiing and mountain climbing but with its combination of qualities has entered the tops and casual wear markets, as trendy surfwear. Again fashion reacted to a new fabric with impeccable qualities.

Wool has very recently successfully entered the active wear market. The collaboration between the International Wool Secretariat and Dupont has recently produced wool plus lycra, called "Woolstretch", for both knitted and woven fabrics. These are expected to become very popular with customers on a global scale due to the benefits of the comfort, innovation and quality.

The collaboration of the IWS and the Australian CSIRO, recently produced Sportwool, a knitted fabric blend of 60% wool on the inside and 40% polyester on the outside. The fabric is considered to be efficient in wicking away moisture from the body and has already been tested successfully by our Olympic athletes. The IWS is reported as enthusiastically working with other fibre groups and the new generation of fibres.

Another section we need to consider is uniforms. Not conventionally thought of as part of the fashion industry, however schools and corporations now approach design houses to update their uniforms to give them a competitive edge and complete their image. This is big business. Here is a perfect opportunity for textile manufactures to introduce a new or newly treated fibre to a mass market at an early age, through schools.

If this experience is a positive one, the opportunity exists of gaining a customer for life. If the experience is negative, the opposite occurs. Reflect back to your own childhood and recall prickly jumpers, lethal melange pants, and dank, smelly blazers on a wet day. Not good! There have been no major advances in the fabric or yarn specifically aimed at this area.

Children are still having experience with wool that is negative. Many public schools have resorted to sweatshirts for the tops, and polyviscose for the tunic. Private schools will eventually follow suit. Wool needs to develop yarn and fabric specifically targeting this section of the market. It remains a major opportunity, not only for volume sales, but to ensure the newest consumer's first experience with wool is a positive one.

The advantages of wool to the designer and consumer.

The advantages to myself as a designer in using wool, are that it gives me great personal satisfaction and that it drapes well. It is versatile and is both warm and cool. It is naturally absorbent and crease resistant, and is fast becoming machine washable. It takes colour and holds it exceptionally well.

The consumer has, I believe, a natural affection for wool. However the consumers I am referring to are the baby-boomers. You and I, and our grandparents hold this affection. Keep in mind that the child and youth consumer have much wider choices than we had, and their first experience of wool in their school years is no longer a good one. I believe they will eventually be lost as wool wearers - this needs your urgent attention, as future repetitions will be serious.

The biggest and most exciting advancement for me in the wool industry in Australia has been the substantial investment in the Macquarie mills. This has positioned the mill to be competitive in the 21st century. It is competitive in the wool flannel and patterned wool area, with the Prato mills in Italy, where I was previously buying this cloth.

Macquarie developed a difficult pattern in a woven check wool for me from a magazine tear-out, that was sensational. This was done quickly and efficiently. Sampling was available in eight weeks with the minimums being less than Italy. They also dye up-to-the-minute fashion colours such as lime, orange and fuschia with the minimums per colour again being less than Italy. Furthermore, turnaround times of bulk were faster than their competitors. This made, and will continue to make, major differences to those areas of the fashion industry using wool.

I believe there is a loyalty and affection to wool, by the consumer and that if they are offered wool garments with all qualities being equal to the competition, they will choose wool.

Top end wool is a fabulous product - no argument there. It is becoming evermore a niche market, and should look to value added. Survival and growth are about volume and change. A good analogy which way to go, would be to look at the Japanese car industry - they offer more features for less money. This is what synthetics and rayons have been doing. The same application of technology and thinking must be applied to wool.

As a Fashion Manufacturer, I require a wool fabric that is mixed with other fibres to increase its features. The Industry must accept that prickly is not acceptable and not saleable. I need a wool that is better value, to enable me to sell volume. In an ideal world I need a cool wool, offered at half the current price, that I can run 365 days of the year. It must not be viewed as a winter item — this must be erased in the eyes of the consumer. We live in a controlled climate in home, car and office. Wool as a fibre and a fabric must cater to these new requirements.

