MEAT & LIVESTOCK AUSTRALIA

finalreport

IMPROVING PRODUCTIVITY

Project code: LAMB.325A

Prepared by: Neil Fogarty, Veronica Ingham, Lynette Mcleod, Jayce Morgan & Gervaise Gaunt
NSW Department of Primary Industries
Orange Agricultural Institute, NSW Department of Primary Industries Victoria

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Maternal Central Progeny Test

ABSTRACT

Uptake of genetic technology and improvement of the Australian lamb industry in maternal breeding lags that in other sectors. The maternal central progeny test (MCPT) evaluated the variation in progeny performance of maternal sires and the scope for genetic improvement. MCPT tested 91 sires from several maternal breeds and focused on evaluation of the 1stX ewe progeny which were mated for 3 lambings with their 2ndX lambs slaughtered. There were important breed effects although variation among individual sires was far greater ($40 gross margin / ewe / year). This means $20,000 higher annual profit for a 1000 ewe enterprise having 1stX ewes sired by top rather than average maternal genetics. Variation in lamb weaning rate (differences of 45% between 1stX ewe progeny groups of sires) was the major profit driver, along with 2ndX lamb growth (3.6 kg post weaning weight) and carcase fat (2.2 mm GR). There were also large differences for age of puberty, milk and wool production from the 1stX ewes. The correlations between maternal sire LAMBPLAN EBVs and growth, carcase and wool production of their progeny were positive and moderately high, with reproduction lower. More widespread recording of reproduction information in maternal breeds should improve the accuracy of reproduction EBVs.

EXECUTIVE SUMMARY

The uptake of genetic technology and improvement of the maternal breeding sector of the lamb industry has lagged behind other sectors. This national maternal sire central progeny test program (MCPT) was initiated in 1997 to evaluate the variation in first and second cross progeny performance of maternal and dual purpose (meat and wool) sires and the scope for genetic improvement in the sector. The MCPT also provides direct linkages between breeds that may contribute information for across-breed genetic evaluation among maternal breeds. Productivity of the crossbred ewe flock has a major impact on the profitability of lamb enterprises and the task is to achieve higher genetic merit among the commercial flocks of crossbred ewes.

The MCPT tested 91 sires from several maternal breeds including Border Leicester, Coopworth, East Friesian and Finnsheep at 4 sites (Cowra, NSW, Hamilton and Rutherglen, Vic and Struan, SA). Common sires were used to provide genetic links across the sites and years for combined analyses of the data., The major focus was on evaluation of the 1stX ewe progeny which were grown out and mated for 3 lambings and their 2ndXslaughter lambs. The survival growth and carcase performance of the 1stX lambs were also measured. Performance of the 2, 700 1stX ewes was assessed by their lamb turnoff rate, the growth and carcase merit of their 11, 000 2ndX lambs and their wool production.

The results have clearly demonstrated the considerable genetic variation among maternal genetics that can be exploited to dramatically improve productivity and profitability of lamb enterprises. While there were some significant differences between the maternal sire breeds in performance of their progeny, the variation among individual sires within the breeds was far greater for most production traits. The range among the 18 Border Leicester sires tested was over $40 gross margin / ewe / year in the profitability of their 1stX daughters. This means a $20,000 higher annual profit for a 1000 ewe enterprise by having 1stX ewes sired by top rather than average maternal genetics.

Variation in lambing rate of the 1stX ewes was the major profit driver that contributed to the differences in gross margins as over 80% of enterprise income was derived from lamb sales and less than 20% from wool. There were differences of up to 45% for lamb weaning rate between 1stX ewe progeny groups of sires within a breed. In addition there were significant differences in 2ndX lamb growth (up to 3.6 kg for post weaning weight) and carcase fat (2.2 mm GR or almost half a fat score). These differences contributed to the gross margin through total weight of carcase turned off and varying proportions of the carcases meeting market specifications. There were also large differences between breeds and sires within breeds for early age of puberty, milk production and weight and fibre diameter of wool from the 1stX ewes. Most breeds had at least some sires that had high performing 1stX daughters.

The correlations between the maternal sire LAMBPLAN EBVs and the growth, carcase and wool production performance of their progeny in MCPT were positive and moderately high. The relative performance of the sires in the growth and carcase of their 1stX progeny was also consistently expressed in their 2ndX progeny. The relationships between LAMBPLAN EBVs of the maternal sires and 1stX ewe reproduction traits were positive although lower than for growth and carcase traits. This reflects the smaller number of animals with recorded reproduction information in the LAMBPLAN data base compared to growth and carcase traits, resulting in lower accuracy of these EBVs. The more widespread recording of reproduction information on maternal breed animals should improve the accuracy of these reproduction EBVs.

The project has supported targeted extension activities through input into LAMBPLAN activities, development of the EDGE Money Making Mums Workshop, Lamb groups, activities of Product Development Officers and state extension specialists, as well as directly through field days and media communication. There have been some 25 training workshops primarily targeted at advisors and consultants, 7 field days with an MCPT focus and a further 27 presentations and displays at

other field days. In addition the total publications from the project have included 11 scientific papers (with a further 14 papers submitted or in preparation), 21 technical reports and presentations, 141 advisory communications largely through industry newsletters and journals, as well as the Dynamic Dams Newsletter being available on the LAMBPLAN website. The Dynamic Dams reader feedback survey indicated a high rating for the Newsletter and the impact of MCPT on industry. Industry understanding of maternal EBVs has been enhanced, in cooperation with LAMBPLAN, through increased adoption of LAMBPLAN by maternal seedstock breeders.

Recommendations include:

- Further targeted extension should be supported to achieve more widespread improvement in maternal performance of industry flocks. The project has many simple as well as more complex messages that need to be packaged differently for the various players (maternal seedstock breeders, 1stX producers, 2ndX producers, self-replacing breeders and lamb processors). These outcomes can be at least partially achieved by support for: a national Maternal Genetic Improvement Workshop for extension specialists and key industry players; update of technical information in the EDGE Money Making Mums Workshop; extensive use of the MCPT results in Prime Time 2005.

- Development of LAMBPLAN Across-breed EBVs for growth, carcase and wool traits is feasible, but caution would be prudent for reproduction traits. The accuracy of reproduction EBVs would be expected to improve as more maternal breed animals have reproduction information recorded in LAMBPLAN. This should be encouraged in light of the importance of reproductive rate to lamb enterprise profitability and the considerable scope for improvement highlighted in the MCPT results. While there is considerable overlap in growth and carcase performance among the breeds in MCPT there are significant and important differences between breed means for several traits. Reproduction is more difficult to evaluate accurately than other production traits as it has a lower heritability and is more subject to environmental variation that cannot be accounted for. The traits used in LAMBPLAN (nlb and nlw) are composite traits of fertility, litter size and lamb survival and these tend to compensate under commercial production systems (eg high litter size results in poorer lamb survival). Breed means were significantly different for the various component traits eg. the progeny of the Finnsheep sires had higher litter size than those from the Border Leicester sires tested in MCPT. In addition there are important genotype x environment interactions for some breeds and sires when their progeny are evaluated in different environments. These factors are likely to preclude the development of useful LAMBPLAN across-breed EBVs for reproduction traits at this stage.

- Assist industry to develop mechanisms and infrastructure to facilitate the use of superior maternal genetics and that provide for the equitable capture of the benefits of improvement by breeders and producers at all stages of the supply chain. New industry structures and breeding alliances need to be facilitated and developed to further foster the uptake of genetic technology by the maternal breeding sector and by commercial producers to exploit the considerable opportunities for improvement. Industry led breeding alliances between breeders and producers at the various levels (seedstock, 1stX, 2ndX) need to be encouraged and facilitated that also recognise that the great majority of benefits from maternal genetic improvement (>85%) are reaped by the 2ndX producer.

- The in-depth analysis of the extensive and comprehensive MCPT data continue to be adequately resourced.

Lamb producers can benefit immediately from applying the results of the MCPT project by ensuring that their ewe flocks comprise superior maternal genetics. This means breeding or purchasing crossbred ewes that are by rams with high LAMBPLAN EBVs for the traits that match the lamb enterprise and ensuring that they are bred from high performing base ewe flocks. The results show that an increase of $20 gross margin/ewe/year can be achieved from 1stX ewes by top maternal sires compared to those by average sires.

The value of these outcomes to the industry is difficult to quantify because they depend on the uptake by commercial breeders. However a modest increase of 5% in lamb turnoff amongst the top 30% of lamb production represents an annual increase of over $18m (farmgate) to the lamb industry.

CONTENTS

BACKGROUND

1. Background and Industry Context

The Australian lamb meat industry exploits crossbreeding from a national flock that is predominantly based on the Merino breed. Some 40% of the annual slaughter of approximately 18 million lambs is F1 first cross progeny of Merino ewes mated to meat breed rams. In addition, over 5 million F1 Merino crossbred ewes are mated annually to terminal sire breed rams with their second cross lamb progeny slaughtered for meat consumption. Over the past decade considerable genetic improvement in growth and carcase traits has been achieved by breeders of terminal sires (Banks 2002) through the use of improved breeding programs and widespread adoption of LAMBPLAN, the Australian genetic evaluation program for meat sheep (Banks 1994). However, genetic improvement of the maternal breeding sector which produces the sires of first cross ewes has lagged behind (Banks 2002). This national maternal sire central progeny test program (MCPT) was initiated in 1997 to evaluate the variation in first and second cross progeny performance of maternal and dual purpose (meat and wool) sires and the scope for genetic improvement in the sector. As well as increasing the rate of improvement through uptake of genetic technology by the maternal breeding sector, the MCPT provides direct linkages between breeds that may contribute information for across-breed genetic evaluation among maternal breeds for some traits at least as now occurs among terminal sire breeds (Brown *et al.* 2000).

The Border Leicester has been the major maternal sire breed used for crossing with the Merino in Australia for over 80 years. Typically the first cross wether progeny are slaughtered as lambs for meat and the first cross ewe progeny are grown out and retained for breeding second cross lambs from matings to terminal sire breed rams. The Coopworth has been used as a self-replacing breed and in the last decade other maternal breeds such as the East Friesian and Finnsheep have been imported and maternal composite breeds have been developed. There is also interest in retention for breeding of first cross ewe progeny of traditional terminal sire breeds such as the Poll Dorset, White Suffolk and Texel. In recent years Merino based breeds have been imported from South Africa and there is increasing interest from breeders in using selected Merino genotypes to improve maternal and meat traits whilst retaining the wool production characteristics of the Merino breed.

Productivity of the crossbred ewe flock has a major impact on the profitability of lamb enterprises, with lamb carcases (number produced, weight and fat level) and wool (weight and fibre diameter) being major contributors to income (Fogarty *et al.* 2003). The potential productivity of the ewes for these traits is determined by their genetic merit. The task is to achieve higher genetic merit among the commercial flocks of crossbred ewes that predominate in the specialist sector of the Australian lamb industry. Crossbreeding has been used very effectively for many years to maximise heterosis. However a wider range of genotypes and genetic technology is now available to achieve more rapid genetic improvement.

The MCPT has tested 91 sires from several maternal breeds including Border Leicester, Coopworth, East Friesian and Finnsheep. There is considerable variation among sires in performance of their crossbred progeny, and opportunities exist to exploit this variation to improve commercial flocks. The MCPT is also assessing the feasibility of developing across-breed estimated breeding values (EBVs) for maternal breeds in LAMBPLAN. New industry structures and breeding alliances need to be developed to foster uptake of genetic technology by the maternal breeding sector and exploit opportunities to bring about more rapid improvement.

The MCPT commenced in 1997 to generate 1stX ewe progeny in the first phase at three sites (Cowra, NSW, Hamilton, Vic and Struan, SA). These 1stX ewes were grown out and mated for three lambings with their 2ndX lambs slaughtered at three sites in the second phase (Cowra, Hamilton and Rutherglen, using the Struan bred ewes). The final report covering the first phase and the early part of the second phase of the project (LAMB.325) was presented in September 2001 and may be referred to for further details. While this report covers the contract for LAMB.325A (2001-2004), which largely encompasses the second phase, the summary of results and recommendations cover both phases.

2. OBJECTIVES

By December 2004, the Research Organisation will achieve the following to the satisfaction of MLA:

1. Evaluate by MCPT 91 high performance maternal and dual purpose sires for:
    a. Growth and carcase phase of 1st and 2nd generation crossbred progeny; and
    b. Maternal phase of 1st generation crossbred female progeny
2. Progressively release to industry across-breed EBVs from the progeny tests and evaluate the scope for and value of converting all LAMBPLAN maternal EBVs to an across-breed basis using the progeny test data to contribute to between breed links.
3. Demonstrate the range in genetic merit in those components of lamb enterprise profitability deriving from the maternal genotype, and support improved industry performance in these areas by a targeted extension program.
4. Enhance, in cooperation with LAMBPLAN, industry understanding of maternal EBVs through increasing the adoption by maternal seedstock breeders from the 2001 level of 55 to 100 by December 2004.

3. EXPECTED OUTCOMES AND BENEFITS TO INDUSTRY

a) Identification of and more widespread use of maternal and crossing sires with high genetic merit for:

- growth, leanness and muscling
- net lambing rate
- wool production and quality

b) Demonstration of the sire variation that exists among crossbred progeny for growth, carcase traits, wool production and ewe lambing rate at different seasons of lambing.

c) Greater uptake of LAMBPLAN by maternal and crossing seedstock breeders.

d) Greater demand for LAMBPLAN information on potential sires and crossbred progeny by ram buyers and purchasers of crossbred dams

e) Greater genetic trends for maternal traits in industry flocks.

f) Improved efficiency of production of lambs through higher lambing rates by matching sires used to the genetic requirements of the lamb production system being used.

The value of these outcomes to the industry is difficult to quantify because they depend on the uptake by commercial breeders. However a modest increase of 5% in lamb turnoff amongst the top 30% of lamb production represents an annual increase of over $18m to these producers.

4. METHODOLOGY

4.1Design

Border Leicester and other breeds of rams used as maternal sires with LAMBPLAN information and nominated by industry, were individually mated to base Merino ewes using thawed frozen semen and laparoscopic artificial insemination. The Merino ewes were randomised and joined to the nominated sires at three sites over three years at each site (Cowra and Hamilton 1997 to 1999 and Struan 1998 to 2000). At Hamilton half the base ewes were Merino and the other half were Corriedale. Three common sires were used at all sites in each year to provide genetic links to allow combined analysis of data and estimation of across site and year sire progeny means.

First cross wether progeny were grown out and slaughtered at average 22kg carcase weight. Growth rate and standard carcase traits (weight, fat, muscle) were recorded. First cross ewe progeny were retained and grown out for breeding. These crossbred ewes were bred for three (3) years to obtain an estimate of lifetime lambing performance. Additional information on variation of out-of-season reproductive activity, fleece weight and fibre diameter was also collected as well faecal worm egg count (FEC) to assess worm resistance. The 1stX ewes were joined to high index LAMBPLAN tested terminal sires. The 2ndX lambs were grown out to heavy weights and slaughtered with standard carcase information collected. Varying production systems eg. spring, summer and autumn joining, were used for the crossbred ewe evaluations at the various sites to conform with general practice in each region. At Cowra the 1stX ewes were split at random prior to their first joining with one group joined in the autumn and the other joined in the spring to assess any GxE interaction or change in ranking of sires when joined out of season in the spring. The 1stX ewes generated at Struan were transferred to Rutherglen at 10-12 months of age for evaluation.

Approximately 25 1stX ewes/sire, assessed over three years in each lambing system, are required to detect a 10% difference in lambing rate. Approximately 33 1stX ewes/sire are required for similar precision for evaluation in two lambing systems. The Merino ewes were randomised on origin, age and liveweight and mated using laparoscopic AI to the nominated sires, aiming to generate the above number of 1stX ewe progeny per sire.

4.2 Sites and Production Systems

Cowra Agricultural Research & Advisory Station
Base ewes: Merino medium wool –12 sires each year X approx 66 base ewes, March 1997, February 1998, 1999
1stX ewe progeny evaluation: ewes split to either autumn or spring joining systems and mated to Poll Dorset rams for 3 lambings.
Autumn - first joining at 7 months (autumn 1998)
Spring - first joining at 14 months (spring 1998)
Final drop of 2ndX lambs slaughtered September 2003

Hamilton Pastoral & Veterinary Institute
Base ewes: Merino fine wool and Corriedale – 12 sires each year X approx 70 base ewes, April 1997, March 1998, 1999
1stX ewe progeny evaluation: ewes joined in autumn to terminal sire rams for 3 lambings, with first joining occurring at 7 months (autumn 1998).
Final drop of 2ndX lambs slaughtered May 2003

Struan Agricultural Centre / Rutherglen Research Institute
Base ewes: Merino broad wool SA type – 14 sires each year X approx 70 base ewes, January 1998,

1999, 2000. The AI matings and base ewe lambings with 1stX wether progeny grown out to slaughter at Struan. The 1stX ewe progeny grown out at Struan to 10-12 months and transferred to Rutherglen for maternal evaluation.
1stX ewe progeny evaluation: ewes joined in spring/summer to White Suffolk ramss, with first joining at 18 months (spring 1999).
Final drop of 2ndX lambs slaughtered November 2004

General Design of Maternal Sire Central Progeny Test

Maternal Sires X Merino Ewes

Matings of maternal sires at Cowra, Hamilton and Struan - 1997,1998,1999, 2000

eg. Border Leicester, Booroola Leicester, Coopworth, Corriedale, East Friesian, Finnsheep

1stX ewes *- grown out*

- survival
- growth
- breeding season
- wool wt, yield, fibre diam
- faecal egg count

1stX wethers *- slaughtered*

- survival
- growth
- carcase wt, fat, ema, pH, colour

Terminal sires X 1stX ewes (x 3 years)

- breeding season
- lambing rate
- wool wt

2ndX lambs *- slaughtered*

- survival
- growth
- carcase wt, fat, ema, pH, colour

4.3 Measurements and Protocols

Minimum data and measurements recorded at each site included:

Maternal Sire Mating Phase
Ewe liveweight - around mating
Pregnancy diagnosis, Foetal number scan (optional)
Lambing data: id, dam id, sire id, date, type of birth, sex, weight, assistance, pms (optional)
Marking - castrate males

****Weaning weight*** (about 11 weeks)
****Liveweight*** + Fat score (GR mm manual) - fasted liveweight
- wethers @ slaughter, ewes @ same age

****Hot carcase weight***
****GR knife*** (hot in chiller)
****Eye muscle area***, calculated (d x w x0.008) from depth and width measurements
C fat, Muscle pH and Colour (L, a, b) - to be negotiated with local works

Reproduction - 1stX ewes
Onset of puberty
Ewes ovulating & ovulation rate (optional)
****Ewe and lambing*** data - similar to Maternal Sire Phase above
****2ndX carcase*** data - similar to Maternal Sire Phase above

Wool Data
1stX ewe hoggets
Greasy Fleece Weight
****Clean fleece weight, *fibre diameter***, yield%
Fleece bin line (main, 2nd, tender) - grab sample for additional measurements
1stX ewe adults - greasy fleece weight, bin line

****major production traits*** *for reporting sire progeny means*

Joinings of 1stX ewes: Ewes were joined to syndicates of terminal sire rams at about 2%. Rams were of the one breed at each site (Cowra, Poll Dorset; Hamilton, Jonesdale; Rutherglen, White Suffolk). Where possible rams were within the top 25% on LAMBPLAN index and balanced EBVs for growth, fat and muscle.

Culling Policy: Generally there was no culling, except for a very few lambs that may not be growing due to injury or disease eg arthritis. A level that was adopted was $<3\sigma$ below the mean weight for the sire group. There was no intervention to remove any 1stX or 2ndX lambs from higher order births.

Additional Data Collected
Milk production: Subsequently milk production data was collected from samples of 1stX ewes from each sire group, on their first lactation at Cowra and Rutherglen, with some data collected at Hamilton. These have involved measurement of milk production in early and late lactation using the 4 hour oxytocin technique. Individual ewe samples have been analysed for composition at commercial laboratories.
Faecal egg count (FEC): Data was collected from most 1stX ewes at an appropriate time during their first year at Cowra and Hamilton.
DNA samples: DNA samples from most 1stX and 2ndX progeny have also been collected from blood and stored for subsequent studies.

4.4 Maintenance Feed Requirements

Grazing intake studies to estimate maintenance feed requirements of the 1stX ewes have been funded by MLA under a separate project contract (LAMB.328). Dr Greg Lee, Special Livestock Research Officer, Orange, who has extensive experience in this area with Merino sheep, developed the experimental protocols and is part of the team involved in supervising this study. The study uses CrO_2 slow release capsules and faecal sampling to estimate feed intake of dry ewes grazing pasture. The study involves all the 1stX ewes at Cowra, Hamilton and Rutherglen, (approximately 2700) with each progeny group sampled after the MCPT lambing evaluation has been completed. The first group of ewes at Hamilton were sampled in February 2002, with the other groups in 2003.

At Cowra there were six groups of ewes (3 drops x 2 season of joining), with the first group sampled in May 2002, three others in spring 2002 and the final groups in 2003. At Rutherglen the ewes were sampled in spring 2002, 2003 and 2004. The results from this project will be reported separately.

4.5Link Sires

Three link sires were used at each site in each year. The links included a Border Leicester (Kelso, BL12), Coopworth (Oaklea, Cp5) and Finnsheep (Warrayure, Fi7) as a broad representation of the genotypes being tested in the project. The owners of the rams paid one entry fee and provided one batch of semen as a normal sire entry and agreed to provide the additional semen for links at a discounted price. In 1998 at Struan the BL link sire was not used due to confusion at AI which resulted in another BL sire being tested.

Following discussions with Dr Arthur Gilmour, it was decided to use the same link sires across all sites and years to provide the most accurate estimates of progeny performance for sires and hence rankings for the various traits. This applies particularly if there are Genotype X Environment interactions present, which we expect could be important for some of the reproduction traits. The downside of using the same links throughout are; a greater disparity in accuracy of sire progeny means between links and other sires, possibly criticisms from other breeders about seen to be favouring some, not necessarily having the best sires being used as links and the breeds improving over time, the risk that the breeds and sires used as links will not be representative of the range of sires being tested. *[With hindsight these possible downsides do not appear to have eventuated. There is obviously a greater accuracy of the link sire progeny means, but they have generally performed fairly well and have covered a range in performance for different traits.]*

There is a long time scale involved before the reproduction and 2ndX lamb data are available, eg. only the first lambing results from the first autumn joined group at Cowra and Hamilton were available before the final sire matings occurred at these sites. Any selection of other link sires could only have been based on 1stX growth and carcase data and only for the final matings.

4.6 Maternal Sire Entries

Despite the extremely short notice for the start of the project in 1997 (for breeders to nominate sires and have semen collected, frozen and delivered), there was an outstanding response. There were 33 sires nominated in the first year, with capacity for only 21 sires at Cowra and Hamilton. A selected and reserve list of sires was established by Neal Fogarty, Leo Cummins and Rob Banks, LAMBPLAN Coordinator. LAMBPLAN information was used and sires were selected to provide a reasonable representation of breeds at each site. Some reserve sires were used at each site because adequate quality semen was not available at AI in March and April 1997.

Subsequent matings were: Struan - January 1998, 1999, 2000

Cowra - February 1998, 1999

Hamilton - March 1998, 1999

All nominations were called in September to allow greatest flexibility in selections and assignment of sires to locations as well as sufficient time for breeders to collect and supply semen.

Procedures for Selecting Sires All site managers and Rob Banks (LAMBPLAN) made final selections for sires to be used across all 3 sites. The following broad criteria were used:

- representation of breeds used in the industry in proportion to their impact

- LAMBPLAN EBVs
- young rams preferred
- regional representation

The details of the 91 maternal sires tested are shown in Appendix A2.

5. PROJECT MANAGEMENT

5.1 Project Team

The project was conducted by a national project team. During the second phase of the project the team comprised:

Dr Neal Fogarty, (Leader) Principal Research Scientist, NSW Department of Primary Industries, Orange Agricultural Institute, Orange NSW 2800.

Gervaise Gaunt, Research Scientist, Department of Primary Industries, Victoria, Rutherglen Research Institute, Rutherglen Vic 3685.

Dr Leo Cummins, Senior Research Scientist, until his retirement in 2002 and subsequently Trevor Pollard, Senior Sheep and Wool Research Officer, Department of Primary Industries, Victoria, Pastoral & Veterinary Institute, Hamilton Vic. 3300.

Veronica Ingham, Meatsheep Geneticist, NSW Department of Primary Industries, Orange Agricultural Institute, Orange NSW 2800, has undertaken the considerable task of much of the data analysis across sites. Ms Ingham started in March 2003 and her position is partly funded by the Australian Sheep Industry CRC.

During the first phase of the project the Struan site was managed by John Stafford, Senior Livestock Officer, Primary Industries South Australia, until his retirement in August 2000 and subsequently by Drs Janelle Hocking Edwards and Nick Edwards, Research Scientists, South Australian Research & Development Institute (SARDI), Struan Research Centre, Naracoorte, SA 5271.

In addition, Dr Arthur Gilmour, Principal Research Scientist, Orange and Dr David Hopkins, Senior Research Scientist, Cowra were involved in the design and development of carcase evaluation protocols and Dr Hopkins has assisted in carcase evaluations at Cowra along with Dr Alex Safari, Research Scientist, Orange.

Jayce Morgan undertook M.Rur.Sc. studies on ewe milk production at Cowra through the University of New England under the supervision of Assoc. Professor Geoff Hinch, Department of Animal Science and Dr Fogarty.

Philip Kenney, Research Officer, Sheep Products, Rutherglen Research Institute, was involved in early planning of the project prior to his retirement in 1997.

Technical Support

Considerable technical support has been provided at each site over the years by:

Cowra: Jayce Morgan, Technical Officer, Kelly Lees, Technical Officer, Lynette McLeod, Technical Officer, Tony Markham, Technical Assistant, Ashley Radburn, Technical Assistant, David Stanley, Technical Officer and the Manager and other staff at Cowra AR&AS and Orange AI. Dr Peter Holst, Principal Research Scientist, provided valuable advice for the milking studies and Sharon Nielsen, Biometrician, undertook analysis of the milk data.

Hamilton: Kerrie Groves, Technical Assistant, Murray Arnold, Senior Technical Officer, Roger Thompson, Senior Technical Officer, Alison Behrend, Technical Assistant, Victoria Condon, Technical Assistant, Michelle Carter, Technical Assistant, Manager, Brian Clark and Stockmen Brian Hurley and Phil Forsyth.

Rutherglen: Greg Seymour, Technical Officer, Paul Curran, Technical Officer, Taffy Phillips, Technical Officer, Max Daniel, Technical Officer and Angela Avery, Research Scientist.

Struan: Jack Rowe, Technical Officer, Tamara Starbuck, Research Officer, Elke Hocking, Lamb Product Development Officer, Liz Abraham, Technical Assistant, John Cooper, Farm Manager and Farm Staff Colin Windebank and Shane Walker.

Project Coordination

Dr Rob Banks was closely involved with the design and management of the project initially through his role as Manager LAMBPLAN and subsequently as Project Co-ordinator for MLA. Dr Alex Ball, Richard Apps and Dr Rob Woolaston have been involved more recently. Laurie Thatcher was the Project Co-ordinator for MLA until the end of 2000.

5.2 Project Technical Meetings and Workshops

The MLA Maternal Genetics Workshop was held in Adelaide (2 & 3 September 2002) in which the results to date from the MCPT project formed an integral part. The national Workshop brought together researchers, extension specialists and industry representatives to establish the platform for continuing the development and utilisation of superior maternal genetics in the industry. A direct outcome was the development of the *Money Making Mums* EDGE Workshop incorporating results from MCPT. Another outcome was development of the software *EBV $ Calculator for Maternal Sires* by N Fogarty and L McLeod for use in the EDGE Workshop.

A Project Team Meeting was held in Sydney (7 May 2002). This was also combined with a meeting of the TTAG group and members of the LAMBPLAN Advisory Committee.

A Project Team Meeting was held in Orange (6-7 May 2003) in conjunction with the Genetics project team in The Australian Sheep Industry CRC. There were several extension specialists and LAMBPLAN/AGBU staff also involved. A workshop was also held on the Sheep Object software being developed at AGBU as part of the MLA project.

A Project Team Meeting was held in Hamilton (10-11 June 2004). Previous Team members Leo Cummins, John Stafford and Janelle Hocking Edwards also participated. The plan for the Final Report, analysis of data and publication and extension activities and follow-up around the completion of the MCPT were formulated. The summary of take home messages and recommendations to MLA were further developed, including a Dynamic Dams reader feedback survey formulated.

A national Workshop on Maternal Genetic Improvement to further develop an extension strategy is currently being planned in conjunction with MLA for early 2005.

5.3 Technical Transfer Advisory Group (TTAG)

John Keiller, Portland, Vic – Composite breeder and lamb producer

Robert Mortimer, Tullamore, NSW – Merino breeder

Don Peglar, Mt Gambier, SA – Coopworth breeder and lamb producer

Charlie Prell The TTAG reviewed the proposal and strongly supported the establishment of the project in February 1997. They further agreed to aid in dissemination of information about the project and provide ongoing advice. This has been an important aspect of the success of the project and widespread interest and implementation of results by industry. The TTAG had representation of maternal seedstock breeders and commercial lamb producers from a wide area of SE Australia. The TTAG members were:

Lynton Arney, Strathalbyn, SA – Border Leicester breeder

Sandy Cameron, Meredith, Vic – Milk sheep and lamb producer

, Crookwell, NSW – Corriedale breeder and lamb producer

TTAG meetings were convened by the MLA Coordinator and were funded separately outside the project. Formal TTAG meetings were held as follows:

February 1997 – Rutherglen

October 1997 – Cowra

September 1998 – Rutherglen

December 1999 – Struan

November 2000 – Cowra

May 2002 – North Sydney (included LAMBPLAN Advisory Committee)

5.4 Evaluation

McCausland Review

Dr Ian McCausland undertook a review for MLA of the impact of the MCPT project in late 2001 (ie at the end of phase 1 and beginning of phase 2). He concluded that the MCPT project represented a key building block in demonstrating the importance of maternal sire genetics in prime lamb production. As a result the industry was realising that maternal sire genetics are of critical importance and the project was providing the information to change attitudes, with changes in practice beginning to take place.

Reader Feedback - Dynamic Dams Newsletter

Some 41 readers returned the feedback survey (10%) that was included in issue No 22 (June 2004) of the Newsletter (see Appendix A3 for form). Some 39% of respondents were ram contributors or seedstock breeders, 39% lamb producers and 17% consultants or advisors.

The Newsletter was valued with 83% rating it high or very high value. Most readers were satisfied with the presentation with 80% rating the style and layout good or very good. The amount of detail contained in the newsletter was considered to be generally right (64%). One reader thought there was too little detail, no one thought there was too much detail and 34% had no opinion.

Almost all respondents (85-100%) rated as high or moderate importance the expression of results for sires as EBVs for lamb growth and carcase merit and various measures of 1stX ewe performance, except for 1stX wool (65%). The EBVs of greatest importance were number of lambs weaned (83% rated high) and lamb growth and carcase merit (78% rated high), with $returns, $ gross margin/ewe (60% rated high) and $gross margin/DSE (65% rated high) rating a little lower. Other suggestions for expression of results included: lamb survival, ability to lamb at 1 yr old; indicators of longevity of breeding ewes and seasonality.

Some 58% of respondents rated the impact of MCPT on industry as very high or high with 27% moderate and 10% little. However most of the moderate and little impact respondents indicated that this was the current impact and future impact on industry would be very high or high.

Asked to list the 2 main *Take Home Messages* from MCPT, responses fell into 3 broad categories: variation between and within breeds; profitability of improved genetics; and lamb survival and growth. Some of the typical responses included: *"select genetic excellence within breed that is best suited to your environment and management", "selection and not necessarily breed/cross type are important profit drivers"*, and *"maternal side of the industry offers huge gains if used correctly".* Many respondents saw the *"importance of the number of lambs weaned"*, how it *"affects returns dramatically"* and how it can be *"improved by genetics and management"*.

Most respondents (76%) had changed the way they ran their business because of the results of MCPT. For most of these it involved a change in genetics or adding breeds (45%), sourcing better ewes/contract mating (13%), developing self-replacing flocks (7%), changed lambing time, feeding (10%) and using results in advice (17%). Most respondents also made comments on MCPT and how the results can be best applied in industry.

6. RESULTS

6.1 Introduction

The lamb industry exploits crossbreeding with over 5 million crossbred (generally Merino 1st cross) ewes mated annually to terminal sire breed rams for production of second cross (2ndX) slaughter lambs. Considerable genetic improvement in growth and carcase traits has been achieved by breeders of terminal sires through the use of improved breeding programs and widespread adoption of LAMBPLAN. However, genetic improvement of the maternal breeding sector which produces the sires of 1stX ewes has lagged behind. The national maternal sire central progeny test program (MCPT) was initiated by breeders and lamb producers through Meat and Livestock Australia in 1997 to evaluate the variation in first and second cross progeny performance of maternal and dual purpose (meat and wool) sires and the scope for genetic improvement in the sector.

The MCPT progeny tested 91 maternal sires that were mated by AI to Merino ewes at three sites (Cowra NSW, Hamilton, Vic. and Struan SA) over 3 years. The sires were entered by seedstock breeders throughout Australia from several breeds. Common link sires were mated at each site in each year so that all 91 sires could be compared, across sites and years.

The MCPT focussed on evaluating the performance of the 1stX ewes by the different sires as well as the growth and carcase performance of the 1stX and 2ndX progeny. The 1stX wether progeny were evaluated for growth and carcase performance and the 1stX ewe progeny were grown out and retained for breeding. The 1stX ewes were mated to high EBV terminal sire rams over 3 years to evaluate their lambing rate and wool production and the growth and carcase performance of their 2ndX lambs. (The 1stX ewes bred at Struan were evaluated at Rutherglen Vic).

Over 3000 1stX wethers were slaughtered and 2700 1stX ewes (approx. 20-30 per sire) were evaluated along with their 2ndX slaughter lambs (approx. 11,000). The 91 maternal sires that have been progeny tested across the various sites were from several breeds. The breeds with the most sires tested included: Border Leicester (18), East Friesian (12), Finnsheep (12), Coopworth (9), White Suffolk (7), Corriedale (6) and Booroola Leicester (6). Other breeds with fewer sires tested were combined for the analysis under "Other" and included: Hyfer, English Leicester, Gromark, Merino, Romney, Poll Dorset, Cheviot, SAMM, South Hampshire Down, Texel, White Dorper and Wiltshire Horn as well as a composite breed (Coronga).

Most of the sires have current LAMBPLAN EBVs. These sire EBVs cover a very large range within their breed for most traits. The MCPT sire average EBVs for yearling weight were generally 1.5 to 2 kg higher than the average for all animals of their breed, with the White Suffolk sires averaging 3.6 kg higher than the Terminal sire average. For most other traits the average EBVs for the MCPT sires were reasonably close to their breed means.

The following results are from the overall analysis that used the link sires to compare the performance of all sires across sites and years. The results show differences between the average progeny of sires for the various breeds adjusted to remove known environmental effects. While there are important and significant differences between the breed averages for the various traits it must be remembered that the differences between the individual sires within the breeds were large with a considerable overlap between the breeds. There were also only relatively small numbers of sires of each breed that were progeny tested.

The production systems for evaluation of the 1stX ewes varied with the sites to account for regional differences. At Cowra the 1stX ewes were randomly split to autumn and spring joining groups prior to their first mating. The autumn joined ewes were mated in Feb/March to lamb in July/Aug and the spring joined groups were mated in Oct/Nov to lamb in March/April. At Hamilton the 1stX ewes were mated in autumn (March/Apr) to lamb in Aug/Sept and at Rutherglen the 1stX ewes were mated in late spring (Nov/Dec) to lamb in Apr/May. The ewes in each group were evaluated on the average annual performance from joinings in 3 years. The autumn joined ewes at Cowra and Hamilton were first mated at 7 months of age to lamb at 12 months of age, whereas the spring joined ewes at Cowra were first joined at 14 months of age and those at Rutherglen were first joined at 17 months of age.

The average annual autumn and spring performance cannot be directly compared as the 1stX ewes were joined for the first time at very different ages. Lambing performance increases dramatically with age and was higher from the older spring joined ewes than the younger autumn joined in the first year. The differences between the seasons were reduced in later years when the relative difference in ages of the ewes was smaller.

This report contains the main findings of the project which are summarised in the following sections, with more details provided in the Appendix tables. The results show the considerable variation found for most measures of performance across the sire breeds and particularly among the individual sires tested. The results are presented for $ gross margin performance of the 1stX ewe progeny of the maternal sires and the growth and carcase performance of the 1stX and 2ndX lambs. While only a limited number of sires from each breed have been tested the results provide seedstock breeders and lamb producers with a sound basis for decision making and genetic improvement in the maternal sector of the lamb industry.

ANALYSIS:

The analysis used mixed models procedures that took account of site,year and season differences as well as other known environmental effects (e.g. age, type of birth, carcase weight) as appropriate for the various traits. The breed and sire progeny means shown for liveweights are adjusted to average age and type of birth and rearing. The common link sires at each site and year allowed the analyses to compare all 91 sires used in MCPT with the sire progeny means for various traits shown in Appendix A1.

Sire breeds: BL = Border Leicester (18 sires); EF = East Friesian (12 sires); Fi = Finnsheep (12 sires); Cp = Coopworth (9 sires); WS = White Suffolk (7 sires); Cr = Corriedale (6 sires); BoL = Booroola Leicester (6 sires); Others = All other breeds combined (21 sires).

Figures: The mark (T) above each bar on the figure indicates the standard error of the mean. As a guide, for two means to be significantly different they need to differ by more than the sum of their standard errors.

6.2 $ Gross Margin Performance of Crossbred Ewes

The income for lamb enterprises is made up of the sales of lambs, which include the value of the carcases and skins, and the sale of wool produced by the ewe. The total value of the lamb carcase is determined by weight and price which varies with its market specification. The gross margin (GM) per ewe is the income from the lamb and wool sales and takes account of the costs of production and marketing (but does not include the cost of replacement ewes). Details of values are shown in the Gross Margin Box (page 21).

Overall the results showed a range in annual GM among the sire breeds of almost $19 per ewe from $81.22 for the Corriedale to $100.03 for the East Friesian 1stX ewes (Fig. 6.2.1). However there was a considerably greater range in annual gross margin among the sires within the breeds. For example, among the 18 Border Leicester sires there was a range of $41 GM/ewe/year for the sire progeny means which ranged from $67 for BL35 to $108 for BL2. There was considerable overlap between the Border Leicester and East Friesian sires (Fig. 6.2.2) with means for all sires shown in Appendix A1.1. The lamb turnoff rate was the major driver for the $GM with over 80% of income from lamb sales and less than 20% from ewe wool. While the number of lambs turned off (which is a combination of lambs born per ewe joined and lamb survival) was the major profit driver, lamb growth rate and fat level (which affect carcase weight and price) also affected profit. Lamb carcase price was determined by carcase weight and fat level which affected the proportion of lambs meeting the market specifications.

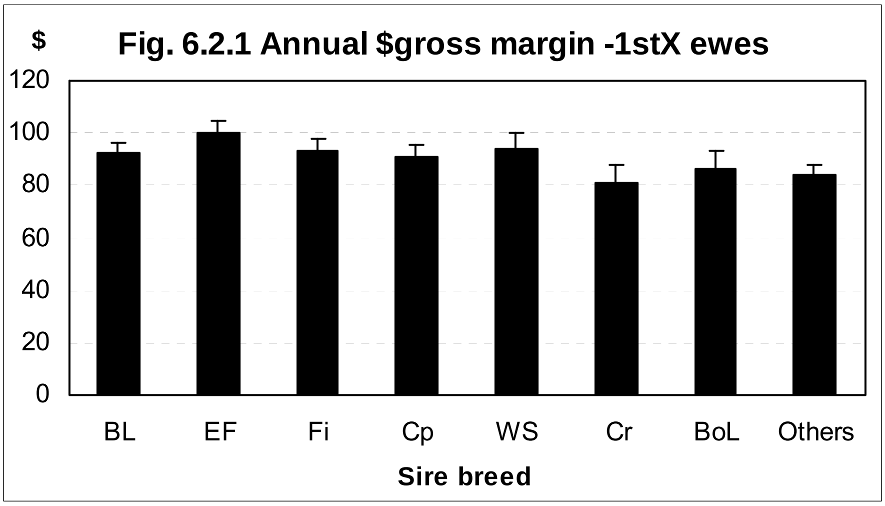
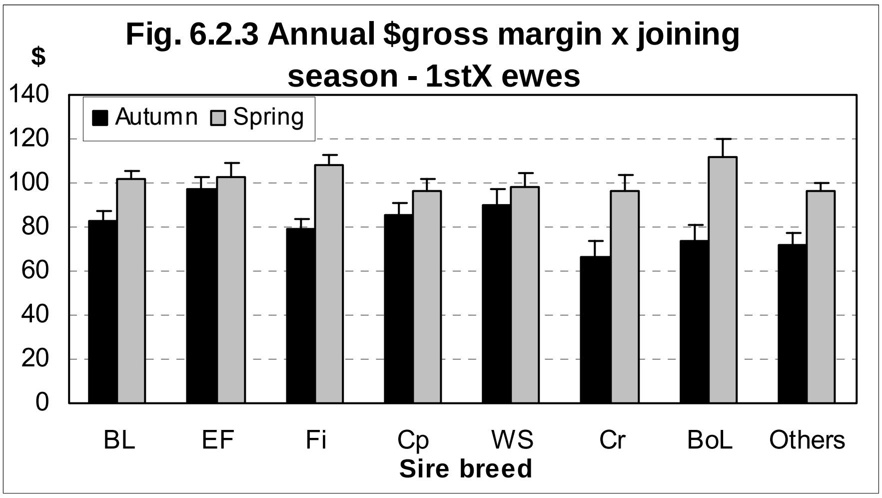


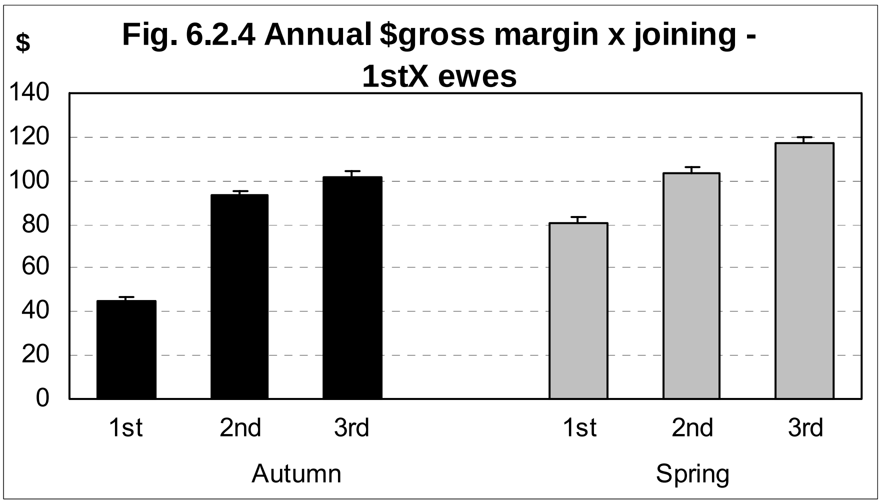
Fig. 6.2.1 Annual $gross margin -1stX ewes

Fig. 6.2.2 Annual $gross margin – 1stX ewes

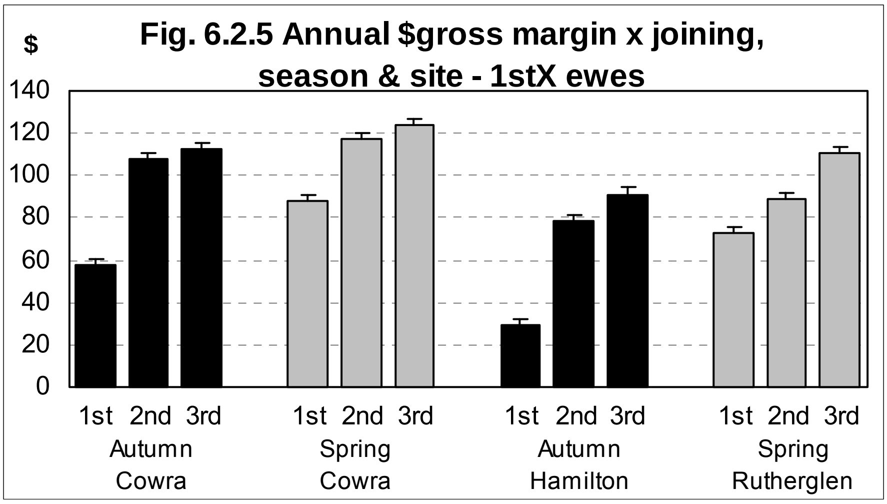
The ranking of the sire breeds (and some sires) also varied with the production system and environment in which their 1stX daughters were evaluated. In particular, the 1stX daughters of the Finnsheep and Booroola Leicester sires had a relatively higher ranking (compared to the other breeds) from the spring than the autumn joining (Fig. 6.2.3). This was largely because the 1stX ewes from both these sire breeds had high lambing rates with a high proportion of triplets and higher order births. Lamb survival tended to be low for these from the autumn joining (lambing in late winter), whereas the spring joining, which is out of season, resulted in fewer higher order births and lambing occurred in autumn with better weather conditions and higher lamb survival.



As expected the annual $GM/ewe increased with age of the 1stX ewes from their first to third joining. The $GM almost doubled from the first autumn joining where the ewes were lambing at 12 months of age compared to the second autumn joining (Fig. 6.2.4). The differences between the autumn and spring joinings were due to both the season and age of ewe effects. These effects can’t be separated in these results for the first and second joinings at least although the age effect would be expected to be small for the third joining.


$
Fig. 6.2.4 Annual $gross margin x joining - 1stX ewes
140
120
100
80
60
40
20
0
1st
2nd
3rd
1st
2nd
3rd
Autumn
Spring

There were differences in performance of the 1stX ewes at the various sites over the 3 joinings that are shown in Fig. 6.2.5. The low $GM / ewe from the first joining at Hamilton was largely due to low lambing performance resulting from the joining at 7 months of age. These ewes did not grow out to sufficiently heavy weights prior to joining so that only a small proportion of ewes reached puberty and subsequently lambed. This highlights the importance of providing adequate ewe nutrition prior to lambing.



There were also some differences between the sire breeds in their relative performance from autumn and spring joinings and the age of ewe effects. Although these effects were smaller than those noted above they did cause significant interactions and may need to be considered when applying the results. The East Friesian sired 1stX ewes had higher performance than the other ewes at the first autumn joining indicating that a high proportion reached puberty at 7 months. The East Friesian 1stX ewes had relatively lower performance at spring than autumn joinings indicating poorer out of season breeding ability. The Finnsheep 1stX ewes had relatively higher performance at spring than autumn joinings because of less higher order multiple births and better lamb survival because of more benign weather at lambing as discussed above.

Take home messages

- Average $ gross margin had a range of $19/ewe/year among sire breeds of the 1stX ewes
- The range in average $ gross margin among maternal sires was twice that between breeds with considerable overlap of the breeds eg. the 18 Border Leicester sires had a range of $41/ewe/year (from $67 to $108)
- Lamb turnoff rate was the major profit driver with lamb growth rate and carcase fat levels also contributing to the proportion of lambs meeting carcase specifications
- There was some variation in ranking of sire breeds (and sires) with production system (autumn and spring joining) and environment

CALCULATION OF $ GROSS MARGINS

The total income was calculated for each 1stXewe in each of her first 3 years. The income from 2ndXlambs was derived from the number of lambs slaughtered and their carcase weight and fat score which determined the carcase and skin prices. The income from the 1stXewe wool was derived from the individual measured clean fleece weight and fibre diameter from their first hogget shearing and individual greasy fleece weight and bin line fibre diameter for the second and third shearing. The prices used for income and costs for calculation of gross margins were as follows:

Prices

2ndX lamb carcase: $3.35/kg for carcases in specs (≥20 kg and fat score 2-4)
Discount grid for carcases out of specs ($/kg):

Wt / FS	1	2-3	4	5
<16 kg	-1.50	-1.50	-1.50	-1.50
16-19.9 kg	-0.75	-0.20	-0.50	-1.00
≥ 20 kg	-0.75	0	0	-0.50

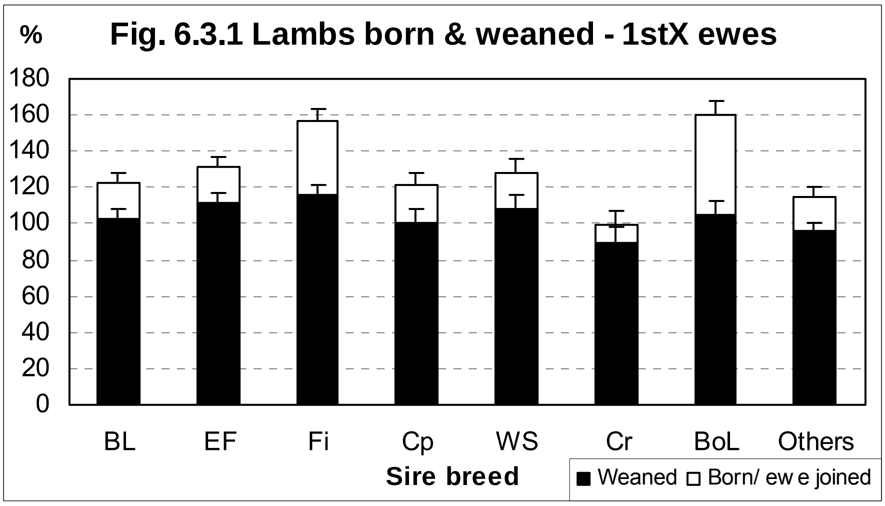
Carcases 16-19.9kg, fat score 2-4 were only given a small discount because they would normally be sold in the trade market or kept longer and sold at heavier weights.
2ndX lamb skins: ≤20 kg carcase weight $11.00; 20.1-24 kg $13.50; >24 kg $14.00.
Carcase and skin prices are based on 5 year averages (2000-2004)
1stX ewe wool: Ten year average (1995-2004) wool prices for the various micron categories were used to calculate wool returns. The individual ewe wool return was multiplied by 0.9 to account for the lower price of the skirtings and oddments.

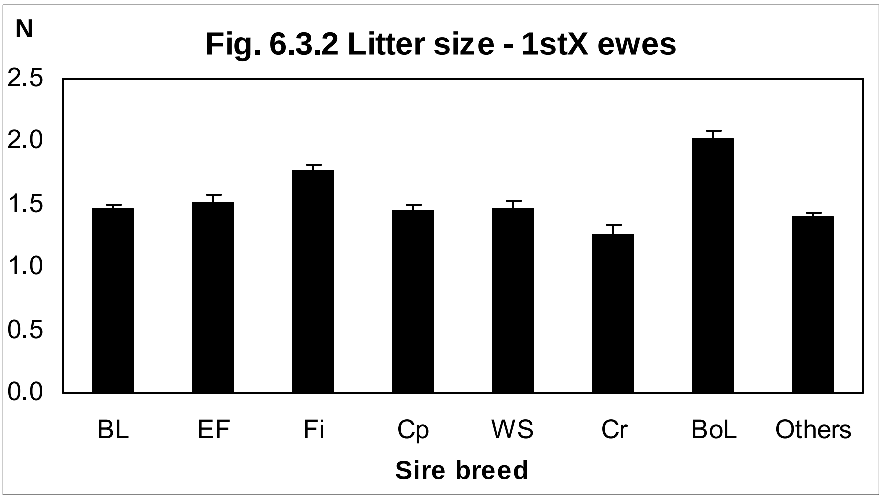
Costs

The average costs applied to individual ewes and lambs for management and marketing were:
1stX ewes: $6.24 (shearing, crutching, health, wool freight) + 7.25% of wool $ (tax, testing, selling costs);
2ndX lambs: $3.72 (health, freight) + 4.5% of carcase and skin $ (selling costs).

6.3 Lambing Performance of Crossbred Ewes

The overall lamb weaning rate averaged over the first 3 joinings (lambs weaned of ewes joined) varied from 89% for the Corriedale 1stX ewes to 116% for the Finnsheep 1stX cross ewes (Fig. 6.3.1). There was an even greater range among the sire breeds for lambing rate at birth, from 99% for the Corriedale to 160% for the Booroola Leicester (Fig. 6.3.1). The difference between the lambs born and lambs weaned reflects lamb survival, which was considerably lower for the Booroola Leicester and Finnsheep than other 1stX cross ewes. These two groups had higher litter size (average number of lambs born per lambing ewe) than the other groups with a high proportion of triplet and higher order births (Fig. 6.3.2).





The variation in lambing performance among the sire groups of the 1stX ewes was considerably greater than that between the breeds. The range in average lambs weaned % among the 18 Border Leicester sires was 121% to 76% and for the 12 Finnsheep sires was 133% to 92% (Fig. 6.3.3). The average lamb survival among the sire groups also showed considerable variation. The litter size, which largely reflects ovulation rate of the 1stX ewes, also showed considerable variation among individual sire groups (Fig. 6.3.4). Even though the average litter size for the Finnsheep sired ewes was high there was overlap between these and the Border Leicester sire groups. Progeny means for lambs weaned, lambs born and litter size for all sires are shown in Appendix A1.2.

Fig. 6.3.3 Lambs born and weaned – 1stX ewes

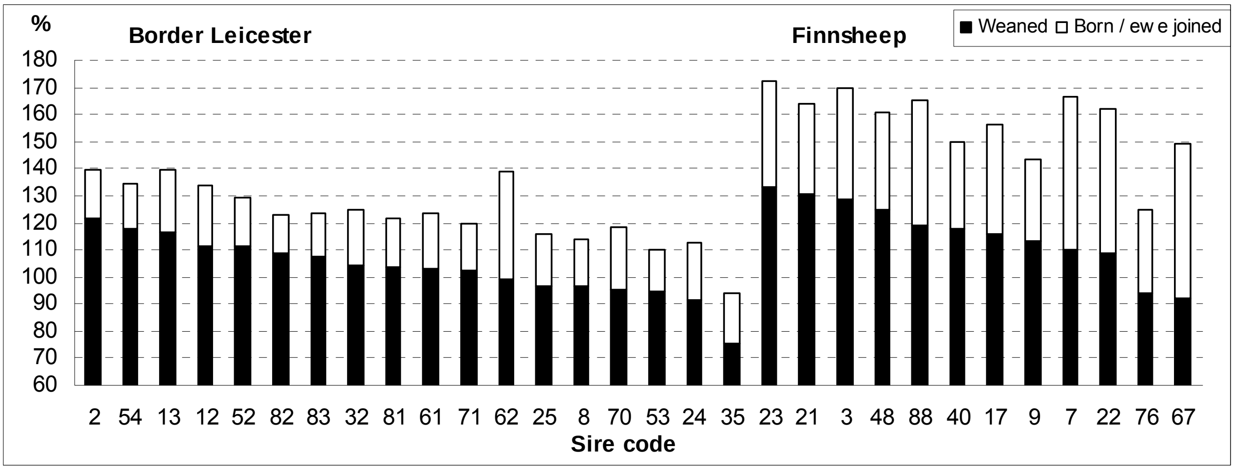
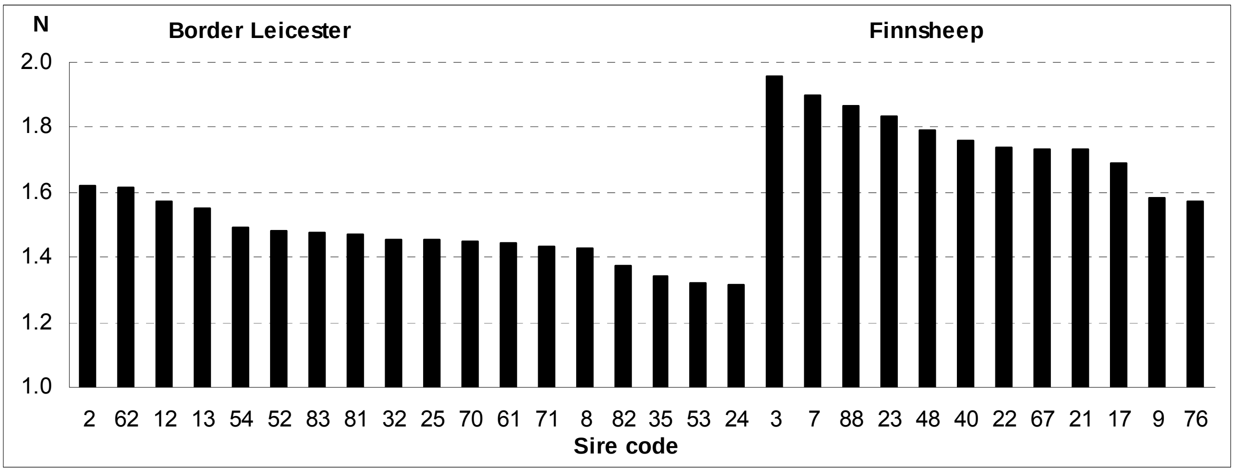


Fig. 6.3.4 Litter size – 1stX ewes



Lambing rate increased with age (at joining) of the 1stX ewes and varied with environment. For lambs born and lambs weaned (of ewes joined) the lambing rate was low for the first autumn joining at Cowra and Hamilton when ewes were joined at 7 months of age (Fig. 6.3.5) and (Fig. 6.3.6). This was because many of the young ewes had not reached puberty to successfully conceive and those that did get pregnant had fewer multiple births. For example of the ewes lambing at 1 year of age almost all had singles at Hamilton and only about 1/3 of the ewes had twins at Cowra, but the same ewes at Cowra averaged twins at 3 years of age (Fig. 6.3.7). For the 2 and 3 year old ewes at Cowra the autumn joined ewes had more lambs born than the spring joined ewes, mainly because of higher average litter size, but poorer lamb survival from the winter lambing resulted in little difference for lambs weaned per ewe joined. [Most breeds of sheep have a higher ovulation rate resulting in more multiples at birth if they are joined in the peak of the breeding season in autumn than if they are joined out of season in the spring.]

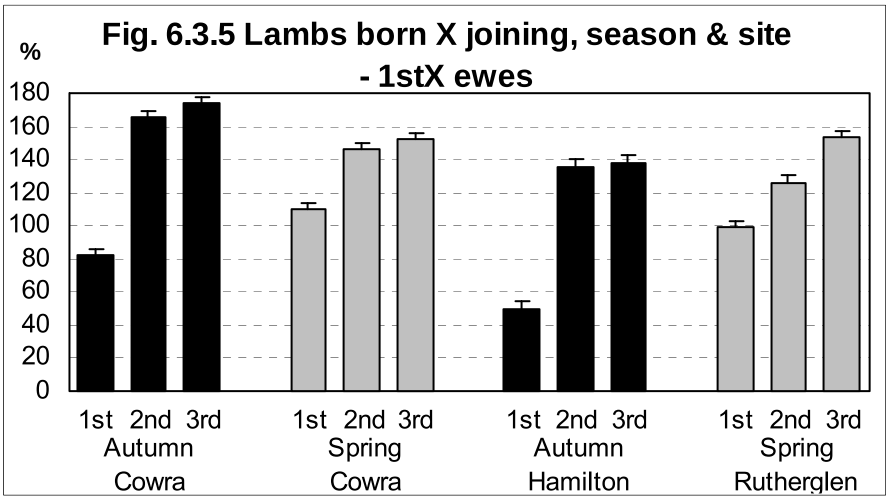


Fig. 6.3.5 Lambs born X joining, season & site - 1stX ewes

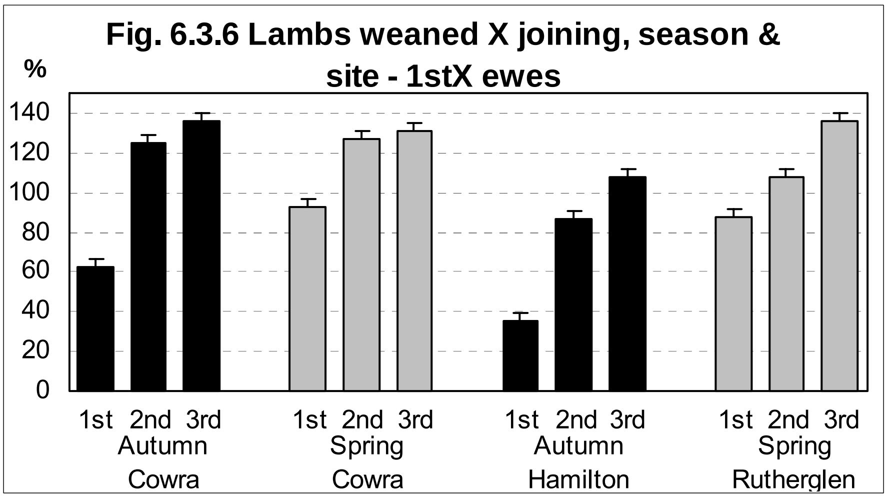


Fig. 6.3.6 Lambs weaned X joining, season & site - 1stX ewes

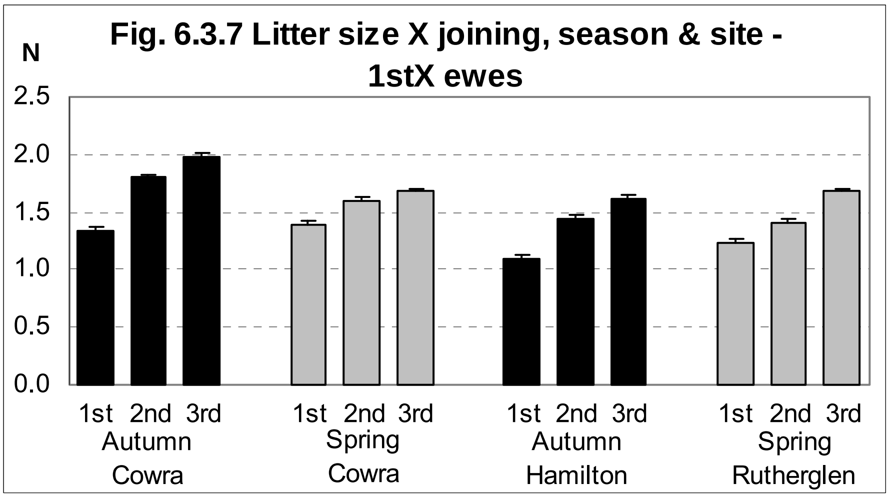
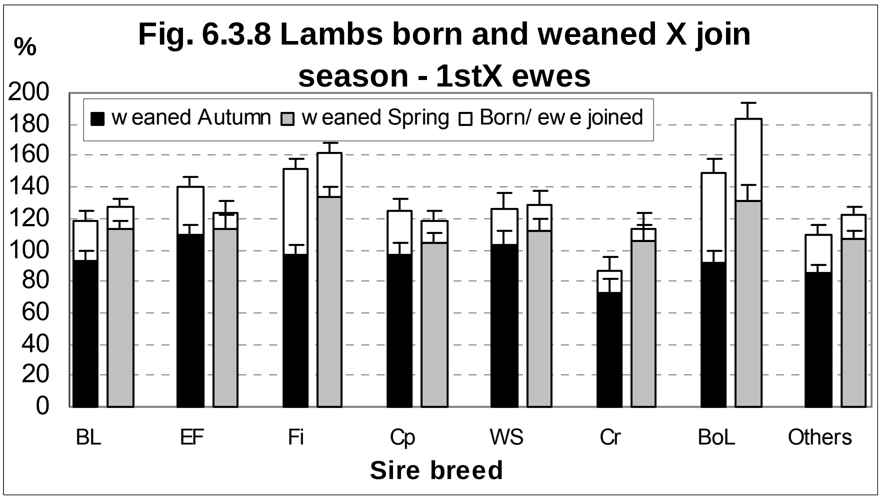
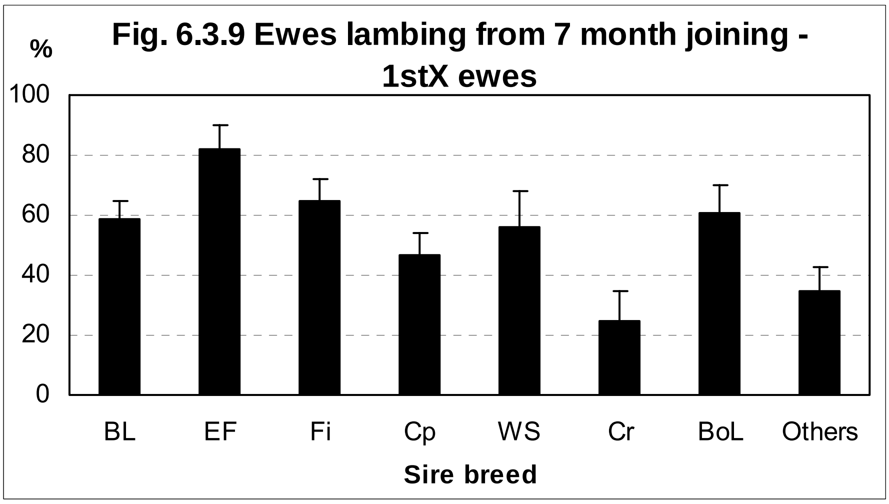


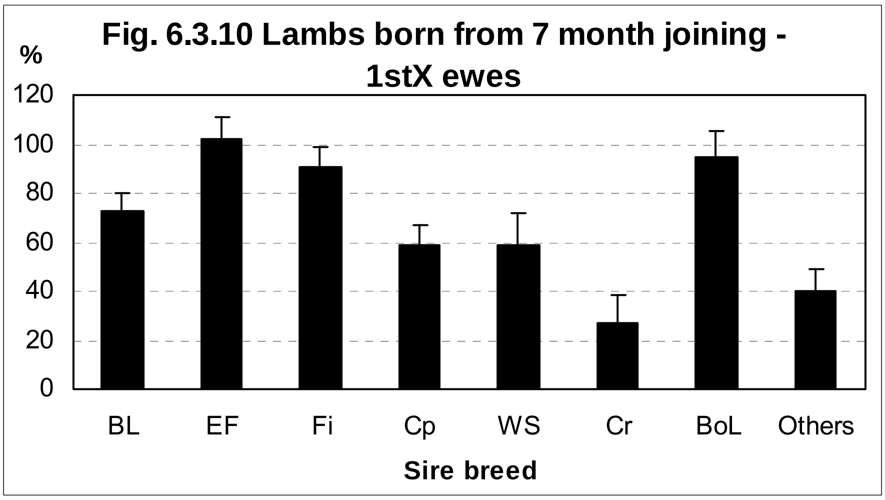
Fig. 6.3.7 Litter size X joining, season & site - 1stX ewes

There were some differences between the sire breeds of the 1stX ewes in average lambing performance from the autumn and spring joinings (Fig. 6.3.8). In particular, the 1stX daughters of the Finnsheep and Booroola Leicester sires had a relatively higher lambing percentage (compared to the other breeds) from the spring than the autumn joinings. This was largely because the 1stX ewes from both these sire breeds had high lambing rates with a high proportion of triplets and higher order births. Lamb survival tended to be low for these from the autumn joining (lambing in late winter), whereas the spring joining, which is out of season, generally resulted in fewer higher order births and lambing occurred in autumn with better weather conditions and higher lamb survival.



their joining at 7 months of age (BL2, Fi3, BL12, Cp36, EF39 and BoL55). The cost of growing out replacement ewes is reduced dramatically when they successfully lamb in their first year. There was no detrimental effect on the ewes from lambing at 1 year of age as their subsequent lambing performance was generally significantlyThe success of joining 1stX ewes at a young age (about 7 months) depends on them achieving puberty and starting to cycle and ovulate. The ewes need to reach a critical live weight (generally >40 kg) in the autumn breeding season. There were considerable differences between the breeds in the percentage of 1stX ewes lambing from the autumn joining at 7 months of age. These ranged from 25% for the Corriedale to 65% for the Finnsheep and 82% for the East Friesian sired 1stX ewes (Fig. 6.3.9) and resulted in 102% lambs born of ewes joined for the East Friesian 1stX ewes (Fig. 6.3.10). The Corriedale 1stX ewes were 5-6 kg lighter than all the other breed groups at joining and as a result few reached puberty in their first breeding season. The East Friesian 1stX ewes were only 1-2 kg heavier than the other ewe groups which were similar average weights (except for the Corriedale). The ewes at Cowra were 5-8 kg heavier at joining than those at Hamilton which resulted in a higher lambing rate at Cowra (82% v 50% lambs born of ewes joined, see Fig. 6.3.5). While on average the East Friesian and the Finnsheep 1stX ewes were more successful from the joining at 7 months than the other breeds there was considerable variation among individual sires from most of the breeds. For example at Cowra there were 6 sire groups of 1stX ewes that weaned more than 90% of lambs (of ewes joined) from higher than ewes that did not lamb at 1 year of age.





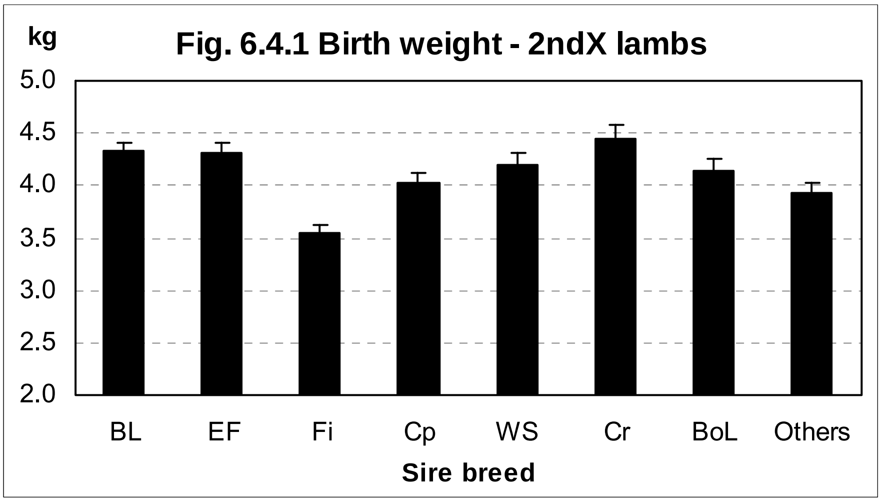
Take home messages

- There were large differences between the sire breed groups of the 1stX ewes for lambing rate (89 to 116% for lambs weaned and 99 to 160% for lambs born)
- Variation in lambing rate was considerably greater among individual sire 1stX ewe groups within breeds eg. the 18 Border Leicester sires ranged from 94% to 140% for lambs born
- Lambing rate, including litter size and lamb survival, varied with season and environment, so that some breeds (and sires) changed rank in different production environments
- Those breeds with high lambing potential were more suited to spring joining where the out of season joining reduced the proportion of triplets and higher order births and lamb survival was enhanced by more benign weather conditions prevailing at lambing
- 1stX ewes from several sire groups successfully weaned over 90% of lambs when joined at 7 months of age in the autumn. While the ewes need to be well grown, it considerably reduces the cost of growing out replacement crossbred ewes.

6.4 Growth of 2ndX Lambs

All the 1stX ewes at each site were joined to the same terminal sire rams to produce 2ndX lambs. Therefore the differences in growth of the 2ndX lambs presented here are due to a combination of the genes of the lambs that have been passed on from the sires of their mothers (¼) and the maternal environment provided by the 1stX ewe mothers.

There were significant differences between the breed averages for birth weight (Fig. 6.4.1), weaning weight (Fig. 6.4.2) and post weaning weight (close to slaughter, Fig. 6.4.3) of the 2ndX lambs. The lambs from the Finnsheep 1stX ewes were about 0.5-0.8 kg lighter than all the other breed groups at birth. They were also significantly lighter, along with those from the Corriedale 1stX ewes, than most other groups at weaning and post weaning. They were about 4.5 kg lighter than the lambs from the East Friesian 1stX ewes, after adjustment for any differences in type of birth and rearing and age. There was also a large range among the progeny averages of the sires within the breeds with considerable overlap across the breeds. For example the 2ndX progeny averages for post weaning weight of the 18 Border Leicester maternal sires ranged from 41.2 to 44.8 kg whereas the range for the 12 East Friesian sires was from 43.4 to 47.5 kg (Fig. 6.4.4). Progeny means for all sires for birth, weaning and post weaning weight are shown in Appendix A1.3.



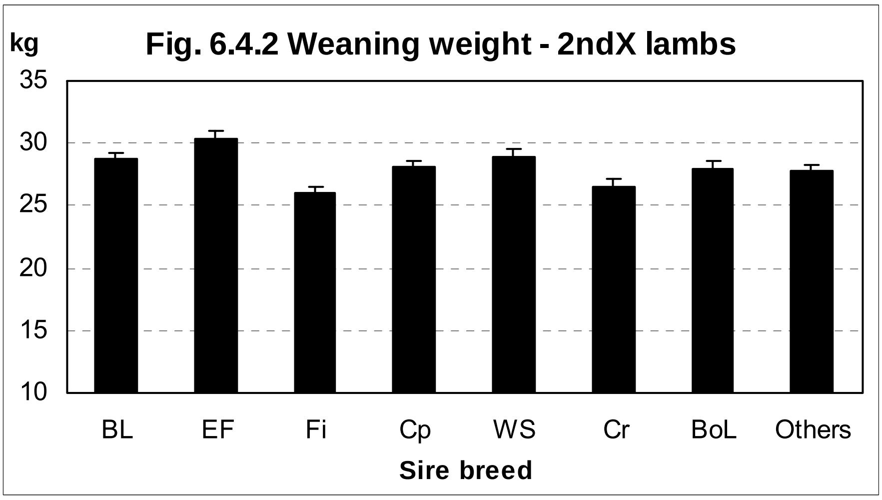


Fig. 6.4.3 Postweaning weight - 2ndX lambs

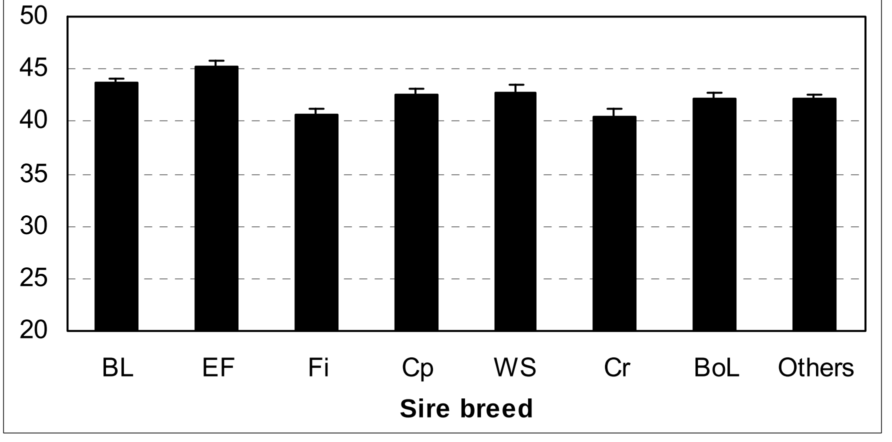
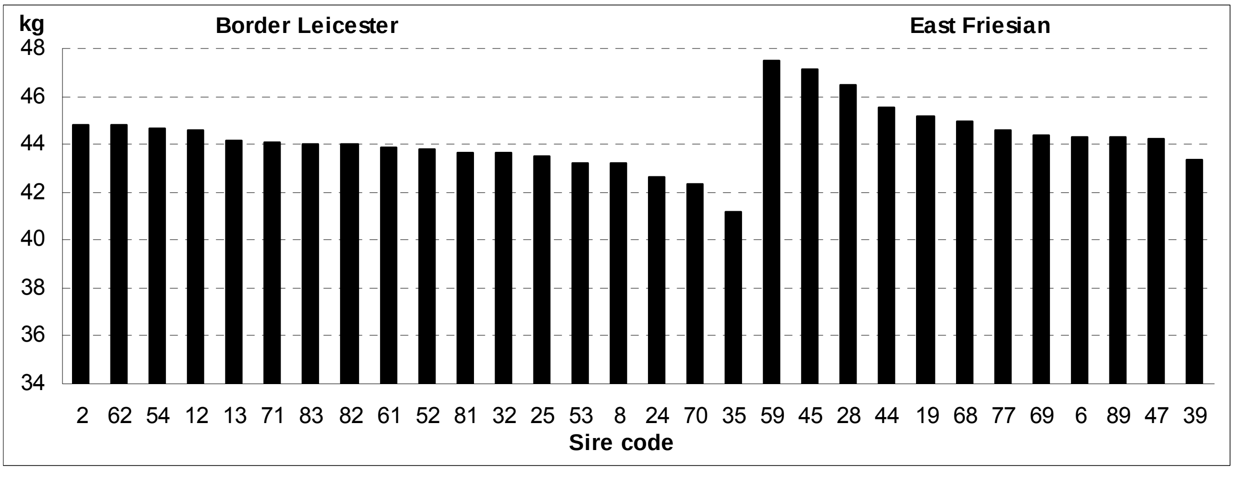


Fig. 6.4.4 Postweaning weight – 2ndX lambs



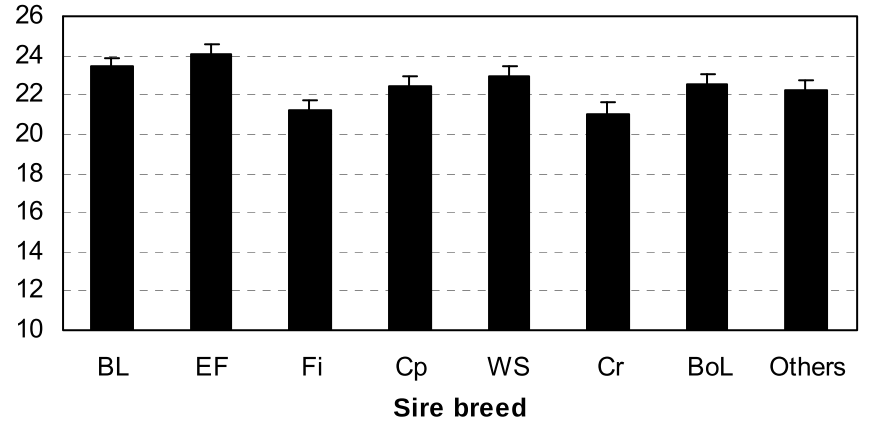
Take home messages

- There were differences between some maternal sire breeds for birth, weaning and for post weaning weight (up to 4kg) of their 2ndX lambs
- There were large differences between progeny of individual maternal sires with an overlap between the maternal sire breeds

6.5 Carcase of 2ndX Lambs

The differences in growth rate between the breeds of sires of the 1stX ewes led to a range in 2ndX carcase weight across the breeds of 3.1 kg (Fig. 6.5.1) as there was little difference between the breeds in dressing %. While the 2ndX lambs from the East Friesian 1stX ewes were the heaviest (24.1 kg) they were not significantly different from the Border Leicester (23.4 kg).

Fig. 6.5.1 Carcase weight - 2ndX lambs



There was a large range in carcase fat levels among the sire breeds of 2.8 mm GR or more than ½ a fat score when compared at the same carcase weight (22.5kg). The leanest carcases were from progeny of the East Friesian 1stX ewes (13.0 mm GR) and the fattest from the Booroola Leicester 1stX ewes (15.8 mm GR) (Fig. 6.5.2). As with growth, there was considerable variation among the individual sire progeny groups for carcase fat levels. The 18 Border Leicester maternal sire groups ranged from 14.1 to 16.3 mm GR and the 12 East Friesian maternal sire groups ranged from 12.1 to 13.6 mm GR (Fig. 6.5.3). Even with the extreme differences between the averages of these two breeds the leanest Border Leicester maternal sire group was similar to the fattest East Friesian maternal sire group. Differences of half a fat score in carcase fat levels may have a significant impact on the proportion of 2ndX lambs meeting a market specification.

Fig. 6.5.2 Carcase fat GR - 2ndX lambs

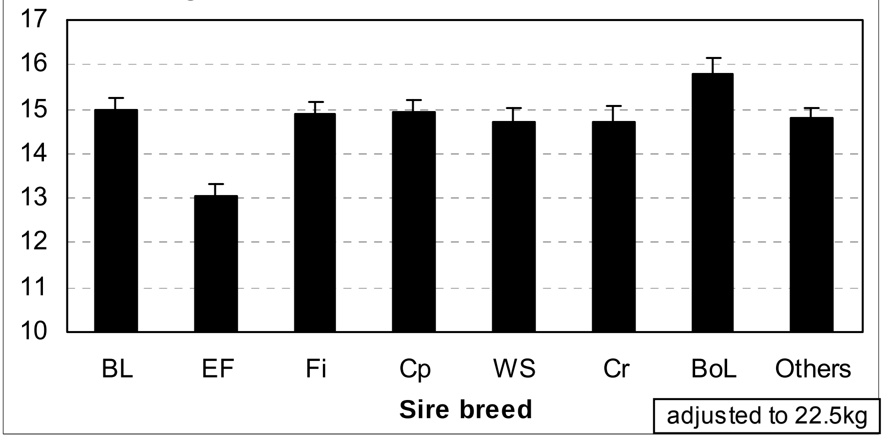
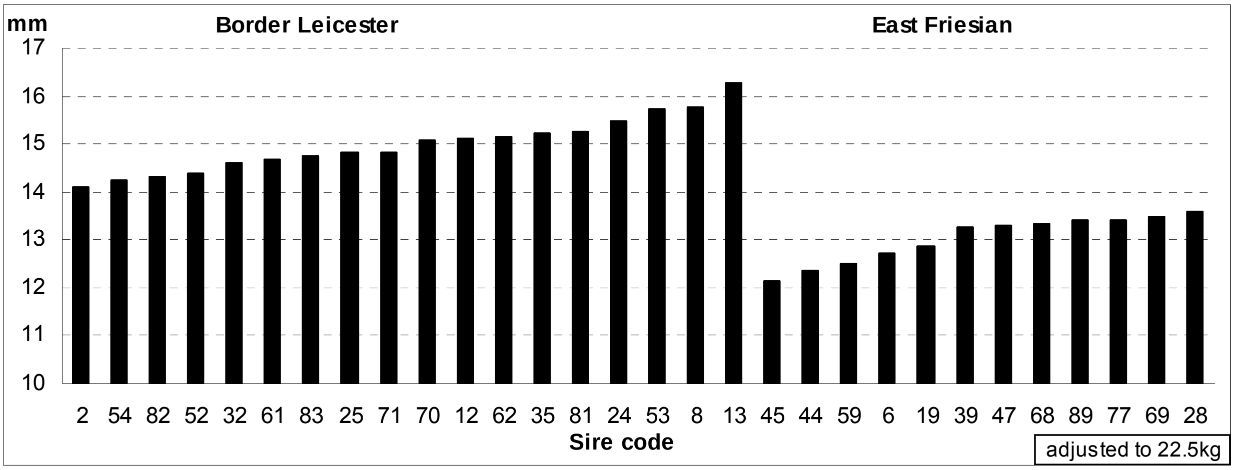


Fig. 6.5.3 Carcase fat GR – 2ndX lambs



There was a smaller range among the breeds for eye muscle area when the 2ndX carcases were compared at the same weight (Fig. 6.5.4). There were some significant breed differences with the White Suffolk (14.9 cm^2) having significantly larger eye muscle area than several of the other breeds of maternal sire. Progeny means for carcase fat and eye muscle area for all sires are shown in Appendix A1.3.

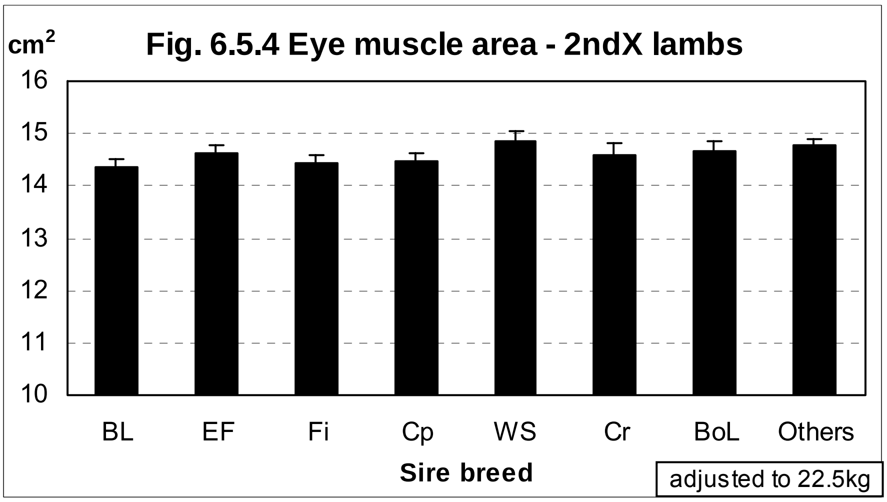


Fig. 6.5.4 Eye muscle area - 2ndX lambs

There were no significant differences between the breed averages for meat colour or meat pH, which are indicators of meat quality.

Take home messages

- There were differences between some maternal sire breeds for carcase weight of up to 2.6 kg and over half a fat score at the same carcase weight for their 2ndX lambs
- There were even greater differences in carcase weight and fat levels between progeny of individual maternal sires within breeds

6.6 Milk Production of Crossbred Ewes

Milk production of the dam is a major determinant of early lamb growth. Lambs are wholly dependent on milk for about the first 4 weeks, after which their rumen is sufficiently developed for them to begin to digest pasture. Lambs continue to benefit from a good milk supply long after they start eating pasture through enhanced growth rate and feed conversion efficiency and development of their capacity to increase pasture intake as they mature.

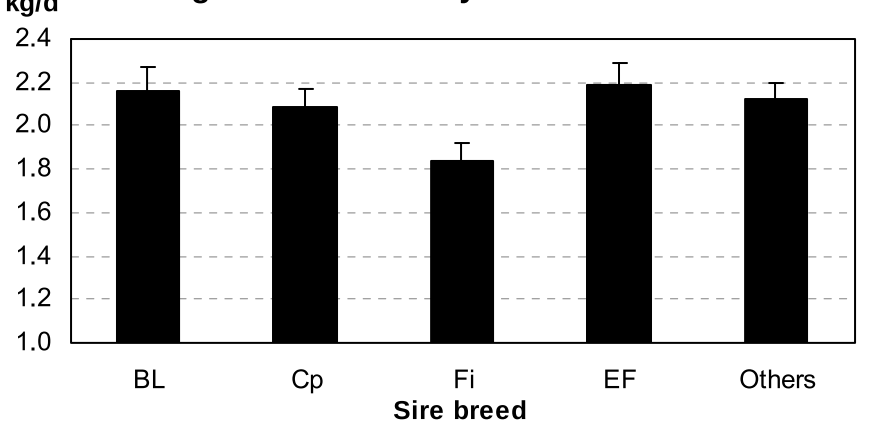
Ewe milk production reaches a peak at about 3-4 weeks and then steadily declines over the lactation. Lambs are generally weaned at 12-14 weeks as ewe milk production has usually declined to low levels. Sheep milking breeds have been selected for higher production and longer persistence of lactation than wool and meat breeds.

The milk production results presented here are from a detailed analysis of the data collected at Cowra. The milk production and milk composition of about half the 1stX ewes from all sire groups at Cowra (528 ewes) were measured on 3 occasions (about 3, 4 and 12 weeks) during their first lactation. Daily milk production was estimated using a standard 4 hour test, in which the ewes were milked out initially (by machine and hand stripping after injection with oxytocin to bring about milk let down) and milked again approximately 4 hours later. The milk from this latter milking was weighed, the time recorded and samples dispatched to a commercial laboratory for analysis of milk composition.

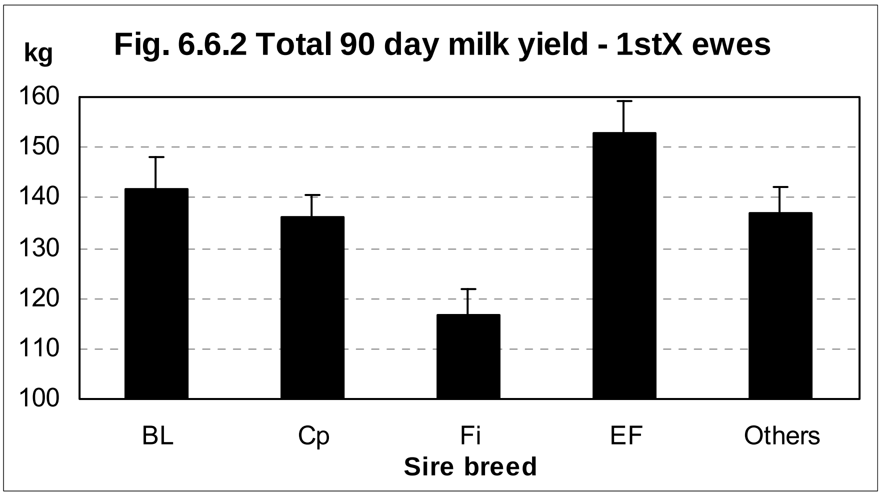
The 1stX ewes were the progeny of 30 maternal sires from the 1997, 1998 and 1999 drops at Cowra. There was an average of 15 daughters of each sire milked with an average of 45 daughters from the 3 link sires that were represented in each drop. These ewes were joined in either the autumn or spring and lambed for the first time at 12 and 19 months of age respectively.

Average milk production from these maiden 1stX ewes was 2.1 kg/day at the peak of lactation (21 days) and declined to 0.7 kg/day at lamb weaning (90 days). There was a considerable range in milk production among the ewes and sire progeny groups as was the case with the other growth and reproduction traits. While there were a limited number of sires of each breed tested there were some significant breed differences in the milk production of their 1stX daughters. Fig. 6.6.1 shows the peak milk yield at 21 days from daughters of 7 Border Leicester sires, 3 sires each from the Coopworth, Finnsheep and East Friesian breeds and 14 sires from the various Other breeds tested.

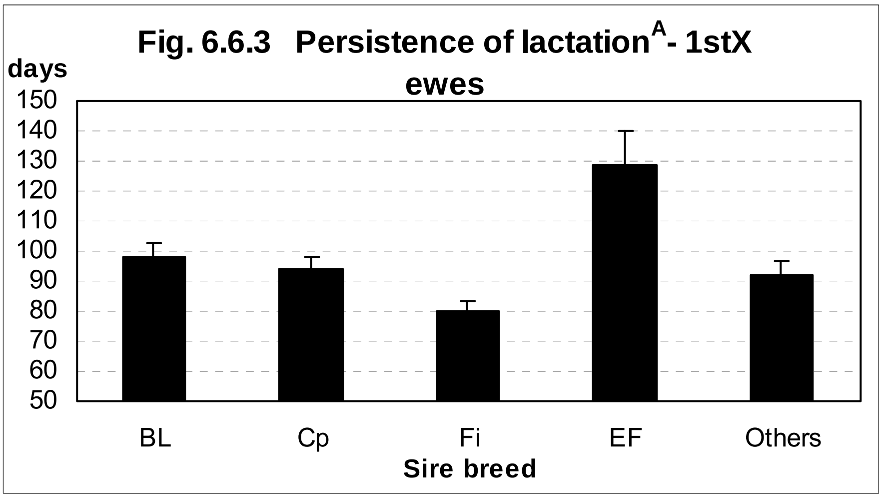
Fig. 6.6.1 Peak milk yield - 1stX ewes



Peak milk production from the Finnsheep 1stX ewes (1.8 kg/d) was lower than all the other breed crosses which ranged from 2.1 to 2.2 kg/d. The Finnsheep 1stX ewes also had the lowest total milk yield of 117 kg over the 90 day lactation, with the East Friesian 1stX ewes the highest at 153 kg (Fig. 6.6.2). The Border Leicester (142 kg) and Coopworth (136 kg) 1stX ewes were intermediate as was the average of the Other sire groups.



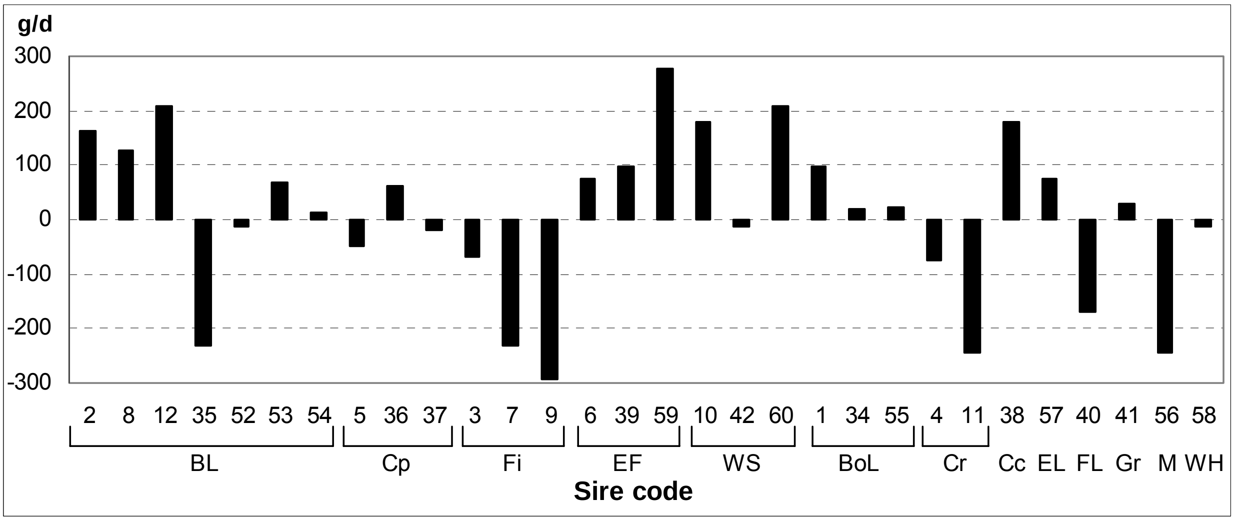
The higher total milk yield of the East Friesian 1stX ewes, despite their similar peak yield to most of the groups, was due to greater persistence of lactation. Their daily milk yield declined at a slower rate over the lactation and they were producing more milk at lamb weaning than the other groups. To illustrate this we defined milking persistence as the number of days for milk yield to decline to 600 g/d. We used the 3 milking records on each ewe to predict persistence for each of the sire breed groups (Fig. 6.6.3). The East Friesian 1stX ewes had much greater persistence (129 days) than the Border Leicester (98 days) and Coopworth (94 days) and particularly the Finnsheep (80 days) 1stX ewes.



[A] Days for milk yield to drop to 600g/day

There was considerable variation among the sire groups within breeds for milk production. Fig. 6.6.4 shows the mean ewe progeny deviations for daily milk yield for the 30 maternal sires tested. These are similar to half the breeding values for the sires as they are based on actual 1stX progeny performance.

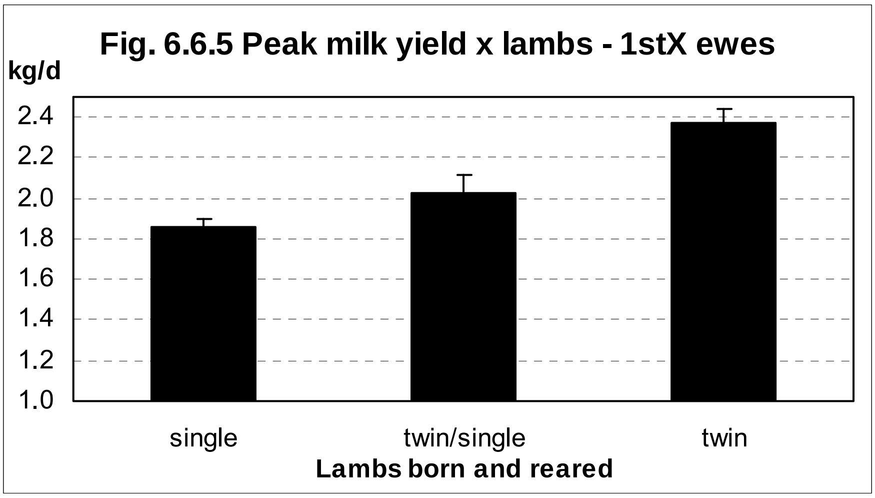
Fig. 6.6.4 Sire progeny mean deviations for milk yield - 1stX ewes



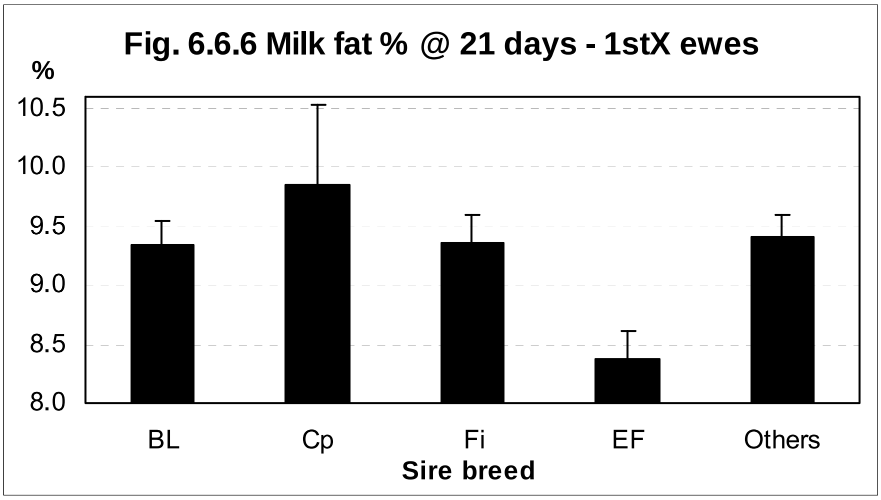
There was a difference in 1stX ewe milk production of 441 g/d for the 7 Border Leicester sires, which ranged from +208 g/d (BL12) to -233 g/d (BL35). There were also large differences among the 3 East Friesian sires although they were all positive (+276 to +75 g/day) and the 3 Finnsheep sires which were all negative (-68 to -292 g/d). There was a moderate range among the 3 Coopworth sires (+63 to -49 g/d), while the 3 White Suffolk sires had a wide range from +210 to -12 g/d. The range among the other sires tested was large, from +179 g/d (Cc38) to – 246 g/d (M56).

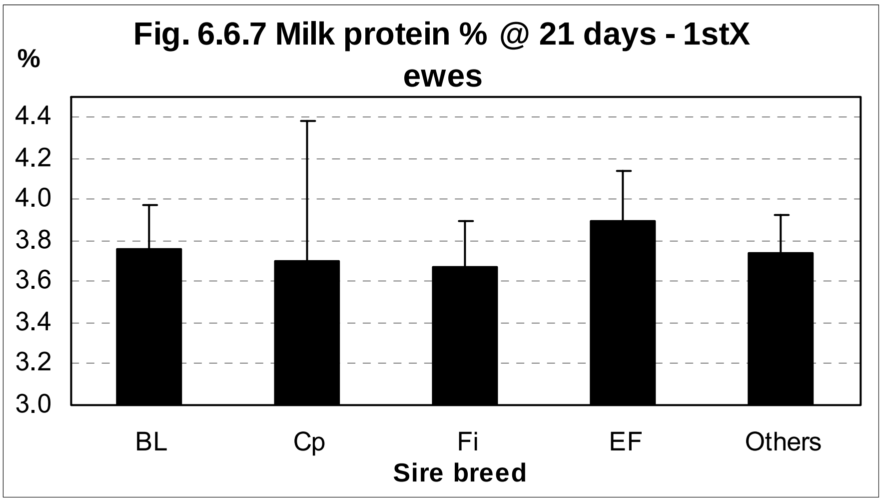
The number of lambs that a ewe bears and suckles as well as their genetic makeup affects milk production of the ewe. Ewes that bear and rear twins produce more milk than similar ewes that bear and rear singles because of greater mammary development during gestation and greater suckling stimulus during lactation. Lambs with greater genetic potential for growth also provide greater suckling stimulus to increase ewe milk production.

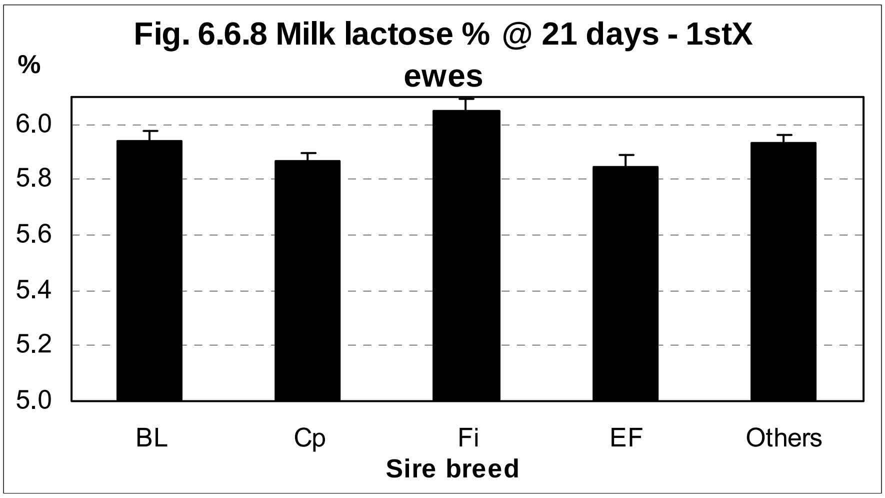
At Cowra (Fig. 6.6.5) the 1stX ewes bearing and rearing twins produced 0.5 kg/d more milk at peak lactation than the ewes bearing and rearing singles (2.4 v 1.9 kg/d). The peak milk production of ewes that lost one twin at lambing was intermediate (2.0 kg/d). These lamb effects were highly significant for peak lactation yield at 21 days, although they were less important by the end of lactation. The difference in persistence of milking for ewes with singles and twins was only 7 days (92 v 99 days respectively).



There were small changes in milk composition over the lactation. Fat % increased from 9.2% at 21 days to 10.3% at 90 days, during which there was a considerable reduction in milk yield. Over the same time protein % increased (3.8 v 5.4 %) and lactose % decreased (5.9 v 5.2 %) from 21 to 90 days respectively. Differences in milk composition between the breeds were generally small and not significant at 21 days (fat % Fig. 6.6.6, protein % Fig. 6.6.7, lactose % Fig. 6.6.8). The exceptions were low fat % for East Friesian sired ewes and high lactose for Finnsheep sired ewes. There was also a large range among the 3 Coopworth sires (see error bars) for fat % (range of 1.8%) and protein % (range of 0.3%), although they had only a small range in yield (see Fig. 6.6.4).







Take home messages

- Ewe milk production of the young maiden 1stX ewes was 2.1 kg/d at peak lactation (21 days) and declined to 0.7 kg/d at lamb weaning (90 days)
- There were large variations in milk production between sire progeny groups of 1stX ewes (range of 522 g/d)
- Although there were limited numbers of sires tested of the various breeds, there were some significant breed differences
- Finnsheep 1stX ewes had lower peak milk yield and total lactation production with shorter persistence of lactation
- East Friesian 1stX ewes had greater persistence of lactation which also resulted in greater total lactation production
- Ewes suckling twins had greater peak milk yield than those suckling single lambs
- Breed and sire differences were generally small for milk composition (fat %, protein % and lactose %)

6.7 Wool Production of Crossbred Ewes

There were large differences between the breed averages for wool production (Fig. 6.7.1) and fibre diameter (Fig. 6.7.3) for the 1stX ewes at their hogget shearing. The Coopworth cross ewes had the highest average clean (and greasy) fleece weight (3.6 kg), with the Corriedale (3.5 kg) and Border Leicester (3.3 kg) 1stX ewes also relatively high, while the Finnsheep (2.8 kg) and White Suffolk (2.4) 1stX ewes were low. There were significant differences between the breeds for yield ranging from 77% for the Coopworth and Border Leicester to 72% for the White Suffolk cross ewes. There were moderate ranges in clean fleece weight among the 1stX ewe sire groups within the breeds, with overlap occurring between the Border Leicester, Coopworth and Corriedale sire groups (Fig. 6.7.2).

Fig. 6.7.1 Clean fleece weight - 1stX ewes

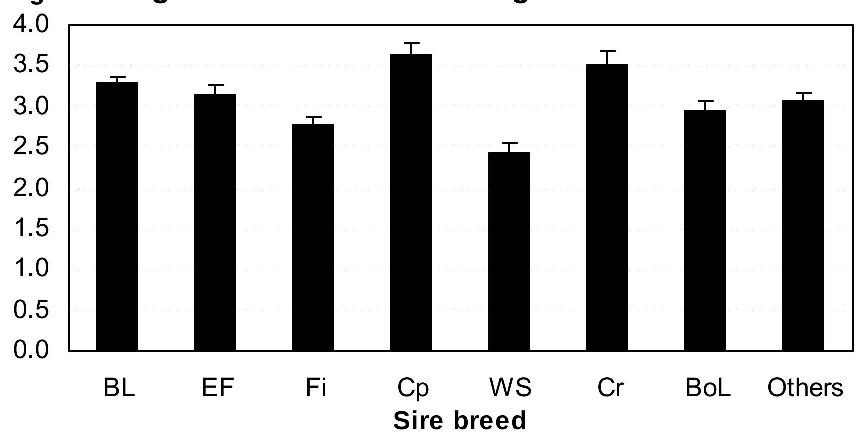
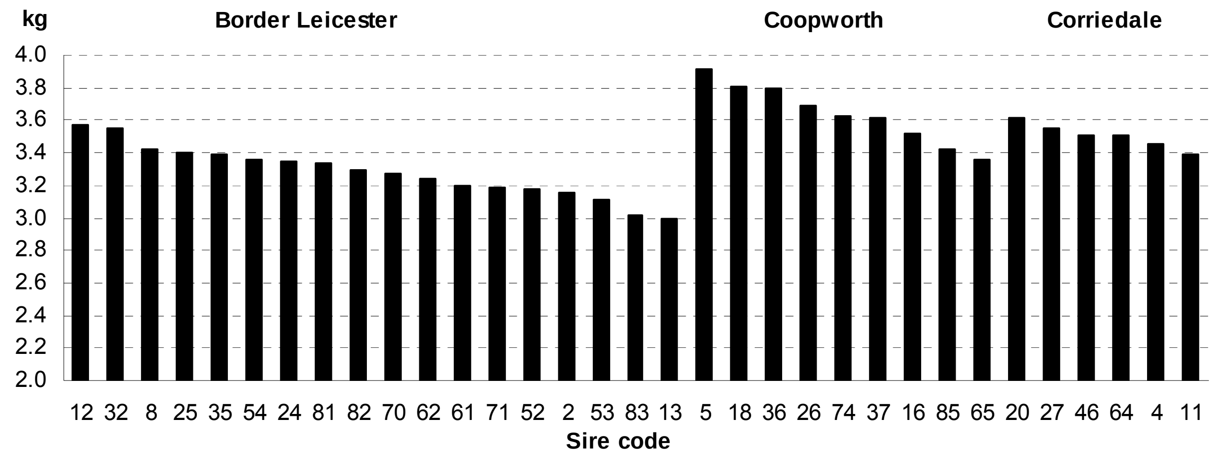


Fig. 6.7.2 Clean fleece weight – 1stX ewes



Average fibre diameter ranged from 24.5 microns for the Corriedale and 24.9 microns for the Finnsheep to 28.9 microns for the Coopworth and 29.1 microns for the Border Leicester 1stX ewes (Fig. 6.7.3). There were also moderate ranges among the sire progeny groups within the breeds, with overlap between the Border Leicester and Coopworth sired 1stX ewe groups (Fig 6.7.4). The Corriedale 1stX ewe sire groups ranged from 23.2 to 25.4 microns with all groups considerably finer than all the Border Leicester and Coopworth sire groups. Progeny means for hogget clean fleece weight and average fibre diameter for all sires are shown in Appendix A1.4.

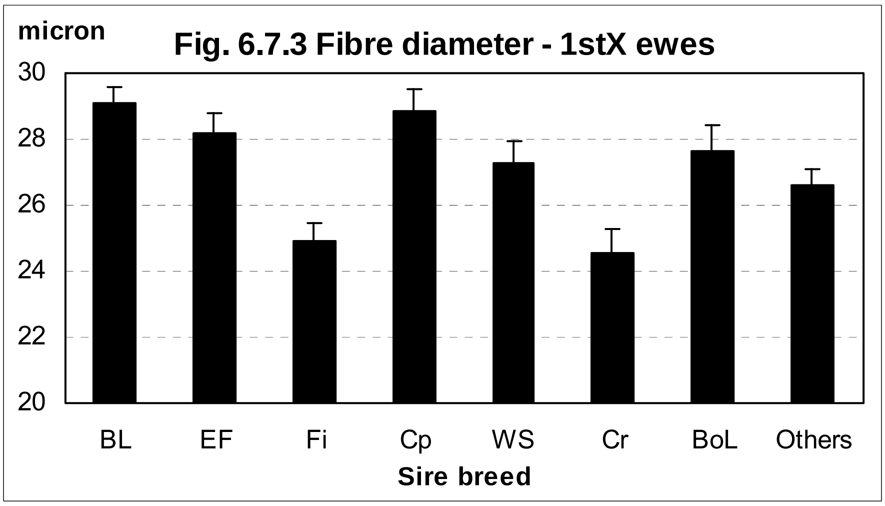
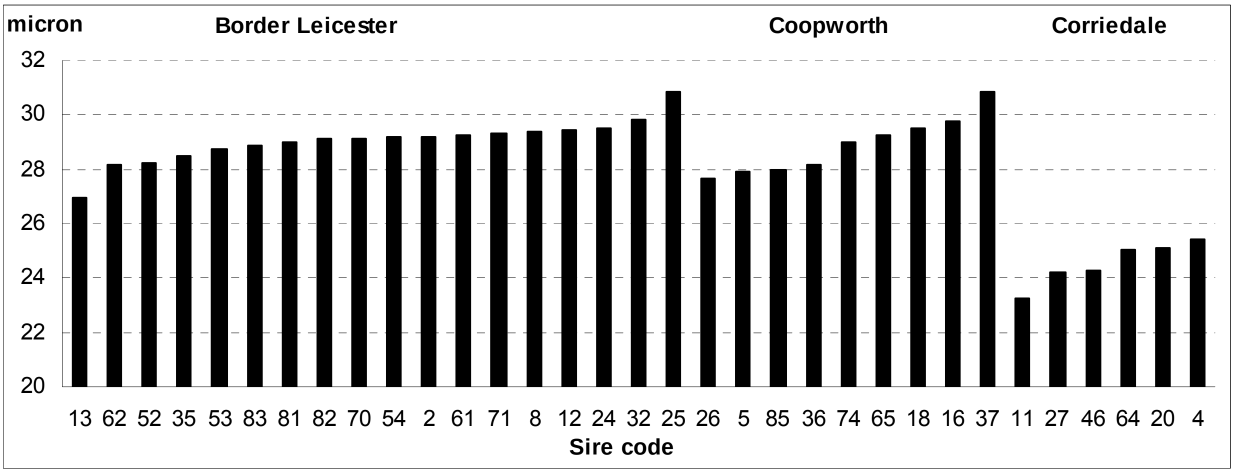


Fig. 6.7.4 Fibre diameter – 1stX ewes

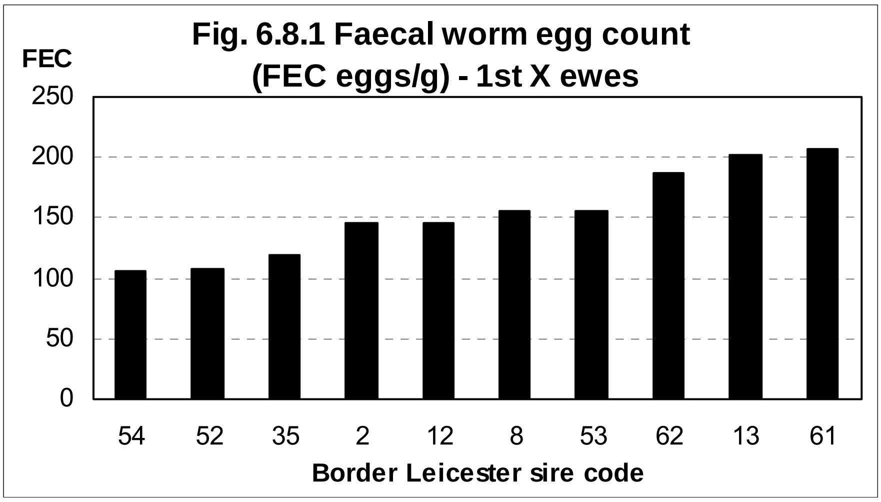


Take home messages

- There were significant differences between the 1stX ewe sire breeds for wool weight and mean fibre diameter
- The Coopworth, Corriedale and Border Leicester sire breeds had the highest fleece weights, with overlap between the sire groups across the breeds
- Fleeces from the Corriedale and Finnsheep 1stX ewes were 3-4 microns finer in average fibre diameter than the other breed groups

6.8 Worm Resistance of Crossbred Ewes

There were no significant breed differences for resistance to worms among the 1stX ewe lambs that were sampled for faecal worm egg count (FEC) in their first year. There were however large differences between individual sire groups of 1stX ewes with the range being almost two fold among the Border Leicester sire groups (Fig. 6.8.1). This indicates selection among individual sires for FEC could improve resistance to worms. Progeny means for all sires with FEC records are shown in Appendix A1.4.



Take home message

- There were no breed differences in FEC for 1stX ewes, but the large differences among individual sire groups indicates selection for low FEC could improve the resistance to worms in crossbred ewe flocks

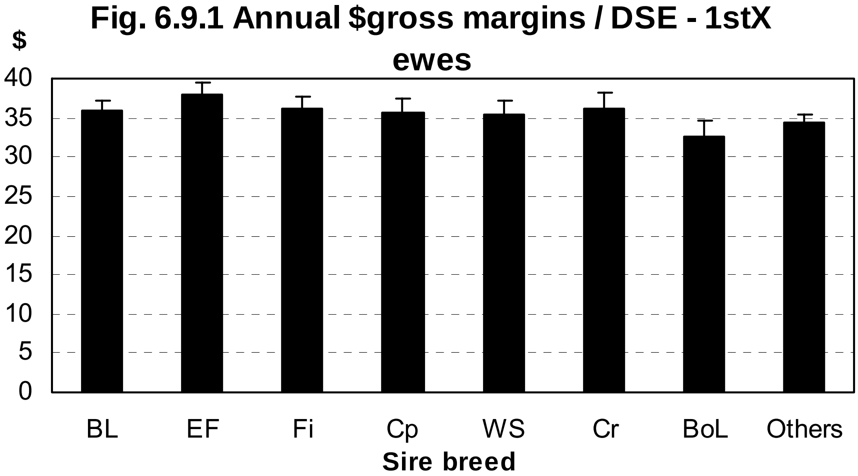
6.9 $Gross Margin per DSE: Accounting for Varying Feed Requirements

The results presented in section 6.2 are the annual $ gross margins on a per ewe basis. Another consideration is the feed requirements of the ewe and her lambs during lactation and subsequent lamb growth to slaughter, which may affect stocking rate. Heavier ewes with greater lambing percentage and faster growing lambs to higher slaughter weight will have higher feed requirements. To examine the effect of this the total annual feed requirements for the individual ewes and their lambs were estimated from their actual performance over the various years and put on a dry sheep equivalent (DSE) basis and expressed as ***$ gross margin per DSE per year***.

There needs to be some care in interpretation of these DSE values as the implicit assumption is that the feed required for all the phases of the production cycle and in the various seasons costs the same. In the real farm situation this is obviously not true. For example firstly the cost of high quality feed for lactating ewes or weaned lambs will generally be higher than that required for maintenance of dry ewes. Secondly the feed required for lambing at the start of the spring flush effectively costs a lot less than the same feed required for lambing in winter or before the autumn break.

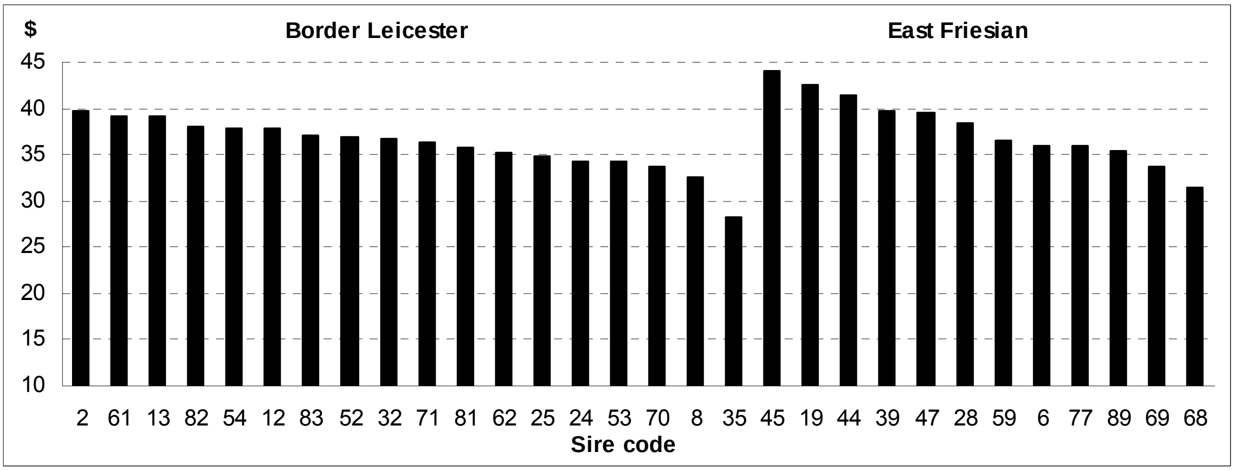
The average total annual feed requirement for the ewe and her lamb(s) grown out to slaughter was 2.2 DSE with a range of 1.5 to 2.7 DSE among the 1stX ewe sire groups. The feed requirements for ewe maintenance throughout the year average about 60%, gestation, lactation and lamb growth to weaning about 22% and lamb growth from weaning to slaughter about 18% of the total annual requirements. There was a range of about 10 kg in the average live weight among the contemporary 1stX ewe sire groups.

Fig. 6.9.1 Annual $gross margins / DSE - 1stX ewes



The range among the average of the sire breed groups in annual $GM/DSE was $5.28, ranging from $32.62 for the Booroola Leicester to $37.90 for the East Friesian sire breed (Fig. 6.9.1). However there was a considerably greater range among the sires within the breeds. For example, among the 18 Border Leicester sires there was a range of over $11 GM/DSE/year for the sire progeny means which ranged from $28.32 for BL35 to $39.77 for BL2. There was considerable overlap between the Border Leicester and East Friesian sires (Fig. 6.9.2, with means for all sires shown in Appendix A1.1). The 1stX ewes with the highest average annual $GM/DSE ($44.03) were by the East Friesian sire EF45. Generally there were only small changes in the relative performance and rankings of the 1stX ewe sire groups when they were compared on a $GM/DSE basis rather than $GM/ewe (compare Fig. 6.2.1 and Fig. 6.9.1). The exceptions were the Corriedale breed which improved relative to the other breeds and the Merino M56 sire which improved its relative position considerably on the $GM/DSE basis, although it was still lower than many other sire groups. The M56 1stX ewes were 8-10 kg lighter than the average of other groups, which meant they had lower feed requirements for maintenance throughout the year. Although the M56 ewes had lower lambing % than most other groups, the lambs were mostly singles and had good lamb survival all of which contributed to a low feed requirement of less than 2.2 DSE. The M56 ewes had fewer lambs slaughtered at a lighter carcase weight and were lean, with most meeting the minimum carcase specification. This meant that the total $ lamb income was lower, although the average wool income was considerably higher than many other groups. These results emphasise the need for producers to carefully consider their production system and select the ewes with the best genetics for their lamb enterprise.

Fig. 6.9.2 $Gross margin per DSE – 1stX ewes



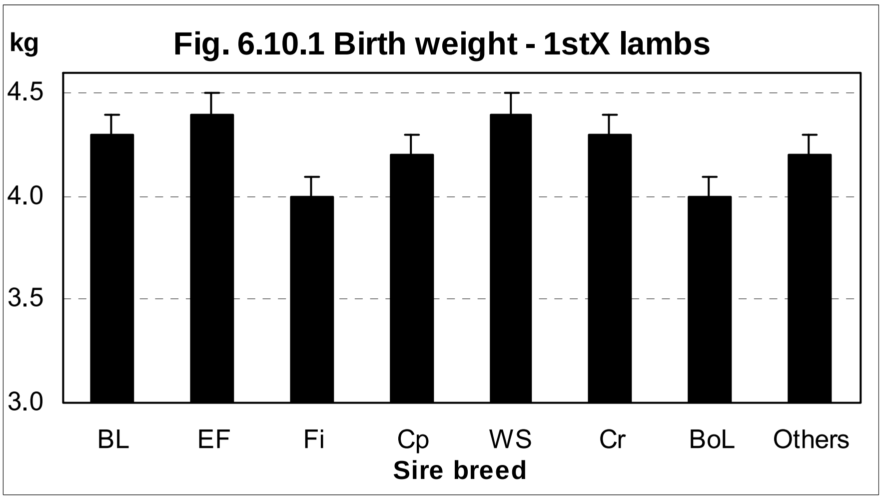
There was little change to the pattern of the effects for season, environment and joining age when DSE was taken into account compared with that described in section 6.2 for $GM/ewe.

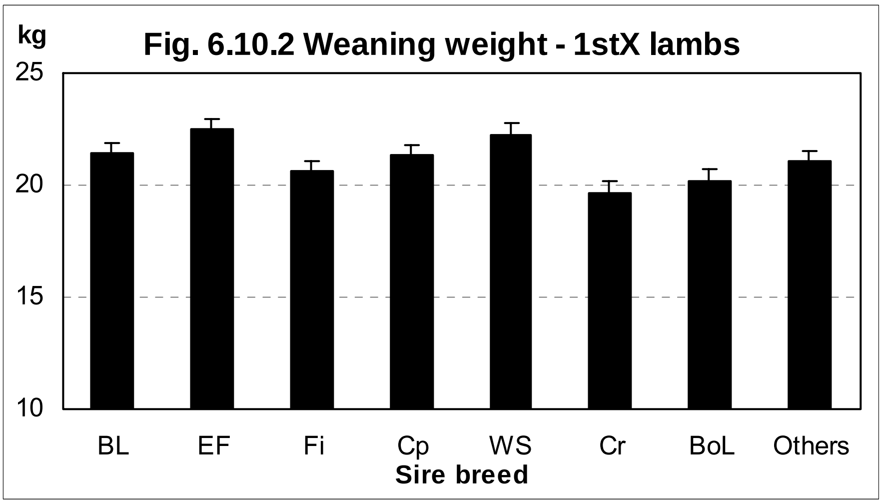
Take home messages

- Taking account of differences in feed requirements to express performance in terms of $GM/DSE had little effect on the relative merit of the sire groups of 1stX ewes, with a few exceptions
- The feed requirements for ewe maintenance average about 60%, gestation, lactation and lamb growth to weaning about 22% and lamb growth from weaning to slaughter about 18% of the total annual requirements

6.10 Growth of 1stX Lambs

There were significant differences between the breed averages for birth weight (Fig. 6.10.1), weaning weight (Fig. 6.10.2) and post weaning weight (Fig. 6.10.3) of the 1stX ewe and wether progeny. The White Suffolk and East Friesian cross lambs were heaviest at all ages, while the Finnsheep and Booroola Leicester cross were lightest at birth and weaning together with the Corriedale cross at weaning and post weaning. The range from the lightest (Corriedale 32.8 kg) to heaviest (White Suffolk 39.0 kg) at post weaning (adjusted for type of birth and rearing and age) was over 7 kg. There was also a large range among the progeny averages of the sires within the breeds with considerable overlap across the breeds. For example the progeny averages for post weaning weight of the 12 East Friesian sires ranged from 36.2 to 42.2 kg whereas the range for the 18 Border Leicester sires was from 36.0 to 39.5 kg (Fig. 6.10.4). Progeny means for birth, weaning and post weaning weight for all sires are shown in Appendix A1.5.





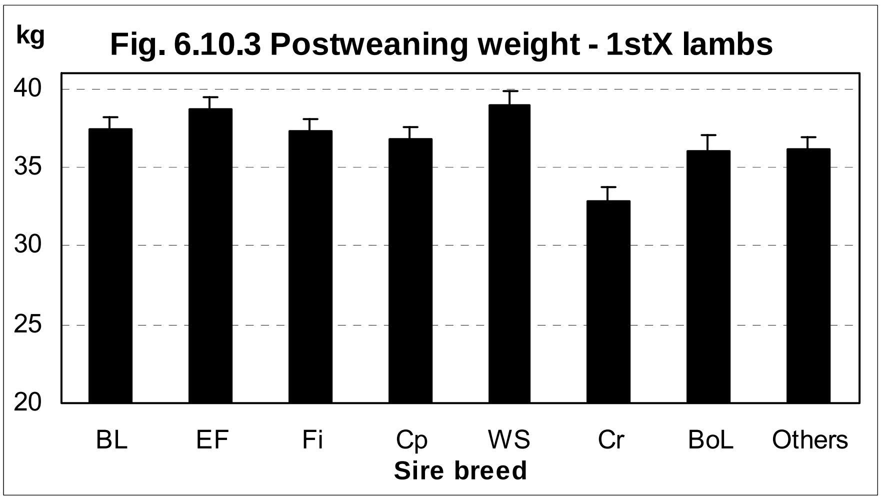
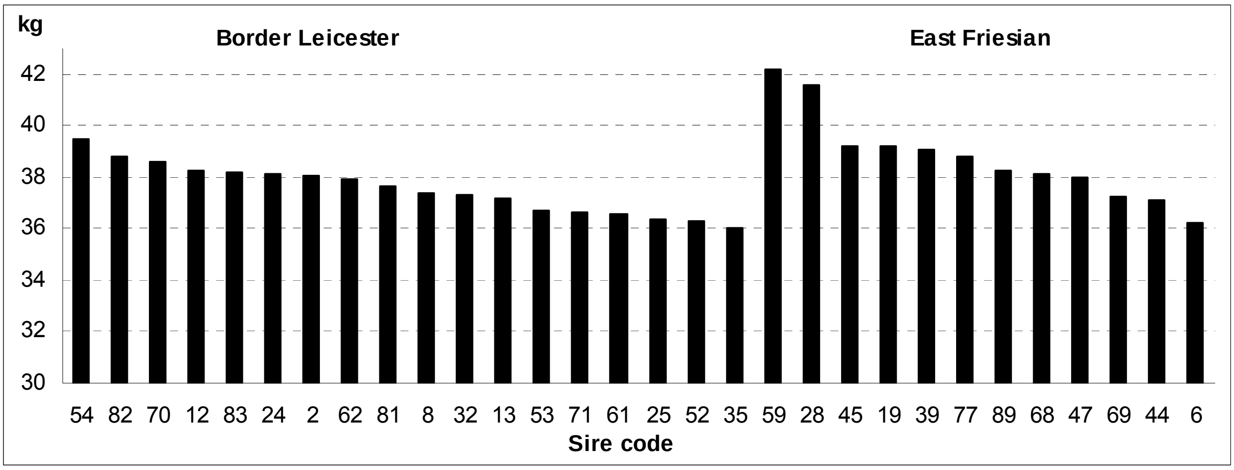


Fig 6.10.4 Postweaning weight – 1stX lambs

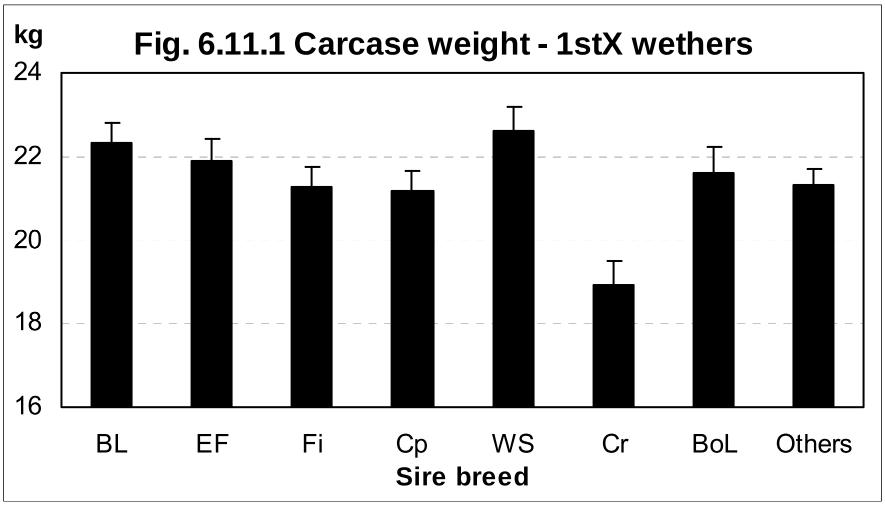


Take home messages

- There were significant maternal sire breed differences of up to 7 kg for postweaning weight of their 1stX progeny
- There were also considerable variation among sires within breeds with overlap between most sire breeds

6.11 Carcase of 1stX Lambs

The differences in growth rate between the breeds led to a range in carcase weight of 3.7 kg across the breeds after adjusting for differences in type of birth and rearing and age at slaughter (Fig. 6.11.1). While the carcase of White Suffolk 1stX wethers were the heaviest (22.6 kg) they were not significantly different from the Border Leicester (22.3 kg) or East Friesian (21.9 kg) carcases. Dressing yield increased with higher carcase weight (about 0.4 %/kg), but there were no significant differences between the breeds when they were compared at the same carcase weight (22 kg).



There was a very large range in carcase fat levels (6.1 mm GR or more than one fat score) between the breed averages (Fig. 6.11.2) when compared at the same weight (22 kg). The East Friesian carcases were very lean (11.1 mm GR), with the Corriedale also being relatively low (13.3 mm GR), while the Booroola Leicester was the highest (17.2 mm GR) and the Border Leicester high (15.4 mm GR). As with growth, there was considerable variation among the individual sire progeny groups for carcase fat levels. The 12 East Friesian sires ranged from 9.7 to 13.5 mm GR and the 18 Border Leicester sires ranged from 13.1 to 17.5 mm GR (Fig. 6.11.3) which is almost 1 fat score range within each of the breeds. This can have a dramatic impact on meeting carcase specifications for weight and fat. Even with the extreme differences between the averages of these two breeds there was an overlap between the individual sire groups. For the 1stX wether carcases the leanest Border Leicester sire group was leaner than the fattest East Friesian sire group.