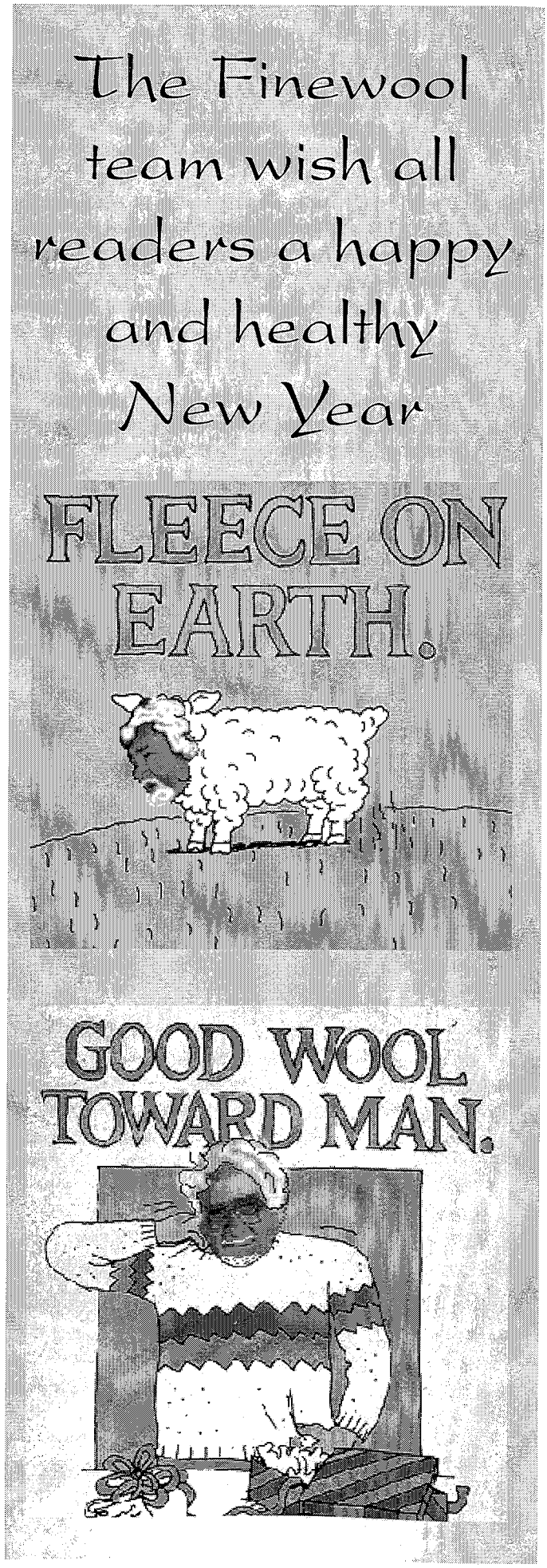
Conclusion

The consumer's current demands on any garment, are the following:

- easycare, washable and with minimal or no ironing
- that it must breathe
- it must be absorbent
- it must be comfortable
- the garment should retain its shape and size for the life of the garment
- it should have appropriate strength for the application
- durability should be a feature
- it should offer value (not cheapness)
- touch sensation must be pleasing
- it is preferably made from a natural fibre, but not necessarily
- it should be light weight - it can have a thick appearance, but still be light weight
- and it should be colourfast

Some of the great limitations of the synthetic competitors to wool were their non-breathing and non-absorbency, and their unfavourable touch. As a result of these limitations, synthetics lacked overall comfort.

These limitations have all been overcome through technological advances. The ensuing consumer reactions have been overwhelming in their embrace of the new synthetics and synthetic blends. Wool needs to develop a cloth with all the desirable attributes mentioned. The synthetic and derivative competitors are being turned into more versatile fibres at an ever faster rate. Wool must move not only to compete and move up to date with its competitors, but move further ahead. **Do this and I see nothing but blue skies.**



Objective measurements of style in the Fine Wool Project Flock

Andrew Swan, CSIRO Armidale

"Style" is a term used in the wool industry to describe certain visual and tactile properties of wool, and is influenced by a number of component traits such as crimp frequency, crimp definition, colour, dust penetration, and staple structure, and handle (ie. softness). Many wool growers believe that style is the most important wool quality trait, especially in the finer micron categories. This is supported to a degree by Wool International data showing that in the 1994/95 selling season, style accounted for 12% percent of the variation in price in wools less than 19 microns. It should be noted however that mean fibre diameter was the most important quality trait, accounting for 51% of the variation in price in this portion of the clip.

Over the past 10 years, CSIRO Division of Wool Technology has developed an image analysis system to objectively measure components of style ("The Style Machine"). This technology can be used to distinguish wools with different processing characteristics. For example, during the Woolspec conference in 1994, Denise Stevens and David Crow showed that lower crimp frequency and better crimp regularity as measured by the style machine were associated with improved top-making performance, reflected by longer fibre length in the top and lower card and noil wastage. These associations were small but significant.

On the current evidence, it would appear that style is an economically important trait, and should be considered in the design of breeding programs. In order to incorporate style into formal breeding objectives, several questions must be answered:

1. What is the economic value of style?
2. Is there genetic variation in objectively measured style?
3. What effect does selection using traditional indices have on style?
4. Are the subjective assessments of style which are commonly used by ram breeders genetically associated with the objectively measured style?

We have a recently completed a trial in which wool samples taken from Fine Wool Project hoggets were measured using the style machine. Altogether, around 4700 midside samples were measured, from progeny born between 1990 and 1994. By analysing these data, we are able to address some of the issues raised above, in particular, points 2., 3., and 4.

The style machine provides information on a number of variables, but those we have concentrated on so far are: crimp frequency, measured in crimps per centimetre; crimp regularity, which is the variability of crimp frequency within staples; colour (yellowness, measured as "tristimulus" values); and dust penetration, measured as the percentage of the staple affected by dust damage. The crimp regularity measurement is intended to reflect crimp definition, or "character". More evenly crimped wools should be reflected by lower values of crimp regularity.