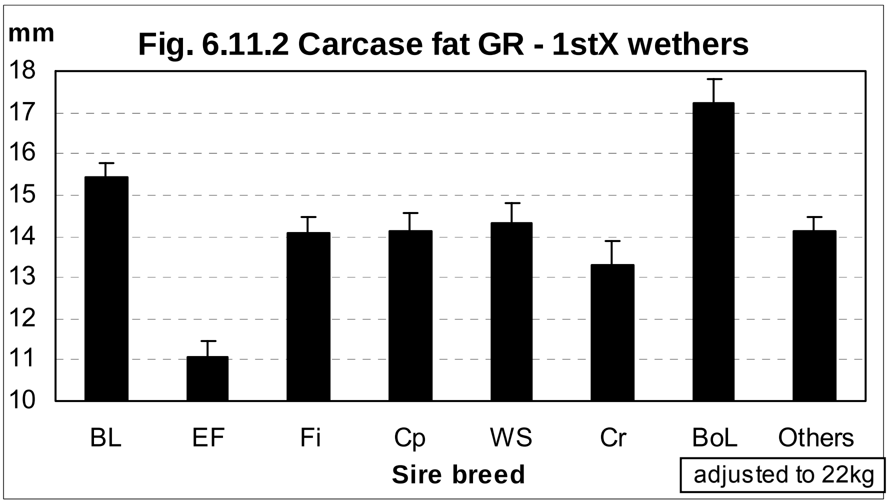
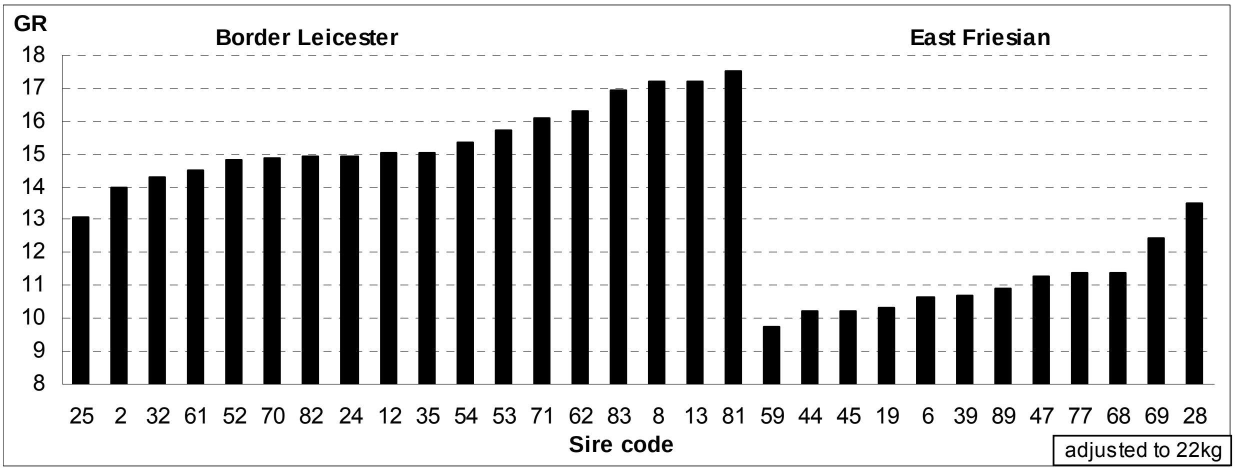
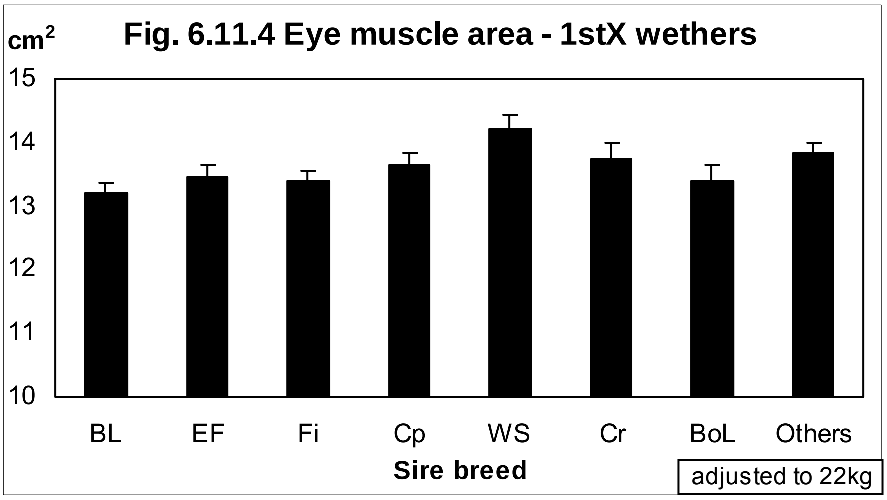


Fig. 6.11.2 Carcase fat GR - 1stX wethers

Fig. 6.11.3 Carcase fat GR – 1stX wethers

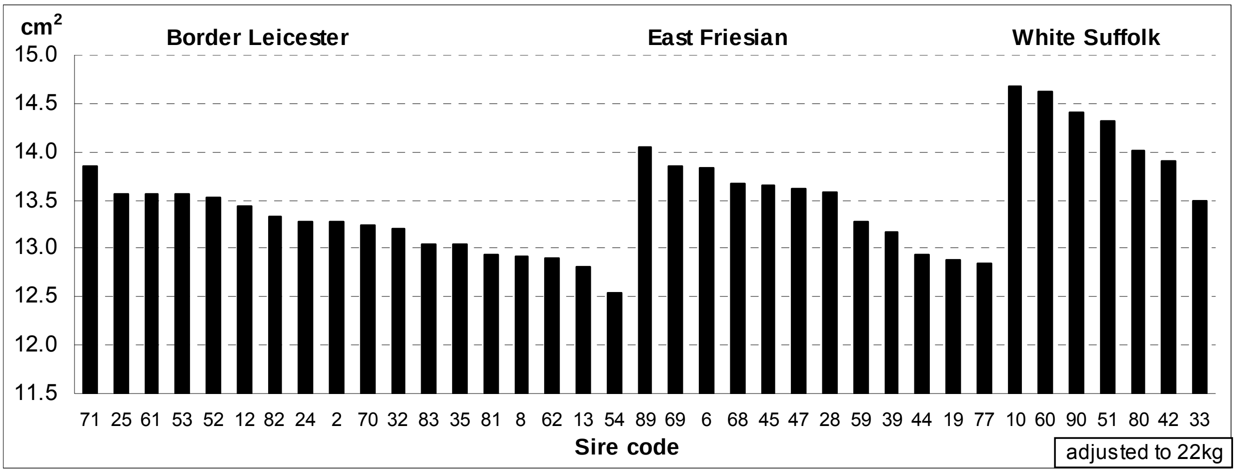


There was a smaller range among the breeds for carcase eye muscle area (Fig. 6.11.4), although there were significant breed differences when they were compared at the same carcase weight (22 kg). The White Suffolk (14.2 cm^2) and Corriedale (13.8 cm^2) had significantly larger eye muscle area than the Border Leicester (13.2 cm^2) 1stX carcases. However the variation among sire progeny means within breeds was such that there was still overlap between these extreme breeds (Fig. 6.11.5). Progeny means for carcase fat (GR) and eye muscle area for all sires are shown in Appendix A1.5.



There were no significant differences between the breed averages for meat colour or meat pH, which are indicators of meat quality.

Fig. 6.11.5 Carcase eye muscle area – 1stX wethers



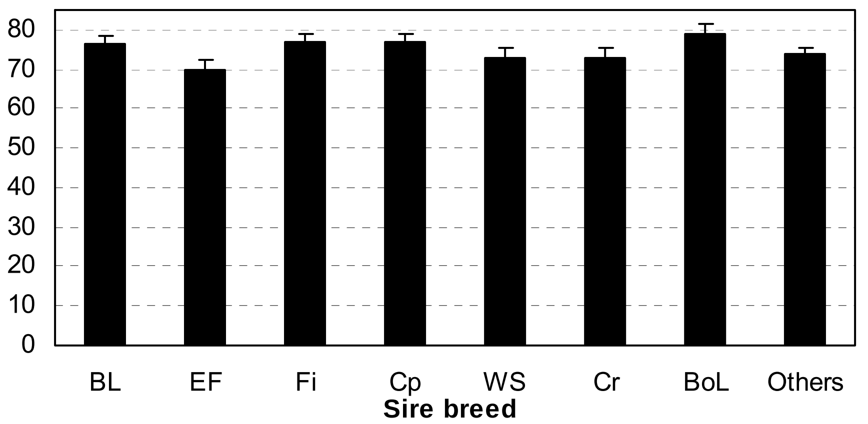
Take home messages

- Differences in growth rate led to a range of 3.7 kg in carcase weight between the sire breeds of 1stX wethers at the same age
- The East Friesian 1stX wether carcases were extremely lean, almost 1 fat score leaner than most other breeds
- There was a range of almost 1 fat score among sires within the breeds which can dramatically affect the proportion of carcases meeting particular market specifications
- Variation for carcase eye muscle area was much less than for fat levels

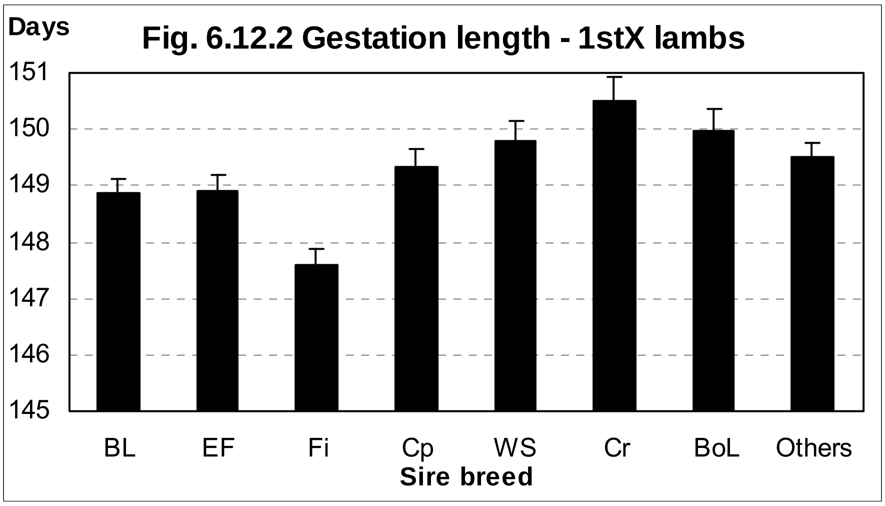
6.12 Survival and Gestation Length of 1stX Lambs

The base Merino ewes (and Corriedale ewes at Hamilton) were treated with hormones prior to their mating to the maternal sires using artificial insemination. This resulted in a high proportion of multiple births, with an average of 1.8 lambs born per ewe lambing. Survival was higher for single (87%) than twin (77%) and triplet (60%) born lambs. There were significant differences between the breeds of sire for survival of the crossbred lambs, ranging from 70 to 77% (Fig. 6.12.1), after accounting for differences in type of birth. The highest survival was for the Booroola Leicester, Border Leicester, Finnsheep and Coopworth sired lambs, with the East Friesian, White Suffolk and Corriedale sired lambs having the lowest lamb survival. Dystocia and a high proportion of ewes requiring assistance at lambing contributed to the poorer lamb survival for the East Friesian (10.1%). The White Suffolk sires (6.3%) also had a higher proportion of ewes requiring assistance (relative to 3% for all other ewes). Progeny means for lamb survival for all sires are shown in Appendix A1.5.

Fig. 6.12.1. Survival % - 1stX lambs



The genotype of the lamb is more important than the dam in determining gestation length and there were significant differences between the sire breeds of the 1stX lambs (Fig. 6.12.2). The Finnsheep 1stX lambs had a shorter gestation (147.6 days) than other crosses, which accounts in part for their lower birth weight. The Corriedale (150.5 days), Booroola Leicester and White Suffolk 1stX lambs had a longer gestation length of about 150 days, while the other breed cross lambs were about 149 days.



Take home messages

- There was lower survival of 1stX lambs from the East Friesian, with a higher incidence of dystocia and ewes requiring assistance than from other sire breeds
- The Finnsheep 1stX lambs had a shorter gestation length (147.6 days) than the other breed crosses (149-150 days)

6.13 AI Mating Performance

The base Merino ewes (including some Corriedale ewes at Hamilton) were artificially inseminated by commercial operators at each site using thawed-frozen semen and laparoscopic insemination following hormone therapy to synchronise oestrous and boost ovulation. The subsequent lambing performance of the base ewes varied considerably between sites and years (Table 6.13.1). Fertility (ewes lambing per ewe inseminated) was consistently higher at Cowra (79 to 84% in the 3 years) than at Hamilton (40 to 69%) or Struan (52 to 56%). There were only small differences in fertility between the breeds of sire. Litter size (lambs born per ewe lambing) was also considerably higher at Cowra (1.8) than Hamilton (1.5) or Struan (1.3) as was the number of lambs weaned per ewe lambing. Sire breed was significant for number of lambs weaned per ewe lambing, which accounts for differences in litter size, lamb survival and ewe rearing ability with the range being 125% for Finnsheep to 108% for the East Friesian sires. The very good results achieved at Cowra were attributed to the attention to detail in management, condition of the ewes, timing of operations and experience of the operator. The details for the base ewe insemination and lambing results at each site in each year are shown in Appendix B1.

Table 6.13.1 Lambing performance of Merino ewes mated by AI

	Ewes AI (n)	Fertility (%)	Litter size (n)	Lambs weaned (%)[A]
Cowra				
1997	791	84	1.86	141
1998	825	82	1.87	136
1999	797	79	1.66	120
Hamilton				
1997	838	69	1.61	111
1998	831	40	1.33	113
1999	830	49	1.63	117
Struan				
1998	1092	56	1.30	102
1999	1065	52	1.37	109
2000	1071	52	1.15	111

[A] Lambs weaned per ewe lambing (%)

Take home message

- High fertility and lambing rates can be achieved using thawed-frozen semen and laparoscopic insemination when an experienced operator is used and there is attention to detail, timing, ewe condition and management

6.14 Relationship of maternal sire LAMBPLAN EBVs with Progeny Performance

Most of the maternal sires used in the MCPT also have LAMBPLAN information available which is based on their own performance and that of relatives in industry flocks. The performance of the 1stX and 2ndX progeny of the sires in MCPT is an independent test of their LAMBPLAN EBVs. The correlations between the LAMBPLAN EBVs (Maternal EBVs September 2004) and mean progeny performance of the sires in MCPT for various traits are shown in Table 6.14.1. The correlations for 1stX progeny for postweaning weight, carcase fat and eye muscle depth were positive and moderately high (about 0.6), especially as the EBVs are based on live measurements and those in the MCPT are from carcases. The correlations with 2ndX progeny performance were lower (0.3-0.4) than those with 1stX progeny, which is expected due to the reduced genetic contribution of the sires as they only contribute ¼ of the genes to the 2ndX progeny. The correlations between sire means for 1stX and 2ndX progeny growth and carcase performance in the MCPT were also positive and moderate to high (weight 0.49, fat 0.47, eye muscle depth 0.33). This indicates the relative performance of the sires from their 1stX progeny is carried through consistently to the 2ndX progeny. The correlation between the LAMBPLAN Maternal EBVs for yearling greasy fleece weight and the wool production of the 1stX ewes was positive and moderate (0.43).

Table 6.14.1 Correlations (± standard error) between LAMBPLAN Maternal EBVs for maternal sires and MCPT performance of their 1stX and 2ndX progeny

LAMBPLAN	MCPT	Correlation
Post weaning weight	1stX post weaning weight	0.56 ± 0.10
	2ndX post weaning weight	0.27 ± 0.13
Post weaning fat	1stX carcase GR	0.65 ± 0.08
	2ndX carcase GR	0.35 ± 0.12
Post weaning emd	1stX carcase emd	0.56 ± 0.10
	2ndX carcase emd	0.32 ± 0.13
Yearling gfw	1stX yearling gfw	0.43 ± 0.12
Lambs weaned	1stX Lambs born	0.27 ± 0.13
	1stX Lambs weaned	0.22 ± 0.14

The correlations between LAMBPLAN Maternal EBVs for lambs weaned and the reproductive performance of the 1stX ewe progeny were positive although moderately low. This probably reflects the smaller number of animals with recorded reproduction information compared to growth and carcase traits in the LAMBPLAN data base and the resultant lower accuracy of the EBVs for number of lambs weaned. As more maternal breed animals have reproduction information recorded the accuracy of these EBVs will improve.

Overall the results clearly show that the use of LAMBPLAN EBVs in selection of maternal sires will result in improved performance of crossbred progeny, especially for growth, carcase and wool traits. The use of maternal sires with high EBVs for number of lambs weaned will also result in improved lambing rate from their 1stX daughters. The more widespread recording of reproduction information in LAMBPLAN by maternal seedstock breeders will increase the accuracy of the reproduction EBVs which will result in more rapid genetic improvement in this very important maternal trait for lamb production.

Take home messages

- LAMBPLAN EBVs work – rams with high EBVs have progeny that are high performing and earn more money
- Sires with high EBVs for growth and carcase generally produce better performing 1stX progeny and the superior merit is consistently passed on to 2ndX progeny
- More widespread recording of reproduction will increase the accuracy of reproduction EBVs and lead to more rapid genetic improvement

6.15 How much are Maternal Sire EBVs Worth?

Maternal sires such as Border Leicester rams that have been tested through LAMBPLAN have estimated breeding values (EBVs) available at sale. Some questions for ram buyers are:

- how much more is a ram with superior EBVs worth?

- how can rams with varying EBVs for different traits be compared?

To help in making these decisions we have developed a computer program (*EBV $ Calculator for Maternal Sires* ©) that calculates the additional $s generated over the lifetime of the ram (and his 1stX and 2ndX progeny) compared to a ram with all EBVs = 0. Maternal sires have EBVs for several traits including:

- maternal weaning weight (EBVmwwt)

- live weight (EBVwt)

- fat GR (EBVfat)

- eye muscle depth (EBVemd)

- number of lambs weaned (EBVnlw)

- greasy fleece weight (EBVgfw)

Use of rams with superior EBVs for these traits will result in progeny (1stX and 2ndX) that have higher performance and have higher returns. Each of the traits will contribute different amounts of $ because they contribute to different products from 1stX and/or 2ndX progeny. For example, rams with positive EBVwt will have heavier progeny which will have higher returns from both 1stX and 2ndX lambs, whereas positive EBVnlw means better lambing rate from the 1stX ewes and more 2ndX lambs sold.

The returns will be different for the 1stX and 2ndX enterprises. They will also vary with the breeding structure, production system and prices in each enterprise. Where maternal sires are mated to Merino or other base ewes in the 1stX enterprise, the wether progeny are sold for slaughter and the ewe progeny are sold for breeding. In the 2ndX enterprise the 1stX ewes are mated to terminal sires and all 2ndX lambs are sold for slaughter with additional returns from the 1stX wool.

Total returns from better production of the progeny of the ram depends on the superiority of the EBVs as well as several other factors relating to the production system and prices. These factors include the number of years the ram is mated, the number of base ewes, their lambing rate, the carcase weight of progeny, price of lambs, carcases and wool, fat discounts and the discount rate that reduces the value of income in future years. The computer program allows all of these factors in the breeding structure, production system and prices to be varied to suit individual situations.

The additional $ returns for a Border Leicester ram using the standard breeding structure, production system and prices (see box) are shown in Table 6.15.1. The EBVs used are for the Band 10 of the Border Leicester LAMBPLAN analysis of 15 Sept 2003 (ie a ram in the top 10% of Border Leicesters). The $ values shown are the additional $ contributed for each trait in both the 1stX and 2ndX enterprises compared with using a ram with all EBVs = 0. In this breeding structure the ram produces 60 1stX wethers and 60 1stX ewes over 3 years and his 60 1stX daughters produce 330 2ndX lambs plus wool over 5 years.

In the 1stX enterprise the 60 1stX wethers from this ram would be heavier and slightly leaner (less carcases discounted for fat score 5) and the 60 1stX ewes would be heavier when sold. This would result in $288 more returns than if a ram with EBVs = 0 was used.

In the 2ndX enterprise there are gains in carcase weight of the 330 2ndX lambs from maternal weaning weight (additional milk and nurturing) and weight as well as leanness (less carcases discounted for fat score 5). The 60 1stX ewes also produce more lambs (from EBVnlw) and wool (from EBVgfw) over their 5 years in the flock. The total additional value in the 2ndX enterprise is $1884.

The results highlight that the great majority (87%) of the additional returns from maternal sires with superior EBVs are in the 2ndX enterprise. This is because many of the economically important maternal traits (maternal weaning weight, lambing rate and wool) are only expressed in the 2ndX enterprise and there are also a lot more expressions of performance (60 1stX ewes x 5 years).The important contribution of increased lambing rate is also highlighted.

Table 6.15.1. Additional value from Band 10 BL sire EBVs

1stX enterprise	**$**	**2ndX enterprise**	**$**
1stX wethers		Maternal weaning wt	416
1stX weight	137	2ndX weight	366
1stX fat	12	2ndX fat	33
1stX ewes		1stX ewe lambing rate	928
1stX weight	139	1stX ewe wool	141
Total 1stX	**288**	**Total 2ndX**	**1884**
		Total (1stX + 2ndX)	**2172**

The EBVs for animals in the various bands of the BL LAMBPLAN analysis (15 Sept 2003) are shown in Table 6.15.2, along with the additional $ returns in the 1stX and 2ndX enterprises from use of a BL ram with these EBVs under the standard breeding structure and prices. The additional value from 1stX and 2ndX progeny of a BL ram with Band 10 EBVs (ie top 10%) is $1508 (i.e. 2172-664) more than if a ram with Band 50 EBVs (i.e. top 50%, or current average for the breed) was used.

Table 6.15.2. Additional value of BL sire EBVs in 1stX and 2ndX enterprises.

BL sire	EBV mwwt	EBV pwwt	EBV pfat	EBV pemd	EBV nlw	EBV gfw	**Total$ 1stX**	**Total$ 2ndX**	***Total $***
Band10	1.92	3.38	-0.40	0.59	0.08	0.23	**288**	**1884**	***2172***
Band 20	1.45	2.72	-0.31	0.37	0.06	0.15	**231**	**1416**	***1647***
Band 50	0.53	1.55	-0.06	0.00	0.02	0.04	**128**	**536**	***664***
Band 75	-0.16	0.56	0.12	-0.26	0.00	-0.03	**42**	**-3**	***39***

EBV $ Calculator for Maternal Sires ©

The breeding structure, production system and prices used in the standard parameter set are:

1stX enterprise

Maternal ram mated to 50 Merino ewes x 3 years with a lamb weaning rate of 80%;

1stX wethers sold at 22 kg carcase weight (dressing 45 %) at $3.20/kg with fat discounts of $1/kg (FS1) and $1.50/kg (FS5), with the average fat level being 15mm GR;

1stX ewes sold for breeding at $1.44 /kg liveweight;

2ndX enterprise

1stX ewes mated to terminal sires x 5 years with an average lamb weaning rate of 110%;

2ndX lambs sold at 24 kg carcase weight (dressing 45 %) at $3.50/kg with fat discounts of $1/kg (FS1) and $1.50/kg (FS5), with the average fat level being 15mm GR and lamb skins $12;

1stX ewe wool production x 5 years at $5.00/kg greasy

A discount rate of 5% p.a. (above CPI) is applied to the dollar income in future years.

Acknowledgement: The *EBV $ Calculator for Maternal Sires ©* was developed by Neal Fogarty and Lynette McLeod with assistance from Elke Hocking and support from Meat and Livestock Australia and the Australian Sheep Industry CRC. It is used in the Edge Workshop: *Money Making Mums.*

Take home messages

- Using maternal rams with high EBVs produces progeny than earn more money (a top 10% EBV ram can earn $1500 more than an average ram)
- Over 85% of the additional $s from high EBVs are earned in the 2ndX enterprise
- All traits contribute to the additional $s especially lambing rate (EBVnlw)

6.16 Implications for the Lamb Industry

The maternal sire central progeny test has clearly demonstrated there is a great range of maternal genetics available to the lamb industry. There is considerable genetic variation that can be exploited to dramatically improve productivity and profitability of lamb enterprises. While there were some important differences between the maternal sire breeds in performance of their progeny, the variation among individual sires within the breeds was far greater. There was a range among the 18 Border Leicester sires tested of over $40 gross margin / ewe / year in the profitability of their 1stX daughters. This means a $20,000 higher annual profit for a 1000 ewe enterprise by having 1stX ewes sired by top rather than average maternal genetics. (Ensuring that the 1stX ewes are bred from top base Merino ewes could also contribute similar additional $s to the annual gross margin.)

Variation in lambing rate of the 1stX ewes was the major profit driver that contributed to the differences in gross margins as over 80% of enterprise income was from lamb sales and less than 20% from wool. There were differences of up to 45% for lamb weaning rates between 1stX ewe progeny groups of sires within a breed. In addition there were significant differences in 2ndX lamb growth (up to 3.6 kg for post weaning weight) and carcase fat (2.2 mm GR or almost half a fat score). These differences contributed to the gross margin through total weight of carcase turned off and varying proportions of the carcases meeting market specifications. There were also large differences between breeds and sires within breeds for early age of puberty, milk production and weight and fibre diameter of wool from the 1stX ewes. Most breeds had at least some sires that had high performing 1stX daughters.

Taking account of the variation in feed requirements for the 1stX ewes and their 2ndX lambs, which affects carrying capacity, generally had little impact on the rankings of the maternal sires, with a couple of exceptions. The best sire groups of 1stX ewes varied to some extent at least with the production system. For example some groups of ewes with very high lambing rates performed relatively better in a spring rather than autumn joining system because of better lamb survival at a lambing time when weather conditions were more benign. The importance of carcase weight and fat levels also varies with a domestic or export target market and under saleyard or grid based selling. This emphasises the importance of breeders clearly identifying their production and marketing system and matching it with the most appropriate genetics.

There were considerable ranges in growth and carcase fat levels among 1stX progeny of the maternal sires which were twice as large as the ranges found in terminal sire progeny tests. The relative performance of the maternal sires for growth and carcase of their 1stX progeny was generally consistently expresses in their 2ndX progeny. The LAMBPLAN EBVs of the maternal sires were generally well correlated with the growth, carcase and wool production performance of their 1stX and 2ndX progeny. The relationship between LAMBPLAN EBVs of the maternal sires for reproduction traits with their 1stX ewe lambing performance was less consistent. This probably reflects the smaller number of animals with recorded reproduction information compared to growth and carcase traits in the LAMBPLAN data base and the resultant lower accuracy of these EBVs. As more maternal breed animals have reproduction information recorded the accuracy of these reproduction EBVs will improve.

A major issue for the industry is to develop appropriate structures to facilitate the use of genetic information for improvement in the maternal breeding sector. Over 85% of the additional $s generated by improved performance from superior maternal sire genetics are reaped by the 2ndX enterprise and only 15% by the 1stX enterprise where the maternal sire rams are directly used. There is a large incentive for managers of 2ndX enterprises to make considerable effort to ensure they have known superior genetics in their crossbred ewe flocks. It is also in the interests of maternal seedstock breeders and their clients to develop marketing strategies that allow the additional $s generated by superior maternal genetics to be shared equitably by all breeders in the supply chain.

As well as the general industry implications outlined above there are specific implications for breeders who use maternal genetics at various levels in the industry as follows:

6.16.1 Implications for maternal seedstock breeders

- There is considerable scope for genetic improvement of maternal traits including: lamb weaning rate, growth, carcase merit, milk production, worm resistance and wool, all of which may be genetically evaluated with LAMBPLAN EBVs
- Effective improvement requires development of a comprehensive breeding objective, genetic evaluation of available animals and use of an appropriate index to assist in selections
- Development of effective marketing strategies are needed to ensure an appropriate share of the additional value of the income generated from superior maternal genetics

6.16.2 Implications for 1stX lamb producers

- Using rams with the right LAMBPLAN EBVs will produce heavier 1stX slaughter lambs that better match target market specifications and earn higher prices
- Using rams with the right LAMBPLAN EBVs for maternal traits will result in more productive and valuable 1stX ewes for breeding which will bring higher prices if they are marketed effectively
- The selection and use of genetically superior rams has a much greater impact on 1stX progeny performance than the choice of a particular breed of ram
- Selection emphasising maternal traits in the base ewe flock will further increase productivity and income as well as increase the value of the 1stX ewe progeny

6.16.3 Implications for 2ndX lamb producers

- Ensure that the 1stX ewes have the right genetics for the production and marketing system as they will earn considerably greater profits for the lamb enterprise
- This means genetics for high lamb weaning rate (in the particular lambing season and environment), maternal traits (mothering, milking, growth and carcase) and wool
- Demand more genetic information and background before purchasing 1stX ewes
- Developing an alliance or contract mating with a high performing Merino flock is a way to ensure greater control over the genetics of the 1stX ewes and regularly source the best genetics for the lamb enterprise
- Don’t wait for the industry to deliver better 1stX ewes at sheep sales

6.16.4 Implications for self-replacing flock breeders

- Implementation of a breeding program that emphasises maternal traits including: lamb weaning rate, growth, carcase merit, milk production, worm resistance and wool

- Emphasise early puberty by selecting ewes that successfully rear lambs in their first year which considerably reduces the cost of growing out replacements
- Decide on a longer term ram strategy of either breeding or purchasing rams that is practical and best fits the management constraints and lamb enterprise

Take home messages

- There was a range of over $40 gross margin/ewe/year due to the maternal sire of the crossbred ewes
- Lamb turnoff rate is the main profit driver, with 2ndX lamb growth and carcase fat level, which affects the proportion of carcases meeting market specification and ewe wool also contributing
- There are important differences between maternal sire breeds for reproduction, growth, milk, carcase fat, wool weight and fibre diameter
- There is considerably more variation among sire groups within breeds than between breeds with overlap of breeds for most traits
- The use of LAMBPLAN EBV information to assist in selections is the best way to exploit the available genetic variation and improve maternal performance

7. CONCLUSIONS AND RECOMMENDATIONS

The maternal sire central progeny test has clearly demonstrated there is a great range of maternal genetics available to the lamb industry. There is considerable genetic variation that can be exploited to dramatically improve productivity and profitability of lamb enterprises. While there were some important differences between the maternal sire breeds in performance of their progeny, the variation among individual sires within the breeds was far greater for most important production traits. There was a range among the 18 Border Leicester sires tested of over $40 gross margin / ewe / year in the profitability of their 1stX daughters. This means a $20,000 higher annual profit for a 1000 ewe enterprise by having 1stX ewes sired by top rather than average maternal genetics.

Variation in lambing rate of the 1stX ewes was the major profit driver that contributed to the differences in gross margins as over 80% of enterprise income was derived from lamb sales and less than 20% from wool. There were differences of up to 45% for lamb weaning rates between 1stX ewe progeny groups of sires within a breed. In addition there were significant differences in 2ndX lamb growth (up to 3.6 kg for post weaning weight) and carcase fat (2.2 mm GR or almost half a fat score). These differences contributed to the gross margin through total weight of carcase turned off and varying proportions of the carcases meeting market specifications. There were also large differences between breeds and sires within breeds for early age of puberty, milk production and weight and fibre diameter of wool from the 1stX ewes. Most breeds had at least some sires that had high performing 1stX daughters.

The correlations between the maternal sire LAMBPLAN EBVs and the growth, carcase and wool production performance of their progeny in MCPT were positive and moderately high. The relative performance of the sires in the growth and carcase of their 1stX progeny was also consistently expressed in their 2ndX progeny. The relationships between LAMBPLAN EBVs of the maternal sires and 1stX ewe reproduction traits were positive although lower for than growth and carcase traits. This reflects the smaller number of animals with recorded reproduction information in the LAMBPLAN data base compared to growth and carcase traits, resulting in lower accuracy of these EBVs. The more widespread recording of reproduction information on maternal breed animals should improve the accuracy of these reproduction EBVs.

Achievements

Relative to Objectives (see Section 2)

1. The evaluation of 91 high performance maternal and dual purpose sires has been completed for:

    a. Growth and carcase phase of 1stX and 2ndX progeny; and

    b. Maternal phase of 1stX ewe progeny

2. Across breed evaluations from the progeny test have been progressively released to industry through the Dynamic Dams Newsletter and other avenues detailed in Section 9. The scope for converting all LAMBPLAN maternal EBVs to an across breed basis is dealt with below under Recommendations.

3. The range in genetic merit available to the industry has been clearly demonstrated by the results from MCPT as well as quantifying the components of lamb enterprise profitability deriving from the maternal genotype. The project has supported targeted extension activities through input into LAMBPLAN activities, development of the EDGE Money Making Mums

Workshop, Lamb groups, activities of Product Development Officers and state extension specialists, as well as directly through field days and media communication. There have been some 25 presentations to training workshops primarily targeted at advisors and consultants, 7 field days with an MCPT focus and a further 27 presentations and displays at other field days. In addition the total publications from the project have included 11 scientific papers(with a further 14 papers submitted or in preparation), 21 technical reports and presentations, 141 advisory communications largely through industry newsletters and journals, as well as the Dynamic Dams Newsletter being available on the LAMBPLAN website. The Dynamic Dams reader feedback survey indicated a high rating for the Newsletter and the impact of MCPT on industry.

4. Industry understanding of maternal EBVs has been enhanced, in cooperation with LAMBPLAN, through increased adoption of LAMBPLAN by maternal seedstock breeders by an increase from 55 in 2001 to 70 in 2004 with an additional 23 SAMM and 109 Merino members.

Outcomes

1. Increased use of LAMBPLAN testing by the maternal sector.
2. A high rate of inquiry from breeders and producers about maternal improvement.
3. Results used by breed societies and breeders in their advertising and promotion.
4. No less than 10 PIRDs with a maternal improvement component have been initiated over the full period of the project.
5. In addition to MCPT, articles are now frequently being published in the press on related PIRDs and improvement of lambing percentage and maternal genetics, often acknowledging stimulus from MCPT. This reflects the considerable change that is occurring in producer's interest in and attitude towards maternal improvement.
6. Some breeding alliances and contract matings have been established, although they have not enjoyed a high success rate for varying reasons.
7. Increased understanding by breeders and producers of the value from using objective measurements and improved knowledge of LAMBPLAN principles.
8. Maternal seedstock sellers providing more objective information and change in seedstock purchasing behaviour by producers, requesting objective information on sheep available for sale.

Recommendations

1. Further targeted extension should be supported to achieve more widespread improvement in maternal performance of industry flocks.

A coordinated national extension approach is required to achieve more widespread implementation of the results and improvement in maternal performance of industry flocks. This needs to include management practices as well so that the potential genetic improvement can be fully exploited. The project has many simple as well as more complex messages that need to be packaged differently for the various players (maternal seedstock breeders, 1stX producers, 2ndX producers, self-replacing breeders and lamb processors). These outcomes can be at least partially achieved by support for:

- a proposed national Maternal Genetic Improvement Workshop for extension specialists and key industry players
- update of technical information in the EDGE Money Making Mums Workshop
- extensive use of the MCPT results in Prime Time 2005

2. Development of LAMBPLAN Across-breed EBVs for growth, carcase and wool traits is feasible, but caution would be prudent for reproduction traits until there is more widespread recording of reproduction in maternal seedstock flocks to improve their accuracy.

The MCPT results provide direct comparisons of sires across several maternal (and other) breeds. The correlations between the sire LAMBPLAN EBVs and their progeny performance in MCPT were positive and moderately high for growth, carcase and wool traits, but were lower (although positive) for reproduction traits. The lower correlations for reproduction traits indicates lower accuracy of these EBVs which would be expected to improve as more maternal breed animals have reproduction information recorded in LAMBPLAN. This should be encouraged among maternal seedstock breeders in light of the importance of reproductive rate to lamb enterprise profitability and the considerable scope for improvement highlighted in the MCPT results.

The number of sires tested from each breed was limited (Border Leicester 18, East Friesian 12, Finnsheep 12, Coopworth 10, White Suffolk 7, Corriedale 6, Booroola Leicester 6) and while they were selected and entered by breeders they were generally representative of the breeds for most traits. The feasibility of calculating reliable LAMBPLAN across-breed EBVs depends on the degree of linkage across the breeds and estimates of breed variances and mean differences. Inclusion of MCPT data in the LAMBPLAN data base will contribute in a limited way to these linkages. There is an increasing level of crossing and linkage between the Border Leicester, Finn, East Friesian and Coopworth breeds in flocks that LAMBPLAN test. While there is considerable overlap in performance among the breeds in MCPT and several are represented among the leading sires for most traits, breed effects are significant (eg leanness of East Friesian, high fat of Border Leicester, low fibre diameter of Finnsheep and Corriedale sires) which indicates there are important differences between breed means for these traits.

Reproduction is more difficult to evaluate accurately than other production traits as it has a lower heritability and is more subject to environmental variation that cannot be accounted for. The traits used in LAMBPLAN (nlb and nlw) are ratios of the cumulative number of lambs (born and weaned) and the number of lambing opportunities for the ewe. These are composite traits which are the multiplicative outcome of the components, fertility, litter size (ovulation rate and embryo survival) and lamb survival. Under commercial production systems the component traits tend to compensate (eg high litter size results in poorer lamb survival). Breed means were significantly different for the various component traits eg. the progeny of the Finnsheep sires had higher litter size than those from the Border Leicester sires tested in MCPT. In addition there are important GxE interactions for some breeds and sires when their progeny are evaluated in different environments (see Section 6.3). These factors are likely to preclude the development of useful LAMBPLAN across-breed EBVs for reproduction traits at this stage.

3. Assist industry to develop mechanisms and infrastructure to facilitate the use of superior maternal genetics and that provide for the equitable capture of the benefits of improvement by breeders and producers at all stages of the supply chain.

The MCPT has clearly demonstrated the use of maternal sires with superior genetic merit results in major improvements in performance. New industry structures and breeding alliances need to be facilitated and developed to foster the uptake of genetic technology by the maternal breeding sector and by commercial producers to exploit these opportunities. Industry led breeding alliances between breeders and producers at the various levels (seedstock, 1stX, 2ndX) need to be encouraged and facilitated. Contract matings are a means whereby lamb producers can achieve greater control over the genetic composition of their ewe flock, although they have generally not been successful for various reasons, including complexity, risk and drought. Any mechanism developed needs to recognise that the great majority of benefits from maternal genetic improvement (>85%) are reaped by the 2ndX producer.

4. The in-depth analysis of MCPT data continue to be adequately resourced.

A meatsheep geneticist has been employed jointly by NSW DPI and the Australian Sheep Industry CRC to assist in analysis and publication of the extensive data base generated from the MCPT project. Two journal papers have been submitted and a further 8 journal and 3 conference papers are in preparation with analyses and writing still to be completed. The data base comprises 91 sires and approximately 8,000 base ewes (Merino and Corriedale) inseminated, 4,000 1stX wethers, 2,700 1stX ewes and 11,000 2ndX lambs covering 64 production trait combinations (trait x animal group) for survival, growth, carcase, meat quality, reproduction, milk, wool and worm resistance performance. The analyses will provide estimates of genetic parameters, including heritabilities and genetic correlations, for a wide range of production traits and measures of overall performance. The relationship between MCPT progeny performance and LAMBPLAN EBVs for the sires will be further evaluated and effects of crossbreeding assessed. A range of composite traits and indexes, including economic weights and total earnings per lifetime is being systematically examined. The results of these analyses will enhance the LAMBPLAN genetic parameter matrix to improve the accuracy of EBVs for maternal breeds and provide more appropriate indexes as well as support more detailed recommendations to the various stakeholders in the industry.

8. Funding

Meat and Livestock Australia

The level of funding from MLA provided salary for a part time Technical Officer at each site, a contribution to other staff salaries and additional operating expenses with the sheep, wool testing, lamb slaughter and carcase measurements, data collection and operating costs at each site. The funding to each organisation over the period of the contract is shown in Table 8.1.

Table 8.1. MLA funding for the project

	2001/02	2002/03	2003/04	2004/05	Total
NSW DPI	93,650	88,940	100,512	55,120	338,222
DPI Vic	106,350	111,060	99,488	115,758	432,656
Total	200,000	200,000	200,000	170,878	770,878

NSW Department of Primary Industries and Department of Primary Industries Victoria

The two research organisations provided the research station resources, including the sheep, management, supplements, overheads and facilities to run the project at each site, together with the Principal Investigators and other staff input not included above. The overall coordination of the project, including data and analysis and the Cowra site were undertaken by the NSW Department of Primary Industries and the Hamilton and Rutherglen sites were undertaken by the Department of Primary Industries, Victoria. These inputs from the state Departments accounted for approximately 50% of the total costs of the project.

The Australian Sheep Industry Cooperative Research Centre

The Australian Sheep Industry CRC has contributed half the salary for a meatsheep geneticist (NSW DPI has contributed the remainder) to be employed since March 2003. This means that the data are being subject to more in-depth scientific analysis and publication than would otherwise have been possible.

Other contributions to Phase 1

The SA Research & Development Institute (SARDI) provided the research station resources for Phase 1 at Struan RC, which generated the 1stX ewes that were subsequently transferred to Rutherglen for evaluation.

Breeders paid an entry fee of $400 per sire accepted for the progeny testing and supplied approximately 70 doses of frozen semen from the ram to the appropriate site. These total cash funds of $36,400 were used over the total period of the project to purchase and store semen required for the link sire matings, produce display and extension materials used at all sites and for the costs associated with production and distribution of the ***Dynamic Dams Newsletter*** and the ***Technical Bulletin*** containing the results section of this report.

The owners of the three link sires agreed to supply the additional frozen semen required for the subsequent matings (approximately 560 doses per sire) at a discount rate. These owners were GB Starritt & Son (BL12), DW & IA Peglar (Cp5) and GM & MA Wake (Fi7) and their generous support for the project is appreciated.

9. COMMUNICATION

The contract for this phase of the Project (30 June 2001 to 31 December 2004) specified the following communication activities:

Dynamic Dams Newsletter – 3 issues / year with key results and application

Industry journal articles eg. Muster – ongoing (Fogarty *et al.*)

Field days and workshops – Product Development Officers and extension staff

There has been extensive output of information from the project. During the period from 30 June 2001 to 31 December 2004, 10 issues of the ***Dynamic Dams Newsletter*** were produced, 22 articles were published in industry journals including The Muster, Farming Ahead, Australian Farm Journal, FEEDBACK and Prograzier and some 18 articles in other industry Newsletters and magazines such as Agriculture Today. An AgNote and a Tips & Tools (*Tapping into Maternal Genetics* – Genetics: LP.06) were also produced. Some 7 Field Days were held where MCPT was a major feature of the program, 23 presentations on MCPT results were made at other Field Days, 25 presentations at Workshops and Training Seminars for advisors and static displays were mounted at Meat Profit Days and Expos. These are only those events and publications involving staff directly associated with the project and do not include other instances where breeders, advisors and consultants have used results and material that has been supplied from the project. The presentations are detailed below, including the numerous media articles, radio interviews and TV coverage.

In addition 9 papers have been presented to scientific and technical conferences in Australia and internationally. The data are currently being extensively analysed and prepared for publication in the scientific literature. Some 10 scientific journal papers are in preparation (2 have been submitted) and another 3 papers are to be submitted to the forthcoming AAABG Conference. Jayce Morgan has also submitted a thesis to the University of New England as part of the requirements for a MRurSc degree. The full list of publications (including those pre June 2001 and the papers in preparation) is in Section 11.

Dynamic Dams **Newsletter**

Ten issues of the ***Dynamic Dams Newsletter*** (No. 14, November 2001 to No. 23, October 2004 – see Appendix C2) were produced and distributed. The mailing list (currently 392) comprises ram contributors, maternal seedstock breeders, lamb producers, advisors, consultants and media sources. Over the time of the project there has been a steady increase in direct requests to be included on the mailing list. The newsletter is also available on the LAMBPLAN website. There has been very favourable feedback and follow-up from producers, consultants and media sources to the Newsletter.

A reader feedback survey form was included in the June 2004 issue of Dynamic Dams (No. 22) to gain a more formal feedback response and assist in presentation of results in an industry format in the Final Report as well as provide an evaluation of the Newsletter and project. The Feedback survey form is in Appendix A3.

Field Days, Seminars and Workshops

- 26 June 2001: Cowra MCPT Day for regional Lamb Groups – Neal Fogarty presented MCPT results and breeding options workshopped, sheep inspected.
- 6 September 2001: Rutherglen Research Institute Field Day. MCPT featured, Gervaise Gaunt presented results and sire progeny groups and lambs displayed.
- 2-4 October 2001: Elmore Field Day,– Gervaise Gaunt and Leo Cummins delivered several presentations of MCPT results.
- 25 October 2001: Meat Profit Day, Warragul Vic., Poster displays and MCPT handout on objectives, results and take home messages.

- Hamilton Beef Expo - display mounted.
- 7 March 2002: NSW Agriculture Training Workshop for new advisory staff – Neal Fogarty presented MCPT results and breeding options.
- 1 May 2002: Trangie QPLU$ Merinos Open Day – Neal Fogarty spoke on *Merino Breeding – Meat adds $$* using results from MCPT and mounted a static display.
- May 2002: Presentation to DNRE Meat Specialist Team – Gervaise Gaunt.
- 28-29 May 2002: NSW Agriculture Sheepmeat Sub-program Meeting – Neal Fogarty presented MCPT results and take home messages.
- June 2002: Gervaise Gaunt gave a presentation to the $uperborder$ AGM and conference.
- June 2002: Gervaise Gaunt gave a presentation to the NRE Wool and Specialised Rural Industries team
- August 2002: Information presented as posters at Sheepvention, Hamilton, Vic.
- 2-3 September 2002: Maternal Genetics Workshop in Adelaide - Neal Fogarty and Gervaise Gaunt presented papers on the results.
- 19 September 2002: Neal Fogarty spoke to the Manildra Agricultural Bureau group on the results
- October 2002: Presentation to the “Pastures for Profit” Prime Lamb Producer Group, (GGaunt)
- October 2002: Presentation to British contingent of seedstock producers, (GGaunt)
- November 2002: Presentation to the Lambcheque/Beefcheque Field Day, (GGaunt)
- 3-5 December 2002: NSW Agriculture Wool & Sheepmeat Services Conference - Neal Fogarty presented results and breeding options with the focus on Merinos.
- 11 February 2003: Neal Fogarty presented two workshops to the Australian White Suffolk Association – National Conference, Orange.
- March 2003: Display at the Meat Profit Day: Holbrook, NSW (GGaunt)
- 29-30 April 2003: Neal Fogarty gave a presentation to the NSW Agriculture Sheepmeat Sub-Program.
- 21 June 2003: $uperborder$ AGM and Conference, Cowra, Neal Fogarty gave a presentation
- 22 June 2003: Pre-pilot of the Money Making Mums Workshop presented to a group of lamb producers and $uperborder$ breeders at Cowra, by Elke Edwards.
- June 2003: Gervaise Gaunt gave a presentation to the DPI Vic Meat Specialist Team
- June 2003: Gervaise Gaunt gave a presentation to the Grassland Society: NSW & Vic.
- June 2003: Gervaise Gaunt gave a presentation to the Victorian Minister for Agriculture – Mr Bob Cameron,
- 24 July 2003: Neal Fogarty gave a presentation to the Edge Management Group on “Successful meatsheep enterprises in 2010” Orange.
- 30 July 2003: Neal Fogarty gave a presentation to the South West Slopes Merino Breeders Seminar, Young
- 14 August 2003: Temora Lamb Production Focus Day, Temora, Neal Fogarty gave a presentation
- 23 August 2003: Mount Gambier Lamb Group, Neal Fogarty gave a presentation
- 24 August 2003: Lucindale Lamb Group, Neal Fogarty gave a presentation
- 28 August 2003: Kangaroo Island Prime Lamb Producers Maternal Workshop, Parndana, Neal Fogarty gave a presentation
- 29 August 2003: Neal Fogarty presented a seminar “The lamb challenge – maternal genetics” to the Animal Science Department, University of Adelaide, Roseworthy
- 3 September 2003: Neal Fogarty gave a presentation to the Gulargambone Rural Group at Cowra,
- September 2003: Elmore Maternal Genetics Field Day, Gervaise Gaunt gave a presentation
- 10 September 2003: Neal Fogarty gave a presentation to the NSW Agriculture Advisors Training Workshop
- 19 September 2003: Neal Fogarty gave a presentation to University of Western Sydney Agriculture students, Orange

- 26 September 2003: Ashley White presented MCPT results to Tooraweenah Lamb Group during special visit to Cowra,
- September 2003: Money Making Mums Workshop presented to 3 groups in SA and Vic.
- 6 November 2003: Neal Fogarty gave a presentation at the Cowra Centenary Field Day, along with posters and display of MCPT ewes (including Ian McDonald, NSW Minister for Agriculture)
- January 2004: Gervaise Gaunt gave a presentation to students from the University of Delaware, USA
- 11 February 2004: White Suffolk Annual Conference, Orange,.Ashley White gave a presentation "Key profit drivers for lamb production" which featured MCPT results
- February 2004: Gervaise Gaunt gave a presentation to students from La Trobe University
- 26-28 April 2004: Neal Fogarty gave a presentation to the Scientific and Industry Advisory Committees of the Australian Sheep Industry CRC, which included the analysis of MCPT data, Coffs Harbour,.
- 18 May 2004: Veronica Ingham and Jayce Morgan gave presentations to the Australian Sheep Industry CRC Seminar for researchers and advisors, Orange.
- 13 May 2004: Neal Fogarty gave a presentation to the NSW Agriculture Genetics Team (researchers and advisors), Orange
- 25-26 May 2004: Neal Fogarty, Veronica Ingham and Jayce Morgan gave presentations to the NSW Agriculture Sheepmeat Sub-Program meeting, Cowra.
- June 2004: Gervaise Gaunt gave a presentation to the DPI Vic, Animal Production Science Team
- 30 June 2004: Seminar for scientists and advisors, Orange, Neal Fogarty gave a presentation on MCPT results.
- 3 August 2004: Regional Sheep Updates, Dongara WA, Neal Fogarty presented a paper summarising MCPT results.
- 4 August 2004: Regional Sheep Updates, Dandaragan WA, Neal Fogarty presented a paper summarising MCPT results.
- 23-24 August 2004: Sheep CRC Meeting and Workshop, Orange, Neal Fogarty and Veronica Ingham made presentations on MCPT results.
- 2 December 2004: NSW DPI Advisors Meeting & Seminar – Neal Fogarty highlighted key messages from MCPT and outlined extension requirements.
- Power point graphs and presentations from MCPT results have been provided to several Advisors (including LAMBPLAN) for use at field days and meetings

Conferences

- 30 July-2 Aug 2001: *Association for the Advancement of Animal Breeding and Genetics* (AAABG) *Conference*, Queenstown, New Zealand – 2 papers presented (Fogarty)
- July/Aug 2001: Dr Fogarty also presented results, by invitation, to 3 *Sheep Farmer Conferences in assoc with AAABG* at Lincoln, Telford, Palmerston North: New Zealand
- 27-28 November 2001: *NSW Wool and Sheepmeat Services Program Conference* – Dr Fogarty was invited to present an insight into the future meatsheep enterprise and requirements.
- *42nd Annual Conference of the Grassland Society of Victoria* – results presented (J Hocking Edwards)
- 19-23 August 2002: 7th World Congress on Genetics Applied to Livestock Production, Montpellier, France, Neal Fogarty presented a paper on the results.
- October 2002: Wool Industry Science and Technology Conference, Hamilton, Leo Cummins presented a paper.
- 7-11 July 2003: 15th Conference of the Association for the Advancement of Animal Breeding and Genetics (AAABG), held as part of the XIX International Genetics Congress in Melbourne, - Neal Fogarty presented a paper.

- 27-28 July 2004: WA Agribusiness Sheep Updates Conference, Perth WA, Neal Fogarty presented a paper summarising MCPT results.

Media

- There have been numerous articles in the Land, Weekly Times, Agriculture Today, Stock and Land, The Farmshed, Mallee Ag News and Hamilton Spectator on the project, or potentially more importantly, stories on related trials, such as Elmore and farmers that focus on improving maternal performance (see clippings attached in Appendix C1). Several articles have also been written for industry journals: FEEDBACK, The Muster, Farming Ahead, Australian Farm Journal, DPI Vic Meat Newsletter, Prograzier and the Kangaroo Island Lamb Newsletter.
- MCPT results have been referred to in several articles in the Land, Stock Journal, and Southern Magazine following reporter requests for information.
- TV interview with Prime TV (NF) following SWS Field Day.
- September 2004: Prime TV filming at Cowra with MCPT and Ashley White.
- MCPT results and use of the EBV calculator was featured in the Weekly Times article following reporter request for information from the Dynamic Dams Newsletter article.
- Several requests from advisors, breeders etc for information, data and graphs to use in extension activities, stud advertising and breed websites, including 5 requests for the EBV Calculator CD from advisors/consultants and breeders.
- 28 October 2004: MLA media release on feed intake and efficiency research.
- 29 October 2004 : Neal Fogarty 2CR ABC Rural Report interview
- 2 November 2004: Neal Fogarty ABC Radio, Longreach Qld, interview
- 16 November 2004: Neal Fogarty contacted by Stock Journal reporter re MCPT results for article.

Website/Electronic

- The Maternal Sire Central Progeny Test project is included on the LAMBPLAN website with ***Dynamic Dams Newsletters*** available. (http://www.mla.com.au/lambplan/mcpt)

Agnote

- *Crossbred Ewes Aren't All Equal* has been produced by NSW Agriculture and is also available on the NSW Agriculture website.

Tips & Tools

- *Tapping into maternal genetics* - Genetics: LP.06

Technical Bulletin 50 (NSW DPI)

- *Dynamic Dams for Lamb Production: More $$$s from crossbred ewes with the right genetics* will be distributed to those on the *Dynamic Dams Newsletter* mailing list and will be available in January 2005. It will also be available at: http://www.agric.nsw.gov.au/reader/sheep-meat/dynamic-dams.html

10. Publications (includes all those from the start of the project in 1997)

10.1 Scientific

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10.2 Scientific – in preparation

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10.5 Electronic

Prime Notes: CD-ROM. "Maternal Sires Central Progeny Test" QDPI
Internet site: http://www.mla.com.au/lambplan/mcpt
Software: EBV $ Calculator for Maternal Sires *(N Fogarty & L McLeod)*

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APPENDIX A1 – SIRE PROGENY MEANS

A1.1 Sire progeny means for annual $ income and gross margins - 1stX ewes

Sire	$ Income	$GM	$GM/DSE	Sire	$ Income	$GM	$GM/DSE
BL2	120.22	108.34	39.77	Cp36	111.91	96.07	37.79
BL8	98.79	83.26	32.56	Cp37	69.97	56.81	26.09
BL12	117.08	101.66	37.79	Cp65	93.18	79.45	31.62
BL13	118.39	103.40	39.09	Cp74	101.71	87.63	34.55
BL24	96.37	82.66	34.25	Cp85	129.63	114.33	41.28
BL25	101.72	87.76	34.91	WS10	100.14	89.29	33.81
BL32	107.74	93.35	36.67	WS33	115.88	100.54	37.22
BL35	81.13	66.67	28.32	WS42	113.60	98.73	35.96
BL52	108.93	94.52	36.99	WS51	112.07	98.15	36.53
BL53	98.20	82.75	34.20	WS60	98.23	82.70	32.88
BL54	119.46	102.54	37.81	WS80	96.78	82.71	31.80
BL61	105.68	91.19	39.11	WS90	123.24	108.00	39.33
BL62	106.09	91.61	35.29	Cr4	94.88	81.29	35.47
BL70	100.55	86.66	33.67	Cr11	87.64	73.97	33.32
BL71	108.40	94.14	36.40	Cr20	101.49	87.63	39.51
BL81	107.33	93.04	35.69	Cr27	94.44	81.28	35.28
BL82	112.99	98.49	37.99	Cr46	101.46	87.88	39.47
BL83	113.16	98.69	37.12	Cr64	88.43	75.25	34.68
EF6	105.06	89.01	36.05	BoL1	86.67	71.59	27.71
EF19	130.41	114.88	42.54	BoL15	107.09	96.35	34.76
EF28	118.14	103.10	38.38	BoL34	90.84	80.82	31.96
EF39	123.56	109.77	39.68	BoL43	104.62	94.16	34.98
EF44	122.45	107.34	41.38	BoL55	98.52	93.48	34.66
EF45	136.48	121.16	44.03	BoL63	92.75	82.81	31.62
EF47	116.09	101.09	39.58	Hy29	102.10	87.93	38.20
EF59	112.26	95.94	36.45	Hy30	103.61	89.29	38.20
EF77	106.76	92.21	36.02	Hy75	111.14	96.51	37.99
EFP68	98.01	83.76	31.53	Hy87	116.16	101.27	38.79
EFR69	104.95	90.29	33.70	EL57	86.79	72.08	31.42
EFP89	106.47	91.85	35.47	EL73	50.28	39.28	18.88
Fi3	114.44	98.51	36.68	Gr41	90.39	77.61	33.39
Fi7	104.58	89.92	34.62	Gr86	105.66	91.54	37.28
Fi9	103.15	87.43	35.66	M56	88.69	75.67	37.53
Fi17	112.52	97.34	37.52	M72	93.14	79.23	33.06
Fi21	117.14	101.77	40.13	Ro14	103.04	89.23	35.20
Fi22	102.87	88.26	36.37	Ro49	101.58	87.90	36.64
Fi23	113.11	97.49	38.11	PD31	111.91	97.15	37.59
FL40	113.16	98.06	36.75	PD79	88.81	75.54	30.47
FiF48	115.43	100.39	38.28	Ch66	94.27	80.86	31.47
Fi67	97.17	82.78	32.11	SAM84	125.82	110.80	41.23
FiF76	98.33	84.42	32.74	SHD78	87.19	73.89	30.61
Fi88	109.73	94.65	35.65	Tx50	96.21	82.95	32.85
Cp5	110.21	95.49	37.74	WD91	112.42	98.11	36.35
Cp16	120.14	105.16	40.17	WH58	97.43	81.91	31.18
Cp18	94.28	80.85	33.03	Cc38	93.15	81.95	33.16
Cp26	115.45	100.48	39.81				

$ Income = average annual $ income from 2ndX lambs slaughtered and 1stX ewe wool
$GM = average annual $ gross margin per ewe
$GM/DSE = average annual $ gross margin per dry sheep equivalent
Based on first 3 joinings and shearings of 1stX ewes

A1.2 Sire progeny means for annual lambing rate - 1stX ewes

Sire	LW (%)	LB (%)	LS	Sire	LW (%)	LB (%)	LS
BL2	121.4	139.7	1.62	Cp36	110.9	132.8	1.50
BL8	96.7	114.0	1.43	Cp37	64.8	89.4	1.31
BL12	111.7	133.7	1.57	Cp65	91.6	115.8	1.54
BL13	116.4	139.9	1.55	Cp74	96.2	119.3	1.47
BL24	91.2	112.4	1.32	Cp85	122.2	138.4	1.55
BL25	96.8	115.8	1.45	WS10	102.7	127.6	1.45
BL32	104.4	124.8	1.46	WS33	117.1	132.1	1.48
BL35	75.6	93.7	1.34	WS42	110.7	130.8	1.55
BL52	111.2	129.4	1.48	WS51	124.0	146.7	1.61
BL53	95.0	110.2	1.32	WS60	93.1	109.5	1.34
BL54	117.5	134.6	1.49	WS80	87.7	110.3	1.37
BL61	103.0	123.7	1.44	WS90	118.7	135.9	1.47
BL62	99.1	139.2	1.62	Cr4	92.4	101.3	1.31
BL70	95.0	118.2	1.45	Cr11	82.0	94.0	1.25
BL71	102.3	119.7	1.43	Cr20	95.7	109.6	1.21
BL81	103.5	121.8	1.47	Cr27	83.2	92.0	1.22
BL82	108.8	122.9	1.38	Cr46	103.8	109.4	1.25
BL83	107.5	123.5	1.48	Cr64	74.8	90.6	1.33
EF6	99.0	119.8	1.36	BoL1	86.3	144.1	2.02
EF19	133.9	149.6	1.59	BoL15	108.5	141.2	1.73
EF28	110.1	130.5	1.50	Bol34	99.5	157.4	2.10
EF39	125.8	156.2	1.75	BoL43	121.0	171.9	2.06
EF44	122.2	129.7	1.49	BoL55	115.5	177.7	2.04
EF45	130.2	140.6	1.60	BoL63	101.9	170.4	2.18
EF47	116.4	124.4	1.44	Hy29	102.6	119.9	1.38
EF59	100.9	119.2	1.44	Hy30	105.2	122.3	1.42
EF77	100.9	122.3	1.39	Hy75	112.0	130.8	1.51
EFP68	92.2	125.8	1.52	Hy87	116.2	141.8	1.57
EFR69	102.8	140.4	1.76	EL57	85.2	109.3	1.38
EFP89	99.7	117.5	1.44	EL73	35.7	52.1	1.28
Fi3	128.5	169.5	1.96	Gr41	85.9	100.3	1.20
Fi7	110.1	166.5	1.90	Gr86	98.0	112.8	1.32
Fi9	113.2	143.5	1.59	M56	79.0	92.3	1.17
Fi17	116.0	156.5	1.69	M72	93.0	115.6	1.47
Fi21	130.6	163.9	1.73	Ro14	92.2	109.4	1.26
Fi22	108.7	161.9	1.74	Ro49	108.2	113.4	1.28
Fi23	133.3	172.1	1.83	PD31	114.6	137.3	1.58
FL40	117.7	149.5	1.76	PD79	81.4	118.3	1.43
FiF48	125.1	160.8	1.79	Ch66	95.0	128.9	1.46
Fi67	92.2	149.3	1.73	SAM84	121.8	139.9	1.55
FiF76	94.0	124.6	1.57	SHD78	83.4	103.6	1.29
Fi88	118.7	165.4	1.87	Tx50	104.8	111.0	1.36
Cp5	110.9	129.6	1.54	WD91	111.8	129.1	1.50
Cp16	111.7	127.5	1.45	WH58	101.9	122.9	1.55
Cp18	81.50	100.6	1.22	Cc38	90.7	110.7	1.44
Cp26	116.9	138.3	1.52				

LW = lambs weaned per ewe joined (%); LB = lambs born per ewe joined (%)
LS = litter size (number of lambs born per ewe lambing)
Based on first 3 joinings of 1stX ewes

A1.3 Sire progeny means for lamb growth and carcase – 2ndX lambs

Sire	BW	WW	PWW	Fat	EMA	Sire	BW	WW	PWW	Fat	EMA
BL2	4.5	29.5	44.8	14.1	14.2	Cp36	4.1	27.3	41.7	15.2	14.5
BL8	4.3	28.5	43.2	15.8	14.3	Cp37	3.8	27.0	41.1	15.1	14.6
BL12	4.3	29.8	44.6	15.1	14.5	Cp65	4.1	28.3	43.0	15.3	14.5
BL13	4.3	29.6	44.1	16.3	14.3	Cp74	3.9	28.1	42.2	15.2	14.3
BL24	4.0	27.4	42.6	15.5	14.2	Cp85	4.4	30.7	45.9	14.0	14.4
BL25	4.2	28.8	43.5	14.8	14.6	WS10	4.3	28.9	42.8	14.6	14.8
BL32	4.4	28.7	43.6	14.6	14.4	WS33	4.2	28.6	42.3	14.5	14.8
BL35	4.1	26.9	41.2	15.2	14.2	WS42	4.3	29.2	43.5	14.1	14.9
BL52	4.5	28.9	43.8	14.4	14.5	WS51	4.2	29.4	43.1	14.5	15.0
BL53	4.2	28.9	43.2	15.7	14.5	WS60	4.0	28.7	42.2	15.3	14.9
BL54	4.6	29.3	44.7	14.2	14.1	WS80	4.0	28.3	42.3	14.8	14.6
BL61	4.5	28.8	43.9	14.7	14.4	WS90	4.4	29.1	43.4	15.1	15.0
BL62	4.4	28.3	44.8	15.1	14.3	Cr4	4.4	26.6	40.6	15.0	14.8
BL70	4.1	27.8	42.4	15.1	14.7	Cr11	4.5	26.7	40.5	14.8	14.4
BL71	4.4	29.4	44.1	14.8	14.4	Cr20	4.5	25.4	39.7	14.1	14.3
BL81	4.3	28.6	43.7	15.3	14.3	Cr27	4.4	28.3	41.9	14.7	14.6
BL82	4.6	28.8	44.0	14.3	14.2	Cr46	4.5	26.0	40.1	15.4	14.8
BL83	4.4	29.4	44.0	14.7	14.3	Cr64	4.3	26.3	40.1	14.5	14.8
EF6	4.4	29.3	44.3	12.7	14.5	BoL1	4.4	27.8	42.6	15.0	14.7
EF19	4.3	30.6	45.2	12.9	14.7	BoL15	4.2	28.9	42.9	15.6	14.8
EF28	4.6	31.9	46.4	13.6	14.6	Bol34	3.8	26.2	40.0	16.5	14.7
EF39	4.2	28.8	43.4	13.3	14.5	BoL43	4.1	28.3	41.9	15.7	14.7
EF44	4.4	31.4	45.6	12.4	14.4	BoL55	4.3	27.9	42.2	15.8	14.5
EF45	4.6	31.6	47.2	12.1	14.2	BoL63	4.0	28.4	42.8	16.2	14.6
EF47	4.3	30.0	44.2	13.3	14.8	Hy29	4.1	26.9	41.7	15.0	14.5
EF59	4.4	31.8	47.5	12.5	14.7	Hy30	3.9	27.4	41.0	14.8	15.0
EF77	4.2	29.5	44.6	13.4	15.0	Hy75	4.0	27.7	42.1	15.3	14.9
EFP68	4.4	31.0	45.0	13.3	14.7	Hy87	4.0	27.9	42.3	15.1	14.8
EFR69	4.0	29.9	44.4	13.5	14.8	EL57	3.8	27.5	41.0	15.5	14.4
EFP89	4.2	29.0	44.3	13.4	14.5	EL73	3.6	27.5	41.4	15.4	14.3
Fi3	3.3	25.1	40.1	14.4	14.7	Gr41	3.9	27.0	41.9	14.7	14.6
Fi7	3.4	26.2	40.9	15.2	14.7	Gr86	4.0	28.7	42.8	15.1	15.1
Fi9	3.5	25.8	39.9	16.0	14.4	M56	3.9	26.4	40.2	14.6	14.2
Fi17	3.4	25.6	39.9	16.0	14.6	M72	3.8	26.5	40.7	14.5	15.1
Fi21	3.5	25.2	40.0	14.9	14.5	Ro14	3.8	27.5	41.9	13.6	14.6
Fi22	3.6	25.6	40.4	14.5	13.9	Ro49	4.3	27.1	42.1	14.9	14.4
Fi23	3.4	25.4	39.9	14.8	14.2	PD31	3.8	28.9	42.9	15.4	15.1
FL40	3.7	26.4	41.0	14.8	14.7	PD79	3.9	28.8	42.8	14.9	14.8
FiF48	3.8	27.4	42.3	14.5	14.0	Ch66	3.6	26.8	42.2	14.7	15.0
Fi67	3.5	24.8	40.5	14.8	14.3	SAM84	4.2	29.3	44.3	14.7	14.7
FiF76	3.9	28.0	42.1	14.1	14.7	SHD78	3.8	26.9	41.1	14.5	14.8
Fi88	3.6	26.1	41.0	14.9	14.5	Tx50	4.0	27.4	42.2	14.5	15.2
Cp5	4.2	27.7	42.3	15.0	14.3	WD91	4.1	30.1	44.3	15.1	14.5
Cp16	4.1	27.7	42.6	15.1	14.5	WH58	4.1	29.1	43.0	14.2	15.1
Cp18	3.9	27.8	41.9	14.4	14.4	Cc38	4.0	28.5	42.2	14.3	14.9
Cp26	3.9	27.7	41.8	14.8	14.8						

BW = birth weight (kg); WW = weaning weight (kg); PWW = post-weaning weight (kg);
Fat = carcase fat (mm GR); EMA =carcase eye muscle area (cm^2), adjusted to 22.5 kg carcase weight.