Table 1 shows the "heritabilities" for these style traits, along with handle. Heritability is a measure of the genetic differences between animals. Higher values indicate traits that will respond well to selection. The values shown in the table are generally in the moderate range, except for dust penetration which is low (10%). These results demonstrate that there is genetic variation in style which can be used to improve the component traits by selection.

Table 1: Heritabilities for style traits

Trait	Heritability
Crimp frequency	27%
Crimp regularity	43%
Greasy colour	40%
Dust Penetration	10%
Handle	22%

Table 2 shows that selecting solely on clean fleece weight and mean fibre diameter will lead to favourable changes in the style traits. The table shows the percentage changes predicted in each trait after 10 years, using selection indices which place varying levels of importance on fibre diameter: the 0.3% index maximises response in clean fleece weight while holding diameter constant, the 10% index maximises response in diameter while holding fleece weight constant, while the 5% index is most effective at increasing fleece weight and reducing diameter simultaneously. In general, the figures indicate that fleeces will become more evenly crimped, whiter, and softer handling. As more emphasis is placed on fleece weight, the fleeces will also tend to become less crimped (lower crimp frequency), and as stated above, this will have favourable effects on processing.

Table 2: Percentage response to selection on clean fleece weight (CFW) and fibre diameter (MFD) after 10 years of selection

Index	CFW	MFD	Crimp freq.	Crimp reg.	Dust pen.	Colour	Handle
0.3%	18.9	0.0	-4.0	-16.6	0.5	-23.1	-12.6
5%	7.5	-15.9	-1.0	-25.1	-5.5	-24.1	-28.2
10%	2.9	-17.7	0.0	-23.2	-6.3	-20.1	-27.8
Trait mean	1.6Kg	16.9μ	6.1	1.0	24.5	2.9	2.8

Note: for colour and handle, lower values correspond to whiter and softer wools respectively, therefore, negative responses are in the desired direction.

The one feature of this study was that some of the objective measurements of style were not closely associated with their "equivalent" subjective assessments. For example, dust penetration as measured by the style machine was not related to dust penetration scored by our trained assessors. Likewise, the crimp regularity measurement of the style measurement was not closely related to our subjectively scored crimp definition. Although this is a little disappointing, we will continue to collaborate with CSIRO Division of Wool Technology to calibrate the two sets of measurements.

Overall however, the results are very pleasing. We have shown that there is sufficient genetic variation to improve style by selection, and perhaps more importantly that selecting to improve clean fleece weight and mean fibre diameter will lead to improvement of style.

Fine Wool Project Processing Trials - Bloodline Differences

Ian Purvis, CSIRO Armidale

Introduction

There is an enormous lead time between the introduction of a new set of breeding goals or a new selection strategy and the realisation of genetic improvement in commercial flocks. Therefore, breeders and their clients need to have the capability of predicting with good accuracy, the consequences of current goals and practices in the medium term.

Fine and Superfine wool breeders have traditionally focused their goals and selection practices on raw wool characteristics, yet this group of breeders have also had close contact with the processing companies who have purchased the high quality end of their clips. This close working relationship is epitomised by the membership and workings of the Superfine Woolgrowers Association. Because of these contacts breeders have always been interested in the processing performance of sale lots from their clips.

However, the capacity of commercial mills to give feedback to breeders and woolgrowers is restricted because sale lots are usually blended with other lots to produce a processing batch. Commercial mills also have limited capacity to conduct trials aimed at evaluating the relative performance of different genetic groups. To date there has never been a formal study that aimed to provide the information necessary to evaluate what effect different selection practices might have on processing performance.

The Fine Wool Project has right from its beginnings had a focus on Wool Quality. The advent of the Cooperative Research Centre for Premium Quality Wool has reinforced this focus and provided us with additional funds to allow processing trials at CSIRO, Division of Wool Technology to be incorporated into the Project. These trials have aimed at establishing, across a range of fine and superfine bloodlines, the relationships between raw wool attributes and processing performance.

How the trials were conducted

Ideally the fleeces from individual animals would be measured and assessed in the raw wool for all known attributes that might influence processing outcomes. These fleeces would then be processed as individual lots and their performance related back to the raw wool measurements. Knowing which bloodline and which sire the animals were from allows us to then evaluate the processing consequences of different selection strategies that are based on raw wool attributes.

Due to the size of the fleece and the numbers required to be processed, it is impractical to base the study on individual fleeces. However, by processing batches based on fleeces from the progeny of individual sires that have been used in the 11 bloodline flocks of the Fine Wool Project, we can get the information necessary to test whether the differences that exist between bloodlines and between sires in raw wool characteristics translate reliably into measures of processing efficiency and top qualities.

With the wonderful collaboration of Barry Harrowfield and Gary Robinson and their team in the Processing Group at CSIRO Division of Wool Technology, Geelong, we have managed to process 140 batches representing 6-7 sires from each of the 11 bloodlines in the Fine Wool Project flocks. This has been a major undertaking right from the time of hogget shearing. The success of the trial in maintaining the genetic identity of fleeces within the shearing shed, getting the raw wool measurements on each of the 140 processing batches, dealing with the movement of wools between Armidale and Ryde, processing the batches, and then ensuring that the integrity of the data was maintained throughout the operation, has been an excellent example of collaborative research.