A1.4 Sire progeny means for wool production and worm resistance of 1stX ewe hoggets and survival of 1stX lambs.

Sire	CFW	FD	FEC	SURV	Sire	CFW	FD	FEC	SURV
BL2	3.2	29.2	145.0	76.4	Cp36	3.8	28.1	140.4	75.4
BL8	3.4	29.4	154.9	76.3	Cp37	3.6	30.9	121.6	76.5
BL12	3.6	29.4	146.5	74.7	Cp65	3.4	29.2	78.0	76.4
BL13	3.0	27.0	202.5	77.1	Cp74	3.6	29.0		77.3
BL24	3.3	29.5		76.4	Cp85	3.4	28.0		76.7
BL25	3.4	30.8		77.1	WS10	2.7	27.2	123.1	72.9
BL32	3.6	29.8		76.6	WS33	2.8	28.5		72.9
BL35	3.4	28.5	118.8	77.6	WS42	2.4	28.9	91.1	74.2
BL52	3.2	28.2	108.3	76.5	WS51	3.0	28.8	105.9	73.6
BL53	3.1	28.7	155.0	76.5	WS60	2.9	28.2	118.6	73.1
BL54	3.4	29.2	106.1	77.1	WS80	2.8	27.4		72.2
BL61	3.2	29.3	206.6	76.4	WS90	2.6	27.7		73.3
BL62	3.3	28.2	187.4	76.6	Cr4	3.5	25.4	132.5	73.5
BL70	3.3	29.2		76.4	Cr11	3.4	23.2	142.1	73.4
BL71	3.2	29.3		77.0	Cr20	3.6	25.1	200.9	72.4
BL81	3.3	29.0		76.7	Cr27	3.6	24.2		73.1
BL82	3.3	29.1		76.7	Cr46	3.5	24.3	133.7	73.3
BL83	3.0	28.9		76.2	Cr64	3.5	25.1	207.6	72.8
EF6	3.1	27.9	136.8	69.9	BoL1	3.2	29.1	127.7	79.3
EF19	3.2	28.9	118.9	70.1	BoL15	2.7	27.3	96.5	78.4
EF28	3.2	28.5		70.1	Bol34	3.1	28.1	152.7	78.9
EF39	3.1	28.6	145.9	70.2	BoL43	2.8	26.9	131.4	78.4
EF44	3.0	27.5	156.0	69.5	BoL55	2.8	27.4	113.2	78.2
EF45	3.3	27.0	150.4	70.0	BoL63	3.1	27.6	167.0	79.1
EF47	3.3	29.0	138.8	69.2	Hy29	2.7	26.3		74.0
EF59	3.3	27.8	133.4	69.8	Hy30	2.9	26.3		74.4
EF77	3.1	28.6		70.2	Hy75	2.5	24.7		73.1
EFP68	3.2	28.2	180.4	69.3	Hy87	3.1	24.6		73.6
EFR69	3.1	28.3	116.9	70.4	EL57	3.8	28.8	126.9	73.0
EFP89	3.1	28.2		70.5	EL73	3.7	30.1		74.3
Fi3	2.7	25.0	139.2	77.1	Gr41	3.0	26.2	133.1	72.4
Fi7	2.7	23.8	144.0	76.6	Gr86	3.6	26.1		73.6
Fi9	2.6	25.0	168.3	77.4	M56	3.7	21.4	210.9	73.5
Fi17	3.0	26.2	144.8	76.6	M72	3.3	21.9		73.8
Fi21	2.8	25.3	143.5	77.3	Ro14	3.7	28.2	52.1	73.1
Fi22	2.8	23.9		76.1	Ro49	3.3	27.7	123.6	73.2
Fi23	2.7	23.1		76.9	PD31	2.8	27.0		73.9
FL40	3.2	25.4	167.2	77.0	PD79	2.6	27.8		73.7
FiF48	2.8	25.2	127.3	77.1	Ch66	3.3	27.0	40.9	73.5
Fi67	2.8	24.7	225.7	76.8	SAM84	3.1	22.2		72.6
FiF76	2.8	26.8		77.7	SHD78	2.8	27.0		73.8
Fi88	2.5	24.6		77.1	Tx50	3.1	28.7	100.1	73.7
Cp5	3.9	27.9	105.3	76.0	WD91	1.6	22.4		73.5
Cp16	3.5	29.7	148.4	78.0	WH58	2.5	29.4	87.0	74.5
Cp18	3.8	29.5	126.9	77.2	Cc38	2.9	28.7	95.0	74.6
Cp26	3.7	27.7		77.0					

CFW = hogget clean fleece weight (kg); FD =hogget fibre diameter (microns);
FEC =faecal worm egg count (eggs/g); SURV = 1stX lamb survival (%).

A1.5 Sire progeny means for lamb growth and carcase - 1stX lambs

Sire	BW	WW	PWW	Fat	EMA	Sire	BW	WW	PWW	Fat	EMA
BL2	4.3	22.2	38.0	14.0	13.3	Cp36	4.1	21.9	38.1	14.8	13.3
BL8	4.3	21.2	37.4	17.2	12.9	Cp37	4.1	21.0	35.3	14.8	13.5
BL12	4.2	21.8	38.2	15.1	13.4	Cp65	4.1	21.2	37.0	14.4	14.2
BL13	4.3	21.2	37.2	17.2	12.8	Cp74	4.2	20.5	35.2	13.9	13.6
BL24	4.1	21.0	38.1	15.0	13.3	Cp85	4.3	21.6	39.4	12.0	13.0
BL25	4.3	20.5	36.4	13.1	13.6	WS10	4.4	22.6	38.4	14.2	14.7
BL32	4.3	21.0	37.3	14.3	13.2	WS33	4.3	22.6	40.3	15.8	13.5
BL35	4.3	20.8	36.0	15.1	13.0	WS42	4.5	21.7	39.4	14.3	13.9
BL52	4.2	21.1	36.3	14.8	13.5	WS51	4.4	22.7	39.9	14.1	14.3
BL53	4.3	21.1	36.7	15.7	13.6	WS60	4.4	21.7	37.2	13.8	14.6
BL54	4.5	21.9	39.5	15.4	12.5	WS80	4.2	22.2	39.3	13.9	14.0
BL61	4.3	21.2	36.6	14.5	13.6	WS90	4.4	22.6	38.9	13.9	14.4
BL62	4.3	21.3	37.9	16.3	12.9	Cr4	4.3	20.0	32.3	12.0	14.6
BL70	4.4	21.9	38.6	14.9	13.2	Cr11	4.4	19.5	31.4	13.8	13.6
BL71	4.1	20.9	36.6	16.1	13.9	Cr20	4.2	19.2	33.9	13.5	13.6
BL81	4.3	21.7	37.7	17.5	12.9	Cr27	4.3	19.9	32.6	13.7	14.0
BL82	4.4	22.0	38.8	14.9	13.3	Cr46	4.3	19.3	33.9	13.8	13.3
BL83	4.4	21.8	38.2	17.0	13.0	Cr64	4.3	19.5	32.7	13.1	13.4
EF6	4.5	22.0	36.2	10.6	13.8	BoL1	4.0	20.2	36.8	16.4	13.2
EF19	4.3	22.1	39.2	10.3	12.9	BoL15	4.0	20.7	36.8	16.6	13.5
EF28	4.5	23.7	41.6	13.5	13.6	Bol34	4.0	20.1	34.5	18.2	13.9
EF39	4.6	22.5	39.1	10.7	13.2	BoL43	4.0	20.0	36.9	17.1	13.2
EF44	4.4	22.0	37.1	10.2	12.9	BoL55	4.1	20.4	36.2	16.6	13.5
EF45	4.4	22.7	39.2	10.2	13.6	BoL63	4.0	19.4	35.0	18.6	13.1
EF47	4.4	22.0	38.0	11.3	13.6	Hy29	3.9	20.3	34.1	12.6	13.8
EF59	4.5	23.3	42.2	9.7	13.3	Hy30	4.0	20.3	33.5	15.4	13.5
EF77	4.4	22.8	38.8	11.4	12.9	Hy75	4.1	20.5	35.8	15.4	14.5
EFP68	4.5	22.4	38.1	11.4	13.7	Hy87	4.0	20.7	37.4	13.8	14.2
EFR69	4.4	22.1	37.2	12.4	13.8	EL57	4.1	21.0	35.6	16.0	13.3
EFP89	4.4	22.0	38.2	10.9	14.1	EL73	4.3	21.6	38.0	13.9	13.2
Fi3	3.9	20.7	36.5	13.6	13.6	Gr41	4.2	20.1	35.0	14.8	13.2
Fi7	3.9	21.0	38.1	14.4	13.6	Gr86	4.3	21.2	36.5	14.7	14.1
Fi9	3.9	19.9	35.5	14.1	13.2	M56	4.1	19.6	31.1	12.7	13.5
Fi17	4.0	21.0	37.1	14.5	13.6	M72	4.1	20.6	34.3	12.9	12.9
Fi21	3.8	20.3	36.8	13.7	12.9	Ro14	4.4	21.2	35.8	13.3	13.8
Fi22	4.0	19.7	37.4	15.3	13.3	Ro49	4.4	21.1	37.1	13.9	13.6
Fi23	4.0	20.1	36.8	14.1	13.5	PD31	4.4	22.8	40.3	14.2	14.1
FL40	4.0	20.7	38.0	14.4	13.4	PD79	4.1	21.7	39.6	14.6	14.3
FiF48	4.2	21.0	38.3	13.5	13.4	Ch66	4.2	20.3	35.2	13.8	14.0
Fi67	4.0	20.9	38.9	14.2	13.5	SAM84	4.1	20.8	35.8	12.2	13.5
FiF76	4.1	20.8	37.1	13.4	13.1	SHD78	4.2	21.5	37.9	14.8	13.9
Fi88	3.9	20.0	36.6	13.6	13.5	Tx50	4.2	21.4	38.2	14.1	15.1
Cp5	4.3	21.6	36.7	14.8	13.4	WD91	4.2	20.5	37.0	14.2	13.6
Cp16	4.2	21.4	36.7	14.5	14.4	WH58	4.4	21.3	38.1	15.6	14.3
Cp18	4.2	20.8	35.2	14.4	13.6	Cc38	4.1	21.0	36.2	13.4	14.3
Cp26	4.2	21.6	38.0	13.3	13.7						

BW = birth weight (kg); WW = weaning weight (kg); PWW = post-weaning weight (kg);
Fat = carcase fat (mm GR); EMA =carcase eye muscle area (cm^2), adjusted to 22 kg carcase weight.

APPENDIX A2 - MATERNAL SIRE ENTRIES – DETAILS

Year	Site	Sire Code	Tag	Stud	Breed	Entrant	Phone No.
1997	**Cowra**	**BoL1**	920047	Struan	Booroola Leicester	PIRSA	08 8762 9100
		BL2	950137	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Fi3	940001	Yamba	Finnsheep	M & L Burns	03 5798 1583
		Cr4	940364	Maluka	Corriedale	P Secker	02 4848 1244
		Cp5*	940449	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		EF6	94B021	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Fi7*	930057	Warrayure	Finnsheep	GM & MA Wake	03 5574 1254
		BL8	950181	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Fi9	935010	Warrayure	Finnsheep	Knight & Bottcher	03 5578 7250
		WS10	910058	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
		Cr11	930097	Coora	Corriedale	Coora Partnership	02 4848 1244
		BL12*	94S291	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
1997	**Hamilton**	**BL13**	950246	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Ro14	930146	Claymour	Romney	Rouch & Gillman	03 5727 1552
		BoL15	924287	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cp16	930069	Narrambla	Coopworth	D Wigan	03 5577 2321
		Fi17	950054	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		Cp18	940421	Oaklea	Coopworth	J Keiller	03 5526 5248
		EF19	94B026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Cr20	880491	Stanbury	Corriedale	Cole & Risbey	03 5593 9278
		Fi21	960002	UNSW	Finnsheep	S & D Jones	03 5122 3328
1998	**Struan**	**Fi22**	890049	ATC	Finnsheep	Jaydee Stud	08 8764 2065
		Fi23	930049	Tambaroora	Finnsheep	Jaydee Stud	08 8764 2065
		BL24	960346	Gleneith	Border Leicester	CE & LJ Arney	08 8536 0031
		BL25	960188	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Cp26	960210	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Cr27	921586	Coora	Corriedale	Coora Partnership	03 5578 6267
		EF28	960133	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Hy29	960028	Cowra	Hyfer	NSW DPI	02 6391 3813
		Hy30	960128	Cowra	Hyfer	NSW DPI	02 6391 3813
		PD31	960110	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		BL32	95T138	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		WS33	951470	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1998	**Cowra**	**BoL34**	950029	Caveton Park	Booroola Leicester	PIRSA	08 8762 9100
		BL35	940765	Retallack	Border Leicester	BLA(NSW)/Grinter	02 6974 1153
		Cp36	960067	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cp37	940274	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cc38	960621	Coronga	Coronga Composite	Premier Breed. Tech	02 6365 8207
		EF39	94B040	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FL40	941016	Wycombe	Finn x Leicester	R & L Coddington	02 6775 5225
		Gr41	955551	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		WS42	940069	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
1998	**Hamilton**	**BoL43**	960322	Struan	Booroola Leicester	PIRSA	08 8762 9100
		EF44	960026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		EF45	94B019	Glenspean	East Friesian	S & J Cameron	03 5286 1455
		Cr46	950161	Gundowringa	Corriedale	HJ & CJ Prell	02 4848 1244
		EF47	950509	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FiF48	960086	Gippfinn	Finn x Friesian	S & D Jones	03 5122 3328
		Ro49	920089	Evergreen	Romney	C Duncombe	03 5264 5170
		Tx50	949002	Coolana	Texel	Coolana Rural	03 5350 5531
		WS51	900429	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1999	**Cowra**	**BL52**	920070	Kegra	Border Leicester	BLA(NSW)/Golder	02 6977 1339
		BL53	960102	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		BL54	970030	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BoL55	950203	Struan	Booroola Leicester	PIRSA	08 8762 9100
		M56	890183	Centre Plus	Merino	L Mortimer & Sons	02 6892 8259
		EL57	960043	Ostlers Hill	English Leicester	ELAssoc/Stephenson	03 5764 1298
		WH58	960505	Clifton Hills	Wiltshire Horn	AWHSBA/Ballantyne	03 5145 8225
		EF59	970100	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		WS60	974842	Linden Genetics	PLG White Suffolk	Linden Genetics	02 6386 2020
1999	**Hamilton**	**BL61**	970188	Wongajong	Border Leicester	AD & CM Wilson	02 5882 3338
		BL62	98X050	Kelso	Border Leicester	GB Starrttt & Son	03 5829 0144
		BoL63	950160	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cr64	910415	Coolana	Corriedale	PG Munro	03 5575 3240
		Cp65	978431	Cashmore Park	Coopworth	J Keiller	03 5526 5248
		CH66	910L92	Grand Ridge	Cheviot	RN Waddell	03 5626 4244
		Fi67	960085	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		EFP68	981019	Yollom	East Friesian x Perendale	MF & ML Molloy	03 5596 2077
		EFR69	970175	Price	East Friesian x Romney	EJ & KJ Price	03 5527 1110
1999	**Struan**	**BL70**	970310	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL71	97W290	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		M72	930051	Merinotech Mid	Merino	Merinotech Mid North	08 8665 4019
		EL73	950T82	Koenarl	English Leicester	CR Taylor	03 5595 0272
		Cp74	970101	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Hy75	960215	Cowra	Hyfer	NSW DPI	02 6391 3813
		FiF76	960132	Gippfinn	Finn Friesian	S & D Jones	03 5122 3328
		EF77	960136	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		SHD78	970155	Tauranga	South Hampshire Down	S & M Macmillan	03 5596 2251
		PD79	970101	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		WS80	970172	Koonawarra	White Suffolk	AWSA	08 8210 5211
2000	**Struan**	**BL81**	960327	Morton	Border Leicester	JD & CM Corbin	08 8765 8058
		BL82	980260	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL83	980085	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		SAM84	980046	Jeancourt	SAMM	W & M Heddle	08 8271 7080
		Cp85	980091	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Gr86	980144	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		Hy87	940278	Cowra	Hyfer	NSW DPI	02 6391 3813
		Fi88	538	Gippfinn	Finn	S & D Jones	03 5122 3328
		EFP89	981071	Yollom	East Friesian x Perendale	Karioi Seed Stock/Udy	03 5597 6621
		WS90	960513	Langley Heights	White Suffolk	AWSA	08 8210 5211
		WD91	990906	Axis	White Dorper	B & L Mawson	08 8537 0615

** Link sires used at each site each year*

APPENDIX A3 – DYNAMIC DAMS – READER FEEDBACK

Dynamic Dams Newsletter

Reader Feedback

Please return to: Neal Fogarty
Fax: 02 63913922
or mail: Orange Agricultural Institute
Forest Rd., ORANGE NSW 2800

Your feedback will help us put together a better Final Report of the results from the Maternal Sire Central Progeny Test (MCPT), which will be in a more useful form for you and others in the industry, as well as help evaluate the MCPT.

1. Please indicate which category of reader fits you:

Ram contributor [] Seedstock breeder [] Producer [] Advisor/Consultant []

Other [] – please state ……………………..

2. Rate the value of the Dynamic Dams Newsletter to you:

Very high value [] High value [] Moderate value [] Little value [] No value []

3. Rate the presentation of MCPT results in the Dynamic Dams Newsletter:

Style and layout: Very good [] Good [] Moderate [] Fair [] Poor []

Amount of detail: Too detailed [] Generally right [] Not enough detail []

Comments ………………………………………………………………………………………

……………………………………………………………………………………………………..

4. Rate how important it is for you to see the results for sires expressed as:

a) 1stX progeny EBVs	High []	Moderate []	Low []
b) 1stX ewe EBVs for number of lambs weaned	High []	Moderate []	Low []
c) 1stX ewe EBVs for wool production	High []	Moderate []	Low []
d) EBVs for lamb growth and carcase merit	High []	Moderate []	Low []
e) 1stX ewe EBVs for $ returns/ewe/yr	High []	Moderate []	Low []
f) 1stX ewe EBVs for $ gross margin/ewe/yr	High []	Moderate []	Low []
g) 1stX ewe EBVs for $ gross margin/DSE/yr	High []	Moderate []	Low []

h) Other – please specify ………………………………………………………………..

…………………………………………………………………………………………………

5. What is your rating of the impact of the MCPT on the industry?

Very high impact [] High impact [] Moderate impact [] Little impact [] No impact []

6. What do you think are the two most important take home messages from the MCPT?

a) ……………………………………………………………………………………….

……………………………………………………………………………………………………..

………………………………………………………………………………………………………

b) ………………………………………………………………………………………..

………
…………………………………………………………………..

7. Have you made any changes in the way you run your business (or provide advice) because of the results from the MCPT? Yes [] No []

If Yes please specify. ………………………………………………………………………………

……………………………………………………………………………………………………..

………………………………………………………………………………………………………

9. How do you think the take home messages from MCPT can be best applied in the industry?

…………………………………………………………………………………………………

…………………………………………………………………………………………………

10. Other comments on MCPT and/or the Dynamic Dams Newsletter. …………………..

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Thank you for your assistance

APPENDIX B1 – LAMBING PERFORMANCE FROM AI MATINGS OF BASE EWES AND AVERAGE CARCASE WEIGHT OF 1STX LAMBS

B1.1 Lambing performance from AI matings of base ewes and average carcase weight of 1stX wethers – Cowra, NSW.

Year of mating & Sire	Ewes AI (n)	Scanned preg (%)	Foetus/ preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lamb survival (%)	Lambs wean /ewe AI (%)
1997							
BL2	66	74.2	1.65	71.2	1.66	79.5	93.9
BL8	66	84.8	1.82	89.4	1.81	73.8	119.7
BL12	65	93.8	2.10	92.3	2.00	67.5	124.6
BoL1	65	86.2	1.84	87.7	1.84	81.9	132.3
Cp5	68	86.8	1.97	91.2	1.84	71.1	119.1
Cr4	67	88.1	1.92	88.1	1.86	73.6	120.9
Cr11	65	84.6	1.89	83.1	1.87	74.3	115.4
EF6	67	88.1	1.97	88.1	1.90	68.8	114.9
Fi3	66	93.9	1.92	92.4	2.03	73.4	137.9
Fi7	67	85.1	1.86	85.1	1.79	79.4	120.9
Fi9	65	92.3	2.12	89.2	2.02	75.2	135.4
WS10	64	87.5	1.84	89.1	1.81	72.8	117.2
Total / Av	**791**	**87.1**	**1.91**	**87.2**	**1.87**	**74.3**	**121.0**
						Av cwt kill 1:	**21.2kg[1]**
						Av cwt kill 2:	**24.0kg[1]**
1998							
BL12	68	89.7	1.93	85.3	1.97	64.0	107.4
BL35	69	84.1	1.95	81.2	1.89	82.1	126.1
BoL34	70	84.3	1.83	84.3	1.78	79.0	118.6
Cc38	68	80.9	1.76	80.9	1.75	79.2	111.8
Cp5	70	85.7	1.83	87.1	1.77	72.2	111.4
Cp36	71	91.5	1.86	91.5	1.74	66.4	105.6
Cp37	68	89.7	1.87	92.6	1.84	72.4	123.5
EF39	69	76.8	1.79	76.8	1.77	70.2	95.7
Fi7	69	91.3	1.97	87.0	2.07	71.8	129.0
FL40	69	88.4	1.95	88.4	1.84	74.1	120.3
Gr41	67	86.6	1.93	88.1	1.97	62.9	109.0
WS42	67	82.1	1.85	82.1	1.78	76.5	111.9
Total / Av	**825**	**85.9**	**1.88**	**85.4**	**1.85**	**72.6**	**114.2**
						Av cwt kill 1:	**20.2kg[1]**
						Av cwt kill 2:	**20.3kg[1]**

[1] Wether 1stX lambs randomised to kill 1 and kill 2 (averages 208 and 242 days respectively 1997, 213 and 241 days 1998, 220 and 255 days 1999).

B1.1 (cont.) Lambing performance from AI matings of base ewes and average carcase weight of 1stX wethers – Cowra, NSW.

Year of mating & Sire	Ewes AI (n)	Scanned preg (%)	Foetus/ preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lamb survival (%)	Lambs wean /ewe AI (%)
1999							
BL12	65	95.4	1.89	86.2	1.75	64.3	96.9
BL52	67	92.5	1.65	91.0	1.66	73.3	110.4
BL53	67	80.6	1.72	67.2	1.73	73.1	85.1
BL54	67	76.1	1.63	73.1	1.67	78.0	95.5
BoL55	68	66.2	1.62	64.7	1.73	69.7	77.9
Cp5	66	92.4	1.75	89.4	1.68	74.7	112.1
EF59	66	81.8	1.61	80.3	1.58	63.1	80.3
EL57	66	77.3	1.63	77.3	1.61	67.1	83.3
Fi7	65	87.7	1.63	84.6	1.64	74.4	103.1
M56	67	83.6	1.57	86.6	1.59	66.3	91.0
WH58	66	77.3	1.67	75.8	1.68	78.6	100.0
WS60	67	83.6	1.84	89.6	1.75	64.8	101.5
Total / Av	**797**	**82.9**	**1.68**	**80.5**	**1.67**	**70.6**	**94.8**
							Av cwt kill 1: 21.6kg[1]
							Av cwt kill 2: 23.0kg[1]

[1] Wether 1stX lambs randomised to kill 1 and kill 2 (averages 208 and 242 days respectively 1997, 213 and 241 days 1998, 220 and 255 days 1999).

B1.2 Lambing performance from AI matings of base ewes and average carcase weight of 1stX wethers – Hamilton, Vic.

Year of mating & Sire	Ewes AI (n)	Scanned preg (%)	Foetus/ preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lamb survival (%)	Lambs wean /ewe AI (%)
1997							
BL12	71			76.1	1.48	71.3	80.3
BL13	66			72.7	1.48	76.1	81.8
BoL15	77			76.6	1.66	69.4	88.3
Cp5	71			81.7	1.62	58.5	77.5
Cp16	71			69.0	1.47	86.1	87.3
Cp18	71			70.4	1.48	68.9	71.8
Cr20	70			72.9	1.65	61.9	74.3
EF19	69			43.5	1.67	62.0	44.9
Fi7	69			89.9	1.69	63.8	97.1
Fi17	68			82.4	1.70	63.2	88.2
Fi21	65			64.6	2.00	70.2	90.8
Ro14	70			75.7	1.64	57.5	71.4
Total / Av	**838**			**73.0**	**1.63**	**67.4**	**79.5**
						Av cwt kill 1: 19.7kg[1]	
						Av cwt kill 2: 20.6kg[1]	
1998							
BL12	71	88.7	1.24	40.8	1.28	86.5	45.1
BoL43	68	88.2	1.25	45.6	1.23	84.2	47.1
Cp5	68	85.3	1.29	45.6	1.48	89.1	60.3
Cr46	68	88.2	1.20	41.2	1.29	86.1	45.6
EF44	67	91.0	1.21	37.3	1.28	71.9	34.3
EF45	70	88.6	1.16	40.0	1.18	87.9	41.4
EF47	68	89.7	1.25	38.2	1.42	62.2	33.8
Fi7	71	85.9	1.20	46.5	1.36	86.7	54.9
FiF48	69	89.9	1.19	49.3	1.32	91.1	59.4
Ro49	71	87.3	1.21	42.3	1.43	76.7	46.5
Tx50	70	90.0	1.30	45.7	1.47	80.9	54.3
WS51	71	91.5	1.23	33.8	1.33	93.8	42.3
Total / Av	**832**	**88.7**	**1.23**	**42.2**	**1.34**	**83.1**	**47.1**
						Av cwt kill: 22.7kg[2]	

[1] Wether 1stX lambs randomised to kill 1 and kill 2 (averages 252 and 271 days respectively). [2] average age of kill 276 days.

B1.2 (cont.) Lambing performance from AI matings of base ewes and average carcase weight of 1stX wethers – Hamilton, Vic.

Year of mating & Sire	Ewes AI (n)	Scanned preg (%)	Foetus/ preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lamb survival (%)	Lambs wean /ewe AI (%)
1999							
BL12	72	66.7	1.73	61.1	1.93	69.4	81.9
BL61	66	24.2	1.25	18.2	1.17	78.6	16.7
BL62	69	55.1	1.42	46.4	1.69	68.5	53.6
BoL63	70	40.0	1.36	38.6	1.37	89.2	47.1
Ch66	70	54.3	1.61	57.1	1.80	63.9	65.7
Cp5	70	60.0	1.50	60.0	1.55	73.8	68.6
Cp65	69	73.9	1.61	72.5	1.72	70.9	88.4
Cr64	69	71.0	1.55	69.6	1.69	65.4	76.8
EFP68	68	50.0	1.62	47.1	1.69	61.1	48.5
EFR69	69	46.4	1.41	43.5	1.53	69.6	46.4
Fi7	69	52.2	1.61	50.7	1.74	75.4	66.7
Fi67	69	44.9	1.35	46.4	1.41	73.3	47.8
Total / Av	**830**	**53.2**	**1.50**	**50.9**	**1.61**	**71.6**	**59.0**
							Av cwt kill: 22.4kg[3]

[3] average age of kill 317 days.

B1.3 Lambing performance from AI matings of base ewes and average carcase weight of 1stX wethers – Struan, SA.

Year of mating & Sire	Ewes AI (n)	Scanned preg (%)	Foetus/ preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lamb survival (%)	Lambs wean /ewe AI (%)
1998							
BL24	78	61.5	1.40	53.8	1.24	84.6	56.4
BL25	77	58.4	1.31	58.4	1.18	88.7	61.0
BL32	78	41.0	1.38	41.0	1.19	84.2	41.0
Cp5	78	59.0	1.43	52.6	1.27	76.9	51.3
Cp26	78	69.2	1.30	65.4	1.24	85.7	69.2
Cr27	78	62.8	1.41	56.4	1.27	80.4	57.7
EF28	78	53.8	1.45	42.3	1.33	77.3	43.6
Fi7	78	74.4	1.60	73.1	1.35	75.3	74.4
Fi22	79	43.0	1.44	41.8	1.27	83.3	44.3
Fi23	78	64.1	1.62	64.1	1.46	74.0	69.2
Hy29	78	70.5	1.51	71.8	1.36	81.6	79.5
Hy30	78	71.8	1.45	69.2	1.30	87.1	78.2
PD31	77	71.4	1.45	62.3	1.44	79.7	71.4
WS33	79	63.3	1.44	62.0	1.35	74.2	62.0
Total / Av	**1092**	**61.7**	**1.44**	**58.2**	**1.30**	**80.9**	**61.4**
							Av cwt kill: 24.2kg[1]
1999							
BL12	77	70.1	1.67	61.0	1.51	69.0	63.6
BL70	79	73.4	1.55	51.9	1.49	77.0	59.5
BL71	75	66.7	1.68	50.7	1.39	84.9	60.0
Cp5	75	65.3	1.51	57.3	1.33	77.2	58.7
Cp74	74	63.5	1.51	50.0	1.27	83.0	52.7
EF77	76	72.4	1.49	59.2	1.20	79.6	56.6
EL73	76	69.7	1.51	56.6	1.42	82.0	65.8
Fi7	75	82.7	1.50	74.7	1.38	76.6	78.7
FiF76	76	77.6	1.61	67.1	1.47	88.0	86.8
Hy75	77	70.1	1.54	58.4	1.40	73.0	59.7
M72	77	61.0	1.49	46.8	1.17	83.3	45.5
PD79	75	73.3	1.73	41.3	1.35	73.8	41.3
SHD78	76	75.0	1.54	43.4	1.21	82.5	43.4
WS80	77	68.8	1.55	50.6	1.41	67.3	48.1
Total / Av	**1065**	**70.7**	**1.56**	**54.9**	**1.36**	**78.4**	**58.6**
							Av cwt kill: 21.9kg[1]

[1] average age of kill 345 days 1998, 343 days 1999.

B1.3 (cont.) Lambing performance from AI matings of base ewes and average carcase weight of 1stX wethers – Struan, SA.

Year of mating & Sire	Ewes AI (n)	Scanned preg (%)	Foetus/ preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lamb survival (%)	Lambs wean /ewe AI (%)
2000							
BL12	77	66.2	1.37	62.3	1.19	86.0	63.6
BL81	78	69.2	1.39	64.1	1.14	86.0	62.8
BL82	65	30.8	1.35	26.2	1.24	100.0	32.3
BL83	77	59.7	1.39	58.4	1.09	85.7	54.5
Cp5	74	70.3	1.38	68.9	1.18	90.0	73.0
Cp85	78	67.9	1.34	60.3	1.09	84.3	55.1
EFP89	76	57.9	1.30	50.0	1.11	90.5	50.0
Fi7	74	79.7	1.41	75.7	1.18	92.4	82.4
Fi88	88	72.7	1.47	63.6	1.11	83.9	59.1
Gr86	77	67.5	1.44	61.0	1.17	80.0	57.1
Hy87	75	66.7	1.54	66.7	1.18	74.6	58.7
SAM84	80	71.3	1.39	68.8	1.13	71.0	55.0
WD91	77	53.2	1.37	54.5	1.14	79.2	49.4
WS90	75	53.3	1.35	44.0	1.09	94.4	45.3
Total / Av	**1071**	**63.3**	**1.39**	**58.9**	**1.14**	**85.6**	**57.0**
							Av cwt kill: 22.6kg[2]

[2] average age of kill 350 days.

APPENDIX B2 – LAMBING PERFORMANCE OF 1STX EWES AND AVERAGE CARCASE WEIGHT OF 2NDX LAMBS

B2.1 Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Cowra NSW, autumn joining 1997 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Autumn 1998 (7mths of age)									
BL2	13	41.6	69.2	1.56	69.2	1.67	115.4	80.0	92.3
BL8	15	39.4	66.7	1.00	66.7	1.00	66.7	50.0	33.3
BL12	15	39.6	93.3	1.36	93.3	1.21	113.3	82.4	93.3
BoL1	19	39.6	68.4	1.92	63.2	2.08	131.6	44.0	57.9
Cp5	18	41.7	72.2	1.31	72.2	1.31	94.4	82.4	77.8
Cr4	21	35.0	47.6	1.00	47.6	1.10	52.4	72.7	38.1
Cr11	18	34.9	22.2	1.25	16.7	1.33	22.2	75.0	16.7
EF6	17	40.2	100.0	1.18	94.1	1.19	111.8	68.4	76.5
Fi3	18	39.5	83.3	1.80	72.2	1.77	127.8	78.3	100.0
Fi7	18	42.9	61.1	2.18	61.1	1.82	111.1	65.0	72.2
Fi9	23	38.8	78.3	1.28	78.3	1.17	91.3	90.5	82.6
WS10	19	40.7	63.2	1.08	63.2	1.17	73.7	50.0	36.8
Total / Av	**214**	**39.5**	**68.8**	**1.41**	**66.5**	**1.40**	**92.6**	**69.9**	**64.8**
							Av cwt 21.1 kg (Av age 194 days)		
Autumn 1999 (19mths of age)									
BL2	13	62.4	100.0	1.62	84.6	1.82	153.8	85.0	130.8
BL8	13	60.3	69.2	1.78	69.2	1.67	115.4	80.0	92.3
BL12	15	60.3	100.0	1.53	100.0	1.60	160.0	87.5	140.0
BoL1	19	62.8	73.7	2.00	73.7	1.93	142.1	59.3	84.2
Cp5	18	59.0	100.0	1.56	100.0	1.56	155.6	82.1	127.8
Cr4	21	56.0	85.7	1.44	85.7	1.39	119.0	92.0	109.5
Cr11	14	55.8	100.0	1.29	92.9	1.23	114.3	93.8	107.1
EF6	17	59.1	94.1	1.63	94.1	1.56	147.1	84.0	123.5
Fi3	17	55.9	94.1	2.19	82.4	2.14	176.5	80.0	141.2
Fi7	17	60.6	100.0	2.41	94.1	2.25	211.8	58.3	123.5
Fi9	21	54.6	100.0	1.86	100.0	1.71	171.4	75.0	128.6
WS10	18	62.2	100.0	1.50	100.0	1.44	144.4	88.5	127.8
Total / Av	**203**	**59.1**	**93.1**	**1.73**	**89.7**	**1.69**	**150.9**	**80.5**	**119.7**
							Av cwt 23.4 kg (Av age 190 days)		

B2.1 (cont.) Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Cowra NSW, autumn joining 1997 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Autumn 2000 (31mths of age)									
BL2	12	73.4	100.0	1.92	91.7	2.09	191.7	91.3	175.0
BL8	10	70.3	80.0	1.75	80.0	1.88	150.0	100.0	150.0
BL12	15	69.7	100.0	1.60	100.0	1.80	180.0	77.8	140.0
BoL1	16	74.2	81.3	2.46	68.8	2.45	168.8	48.1	81.3
Cp5	18	70.9	94.4	2.06	94.4	2.12	200.0	75.0	150.0
Cr4	21	67.4	81.0	1.88	76.2	1.88	142.9	83.3	119.0
Cr11	14	64.0	100.0	1.86	78.6	1.82	142.9	85.0	121.4
EF6	16	67.9	100.0	1.75	100.0	1.69	168.8	81.5	137.5
Fi3	16	65.3	100.0	2.25	81.3	2.54	206.3	60.6	125.0
Fi7	17	69.0	100.0	2.24	94.1	2.50	235.3	47.5	111.8
Fi9	21	63.8	100.0	2.00	95.2	2.05	195.2	85.4	166.7
WS10	18	71.9	83.3	1.87	77.8	1.86	144.4	76.9	111.1
Total / Av	**194**	**69.0**	**93.3**	**1.97**	**86.5**	**2.06**	**177.2**	**76.0**	**132.4**
									Av cwt 21.2 kg (Av age 183 days)

B2.2 Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Cowra NSW, spring joining 1997 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Spring 1998 (14 mths of age)									
BL2	14	54.0	100.0	1.57	92.9	1.46	135.7	100.0	135.7
BL8	16	51.3	81.3	1.38	81.3	1.38	112.5	94.4	106.3
BL12	16	55.3	68.8	1.36	62.5	1.50	93.8	86.7	81.3
BoL1	18	53.3	72.2	1.92	72.2	1.85	133.3	66.7	88.9
Cp5	16	53.8	75.0	1.42	62.5	1.50	93.8	93.3	87.5
Cr4	21	44.7	81.0	1.24	81.0	1.12	90.5	100.0	90.5
Cr11	17	47.9	76.5	1.15	70.6	1.08	76.5	92.3	70.6
EF6	17	50.2	64.7	1.18	64.7	1.18	76.5	92.3	70.6
Fi3	18	51.1	88.9	1.88	83.3	1.93	161.1	75.9	122.2
Fi7	17	52.7	82.4	2.00	70.6	1.92	135.3	65.2	88.2
Fi9	22	50.4	90.9	1.50	81.8	1.44	118.2	84.6	100.0
WS10	19	55.8	94.7	1.39	89.5	1.41	126.3	87.5	110.5
Total / Av	**211**	**51.7**	**81.4**	**1.50**	**76.1**	**1.48**	**112.8**	**86.6**	**96.0**
							Av cwt 21.6 kg (Av age 155 days)		
Spring 1999 (26 mths of age)									
BL2	13	68.9	92.3	2.00	92.3	2.00	184.6	79.2	146.2
BL8	16	70.3	93.8	1.47	93.8	1.47	137.5	90.9	125.0
BL12	16	72.3	75.0	1.92	75.0	1.83	137.5	90.9	125.0
BoL1	18	70.3	83.3	2.13	72.2	2.38	172.2	74.2	127.8
Cp5	16	66.0	93.8	1.53	93.8	1.47	137.5	90.9	125.0
Cr4	21	61.3	90.5	1.47	90.5	1.47	133.3	96.4	128.6
Cr11	17	60.4	88.2	1.47	88.2	1.47	129.4	77.3	100.0
EF6	17	61.5	88.2	1.53	82.4	1.50	123.5	90.5	111.8
Fi3	18	67.1	100.0	1.94	100.0	2.11	211.1	86.8	183.3
Fi7	16	69.5	100.0	1.75	93.8	1.67	156.3	92.0	143.8
Fi9	22	66.4	95.5	1.71	90.9	1.90	172.7	73.7	127.3
WS10	17	68.0	88.2	1.53	88.2	1.53	135.3	82.6	111.8
Total / Av	**207**	**66.8**	**90.7**	**1.71**	**88.4**	**1.73**	**152.6**	**85.4**	**129.6**
							Av cwt 23.1kg (Av age 183 days)		

B2.2 (cont.) Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Cowra NSW, spring joining 1997 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Spring 2000 (38 mths of age)									
BL2	12	77.8	100.0	1.50	91.7	1.45	133.3	93.8	125.0
BL8	16	78.2	87.5	1.57	87.5	1.57	137.5	90.9	125.0
BL12	14	83.1	85.7	1.58	85.7	1.67	142.9	95.0	135.7
BoL1	18	78.6	77.8	2.14	77.8	2.29	177.8	78.1	138.9
Cp5	14	72.2	85.7	1.58	85.7	1.58	135.7	100.0	135.7
Cr4	19	67.0	84.2	1.56	84.2	1.50	126.3	100.0	126.3
Cr11	16	67.7	100.0	1.31	100.0	1.31	131.3	100.0	131.3
EF6	17	67.3	94.1	1.38	94.1	1.38	129.4	86.4	111.8
Fi3	17	71.9	100.0	2.06	94.1	2.19	205.9	80.0	164.7
Fi7	16	73.0	93.8	2.00	93.8	2.27	212.5	79.4	168.8
Fi9	21	70.3	100.0	1.62	100.0	1.57	157.1	81.8	128.6
WS10	15	77.9	100.0	1.60	100.0	1.53	153.3	87.0	133.3
Total / Av	**195**	**73.7**	**92.4**	**1.66**	**91.2**	**1.69**	**153.6**	**89.4**	**135.4**
									Av cwt 24.5kg (Av age 180 days)

B2.3 Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Cowra NSW, autumn joining 1998 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Autumn 1999 (7mths of age)									
BL12	16	36.6	75.0	1.50	75.0	1.33	100.0	87.5	87.5
BL35	22	33.6	40.9	1.44	40.9	1.44	59.1	84.6	50.0
BoL34	20	32.1	80.0	1.81	75.0	1.73	130.0	57.7	75.0
Cc38	16	34.4	31.3	1.00	31.3	1.00	31.3	100.0	31.3
Cp5	19	35.5	57.9	1.36	57.9	1.36	78.9	86.7	68.4
Cp36	19	36.5	68.4	1.69	68.4	1.69	115.8	81.8	94.7
Cp37	17	33.7	41.2	1.00	41.2	1.00	41.2	85.7	35.3
EF39	19	36.9	100.0	1.42	100.0	1.37	136.8	69.2	94.7
Fi7	20	35.6	80.0	1.75	75.0	1.73	130.0	53.8	70.0
FL40	21	36.9	71.4	1.73	61.9	1.54	95.2	65.0	61.9
Gr41	16	32.7	43.8	1.29	37.5	1.00	37.5	83.3	31.3
WS42	17	35.9	76.5	1.38	64.7	1.27	82.4	71.4	58.8
Total / Av	**222**	**35.0**	**63.9**	**1.45**	**60.7**	**1.37**	**86.5**	**77.2**	**63.2**
									Av cwt 26.4kg (Av age 260 days)
Autumn 2000 (19mths of age)									
BL12	16	63.2	93.8	1.87	93.8	1.93	181.3	82.8	150.0
BL35	22	63.1	81.8	1.44	81.8	1.39	113.6	80.0	90.9
BoL34	20	58.2	80.0	2.50	70.0	2.43	170.0	64.7	110.0
Cc38	16	61.4	100.0	1.88	100.0	1.88	187.5	76.7	143.8
Cp5	19	59.6	94.7	2.00	89.5	2.06	184.2	94.3	173.7
Cp36	19	63.8	100.0	1.84	94.7	1.94	184.2	82.9	152.6
Cp37	16	61.0	93.8	1.67	93.8	1.67	156.3	80.0	125.0
EF39	18	63.9	94.4	2.00	83.3	2.00	166.7	80.0	133.3
Fi7	20	60.7	95.0	2.26	95.0	2.37	225.0	62.2	140.0
FL40	21	63.8	95.2	2.00	95.2	1.95	185.7	84.6	157.1
Gr41	15	60.2	93.3	1.50	93.3	1.50	140.0	81.0	113.3
WS42	16	63.2	100.0	1.88	100.0	1.81	181.3	93.1	168.8
Total / Av	**218**	**61.8**	**93.5**	**1.90**	**90.9**	**1.91**	**173.0**	**80.2**	**138.2**
									Av cwt 21.3kg (Av age 189 days)

B2.3 (cont.) Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Cowra NSW, autumn joining 1998 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Autumn 2001 (31mths of age)									
BL12	15	68.0	100.0	2.00	100.0	1.87	186.7	71.4	133.3
BL35	22	69.0	72.7	1.88	63.6	1.86	118.2	69.2	81.8
BoL34	20	63.2	85.0	2.59	75.0	2.47	185.0	62.2	115.0
Cc38	16	64.2	81.3	2.08	81.3	2.00	162.5	76.9	125.0
Cp5	16	65.5	93.8	2.13	93.8	2.13	200.0	81.3	162.5
Cp36	19	68.1	94.7	1.78	94.7	1.78	168.4	81.3	136.8
Cp37	15	63.0	73.3	1.64	73.3	1.55	113.3	35.3	40.0
EF39	18	68.7	94.4	2.53	88.9	2.50	222.2	65.0	144.4
Fi7	20	64.5	100.0	2.30	95.0	2.11	200.0	62.5	125.0
FL40	20	66.6	90.0	1.94	85.0	2.00	170.0	79.4	135.0
Gr41	15	62.7	86.7	1.46	86.7	1.46	126.7	68.4	86.7
WS42	16	64.3	93.8	2.00	81.3	2.15	175.0	89.3	156.3
Total / Av	**212**	**65.6**	**88.8**	**2.03**	**84.9**	**1.99**	**169.0**	**70.2**	**120.2**
									Av cwt 21.8 kg (Av age 197 days)

B2.4 Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Cowra NSW, spring joining 1998 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Spring 1999 (14 mths of age)									
BL12	17	64.3	64.7	1.55	58.8	1.20	70.6	91.7	64.7
BL35	21	58.3	57.1	1.25	52.4	1.18	61.9	92.3	57.1
BoL34	21	53.3	66.7	2.07	52.4	2.00	104.8	81.8	85.7
Cc38	16	59.0	50.0	1.25	43.8	1.43	62.5	80.0	50.0
Cp5	19	59.1	78.9	1.47	78.9	1.47	115.8	95.5	110.5
Cp36	20	60.5	85.0	1.47	85.0	1.35	115.0	91.3	105.0
Cp37	15	55.3	33.3	1.40	33.3	1.20	40.0	100.0	40.0
EF39	17	60.5	82.4	1.71	88.2	1.73	152.9	88.5	135.3
Fi7	19	57.0	94.7	1.94	94.7	1.72	163.2	58.1	94.7
FL40	20	59.3	90.0	1.78	80.0	1.81	145.0	79.3	115.0
Gr41	17	55.0	82.4	1.29	82.4	1.21	100.0	94.1	94.1
WS42	16	60.8	81.3	1.31	75.0	1.17	87.5	85.7	75.0
Total / Av	**218**	**58.5**	**72.2**	**1.54**	**68.7**	**1.46**	**101.6**	**86.5**	**85.6**
									Av cwt 25.4kg (Av age 191 days)
Spring 2000 (26 mths of age)									
BL12	17	76.1	100.0	1.82	100.0	1.76	176.5	86.7	152.9
BL35	21	74.6	85.7	1.33	85.7	1.33	114.3	79.2	90.5
BoL34	18	65.7	88.9	2.38	88.9	2.56	227.8	68.3	155.6
Cc38	14	73.7	92.9	1.38	92.9	1.23	114.3	87.5	100.0
Cp5	19	68.7	100.0	1.47	100.0	1.42	142.1	96.3	136.8
Cp36	20	70.8	100.0	1.35	100.0	1.35	135.0	85.2	115.0
Cp37	15	67.6	73.3	1.27	73.3	1.27	93.3	78.6	73.3
EF39	16	69.7	93.8	1.87	93.8	1.80	168.8	88.9	150.0
Fi7	19	67.4	100.0	2.05	94.7	1.89	178.9	94.1	168.4
FL40	19	70.5	84.2	1.88	84.2	1.94	163.2	90.3	147.4
Gr41	16	66.1	100.0	1.00	100.0	1.06	106.3	100.0	106.3
WS42	16	71.7	87.5	1.64	87.5	1.64	143.8	87.0	125.0
Total / Av	**210**	**70.2**	**92.2**	**1.62**	**91.7**	**1.61**	**147.0**	**86.8**	**126.8**
									Av cwt 23.8kg (Av age 191 days)

B2.4 (cont.) Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Cowra NSW, spring joining 1998 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Spring 2001 (38 mths of age)									
BL12	17	80.6	100.0	1.71	100.0	1.76	176.5	93.3	164.7
BL35	21	78.0	81.0	1.47	81.0	1.47	119.0	92.0	109.5
BoL34	18	67.1	88.9	2.13	88.9	2.38	211.1	63.2	133.3
Cc38	14	77.3	100.0	1.57	92.9	1.62	150.0	90.5	135.7
Cp5	18	72.8	100.0	1.67	100.0	1.67	166.7	86.7	144.4
Cp36	19	77.2	94.7	1.61	94.7	1.56	147.4	85.7	126.3
Cp37	14	70.5	71.4	1.40	71.4	1.40	100.0	78.6	78.6
EF39	15	73.8	93.3	1.86	86.7	2.15	186.7	96.4	180.0
Fi7	18	71.0	100.0	1.78	94.4	1.94	183.3	90.9	166.7
FL40	19	75.2	100.0	1.95	100.0	1.84	184.2	80.0	147.4
Gr41	16	71.2	100.0	1.19	93.8	1.27	118.8	100.0	118.8
WS42	15	75.8	86.7	1.62	80.0	1.58	126.7	78.9	100.0
Total / Av	**204**	**74.2**	**93.0**	**1.66**	**90.3**	**1.72**	**155.9**	**86.4**	**133.8**
									Av cwt 25.0kg (Av age 175 days)

B2.5 Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Cowra NSW, autumn joining 1999 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Autumn 2000(7mths of age)									
BL12	16	44.0	68.8	1.45	62.5	1.40	87.5	85.7	75.0
BL52	19	40.1	73.7	1.29	68.4	1.15	78.9	73.3	57.9
BL53	14	40.7	78.6	1.18	50.0	1.29	64.3	100.0	64.3
BL54	21	43.0	76.2	1.56	61.9	1.38	85.7	88.9	76.2
BoL55	16	40.4	87.5	1.64	81.3	1.54	125.0	75.0	93.8
Cp5	16	41.9	50.0	1.38	43.8	1.43	62.5	80.0	50.0
EF59	12	47.4	58.3	1.29	58.3	1.29	75.0	88.9	66.7
EL57	13	39.7	38.5	1.40	38.5	1.40	53.8	71.4	38.5
Fi7	15	42.3	46.7	1.57	40.0	1.33	53.3	37.5	20.0
M56	17	35.6	41.2	1.43	29.4	1.40	41.2	85.7	35.3
WH58	12	43.2	41.7	1.60	41.7	1.60	66.7	87.5	58.3
WS60	19	40.1	21.1	1.25	21.1	1.00	21.1	75.0	15.8
Total / Av	**190**	**41.5**	**56.8**	**1.42**	**49.7**	**1.35**	**67.4**	**79.1**	**54.3**
Av cwt 21.8kg (Av age 203 days)									
Autumn 2001 (19mths of age)									
BL12	16	60.6	100.0	2.00	100.0	2.25	225.0	52.8	118.8
BL52	19	57.8	94.7	1.78	94.7	1.83	173.7	81.8	142.1
BL53	13	59.1	92.3	2.00	92.3	1.83	169.2	63.6	107.7
BL54	21	62.3	100.0	1.90	95.2	1.90	181.0	76.3	138.1
BoL55	14	59.3	100.0	2.07	100.0	2.14	214.3	66.7	142.9
Cp5	16	57.5	81.3	2.15	81.3	2.00	162.5	73.1	118.8
EF59	12	63.7	91.7	1.55	91.7	1.73	158.3	73.7	116.7
EL57	12	54.3	91.7	1.73	91.7	1.82	166.7	80.0	133.3
Fi7	15	60.6	100.0	2.13	100.0	2.40	240.0	30.6	73.3
M56	17	49.0	82.4	1.50	82.4	1.36	111.8	63.2	70.6
WH58	12	63.4	91.7	2.00	91.7	2.27	208.3	68.0	141.7
WS60	18	60.6	94.4	1.41	83.3	1.27	105.6	89.5	94.4
Total / Av	**185**	**59.0**	**93.3**	**1.85**	**92.0**	**1.90**	**176.4**	**68.3**	**116.5**
Av cwt 21.9kg (Av age 202 days)									

B2.5 (cont.) Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Cowra NSW, autumn joining 1999 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Autumn 2002 (31mths of age)									
BL12	16	58.6	100.0	2.00	100.0	2.06	206.3	97.0	200.0
BL52	19	53.6	94.7	1.83	94.7	1.94	184.2	91.4	168.4
BL53	13	56.0	100.0	1.62	100.0	1.54	153.8	100.0	153.8
BL54	18	58.0	100.0	1.94	100.0	1.94	194.4	94.3	183.3
BoL55	14	57.0	85.7	2.33	85.7	2.50	214.3	73.3	157.1
Cp5	16	54.6	100.0	2.19	100.0	2.19	218.8	85.7	187.5
EF59	12	62.1	100.0	1.83	100.0	1.92	191.7	87.0	166.7
EL57	12	52.3	91.7	1.64	83.3	1.90	158.3	84.2	133.3
Fi7	15	57.5	100.0	2.53	100.0	2.47	246.7	67.6	166.7
M56	17	48.4	88.2	1.33	88.2	1.33	117.6	90.0	105.9
WH58	11	63.7	72.7	2.00	72.7	2.13	154.5	94.1	145.5
WS60	18	59.0	88.9	1.81	88.9	1.75	155.6	85.7	133.3
Total / Av	**181**	**56.7**	**93.5**	**1.92**	**92.8**	**1.97**	**183.0**	**87.5**	**158.5**
									Av cwt 23.1 kg (Av age 170 days)

B2.6 Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Cowra NSW, spring joining 1999 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Spring 2000 (14 mths of age)									
BL12	14	58.3	92.9	1.46	92.9	1.46	135.7	89.5	121.4
BL52	18	55.1	88.9	1.19	83.3	1.13	94.4	94.1	88.9
BL53	13	53.2	76.9	1.10	76.9	1.10	84.6	90.9	76.9
BL54	19	59.3	100.0	1.42	94.7	1.33	126.3	83.3	105.3
BoL55	16	56.6	100.0	2.00	100.0	2.06	206.3	51.5	106.3
Cp5	16	52.3	87.5	1.21	81.3	1.23	100.0	93.8	93.8
EF59	13	60.4	76.9	1.30	69.2	1.22	84.6	90.9	76.9
EL57	12	54.7	75.0	1.00	75.0	1.00	75.0	100.0	75.0
Fi7	16	52.6	100.0	1.94	93.8	1.60	150.0	75.0	112.5
M56	17	47.1	100.0	1.06	100.0	1.00	100.0	100.0	100.0
WH58	13	58.1	100.0	1.15	92.3	1.08	100.0	84.6	84.6
WS60	20	55.0	100.0	1.30	100.0	1.20	120.0	83.3	100.0
Total / Av	**187**	**55.2**	**91.5**	**1.34**	**88.3**	**1.29**	**114.7**	**86.4**	**95.1**
									Av cwt 24.9kg (Av age 187 days)
Spring 2001 (26 mths of age)									
BL12	14	72.1	92.9	1.69	92.9	1.69	157.1	77.3	121.4
BL52	18	67.6	94.4	1.65	94.4	1.65	155.6	82.1	127.8
BL53	13	64.3	92.3	1.17	92.3	1.17	107.7	92.9	100.0
BL54	19	73.3	100.0	1.47	100.0	1.47	147.4	92.9	136.8
BoL55	12	71.0	100.0	2.00	83.3	2.20	183.3	86.4	158.3
Cp5	15	63.5	80.0	1.33	80.0	1.33	106.7	93.8	100.0
EF59	13	74.6	76.9	1.60	76.9	1.50	115.4	93.3	107.7
EL57	12	66.8	100.0	1.25	100.0	1.25	125.0	80.0	100.0
Fi7	16	63.3	100.0	1.88	100.0	1.81	181.3	93.1	168.8
M56	17	59.0	82.4	1.14	82.4	1.14	94.1	93.8	88.2
WH58	13	72.9	100.0	1.38	100.0	1.46	146.2	94.7	138.5
WS60	20	68.7	80.0	1.38	85.0	1.35	115.0	91.3	105.0
Total / Av	**182**	**68.1**	**91.6**	**1.50**	**90.6**	**1.50**	**136.2**	**89.3**	**121.0**
									Av cwt 24.1kg (Av age 183 days)

B2.6 (cont.) Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Cowra NSW, spring joining 1999 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Spring 2002 (38 mths of age)									
BL12	13	75.7	76.9	1.80	76.9	1.80	138.5	94.4	130.8
BL52	16	69.2	87.5	1.71	87.5	1.71	150.0	95.8	143.8
BL53	13	67.2	92.3	1.17	84.6	1.36	115.4	93.3	107.7
BL54	19	76.3	94.7	1.56	94.7	1.50	142.1	96.3	136.8
BoL55	10	73.6	80.0	2.25	80.0	2.75	220.0	68.2	150.0
Cp5	15	66.4	86.7	1.69	86.7	1.69	146.7	77.3	113.3
EF59	13	77.0	84.6	1.64	84.6	1.45	123.1	87.5	107.7
EL57	12	68.8	75.0	1.33	83.3	1.40	116.7	57.1	66.7
Fi7	15	64.3	100.0	1.73	100.0	1.80	180.0	85.2	153.3
M56	15	62.4	86.7	1.38	93.3	1.21	113.3	94.1	106.7
WH58	13	75.0	69.2	1.67	76.9	1.70	130.8	82.4	107.7
WS60	20	71.2	85.0	1.41	85.0	1.47	125.0	88.0	110.0
Total / Av	**174**	**70.6**	**84.9**	**1.61**	**86.1**	**1.65**	**141.8**	**85.0**	**119.5**
									Av cwt 25.1kg (Av age 174 days)

B2.7 Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Hamilton, Vic, autumn joining 1997 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Autumn 1998 (7mths of age)									
BL12	23	32.1	39.1	1.00	30.4	1.00	30.4	71.4	21.7
BL13	28	31.8	64.3	1.17	67.9	1.16	78.6	77.3	60.7
BoL15	35	33.2	42.9	1.07	40.0	1.07	42.9	66.7	28.6
Cp5	21	32.5	38.1	1.13	33.3	1.14	38.1	75.0	28.6
Cp16	23	33.1	47.8	1.00	43.5	1.00	43.5	100.0	43.5
Cp18	24	29.1	25.0	1.00	25.0	1.17	29.2	71.4	20.8
Cr20	29	29.6	24.1	1.00	20.7	1.00	20.7	50.0	10.3
EF19	19	35.5	89.5	1.24	89.5	1.24	110.5	95.2	105.3
Fi7	39	35.2	61.5	1.50	56.4	1.55	87.2	52.9	46.2
Fi17	30	33.0	80.0	1.13	70.0	1.14	80.0	58.3	46.7
Fi21	25	31.6	84.0	1.24	76.0	1.21	92.0	78.3	72.0
Ro14	27	32.0	22.2	1.00	22.2	1.00	22.2	83.3	18.5
Total / Av	**323**	**32.4**	**51.5**	**1.12**	**47.9**	**1.14**	**56.3**	**73.3**	**41.9**
						Av cwt 20.6kg (Av age 244 days)			
Autumn 1999 (19mths of age)[1]									
BL12	23	56.4	95.7	1.55	65.2	1.53	100.0	60.9	60.9
BL13	27	55.2	100.0	1.48	70.4	1.42	100.0	88.9	88.9
BoL15	35	56.4	91.4	1.53	60.0	1.43	85.7	80.0	68.6
Cp5	21	55.0	100.0	1.57	76.2	1.63	123.8	61.5	76.2
Cp16	22	57.2	100.0	1.55	63.6	1.57	100.0	63.6	63.6
Cp18	23	54.7	95.7	1.23	65.2	1.33	87.0	75.0	65.2
Cr20	29	48.4	100.0	1.31	72.4	1.29	93.1	92.6	86.2
EF19	16	54.6	100.0	1.56	75.0	1.58	118.8	68.4	81.3
Fi7	39	55.4	100.0	1.95	64.1	2.12	135.9	56.6	76.9
Fi17	30	53.7	96.7	1.76	66.7	1.85	123.3	70.3	86.7
Fi21	24	51.4	95.8	1.61	54.2	1.77	95.8	73.9	70.8
Ro14	27	54.4	88.9	1.38	70.4	1.47	103.7	53.6	55.6
Total / Av	**321**	**54.4**	**95.6**	**1.54**	**66.2**	**1.58**	**104.2**	**70.4**	**72.4**
						Av cwt 24.6kg (Av age 302 days)			

[1] Outbreak of vibriosis prior to lambing caused abortions (not included in $ or lambing % analyses)

B2.7 (cont.) Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Hamilton, Vic, autumn joining 1997 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Autumn 2000 (31mths of age)									
BL12	23	59.5	91.3	1.43	95.7	1.55	147.8	79.4	117.4
BL13	25	58.1	92.0	1.48	88.0	1.64	144.0	83.3	120.0
BoL15	35	61.3	94.3	1.61	94.3	1.55	145.7	84.3	122.9
Cp5	21	56.2	95.2	1.40	95.2	1.55	147.6	93.5	138.1
Cp16	22	57.6	100.0	1.64	100.0	1.64	163.6	86.1	140.9
Cp18	23	56.2	95.7	1.09	91.3	1.10	100.0	78.3	78.3
Cr20	28	49.7	100.0	1.18	100.0	1.18	117.9	93.9	110.7
EF19	16	56.2	100.0	1.63	93.8	1.73	162.5	84.6	137.5
Fi7	38	57.3	100.0	1.76	100.0	1.89	189.5	66.7	126.3
Fi17	28	54.3	96.4	1.67	92.9	1.73	160.7	66.7	107.1
Fi21	23	54.1	100.0	1.74	95.7	1.77	169.6	71.8	121.7
Ro14	27	58.3	96.3	1.23	96.3	1.23	118.5	84.4	100.0
Total / Av	**309**	**56.6**	**96.8**	**1.49**	**95.3**	**1.55**	**147.3**	**81.1**	**118.4**
Av cwt 22.2 kg (Av age 277 days)									
Autumn 2001 (43mths of age)									
BL12	22	66.8	90.9	1.55	90.9	1.60	145.5	84.4	122.7
BL13	23	66.2	95.7	1.41	100.0	1.43	143.5	84.8	121.7
BoL15	34	67.2	100.0	1.50	97.1	1.48	144.1	81.6	117.6
Cp5	21	62.4	100.0	1.62	100.0	1.62	161.9	85.3	138.1
Cp16	22	64.4	100.0	1.55	95.5	1.62	154.5	88.2	136.4
Cp18	22	66.3	90.9	1.30	81.8	1.39	113.6	92.0	104.5
Cr20	28	52.9	100.0	1.14	100.0	1.14	114.3	84.4	96.4
EF19	16	64.4	100.0	1.56	100.0	1.63	162.5	88.5	143.8
Fi7	38	63.6	100.0	1.82	100.0	1.92	192.1	65.8	126.3
Fi17	28	59.9	100.0	1.64	96.4	1.81	175.0	81.6	142.9
Fi21	22	58.9	100.0	1.68	100.0	1.64	163.6	75.0	122.7
Ro14	27	68.1	88.9	1.50	92.6	1.60	148.1	82.5	122.2
Total / Av	**303**	**63.4**	**97.2**	**1.52**	**96.2**	**1.57**	**151.6**	**82.8**	**124.6**
Av cwt kill 1: 16.5kg (Av age 248 days)									
Av cwt kill 2: 21.2kg (Av age 289 days)									

B2.8 Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Hamilton, Vic, autumn joining 1998 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Autumn 1999 (7mths of age) [1]									
BL12	20	37.5	80.0	1.19	85.0	1.18	100.0	75.0	75.0
BoL43	12	36.1	75.0	1.33	75.0	1.67	125.0	73.3	91.7
Cp5	16	32.6	62.5	1.20	68.8	1.27	87.5	85.7	75.0
Cr46	19	32.0	21.1	1.25	31.6	1.00	31.6	33.3	10.5
EF44	13	33.7	61.5	1.25	53.8	1.14	61.5	87.5	53.8
EF45	13	39.2	53.8	1.43	23.1	1.67	38.5	40.0	15.4
EF47	8	35.6	100.0	1.13	50.0	1.25	62.5	60.0	37.5
Fi7	10	35.0	50.0	2.00	70.0	2.00	140.0	21.4	30.0
FiF48	14	37.0	71.4	1.50	50.0	1.71	85.7	58.3	50.0
Ro49	16	35.8	43.8	1.14	50.0	1.00	50.0	75.0	37.5
Tx50	19	37.9	73.7	1.00	73.7	1.07	78.9	33.3	26.3
WS51	13	38.8	30.8	1.00	38.5	1.20	46.2	50.0	23.1
Total / Av	**173**	**35.9**	**60.3**	**1.28**	**55.8**	**1.35**	**75.6**	**57.7**	**43.8**
									Av cwt 21.5 kg (Av age 290 days)
Autumn 2000 (19mths of age)									
BL12	20	50.2	100.0	1.30	95.0	1.37	130.0	76.9	100.0
BoL43	12	47.0	100.0	1.67	91.7	2.00	183.3	59.1	108.3
Cp5	16	44.5	100.0	1.56	100.0	1.56	156.3	80.0	125.0
Cr46	17	44.7	100.0	1.06	94.1	1.13	105.9	83.3	88.2
EF44	12	46.6	100.0	1.08	100.0	1.17	116.7	78.6	91.7
EF45	13	54.0	100.0	1.62	100.0	1.69	169.2	77.3	130.8
EF47	8	50.2	100.0	1.25	100.0	1.25	125.0	80.0	100.0
Fi7	10	51.6	100.0	2.10	100.0	2.20	220.0	54.5	120.0
FiF48	14	49.9	100.0	1.57	92.9	1.69	157.1	72.7	114.3
Ro49	16	47.8	100.0	1.13	100.0	1.13	112.5	94.4	106.3
Tx50	18	54.3	88.9	1.31	83.3	1.27	105.6	89.5	94.4
WS51	12	52.9	100.0	1.42	91.7	1.45	133.3	68.8	91.7
Total / Av	**168**	**49.5**	**99.1**	**1.42**	**95.7**	**1.49**	**142.9**	**76.3**	**105.9**
									Av cwt 24.6kg (Av age 273 days)