Some Early Highlights

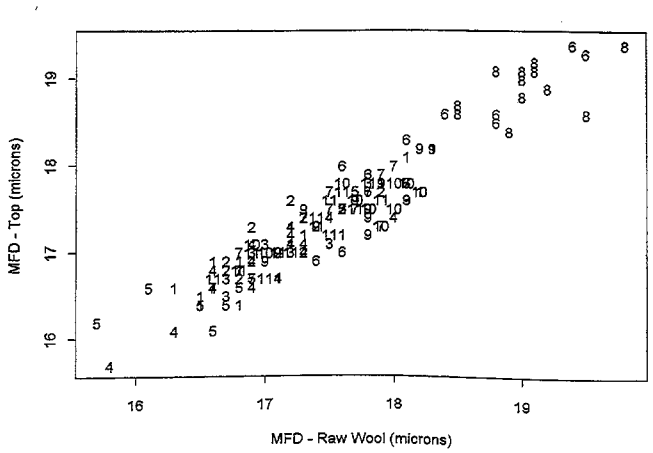
There is so much information arising from this trial that we will devote a future issue of the Newsletter solely to these results. However we have presented below some of the highlights.

Mean Fibre Diameter (MFD)

Because this trait is so important in determining the price of raw wool and processed products, it is vital that we understand the processing consequences of differences between genetic groups in the MFD of their fleeces.

By examining Figure 1, below, you will see that there is extremely good agreement between the MFD of the processing batches prior to processing, and the MFD measured on the top at the completion of combing. Each number identifies the average measurement of the batches representing a sire, and the number itself represents the bloodline to which the sire belongs. It is clear that the MFD of the individual sires is very predictable. The average measurement of the bloodlines is also very stable from raw wool to top. On average the top measurements were approximately 0.16 microns broader than in the raw wool. This is probably accounted for by the finer weathered tip component that will have ended up in the noil.

Figure 1 Relationship between Mean Fibre Diameter in Raw Wool and Top in Sire Processing Batches



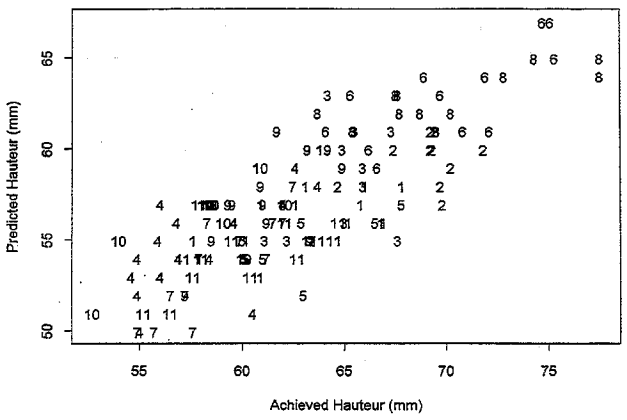
Predicting Top Length

Next to mean fibre diameter, top length (called hauteur) is the most important determinant of price for combed tops. Figure 2 shows that the processing conditions at CSIRO Division of Wool Technology at Geelong have produced tops with a significantly greater top length (hauteur) than predicted by the CSIRO1 prediction formula. This formula is one of the formulae developed by CSIRO to assist mills and buyers to purchase greasy wool lots with the measurements that will , on average, produce tops with the required specifications. The formula has not been specifically designed for our type of study but is one measure of gauging our predictive capability. The formula incorporates measures of several raw wool components.

Allowing for this difference between the predicted and achieved top length there is still a very high correlation between the achieved and predicted values (0.8).

The difference between predicted and achieved hauteur does vary with bloodline. In other words, the batches from some bloodlines are longer than the average difference. However, within each bloodline there is a range of sire values for the difference between predicted and achieved hauteur.

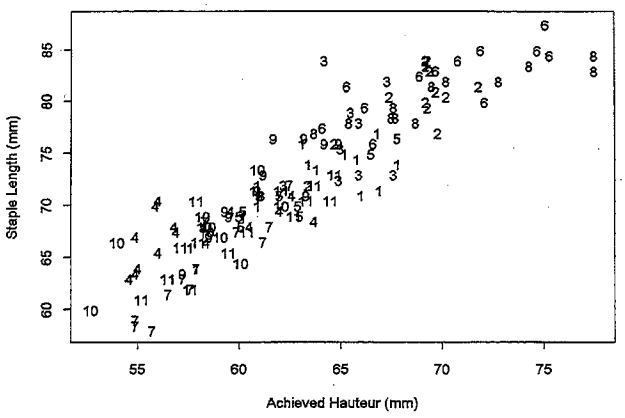
Figure 2 Relationship between Achieved Hauteur and Predicted Hauteur (CSIRO1 formula) in Sire Processing Batches



Staple Length and Achieved Top Length

When we dissect the contribution of the attributes of the raw wool that form the batches to the prediction of top length we can see the overwhelming importance of staple length in accounting for variation in achieved top length (Figure 3). The strength of the association is such, that other attributes of the raw wool can only play a minor role in producing differences in achieved top length.