[1] Outbreak of vibriosis prior to lambing caused abortions (not included in $ and lambing % analyses)

B2.8 (cont.) Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Hamilton, Vic, autumn joining 1998 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Autumn 2001 (31mths of age)									
BL12	20	66.2	100.0	1.70	100.0	1.95	195.0	76.9	150.0
BoL43	12	62.3	100.0	1.67	91.7	2.00	183.3	77.3	141.7
Cp5	16	56.9	100.0	1.75	93.8	1.80	168.8	85.2	143.8
Cr46	17	55.9	100.0	1.18	100.0	1.24	123.5	90.5	111.8
EF44	12	58.7	100.0	1.58	100.0	1.83	183.3	95.5	175.0
EF45	13	65.5	100.0	1.62	100.0	1.69	169.2	95.5	161.5
EF47	8	59.6	100.0	1.25	100.0	1.50	150.0	100.0	150.0
Fi7	10	59.7	100.0	1.90	100.0	2.00	200.0	70.0	140.0
FiF48	14	61.5	92.9	1.77	100.0	1.86	185.7	65.4	121.4
Ro49	16	61.6	100.0	1.38	93.8	1.33	125.0	90.0	112.5
Tx50	16	64.3	93.8	1.40	87.5	1.43	125.0	90.0	112.5
WS51	12	66.2	100.0	1.67	100.0	1.83	183.3	86.4	158.3
Total / Av	**166**	**61.5**	**98.9**	**1.57**	**97.2**	**1.71**	**166.0**	**85.2**	**139.9**
									Av cwt 19.9 kg (Av age 252 days)
Autumn 2002 (43mths of age) [2]									
BL12	20	72.2	80.0	1.50	75.0	1.53	115.0	100.0	115.0
BoL43	10	69.5	50.0	1.80	50.0	2.20	110.0	72.7	80.0
Cp5	15	65.2	86.7	1.77	86.7	1.92	166.7	84.0	140.0
Cr46	17	62.1	76.5	1.46	76.5	1.54	117.6	80.0	94.1
EF44	12	65.5	83.3	1.50	83.3	1.50	125.0	93.3	116.7
EF45	13	71.8	92.3	1.67	92.3	2.08	192.3	88.0	169.2
EF47	8	66.1	100.0	1.25	100.0	1.38	137.5	100.0	137.5
Fi7	10	66.8	90.0	1.67	90.0	2.11	190.0	57.9	110.0
FiF48	14	67.1	100.0	1.50	100.0	1.79	178.6	92.0	164.3
Ro49	16	71.8	62.5	1.30	56.3	1.67	93.8	73.3	68.8
Tx50	16	73.1	87.5	1.43	87.5	1.79	156.3	88.0	137.5
WS51	12	73.7	75.0	1.67	83.3	1.90	158.3	78.9	125.0
Total / Av	**163**	**68.7**	**82.0**	**1.54**	**81.7**	**1.78**	**145.1**	**84.0**	**121.5**
									Av cwt kill 20.4kg (Av age 302 days)

[2] Ryegrass staggers affected ewes at joining reducing conception rates (not included in $ and lambing % analyses)

B2.9 Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Hamilton, Vic, autumn joining 1999 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Autumn 2000 (7mths of age)									
BL12	30	31.0	33.3	1.00	30.0	1.00	30.0	77.8	23.3
BL61	9	31.3	33.3	1.00	44.4	1.00	44.4	75.0	33.3
BL62	13	32.1	76.9	1.40	76.9	1.30	100.0	53.8	53.8
BoL63	17	46.7	41.2	1.43	47.1	1.50	70.6	50.0	35.3
Ch66	22	29.6	40.9	1.00	50.0	1.00	50.0	45.5	22.7
Cp5	19	31.5	31.6	1.17	36.8	1.29	47.4	44.4	21.1
Cp65	26	30.8	34.6	1.11	42.3	1.18	50.0	76.9	38.5
Cr64	22	27.2	9.1	1.00	9.1	1.00	9.1	100.0	9.1
EFP68	17	32.5	52.9	1.11	58.8	1.20	70.6	50.0	35.3
EFR69	18	33.1	72.2	1.23	72.2	1.15	83.3	53.3	44.4
Fi7	21	34.8	71.4	1.47	61.9	1.23	114.3	25.0	28.6
Fi67	14	33.6	64.3	1.44	50.0	1.29	42.9	66.7	28.6
Total / Av	**228**	**32.8**	**46.8**	**1.20**	**48.3**	**1.18**	**59.4**	**59.9**	**31.2**
						Av cwt 20.5 kg (Av age 253 days)			
Autumn 2001 (19mths of age)									
BL12	30	54.4	96.7	1.34	96.7	1.41	136.7	73.2	100.0
BL61	9	52.4	100.0	1.33	100.0	1.44	144.4	61.5	88.9
BL62	13	54.3	92.3	1.50	100.0	1.38	138.5	50.0	69.2
BoL63	16	50.4	93.8	2.00	87.5	2.36	206.3	39.4	81.3
Ch66	22	53.3	95.5	1.38	100.0	1.55	154.5	52.9	81.8
Cp5	19	53.4	94.7	1.61	94.7	1.61	152.6	72.4	110.5
Cp65	25	55.6	84.0	1.57	92.0	1.52	140.0	57.1	80.0
Cr64	22	47.6	95.5	1.10	77.3	1.12	86.4	68.4	59.1
EFP68	15	55.8	93.3	1.21	93.3	1.14	106.7	68.8	73.3
EFR69	18	57.8	77.8	1.57	88.9	1.75	155.6	60.7	94.4
Fi7	20	54.3	95.0	1.68	95.0	1.68	160.0	21.9	35.0
Fi67	13	54.5	100.0	1.69	100.0	1.69	169.2	31.8	53.8
Total / Av	**222**	**53.6**	**93.2**	**1.50**	**93.8**	**1.56**	**145.9**	**54.8**	**77.3**
						Av cwt 22.4kg (Av age 306 days)			

B2.9 (cont.) Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Hamilton, Vic, autumn joining 1999 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Autumn 2002 (43mths of age) [1]									
BL12	30	59.0	53.3	1.56	53.3	1.63	86.7	84.6	73.3
BL61	9	57.1	88.9	1.38	88.9	1.38	122.2	90.9	111.1
BL62	13	60.4	76.9	1.80	69.2	2.11	146.2	63.2	92.3
BoL63	16	55.5	93.8	1.67	81.3	2.08	168.8	59.3	100.0
Ch66	22	58.8	86.4	1.58	86.4	1.47	127.3	78.6	100.0
Cp5	19	58.3	89.5	1.59	89.5	1.76	157.9	76.7	121.1
Cp65	23	60.3	65.2	1.53	65.2	1.73	113.0	80.8	91.3
Cr64	22	52.0	54.5	1.42	50.0	1.55	77.3	58.8	45.5
EFP68	15	59.0	93.3	1.71	86.7	1.92	166.7	52.0	86.7
EFR69	17	62.8	70.6	1.75	70.6	2.42	170.6	62.1	105.9
Fi7	20	60.3	80.0	1.69	75.0	1.87	140.0	42.9	60.0
Fi67	13	60.2	92.3	1.67	84.6	1.64	138.5	27.8	38.5
Total / Av	**219**	**58.6**	**78.7**	**1.61**	**75.1**	**1.80**	**134.6**	**64.8**	**85.5**
									Av cwt 18.7kg (Av age 293 days)

[1] Ryegrass staggers affected ewes at joining reducing conception rates (not included in $ and lambing % analyses)

B2.10 Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Rutherglen, Vic, spring joining 1998 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Spring 1999 (17 mths of age)									
BL24	22	51.6	77.3	1.12	72.7	1.00	72.7	75.0	54.5
BL25	21	52.8	61.9	1.23	61.9	1.08	66.7	92.9	61.9
BL32	14	55.7	92.9	1.15	92.9	1.15	107.1	86.7	92.9
Cp5	20	52.3	95.0	1.32	90.0	1.33	120.0	79.2	95.0
Cp26	24	52.0	91.7	1.27	95.8	1.17	112.5	88.9	100.0
Cr27	15	47.4	73.3	1.18	73.3	1.09	80.0	83.3	66.7
EF28	17	59.9	70.6	1.33	70.6	1.33	94.1	93.8	88.2
Fi7	31	51.1	83.9	1.77	83.9	1.81	151.6	70.2	106.5
Fi22	20	47.4	100.0	1.70	100.0	1.75	175.0	65.7	115.0
Fi23	17	47.6	100.0	1.59	94.1	1.63	152.9	76.9	117.6
Hy29	26	45.6	92.3	1.25	92.3	1.21	111.5	96.6	107.7
Hy30	30	46.4	83.3	1.40	83.3	1.28	106.7	96.9	103.3
PD31	27	54.5	85.2	1.30	88.9	1.21	107.4	82.8	88.9
WS33	26	56.3	84.6	1.32	88.5	1.30	115.4	90.0	103.8
Total / Av	**310**	**51.5**	**85.1**	**1.35**	**84.9**	**1.31**	**112.4**	**84.2**	**93.0**
							Av cwt 22.6 kg (Av age 188 days)		
Spring 2000 (29 mths of age)									
BL24	20	63.7	95.0	1.16	95.0	1.16	110.0	86.4	95.0
BL25	20	62.6	90.0	1.44	90.0	1.44	130.0	84.6	110.0
BL32	11	60.6	90.9	1.60	90.9	1.50	136.4	86.7	118.2
Cp5	18	58.3	94.4	1.53	94.4	1.47	138.9	80.0	111.1
Cp26	23	57.2	100.0	1.35	100.0	1.35	134.8	87.1	117.4
Cr27	15	55.1	80.0	1.17	73.3	1.18	86.7	100.0	86.7
EF28	17	66.6	88.2	1.27	88.2	1.40	123.5	81.0	100.0
Fi7	31	56.2	96.8	1.67	96.8	1.80	174.2	70.4	122.6
Fi22	18	53.6	88.9	1.75	88.9	1.63	144.4	76.9	111.1
Fi23	17	55.1	100.0	1.88	100.0	1.82	182.4	87.1	158.8
Hy29	26	51.8	96.2	1.16	96.2	1.16	111.5	93.1	103.8
Hy30	28	52.1	96.4	1.30	100.0	1.29	128.6	94.4	121.4
PD31	26	63.5	96.2	1.60	96.2	1.60	153.8	92.5	142.3
WS33	26	63.1	92.3	1.21	84.6	1.23	103.8	92.6	96.2
Total / Av	**296**	**58.5**	**93.2**	**1.43**	**92.5**	**1.43**	**132.8**	**86.6**	**113.9**
							Av cwt 21.5kg (Av age 210 days)		

B2.10 (cont.) Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Rutherglen, Vic, spring joining 1998 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Spring 2001 (41 mths of age)									
BL24	20	67.7	95.0	1.58	95.0	1.58	150.0	90.0	135.0
BL25	20	67.3	90.0	1.67	85.0	1.76	150.0	90.0	135.0
BL32	9	68.6	77.8	1.71	77.8	1.71	133.3	91.7	122.2
Cp5	18	62.7	94.4	1.76	94.4	1.82	172.2	90.3	155.6
Cp26	23	62.3	95.7	1.91	91.3	1.86	169.6	89.7	152.2
Cr27	15	60.2	93.3	1.50	93.3	1.43	133.3	100.0	133.3
EF28	16	72.0	87.5	1.64	87.5	1.64	143.8	100.0	143.8
Fi7	31	63.3	90.3	1.89	90.3	1.96	177.4	76.4	135.5
Fi22	17	58.8	100.0	1.88	100.0	1.76	176.5	80.0	141.2
Fi23	17	60.5	100.0	2.06	100.0	2.12	211.8	91.7	194.1
Hy29	25	58.0	96.0	1.63	96.0	1.63	156.0	82.1	128.0
Hy30	28	57.9	100.0	1.50	96.4	1.56	150.0	81.0	121.4
PD31	26	67.7	96.2	1.76	96.2	1.92	184.6	83.3	153.8
WS33	24	69.6	100.0	1.83	100.0	1.83	183.3	90.9	166.7
Total / Av	**289**	**64.0**	**94.0**	**1.74**	**93.1**	**1.76**	**163.7**	**88.4**	**144.1**
						Av cwt kill 1: 21.2kg (Av age 204 days)			
						Av cwt kill 2: 20.3kg (Av age 211 days)			

B2.11 Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Rutherglen, Vic, spring joining 1999 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Spring 2000 (17 mths of age)									
BL12	16	57.3	81.3	1.31	81.3	1.31	106.3	88.2	93.8
BL70	23	56.6	78.3	1.06	78.3	1.06	82.6	84.2	69.6
BL71	21	55.1	66.7	1.21	71.4	1.27	90.5	84.2	76.2
Cp5	29	52.7	72.4	1.10	69.0	1.10	75.9	90.9	69.0
Cp74	15	51.4	60.0	1.11	60.0	1.11	66.7	70.0	46.7
EF77	17	54.3	64.7	1.00	64.7	1.00	64.7	90.9	58.8
EL73	23	50.8	30.4	1.29	26.1	1.33	34.8	100.0	34.8
Fi7	25	53.1	76.0	1.89	72.0	1.94	140.0	68.6	96.0
FiF76	32	53.0	50.0	1.38	53.1	1.41	75.0	79.2	59.4
Hy75	22	50.3	90.9	1.25	86.4	1.26	109.1	95.8	104.5
M72	13	52.3	53.8	1.00	76.9	1.00	76.9	90.0	69.2
PD79	14	58.3	100.0	1.29	92.9	1.31	121.4	76.5	92.9
SHD78	19	56.9	73.7	1.07	68.4	1.08	73.7	78.6	57.9
WS80	16	56.1	56.3	1.00	62.5	1.00	62.5	100.0	62.5
Total / Av	**285**	**54.2**	**68.2**	**1.21**	**68.8**	**1.23**	**84.3**	**85.5**	**70.8**
Av cwt 21.1kg (Av age 204 days)									
Spring 2001 (29 mths of age)									
BL12	16	63.8	100.0	1.75	100.0	1.63	162.5	84.6	137.5
BL70	23	62.7	82.6	1.58	82.6	1.63	134.8	77.4	104.3
BL71	21	62.1	90.5	1.47	85.7	1.50	128.6	96.3	123.8
Cp5	29	58.9	89.7	1.38	86.2	1.32	113.8	87.9	100.0
Cp74	15	59.4	86.7	1.46	86.7	1.54	133.3	85.0	113.3
EF77	16	59.6	93.8	1.27	93.8	1.40	131.3	90.5	118.8
EL73	23	59.4	43.5	1.20	30.4	1.00	30.4	42.9	13.0
Fi7	24	60.5	91.7	2.14	91.7	2.05	187.5	68.9	129.2
FiF76	32	57.1	87.5	1.61	90.6	1.55	140.6	84.4	118.8
Hy75	22	53.6	100.0	1.50	100.0	1.50	150.0	84.8	127.3
M72	13	58.1	92.3	1.50	84.6	1.55	130.8	70.6	92.3
PD79	13	61.7	100.0	1.38	92.3	1.25	115.4	66.7	76.9
SHD78	18	63.6	94.4	1.29	94.4	1.12	105.6	89.5	94.4
WS80	16	62.0	93.8	1.47	68.8	1.45	100.0	50.0	50.0
Total / Av	**281**	**60.2**	**89.0**	**1.50**	**84.8**	**1.46**	**126.0**	**77.1**	**100.0**
Av cwt kill 1: 21.3kg (Av age 195days) Av cwt kill 2: 19.6kg (Av age 202 days)									

B2.11 (cont.) Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Rutherglen, Vic, spring joining 1999 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Spring 2002 (41 mths of age)									
BL12	14	78.8	100.0	1.71	100.0	1.71	171.4	83.3	142.9
BL70	23	75.7	87.0	1.60	87.0	1.60	139.1	90.6	126.1
BL71	21	72.3	95.2	1.60	95.2	1.50	142.9	90.0	128.6
Cp5	29	71.9	96.6	1.54	93.1	1.48	137.9	97.5	134.5
Cp74	15	69.6	93.3	1.50	93.3	1.50	140.0	90.5	126.7
EF77	15	71.0	86.7	1.38	86.7	1.38	120.0	88.9	106.7
EL73	23	71.9	39.1	1.11	39.1	1.11	43.5	70.0	30.4
Fi7	24	68.9	91.7	1.91	91.7	1.86	170.8	73.2	125.0
FiF76	31	69.3	90.3	1.61	90.3	1.61	145.2	95.6	138.7
Hy75	22	65.5	100.0	1.68	95.5	1.71	163.6	88.9	145.5
M72	13	71.5	84.6	1.91	84.6	1.82	153.8	90.0	138.5
PD79	13	77.3	92.3	1.58	84.6	1.64	138.5	55.6	76.9
SHD78	18	77.9	94.4	1.41	94.4	1.41	133.3	83.3	111.1
WS80	15	75.3	100.0	1.47	100.0	1.47	146.7	90.9	133.3
Total / Av	**276**	**72.6**	**89.4**	**1.57**	**88.3**	**1.56**	**139.1**	**84.9**	**118.9**
						Av cwt kill 23.1kg (Av age 178 days)			

B2.12 Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Rutherglen, Vic, spring joining 2000 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Spring 2001 (17 mths of age)									
BL12	22	57.0	86.4	1.32	86.4	1.26	109.1	91.7	100.0
BL81	24	60.5	87.5	1.19	87.5	1.14	100.0	91.7	91.7
BL82	12	55.4	83.3	1.20	83.3	1.10	91.7	90.9	83.3
BL83	18	58.7	83.3	1.40	83.3	1.33	111.1	95.0	105.6
Cp5	17	54.0	82.4	1.29	82.4	1.29	105.9	94.4	100.0
Cp85	19	60.9	89.5	1.18	89.5	1.18	105.3	100.0	105.3
EFP89	19	55.9	63.2	1.17	63.2	1.17	73.7	92.9	68.4
Fi7	34	54.0	85.3	1.69	82.4	1.75	144.1	77.6	111.8
Fi88	26	53.4	88.5	1.61	88.5	1.70	150.0	87.2	130.8
Gr86	25	55.4	88.0	1.18	88.0	1.18	104.0	96.2	100.0
Hy87	23	55.3	100.0	1.35	100.0	1.26	126.1	89.7	113.0
SAM84	16	56.1	100.0	1.38	100.0	1.31	131.3	95.2	125.0
WD91	16	54.7	87.5	1.36	87.5	1.14	100.0	87.5	87.5
WS90	14	59.2	100.0	1.29	100.0	1.21	121.4	100.0	121.4
Total / Av	**285**	**56.5**	**87.5**	**1.33**	**87.3**	**1.29**	**112.4**	**92.1**	**103.1**
		Av cwt kill 1: 21.9kg (Av age 198days)				**Av cwt kill 2: 20.3kg (Av age 205 days)**			
Spring 2002 (29 mths of age)									
BL12	22	67.1	86.4	1.68	81.8	1.56	127.3	89.3	113.6
BL81	24	68.6	79.2	1.47	79.2	1.47	116.7	92.9	108.3
BL82	12	68.1	100.0	1.33	100.0	1.25	125.0	100.0	125.0
BL83	18	66.0	83.3	1.47	83.3	1.40	116.7	90.5	105.6
Cp5	17	62.4	76.5	1.46	76.5	1.54	117.6	90.0	105.9
Cp85	19	70.3	89.5	1.35	89.5	1.35	121.1	95.7	115.8
EFP89	19	66.3	63.2	1.33	68.4	1.38	94.7	94.4	89.5
Fi7	34	64.7	85.3	2.07	82.4	2.04	167.6	77.2	129.4
Fi88	25	63.8	92.0	1.78	92.0	1.91	176.0	77.3	136.0
Gr86	24	63.1	100.0	1.29	100.0	1.21	120.8	86.2	104.2
Hy87	22	64.5	100.0	1.55	100.0	1.50	150.0	75.8	113.6
SAM84	16	67.4	100.0	1.75	100.0	1.50	150.0	87.5	131.3
WD91	16	66.1	100.0	1.44	93.8	1.47	137.5	86.4	118.8
WS90	14	69.3	100.0	1.43	100.0	1.43	142.9	85.0	121.4
Total / Av	**282**	**66.3**	**89.7**	**1.53**	**89.1**	**1.50**	**133.1**	**87.7**	**115.6**
						Av cwt kill 23.6kg (Av age 180 days)			

B2.12 (cont.) Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Rutherglen, Vic, spring joining 2000 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Spring 2003 (41 mths of age)									
BL12	19	76.3	94.7	2.00	94.7	2.06	194.7	89.2	173.7
BL81	24	78.3	91.7	1.77	87.5	1.76	154.2	86.5	133.3
BL82	12	73.5	100.0	1.67	100.0	1.58	158.3	94.7	150.0
BL83	18	75.6	88.9	1.94	88.9	1.69	150.0	92.6	138.9
Cp5	17	71.5	88.2	1.87	88.2	1.67	147.1	96.0	141.2
Cp85	19	77.8	100.0	1.95	100.0	1.95	194.7	89.2	173.7
EFP89	17	73.5	88.2	1.67	88.2	1.53	135.3	95.7	129.4
Fi7	31	69.8	100.0	2.16	100.0	1.97	196.8	82.0	161.3
Fi88	22	68.7	95.5	2.29	90.9	2.05	186.4	73.2	136.4
Gr86	24	69.6	91.7	1.45	91.7	1.36	125.0	93.3	116.7
Hy87	22	72.3	95.5	1.95	95.5	2.00	190.9	88.1	168.2
SAM84	16	72.9	100.0	1.81	100.0	1.88	187.5	90.0	168.8
WD91	15	73.8	100.0	2.00	100.0	1.87	186.7	96.4	180.0
WS90	14	74.8	92.9	1.77	92.9	1.69	157.1	86.4	135.7
Total / Av	**270**	**73.5**	**94.8**	**1.88**	**94.2**	**1.79**	**168.9**	**89.5**	**150.5**
						Av cwt kill 20.7 kg (Av age 220 days)			

APPENDIX C1 – MEDIA CLIPPINGS

B2.12 (cont.) Lambing performance of 1stX ewes and average carcase weight of 2ndX lambs – Rutherglen, Vic, spring joining 2000 cohort 1stX ewes.

Year of mating & Sire	Ewes Joined (n)	Ewe Livewt (kg)	Scan preg (%)	Foetus /preg ewe (n)	Ewes lambed (%)	Lambs born/ ewes lamb (n)	Lambs born/ ewe join (%)	Lamb survival (%)	Lambs wean /ewe join (%)
Spring 2003 (41 mths of age)									
BL12	19	76.3	94.7	2.00	94.7	2.06	194.7	89.2	173.7
BL81	24	78.3	91.7	1.77	87.5	1.76	154.2	86.5	133.3
BL82	12	73.5	100.0	1.67	100.0	1.58	158.3	94.7	150.0
BL83	18	75.6	88.9	1.94	88.9	1.69	150.0	92.6	138.9
Cp5	17	71.5	88.2	1.87	88.2	1.67	147.1	96.0	141.2
Cp85	19	77.8	100.0	1.95	100.0	1.95	194.7	89.2	173.7
EFP89	17	73.5	88.2	1.67	88.2	1.53	135.3	95.7	129.4
Fi7	31	69.8	100.0	2.16	100.0	1.97	196.8	82.0	161.3
Fi88	22	68.7	95.5	2.29	90.9	2.05	186.4	73.2	136.4
Gr86	24	69.6	91.7	1.45	91.7	1.36	125.0	93.3	116.7
Hy87	22	72.3	95.5	1.95	95.5	2.00	190.9	88.1	168.2
SAM84	16	72.9	100.0	1.81	100.0	1.88	187.5	90.0	168.8
WD91	15	73.8	100.0	2.00	100.0	1.87	186.7	96.4	180.0
WS90	14	74.8	92.9	1.77	92.9	1.69	157.1	86.4	135.7
Total / Av	**270**	**73.5**	**94.8**	**1.88**	**94.2**	**1.79**	**168.9**	**89.5**	**150.5**

Av cwt kill 20.7 kg (Av age 220 days)

Crossbred ewes make for better offspring

An extra four million heavy slaughter lambs per year are likely to be required by 2010. This means considerably more ewes need to be mated to meat sires, higher lamb turn-off rates achieved and lambs finished to heavier weights, at a time when the national ewe flock continues to decline. This article discusses the scope for improved lamb productivity and profitability.

by **Neal Fogarty,**
NSW AGRICULTURE

The right crossbred ewe flock can make a significant difference to returns from a lamb enterprise — as much as $50 per ewe per year.

The national Maternal Sire Central Progeny Test (MCPT) has clearly demonstrated the importance of selecting the best ewes for a lamb enterprise.

This means ensuring crossbred ewes are of high genetic merit and that they are by sires selected for the traits that contribute most to the profit of the enterprise.

Recent results from the MCPT show the sire of the crossbred (first-cross) ewe has a strong effect on the lambing rate of the crossbred ewes; growth of their second-cross lambs; carcass merit of their second-cross lambs; the proportion of second-cross lambs meeting carcass specifications; and in wool returns and worm resistance.

This adds up to differences in returns and gross margins of $50/ewe/year.

Figure 1 shows the results for three lambings at Cowra, New South Wales, from groups of first-cross ewes by 12 different sires out of the same Merino ewes (see Table 1, page 60 for the sire codes).

The sires of the first-cross ewes are sourced from several breeds and there is considerable variation between sires within breeds.

The top groups of ewes all had a high percentage of lambs with good survival that grew rapidly to heavy weights at slaughter.

There also were large differences in the proportion of carcasses that met the specifications to achieve the highest price.

First-cross lambing rates

Lambing rate varied considerably between the first-cross ewe groups, ranging from 82–133 per cent of lambs weaned.

Figure 2 shows the average lambing percentage (lambs born and weaned over three years) for the 12 groups of first-cross ewes.

The ewes were joined to Poll Dorset rams during February to lamb during July with their first joining at seven months of age.

There were large differences between the sire groups within breeds.

For example, some groups had more than 180% of lambs born with large differences in their survival.

The relative lambing rates for the first-cross ewe groups were reasonably consistent over the three years.

Joining season

The season of joining and lambing can have a strong influence on lambing performance from crossbred ewes with different genetics.

Ewes joined during spring or outside the normal breeding season will generally have a

The sire of the first-cross ewe affects production and gross margins dramatically ($50 per ewe per year).

What is the MCPT?

The national Maternal Sire Central Progeny Test (MCPT) is testing 91 maternal sires that have been mated by artificial insemination to Merino ewes.

The seven-year project, being carried out at three sites (Cowra, New South Wales, Hamilton, Victoria and Struan, South Australia), uses sires entered by seedstock breeders from several breeds, including Border Leicester, East Friesian, White Suffolk, Finnsheep, Coopworth and Corriedale. Common link sires have been mated at each site in each year so all 91 sires can be compared.

The project evaluates the performance of crossbred ewes by the different sires.

The first phase is complete and covered growth and carcass performance of the first-cross wether progeny.

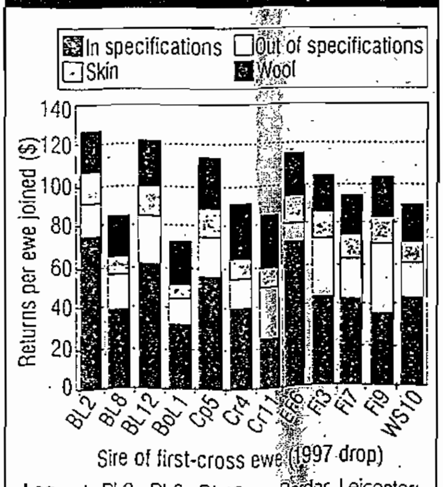
The second phase involves growing out and mating the first-cross ewe progeny for second-cross lamb production. The first-cross ewes are mated to high estimated breeding value terminal sires and will be completed for all groups during 2004.

The lambing rate and wool production of the first-cross ewes and the growth and carcass performance of the second-cross lambs are being evaluated.

More than 3000 first-cross wethers have been slaughtered and 3000 first-cross ewes (20–30 per sire) are being evaluated with their second-cross lambs slaughtered.

More information and results are available at www.mla.com.au/lambplan/mcpt/.

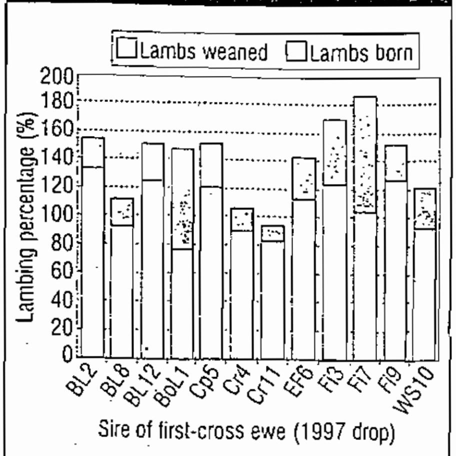
FIGURE 1 First-cross ewe returns



Legend: BL2, BL8, BL12 = Border Leicester; BoL1 = Booroola Leicester; Cp5 = Coopworth; Cr4, Cr11 = Corriedale; EF6 = East Friesian; Fi3, Fi7, Fi9 = Finnsheep; WS10 = White Suffolk.

Source: NSW Agriculture

FIGURE 2 Autumn-joined lambing



Legend: BL2, BL8, BL12 = Border Leicester; BoL1 = Booroola Leicester; Cp5 = Coopworth; Cr4, Cr11 = Corriedale; EF6 = East Friesian; Fi3, Fi7, Fi9 = Finnsheep; WS10 = White Suffolk.

Source: NSW Agriculture

Wagga Wagga paper ~ 1/12/04

Geoff Casburn
Sheep Livestock Officer
NSW Department of Primary Industries

Good mums make a big difference!

More than half of a lambs performance at weaning is a direct result of its mother!

A good 1st cross mum is one that not only supplies superior genes for lamb growth but just as importantly will produce more milk, be more caring and wean more lambs.

To select a ramthat will produce such a mumwill take more than just a visual inspection.

Maternal Estimated Breeding Values (EBVs) are calculated to help you select rams that will produce good mums,whichthen inturn produce good lambs.

Maternal EBVs include direct values for the first generation of lambs born such as growth, fat and eye muscle depth.

Half of these valuesare then passed onto the next generation.

A ram with an EBV of +5 for growth will produce progeny which are +2.5 kg heavier than the average.

They also provide values for how well the first generation will perform as mothers, for example, the EBV for 'number of lambs weaned' (NLW) calculates how many more lambs will be weaned.

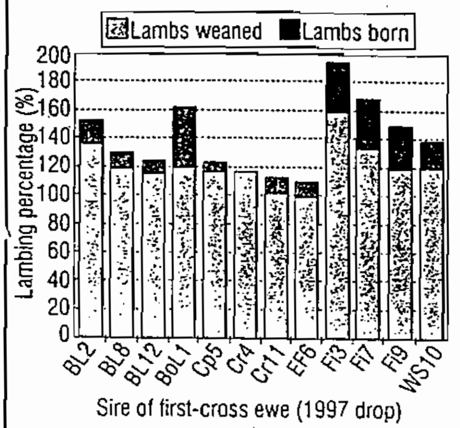
A ram with an EBV of 0.2 for NLW, will produce daughters who on average will wean 10% more lambs than the average(half the value of the ram).

There is also anEBV for 'maternal weaning weight' (MWWT) which calculates how much heavier 2nd generation lambs will be at weaning due to their mothers ability to produce milk and care for them.

A ram with an EBV of +5 for MWWT will produce ewes that rear lambs which are +2.5 kg heavier than average at weaning.

Whether you breed your own or you buy first cross ewes it pays to ensure the maternal sires have been selected according to their ability to produce good mums who inturn will produce good lambs!

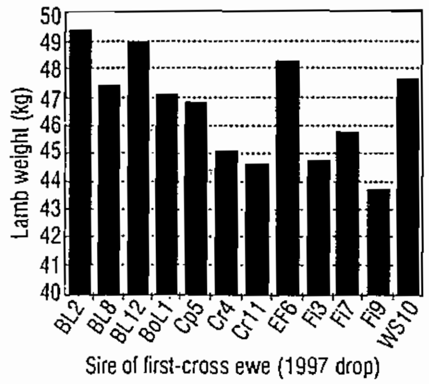
FIGURE 3 Spring-joined lambing



Legend: BL2, BL8, BL12 = Border Leicester; BoL1 = Booroola Leicester; Cp5 = Coopworth; Cr4, Cr11 = Corriedale; EF6 = East Friesian; Fi3, Fi7, Fi9 = Finnsheep; WS10 = White Suffolk.

Source: NSW Agriculture

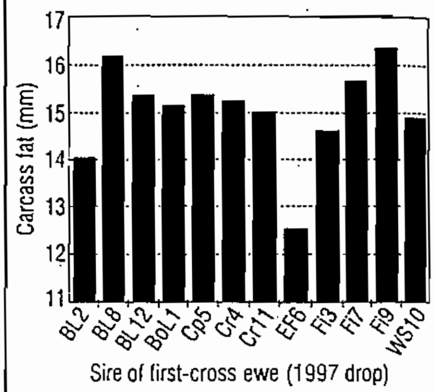
FIGURE 4 Second-cross lamb growth



Legend: BL2, BL8, BL12 = Border Leicester; BoL1 = Booroola Leicester; Cp5 = Coopworth; Cr4, Cr11 = Corriedale; EF6 = East Friesian; Fi3, Fi7, Fi9 = Finnsheep; WS10 = White Suffolk.

Source: NSW Agriculture

FIGURE 5 Carcass fat



Carcass fat (GR) of second-cross lambs.

Legend: BL2, BL8, BL12 = Border Leicester; BoL1 = Booroola Leicester; Cp5 = Coopworth; Cr4, Cr11 = Corriedale; EF6 = East Friesian; Fi3, Fi7, Fi9 = Finnsheep; WS10 = White Suffolk.

Source: NSW Agriculture

lower ovulation rate, resulting in fewer multiple births than the same ewes joined during autumn (peak breeding season).

Fewer ewes might be cycling and conceive during spring and this is also affected by the genetics for length of breeding season.

The lambing season also can affect lamb survival.

The combined results of these factors are shown by comparing the performance of half-sisters in Figure 2 on page 59 (autumn joining) and Figure 3 (spring joining).

Some ewe groups had a high proportion of multiple births (triplets and quadruplets) when joined during autumn, which had poor lamb survival in July–August.

When these ewe types were joined during s...ng they had fewer higher order multiple b...ns and better lamb survival at lambing during March–April, with a relatively better lamb weaning rate.

Growth of second-cross lambs

There were differences of up to six kilograms in liveweight of the second-cross lambs before slaughter (see Figure 4), due to the sire of the dam alone (after accounting for age and birth or rearing type).

This was due to both the genes for growth passed onto the lamb and the milk production and maternal environment provided by the ewe.

Carcass characteristics

There was a large range in fat levels (see Figure 5), muscling, conformation and dressing percentage between the second-cross lambs from the various first-cross ewe groups.

This can have a dramatic impact on the success in meeting particular market specifications.

The range of four-millimetre fat shown (at the same carcass weight) represents almost a full fat score due to different first-cross ewes alone, with variation between sires within breeds.

Implications

Careful selection of the sire mated to Merino ewes can pay handsome dividends.

The correct sire can produce heavier first-cross slaughter lambs that better match market specifications and earn higher prices.

The right sire also can result in more productive and valuable first-cross ewe progeny for breeding.

Crossbred ewe enterprises can earn improved profits by ensuring the first-cross ewes have the right genetics for the chosen production system and enterprise. This means the genetics for high lambing rate (in a specific lambing season), maternal traits (mothering, milking, growth and carcass) and wool.

Developing an alliance or contract mating with a high-performing Merino flock is one way to control the genetics of the first-cross ewes and regularly source the best genetics for the enterprise.

Acknowledgements: The MCPT is run at Cowra by NSW Agriculture; at Hamilton and Rutherglen by Department of Primary Industries (Victoria); and at Struan by South Australian Research and Development Institute, with support from Meat and Livestock Australia and Australian Sheep Industry Co-operative Research Centre.

TABLE 1 Maternal sires (as shown in Figures 1–5)

Sire code	Breed	Stud	Entrant	Phone
BL2	Border Leicester	Johnos	NW and JI Johnson	(08) 8756 6053
BL8	Border Leicester	Inverbrackie	C and L Arney	(08) 8536 0031
BL12	Border Leicester	Kelso	GB Starritt and Son	(03) 5829 0144
BoL1	Booroola Leicester	Struan	PIRSA	(08) 8762 9100
Cp5	Coopworth	Oaklea	D and I Paglar	(08) 8738 9291
Cr4	Corriedale	Maluka	P Secker	(02) 4848 1244
Cr11	Corriedale	Coora	Coora Partnership	(02) 4848 1244
EF6	East Friesian	Silverstream	A Baillieu	(03) 5597 6598
Fi3	Finnsheep	Yamba	M and L Burns	(03) 5798 1583
Fi7	Finnsheep	Warrayure	G and M Wake	(03) 5574 1254
Fi9	Finnsheep	Warrayure	Knight and Butcher	(03) 5578 7250
WS10	White Suffolk	Leachim	Australian White Suffolk Association	(08) 8865 2085

Source: NSW Agriculture.

About the author

Dr Neal Fogarty is principal research scientist with NSW Agriculture and the Australian Sheep Industry CRC, based at Orange, NSW.

Email: neal.fogarty@agric.nsw.gov.au
Phone: (02) 6391 3813; fax: (02) 6391 3922.

In spite of the drought these hardy Texels thrived on zilch rations. Finn X Merinos also exhibited resilience at 'Hillside". Andy Roberts, Cootumundra, NSW.

Dr Neal Fogarty and Robin Hilson. A practical, academic conversation accounted for a morning in no time. Realistic scientists with 'insight' are so vital to both countries developing sheep industries. Orange Agricultural Institute, NSW.

OBSERVATIONS OF NSW AND VICTORIA - JULY 2004

- The continuing dry is serious. Possible drought is the No. 1 issue. Water storage levels in Victoria and New South Wales are 25% of capacity. Only in west and south Victoria are dams full. All farmers agreed the 'past' drought was the worst that they had experienced.
- The MCPT publication 'Dynamic Dams' suggested farmers should establish contracts with Merino farmers to secure supply of prime-lamb dams and contractually supply lambs to processors.

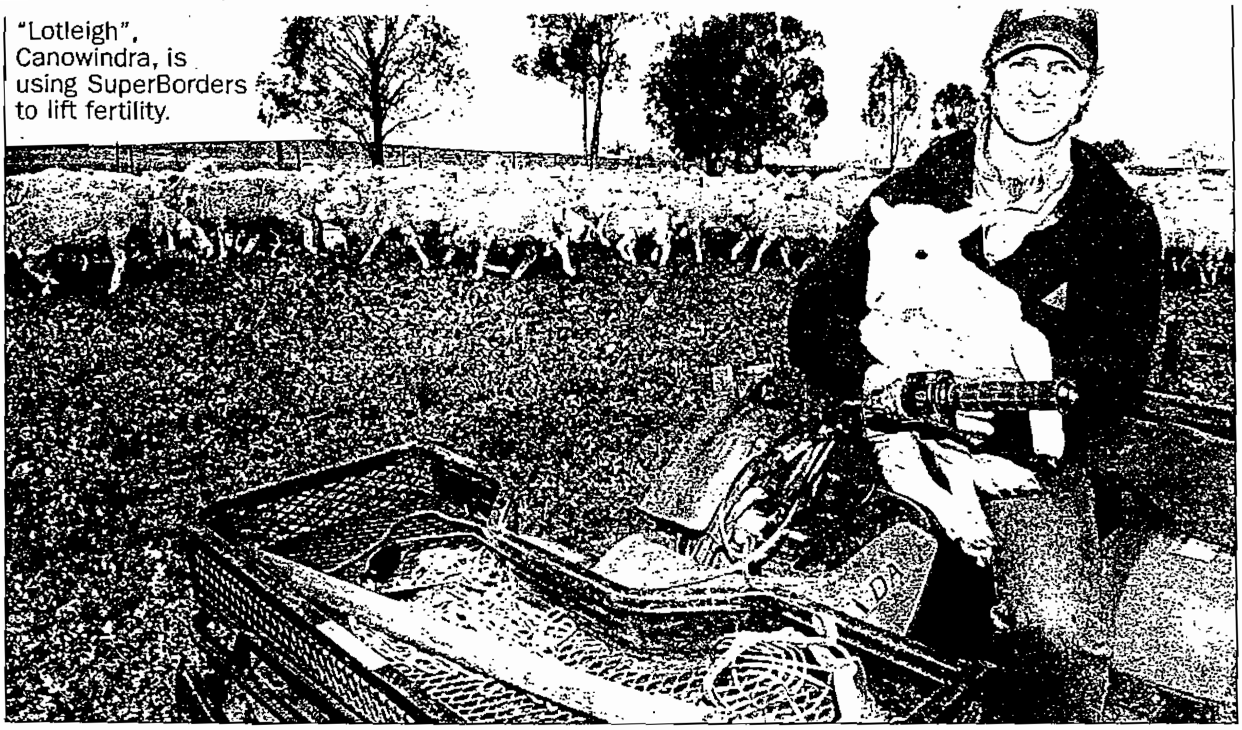
  All contracts failed as the drought worsened. Processors still buy their stock from saleyards at the cheapest possible price.

  Supply and breeding contracts are needed.
- Re-greening Australia. State governments assist planting. Waterways are fenced off, banks cultivated then drilled with Acacia, Eucalyptus and Australian plant seeds. Individual plants are often dug directly into the ground. Thousands of kilometres of planting is appreciated by everybody. Enclosures maybe grazed lightly. Waterways are protected for the first time ever.
- Australia now has 'Rural Compensation Solicitors'. These lawyers specialize in getting money for rural people involved in accidents. *What next?*
- New South Wales and Victorian farmers are moving to cross breeding. Crossbreeding has been 'preached' in Australia by OSRS (since 1987). Large numbers of Finn, Texel, Australian Whiteface composites will be farmed soon. *Excellent*
- Many of farmers asked after Ra; few asked after Robin.
- Australians are great drivers. Speed limits throughout Australia vary markedly and actually make driving tough for outsiders.
- Sheep numbers are at the lowest level in decades, just 44.5 million ewes, 40m breeding Merinos and 4.5m first-cross ewes. *Unverified figures*
- Dubbo sale (9 July) price for a lamb, ten months old, was about A$150 per head. In Bendigo one TMG contact, Mark Chambers, sold Texel X Finn lambs for just under A$200 per head.

  Sheepmeat has moved up the menu with lamb rack selling for A$40 per kg in Sydney.

  Farmers feel very confident about sheepmeat prospects.
- The Maternal Sire Central Progeny Test (MCPT) is coming to a close. A large-scale analysis will collate results. Ram gene pools have been quite small and some of the rams were not representative (a personal opinion). Some results have been distorted by poor management. In Hamilton stock died unnecessarily in a storm because no one was around on Saturday or Sunday.

  The progeny trial has been very interesting. It is important to keep the momentum for change going.



"Lotleigh", Canowindra, is using SuperBorders to lift fertility.

No looking back for SuperBorder mix

By LIZ BULL

THREE years ago Canowindra mixed farmers Scott and Anne Hickman, "Lotleigh", changed from using Border Leicester sires to SuperBorder rams in the their first-cross lamb enterprise.

Now they can't work out why people wouldn't use them – given the information that is available.

"The $indexes and Lambplan figures which are supplied with the rams are invaluable," Mr Hickman said.

The Hickmans run a mixed farming enterprise on 750 hectares east of Canowindra, with 300ha of crop – wheat, canola, and lupins – 50 head of Angus and Limousin cattle, and their first-cross lamb operation.

Each February Mr Hickman joins 1000 Merino ewes to SuperBorder rams, and another 600 Merino ewes to Prime SAMMs, for a July/August lambing.

This year, after a tough season and difficult joining, Mr Hickman is hoping for between 90 and 100 per cent lambing.

The ewe portion of his Merino/SuperBorder lambs are sold out of the paddock at 10 to 12 months of age to his brother, Angus, "Talinga", Woodstock, and incorporated into his 3000-ewe second-cross lamb enterprise.

"That's one thing about the Merino/SuperBorder ewe, it's exceptionally fertile," Mr Hickman said.

"We kept our first cross ewe lambs about two years ago and joined them, and had 140 per cent lambing, and they are very good mothers, so they kept a huge proportion of them to weaning," he said.

Last year, because the seasonal conditions meant his brother couldn't handle the additional numbers, Mr Hickman sold his ewe lambs off-shears, out of the paddock for $110 a head.

The wether portion of the first-cross lambs is sold at seven to eight months of age, weighing between 48 and 50 kilograms (live), direct to the abattoir, Southern Meats at Harden.

Mr Hickman said if their feed reserve could handle it, he kept some of the wethers for another two months and sold them for the export market at 55 to 60kg (live).

"We prefer to sell the lambs over the hooks, rather than through the saleyards, because we cop discounts in the saleyards when first-cross lambs are sold alongside second cross lambs."

Mr Hickman said one of the most pleasing aspects of the change from Border Leicester to SuperBorder was the figures supplied with the rams.

"We aim to buy a ram with high fertility, number of lambs weaned, good birth weight and high twinning figures – all of which are supplied with SuperBorders."

Mr Hickman said the rams had brought the lambs back to a four-score fat measurement when they were finished, rather than the five score and above he was getting with some of his Border Leicester rams.

Buying good quality Merino ewes is another factor which Mr Hickman believes is a strong contributor to the success of his operation, sourcing "a good framed western Merino ewe" from the Riverina area.

"Sourcing those good Merino ewes is going to be the hardest thing we have to face in the meat industry in the next couple of years – you can't have a meat industry without a Merino industry to get those good first-cross ewes," he said.

However, Mr Hickman isn't going to be paying ridiculous money for those good Merino ewes in the coming years.

"You have to put a dollar figure on your lamb operation and be sensible about buying ewes.

"I'm not going to go and pay $140 a head for Merino ewes because I can't afford it, and I can't get the returns – you have to be realistic about what you can make money out of."

Mr Hickman hoped people buying first-cross ewes would appreciate the additional figure information that came with buying a ewe with SuperBorder genetics.

He said he had confidence in the lamb industry and hoped as Australia pulled out of the drought it could sustain markets.

"My only concern with Australia being in drought is suppling our markets and the risk of other countries coming in and pinching them."

Prime Lamb Annual

Harnessing genes for higher weaning rates

FIRST-CROSS lamb breeders are being sought to become "guinea pigs" in a new commercial evaluation of a high fecundity strain of Border Leicesters.

The new strain, bearing the registered name BL Infused, is thought to have the capacity to lift weaning rates in first-cross joinings by between 20 and 30 per cent.

And at present prices of lambs, and of the ewes required to produce them, that adds up to real potential for a bottom-line earnings boost.

The BL Infused project is a joint venture involving Victorian Border Leicester stud breeders, Ian and Bruce Starritt, and Professor Euan Roberts from the University of NSW.

It has its origins in a research project conducted by CSIRO at Chiswick in the early 1990s with funding from the then Australian Meat Research Committee.

The goals of the project were to explore the potential for infusing the high-fecundity Booroola Merino gene into Border Leicesters to lift the Merino cross lambing percentages.

One of the limitations of that project was that the researchers had no way of knowing then how much of the so-called FEC B high-fecundity

By PETER AUSTIN

gene was being passed on to ewe progeny.

The researchers had to wait until the ewes began to ovulate, to determine from the ovulation rate whether they had picked up a single gene, two genes or no genes of the high fecundity strain.

That has now changed with the advent of DNA technology, which enables the genetic make-up of animals to be scientifically measured.

CSIRO made approaches to Border Leicester breeders to experiment with the FEC B-infused rams, but met resistance owing to concerns about compromising breed purity.

However, trials conducted on four New England commercial sheep properties over three years were encouraging, indicating a 20 to 30pc lift in crossbred lamb weaning percentages by FEC B-infused rams compared with normal Border Leicesters.

Having failed to interest terminal sire breeders in the project, CSIRO dispersed the Booroola Leicester research flock in June 1995, at which time it was taken over by South Australia's Struan Agricultural Research Station where the Booroola Leicester research has had a low priority.

It was only after the advent of DNA technology, and its application to sheep genetics research, that Professor Roberts hit on the idea of revisiting the Booroola Leicester flock to see what potential it might hold for the booming prime lamb industry.

In 2002 he selected seven rams from the Struan flock and sent blood samples from them to the New Zealand Ag Research DNA testing laboratory in Dunedin (at that time the only facility offering this service) for genetic analysis.

That revealed a "jackpot", in the shape of two rams found to be homozygote – that is, carrying a double dose of the FEC B gene.

These so-called FEC BB rams will in theory be guaranteed to pass one FEC B gene to their Border Leicester progeny – sufficient (on the basis of past research) to produce a 20 to 30pc lift in weaning rates in Border/Merino cross ewes.

Professor Roberts was excited by the possibilities and lost no time forming a partnership to develop the concept with the Starritt brothers of "Kelso Park" and "Womboota" in northern Victoria.

It's not Professor Roberts' first foray into terminal sire manipulation: he was a driving force also in the development o[f] White Suffolk breed in the [1970s] and 1980s, using Poll Do[rset] genes to "white-up" black-fac[e] Suffolks.

Then, as now, the "tampe[ring] with an established bre[ed] by infusion of traits from ot[her] breeds to achieve an imp[rove]ment was not always welc[ome], and Professor Roberts doe[s] doubt there will be sceptic[s] about the BL Infused progr[am].

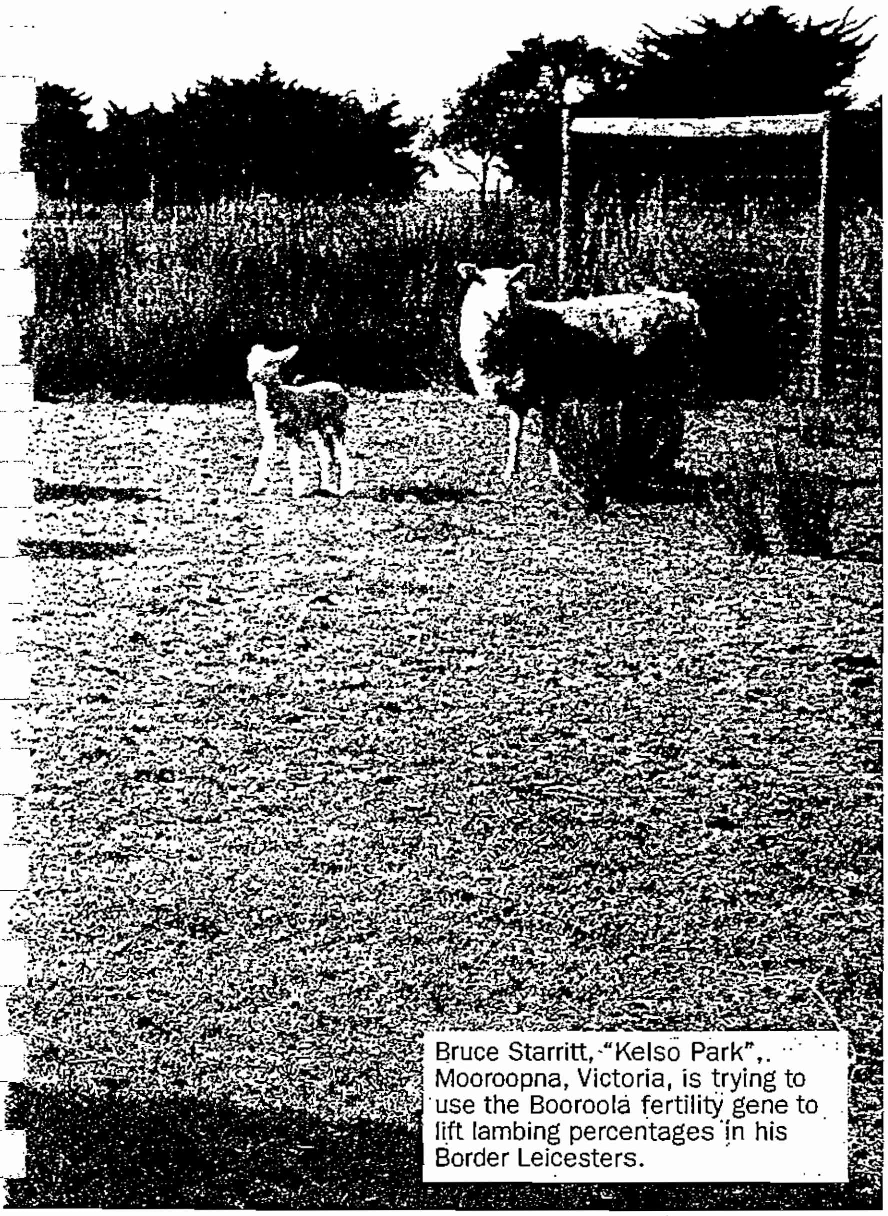
But he says the proof o[f the] pudding will be in the eating – this case, in the resu[lts] achieved by commercial b[reed]ers in first-cross mating [com]parisons.

The two FEC BB rams h[ave] each been mated to more [than] 30 registered Border Leic[ester] ewes on "Kelso Park" a[nd]

BL Infused Project

- The new high fecundity strain of Border Leicesters, called BL Infused, is thought to have the capacity to lift weaning rates in first-cross joinings by between 20 and 30 per cent
- The BL Infused project is a joint venture involving Victorian Border Leicester stud breeders, Ian and Bruce Starritt, and Professor Euan Roberts from the University of NSW.
- The project follows a research project conducted by CSIRO at Chiswick in the early 1990s.

The goals of that project were to explore the potential for infusing the high-fecundity Booroola Merino gene into Border Leicesters to lift the Merino cross lambing percentages.



Bruce Starritt, "Kelso Park", Mooroopna, Victoria, is trying to use the Booroola fertility gene to lift lambing percentages in his Border Leicesters.

"Womboota" and the first lambs are now on the ground.

After classing and DNA testing the top ram lambs on "Kelso Park" will be joined in 2005 and 2006 to 2004-drop ewe lambs on "Womboota", and vice versa.

Meanwhile, a number of these heterozygous BL Infused ram lambs will be available for purchase from both properties in March-April next year, by which time they are expected to be well enough grown to join to Merino ewes.

Expressions of interest are being sought from commercial breeders interested in reserving ram lambs from this drop. A $250 booking fee will be required, and the price of the infused rams will be the same as the ruling prices for the two studs' registered flock rams.

Buyers must make a commitment to compare the weaning percentages achieved by the BL Infused sires' daughters with those of the daughters of pure Border Leicester rams.

Purebred rams (controls) from the same drop will be available for purchase from the same two studs, or breeders can use their existing Border Leicester rams for comparison.

Bruce Starritt said the first lambs dropped to the FEC BB ram on his "Kelso Park" property earlier this month had "looked like pure Border Leicesters", though they obviously weren't.

"We can't be sure of the Border Leicester percentage in the Struan rams so we're calling them 50 per cent to be on the safe side, which means after three crosses they'll qualify as pure," he said.

Genetics linked to profits

WHILE weaning rates in a prime lamb flock are obviously a critical contributor to enterprise profitability, they need to be seen in context.

Benchmarking analysis by Holmes Sackett and Associates suggests that higher weaning rates on their own are not necessarily a path to improved profits.

The reason for this, as Sandy McEachern explains in a recent issue of *On Farm*, is that additional fertility is frequently "bought" at a cost, either by increased supplementary feeding or by sacrificed income from selling twin lambs at lighter weights.

A far more relevant measure of flock performance than lambs weaned per ewe is lambs weaned per hectare, which is where those producers able to sustain higher stocking rates come out in front.

But another study, also by Mr McEachern, shows higher weaning rates can become a profit driver if they are achieved at low cost, which is where genetic improvement comes in.

He modelled four different methods of achieving higher weaning rates to monitor their respective impacts on bottom-line performance, against a "control" mob.

The four strategies modelled were: lowering stocking rates to improve ewe nutrition; supplementary feeding ewes from weaning to joining (to achieve a target condition score at joining); supplementary feeding ewes during pregnancy, and increasing ewes' genetic potential.

At the end of the day, the first three strategies achieved no significant improvement (and, in the first case, a substantial reduction) over the control mob, because costs outweighed the benefits.

But the fourth strategy – applying superior genetics to lift weaning percentages from 122 per cent to 143pc – brought a 22kg increase of lamb produced per hectare and a $46/ha lift in gross margin.

The exercise was based on a specialist prime lamb flock, but holds good for a first-cross enterprise based on Merino ewes.

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Crossbred ewes depend on sires for performance

ANNETTE CROSS
Tamworth

LAMB producers buying crossbred ewes with superior genetic merit are making an investment in the profitability of their lamb enterprise well into the future, according to NSW Department of Primary Industries researcher Neal Fogarty.

Research shows that crossbred ewes sired by high estimated breeding value (EBV) rams produce more lambs that grow faster, with more meeting market carcase specifications, plus the ewes grow more wool.

"Top ewes will give an immediate payoff and will continue to outperform average ewes throughout their lifetime," Dr Fogarty said.

"Crossbred ewes by sires that have EBVs in the top 10 per cent, will have over $25 higher returns than crossbred ewes by sires with average EBVs."

The findings have been backed up by the recent results from a national progeny test for maternal sires initiated by Meat and Livestock Australia and the Australian Sheep Industry Cooperative Research Centre. It clearly shows crossbred ewes by different sires can have very large differences in production and profitability.

Ram breeders (Border Leicester and other breeds) entered sires in the progeny test that were mated to Merino ewes. The crossbred wether progeny were slaughtered and the crossbred ewe progeny were mated to terminal sire rams over three years for evaluation.

"The top sire groups of crossbred ewes consistently outperformed the average groups of ewes by as much as $25/ewe/year," Dr Fogarty said.

"These top groups of ewes had high lambing percentages and turned off more and heavier lambs for slaughter, with a high proportion meeting the market specifications for both carcase weight and fat score."

Most lamb producers buy terminal sires with objective information on EBVs for growth, fat and muscle, allowing them to match the genetics of the selected sires with their enterprise environment and markets.

However, often there is little or no objective information available when purchasing crossbred ewes.

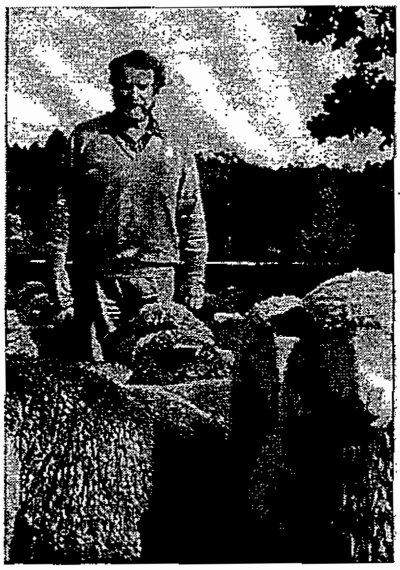
Dr Fogarty said producers should seek information from the crossbred ewe breeder on the genetics of the sires used and the performance and selection history of the base ewe flock.

"The genetic merit and performance of the ewe flock is the major driver of lamb enterprise profitability," he said.

"Therefore, producers need to ensure that the sires of the crossbred ewes have high EBVs for growth and maternal traits including lambing rate and that the base ewe flock has a high lambing rate, with good lamb survival and growth.

"Where you will be mating the crossbred ewes outside the normal autumn breeding season they should preferably have been bred in a flock with a history of good out of season lambing."

■ **Contact Dr Neal Fogarty, 6391 3813.**



Dr Neal Fogarty with some of the crossbred ewe lambs from the progeny test.

Maternal Sire EBVs – how much are they worth?

Maternal Sire EBVs – how much are they worth?

Neal Fogarty, Principal Research Scientist, NSW Agriculture, Orange

Maternal sires such as Border Leicester rams that have been tested through LAMBPLAN have estimated breeding values (EBVs) available at sale. Some questions for ram buyers are:

- how much more is a ram with superior EBVs worth?
- how can rams with varying EBVs for different traits be compared?

Use of rams with superior EBVs for these traits will result in progeny (1stX and 2ndX) that have higher performance and have higher returns. Each of the traits will contribute different amounts of $ because they contribute to different products from 1stX and/or 2ndX progeny. For example, rams with positive EBVwt will have heavier progeny which will have higher returns from both 1stX and 2ndX lambs, whereas positive EBVnlw means better lambing rate from the 1stX ewes and more 2ndX lambs sold.

The returns will be different for the 1stX and 2ndX enterprises. They will also vary with the breeding structure, production system and prices in each enterprise. Where maternal sires are mated to Merino or other base ewes in the 1stX enterprise, the wether progeny are sold for slaughter and the ewe progeny are sold for breeding. In the 2ndX enterprise the 1stX ewes are mated to terminal sires and all 2ndX lambs are sold for slaughter with additional returns from the 1stX wool.

Total returns from better production of the progeny of the ram depends on the superiority of the EBVs as well as other factors such as the number of years the ram is mated, the number of base ewes, their lambing rate, the carcass weight of progeny, price of lambs, carcasses and wool and fat discounts etc. The computer program allows all of these factors in the breeding structure, production system and prices to be varied to suit your situation.

The additional $ returns for a Border Leicester ram using the standard breeding structure, production system and prices (see box) are shown in Table 1. The EBVs used are for the Band 10 of the Border Leicester LAMBPLAN analysis of 15 Sept 2003 (ie a ram in the top 10% of Border Leicesters).

The $ values shown are the additional $ contributed for each trait in both the 1stX and 2ndX enterprises compared with using a ram with all EBVs = 0. In this breeding structure the ram produces 60 1stX wethers and 60 1stX ewes over 3 years and his 60 1stX daughters produce 330 2ndX lambs plus wool over 5 years.

In the 1stX enterprise the 60 1stX wethers from this ram would be heavier and slightly leaner (less carcasses discounted for fat score 5) and the 60 1stX ewes would be heavier when sold. This would result in $303 more returns than if a ram with EBVs = 0 was used.

In the 2ndX enterprise there are gains in carcass weight of the 330 2ndX lambs from maternal weaning weight (additional milk and nurturing) and weight as well as leanness (less carcasses discounted for fat score 5). The 60 1stX ewes also produce more lambs (from EBVnlw) and wool (from EBVgfw) over their 5 years in the flock. The total additional value in the 2ndX enterprise is $2305.

The results highlight that the great majority (88%) of the additional returns from maternal sires with superior EBVs are in the 2ndX enterprise. This is because many of the economically important maternal traits (maternal weaning weight, lambing rate and wool) are only expressed in the 2ndX enterprise and there are also a lot more expressions of performance (60 1stX ewes x 5 years).The important contribution of increased lambing rate is also highlighted.

Table 2. Additional value of BL sire EBVs in 1stX and 2ndX enterprises

BL sire	EBV mwwt	EBV pwwt	EBV pfat	EBV pemd	EBV nlw
Band 10	1.92	3.38	-0.40	0.59	0.08
Band 20	1.45	2.72	-0.31	0.37	0.06
Band 50	0.53	1.55	-0.06	0.00	0.02
Band 75	-0.16	0.56	0.12	-0.26	0.00

The EBVs for animals in the various bands of the BL LAMBPLAN analysis (15 Sept 2003) are shown in Table 2, along with the additional $ returns in the 1stX and 2ndX enterprises from use of a BL ram with these EBVs under the standard breeding structure and prices. The additional value from 1stX and 2ndX progeny of a BL ram with Band 10 EBVs (ie top 10%) is $1818 (ie 2608-790) more than if a ram with Band 50 EBVs (ie top 50%) was used.

Continued on page 9

Maternal Sire EBVs – how much are they worth?

Acknowledgement: The *EBV $ Calculator for Maternal Sires* © was developed by Neal Fogarty and Lynette McLeod with assistance from Elke Hocking and support from Meat and Livestock Australia and the Australian Sheep Industry CRC. It is used in the Edge Workshop: *Money Making Mums.*

Table 1. Additional value from Band 10 BL sire EBVs

1stX enterprise	$	2ndX enterprise	$
1stX wethers		Maternal weaning weight	509
1stX weight	144	2ndX weight	448
1stX fat	13	2ndX fat	40
1stX ewes		1stX ewe lambing rate	1136
1stX weight	146	1stX ewe wool	172
Total 1stX	***303***	***Total 2ndX***	***2305***
		Total (1stX + 2ndX)	***2608***

EBV $ Calculator for Maternal Sires ©
The breeding structure, production system and prices used in the standard parameter set are:
1stX enterprise
Maternal ram mated to 50 Merino ewes x 3 years with a lamb weaning rate of 80%;
1stX wethers sold at 22 kg carcass weight (dressing 45 %) at $3.20/kg with fat discounts of $1/kg (FS1) and $1.50/kg (FS5), with the average fat level being 15mm GR;
1stX ewes sold for breeding at $1.44 /kg liveweight;
2ndX enterprise
1stX ewes mated to terminal sires x 5 years with an average lamb weaning rate of 110%;
2ndX lambs sold at 24 kg carcass weight (dressing 45 %) at $3.50/kg with fat discounts of $1/kg (FS1) and $1.50/kg (FS5), with the average fat level being 15mm GR and lamb skins $12;
1stX ewe wool production x 5 years at $5.00/kg greasy

Getting it right: ewe and ram selection is vital to higher-returning breeding plans.