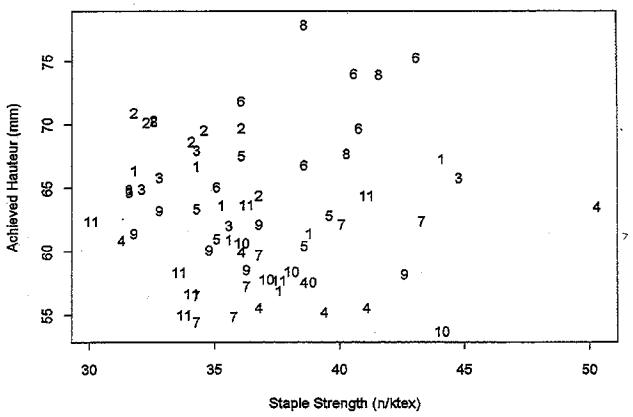
Figure 3 Relationship between Achieved Hauteur and Staple Length in Sire Processing Batches



Staple Strength and Top Length

Figure 4 shows there is a poor association between achieved hauteur and average staple strength of the processing batches. This means that in these very sound wools, staple strength does not influence top length. For wools of lower staple strength, there may be some effect, but that remains to be tested.

Figure 4 Relationship between Achieved Hauteur and Staple Strength in Sire Processing Batches



Conclusion

These results are very exciting. The challenge for us is to now devise ways of incorporating the predictive power into software packages so that breeders can have the capacity of evaluating their current breeding goals and selection practices against other ways of doing things.

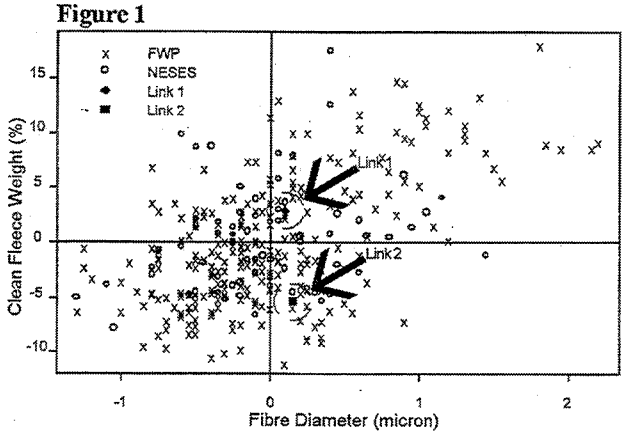
How does the Fine Wool Project Flock compare to industry standards?

Andrew Swan, CSIRO, Armidale

A regular and valid criticism of many research flocks is that they are not relevant to commercial wool producers. This is because after an initial establishment phase they are maintained as closed flocks. From the time the Fine Wool Project flock began 1990, we tried to avoid this by adopting a policy of purchasing replacement sires from the contributing stud owners each year. In total, more than 300 sires have been used over the life of the project.

Having implemented this practice, we decided that it would be a valuable exercise to benchmark the performance of the

Figure 1



flock to a known industry standard. Consequently, since 1993 we have entered randomly chosen Fine Wool Project sires in the New England Sire Evaluation Scheme (NESES). These sires provide us with "genetic links" to NESES, which allow us to compare the performance of all sires used in the two flocks. The "link" sires have also been used in all but two of the matings in the Fine Wool Project, and are therefore useful in providing genetic links *across years* within the flock. This also means that they have large numbers of progeny, which is important in providing accurate predictions of genetic merit.

In order to compare the sires in the two flocks, we conducted a combined analysis of the Fine Wool Project and NESES data sets, to estimate progeny values for the sires for clean fleece weight and mean fibre diameter. These progeny values are shown in Figure 1. The Fine Wool Project sires are depicted by crosses, the NESES sires by open circles, and the first and second link sires by a filled diamond and a square respectively. These two sires will be referred to as "CSIRO Random 1" and "CSIRO Random 2" in the forthcoming edition of Merino Superior Sires, which presents across flock evaluations for central test sire evaluation schemes.

The pleasing feature of the graph is that the sires used in the Fine Wool Project compare favourably with the NESES rams. The top performing NESES sires come out slightly ahead of the best Fine Wool Project sires, and while there are greater numbers of the latter in the less favourable regions of the graph (ie., the lower right hand quadrant), there is considerable overlap. Although only two traits have been analysed in this fashion (albeit two of the more important ones), the exercise demonstrates that fine wool growers can be confident that the results coming out of the Fine Wool Project are highly relevant to their situation.

Acknowledgement: We would like to thank The New England Merino Sire Evaluation Association for providing access to the NESES data in order to perform this linked analysis

Condobolin Fine Wool Project - Results to date

Kathy Coelli and Kevin Atkins
CRC for Premium Quality Wool and NSW Agriculture, Orange

1. Improvement in production

Fleece production from the Fine Wool Project wethers at Condobolin has improved dramatically since their first introduction to the district. Fleece weight of the 1991 drop has improved by over 30% despite the fact that staple length has decreased by 5 mm. Fibre diameter has increased by only 0.75 µm/yr, which is in line with the micron blowout estimate made from the Merino Bloodline Comparison of 0.67 µm/yr (NSW & Vic Wether Trials 1984-95). Production figures for the 1991 drop of wethers at Condobolin are displayed in Table 1. The low staple strength figure in 1994 is a result of low rainfall during that year causing a mid-staple break during Autumn.

Table 1: Fleece production of the 1991 drop wethers for the 1993 - 1995 shearings.

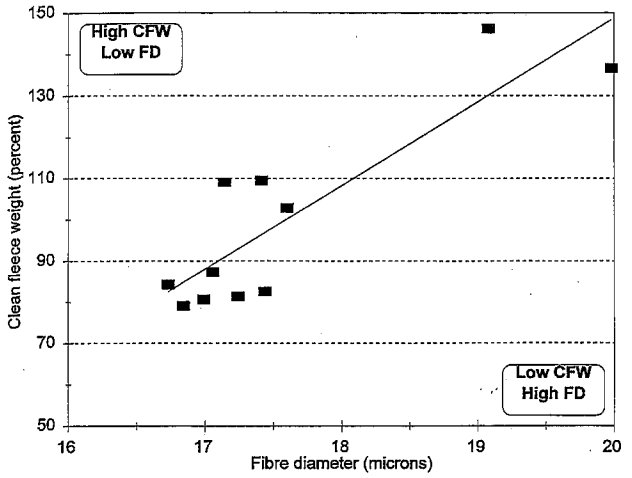
Year of measure	GFW (kg)	CFW (kg)	YLD (%)	FD (µm)	SLEN (mm)	SSTR (N/Ktex)
1993	3.55	2.45	68.6	17.1	82.9	34.0
1994	4.64	3.09	66.3	18.4	83.5	23.0
1995	5.13	3.27	63.1	18.6	77.7	32.8

2. Production results

The 1991 drop of wethers have only recently been sold from the Research Station following 4 consecutive shearings between 1993 and 1996. The 1993 and 1994 drops have been shorn for two and one years respectively. The 1995 drop of wethers were recently transported to Condobolin following their hogget shearing in Armidale.

Data currently available covers the shearings from 1993 - 1995, which includes three measurements on the 1991 drop wethers and one measurement on the 1993 drop wethers. There remains a strong across bloodline relationship between fleece weight and fibre diameter as displayed in Figure 1. However, there is scope among the fine wool lines for increasing fleece weight by up to 30% while maintaining fibre diameter.

Figure 1: Clean fleece weight versus fibre diameter.



As a result of the extensive data collected from the Fine Wool Project wethers we have been able to estimate repeatabilities from a number of measured production and wool quality traits. These estimates are listed in Table 2. The estimates for fleece weight, yield, fibre diameter and staple length are very similar to estimates from other populations. The surprise was the low repeatabilities for staple strength, wool colour and resistance to compression, where estimates for other populations are less available. We will need to monitor repeatabilities for wool quality traits more closely in future.

Table 2: Repeatability estimates for additionally measured traits.

Trait	Greasy flc. wt.	Clean yield	Fibre diameter	Staple length	Staple strength	Clean colour	Res. to comp.
Repeat.	0.63	0.58	0.84	0.60	0.20	-0.06	0.02

3. Measured versus subjective assessment

Wool quality measurements collected on the wethers include a range of quantitative measures and visual assessments. The relationship between measured clean colour and visually assessed greasy colour is displayed in Figure 2, showing only a small correlation exists between the two traits.

Figure 2: Clean colour versus assessed colour.

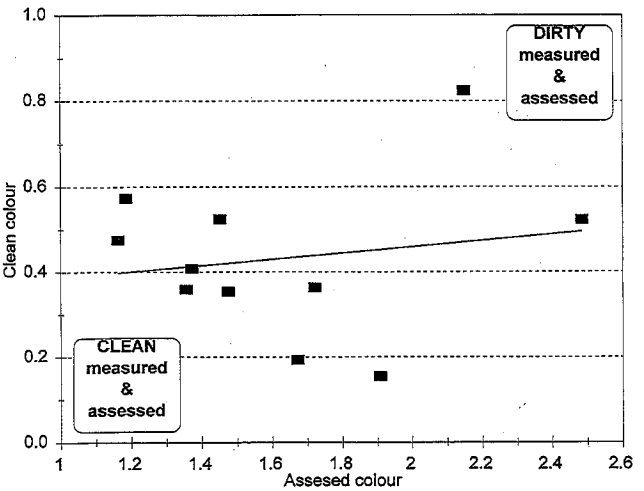


Figure 3: Staple strength versus assessed tenderness.