Superior rams for extra returns

By BRIAN CLANCY

PRIME lamb producers can lift returns by up to 20 per cent by using better bred first-cross ewes.

That superior breeding, according to NSW Agriculture livestock research scientist Neal Fogarty, depends on the ewes being bred by a maternal dam sire with rankings in the top 10 per cent for Lambplan breeding values.

To prove the worth of using superior sires, Dr Fogarty and a colleague, Lynette McLeod, developed a calculator or computer program that assessed the worth of a progeny-tested maternal sire.

Dr Fogarty said the program relied on estimated breeding values (EBVs) for several traits, including maternal weaning weights, liveweights, fat and eye muscle depths; numbers of lambs weaned and greasy fleece weights.

The program also took into account that the maternal sire would be used over three seasons and his first-cross ewe offspring would rear about 1[illegible]0 lambs over three seasons.

Dr Fogarty said a producer could factor in their own returns, mating and weaning rates.

As an example, Dr Fogarty could compare a Border Leicester ram with a top 10 per cent breeding value with those with an average or in the 50 per cent breeding value band.

These Border Leicesters were mated annually to 50 Merino ewes that produced an 80 per cent weaning rate.

The calculator also includes the sale of first-cross wethers.

Based on producing a 24kg second-cross lamb carcass with a 45 per cent dressing percentage for a return of $3.50/kg, Dr Fogarty found the first and second-cross progeny of the superior sires could return about $1800 a ram more than progeny from the maternal sire with average breeding values.

Maternal sires get EBVS

REGISTRATION of maternal dam sires in Lambplan are increasing by 2 per cent per annum.

Lambplan project manager Alex Ball said there were now 30,000 maternal dam sires in Lambplan.

Dr Ball said the estimates were that 35 per cent of all maternal sires sold this year had estimated breeding values (EBVs).

These maternal sires included Border Leicesters, Finns, East Friesians, SAMMs and Coopworths.

This compares with the estimated 72 per cent of prime lamb sires that are sold with EBVs. There are now more than 100,000 prime lamb sires on Lambplan, with breeding data.

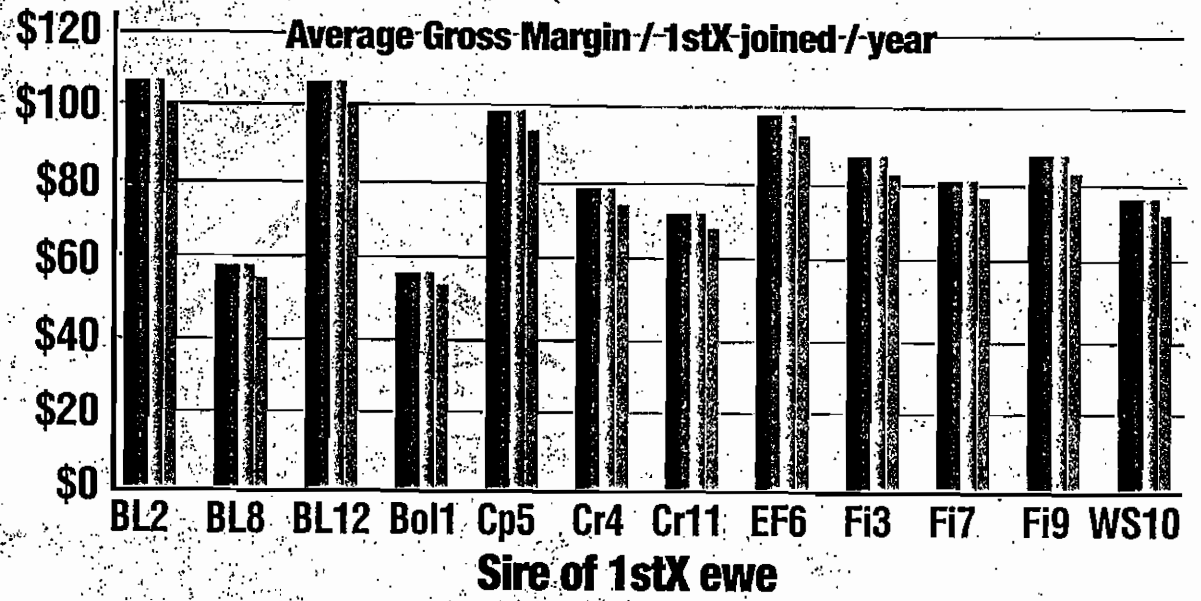
Dr Ball said as more and more prime lamb producers began to realise the importance of having a genetically superior prime lamb mother, demand for the testing of maternal sires had increased.

Dr Ball said all 16 breeders in the Superborders group were performance recording, as were all the Coopworth, East Friesian and SAMM studs.

– BRIAN CLANCY

Ewes make all the difference

Prime lamb profits better from XB ewes



THE importance of selecting the very best ewes for a prime lamb enterprise has been reinforced by results from the national maternal sire central progeny test (MCPT).

Results show the best crossbred ewes achieve an annual gross margin $50 above some of their counterparts.

NSW Agriculture researcher Neal Fogarty said the genetics of the crossbred ewe flock could make a big difference to the profitability of a prime lamb enterprise.

"Most lamb producers take a lot of care in selecting the right terminal sires to mate to their crossbred ewes," Mr Fogarty said.

"Unfortunately there has been little objective information available when purchasing or selecting crossbred ewes.

"Yet the genetic merit and performance of the ewe flock is the major driver of lamb enterprise profitability."

The MCPT compares ewe progeny of maternal sires for fertility, fecundity, and wool production and the growth and carcase performance of their second cross lambs.

Crossbred ewes by different sires (and from different base Merino ewes) could lead to very large differences in production and profitability, according to Mr Fogarty.

"This means ensuring crossbred ewes are of high genetic merit and that they are by sires selected for the traits that contribute most to the profit of the enterprise.

"Recent results from the MCPT have shown that the sire of the crossbred (1stX) ewe has a marked effect on the lambing rate of the crossbred ewes, growth of their second cross lambs and carcase merit of their second cross lambs.

"The sire of the crossbred ewe also impacts on the proportion of second cross lambs meeting carcase specifications, wool returns from the crossbred ewes and worm resistance of the crossbred ewes."

This adds up to a difference in gross margins of as much as $50 per ewe per year. The results illustrated in the Graph are for groups of 1stX ewes by 12 different sires out of the same Merino ewes at Cowra AR&AS over 3 lambings. The sires of the 1stX ewes are from several breeds and there is considerable variation between sires within breeds.

There were major differences in the lambing percentage and the subsequent number of lambs turned off for slaughter, as well as the carcase characteristics and proportions of these 2ndX lambs meeting specifications.

Ensuring you have the best crossbred ewes for your production system and lamb markets will improve your profitability.

■ **Acknowledgement: MCPT is supported by Meat and Livestock Australia and the Australian Sheep Industry CRC. For further information contact Neal Fogarty at Orange on (02)6391 3813.**

Tapping into maternal genetics

The widespread uptake of LAMBPLAN by ram breeders has led to more lamb producers using Estimated Breeding Values (EBVs) to select the right terminal sires to meet production and market requirements. However, despite being aware that these rams account for only half of the lamb's genetic potential, there is generally little objective information sought or used when purchasing or selecting crossbred or purebred prime lamb dams.

The genetic merit and performance of the ewe flock is a major driver of lamb enterprise profitability. Breeders who neglect to focus on ewe performance in their breeding program are passing up a significant opportunity to improve their profitability.

WHAT IS THE MATERNAL CENTRAL PROGENY TEST (MCPT)?

The MCPT was established to demonstrate the impact of maternal sires on the growth and carcase characteristics of their F1 wether progeny, and the profitability of their F1 daughters as prime lamb mothers.

Ninety-one sires have been mated to Merino or Corriedale ewes at three sites over three years, to produce over 6,000 first cross progeny. The sires were provided by seedstock breeders throughout Australia and represented twenty breeds and four hybrids.

Phase one of the MCPT, which is now complete, evaluated the maternal sire effect on growth and carcase performance of over 3,000 first cross wether progeny.

The second ongoing phase involves growing out and mating the first cross ewe progeny for second cross lamb production. First cross ewes are mated to high LAMBPLAN EBV terminal sires over three years.

What can I do to improve my ewe flock?

The first step is to define the characteristics that contribute to the profitability of your enterprise, then determine where the greatest opportunities for improvement lie. For example, lamb weaning rate, second cross lamb growth through better maternal performance, better spring joining ability or improved performance in second cross carcases.

You need to ensure that the sires (and the base ewe flock they are mated to) have high genetic merit for the key traits that influence your profit. This applies whether you buy in or breed your own ewes. LAMBPLAN/MGS EBVs are the best selection tool available to identify superior rams.

KEY BENEFITS

- By improving the genetic merit of your ewe flock you can improve your lamb enterprise profitability.
- The Maternal Central Progeny Test (MCPT) has demonstrated differences in returns of over $50 per ewe per year due to the ewe's sire.
- LAMBPLAN/Merino Genetic Services (MGS) Estimated Breeding Values (EBVs) are the most effective and reliable way of identifying rams to deliver this benefit.

Buying first cross ewes

You need to ensure the first cross ewes are:

- bred from a high performing base flock; and
- by sires that are LAMBPLAN/MGS tested and selected for the traits that are important to your enterprise.

Some producers achieve this by contracting to buy first cross ewe progeny prior to mating with selected sires. They may even supply the sires to be used as part of the contract.

Breeding ewes and replacements

Breeding your own first cross ewes allows full control of the breeding program and health status, but incurs the extra cost and management of a base flock and growing out replacements.

A self-replacing flock (purebred or composite) also allows control of the breeding program and health status, and incurs the extra cost and management of growing out replacements and running a breeding program. However, genetic progress

The MCPT demonstrates the importance of selecting the best ewes for prime lamb production. To reliably obtain crossbred ewes of high genetic merit, breeders should source ewes bred from LAMBPLAN/MGS sires with high EBV and index ratings for the traits that contribute most to the profit of their enterprise.

The sire of the crossbred (first cross) ewe has a marked effect on:

- lambing rate of ewes (lambs born);
- survival of lambs born (lambs weaned);
- growth of their second cross lambs;
- carcase merit of their second cross lambs;
- proportion of second cross lambs meeting carcase specifications;
- wool returns from the crossbred ewes; and
- worm resistance of the crossbred ewes.

can be monitored with a self-replacing flock. In both situations the sires used should be LAMBPLAN/MGS tested and selected for high merit for the traits that are important to your enterprise.

Some emphasis on ability to successfully join at an early age may reduce the cost of growing out replacements and the capacity for out of season joining may enhance breeding and marketing opportunities. A wide genetic base must be maintained to avoid rapid accumulation of inbreeding.

MCPT shows impact of maternal sires

The MCPT is not yet complete, but analysis of results to date confirms that maternal sires have a significant impact on the profitability of prime lamb production.

Based on 2001/02 average prices, returns differed by more than $50 per ewe per year from the value of second cross lamb carcases, accounting for the proportions in and out of specifications, lamb skins and ewe wool production.

Breeds and sires

Not all breeds are equal for all traits. As a result of testing and comparing a number of sires from each of the major maternal breeds, some trends are being identified. The following list shows some of the breed trends identified to date, along with those breeds that have positive genetics for that trait. However, note that there is large variation among sires within all breeds and considerable overlap across breeds.

Carcase leanness	East Friesian, Merino, Corriedale
Carcase muscle	Texel, Poll Dorset, White Suffolk
Lamb growth	East Friesian, Poll Dorset, White Suffolk, Border Leicester
Lamb weaning rate	Border Leicester, Finnsheep, Coopworth, East Friesian
Lamb litter size	Booroola Leicester, Finnsheep
Early sexual maturity (lambing at one year)	Finnsheep, East Friesian, Booroola Leicester, Border Leicester
Clean wool weight	Coopworth, Border Leicester, Corriedale, Merino
Low wool fibre diameter	Merino, Corriedale, Finnsheep

Implications for lamb producers

The importance of emphasising particular traits in the selection of sires varies with the enterprise and output. For example:

- First cross wethers for slaughter – growth and carcase traits.
- First cross ewes for breeding – lambing rate, maternal traits, growth and carcase attributes (second cross lamb) and wool.

No one sire or breed is superior for all traits. For most traits the variation in progeny performance is as great between sires within a breed as between breeds. Although some breeds have relative strengths for some traits, selection on breed alone will not ensure high performance rams are selected.

The best sire for producing high performing, first cross ewes that provide optimum lifetime profit is unlikely to be the best sire for producing first cross slaughter wethers. For those breeding their own first cross ewe replacements, the choice of traits will be determined by a balance between the value of first cross wether lambs and the total lifetime value of the first cross ewes produced.

For more information contact

LAMBPLAN/Merino Genetic Services
Phone: (02) 6773 2948
Fax: (02) 6773 2707
Email: info@lambplan.com.au
Web site: www.mla.com.au or www.lambplan.com.au

Department of Animal Science, University of New England
Armidale, NSW 2351
Tel: (02) 6773 2948 Fax: (02) 6773 2707
www.lambplan.com.au www.mla.com.au/mgs

MEAT & LIVESTOCK AUSTRALIA
ABN: 39 081 678 364
Level 1, 165 Walker Street, North Sydney, NSW 2060
Locked Bag 991, North Sydney, NSW 2059
Tel: (02) 9463 9333 Fax: (02) 9463 9393 www.mla.com.au
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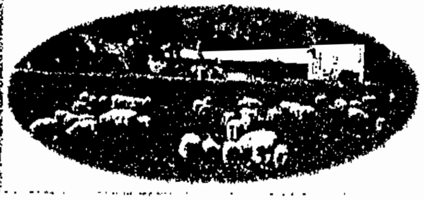


NSW Agriculture

Centenary Field Day

Cowra Agricultural Research and Advisory Station

Research reaches new heights with crossbred ewes

The recently completed national maternal sire central progeny test (MCPT) has had stunning results, with the best crossbred ewes reaching $50 higher annual gross margins per ewe.

The MCPT is a joint project involving research sites in NSW, Victoria and South Australia.

The Cowra Agricultural Research & Advisory Station has been the main site over a seven year timeframe where progeny were bred to allow both the performance of the mother and her progeny to be evaluated over a number of years.

Dr Neal Fogarty said the MCPT clearly demonstrated the importance of selecting the best ewes for your lamb enterprise.

"The genetics of the crossbred ewe flock can make a big difference to profitability from your lamb enterprise," he said.

"There has generally been little objective information available when purchasing or selecting crossbred ewes, yet the genetic merit and performance of the ewe flock is the major driver of lamb enterprise profitability."

The MCPT compares ewe progeny of maternal sires for fertility, fecundity, and wool production and the growth and carcass performance of their second cross lambs.

Crossbred ewes by different sires (and from different base Merino ewes) can have very large differences in production and profitability.

"This means ensuring your crossbred ewes are of high genetic merit and that they are by sires selected for the traits that contribute most to the profit of your enterprise," Dr Fogarty said.

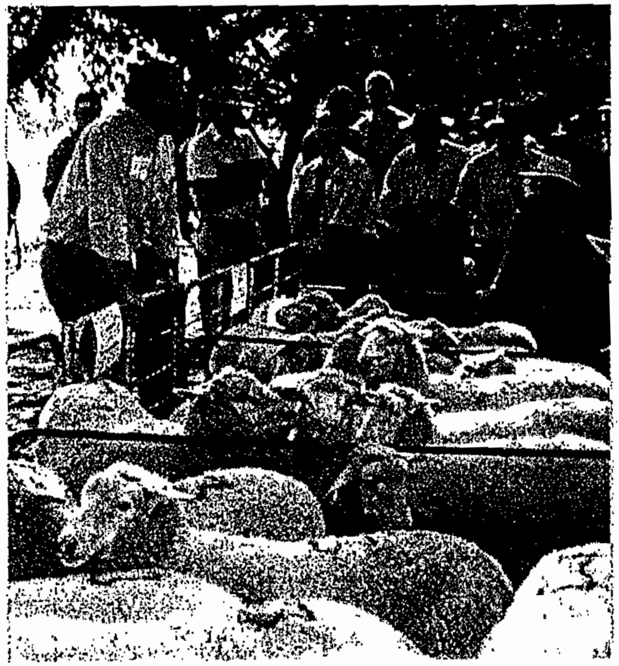
Recent results from the MCPT have shown that the sire of the crossbred (1stX) ewe has a marked effect on the lambing rate of the crossbred ewes, growth of their second cross lambs, carcass merit of their second cross lambs, proportion of second cross lambs meeting carcass specifications, wool returns from the crossbred ewes and worm resistance of the crossbred ewes.

"This adds up to a difference in gross margins of $50 per ewe per year," Dr Fogart said.

"Ensuring you have the best crossbred ewes for your production system and lamb markets will improve your profitability."

MCPT is supported by Meat and Livestoek Australia and the Australian Sheep Industry CRC.

Right: Dr Neal Fogarty takes a blood sample as part of the MCPT.



Dr Neal Fogarty addressing farmers at a MCPT Field Day.

Technical Assistant Tony Markham and Technical Officer Jayce Morgan have worked with Dr Neal Fogarty on the MCPT project.

Livestock

Land 7 Aug 2003

Crossbred revolution

Woolgrowers told to mate for meat

By NIKKI ALLEN

WOOL producers are being encouraged to cash in on the prime lamb price revolution in a bid to spread their risk and earn extra bucks.

An additional four million heavy slaughter lambs per year would be required by the end of the decade, according to statistics revealed at a seminar in Young last week.

For the fourth year running Australian saleyards have notched up records for export quality lambs and experts are saying demand won't slip.

But rather than pay top money for quality lines of first cross ewes to join to meat sires, wool producers have been urged to use what they already have.

NSW Agriculture principal research scientist, Dr Neal Fogarty, Orange, said there was huge demand for more lamb and sheep meat.

"There are opportunities for Merino breeders to maintain their self-replacing flock but, at the same time, get returns and profits from the meat side of the enterprise," he said.

He told producers at a South West Slopes Merino Breeders seminar in Young to mate a portion of the Merino ewes to meat sires – and rather than simply aim to produce a prime lamb, he said there was also the option of producing first cross ewes.

"There are a couple of different choices. They can use a terminal sire and produce slaughter lambs or sell them to a specialist finisher," Dr Fogarty said.

"Or they can use a maternal sire like a Border Leicester or some of the other breeds around to produce first cross ewes, because they are going to be in very short supply over the next few years.

"In the last few years we have also seen meat buyers purchasing the first cross ewes and slaughtering them to keep up their supply of lambs ... so basically first cross producers haven't been as prepared."

Despite the fact that many of the specialist wool-producing Merino ewes have been considered too small for lamb production, Dr Fogarty said it was not necessarily the case.

"There are a lot of fine wool flocks that have good sized ewes suitable for producing first-cross lambs suitable for the meat market, providing the management and nutrition are adequate," he said.

According to NSW Agriculture figures, the Merino already contributes more than 50 per cent of the genes of slaughter lambs in Australia.

Dr Fogarty said 20pc of slaughter lambs were straight Merino.

He said there was also a significant contribution from Merinos to first and second cross lambs.

Hassall and Associates consultant, Ian Rogan, Dubbo, said the gross margin per dry sheep equivalent (DSE) for first cross lamb production was now $38, and the average price for first cross lambs over the past five years was just $17/DSE.

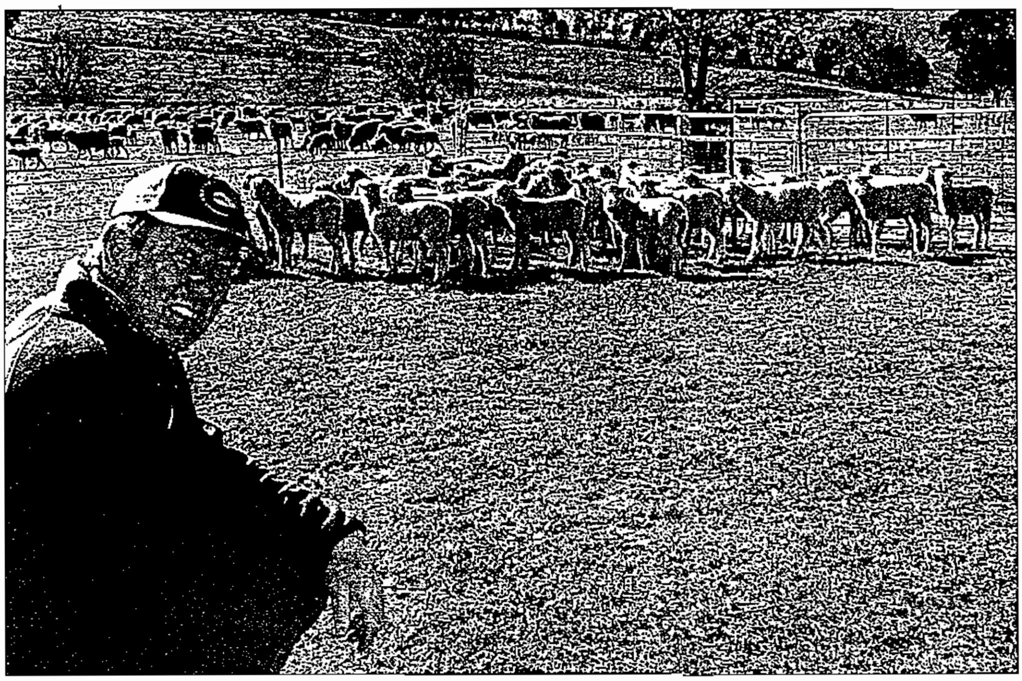
He said second cross lamb production had averaged $13/DSE over the past five years but had risen to $36 in 2003.

Former principal of University of Sydney's Orange Agricultural College, Emeritus Professor John Chudleigh, Orange, said the drought during 2002 and 2003 had led to a shortage of mutton and lamb and was being reflected in the extreme prices, even before the drought had broken.

Professor Chudleigh said lamb production had increased over the past 10 years, except for the last two drought years, but it was the export market driving prices.

Lamb Demand

- The huge demand for lamb has created opportunities for Merino breeders to retain their flock but to join a portion to meat sires
- Demand exists for both prime lambs and first cross ewes, giving producers the option of using either a maternal or a terminal meat sire
- Drought-induced flock numbers and the huge demand from the export lamb industry is behind the market demand



Successful southern mix

WANTABADGERY wool and lamb producer, Fred Hazelwood, "Karrawarra", has been joining 30 per cent of his ewes to Merino rams and the rest to meat sires for 20 years.

It was his management practice prior to the high prices for prime lambs in the past three to four years, but it is a method that he has stuck by.

He doesn't run any first cross ewes, just joins Poll Dorset rams to the Merino ewes and then turns off suckers weighing about 17 kilograms dressed.

"The best prices we received for lambs last year was $100 to $110," he said.

And Mr Hazelwood (pictured) is hoping that his first cross lambs, currently grazing on a wheat crop, will make similar if not better money this year.

He said it was understandable that many Merino breeders would increase the portion of ewes that they joined to meat sires due to the high prices.

By using larger framed Merino ewes he said there were still good gains to be made from crossing them with the Poll Dorset ram.

Mr Hazelwood's Merino flock is based on Pastora bloodlines.

CROSSBRED EWES AREN'T ALL EQUAL

NSW Agriculture, Orange Agricultural Institute
Neal Fogarty

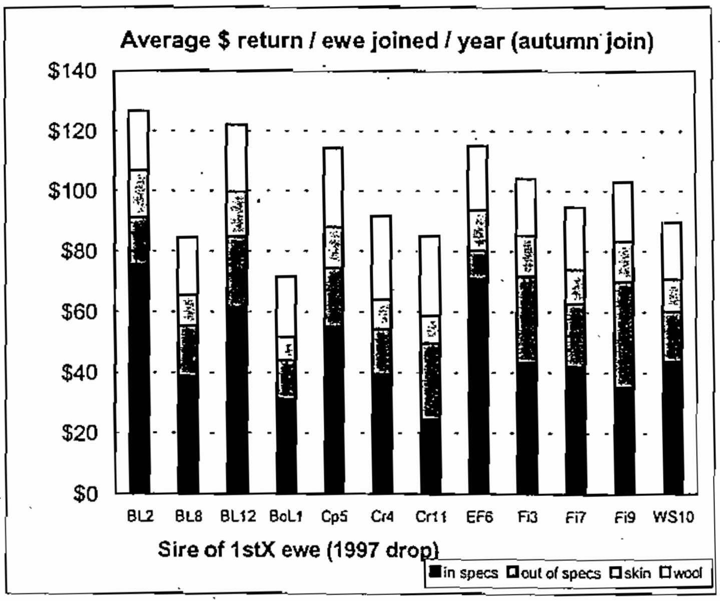
The right crossbred ewe flock can make a big difference to $ returns and profitability from your lamb enterprise.

Most lamb producers take considerable care in selecting the right terminal sires to mate to their crossbred ewes. However there has generally been little objective information available when purchasing or selecting crossbred ewes. Yet the genetic merit and performance of the ewe flock is the major driver of lamb enterprise profitability. The MCPT compares ewe progeny of maternal sires for fertility, fecundity, growth and carcass characteristics.

Crossbred ewes by different sires can have very large differences in production and profitability. The national maternal sire central progeny test (MCPT) has clearly demonstrated the importance of selecting the best ewes for your lamb enterprise. This means ensuring your crossbred ewes are of high genetic merit and that they are by sires selected for the traits that contribute most to the profit of your enterprise.

Recent results from the MCPT have shown that the sire of the crossbred (1stX) ewe has a marked effect on the:

- lambing rate of the crossbred ewes
- growth of their second cross lambs
- carcass merit of their second cross lambs
- proportion of second cross lambs meeting carcass specifications
- wool returns from the crossbred ewes



- worm resistance of the crossbred ewes

This adds up to a difference in returns of over $50 per ewe per year. The results illustrated in the Figure below are for groups of 1stX ewes by 12 different sires out of the same Merino ewes at Cowra over 3 lambings. The sires of the 1stX ewes are from several breeds and there is considerable variation between sires within breeds.

There were major differences in the lambing percentage and the subsequent number of lambs turned off for slaughter, as well as the carcass characteristics and proportions of these 2ndX lambs meeting specifications.

Ensuring you have the best crossbred ewes for your production system and lamb markets will improve your profitability.

Is he pretending –Or should we call the doctor?

Agriculture Today 31/7/03 p14.

Breed from selected second-cross ewes

NEAL FOGARTY
Orange

FINDING good replacement crossbred ewes can be difficult. In recent years many of the best ewes have been slaughtered as lambs, with the drought resulting in further shortages.

As producers begin to restock, ewes will be at a premium and good quality crossbred ewes may be very difficult to buy. But some producers have found a solution right on their own property — breeding from selected second-cross ewes.

The second-cross ewes are available without a cash outlay — although there is the opportunity cost of forgone lamb sales — and the producer knows their genetic background and health status.

Breeding from them may seem like heresy to some in Australia where we have a long history of using border leicester-merino first-cross ewes, but it is common practice overseas to retain multi-cross ewes.

Some important implications that need considering, however, are breed effects and genetics, hybrid vigour, management changes, ram selection for your target lamb market, wool production and quality, and longer-term breeding goals.

Productivity of the ewe flock has a major impact on the profitability of a lamb enterprise. The genetic merit of the dam determines her potential lamb turnoff and milk production for early lamb growth.

The dam also contributes genes, equally with the sire, for growth and carcasem erit of the lamb. Recent research at NSW Agriculture's Cowra Agricultural Research and Advisory Station, supported by Meat and Livestock Australia, has shown a gross margin difference of $50 per ewe per year between groups of first-cross ewes by different sires.

No one maternal breed cross has all the answers and there is considerable variation between sires within all the maternal crossing breeds. It is important to source crossbred ewes by sires with high genetic merit and bred from a high-performing base ewe flock.

Selection of the best ewe lambs to retain is important for success. Ewe progeny from scanned twin bearers would be a good group to retain. Faster growing lambs will reach puberty earlier and can be mated younger. Dorset-cross ewes may also join more successfully and earlier in the spring than border leicester-merino ewes.

Hybrid vigour has the most impact on lambing rate and survival, less impact on growth and wool and little effect on carcase traits. Using second-cross ewes exploits maximum hybrid vigour for maternal traits.

▸▸ **PROGENY TEST**

Do homework and cash in

By GERVAISE GAUNT and SHYAMAL DAS

DURING the past year, prime lamb producers have been enjoying record returns from their enterprises.

The downside is the higher cost for replacement breeding animals, which has forced producers to question the point of spending more money on replacement breeding stock.

Now that lamb is reaching a higher market price, producers need to look at the economics of replacement stock, and ask themselves how much is too much to pay for replacement ewes.

In other words, what is the difference in returns on investment from an "average" priced dam compared with a more "expensive" higher priced and "more highly productive" dam.

Research results suggest paying a higher price to obtain high performance prime lamb dams compared with average dams.

Genetic improvement has played a key role, in addition to market development, in the improvement of Australia's lamb industry.

Genetic improvement of terminal sires initiated by LambPlan for prime lamb production has been paramount.

When Australia is faced with the challenge of supplying an extra five million heavy lambs each year to satisfy expanding markets, producers cannot ignore the additional gain that can be made by using superior maternal genetics.

During the past decade, state governments and Meat and Livestock Australia have funded genetic improvement programs.

One such program is the national Maternal Central Progeny Test being conducted at Rutherglen and Hamilton, Cowra, in NSW, and Struan, in South Australia.

The MCPT aims to demonstrate and quantify the variation between maternal sires evaluated in this multi-state trial.

The MCPT is assessing 91 "top" maternal sires from various breeds, such as Border Leicester, Finn, Coopworth and East Friesian, that are used for first-cross ewe production.

Prime concern: the cost of replacement ewes poses a dilemma for prime lamb producers.

Value-plus: genetic improvement has boosted the value of the nation's flock.

Mid-way through a six-year project, preliminary results comparing the first year's intake of 17 sires have shown gross returns from top sires are worth 23 per cent more than the average of all ewes.

In monetary terms, the top sire produced $88 per year per ewe joined, compared with the bottom sire, which returned $53 per year per ewe joined. The overall average gross returns for all ewes joined, per year, was $68.

Prices were based on the national five-year average for lamb carcasses of $1.95/kg.

The difference would be even greater if current high lamb prices were used.

The major driver of dollar returns is the number of lambs slaughtered (that is, weaning percentage), with other traits of growth, fat and wool also contributing.

In the MCPT, lamb carcases contributed to 62 per cent of returns, lamb skins 12 per cent and wool from first-cross ewes, 26 per cent.

The average weaning percentages from first-cross adult ewes from different maternal sire groups have ranged from 35 per cent to 167 per cent.

Several breeds are represented in the top trait leaders, and the same breeds are also represented in the lowest rank.

A desire to be performance-driven has brought lamb producers and prime lamb ewe breeders closer.

There are several examples where producers and breeders have discussed their needs, formed alliances of mutual benefit and urged breeders to breed ewes with measurable performance.

Examples are the South-West Prime Lamb Group in Victoria, the South Australian First Cross Ewe Breeders Association, SSuperlambs, CentrePlus Merino and the Western Australian Q Lamb.

Another development is in the growth of "contract mating".

Thanks to the efforts of the various stakeholders within the lamb industry, there is now a system available to obtain high performance dams.

The system can predict ewes that will produce lambs that are, for example, 1kg heavier, 0.5mm leaner with 0.4mm deeper muscle and will produce 3 per cent more lambs than the average Merino or first-cross ewe.

• GERVAISE GAUNT is a research scientist at the Rutherglen Research Institute. SHYAMAL DAS is a lamb industry officer with the Department of Primary Industries at Swan Hill.

BREEDING FROM SECOND CROSS EWE LAMBS

By Neal Fogarty, Principal Research Scientist, NSW Agriculture, Orange

Finding good replacement crossbred ewes can be difficult. In recent years many of the best ewes have been slaughtered as lambs and the drought has resulted in further shortages. As producers restock, ewes will be at a premium and suitable quality crossbred ewes may be very difficult to obtain. Some producers have found a solution right on their own property by breeding from selected second cross ewes.

The second cross ewes are available without a cash outlay (although there is the opportunity cost of forgone lamb sales) and they are of known genetic background and health status. Breeding from them may seem like heresy to some in Australia, where we have a long history of using Border Leicester X Merino (BLM) first cross ewes, but it is common practice overseas to retain multi-cross ewes. There are however some important implications that need considering;

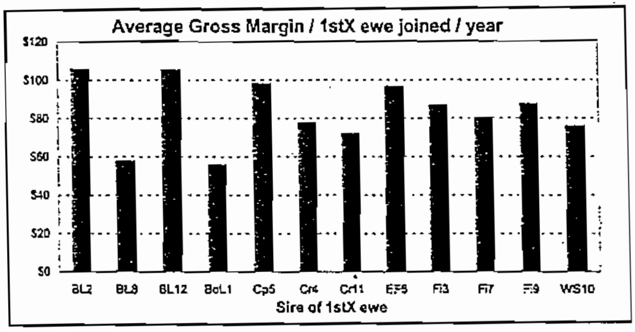
- breed effects and genetics,
- hybrid vigour,
- management changes,
- ram selection for your target lamb market,
- wool production and quality,
- longer term breeding goals.

HOW IMPORTANT IS THE EWE?

Productivity of the ewe flock has a major impact on profitability of the lamb enterprise. The genetic merit of the dam sets her potential lamb turnoff and milk production for early lamb growth. The dam also contributes genes, equally with the sire, for growth and carcass merit of the lamb. Recent research at Cowra, supported by Meat and Livestock Australia, has shown a range of $50/ewe/year in gross margins between groups of first cross ewes by different sires (see Fig).

No one maternal breed cross has all the answers and there is considerable variation between sires within all the maternal crossing breeds. It is important to source crossbred ewes that are by sires with high genetic merit and bred from a high performing base ewe flock. The ewe genotype has a marked influence on lambing rate, lamb growth rates and carcass traits.

Johnos Border Leicester Stud Ewes and lambs, Keith, SA



Sirecode	av(3yrs)/year(autumn joined)
BL2	$105.59
BL8	$57.61
BL12	$105.18
BoL1	$55.72
Cp5	$97.91
Cr4	$77.48
Cr11	$71.87
EF6	$96.47
Fi3	$86.54
Fi7	$80.16
Fi9	$87.23
WS10	$75.82
	$83.13

The Figure shows average gross margins over 3 years at Cowra for contemporary groups of first cross ewes that were sired by 12 different maternal rams. Returns are from second cross carcasses, lamb skins and wool from the ewes. The maternal sire breed codes are: BL Border Leicester, BoL Booroola Leicester, Cp Coopworth, Cr Corriedale, EF East Friesian, Fi Finnsheep, WS White Suffolk.

Australian Sheep and Wool Show 2003
Champion Hampshire Ram exhibited by F. Murray, Nagambie, Vic.

IMPLICATIONS OF BREEDING FROM SECOND CROSS EWES

Selection of the best ewe lambs to retain is important for success. Ewe progeny from scanned twin bearers would be a good group to retain. Faster growing lambs will reach puberty earlier and can be mated younger.

Hybrid vigour is greatest for lambing rate and survival, moderate for growth and wool and very small for carcass traits. Using second cross ewes exploits maximum hybrid vigour for maternal traits. It may be worth considering a different breed of terminal sire ram to get maximum hybrid vigour for growth among their lamb progeny (see Ram selection below).

Management to ensure ewes are well grown (minimum 42 kg and preferably up to 50 kg live weight) to mate successfully at an early age. Some groups of first cross ewes weaned 100% of

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lambs from an autumn mating at 7 months of age at Cowra. Success requires the ewes to have genetics for early puberty and to be well grown. Results from mating young ewes in the spring and early summer are much more variable than mating in the autumn. Young Dorset cross ewes may join more successfully and earlier in the spring than young BLM ewes because of their naturally longer breeding season.

Rams must be healthy, active and fertile. Better results from young ewes will also be achieved if the rams are experienced, a high percentage is used and the joining period extended for a couple of weeks longer than for mature ewes.

Mating ewes at 7-9 months with pregnancy scanning also allows the sale of any dry ewes while they are still lambs. There are no detrimental affects on subsequent performance from lambing ewes at one year of age, providing they have adequate nutrition during pregnancy to continue growing.

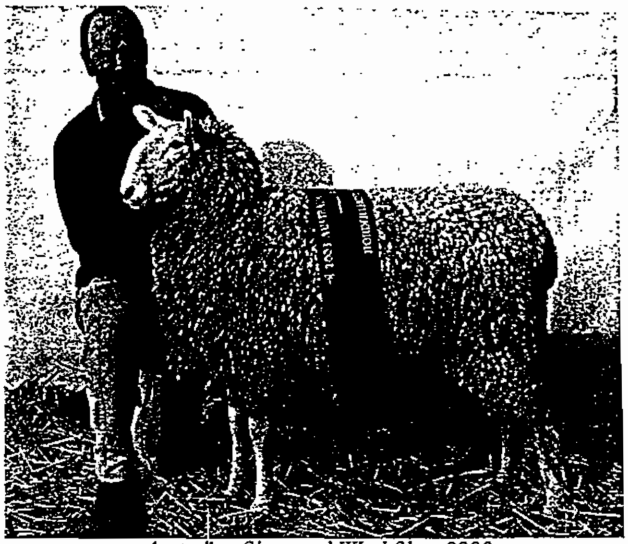
Ram selection — a different breed of terminal sire will give maximum hybrid vigour for lamb survival and growth, although the same breed will still retain about half the level of hybrid vigour. You may also need to consider the genetics or estimated breeding values (EBVs) of the rams to produce lambs for a specified target market, as the genetics of the ewe will be different.

Wool — second cross ewes would be expected to produce 0.5 to1.0 kg less clean wool of 1-2 microns lower fibre diameter than comparable BLM first cross ewes.

Long term breeding goals — development of a composite breed line for supply of replacement ewes requires a well planned breeding and selection program if it is to be successful.

TAKE HOME MESSAGES

- Breeding from second cross ewes may be a short term strategy to find suitable crossbred ewes.



Australian Sheep and Wool Show 2003
Best Novice Exhibit shown by Andrew Bos, Tragowel Stud, Horsham,. Vic

- The genetics and performance of the ewe flock is a major driver of lamb productivity and profitability (a range of up to $50/ewe/year).
- Several implications for your enterprise need to be considered for success.

ACKNOWLEDGEMENTS

Results shown are from the Maternal sire Central Progeny Test (MCPT) run by NSW Agriculture, DPI Vic and SARDI with support from Meat and Livestock Australia and the Australian Sheep Industries CRC.

BORDER LEICESTERS

$UPERBORDER$ CONFERENCE

The fifth annual conference of SuperBorderS Inc. was held at Cowra on 20-23rd June 2003. It was well attended by the majority of members and the group warmly welcomed new members Ross and Colleen Lomas from Cavendish, Vic.

The first day was spent in a pilot workshop with Elke Hocking (Stevens) from South Australia's PIRSA on choosing the best ewes for commercial lamb production, titled Money Making Mums. The ultimate audience for this workshop will be commercial producers using or breeding first cross ewes. SuperBorderS are particularly interested in advising producers how to buy the best maternal genetics for their breeding programs.

Every year there are more First and Second-cross breeders who want better genetics for lamb production, with the demand for heavier carcass weights continuing. SuperBorderS rams are all measured for growth rate and the milking ability of their mothers and sisters, so the 1st cross ewes will be the best possible if the rams with the best figures are chosen. Ms Hocking explained how EBVs are derived and how to use them to choose the right ram for each production situation.

At the conference, Neil Fogarty (NSW Agriculture) reported on the latest analysis of the Central Maternal Sire Progeny Test, which includes many sires from SuperBorderS flocks. Border rams are still among the best and the take home message is still to choose the best available rams, because there is a range of $50/ewe/year in returns between the top and bottom sires.

The conference decided to update the composition of the Dollar Index. The revised index places more importance on growth rate to 300 days (the age when most lamb is marketed) and on Maternal Weaning weight (the part of early growth contributed by the ewe), as well as updating the dollar values for lamb and wool. As usual Alex Ball from LAMBPLAN gave expert advice on how to use and interpret the LAMBPLAN figures.

Amy Bell from CSIRO Armidale spoke to members on the NEMESIS worm project. Drenching for worms can be halved after 10-14 years of selection for low worm counts and SuperBorderS members are beginning to test and select along these lines. This will be an important advantage in future.

Much time was spent in discussing marketing rams. Richard Apps from LAMBPLAN outlined the principles of a good marketing program and members contributed to a new plan for marketing SuperBorderS. The preliminary results of a survey of members show an increase in number of SuperBorderS rams sold and sale prices in 2002 over 2001, in spite of drought and fire affecting producers' clients. Members reported clients' successes at the First-cross ewe sales with ewes sold with the SuperBorderS tag and the yellow "Bred from SuperBorderS" card on the pen.

Phillip Russell, Jane Court, Lynton Arney and Graeme Golder looking at Phillip's Lambplan EBV's for his Tenalba Stud sheep on his property at Conawindra following the SuperBorder Conference.

A new program of sharing genetics of the best sheep in members' flocks was agreed on. Lynton Arney is in charge of this program, which will use semen from the best SuperBorderS rams that will be matched with the best SuperBorderS ewes.

There was a full discussion on the SuperBorderS standards for data collection, with the need for full weaning weight records re-emphasised. Most members are now also collecting wool weights. A high level of recording leads to accurate computer analysis and ultimately to an increased rate of genetic gain.

More new members will be very welcome to join the group and take advantage of all the progress made by this progressive group that started with a vision 4 years ago to meet the market need for specified genetics. It is now supported by Departments of Agriculture and private lamb production advisers, as well as our many clients who are breeding for the large export lamb. The faster growth rate of lamb sires, such as those bred from SuperBorderS, is a key part of the new PRIME TIME program by MLA to increase lamb production through larger carcass weights and higher fertility.

The informative and friendly conference was finished off by the election of office bearers for 2003/4 and a visit to the Tenalba Stud of Phillip and Simone Russell in the rolling hills of Canowindra. Phillip had all his LAMBPLAN figures in his lap-top beside the yards and the progeny of numerous sires were viewed with interest. Numerous informal visits to other studs followed as families made their way home.

The new committee is Bruce Starritt (President), Wes Kember (vice President), Phillip Russell (Treasurer), Christine Wilson (Secretary), Lynton Arney, George Carter and Graeme Golder (members).

Michael Corkbill, Phillip Russell and Elke Hocking at the SuperBorder Conference, Cowra 2003

Christine Wilson,
Secretary (03) 5882 3338

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If ewes were scanned and twin bearers lambed separately, their ewe progeny would be a good group to consider for retaining in the ewe flock.

Second cross ewe lambs can be a prime lamb dam alternative

By NEAL FOGARTY

BREEDING from selected second cross ewes may be a viable alternative when it is difficult to source suitable replacement crossbred ewes. In recent times many of the best crossbred ewes have been slaughtered as lambs to meet the demands of the expanding market.

The drought has further exacerbated the situation by reducing overall sheep numbers.

As producers restock after the drought, replacement ewes will be at a premium and suitable quality crossbred ewes may be very difficult if not impossible to source.

Some producers have found a solution right on their own property.

They have kept a selected portion of their second cross ewe lambs as replacements for breeding prime lambs. As well as being readily available without a cash outlay (although there is obviously the opportunity cost of forgone lamb sales), they are of known genetic background and health status.

While breeding second cross ewes may seem like heresy to some in Australia, where we have a long history of using Border Leicester X Merino (BLM) first cross ewes, keeping multicross lambs as replacement ewes is common practice overseas.

However, retaining second cross ewe lambs for breeding has some implications for the lamb enterprise that need to be considered, including breed effects and genetics, hybrid vigour, some management changes, ram selection for the target lamb market, wool production and quality and longer term breeding goals.

HOW IMPORTANT IS THE EWE? Productivity of the ewe flock has a major impact on returns and profitability of the lamb enterprise.

The major sources of income are from the sale of lambs and wool from the ewes.

The total return from lambs is largely determined by the number sold and their weight, with the price also effected by carcass fat and conformation.

Wool returns from crossbred ewes are largely determined by the weight and quality as it affects price. In a high performing crossbred flock, income from lamb sales is almost four times that from wool.

For example, in a flock turning off 120% of lambs averaging 20kg carcass weight at $3/kg plus $12 skin, gross returns from lamb sales are $86.40/ewe, whereas that from wool, 4kg clean at 600c/kg (30 micron) is $24/ewe.

The genetic merit of the dam sets her potential lamb turnoff and her milk for early lamb growth, nutrition and other management factors being equal. The dam also contributes genes, equally with the sire, for growth and carcass merit of the lamb.

Recent results from the Maternal sire Central Progeny Test (MCPT) have clearly demonstrated the importance of the dam and her genetic make up for lamb production.

The MCPT (see box story page 33) has shown a range of $50/ewe/year in returns and gross margins between groups of first cross ewes by different sires. Figure 1 shows the variation in returns during three years at Cowra among contemporary groups of first cross ewes that were sired by 12 different maternal rams.

The differences in total lamb returns between the groups are largely due to differences in the average number of lambs turned off for slaughter. The three year average lamb weaning percentage for all 12 groups (autumn joined, including first joining at seven months of age) was 106%, with the range among the groups being 133% to 75%.

There were also large differences in the proportion of the lambs meeting the target carcass specification at slaughter (20+ kg carcass weight and fat score 2, 3, 4). First cross ewe wool production averaged 22% of total returns across all groups.

The strong message coming from the MCPT results is that the genetics of the crossbred ewe flock can have a major impact on productivity and profitability of the lamb enterprise.

No single maternal breed cross has all the answers and there is considerable variation between sires within all the maternal crossing breeds.

It is important to source crossbred ewes that are by sires with high genetic merit for the traits that are important to your enterprise profitability, as well as out of a high performing base ewe flock. High lambing performance is obviously important. In addition the results have shown the ewe genotype has a marked influence on lamb growth rates and carcass traits that are important if the target market has particular carcass specifications.

Figure 1 shows average returns during three years at Cowra for contemporary groups of first cross ewes that were sired by 12 different maternal rams.

Returns are split into those from second cross carcasses meeting the target specification (20+kg, fat score 2, 3, 4), carcasses outside the specification, lamb skins and wool from the ewes. The maternal sire breed codes are: BL Border Leicester, BoL Booroola Leicester, Cp Coopworth, Cr Corriedale, EF East Friesian, Fi Finnsheep, WS White Suffolk.

IMPLICATIONS OF BREEDING FROM SECOND CROSS EWES: The BLM has been the most commonly used crossbred ewe for intensive lamb production in Australia for the last 80 years.

Results from MCPT and other trials show BLM ewes can perform well when they are sired by high genetic merit rams (see BL2 and BL12 in Figure 1).

First cross ewe groups by some sires of other breeds have also performed well. There are some sires in the MCPT from breeds generally regarded as terminal sires, such as the Poll Dorset, White Suffolk and Texel.

Some of their first cross ewe groups have also performed well as shown by sires WS33 and PD31 at Rutherglen, Figure 2. The point is that regardless of the breed it is important to select sires (and base ewes) with top genetics to breed superior crossbred ewes.

Selecting the best second cross ewe lambs to retain for breeding is also an important decision that can affect the success of the practice.

If your current ewes were scanned and twin bearers were lambed separate- ▶

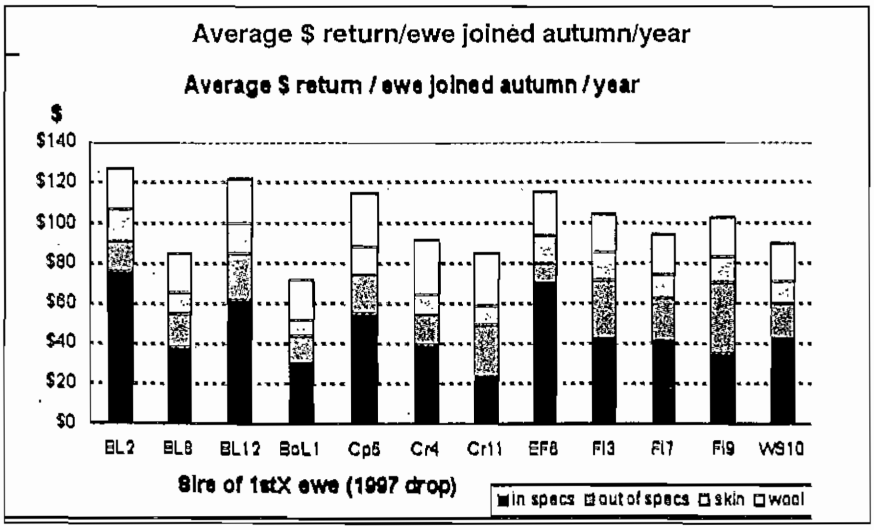


Figure 1: Average financial returns from first cross ewes sired by 12 different rams.

ly, their ewe progeny would be a good group to consider for retaining in the ewe flock.

Faster growing lambs will also reach sexual maturity earlier and can be successfully mated at a younger age. Dorset cross ewes may also join more successfully and earlier in the spring than BLM ewes because of their generally longer breeding season.

Figure 2 shows average carcass returns from their second lambing at Rutherglen for contemporary groups of first cross ewes that were sired by 14 different maternal rams.

Returns are split into those from second cross carcasses meeting the target specification (20+kg, fat score 2, 3, 4) and carcasses outside the specification.

The maternal sire breed codes are: BL Border Leicester, Cp Coopworth, Cr Corriedale, EF East Friesian, Fi Finnsheep, Hy Hyfer, Pd Poll Dorset, WS White Suffolk.

HYBRID VIGOUR: Crossbreeding takes advantage of hybrid vigour, which is expressed when crossbred progeny perform better than the average performance of the parent breeds. The amount of hybrid vigour expressed varies for different characteristics and between different breed crosses.

Hybrid vigour is greatest for maternal and fitness traits such as lambing rate and survival, moderate for growth and wool production and very small if any for carcass traits.

Using second cross ewes for breeding still retains the maximum hybrid vigour for maternal traits as they comprise three different breeds. It may be worth eonsidering using a different breed of terminal sire ram to retain maximum hybrid vigour for growth among their lamb progeny (see Ram selection below).

MANAGEMENT: Well-grown crossbred ewes can be mated sueeessfully at an early age, especially in autumn. Some groups of first cross ewes weaned 100% of lambs from an autumn mating at seven months of age in the MCPT.

It is critieal for success to have the genetics for early puberty and the ewes well-grown to a minimum of 42kg and preferably up to 50kg live weight at mating.

Ensure the rams are healthy, active and fertile. Better results will also be achieved if the rams are experienced, a high percentage is used and the joining period extended for a couple of weeks longer than normal with mature ewes. This applies equally to second cross and first cross ewes.

Mating second cross ewes at seven to nine months also allows the flexibility of selling dry ewes on the lamb market following pregnancy scanning.

This may mean that you should join more ewes than are required as replacements to allow for this later culling. There are no detrimental affects on subsequent performance from lambing ewes at one year of age, providing they have adequate nutrition during pregnancy to continue growing. In fact research shows ewes that successfully lamb at one year of age have higher lambing rates in later years than ewes that are not joined in their first year.

Results from mating young ewes in the spring and early summer are much more variable than in the autumn. It is outside the natural breeding season and few immature ewes may be cycling and capable of conceiving. Generally Dorset cross ewes will join more successfully and earlier in the spring than BLM ewes because of their naturally longer breeding season.

RAM SELECTION: There are two important aspects of ram selection. Firstly, it may be desirable to use a different breed of terminal sire over the second cross ewes.

This will retain maximum hybrid vigour for lamb survival and growth. Although using the same breed of ram as in the previous generation ie Poll Dorset (PD) x (PDxBLM), means you still retain about half the hybrid vigour relative to using a different breed.

It is important not to mate thc same individual rams (or close relatives ie half brothers) that sired the ewes as this would result in some inbred lambs, which would have poorer survival and growth.

Secondly, you may need to consider the genetics or estimated breeding values (EBVs) of the sires to be used.

The terminal sire rams selected on a particular index or EBV range for mating to your BLM ewes to produce lambs for a specified target market, may not be suitable when mated to the second cross ewes.

For example, if high growth and lean EBV sires are used over second cross ewes that are also progeny of similar sires, their lambs may not have sufficient finish for the domestic market. This is even though the second cross lambs from the BLM ewes may have regularly met the specification – sires with less emphasis on leanness would be more suitable.

WOOL PRODUCTION AND QUALITY: The production and quality of wool from second cross ewes relative to that from BLM ewes varies depending on their genetics.

However, trial results generally indieate that PD second cross ewes would be expected to cut 0.5 to 1.0 kg less clean wool of 1-2 microns lower fibre

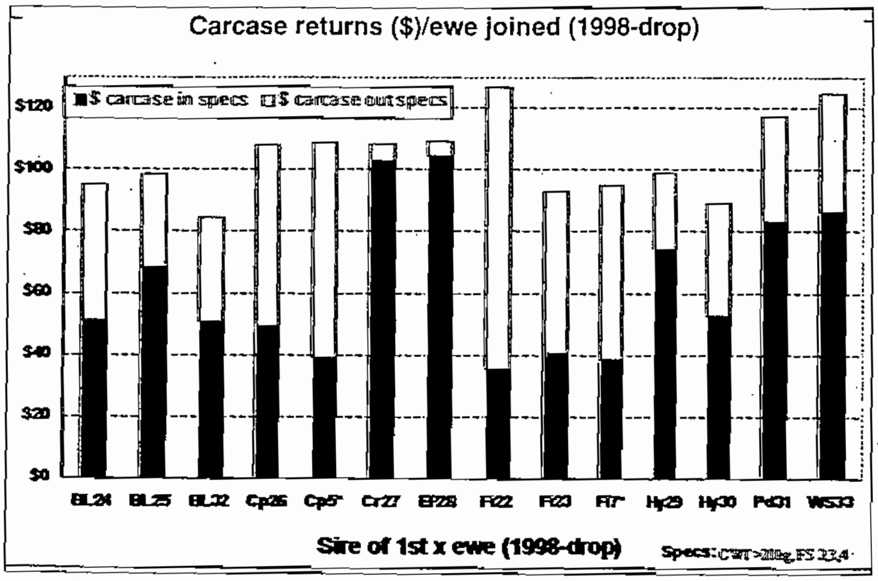


Figure 2: Carcase returns per first cross ewe flocks joined to different rams.

diameter than comparable BLM first cross ewes.

On current crossbred wool prices this represents an advantage in annual wool returns to the BLM ewe of $0 to $4. Lamb skins from BLM ewes may be slightly heavier and have longer wool, but the differences in their value will be very small.

Contamination with black fibres or kemp may be a concern if the second cross ewes have been sired by black faced or some of the exotic breeds that have kemp or hair fibres.

LONG TERM BREEDING GOALS: The mating of second cross ewes could be a useful short term strategy to overcome the current shortage of BLM ewes as lamb producers need to restock.

There are also many Merino breeders with terminal sire first cross lambs, many of which could not be finished for slaughter during the summer, who could use a similar strategy for restocking.

For some breeders it may be a longer term strategy, which eventually develops into breeding all their own replacement crossbred ewes. This entails developing a composite breed line and requires a planned breeding and selection program if it is to be successful.

In recent years several new breeds have been developed or imported and many of the traditional breeds have improved considerably with detailed genetic information available. This means that producers now have a wide choice of genotypes to select from to more closely match their production/marketing system, level of management and environmental constraints.

Sourcing genetically superior crossbred ewes that are suitable to the particular lamb enterprise is difficult for restockers. This will be particularly difficult coming out of the current drought.

Another way of securing a supply of suitable ewes is through contract mating, in which a breeder agrees to produce first cross ewes of known genetic merit, health status and of the required specifications.

Lamb producers contract to purchase first cross ewes that are sired by rams they have selected or maybe even purchased. This allows the lamb producer to choose a high performing base flock and control the genetic merit of the sires used.

Mating second cross ewes at seven to nine months also allows the flexibility of selling dry ewes on the lamb market following pregnancy scanning.

TAKE HOME MESSAGES: Breeding from second cross ewes that have been retained may be a feasible strategy to overcome the current difficulties in sourcing crossbred ewes.

The performance of the ewe flock is a major driver of the lamb enterprise productivity and profitability. Gross margins have been shown to vary by as much as $50/ewe/year (around an average of $83) between crossbred ewes by different sires. Use of selected second cross lambs may offer the flexibility of early mating. There are implications that need to be considered including breed effects and genetics, hybrid vigour, management changes, ram selection and target markets, wool production and quality and longer term breeding goals.

Contact: Dr Neal Fogarty is Principal Research Scientist, NSW Agriculture, Orange, phone (02) 6391 3813; email <neal.fogarty@agric.nsw.gov.au>.

What is the MCPT?

A TOTAL of 91 maternal sires have been mated to Merino ewes at three sites (Cowra AR&AS, Hamilton PVI and Struan RC) by AI during three years.

The sires were entered by seedstock breeders throughout Australia from several breeds, including Border Leicester, East Friesian, Finnsheep, Coopworth,

White Suffolk and Corriedale, common link sires have been mated at each site in each year so that all 91 sires can be compared.

The first phase of MCPT is now completed and involved growth and carcass performance of the 1stX wether progeny.

The second ongoing phase involves growing out and mating the 1stX ewe progeny for 2ndX lamb production.

The 1stX ewes are mated to high EBV terminal sires during three years. The lambing rate and wool production of the 1stX ewes and the growth and carcass performance of the 2ndX lambs is being evaluated. (The 1stX ewes bred at Struan are being evaluated at Rutherglen RI).

More than 3000 1stX wethers have been slaughtered and 3000 1stX ewes (approximately 20-30 per sire) are being evaluated.

The MCPT is run at Cowra by NSW Agriculture, at Hamilton and Rutherglen by the Department of Primary Industries, Victoria and at Struan by the South Australian Research and Development Institute, with support from Meat and Livestock Australia.

– Neal Fogarty

Producers back the mating of ewe lambs

by Kerrie Groves and Leo Cummins,
VICTORIAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

Earlier mating of ewe lambs is an option for producers who wish to rear their own ewes or want to reduce the outlay for replacements.

A Department of Natural Resources and Environment survey of prime lamb producers in south-western Victoria showed mating ewe lambs as early as seven months of age was proving a useful strategy.

Mating of ewe lambs is not widely adopted but cost pressures and recognition of the possible genetic consequences of the traditional system are forcing a change.

On the downside, there is a risk that the twinning rate and birth weights are lower and lamb mortality is higher compared with the older ewes.

But producers can counteract these problems by ensuring better nutrition from weaning until the end of joining.

Mating ewe lambs

The department surveyed 13 prime lamb producers, who had experience with mating ewe lambs. These farmers mated ewes during January–March, achieving an average lambing percentage of 130 per cent (ranging from 110–170) for adult ewes during 2001. The expected main flush of lambing occurred five months after the start of joining.

During 2001, nine producers also joined flocks of 70–1600 ewe lambs at seven months of age.

Of the 13 producers surveyed, eight said mating seven-month-old ewe lambs was a useful strategy, two producers generally mated later at 9–10 months of age and three felt it was not successful.

Success rates

For these producers, the average lambing percentage for ewe lambs was 72% (ranging from 32–102%), which was in line with owners' expectations.

Of particular interest is that one producer who achieved only a 32% lambing rate felt it was still a useful strategy to mate ewe lambs.

For three producers, the ewe lambs started lambing on the due date but for the remaining six there was a delay of up to one month for the peak of lambing.

Of four producers who did not join ewe lambs during 2001, three expected (based on experience) the start of lambing would be delayed by up to one month.

Performance pitfalls

Generally, the twinning rate and birth weights were lower and lamb mortality was higher in ewe lambs compared with older ewes.


DNRE

Mating ewe lambs as young as seven months of age can benefit producers provided the lambs maintain an adequate nutritional level.

Although the ewe lambs did not require more assistance at birth, often additional care was taken in the selection of sires.

Ewe mortality was similar to that in adult ewes.

Only four producers felt the lambs grew out as well as those from adult ewes.

Eight producers said that with particular attention to feeding, lambs would grow out successfully, while one producer said they would remain undersize for life.

Nine producers said the ewes performed satisfactorily in later years but four felt the ewes were penalised by this early pregnancy and would not conceive as well as expected during the following joining period.

Ensuring success

Extra management was required for a successful lambing system.

These included better nutrition from weaning until the end of joining, target weights of 38–50 kilograms at mating, drafting the heavier lambs for mating, to mating all ewe lambs.

Most producers carried out ultrasound scanning and provided better nutrition for pregnant and twinning ewes, they monitored worm egg counts and used capsules for worm control. Three producers reported foetal loss due to Campylobacter infection.

Controlling nutrition carefully during pregnancy may allow an increase in birth weight and lamb survival without increasing the incidence of dystocia.

A better definition of nutritional targets for ewe lambs is needed and these are likely to be genotype-dependant.

Interactions between nutrition, day length, age and the ram effect all impact on conception.

For more information contact Leo Cummins by email on leo.cummins@nre.vic.gov.au, phone (03) 5573 0900 or fax (03) 5571 1523.

Further reading

For more information on joining ewe lambs, see *Farming Ahead* No. 119, page 61.

Deep Litter Shed Project has commenced

The "Deep Litter Shed" project has commenced at VIAS, with the introduction of 360 weaner pigs under strict quarantine conditions. The purpose of this project will be to determine why pigs housed in large groups in deep litter pens often grow faster than pigs housed in conventional pig production systems. This project will be completed by June 2005. Preliminary results will be available by the end of the year. Further info: Ray King (03) 9742 0441

Pig Health Monitoring Annual Report

The Pig Health Monitoring Service 2002 Annual Report has been produced by the Pig Health Research Unit at DPI, Bendigo and is available from Karen Moore on (03) 5430 4534

Proteomics workshop at the South Korean National Livestock Research Institute (NLRI)

Proteomics is the study of proteins within the cells that make up animals. The term 'proteome' refers to the proteins that are expressed from the genome. Individual proteins maybe up or down regulated, or switched off all together, which results in a change in animal phenotype. Dr. Matthew McDonagh of VIAS, Werribee has recently established a state of the art proteomics facility through the Growing Victoria Infrastructure program. As a result of this work, Matthew was invited by scientists at the South Korean NLRI to undertake a 2-week workshop to develop techniques to apply this technology to research on muscle growth. The direction of muscle research in Korea is well aligned with that in VIAS, and a collaborative research approach is being developed. The future outcomes of this work will help us understand on-farm animal production with the view to meet market specifications.
Further info: Dr. Matthew McDonagh (03) 9742 0444

Successful first year for LambCheque

Despite the dry conditions, four groups, with 69 participants successfully completed year 1 of the 3-year program. The groups are predominantly located in the Western District around the areas of Coleraine, Winchelsea/Barwon, Balliang and Derrinallum LambCheque is based on the similar program BeefCheque, which started in Gippsland 9 years ago. Year 1 of LambCheque focuses on acquiring Prograze skills, year 2 looks at the establishment of a focus farm and year 3 looks at financial analysis and benchmarking.
Further info: Sally Murray (03) 5430 4442

Meat Industry Worksafe Project

Worksafe Victoria have initiated a project to reduce O,H&S injuries in the meat industry. Co-investors of this project are MLA and Victorian meat processors. DPI are contributing technical expertise to the project.
Further info: Stuart Baud (03) 9742 0441

Snapshot of the Maternal Central Progeny Test Project

The lamb industry recognises that using high performance terminal sires improves returns, however, using high merit maternal dams can provide even greater financial and efficiency gains. Ninety-one high performance maternal sires are being assessed in a national trial at Rutherglen, Hamilton, Struan and Cowra. The project is clearly demonstrating the differences in performance between ewes by different sires. Results show ewes from top sires can earn $50/ewe/year more in annual returns than bottom sires. Overall this means a prime lamb producer with a 1000 ewe flock could achieve up to $50,000 per year in extra returns by ensuring the ewes are of the highest genetic merit for the enterprise. The major driver is number of lambs slaughtered (ie. weaning percentage), with other traits, growth, fat and wool also contributing. Results show sires from several breeds are represented among the trait leaders (growth, muscle, leanness, wool and reproduction) and variation within breeds is considerable. For example, the range among Border Leicester sire groups is about $33/ewe/year. The project is currently in its sixth year and final results will be available in December 2004. It is anticipated that the project will demonstrate the enormous potential within the industry for improvement of maternal genetics that can be achieved by seedstock and prime lamb producers using objective measurements such as LAMBPLAN (the national genetic evaluation program for meat sheep). Data generated will be used to develop across-breed Maternal Estimated Breeding Values for the lamb industry. It is estimated that increased use of LAMBPLAN by maternal seedstock breeders could contribute to an increase in the average genetic merit in prime lamb maternal sires by 1% per annum. We envision that the MCPT will be the catalyst for improvement of prime lamb dam genetics over the next decade. Further info: Gervaise Gaunt (02) 6030 4571

Review of Saleyards QA Program

DPI has snbmitted a written report to the Review of the National Standards for the Saleyards Quality Assurance Program. The report was based on the collated opinions of Animal Health, Meat Team, Animal Welfare and Bureau of Animal Welfare and contained a number of recommendations for the continued improvement of the Saleyards QA program. Further info: Julie Simons (03) 9217 4358

CONTACT DETAILS

This newsetter is compiled by Belinda Grace on behalf of the DPI Meat Program.

Any comments, inclusion, suggestions, or mailing list enquires can be forwarded via email to
Belinda.Grace@nre.vic.gov.au

State Government Victoria AUSTRALIA

Agriculture Today

Time to focus on meat traits in the Merino

With lamb markets expanding more Merino and first cross ewes will need to be mated to meat sires, higher lamb turn-off rates must be achieved and lambs need to be finished to heavier weights.

AS demand for lamb and mutton continues to increase Merino producers are cashing in on high meat prices.