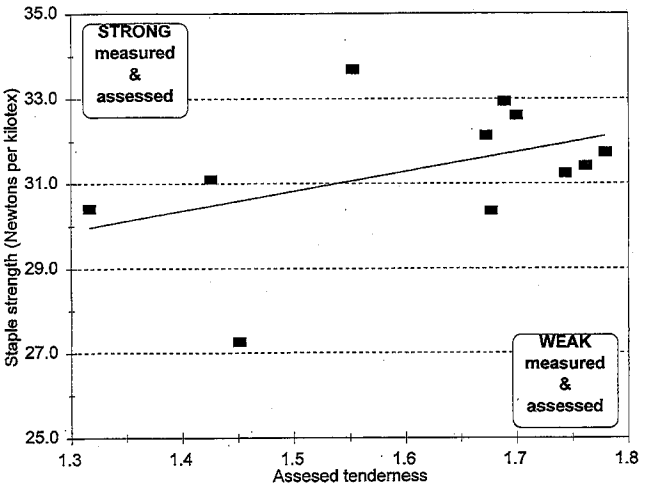


Figure 3 shows the relationship between measured staple strength and assessed tenderness. We would expect a strong negative relationship between measured strength and assessed tenderness but Figure 3 shows no relationship between flocks. It may be that the large differences between flocks in staple length is interfering with measured staple strength as an indicator of tenderness. The likelihood of tender wool and its measurement in these fine wool sheep at Condobolin is an area which will require further study in future.

4. Condobolin Fine Wool Project Field Day

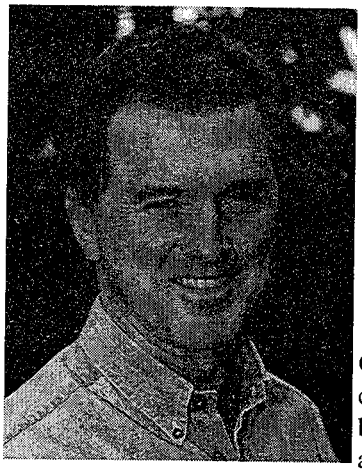
It is planned to hold a field day on the Condobolin Fine Wool Project during June/July next year. At that stage information on the processing performance of wools from the Condobolin wethers in comparison with their sisters at Armidale should be available.

AWARD

- note from Laurie Piper
(Director, Wool CRC)

In todays Honours lists, (25/1/97) the Deputy Director of the Wool CRC, Professor David Lindsay has been awarded a gong and is now an Officer in the General Division (AO). I'm sure you will all join with me in congratulating David on this well deserved honour.

David Lindsay about to get the gong



Mike Lollback

Wether Trials Demonstrate Bloodline Differences

Mike Lollback, NSW Agriculture, Tamworth

One of the major issues for commercial Merino breeders is the selection of a ram source for use in their flocks. Commercial breeders are well aware that the genetic potential of their flock is largely determined by the stud from which rams are purchased. As a general rule if the stud is making good progress, its commercial clients will be following the same trend.

The solution to this problem appears to be quite straight forward. Simply identify the best stud and then buy the best rams you can afford from that stud. Unfortunately the solution is not as simple as it sounds. It is very difficult to make accurate comparisons between studs; the picture is confused by the different environments and management systems under which the sheep are run.

What is required is a system which compares the performance of different bloodlines under the same environmental and management conditions. In other words, a system which attempts to objectively measure the genetic differences between bloodlines. This is what wether trials have been designed to achieve.

The Southern New England Merino Field Day Group has sponsored three wether trials in the Walcha area. The current trial commenced in 1994 and involves 26 teams of randomly selected wethers which were dropped in spring 1993. The first trial shearing took place in July 1995 and the second shearing in July 1996. The trial will continue for another two shearings and in the meantime another trial will be organized based on wethers dropped in spring 1997. This approach will ensure a continual evaluation of bloodlines used in the New England area. The trial is open to any breeder who is interested in learning more about their flock's performance .

There are many wether trials run in NSW and in other states and the production information generated is an invaluable source of data to evaluate the genetic differences between bloodlines. NSW Agriculture has been analysing these data since the late 1970s for this purpose. The analysis removes the variation in performance due to differing environmental conditions between trials and years and focuses on the genetic variation between the bloodlines.

Information is produced on the commercially important traits of fleece weight, fibre diameter, yield, bodyweight, style, colour, staple length and staple strength. The analysis is updated regularly and is available to interested breeders. The accuracy of the bloodline data is a major consideration and bloodline performance is not published until it is considered to be reliable. This means that the performance of each bloodline is based on sufficient data i.e. the number of teams representing the bloodline and that the teams representing that bloodline are a random sample of all the clients of that stud.

The 1996 results (see Table 1, p.11) of the Walcha Wether trial are based on average wool prices achieved during the 1995-96 selling season. While prices remained subdued there were still significant premiums available for the finer types and this was reflected in the team results.

Using the Results

While annual results of local trials are helpful, the real benefits of wether trial data become apparent when it is included in the bloodline analysis which is designed to identify real differences in performance between bloodlines. The report of this analysis, 'Merino Bloodlines: the Differences' is updated regularly and is available from NSW Agriculture.

Currently several local fine wool studs are included in the analysis and several others e.g. Mirani, Yalgoo, Westvale and Cressbrook are on the verge of being published. Once a bloodline qualifies for inclusion on the list, a 'benchmarking' procedure can be used by commercial breeders to define their flock's level of performance relative to other bloodlines. This procedure can be used to investigate opportunities for improving performance by using other bloodlines provided they meet all the requirements of the commercial breeder.

This article is a brief description of the usefulness of wether trial data. If a breeder intended to use the data to investigate alternative ram sources, it would be essential to have access to the latest report and be aware of the procedure to follow and the precautions involved.

Food for thought .....

* When it rains, why don't sheep shrink?
* If a book about failures doesn't sell, is it a success?
* What do you do when you discover an endangered animal that eats only endangered plants?
* When companies ship Styrofoam, what do they pack it in?
* How do you know when it's time to tune your bagpipes?
* Is it true that cannibals don't eat clowns because they taste funny?
* If a parsley farmer is sued, can they garnish his wages?

Table 1 Walcha Wether Trial 1996 Shearing Results.

Team	Bloodline	Rank	Fibre Diam.	GFW % (kg)	Yld. Dev	CFW % (kg)	Wool Value $	Wool Value %	Body Wt. %
Averages			**18.9**	**4.8**	**76.0**	**3.7**	**30.91**		**44.7**
Nivison Family Mirani Walcha	Mirani	1	17.2	93.0	2.5	95.2	41.88	135.5	96.0
L. Fletcher Coomooloo Walcha	Coomooloo	2	18.0	97.1	-1.4	95.2	37.27	120.6	89.9
G Nivison Yalgoo Walcha	Yalgoo	3	18.2	101.3	0.9	100.6	36.57	118.3	98.6
J. Maher Gostwyck Uralla	Gostwyck	4	17.7	90.9	0.3	89.7	35.09	113.5	96.7
R Fulloon Cressbrook Armidale	Cressbrook	5	18.5	103.3	1.8	106.1	34.29	110.9	109.4
A Van Eyk Shalimar Walcha	Shalimar	6	17.7	90.9	0.9	89.7	34.17	110.5	106.5
A Burgess Ruby Hills Walcha	Ruby Hills	7	18.3	97.1	2.3	100.6	33.14	107.2	100
G Fletcher Auchen Dhu Walcha	Auchen Dhu	8	18.4	93.0	-1.8	92.5	32.12	103.9	103.8
J McLaren Nerstane Woolbrook	Nerstane	9	18.9	113.7	-0.7	111.5	32.08	103.8	105.4
J Hayter Kamballie Guyra	Nerstane (1)	10	18.8	99.2	1.9	103.3	31.37	101.5	99.8
L Blanch Westvale Walcha	Westvale	11	18.3	93.0	0.4	92.5	31.06	100.5	92.0
C Laurie Boree Walcha	Borris	12	19.5	119.9	-2.1	116.9	31.00	100.3	107.4
J Wood Woodleigh Kingstown	Nerstane	13	19.9	111.6	1.4	114.2	30.48	98.6	102.0
R King Waterloo Walcha	WRBG	14	18.8	97.1	1.4	100.6	30.28	98.0	99.1
I Sutherland Deargee Uralla	Deargee	15	18.2	88.9	1.1	89.7	29.94	96.8	100.7
D Cameron Tiara Walcha	WRBG	16	18.9	97.1	1.4	100.6	30.28	98.0	99.1
A Wood Caversham Uralla	Bungulla	17	19.7	113.7	0.6	114.2	28.99	93.8	93.7
R MacLean Saumarez Armidale	Saumarez	18	20.0	105.4	0.4	106.1	28.19	91.2	103.6
B Miller Danbury Bendemeer	Nerstane	19	19.7	107.5	-2.4	106.1	28.16	91.1	102.0
M Fenwicke Branga North Walcha	WRBG	20	19.4	99.2	1.1	100.6	28.11	90.9	106.9
E Barnet Miramoona Walcha	Miramoona	21	19.6	101.3	1.1	103.3	27.40	88.6	100.2
M Endacott Merrindee Armidale	Merrindee	22	18.0	80.6	-1.6	78.9	27.39	88.6	91.7
D Fletcher Auchen Dhu Walcha	Auchen Dhu	23	19.1	95.1	-3.9	89.7	26.89	87.0	100.5
D Rainger Brockley Guyra	Wanganella	24	21.4	119.9	-2.8	116.9	26.77	86.6	100.7
J Harris Abbington Bundarra	Mumblebone	25	20.5	109.5	-1.7	106.1	26.22	84.8	97.5
J Hayter Kamballie Walcha	Petali (2)	26	18.8	82.7	-0.2	81.6	25.21	81.6	94.9

(1) The wethers in this team were bred from Petali ewes by Nerstane rams i.e. a first cross Nerstane/Petali.
(2) The wethers in this team were bred from ewes purchased from Petali sired by Petali rams.