Now the race is on to further increase returns from meat by including meat traits in breeding objectives, using alternate sires and getting involved in breeding and production alliances.

During the past decade there has been an increase in matings of Merino (M) ewes to terminal sire (TS) rams and a decline in matings of crossbred ewes. TSxM first cross lambs now account for 40 per cent and second cross 33 per cent of the national lamb slaughter. About 20 per cent is made up of straight-bred Merino lamb.

Today more than half of the genetic makeup of slaughter lamb is derived directly from the Merino.

As a result genetic improvement of meat traits in the Merino is critical to the international competitiveness of the lamb industry.

Lamb markets are expanding with an extra four million heavy slaughter lambs likely to be needed each year by the end of the decade — conservative estimates suggest exports will account for 50 per cent of production.

This means more Merino and first cross ewes need to be mated to meat sires, higher lamb turn-off rates must be achieved and lambs need to be finished to heavier weights (22.6kg).

An additional 1.3 million crossbred ewes will need to be mated with an increase in average lamb turn-off from the current 110 to 125 per cent, *plus* an additional one million Merino ewes mated to terminal sire rams with an increased average lamb turn-off from 80 to 85 per cent.

This increase in lamb turn-off will be achieved using a combination of management in the short term and genetics in the longer term.

Australia's large Merino ewe flock means additional numbers of first cross lambs can be produced in the short term.

In the longer term joining more Merino ewes to meat rams will impact on the number of replacement ewes available for selection in Merino flocks.

To meet these challenges there will need to be more specialist lamb production and a greater differentiation between breeder and finisher enterprises.

Selection of sires will be based on genetics to achieve faster growth and to meet carcase specifications for weight, fat and muscle/meat yield.

Meat traits are moderately to highly heritable and will respond to selection. Studs with clients who derive significant income from meat production should consider including meat traits as well as wool traits in their breeding objectives.

Implications

Flock structure A key factor determining the proportion of ewes that can be mated to meat sires is lambing percentage in the Merino flock. The higher the lambing rate, the fewer ewes need to be mated to Merino rams to maintain the Merino ewe flock. The remainder of the ewes can then be mated to meat rams to produce first cross lambs for sale or slaughter.

Lambing percentage The reproductive rate or lambing percentage of the ewe flock affects the total number of lambs produced. A higher lambing percentage means more ewes are available to be mated to meat rams. These ewes will also produce about 10 per cent more first cross lambs than if they had been mated to Merino rams.

Selection of meat sires There is variation in the growth and weight of lambs from different sires. It is important to select sires with high genetic merit for growth so lambs can be turned off sooner and at heavier weights.

If carcase traits (fat and muscle) are important in your lamb market they should also be considered when selecting rams. Most terminal sire ram breeders use LAMBPLAN, and can provide EBVs for weight, fat and muscle.

Maternal traits (reproduction and wool) should also be considered in selection of rams to produce first cross breeding ewes. Growth and carcase traits are important because the first cross wether progeny are sold for slaughter and these genes are also passed onto the second cross lambs.

Finishing lambs Good management and nutrition (quantity and quality) are essential to finish lambs to the required market specifications. Good quality pasture needs to be saved for weaners and irrigation or supplements may be needed to ensure good lamb growth.

■ **This article is based on a paper presented by NSW Agriculture senior research scientist Neal Fogarty at the recent QPLU$ open day at Trangie. Copies of the proceedings are available by phoning (02) 6880 8000.**

Mallee Ag News 11/7/02

What is a Ewe Worth to You?

Gervaise Gaunt and Shyamal Das, NRE Lamb Industry Officers, Rutherglen and Swan Hill.

Over the last year prime lamb producers have been enjoying record returns from their enterprises. The downside of this is that prices for replacement breeding animals have also increased forcing producers to question the gains from spending more money on replacement breeding stock.

Now that lamb is reaching a higher market price, producers need to look at the economics of replacement stock and ask themselves how much is too much to pay for replacement ewes. In other words, what is the difference in returns on investment from an "average" priced dam compared to a more "expensive" higher priced and "more highly productive" dam.

Table 1 shows the overall key performance indicators of the Australian lamb industry. Genetic improvement has played a key role, in addition to market development in the improvement of Australia's lamb industry. Genetic improvement of terminal sires initiated by LAMBPLAN® for prime lamb production has been paramount. When Australia is faced with the challenge of supplying an extra four million heavy lambs each year to satisfy expanding markets, producers cannot ignore the additional gain that can be made by using superior maternal genetics.

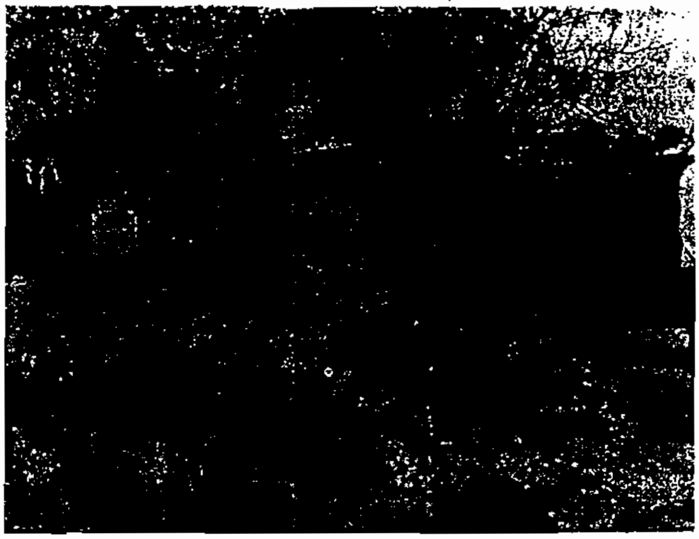
Over the last decade, state governments and Meat and Livestock Australia have funded genetic improvement programs. One such program is the national Maternal Central Progeny Test (MCPT) being conducted at Rutherglen and Hamilton in Victoria, Cowra in NSW and Struan in S.A. The MCPT aims to demonstrate and quantify the variation between maternal sires evaluated in this muti-state trial.

The MCPT is currently assessing 91 "top" maternal sires from various breeds, for example, Border Leicester, Finn, Coopworth and East Fresian, that are used for 1st cross ewe production. Production traits of reproduction (1st cross ewes), carcase (1st cross wethers and 2nd cross lamb progeny) and wool (1st cross ewes) are assessed.

Results show that the maternal sire has a significant impact on lamb enterprise profitability. Mid-way though a six-year project preliminary results comparing the first year's intake of 12 sires, have shown gross returns from top sires are worth 23 percent more than the average of all ewes. In monetary terms, the top sire produced $88 per year, per ewe joined, compared to the bottom sire which returned $53 per year, per ewe joined. The overall average gross returns for all ewes joined, per year was $68. Prices are based on the national five-year average for lamb carcases ($1.95 kg), skins and wool (1995-2000). The difference would be even greater if current high lamb prices were used.

The major driver of dollar returns is the number of lambs slaughtered (that is, weaning percentage), with other traits of growth, fat and wool also contributing. In the MCPT, lamb carcases contribute to 62 percent of returns, lambs skins 12 percent and 26 percent for wool from 1st cross ewes.

The average weaning percentages from 1st cross adult ewes from different maternal sire groups have ranged from 35 percent to 167 percent. Several breeds are [illegible]



• A typical Ewe Sale Day at Wycheproof Saleyard.

performance such as LAMBPLAN® EBVs is an important criteria for progressive prime lamb producers to ask for when buying replacement ewes.

In a traditional ewe sale the age of ewe, quantity for sale and breeder's name are provided. Often the size and uniformity of ewes in sale lots vary considerably. Smaller ewes can be due to several reasons such as being a product of multiple births, they have had a nutritional setback, or they are from a late district and are not mature. However, this may not only be due to environmental factors, as poor genetics also play a role. All these reasons will affect the ewes' future performance. Some might perform above expectation and those with poorer genetics will perform below expectation.

A desire to be performance driven has brought lamb producers and prime lamb ewe breeders closer. There are several examples where producers and breeders have discussed their needs, formed alliance of mutual benefit and prompted breeders to breed ewes with measurable performance. Examples are South-West Prime Lamb Group in Victoria and South Australian 1st Cross Ewe Breeders Association, [illegible]

MCPT Field Day contact your local Lamb Industry Officer.

More information about MCPT trial findings, maternal genetics news and related research are published in a newsletter titled "Dynamic Dams" and can be obtained from the LAMBPLAN website http://lambplan.com.au/mcpt

[illegible] Indicators of the Australian Lamb Industry (at 30 June 2001)

	1990	2001
Total lambs slaughtered (m)	15.9	18.9
Av Carcass Wt (kg)	17.5	19.7
Lamb Marketed OTH (m)	0.15	5.6
No. of Branded Lamb Alliances	0	24
Lamb sold through all Alliances	0	2.0
No. of Lamb Producer Groups	0	72
Producer Group Members	0	1973
Volume of Exports ('000 tonnes)	[illegible]	115
Value of Exports ($A m)	104	506

Stock & Land
5/9/02

Pricey dams boost enterprise profitability

By GERVAISE GAUNT

LAMB producers have been enjoying record returns from prime lamb enterprises but prices for replacement breeding animals have increased.

That has forced producers to question the marginal gains between higher priced and more highly productive dams compared with average priced dams.

Research supports paying a higher price to obtain high performance prime lamb dams, with lambs from 1000 superior dams grossing $100,000 more than 1000 average quality dams over five years.

The high performance dams usually returned the additional cost paid in their first year of production.

High performance dams can be obtained by buying structually sound stock from breeders who use performance records and objective measurements such as Lambplan.

Producers are advised to identify and rank production traits such as reproduction, growth, leanness and wool.

Contract matings can provide more control over dam genetics and will provide an opportunity to obtain optimum dam genetics.

Over the past decade, state governments and Meat and Livestock Australia (MLA) have funded breeding improvement programs such as the national maternal sire progeny test (MCPT) at Rutherglen and Hamilton, Cowra, NSW and Struan SA.

This aims to demonstrate and quantify the variation between maternal sires evaluated in this multi-state trial by looking at 91 top maternal sires from a range of breeds. They include Border Leicesters, Finns, Coopworths and East Fresians.

These are used for first-cross ewe production and key production traits including reproduction (first-cross ewes), carcase (first-cross wethers, second-cross lamb progeny) and wool (first-cross ewes) are being assessed.

The results show the maternal sire has a significant impact on lamb enterprise profitability.

Preliminary results of the six-year trial, now into its middle stage, show gross returns from ewe progeny groups of top sires are worth 23 per cent more than the average of all ewe progeny produced in the trial.

The top sire produced $88 a year for each ewe joined, compared with the bottom sire which returned $53 a year for each ewe joined. The overall average gross returns for all ewes joined was $68 a year.

Prices are based on a national five-year average for lamb carcases ($1.95 kg), skins and wool (1995-2000). The difference would be greater with current high lamb prices.

The major driver of dollar returns is the number of lambs slaughtered (the weaning percentage), with growth, fat and wool also contributing.

Lamb carcases contributed to 62pc of returns, lambs skins 12pc and 26pc for wool from first-cross ewes.

The average weaning percentages from first-cross adult ewes from different maternal sire groups have ranged from 35pc to 167pc.

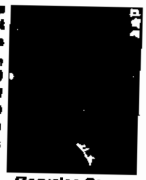
Several breeds are represented in the top trait and the same breeds are also represented in the lowest ranks.

■ Gervaise Gaunt is a research scientist based at the Rutherglen Research Institute.

More money in 'Superior' dams

Record prices for prime lambs have pushed up prices for replacement prime lamb mothers. That has forced many producers to question the value for money spent on an 'average' priced dam compared to a higher priced and generally more highly productive dam.

Gervaise Gaunt, a research scientist at NRE's Rutherglen Research Institute, says research supports paying a higher price for high performance prime lamb dams compared to average dams.


Gervaise Gaunt

In fact, the research shows that lambs from 1000 'superior' dams compared with lambs from 1000 'average' dams will make the prime lamb breeder $100,000 more in gross returns over five years.

"High performance dams usually return the additional cost paid in their first year of production," Gervaise says.

Over the last decade, State governments and MLA have funded breeding improvement programs. One of these is the national Maternal Sire Progeny Test (MCPT) conducted at Rutherglen and Hamilton (Vic), Cowra (NSW), and Struan (SA).

The MCPT aims to quantify the variation between maternal sires evaluated on economically important traits such as reproduction, carcase merit and wool. The MCPT is currently assessing 91 'top' Border Leicester, Finn, Coopworth and East Friesian, 'maternal sires' used in first-cross ewe production.

[illegible] first year's 12 sires, has shown gross returns from ewe progeny groups of top sires are worth 23% more than the average of all ewe progeny produced in the trial," Gervaise says.

The top sire produced $88/year/per ewe joined, compared with the bottom sire, which returned $53/year/per ewe joined. The overall average gross returns for all ewes joined, per year was $68. Prices are based on national five-year average for lamb carcases ($1.95 kg), skins and wool (1995-2000). The difference would be more with the current higher lamb prices.

Gervaise says the major driver of dollar returns is the number of lambs slaughtered (weaning percentage), with growth, fat and wool also contributing.

In the MCPT overall, lamb carcases contributed 62% of returns, lambs skins 12% and 26% for wool from first-cross ewes. The average weaning percentages from first-cross adult ewes from different maternal sire groups ranged from 35-167%.

Several breeds are represented in the top trait leaders, and the same breeds are also represented in the lowest ranks.

One of the best ways of obtaining high performance ewes is to become involved in contract mating, Gervaise says. This provides the opportunity to obtain high performance ewes bred specifically for a production system and market objective.

Contract mating is an agreement between various partners, resulting in the production of first-cross ewes. There is no limit to the number of partners that can be involved in contract mating – these include first-cross ewe breeders, first-cross ewe buyers, maternal seedstock producers, processors and agents.

The contract can include genetics, health, management, delivery and pricing. But for a contract to be successful, good communication and trust between partners is essential, Gervaise says.

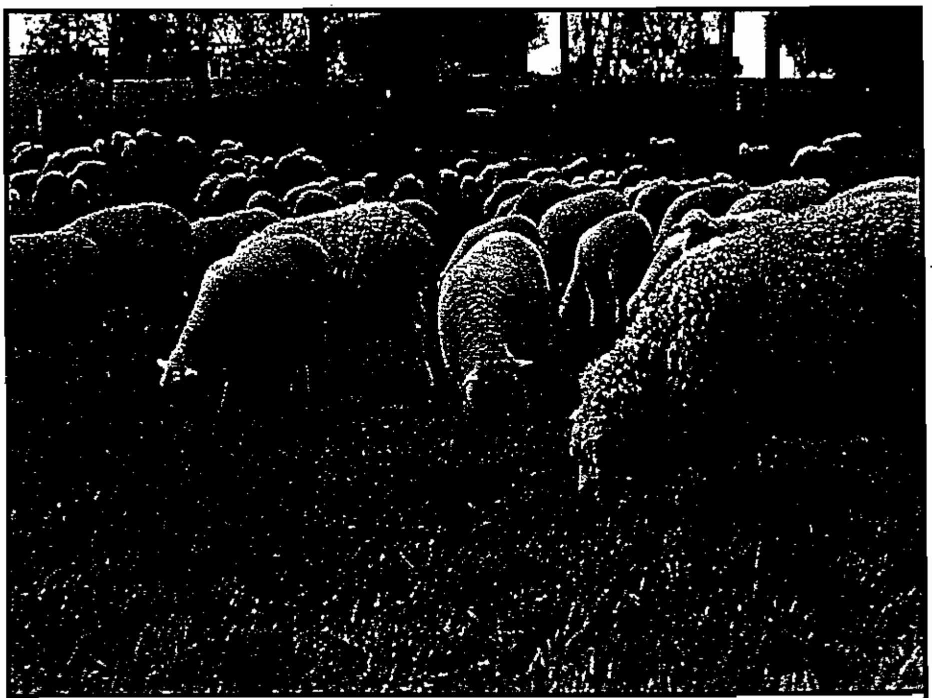
More information can be obtained from the LAMBPLAN website http://lambplan.une.edu.au/mcpt or contact NRE directly to be included on the mailing list for the MCPT Dynamic Dams newsletter.

Contact: Gervaise Gaunt 02 6030 4571.

Contract Mating
~the key to obtaining the "best" prime lamb dam genetics.

Results arising from the Maternal Central Progeny Test (MCPT) funded by MLA and NRE, have shown additional investment in high performance dams is justified. In the last edition of Marksman News (Winter 2002), results were presented that showed high performance dams would easily return the additional price paid plus more. One of the best ways of obtaining high performance ewes is to become involved in contract mating. This provides the opportunity to obtain high performance ewes that are bred specifically for a production system and marketing objective.

Contract mating is an agreement between various partners, resulting in the production of first-cross ewes. The contract is organised well in advance and is written to ensure it is a win/win arrangement between partners. There is no limit to the number of partners that can be involved in contract mating – these include first-cross ewe breeders, first-cross ewe buyers, maternal seedstock producers, processors and agents. It can also be between groups of buyers and breeders and include strong involvement from a group of maternal seedstock producers, which supply maternal sires to these groups. Components of the contract can include genetics, health, management, delivery and pricing.



MCPT Ewes and Lambs
Photo: John Schneider

Advantages of contract mating are numerous. Incentives are provided to first-cross breeders to improve genetics and implement additional management practices. Increased feedback and enhanced communication flow will lead to continuous genetic improvement. Participation in contract mating ensures known flock health status, a guaranteed market and assists in financial planning. Improving genetics of first-cross dams, wethers and second-cross lambs will result in a superior breeding and meat product that will provide partners with greater marketing advantages and increased profitability. For a contract to be successful, good communication and trust between partners is essential.

For more comprehensive guidelines on contract mating please contact:

Gervaise Gaunt
☎ ***02 60304571***
Rutherglen Research Institute
Gervaise.Gaunt@nre.vic.gov.au

The LAND 4/7/02

Measurement's nothing new

OBJECTIVE measurement in the show ring is not a new phenomenon — Poll Dorset breeders started the trend as far back as in 1972.

Retired breeders, Ross and Veeda Faulks, Cootamundra, and Fay and John Wright, Cowra, were among the group of breeders whose sheep provided much of the research which went into the creation of Lambplan.

Originally part of the Cowra Show itself, the Poll Dorset exhibitors were keen for competition to go beyond the decision of one man on the day.

"We were trying to get away from one being a better presenter or a better feeder than the others," Mr Wright said.

So at each show breeders would enter six ewe lambs to be run together at the NSW Agriculture research station for 12 months before competing at the following year's show, with still pictures and a rule used to measure fat depth before the development of scanning.

Ross and Veeda Faulks of Cootamundra, formerly of Oura Poll Dorset stud, Cootamundra, with Fay and John Wright of Cootamundra, formerly of Cindy-Lou Poll Dorset stud.

Breeders funded the feeding of the stock, which offered scientists a valuable research tool to develop what became the sheep meat testing service.

This form of competition continued until 1988 — not long before the launch of Lambplan.

Both the Faulks and Wrights are now retired from their respective studs, Oura and Cindy-Lou Poll Dorset.

Balancing maternal genetics with carcase traits

Focusing on ewe flock genetics has been further refined since tapping into the results of the Maternal Central Progeny Test (MCPT) for NSW sheep breeder Graeme Golder.

Based in a typical mixed farming area on the south-west slopes Mr Golder runs three sheep enterprises on his 1,200 hectare property, 'Avondale'. Along with a Border Leicester stud, 'Kegra', a first-cross ewe breeding business and a commercial enterprise selling first-cross wether lambs over the hooks, Mr Golder also grows wheat, canola and stock feed.

Ever since Mr Golder began breeding Border Leicester sheep in 1979 he has been looking at the genetics of his flock but it really kicked into gear with the evolution of maternal estimated breeding values (EBVs), developed and now available through LAMBPLAN.

"The maternal LAMBPLAN made it easier to trace which sheep were genetically superior for the number of lambs weaned – it was backed up by the maternal central progeny test results," Mr Golder said.

The Maternal Central Progeny Test (MCPT) began in 1997 at Cowra, NSW and sites at Hamilton and Rutherglen in Victoria and Straun in SA.

The test set out to evaluate the differences in the production and dollar returns from the first-cross progeny of 91 sires.

Sires are entered into the program by breeders, including Mr Golder, and cover several breeds including Border Leicester, East Friesian, Finnsheep, Coopworth, White Suffolk and Corriedale.

While the MCPT had clearly brought home the message that some sires have a lot of lambs born, many of those weren't being reared to weaning. It's an issue Mr Golder had been very aware of for a number of years.

The Golders' property is next to a wildlife sanctuary where fox numbers were causing high losses from predation.

So it became important for Mr Golder to start making notes of which ewes stay and protect their lambs and which ones had a tendency to be less protective of their offspring. He is giving them a grade from 1-5 for their mothering ability and is using this information for selection in his flock.

NSW Border Leicester breeder Graeme Golder and his son Chris tag twin lambs to ensure accurate performance records are provided to LAMBPLAN.

"Concentrating on maternal genetics revolves around the number of lambs at the end of the day," Mr Golder said.

The maternal genetic information now available through maternal EBVs became another 'tool in the tool box' for Mr Golder.

> *"It's a balancing act to breed maternal breeds. You can't select only on maternal traits, it is also vital to have good carcase traits."*

"You can't tell the fertility of a sheep or a ram by looking at it. You can't tell the milking ability of his female offspring by looking at him," Mr Golder said.

Mr Golder provides accurate records to LAMBPLAN who collate the figures and subsequently provide the EBVs on the individual animals.

"These sort of facilities are worth it. We wouldn't be able to do it as accurately as we are now without them," Mr Golder said.

To better measure the dollar returns from maternal sires Mr Golder and 12 other Border Leicester breeders set up the SuperBorders group three years ago.

Recently retired as Chairman of the SuperBorders group Mr Golder said taking the guesswork out of selecting rams and providing a dollar index on the maternal side was the driving force behind the group.

The group now has 20 members who provide records to LAMBPLAN to calculate the genetic merit or EBV of each animal, rated against the breed average.

These EBVs are then combined into an index, called the Border Leicester Dollar index which combines a ram's EBVs according to the actual dollar value of their progeny's extra growth, extra fertility and better carcase quality.

Mr Golder last year achieved a dollar index of 105.61 for the stud. This means that on average a ram from his stud will produce $5.61 in extra lamb value for every ewe joined. So in the working life of four years, a ram producing 200 progeny, would add an extra $5.61 x 200 or $1,122.

While Mr Golder has good numbers of lambs weaned with good weaning weights he is currently concentrating on improving maternal weaning weights or the milking ability of the ewe.

The stud flock have an average EBV of +0.069 or for every 100 ewes that are joined an extra 6.9 lambs are weaned. Weaning weights averaged +1.32 – so the progeny produced are half 1.32 or 0.67 kilograms heavier at 100 days of age.

Mr Golder explained that it's a balancing act to breed maternal breeds. You can't select only on maternal traits and that it was also vital to have good carcase traits.

"Concentrating on maternal genetics revolves around the number of lambs at the end of the day."

"First and foremost the sheep has to look right – it is no good to breed a sheep if it hasn't got a carcase that the industry needs. The carcase has to hang well," he said.

Mr Golder believes this balance is coming together and seems to be performing well for heavy export lambs (24-28kg).

His first consignment of first-cross lambs this year averaged 29kg. However Mr Golder was careful to point out that once lambs were around 27-28kg they tend to start laying down more fat.

Mr Golder said it was basically about getting more lambs to weaning age and having more lambs to sell.

more info

Alex Ball
LAMBPLAN
Phone: (02) 6773 2493
Email: aball@mla.com.au

Spotlight on genetic potential of ewe flock

No lamb producer would be surprised to hear that selecting the right genetics for your flock can mean a difference of up to $35 an animal.

However, he might be if this difference to dollar returns could be made by selecting the right crossbred ewe flock.

Most lamb producers take considerable care in selecting the right terminal sires to mate to their crossbred ewes. However there has generally been little objective information available when purchasing or selecting crossbred ewes.

Yet NSW Agriculture principal research scientist Dr Neal Fogarty, who heads up the Maternal Central Progeny Test (MCPT) team, said the genetic merit and performance of the ewe flock is the major driver of lamb enterprise profitability.

A new four-page tips and tools brochure, 'Tapping into maternal genetics' published by Meat and Livestock Australia (MLA) and NSW Agriculture outlines the results of the MCPT and the potential for selecting the right maternal genetics to improve your bottom line.

The MCPT compares ewe progeny of maternal sires for fertility, fecundity, growth and carcase characteristics.

"Crossbred ewes by different sires can have very large differences in production and profitability," Dr Fogarty said.

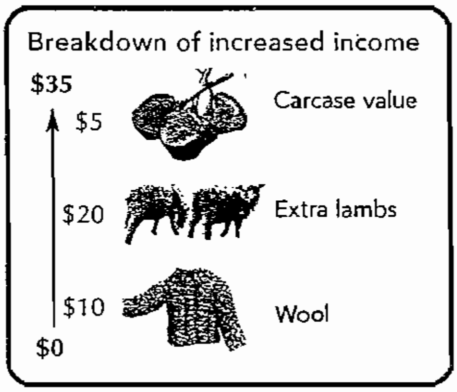
"This means ensuring your crossbred ewes are of high genetic merit and that they are from sires selected for the traits that contribute most to the profit of your enterprise."

Results from the MCPT have shown that the sire of the crossbred (first-cross) ewe has a marked effect on the:

- lambing rate of the crossbred ewes;
- growth of their second-cross lambs;
- carcase merit of their second-cross lambs;
- proportion of second-cross lambs meeting carcase specifications;
- wool returns from the crossbred ewes; and
- worm resistance of the crossbred ewes.

This adds up to a difference in returns of over $35 per ewe per year.

The brochure also outlines other considerations that can affect the overall performance and profitability of a flock



such as the size of the ewes, high milk production, spring joining ability, early puberty and wool.

MCPT results have shown very large differences in performance for all these traits from crossbred ewes by different sires. This means there is considerable scope for selecting ewes that best suit your lamb production system.

While it clearly points out that no one sire or breed is superior for all traits, a list of the variation in breeds and sires is provided. Some breed trends outlined include carcase leanness which is most apparent in East Friesian, Merino and Corriedale while lamb growth is rated most highly in Poll Dorset, White Suffolk, Border Leicester and East Friesian.

Some simple suggestions are also provided for producers to achieve greater control over the genetics of their ewe flock.

The brochure 'Tapping into maternal genetics' will be available in August and can be ordered by contacting the MLA Producer Hotline on 1800 155 900 or via the web site at www.mla.com.au.

more info

Neal Fogarty
NSW Agriculture
Phone: (02) 6391 3813
Email: neal.fogarty@agric.nsw.gov.au

NSW Agriculture TODAY Sept 2001

Maternal genetics

More, heavier lambs from good mothers

NEAL FOGARTY
Orange

EWE flocks with better genetics have higher lambing rates. Their lambs grow faster because they pass on genes for high growth and the ewes provide a better maternal environment (milk and nurturing).

Markets are becoming more specific in their requirements for carcases. For example, most export buyers require a heavy carcase but discount the price if they are over fat. This means greater returns and profit from ewe flocks with better genetics because they market more and heavier lambs, with most meeting the market specifications to achieve the highest prices.

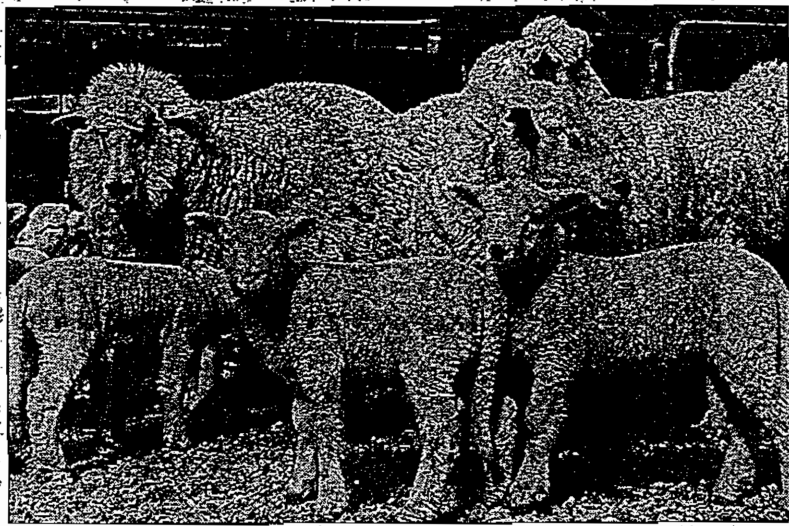
Recent research has shown differences in returns of over $35/ewe/year from groups of first cross ewes by different maternal sires. Figure 2 shows the total $ returns over three years from 12 groups of crossbred ewes at Cowra. The crossbred ewes are progeny of the same Merino ewes and 12 different maternal sires entered by seedstock breeders from several breeds in the Maternal sire Central Progeny Test (MCPT). The crossbred ewes were all mated to blue dot Poll Dorset rams and lambed together each year.

The top group of ewes (sire Border Leicester BL2) returned $263/ewe over three years. This was $105 more than the lowest group (+$35/ewe/year) and 23 per cent more than the average of all ewes. Other sires from breeds such as the East Friesian and Coopworth also had ewe progeny with high returns. It is important to note that there was considerably more variation in returns between the sire groups than between the breeds.

The top groups of ewes all had high lambing rates. Their lambs grew faster which resulted in heavy carcase weights and a greater total carcase weight sold. A high proportion of carcases met the target market specifications for the top price per kg because they were not over fat. Lamb carcases contributed 62 per cent of returns, with lamb skins 12 per cent and ewe wool 26 per cent. Lamb was a higher proportion of returns for those groups with higher lamb production eg. BL2 (81 per cent for carcases and skins).

The lambing percentage varied considerably eg. the range was 81 to 167 per cent lambs weaned per ewe joined at their third lambing. While some other groups had higher percentages of lambs born, due to more multiples, lower lamb survival reduced their lamb weaning per cent. The relative lambing performance of the ewe groups was consistent over the three years.

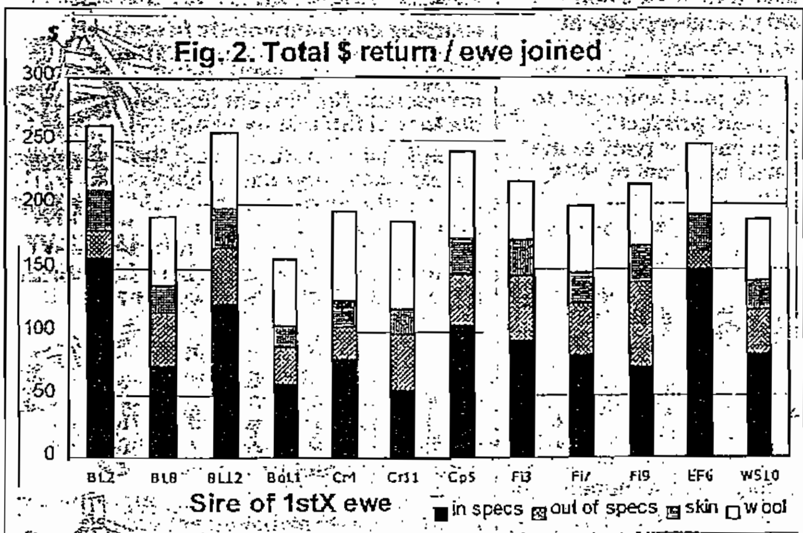
There was a range of 6 kg in average weight of lambs (43 to 49 kg) from the ewe groups, after accounting for differences in age and type of birth and rearing (single /twin). Fat levels of the carcases from the ewe groups also varied by 5mm GR, at the same carcase weight, which is a whole fat score.



Better ewe genetics means better lamb performance and more profit.

At A Glance

- Sire of the crossbred ewe dramatically affects production and returns (to $35 /ewe/yr)
- Superior sires are from several breeds
- High returns require high lambing rate
- Contract matings can allow more control over genetics of crossbred ewes



Implications

GENETICS determines the potential productivity of the ewes for all these traits. Better ewe genetics means better lamb performance and more $ profit. The task is to achieve better genetics among commercial lamb flocks.

Lamb producers need to exert greater control over the selection and genetic merit of the sires (and dams) of their crossbred ewe flock. New industry structures and breeding alliances are being developed. Contract mating using LAMBPLAN selected sires is being used by some producers and groups to achieve this.

Contact: Neal Fogarty (02) 6391 3813.

Genes secret to better prime lamb profits

By KIM WOODS

LAMB producers could pocket an extra $25 for every ewe joined by using superior maternal sires.

The first year of data from the maternal central progeny test at the Rutherglen Research Institute has revealed a carcass return per ewe joined of $54 for the top sire, and $29 for the bottom sire.

This was based on commercial slaughter rates of $1.75/kg for a 20kg carcass, fat score two to four, and $1.50/kg for carcasses under 20kg.

Rutherglen research scientist Gervaise Gaunt said if the ewes were joined for five years, the difference between the top and bottom sire would be $123 per ewe lifetime.

"If a maternal sire produces about 100 ewes in his lifetime, the difference between the top and bottom sire in this trial alone would be $12,300, and this does not take into account the income from his wether progeny," Ms Gaunt said.

"These results emphasise the huge differences and profitabilities achievable in the prime lamb industry from using correct genetics, suited to your production system."

The maternal central progeny test is conducted by state departments of agriculture in partnership with Meat and Livestock Australia.

The trial provides information on the potential of genetics to improve profitability and encourages the use of objective measurements such as Lambplan.

The trial will also identify superior sires and breeds for the maternal traits of wool, reproduction, mothering ability, growth, leanness and muscling.

A total of 91 sires are under evaluation at three sites — Hamilton, Cowra and Rutherglen.

The sires have been nominated by industry breeders and then joined to Merino and Corriedale ewes.

The first-cross ewes are retained for three matings to assess lambing and crossbred lamb progeny performance and other traits in a range of production systems.

The breeds in the first intake of the Rutherglen trial are Border Leicester, Booroola Leicester, Corriedale, Coopworth, Finn, East Friesian, White Suffolk, Hyfer and Poll Dorset.

Ms Gaunt said that while some terminal sire breeds had made genetic gains of 35 per cent through the use of Lambplan since 1989, progress in the maternal breeds had been slow.

"The lag in genetic improvement can mainly be attributed to the lack of flow of information, trading mechanisms for first-cross ewes and an unawareness of gains that can be made through improvement of the maternal sector," she said.

"There are even greater potential increases in productivity and profitability for lamb enterprises from wide use of superior maternal genetics.

"Genetic merit of the ewes determines the potential productivity of the flock and also affects carcass characteristics of slaughter lambs."

In the first year of the Rutherglen trial, the Finn cross and Hyfer cross ewes had the lowest pre-joining liveweights, although their conception rates were as good or better than other breeds with heavier liveweights.

"This emphasises the importance of purchasing ewes from sires with the ability to breed highly fertile daughters as well as the importance of peak condition at joining, to achieve maximum lamb turn off for increased profitability," Ms Gaunt said.

In addition to high conception rates, the Finn cross ewes in the Rutherglen trial also had a high incidence of multiple births, resulting in more lambs turned off for each ewe.

But, the poor survival rate of lambs from Finn cross dams, mainly due to mismothering, needed to be addressed, Ms Gaunt said.

• A discussion on the value of improving prime lamb dams, dam alliances and marketing, and a display of the progeny test ewes and lambs will be held at the Rutherglen Research Institute field day on September 6.

Livestock Border Leicester Review

Why any old ram won't do

RESULTS from the Maternal Central Progeny Test at the Cowra Research Station have shown Border Leicesters to be a superior sire over Merino ewes, to produce prime-lamb mothers.

The test, an independent analysis of maternal breeds and rams in the prime lamb industry, was set up to compare the value of all modern breeds over Merino ewes, to produce first-cross ewes.

Although results are slow to come in, at least one round of ewes has completed three lambings, and from that round the top two rams were Border Leicesters, on the basis of dollar returns for each ewe joined.

This figure was more than $250 a ewe, with returns based on five-year average prices for lamb, skins and wool.

The top Border ram gave returns of $263/ewe, $105 more than for the bottom ram.

From the same trial came the conclusion that choosing the best ram was more important than choosing the breed.

There was a big variation in returns from the various rams within a breed: not all the Borders were the best, and the same went for other breeds.

The message is that prime lamb producers can't choose any old ram — that they have to go for quality, by purchasing rams from studs that care about their breeding and are working on genetics.

The breed is also starting to meet demand among prime lamb producers for ewes with a measured genetic merit.

Estimated breeding values are being identified in rams and through to first-cross ewes, so producers working to a specification over-the-hooks market can buy the types of ewes they need.

■ **Contributed by Allan Wilson, secretary of the Australian Border Leicester Association.**

INNOVATIVE ALLIANCE CREATES A WIN WIN SITUATION

A prime lamb producer in the South East and a Merino wool producer in the Adelaide hills have joined forces in a commercial alliance to produce first cross prime lamb mothers of high genetic merit.

Tom Megaw, who runs a prime lamb enterprise at Allendale East, south of Mount Gambier was keen to buy in replacement ewes with high genetic merit. He usually purchased replacement ewes at off-shears sales. However, although this is a very common practice in the prime lamb industry, the purchaser generally has no idea of the genetic worth of the ewes that he has purchased.

Mr Megaw, with the assistance of livestock agents Westfarmers Dalgety, arranged to provide rams that were 75 percent Coopworth and 25 per cent East Friesian to Angus McLachlan of "Rosebank", Mount Pleasant in the Adelaide Hills. Mr McLachlan mated these rams to 4.5 year old large framed South Australian ewes with wool of about 23 microns fibre diameter.

The rams were purchased by Mr Megaw from "Oaklea" stud owned by Mr and Mrs Don Pegler of Kongerong, near Mount Gambier.

An agreement was made for Mr Megaw to buy back the female crossbred progeny on a live weight basis with a minimum weight being specified in the agreement. The agreement specified that all rams be subjected to a veterinary inspection prior to going on Mr McLachlan's property.

On November 1, 2000, 450 crossbred ewe lambs arrived on Mr Megaw's property. They averaged 37 kg live weight and had been shorn, drenched, ear-tagged and vaccinated prior to their arrival. They were grazed on good quality pasture and when that became scarce, subsequently supplementary fed.

They were mated to Poll Dorset rams in the first week of February, 2001. At that time, their average body weight was 43 kg.

This arrangement has worked out well for both parties.

Mr Megaw has obtained good quality crossbred ewes which should suit his operation. The Merino mothers of these lambs are good quality, large framed animals. The sires of the lambs should contribute valuable traits for crossbred ewes as the Coopworth is well known as being a highly fertile breed with excellent mothering ability and the East Friesian is also highly fertile with excellent milk production.

Mr McLachlan finds that the season dries off quickly on his property and consequently, often has difficulty managing lambs over summer. This arrangement allows the weaner lambs to leave the property prior to summer and thereby simplifies the sheep management on the property.

The alliance described is an example of the benefits that can accrue through prime lamb producers linking up with Merino producers in drier areas for the mutual benefit of both.

Ian Sanderson

CHEVIOTS

MATERNAL SIRES PROGENY TEST

Grand Ridge Cheviot Stud principal Rob Waddell, Seaview, Victoria has entered his ram Greyoaks L92-91 in the Maternal Sires Progeny Test.

Over 80 rams of various breeds from all over Australia are being tested in trials at three sites in Victoria, South Australia and New South Wales.

The trial which commenced in 1999 has two years to run with the program including first cross ewe matings. Details of the trials are available from Dr. Neal. Fogarty, Orange Agriculture Institute and are reported in The Muster at regular intervals.

So far Greyoaks L92-91 (CH66) has been performing very well with above average ratings for fat, eye muscle and worm count.

- Fat: 0.9 mm
- Weight: 2-4 kg
- Eye muscle area: +0.6 cm²
- Faecal worm count: -2.5

The ram had the lowest worm count of all the rams tested, making it the most highly worm resistant entry.

Further wool data shall be released at a later date so we shall look forward to the Cheviot's performance.

Aug 2001 No 52

Road test to shape future

WHAT type of first-cross ewe is the best?

This question and others might be answered in trials of new breeds of first-cross ewes at the Elmore field days.

Dedicated prime lamb producers want lambs that grow faster and turn out leaner.

The Elmore field days committee, in co-operation with the Campaspe Prime Lamb Producers Group, is comparing two new breeds of first-cross ewes against the Border Leicesters.

Will East Friesians or Finns be better?

The first large-scale trial of these breeds in Australia will start this year.

The trial aims to find super-ewes capable of:

- Producing 148 per cent of lambs each year from a May lambing.
- Achieving growth rates of 350g a day (10kg a month).
- Making carcass weights of 24kg at 20 weeks (50kg liveweight).

Elmore Field Days Preview

- Producing carcasses with no more than 15mm (fat score 3) of fat.

The project will look at financial and physical differences between producing lambs from three different maternal lines of ewes, evaluate their suitability to the environment and increasing the proportion of prime lambs meeting target specifications.

The first-cross ewes were produced under contract for the Elmore field days trial at Deniliquin last year.

The ewe lambs were bred from 900 Merino ewes and run under identical conditions.

The lambs were grown out at Elmore to a weight of 50kg liveweight and joined to Poll Dorset rams from February 1.

Lupins were fed at 200g a day throughout January, at a total cost of $1.20 a head.

The lupins led to a weight gain of 5kg throughout January, ensuring the lambs reached the 50kg benchmark before they were mated.

Poll Dorset rams were selected from one stud (Wyndamah) using the genetic selection package LambPlan.

LambPlan enabled the selection of similar rams, summarised in the Estimated Breeding Values of Poll Dorset Ram Team table.

The ewe lambs were mated for seven weeks and began their lambing on July 1.

The ewes were pregnancy scanned 80 days from the start of the joining period with above-average results achieved.

An average of 146 per cent pregnant with 8 per cent dry ewes means it might be possible to aim for greater than 120 per cent lambing from maiden ewes.

The East Friesians had the highest pregnancy rate at 152 per cent, while the Border/Finns had the lowest at 138 per cent.

While there are differences in the pregnancy rate between breeds, the most important factor is the final selling percentage, which will determine the ewe's mothering ability and true value.

The average weights of the ewe lambs were similar (see the weights/pregnancy scanning table).

However, the Borders were one fat score better than the other two breeds and might influence the milking ability of the Borders — and therefore lamb growth rates.

The ewes were shorn with nine months of wool growth on June 20 (see the results table).

The East Friesians cut 0.4kg less wool than the Borders and Border/Finn ewes and therefore had a lower return per ewe of $14.36 verses $15.70, a difference of $1.38.

All fleece lines were valued visually.

Core testing of the lines will be available at the field days, along with a display of average fleeces.

WOOL SHEARING RESULTS 2001

	Borders	East Friesians	Border/ Finns
Total ewe numbers	108	113	100
Fleece kg/ewe	3.40	3.06	3.31
Total value of wool @ $3.60/kg	$15.74	$14.36	$15.70
Difference in total wool value $/ewe	0	-$1.38	0

On test: fast-growing and lean lambs are the object of the Elmore ewe trials.

All ewes and lambs will be displayed at the shearing shed on the corner of Corop Drive and 10th Avenue at the field days.

More information on lambing percentages and lamb growth rates will be available then.

Some of Australia's leading researchers into maternal genetics will also be available to discuss future trends for, and advances in, the prime lamb industry.

The researchers will deliver 15-minute presentations throughout the field days highlighting how all second cross lamb producers can take advantage of advances in new genetics for the prime lamb industry.

AVERAGE EWE WEIGHTS AT PREGNANCY SCAN

Date 17/1/01	Total % single	Total % twin	Total % dry ewes	Pregnancy %	Total pregnant
Borders	38.31	55.14	6.5	148.8	
Finn/Borders	35.24	512.43	13.0	138.1	146.3
East Friesians	39.28	56.25	4.5	151.8	

EBVs OF POLL DORSET RAM TEAM

Lot/No.	Estimated Breeding Values YWT (growth)	YFAT (fat)	YEMD (muscle)	Index 60.20.20
72/42	4.9	-0.40	0.3	133
73/82	5.3	-0.40	0	130
74/192	5.3	-0.30	0.1	131
127/438	4.9	-0.50	0.1	131
131/529	5	-0.80	0	133
137/498	5.6	-0.70	-0.1	133
Average	5.2	-0.52	0.07	132

Simple premise: Kate Joseph says the key to a group lamb trial is to build relationships and develop trust.

In the driving seat for profit

At a glance

Kate Joseph
Enterprise: Prime lambs
Special feature: The cutting edge of lamb production
Report: JOHN PARRY

PROFIT drivers in prime lamb production are no secret to industry stalwart Kate Joseph.

"The more lambs you can get on the ground and the heavier you can get them by sale time, the higher the profit," Kate said.

The Tyrenderra lamb producer and driving force behind the South West Prime Lamb Group told the annual BeefCheque workshop in Gippsland recently that the concept was simple in concept but challenging to achieve.

The lamb group has 50 members in the Heywood-Condah-Portland area and one of its key activities is benchmarking to compare production and financial performance.

Kate said gross margin results over five years had shown that it was not necessarily high overheads that brought small properties undone.

The top three members in the 25-member benchmarking group had sheep enterprise costs that were not the lowest, their stocking rates were only just above average and there was very little difference in price per kilogram received.

"Despite this, the gross margin for the top three was $165/ha better than the average for the group," Kate said.

"What gave them the leverage? Lambing percentage and time of lambing."

"The more lambs on the ground and the heavier the lambs at sale time, the higher the profit."

She said the other spin-off from benchmarking was the cost of production.

"Nothing frustrates me more than producers crying poor and whingeing about not making a living when they don't know what it costs to produce a kilogram of meat.

"How can you budget and improve your bottom line without this basic information?"

Break even price or cost of production for the benchmarking last financial year ranged from $1.25 to $3.30/kg.

"The average was $2.09, and that's why people don't want to work it out.

"It can be very depressing when the average price that year was $2.10."

Over the past year, the lamb group has set up a 60ha focus farm to demonstrate grazing techniques and production methods to produce 1000kg liveweight of lamb per hectare per year, within three years.

"It's ambitious when you consider our best producer is doing just over 500kg/ha."

Kate said best practice was being applied to all aspects of the property.

"The premise is that no one does everything right but different producers achieve best practice in different areas."

One of the group's less successful projects was to develop a link network with first cross ewe breeders to supply replacement ewes.

Most prime lamb dams bought by group members are bought from the Naracoorte sales. But, while lamb producers have a lot control over the choice of sires using objective measurement, the choice of our dams is left to chance.

"We have been working with a group of South Australian breeders to develop methods of measuring ewe performance," Kate said.

"We wanted to show the breeders that supplying replacement ewes is a specialist business and that there is a market for well-bred sheep."

Kate said the key to the project was developing relationships and building trust, but this had been difficult.

"Most SA first cross breeders do so ad hoc as a by-product of wool production," Kate said.

"Very few have any understanding of Lambplan and sire selection and they don't see any advantage in paying extra for better rams when they sell their animals."

Even though no alliances were achieved, Kate said the project had allowed group members to better define traits they required in their replacement ewes.

One of the group's most successful ventures has been the Southern Agricultural Producers Co-operative formed 18 months ago to gain control of marketing.

"We felt we were spending 18 months producing a lamb only to lose control at the important stage of marketing," Kate said. "Our aim was to show processors we could supply them with a product they required."

SAPCo has a six-member board and one external director.

"We have sold about 80,000 lambs since formation worth $3 million and membership has grown to 36 producers."

All lambs are individually assessed and sold into an appropriate markets through six different processors.

Kate said the business was structured to market other agricultural products and accept members from anywhere in southern Australia.

While SAPCo is an initiative of the lamb group, it is run as a fully commercial business.

Weekly Times July 11, 2001

Trial points the way

KONGORONG, between the South Australian coast and Mt Gambier, is one those lucky farming districts.

Kongorong's soils are deep, its climate mild and its 800mm rainfall reliable.

Local prime lamb producer Trevor Little reckons you can just about produce anything in the district.

While many of his neighbours are milking cows, breeding and fattening cattle and growing pine trees, Trevor has been quite happy to stick with lambs, following suit from his father who settled the 300 hectare property in 1949.

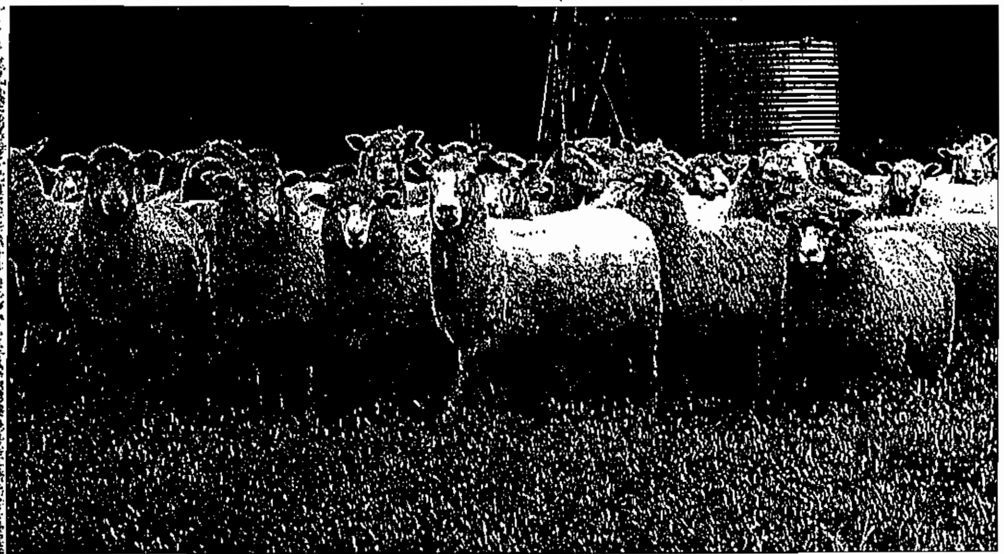
But while prime lambs had been profitable for many decades, Trevor found that rising costs, even in places like Kongorong, meant you couldn't afford to rest on your laurels.

It was in 1993 that Trevor agreed to allow his property, Windiknowie, and flock to participate in a Grassland Society of Victoria productivity demonstration trial to boost pasture and lamb numbers.

At a glance

Trevor Little
Enterprise: Prime lambs
Special feature: Striving for productivity gains
District: Mt Gambier (SA)
Report: BRIAN CLANCY

Geoff Saul, from Hamilton's Pasture Research Institute, took charge of the pasture work, while Dr Colin Earl, from South Australia's Struan Research Station, took charge of boosting flock productivity.



Meat and greet: Trevor's sheep returned a Viascan reading of 13.3kg for lean meat yield.

A control paddock and flock were compared alongside a productivity paddock and a flock of the prolific Booroola cross-bred ewes.

The productivity paddock involved extensive pasture renovation and a doubling of an application of GoldPhos to a rate of 110kg/ha.

The control paddock was stocked at 7.1 ewes (Border Leicester-Merino) per hectare while the productivity paddock was at 8.9 ewes (Booroola cross).

The control flock had a lamb weaning percentage of 122 and average lamb weaning weight of 49kg live.

The productivity flock had a weaning percentage of 136 and weaning weight of 52kg.

But, more importantly, after accounting for pasture renovation and additional fertiliser costs, the productivity paddock produced a gross margin of $613 as against the control's $425.

Those results left an indelible mark on Trevor.

Lessons from the productivity trials are incorporated in his current farm strategies.

While the gross margin figures have been affected by rising costs, the current higher prices for lambs have more than compensated.

Trevor is now running 1700 ewes, including 200 with the Booroola strain, and, this season, hopes to market 2000 lambs.

The first consignment was contracted to the Tatiara Meat Company last month. They averaged 25.44kg and returned $92.

But what Trevor found more exciting was that they returned a Viascan reading of 13.3kg for lean meat yield.

With a yield above 50 per cent, Trevor can't wait for the day when he will be paid on a lean meat yield basis.

Trevor buys replacement ewes from annual Naracoorte sales and paddocks are set stocked.

Ewes are joined in December-January to Poll Dorset rams and matings are staggered every two weeks to avoid a peak lambing.

Trevor Little

Ewes are [illegible] in May before lambing. Lambs are left on their mothers up to the point of marketing.

"If you wean them, a lot of lambs will fret and suffer a temporary setback," Trevor said.

Lambs that are not ready for selling by December — about 10 per cent — are shorn and held over for fattening and marketing by early autumn.

As for problems, Trevor reckons that foxes are his number one enemy. They live in adjoining pine forest and wreak havoc, particularly at lambing time.

Trevor said although some foxes would not touch a live lamb, they would often disturb a ewe and cause the mismothering of a twin lamb.

He estimates that he could lose up to eight or nine lambs a night during lambing, despite an extensive baiting period prior to lambing.

"It's pity there isn't a bounty on them," he said.

The LAND 9/5/02 p.5

More lamb, please

And meatier Merinos with that order, too

By JAMES NASON

THE sheep industry is shaping as a nice little earner for at least another 10 years – provided Australia can breed enough sheep to keep up with expanding markets.

Neal Fogarty, a NSW Agriculture senior research scientist at Orange, suggests Australia will need to produce an extra four million lambs a year to match demand at the end of this decade – and meatier Merinos will play a key role in meeting that demand.

And as new importance is placed on meat traits in Merino breeding, there are predictions that greater numbers of prime lamb breeders will opt for mating terminal sires straight to Merino ewes.

But the million dollar question remains: can Australia achieve a target of four million more lambs a year given the alarming decline that has occurred in national Merino and crossbred ewe numbers?

There are several recent examples of declining numbers.

- Live export and domestic and export slaughter figures suggest a record 39 million sheep and lambs went under the knife in 2001.
- Almost all of the increase of more than four million lambs in the annual slaughter during the past five years has been first-cross lambs out of Merino ewes.
- The total national ewe flock is less than 55 million head and continues to decline following its rapid reduction in the early 1990s.
- A 41 per cent fall has occurred in the southern NSW flock from 1990 to 2000 (from 13.9 million sheep to 8.2 million).
- The latest official wool production forecast of 520 million kilograms for the next financial year is half the clip shorn in 1989/90.
- At the recent Ben Nevis Merino stud dispersal sale in Victoria, where meat buyers dominated buying ranks, stud ewes at $57 a head failed to bring as much as Merino wethers, at $62 a head.

But Mr Fogarty has written in the latest Sheepmeat Council of Australia newsletter that the current size of the Merino ewe flock means additional numbers of first-cross lambs can be produced in the short term.

"Growing them out to successfully meet carcase specifications is another issue," he says.

"However, in the longer term, joining more ewes to meat rams impacts on the greater number of replacement ewes available for selection in Merino flocks.

"Of greater concern is the decline in the availability of first-cross ewes."

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Wanted: four million extra lambs 10/05/2002

The sheep industry is shaping as a good industry to be in for at least another 10 years - provided Australia can breed enough sheep to keep up with expanding markets.

Neal Fogarty of NSW Agriculture, Orange, suggests Australia will need to produce an extra four million lambs a year to match demand by the end of this decade - and meatier Merinos will play a key role in meeting that demand.

Despite the dramatic rundown in ewe numbers, Mr Fogarty believes the sheep industry can reach such targets.

Writing in the latest Sheepmeat Council of Australia newsletter, he maintains the current size of the Merino ewe flock means additional numbers of first-cross lambs can be produced in the short term.

"Growing them out to successfully meet carcase specifications is another issue," he said.

"However, in the longer term, joining more ewes to meat rams impacts on the greater number of replacement ewes available for selection in Merino flocks.

"Of greater concern is the decline in the availability of first-cross ewes."

Mr Fogarty predicts that about 1.3 million additional crossbred ewes will need to be mated (24pc more than now), with an increase from 110pc to 125pc in average lamb turnoff from all crossbred ewes, plus an additional one million Merino ewes mated to terminal sire rams (11pc more than now), with an increased average lamb turnoff from 80pc to 85pc.

Author: James Nason
Source: Rural Press Limited

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NSW Agriculture TODAY — Sheep and Wool

The lamb revolution

NEAL FOGARTY
Orange

RECENT record lamb prices cap off a remarkable decade of successful change for the lamb industry.

All sectors of the industry have been transformed. Lamb has a greater appeal and consumer profile, farm productivity has been lifted to new highs, and there is a marked professionalism among those involved in the production chain.

The achievements include:

- the value of lamb production to Australian farmers has increased by more than 150 per cent to more than $1 billion;
- lamb exports have more than doubled and are now more than 35 per cent of production;
- average lamb carcase weights have increased by 14 per cent to almost 20 kilograms, while fat levels have been reduced by more than 10 per cent;
- the decline in domestic per capita consumption has been turned around, and
- lamb has new, exciting and healthier products, a high consumer image, and an established place on fine dining menus.

Successful revolutions don't just happen. They require planning, co-operation, organisation, dedication, persistence and a commitment to succeed.

A co-ordinated national program of research, production and product development, marketing and promotion was developed in the early 1990s. The program aimed to arrest the declining domestic consumption and boost exports.

Profitable export markets were developed by processors with promotional support from MLA, especially the Fresh Australian Range Lamb program into North America. It was so successful the US government imposed quotas and tariffs for three years until last year, but even this could not stem the increased market demand. Major promotions were also held in the domestic market (for example, Trim Lamb) that recognised changed consumer needs and expectations.

Genetic improvement was seen as a key strategy for producing heavier, leaner carcases from faster-growing lambs.

The national genetic evaluation program, LAMBPLAN, was launched in 1989.

The research and development that backed LAMBPLAN included estimation of previously unavailable genetic parameters for a comprehensive range of growth, carcase, reproduction and wool traits in Australian meatsheep breeds.

It also involved development of state of the art statistical procedures and computer software to allow estimated breeding values (EBVs) of animals to be compared across flocks, implementation of live animal scanning technology for muscle and fat and their incorporation into practical genetic improvement programs on-farm.

Neal Fogarty says all sectors of the lamb industry have been transformed.

LAMBPLAN now tests more than 70 per cent of terminal sires used throughout Australia, producers pay significant premiums for high EBV rams and genetic trends are currently increasing at more than four per cent per year. LAMBPLAN is now an operating division of MLA with strong industry ownership.

Another major initiative over the last decade was the formation of lamb production and marketing groups and the development of alliances with processors and retailers. These aimed to improve profitability and the consistency of lamb quality and supply.

Value-based marketing was widely adopted, with the percentage of NSW lambs traded over-the-hooks (OTH) increasing from less than 5 per cent to almost 35 per cent in 2000.

The past decade has seen a major culture shift with lamb now viewed as an industry in its own right.

Major current issues are to maintain the supply of lambs to meet expanding markets in light of the decline in the total sheep population and also recognition of the importance of the Merino and its improvement for lamb production.

APPENDIX C2 – DYNAMIC DAMS NEWSLETTER *NUMBERS 23 TO 14*

Dynamic Dams
Ewe genetics for the future

ISSN 1446-3210 http://www.mla.com.au/lambplan/mcpt No. 23, October 2004

In This Issue

Editors: Neal Fogarty & Lynette McLeod
NSW Department Primary Industries
Orange Agricultural Institute
Orange, NSW 2800
Ph: (02) 6391 3813
Fax: (02) 6391 3922
Email: neal.fogarty@agric.nsw.gov.au

Dynamic Dams reports on the project ***Maternal sire Central Progeny Test (MCPT)****, which is part of the* ***MLA Lamb Program****, and provides other information for lamb breeders to improve their maternal genetics.*
Contributions from readers are welcome.

MILK PRODUCTION OF 1STX EWES

Neal Fogarty and Jayce Morgan

Milk production of the dam is a major determinant of early lamb growth. Lambs are wholly dependent on milk for about the first 4 weeks, after which their rumen is sufficiently developed for them to begin to digest pasture. Lambs continue to benefit from a good milk supply long after they start eating pasture through enhanced growth rate and feed conversion efficiency and development of their capacity to increase pasture intake as they mature.

Ewe milk production reaches a peak at about 3-4 weeks and then steadily declines over the lactation. Lambs are generally weaned at 12-14 weeks as ewe milk production has usually declined to low levels. Sheep milking breeds have been selected for higher production and longer persistence of lactation than wool and meat breeds.

The milk production results presented here are from a detailed analysis of the data collected at Cowra. The milk production and milk composition of about half the 1stX ewes from all sire groups at Cowra (528 ewes) were measured on 3 occasions (about 3, 4 and 12 weeks) during their first lactation. Daily milk production was estimated using a standard 4 hour test, in which the ewes were milked out initially (by machine and hand stripping after injection with oxytocin to bring about milk let down) and milked again approximately 4 hours later. The milk from this latter milking was weighed, the time recorded and samples dispatched to a commercial laboratory for analysis of milk composition.

The 1stX ewes were the progeny of 30 maternal sires from the 1997, 1998 and 1999 drops at Cowra. There were an average of 15 daughters of each sire milked with an average of 45 daughters from the 3 link sires that were represented in each drop. These ewes were joined in either the autumn or spring and lambed for the first time at 12 and 19 months of age respectively.

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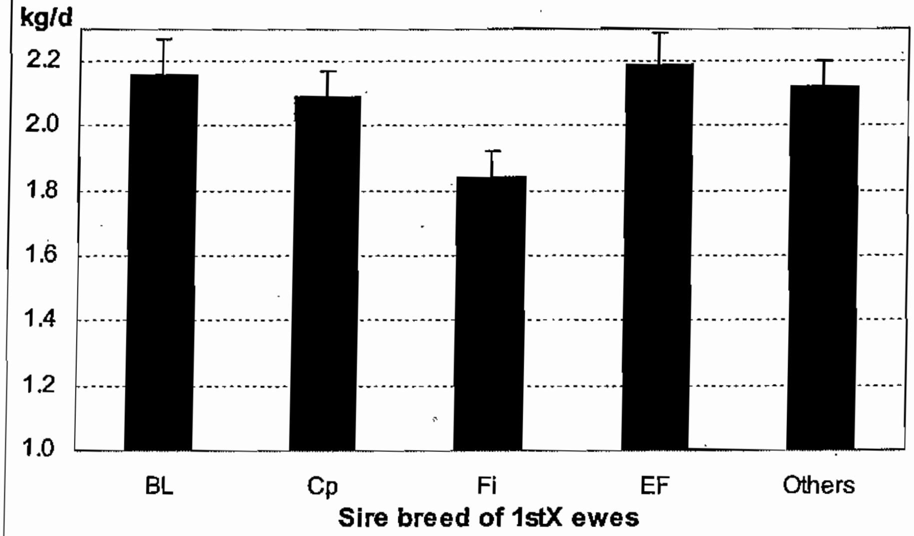


Fig. 1. Peak milk yield @ 21 days

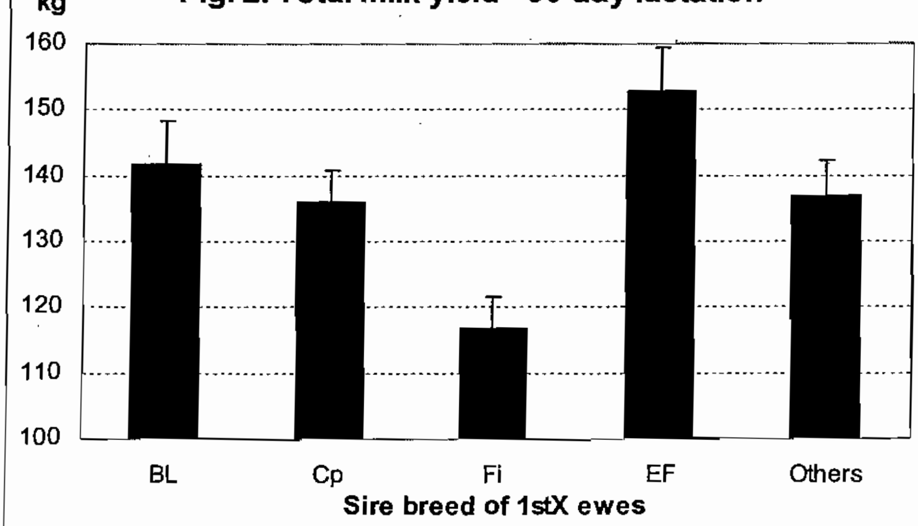


Fig. 2. Total milk yield - 90 day lactation

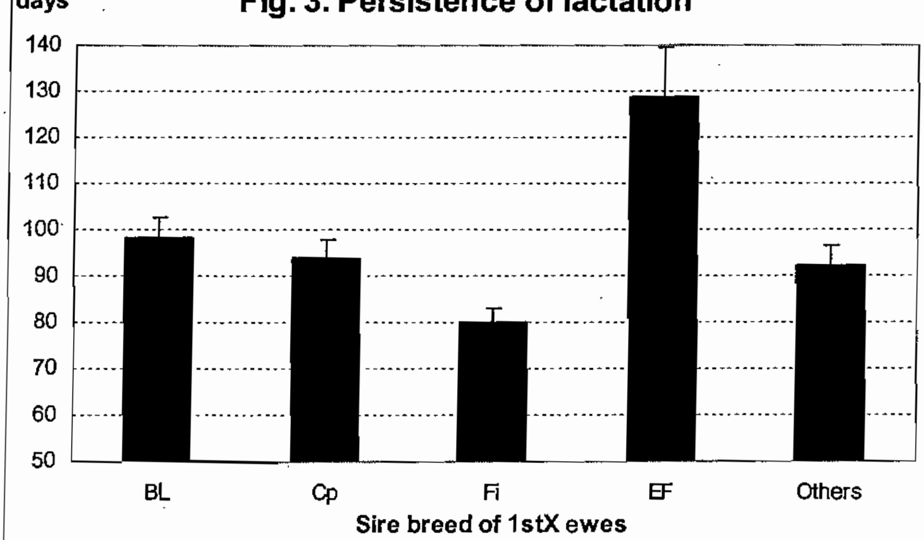


Fig. 3. Persistence of lactation[A]

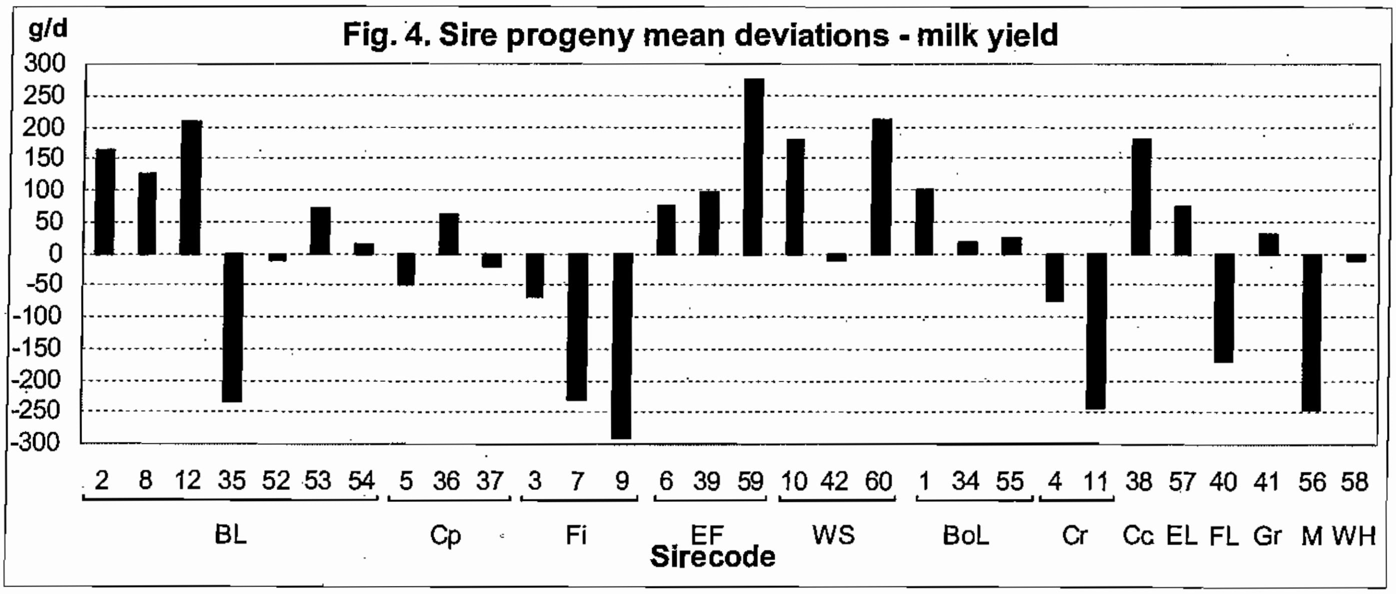
[A]Days for yield to drop to 600g/day

Milk production

Average milk production from these maiden 1stX ewes was 2.1 kg/day at the peak of lactation (21 days) and declined to 0.7 kg/day at lamb weaning (90 days). There was a considerable range in milk production among the ewes and sire progeny groups as was the case with the other growth and reproduction traits. While there were a limited number of sires of each breed tested there were some significant breed differences in the milk production of their 1stX daughters. Fig. 1 shows the peak milk yield at 21 days from daughters of 7 Border Leicester sires, 3 sires each from the Coopworth, Finnsheep and East Friesian breeds and 14 sires from the various Other breeds tested.

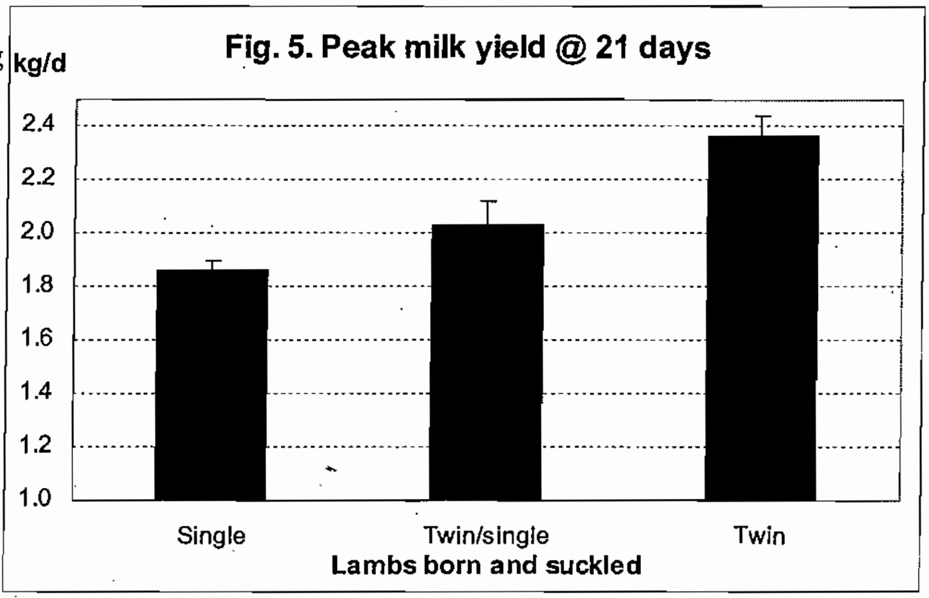
Peak milk production from the Finnsheep 1stX ewes (1.8 kg/d) was lower than all the other breed crosses which ranged from 2.1 to 2.2 kg/d. The Finnsheep 1stX ewes also had the lowest total milk yield of 117 kg over the 90 day lactation, with the East Friesian 1stX ewes the highest at 153 kg (Fig. 2). The Border Leicester (142 kg) and Coopworth (136 kg) 1stX ewes were intermediate as was the average of the Other sire groups.

The higher total milk yield of the East Friesian 1stX ewes, despite their similar peak yield to most of the groups, was due to greater persistence of lactation. Their daily milk yield declined at a slower rate over the lactation and they were producing more milk at lamb weaning than the other groups. To illustrate this we defined milking persistence as the number of days for milk yield to decline to 600 g/d. We used the 3 milking records on each ewe to predicted persistence for each of the sire breed groups (Fig. 3). The East Friesian 1stX ewes had much greater persistence (129 days) than the Border Leicester (98 days) and Coopworth (94 days) and particularly the Finnsheep (80 days) 1stX ewes.



Sire variation

There was considerable variation among the sire groups within breeds for milk production. Fig. 4 shows the mean ewe progeny deviations for daily milk yield for the 30 maternal sires tested. These are like breeding values for the sires as they are based on actual progeny performance.



There was a difference in 1stX ewe milk production of 441 g/d for the 7 Border Leicester sires, which ranged from +208 g/d (BL12) to -233 g/d (BL35). There were also considerable ranges among the 3 East Friesian sires although they were all positive (+276 to +75 g/day) and the 3 Finnsheep sires which were all negative (-68 to -292 g/d). There was a moderate range among the 3 Coopworth sires (+63 to -49 g/d), while the 3 White Suffolk sires had a considerable range from +210 to -12 g/d. The range among the other sires tested was considerable, from +179 g/d (Cc38) to – 246 g/d (M56).

Lamb effects

The number of lambs that a ewe bears and suckles as well as their genetic makeup affects milk production of the ewe. Ewes that bear and rear twins will produce more milk than similar ewes that bear and rear singles because of greater mammary development during gestation and greater suckling stimulus during lactation. Lambs with greater genetic potential for growth also provide greater suckling stimulus to increase ewe milk production.

At Cowra (Fig. 5) the 1stX ewes bearing and rearing twins produced 0.5 kg/d more milk at peak lactation than the ewes bearing and rearing singles (2.4 *v* 1.9 kg/d). The peak milk production of ewes that lost one of twins at lambing was intermediate (2.0 kg/d). These lamb effects were highly significant for peak lactation yield at 21 days, although they were less important by the end of lactation. The difference in persistence of milking for ewes with singles and twins was only 7 days (92 *v* 99 days respectively).

Legend for Figs.
Sire breeds: BL = Border Leicester; Cp = Coopworth; Fi = Finnsheep; EF = East Friesian; Others = All other breeds combined
Figs: The mark (T) above each bar on the figure indicates the standard error of the mean. For two means to be significantly different they need to differ by more than the sum of their standard errors.

kg/d). The peak milk production of ewes that lost one of twins at lambing was intermediate (2.0 kg/d). These lamb effects were highly significant for peak lactation yield at 21 days, although they were less important by the end of lactation. The difference in persistence of milking for ewes with singles and twins was only 7 days (92 *v* 99 days respectively).

Milk composition

There were small changes in milk composition over the lactation. Fat % increased from 9.2% at 21 days to 10.3% at 90 days, during which there was a considerable reduction in milk yield. Over the same time protein % increased (3.8 v 5.4 %) and lactose % decreased (5.9 v 5.2 %) from 21 to 90 days respectively. Differences in milk composition between the breeds were generally small and not significant at 21 days (fat % Fig. 6, protein % Fig. 7, lactose % Fig. 8). The exceptions were low fat % for East Friesian sired ewes and high lactose for Finnsheep sired ewes. There was also a large range among the 3 Coopworth sires (see error bars) for fat % (range of 1.8%) and protein % (range of 0.3%), although they had only a small range in yield (see Fig. 4).

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Fig. 6. Milk fat % @ 21 days

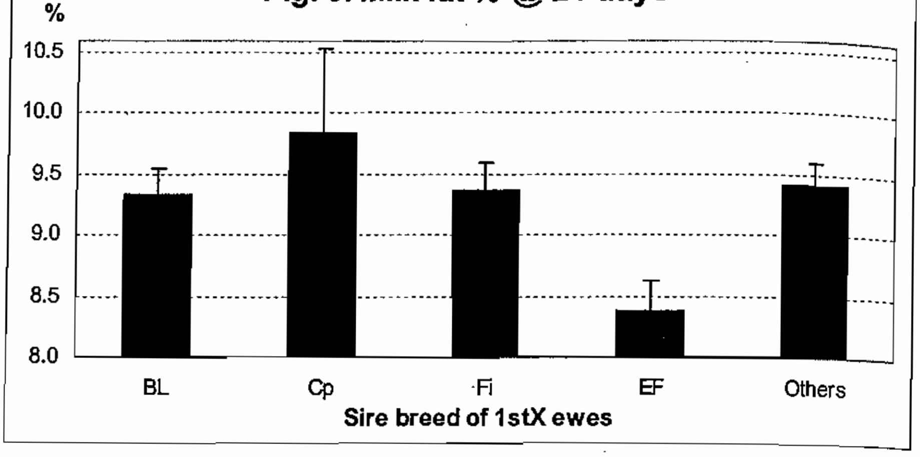


Fig. 7. Milk protein % @ 21 days

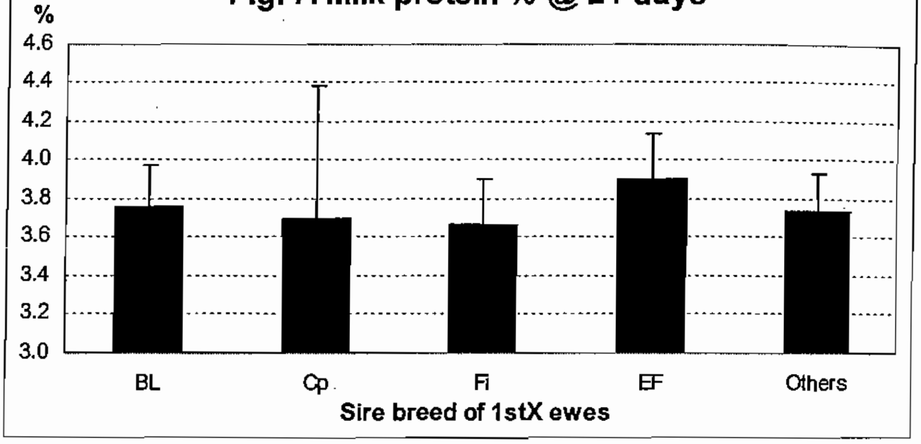


Fig. 8. Milk lactose % @ 21 days

Take home messages

- ewe milk production of the young maiden 1stX ewes was 2.1 kg/d at peak (21 days) and declined to 0.7 kg/d at lamb weaning (90 days of lactation)
- there was considerable variation in milk production between sire progeny groups of 1stX ewes (range of 522 g/
- although there were limited numbers of sires tested of the various breeds, there were some significant breed differences
- Finnsheep cross ewes had lower peak milk yield and total lactation production
- East Friesian cross ewes had greater persistence of lactation which also resulted in greater total lactation produ tion
- ewes suckling twins had greater peak milk yield than those suckling singles
- breed and sire differences were generally small for milk composition (fat %, protein % and lactose %)

HAMILTON SUMMARY

At Hamilton the maternal sires were mated by artificial insemination to finewool Merino and Corriedale ewes in 1997, 1998 and 1999. The 1stX ewe progeny were subsequently joined in autumn (generally March/April), with each drop of ewes joined for the first time at about 7 months of age. The 1stX ewes were joined to selected composite terminal sire rams.

The evaluation of lamb production from each drop of 1stX ewes was planned over their first 3 lambings. However in 1999 an outbreak of vibriosis caused abortions among many of the ewes (1997 and 1998 drop) prior to lambing and in 2002 the ewes (1998 and 1999 drop) were affected by ryegrass staggers at joining which resulted in over 20% being non-pregnant. As the lambing results from these 2 years are not representative of the genetic potential of the various 1stX ewe groups they cannot be included in the comparisons. The 1997 and 1998 drop 1stX ewes were joined again to obtain more data from a 4th lambing, but for the 1998 drop this was the lambing affected by ryegrass staggers. It was not possible to join the ewes again in the project in 2003 to obtain additional data. This means that the results presented here for evaluation of lambing performance and $ Gross Margins are based on different lambings for the 3 drops of 1stX ewes as follows: 1997 drop - lambings at 1, 3 and 4 years of age; 1998 drop – lambings at 2 and 3 years of age; 1999 drop – lambings at 1 and 2 years of age. Therefore the 3 drops of 1stX ewes have very different average performance levels. Adjustments will be made for these differences when the overall analysis is done to compare the performance of all 91 maternal sires later this year. The growth and carcase performance of the 2ndX lambs in 1999 and 2002 was not affected and has been included in the data. The results presented are from a large data set representing a total of 719 1stX ewes and 2096 2ndX lambs slaughtered.

Performance is presented in several ways within the 3 drops of the 1stX ewes. The ***average $ returns per ewe joined per year*** over the 2 or 3 lambings as above also shows the contributions to total $ returns from 2ndX lamb carcasses (in specs and out of specs), lamb skins and wool from the 1stX ewes. The $ returns are based on the actual number of 2ndX lambs slaughtered (per ewe) and their carcass weights and fat measurements together with the clean wool produced from the 1stX ewes. The only adjustment to carcass weight was for sex to account for any differences in the proportion of wethers and ewes between the groups. Therefore the $ returns reflect the differences in value on the farm of ewes lambing earlier and having heavier lamb carcasses than those lambing later, multiple born and reared lambs will on average be lighter than singles but their carcass weights are added together. The prices for lambs and wool are detailed in the box.

The $ returns only tells part of the story as the different costs associated with production and marketing the lamb carcasses and wool need to be deducted so the ewe groups can be compared on a ***$ gross margin per ewe joined per year*** basis. The costs used for calculation of the $ gross margins are shown in the box.

PRICES AND COSTS USED FOR $ RETURNS AND $ GROSS MARGINS

Prices

2ndX lamb carcass: $3/kg for in specs (= or > 20 kg and fat score 2-4)
Discount grid for out of specs ($/kg):

wt / FS	1	2-4	5
<16 kg	-1.50	-1.50	-1.50
16-19.9 kg	-0.75	-0.15	-0.50
=> 20 kg	-0.75	0	-0.50

Carcasses 16-19.9kg, fat score 2-4 were only given a small discount because they would normally be sold in the trade market or kept longer and sold at heavier weights.
2ndX lamb skins: <20.1 kg carcass weight $9.75; 20.1-24 kg $12.00; >24 kg $12.50.
1stX ewe wool: Average 2001/02 wool prices for the various micron categories were used to estimate wool returns. The individual ewe wool return was multiplied by 0.9 to account for the lower price of the skirtings and oddments.

Costs

The average costs applied to individual ewes and lambs for management and marketing were:
1stX ewes: $7.20 (shearing, crutching, health, wool freight) + 7.25% of wool $ (tax, testing, selling costs);
2ndX lambs: $3.66 (health, freight) + 4.5% of carcass $ (selling costs).

Fig. 9a. Average $ return / ewe joined / year

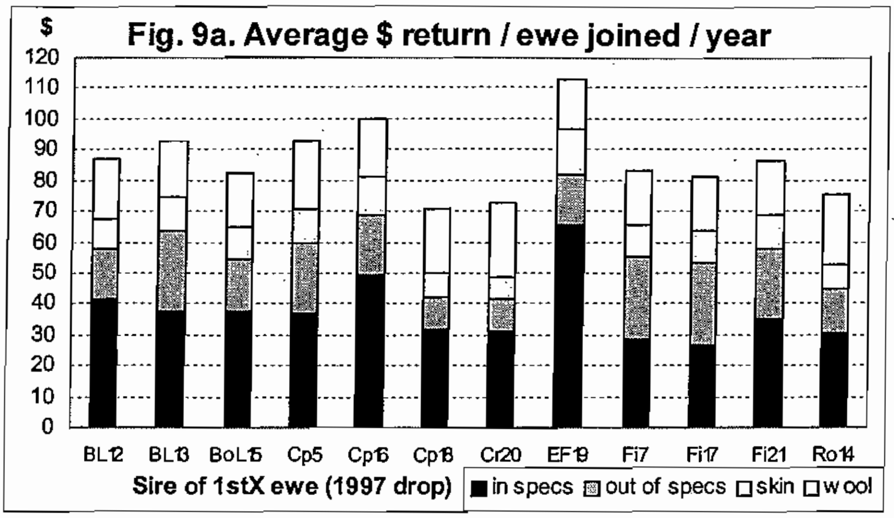


Fig. 9b. $Gross Margin / ewe / year

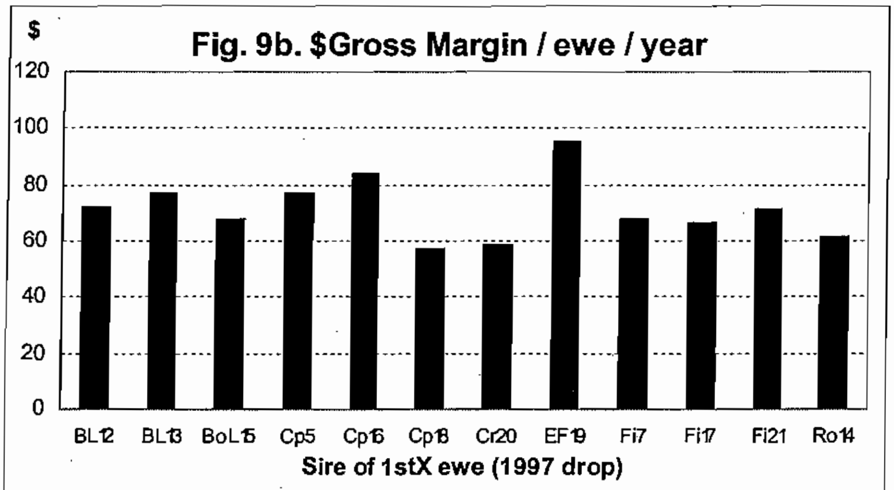


Fig. 9c. $Gross Margin / DSE / year

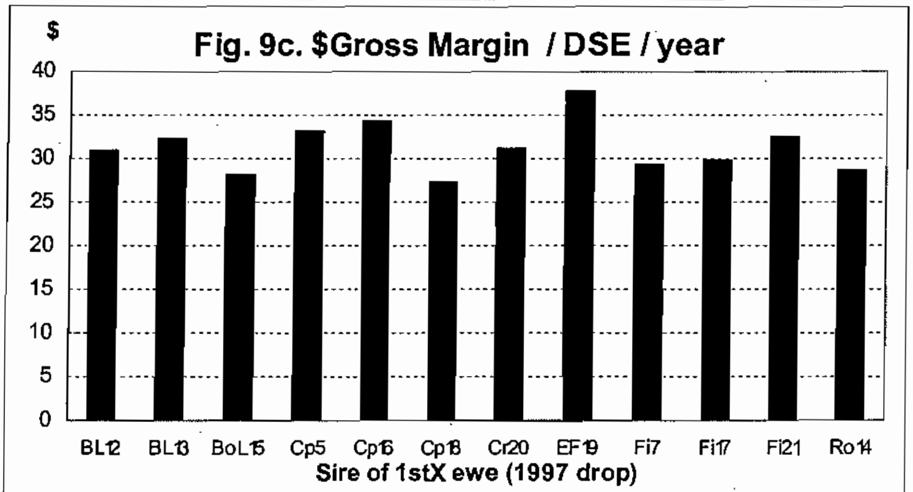
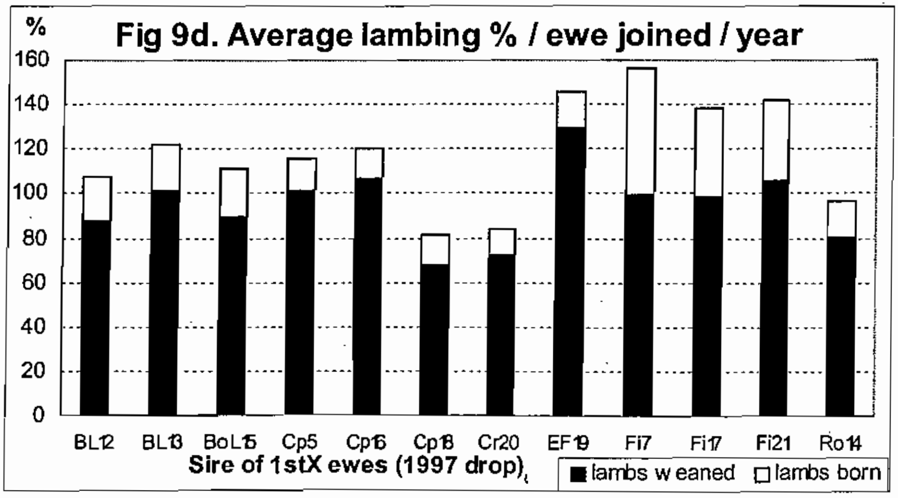


Fig 9d. Average lambing % / ewe joined / year



Another consideration is feed requirements of the ewe and her lambs during lactation and subsequent lamb growth to slaughter, which may affect stocking rate. Heavier ewes with higher lambing percentage and faster growing lambs to higher slaughter weight will have higher feed requirements. To examine the effect of this the total annual feed requirements for the ewes and their lambs have been estimated from their actual performance over the various years and put on a dry sheep equivalent (DSE) basis and expressed as ***$ gross margin per DSE per year***. There needs to be some care in interpretation of these DSE values as the implicit assumption is that the feed required for all the phases of the production cycle and in the various seasons costs the same. In the real farm situation this is obviously not true. For example (a) the cost of high quality feed for lactating ewes or weaned lambs will generally be higher than that required for maintenance of dry ewes and (b) the feed required for lambing at the start of the spring flush effectively costs a lot less than the same feed required for lambing in winter or before the autumn break.

The other figures show various measures of performance that contribute to the $ returns from the 1stX ewes and their 2ndX lambs. The ***average lambing %*** of the 1stX ewes (lambs born and lambs weaned per ewe joined over the various years shows the differences in lambing rate and lamb survival to weaning. Most lambs that reached weaning subsequently survived and were slaughtered.

The ***2ndX lamb weaning weight*** shows the differences in genes for growth passed onto the lamb ***and*** the milk production and nurturing from the 1stX ewe. These weights have been adjusted to twin reared lambs at 100 days of age to account for the non genetic effects due to differences between the groups in the proportions of multiples, being born earlier or later in the drop and sex.

The ***2ndX lamb post weaning weight*** shows the differences in genes for growth to slaughter that have been passed onto the lamb from the 1stX ewe, including the effects carried over from pre-weaning. These weights have been adjusted to twin reared lambs at 280 days of age to account for these non genetic effects.

The ***2ndX lamb carcass fat*** shows the differences in genes for carcass fat at the GR site. These have been adjusted to 22 kg carcass weight so they are compared on the same basis.

The ***2ndX lamb carcass eye muscle area*** shows the differences in genes for carcass muscle. These have been adjusted to 22 kg carcass weight so they are compared on the same basis.

$ RETURNS

The average $returns per ewe per year over the 3 lambings for the 1997 drop 1stX ewes (lambings at 1, 3 and 4 years of age) are shown in Fig. 9a and for 2 lambings for the 1998 drop 1stX ewes (Fig.11a – lambings at 2 and 3 years of age) and 1999 drop 1stX ewes (Fig.13a – lambings at 1 and 2 years of age). There was considerable variation among the different 1stX ewe sire groups with the range between top and bottom in each drop of ewes being $42.38 (1997), $55.32 (1998) and $33.16 (1999).

Approximately 78% of the annual returns for the 1997 drop 1stX ewes were from lamb (carcasses in and out of specs and skins) with only 22% from ewe wool. The returns from wool were slightly lower for the 1998 drop ewes (17.5%) as returns at 1 year of age were not included. In contrast wool returns were higher for the 1999 drop ewes (34%) because lambing performance was low at 1 and 2 years of age and wool value relatively higher.

There were also large differences in the proportion of lamb carcass in specs (>20

Fig 10a. 2ndX lamb weaning weight

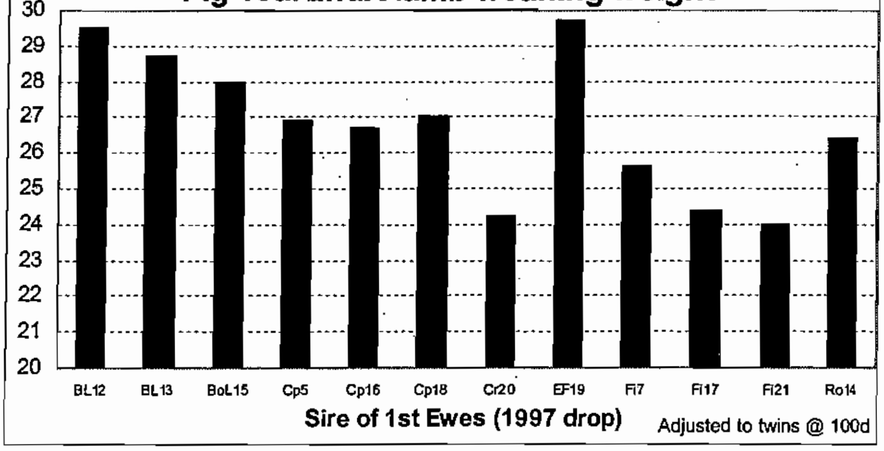


Fig 10b. 2ndX lamb postweaning weight

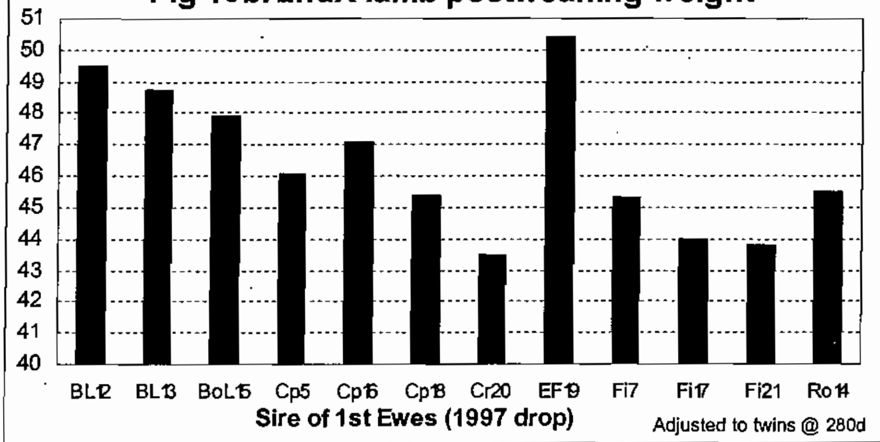


Fig 10c. 2ndX lamb carcass - Fat GR

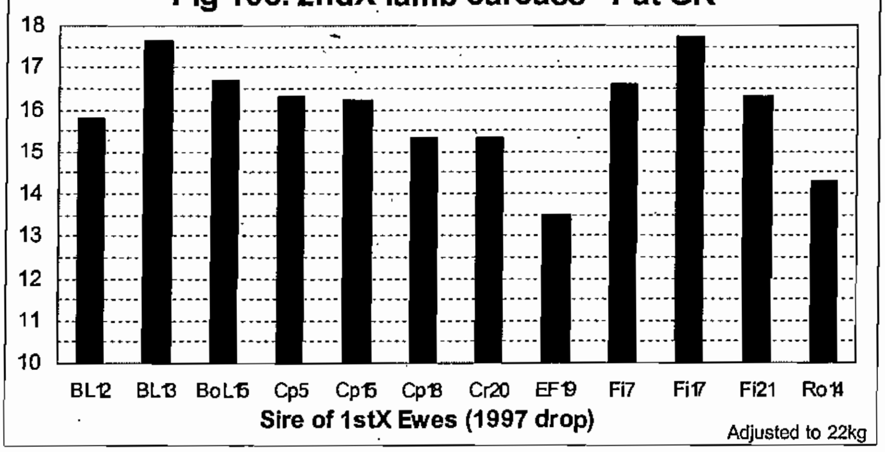
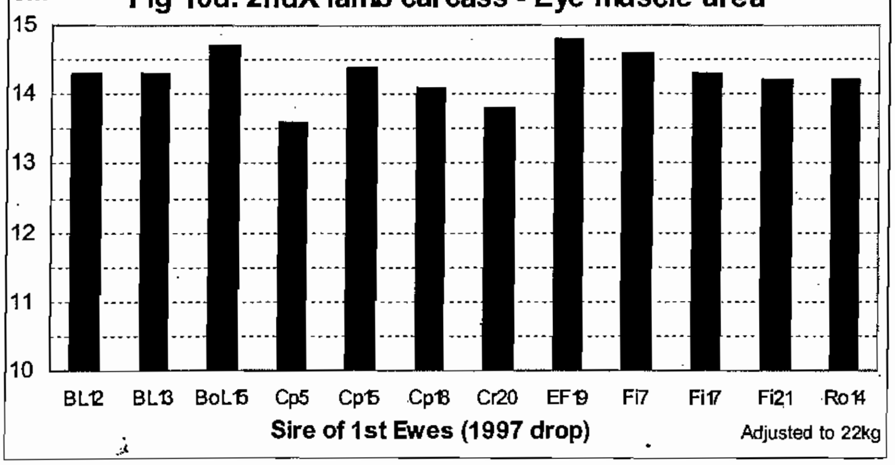


Fig 10d. 2ndX lamb carcass - Eye muscle area



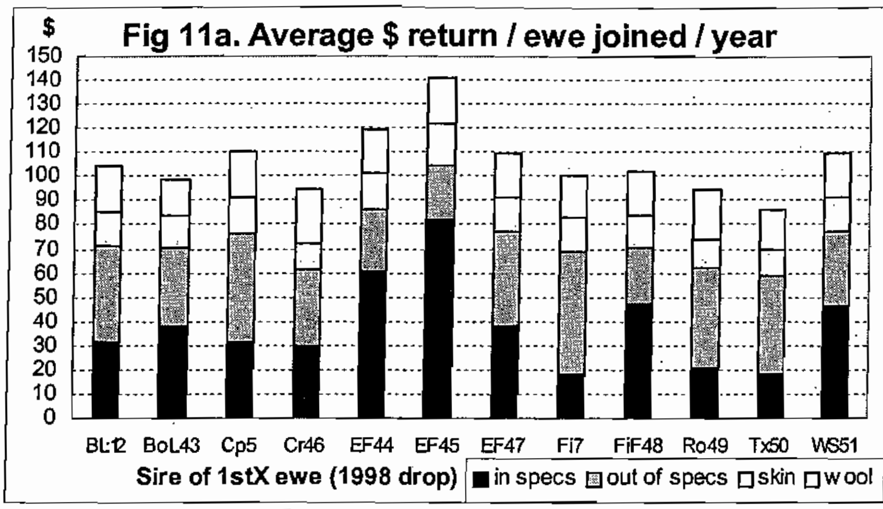


Fig 11a. Average $ return / ewe joined / year

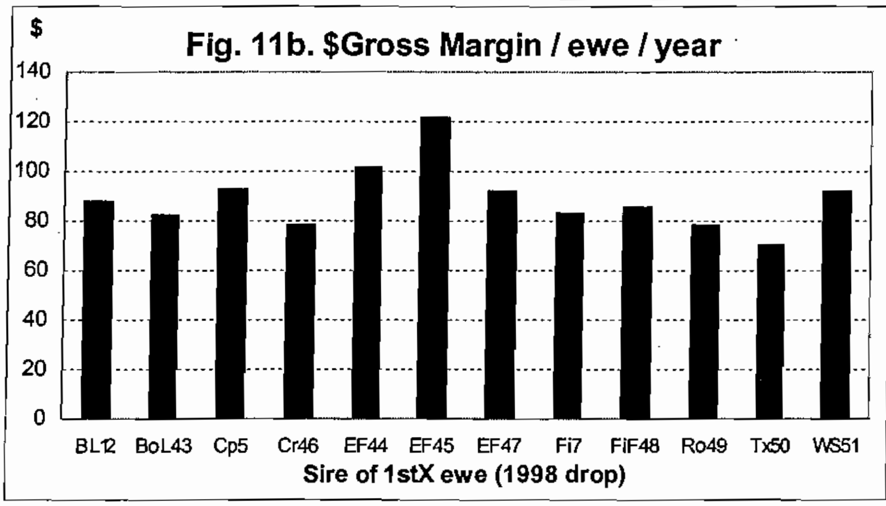


Fig. 11b. $Gross Margin / ewe / year

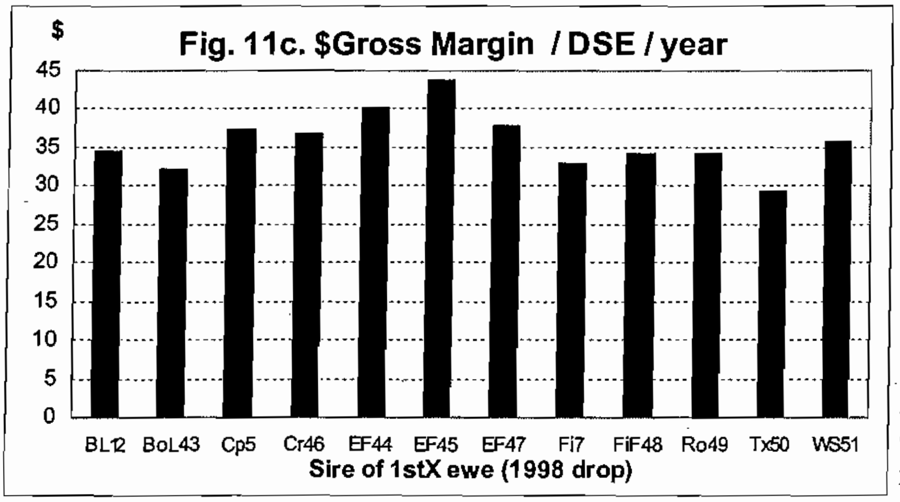


Fig. 11c. $Gross Margin / DSE / year

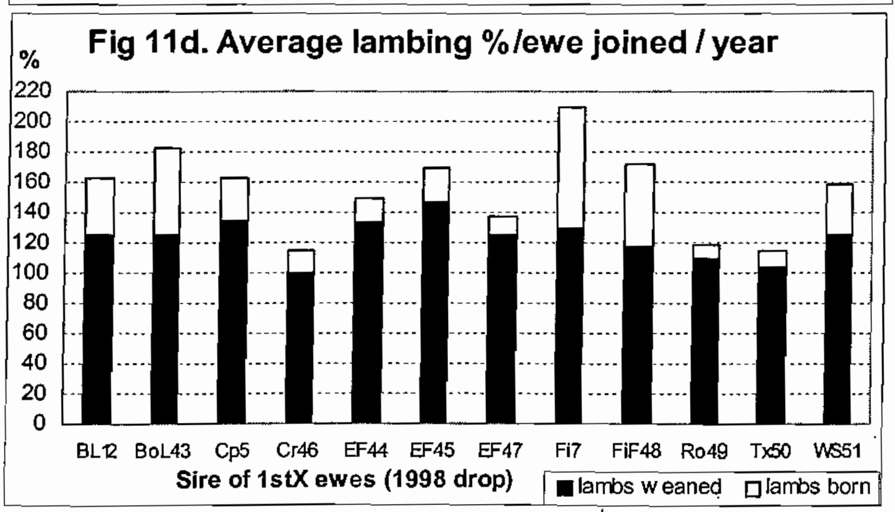


Fig 11d. Average lambing %/ewe joined / year

kg and fat score 2-4) and out of specs. An example of this is the contrast between the EF19 and BL13 sire groups (1997 drop ewes - Fig 9a). Less than 59% of the carcase value from BL13 were in specs whereas 80% of those from EF19 were in specs. The main reasons for this were that the EF19 ewes had fast growing lambs (Fig. 10b) which resulted in carcases averaging 0.5 kg heavier than those from BL13 ewes and they were also considerably leaner (Fig. 10c – over 4 mm GR), which meant there were very few overfat carcases from EF19 ewes. The contrast between these groups shows that different production and marketing systems may need crossbred ewes with particular genetics to best match the requirements.

It is also worth noting that while lambing % is a major driver of $ returns, survival and growth rate of lambs and their ability to meet carcass specs (and ewe wool production) also contribute to profitability of the enterprise. It is important to match the genetics of the ewe (and ram) flock to the production and marketing requirements of the enterprise.

$ GROSS MARGINS (GM)

The average $GM per ewe per year over the various lambings for the 1stX ewe groups are shown in Figs. 9b, 11b and 13b. Taking account of the costs and expressing the results as $GM per ewe per year had little effect on the proportions of differences between the groups or the relative rankings of the sire groups compared with the $ returns.

The range in $GM between the highest and lowest group of 1stX ewes in each drop varied from $30 to almost $51 and averaged almost $40/ewe/year. This represents a difference in annual profitability of $40,000 for a 1000 ewe enterprise. Some of the differences are due to breed of sire but most of the differences are due to variation among individual sires of the 1stX ewes.

...M/DSE

...verage DSEs over 3 years for the ...nd her lamb(s) to slaughter ranged ...1.7 to 2.3 DSE for the 1997 drop ...ewe groups. The feed requirements ...ewe maintenance were about ...gestation, lactation and lamb ...h to weaning about 25% and lamb ...h from weaning to slaughter about ...of the total annual requirements.

...verage $GM per DSE per year ...he various lambings for the 1stX ...roups are shown in Figs. 9c, 11c ...3c. Within most of the drops there ...range in average weight of the 1stX ...roups of about 10.7kg. The range ...rage $GM per DSE per year ...en the 1stX ewe groups was about ...M/DSE. Generally there were only ...changes in the relative performance ...nkings of the 1stX ewe sire groups ...they were compared on a $GM/ ...basis rather than $GM/ewe.

...ver it is worth noting that there was ...ive improvement in the ranking of ...orriedale sire group in each drop ...0 1997 drop Fig 9c; Cr46 1998 ...Fig 11c; Cr64 1999 drop Fig 13c). ...groups of ewes were lighter than ...other groups in their drop which ...s they had lower feed requirements ...aintenance throughout the year. They ...had lower lambing % (lower feed ...ement for lactation and lamb ...th), which was compensated for by ...r wool value (Figs 9a, 11a and 13a). ...means that they ranked relatively ...among their drop when compared ...$GM/DSE than $GM/ewe basis, ...ugh they were still outperformed by ...al other groups. These results again ...asise the need to carefully consider ...production system and select the ...with the best genetics for your lamb ...prise.

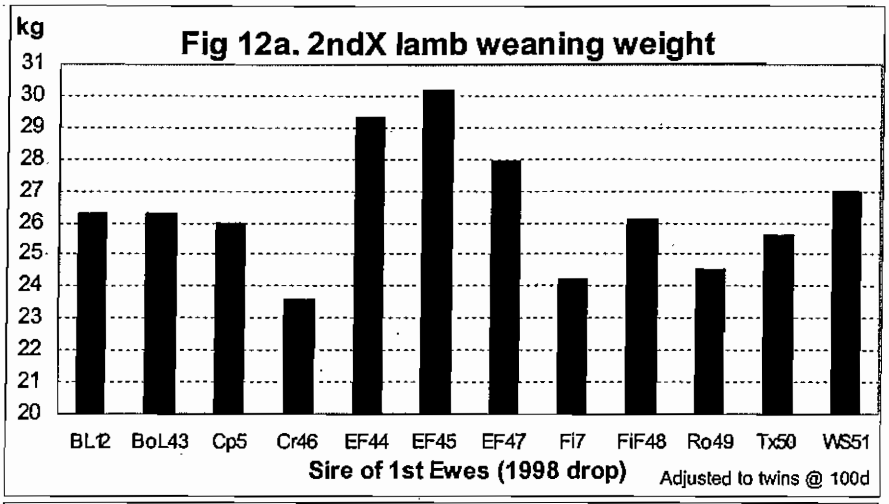


Fig 12a. 2ndX lamb weaning weight

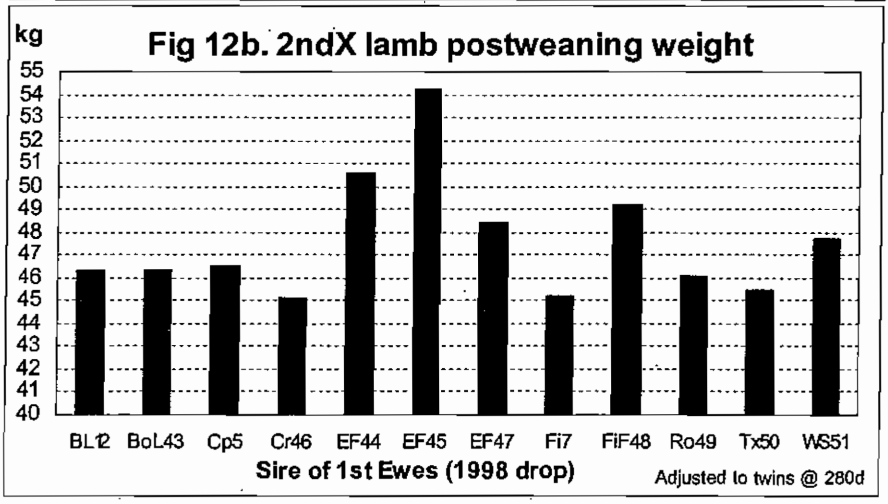


Fig 12b. 2ndX lamb postweaning weight

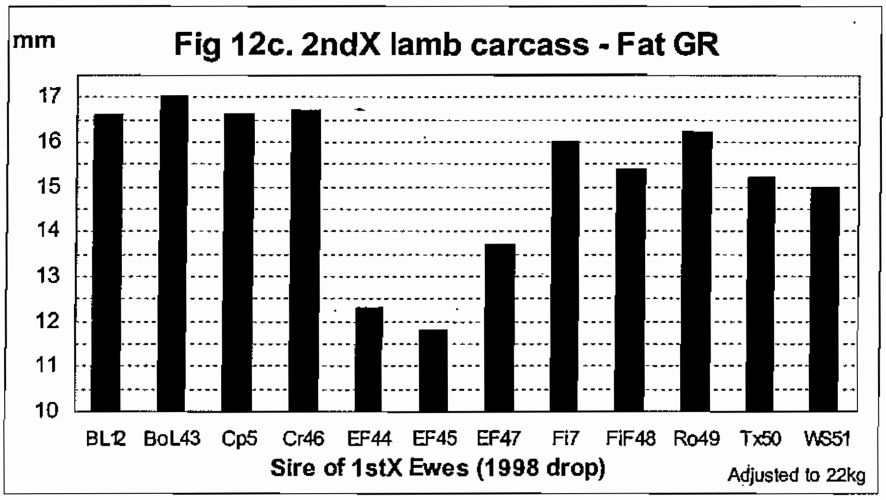


Fig 12c. 2ndX lamb carcass - Fat GR

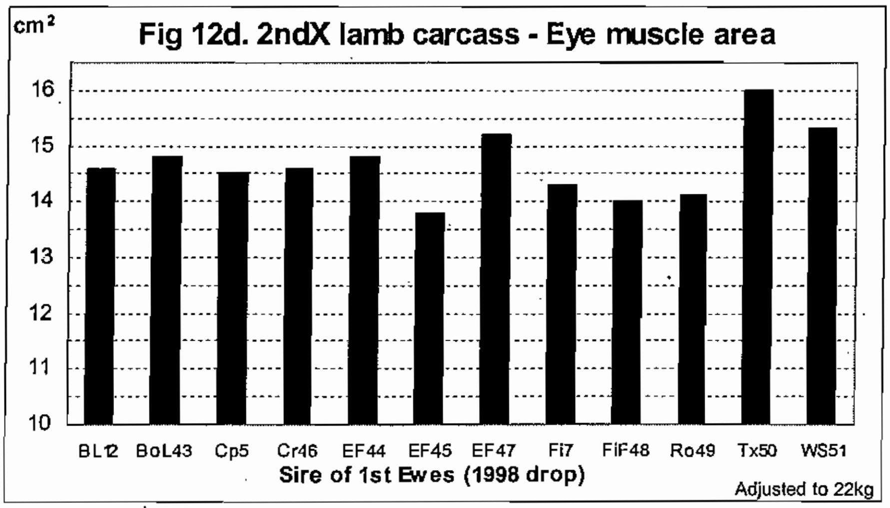
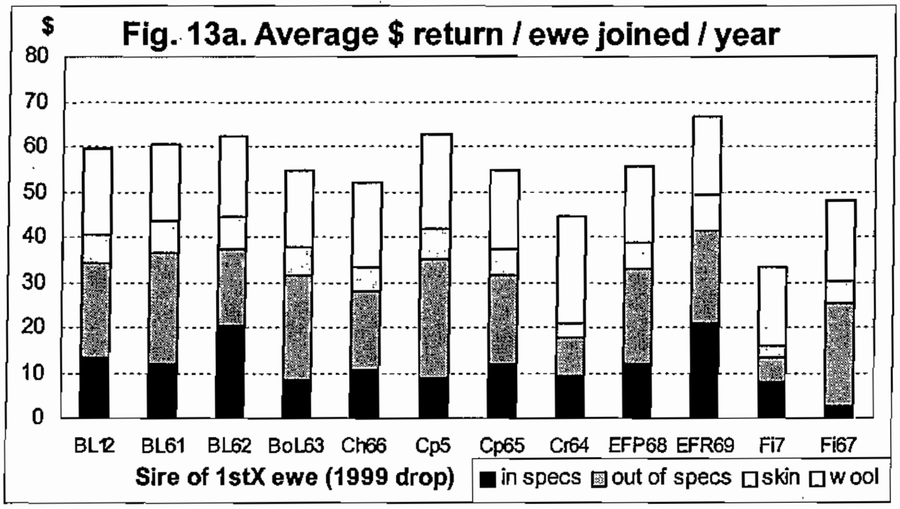
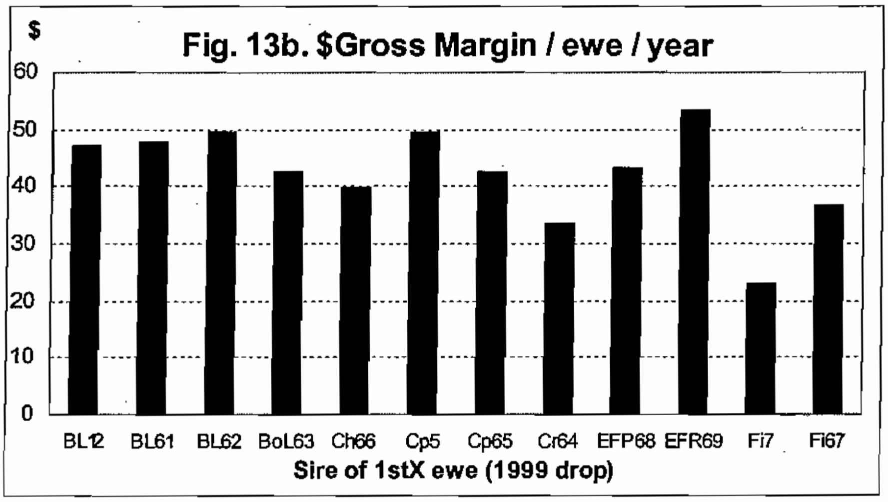
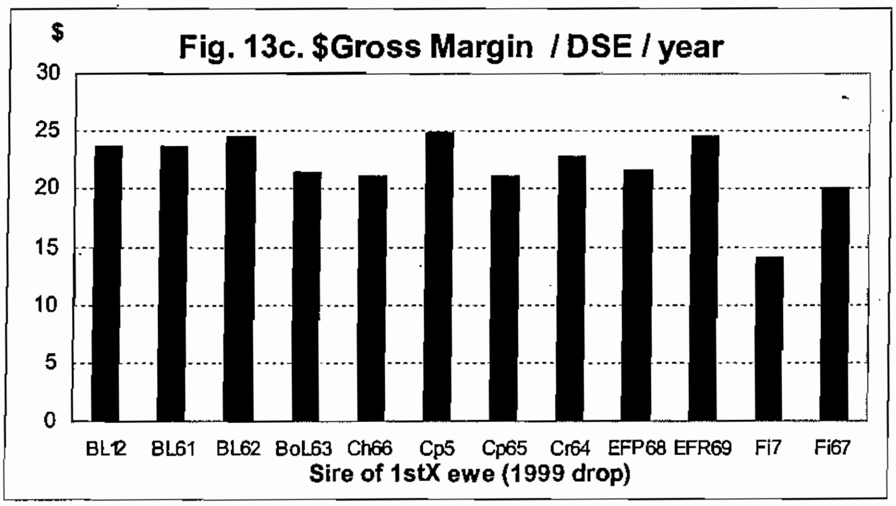
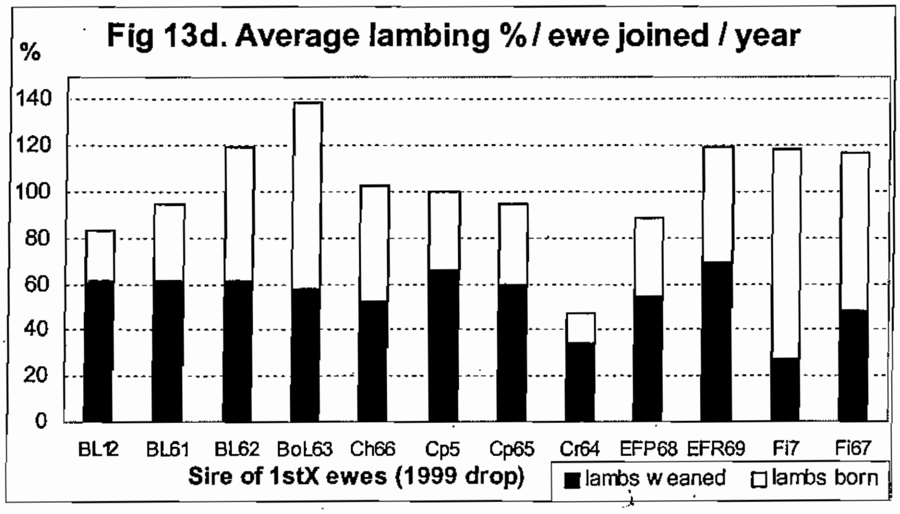


Fig 12d. 2ndX lamb carcass - Eye muscle area









1STX EWE LAMBING %

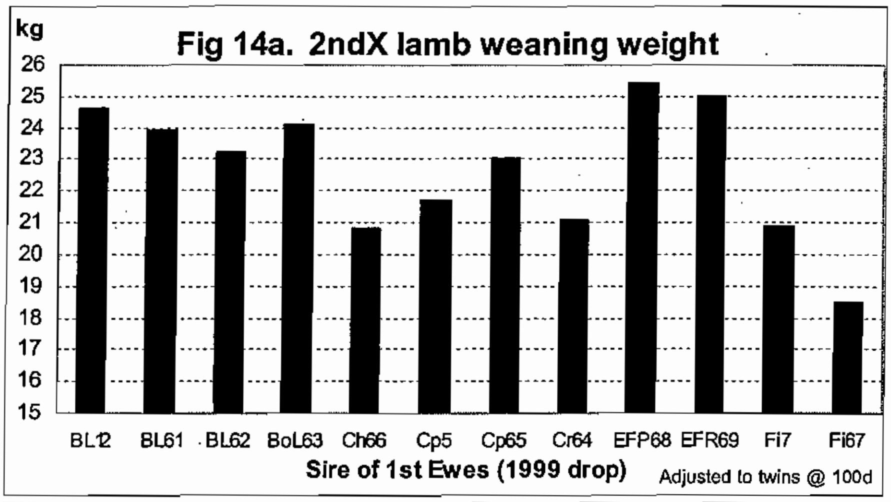
The average lambing % for the various lambings of 1stX ewes are shown in Figs. 9d, 11d and 13d. The ewes were joined in March/April which is at the peak of the breeding season, although some ewes may not have reached puberty in their first year when they were joined at 7 months of age. The lambing results from the first joining at 7 months at Hamilton were generally disappointing and highlighted the importance of having the ewes well grown for a successful mating. To illustrate this lambing results for the 1999 drop ewes are shown separately for their first lambing at 1 year of age (Fig15a) and second at 2 years of age (Fig 15b). While most of the BL62 1stX ewes lambed from their first joining (100% lambs born/ewe joined, Fig 15a) most of the other groups had less than half the ewes become pregnant. Poor lamb survival also meant that there were only 3 groups of ewes that weaned more than 40% of lambs. The lambing potential of these ewes is better shown in their second lambing at 2 years of age (Fig 15b) where 6 groups had more than 150% of lambs born, although again lamb survival was generally poor.

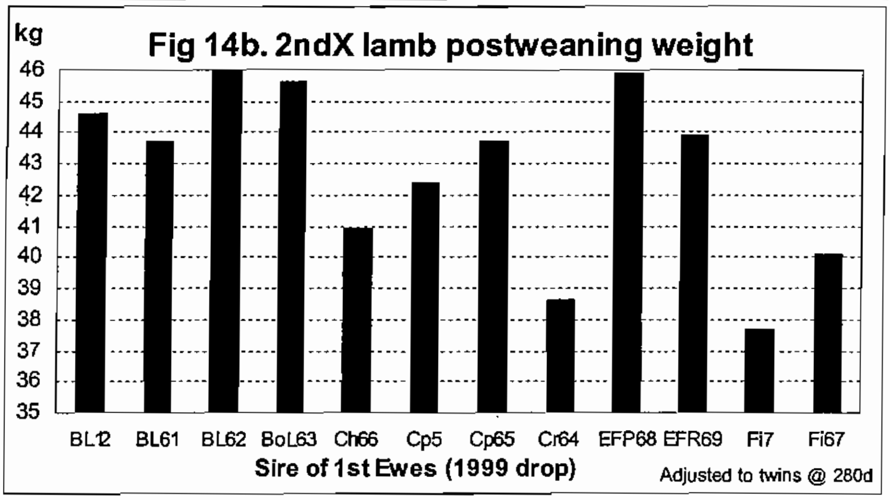
2NDX LAMBS

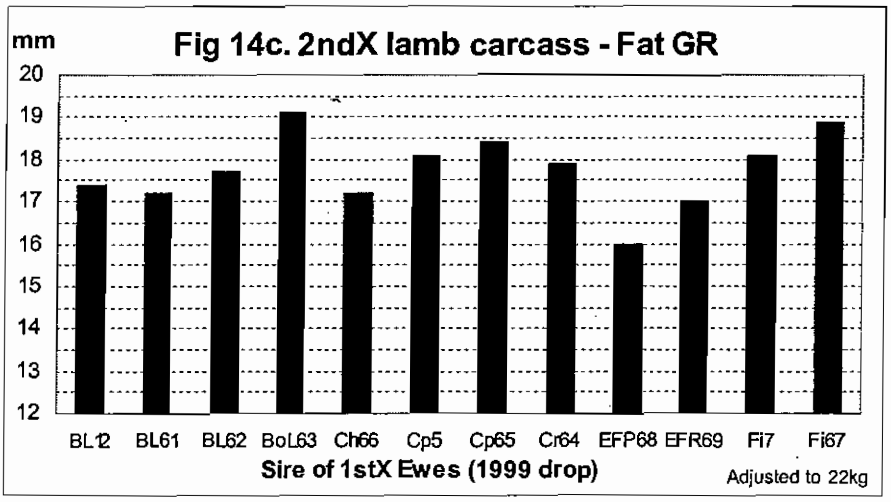
Growth – Average weaning weights of the 2ndX lambs from the ewe groups are shown in Figs. 10a, 12a and 14a and average post weaning weights in Figs. 10b, 12b and 14b. The difference between the heaviest and lightest group within each drop averaged over 6 kg for weaning weight and 8 kg for post weaning weight, which resulted in an average difference of over 4 kg for carcass weight. The 2ndX lambs are all by the sane terminal sire rams and the 1stX ewes were all out of the same lines of Merino or Corriedale ewes, so the only difference in genetics of the lambs is the maternal sire. The weights have been adjusted for differences in proportion of multiples, age and sex so the differences are due solely to the genes passed on from the maternal sires (i.e. genes for growth of the lambs) and for milking and nurturing of the ewe.

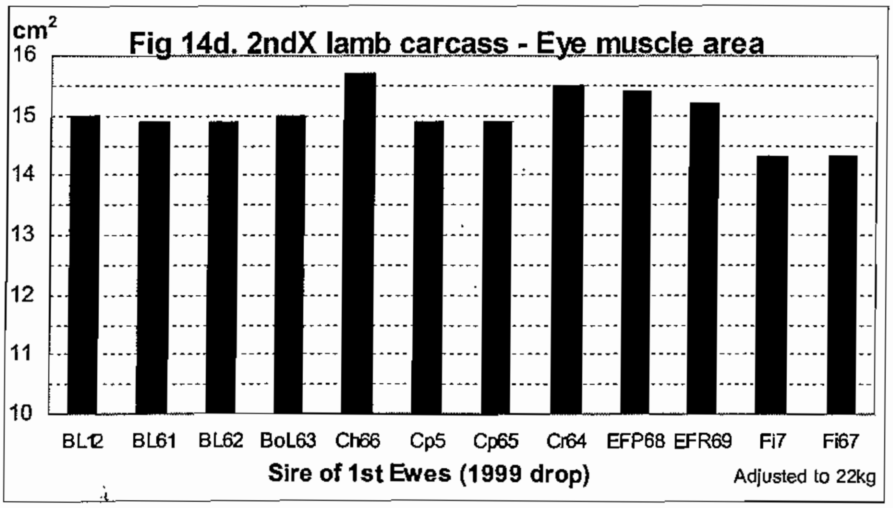
Carcass fat- Average fat levels (GR) for the 2ndX carcasses are shown in Figs. 10c, 12c and 14c. Within each drop the difference between the leanest and fattest carcass group is over 3 mm GR which is more than half a fat score. These fat levels have been adjusted to 22 kg and the average of ewes and wethers so the genotypes can be compared free of the effect of differences in carcass weight and sex. Over all carcases the fat GR increased by 1mm for each 1 kg increase in carcase weight and ewes were 1.8 mm fatter than wethers at the same carcase weight.

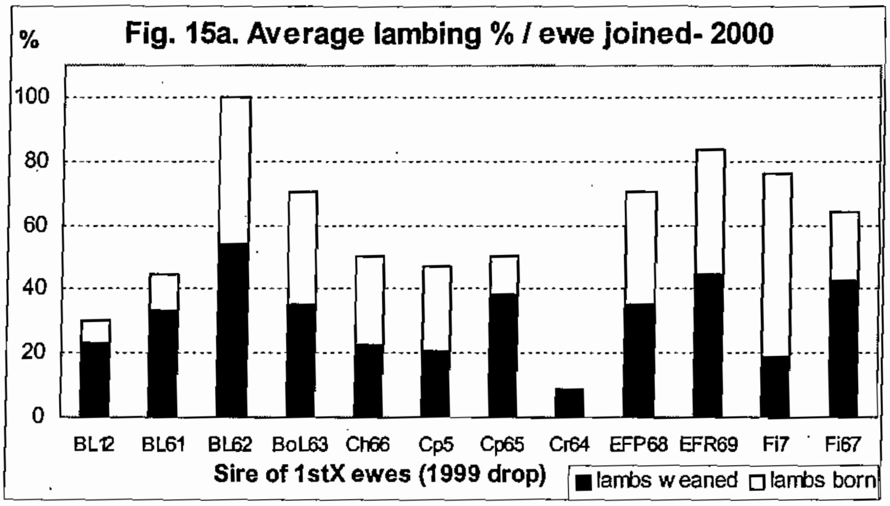
Carcass muscle - Average eye muscle area for the groups of 2ndX carcasses are shown in Figs. 10d, 12d and 14d. Within each drop of 1stX ewes there was a range of 1.5 cm^2 in eye muscle area. These muscle measurements have also been adjusted for sex and to 22 kg so the genotypes can be compared free of the effect of differences in carcass weight. Over all carcases the eye muscle area increased by 0.5 cm^2 for each 1 kg increase in carcase weight and ewes had slightly smaller eye muscle area than wethers (0.1 cm^2) at the same carcase weight.

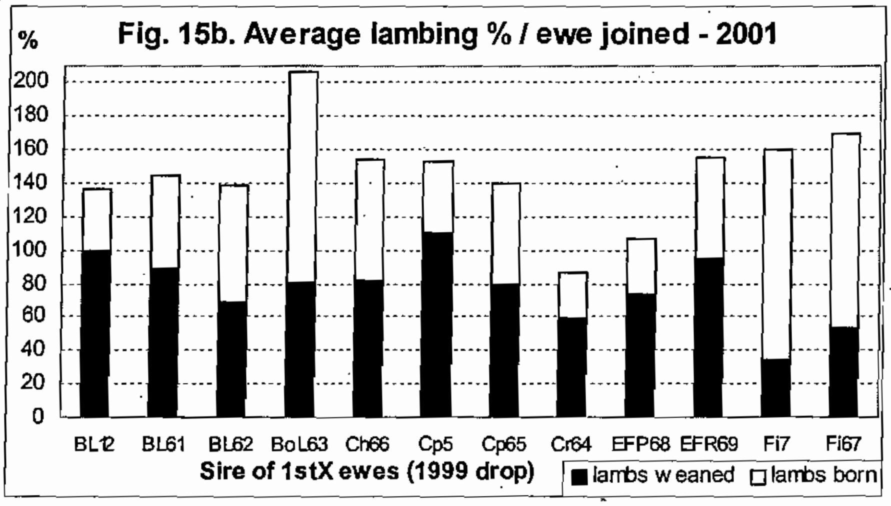












Take home messages

1stX ewe performance

- An average range of almost $40 gross margin/ewe/year between the top and bottom performing 1stX ewe groups by different maternal sires is consistent with results at Cowra and Rutherglen
- Several maternal sire breeds had high performing 1stX ewe progeny and there was considerable variation between sires within breeds
- Selection of the best maternal genetics for your lamb production enterprise means considerably more $$$s profit

2ndX lamb performance

- The genetics of the ewe can have a considerable affect on the growth and carcass merit of their lambs. Differences in growth and dressing % can result in over 4 kg higher carcass weight ($12 more per lamb) or lambs having to be kept considerably longer to reach a particular target weight.
- The genetics of the ewe can result in significant differences in carcass fat (over half a fat score) and muscle the same carcass weight, which may affect the proportion of lambs meeting a particular carcass spec and the price received.

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MCPT UPDATE

RUTHERGLEN (Gervaise Gaunt)

Seasonal Conditions

Rutherglen has experienced a reasonable winter and a good spring season. By the end of September the region received 323 mm rainfall which is below the average rainfall normally experienced at this time of year. Pasture availability is now high (3-4 t/ha). Supplementary feeding of lambs continued post-weaning with the lambs being fed 100g/head/day wheat/barley with supplements plus ad-lib clover/ ryegrass hay.

Weaning and Lamb Growth

Lambs were weaned on the 1st July (average 87 days of age) and weaning weights and the latest October weight is shown in Table 1. Weaning occurred a few weeks earlier than usual due low feed availability. Growth rates for lambs from birth to weaning averaged 200 g/day. The results from the latest weighing in early October show that the growth rates have improved due to better feed availability with lambs averaging 240 g/day over the spring months. So that no lambs are disadvantaged by their sex (male or female), birth and rear type (eg. single or multiple) or date of birth (early vs late) the data has been adjusted and reported as single wethers averaging 87 days of age for weaning and 183 days at October weight. There is a considerable variation between sire groups for October weights, which range from 47.6 kg (Fi7) to 53.6 kg (Cp85).

Average weaning percentage (number of lambs weaned / ewes joined) for the 2000-drop ewes was 153% with only 2 lambs deaths between marking and weaning. Weaning percentages ranged from 117% (Gr86) to 180% (WD91). It is anticipated the lambs will be slaughtered in early November.

Table 1. 2ndX lamb weights at weaning and October - 2000 drop 1stX ewes

Sire Code	No. Ewes Joined	No. Lambs weaned	Lambs weaned /ewe joined %	Weaning weight**	October weight**
BL12*	19	33	174	30.9	52.7
BL81	23	32	139	28.8	50.8
BL82	12	17	142	29.8	52.1
BL83	18	25	139	30.5	50.6
CP5*	17	24	141	26.5	47.7
CP85	19	34	179	30.9	53.6
EFP89	17	22	129	29.1	49.8
Fi7*	31	49	158	26.2	47.6
Fi88	20	30	150	27.4	48.1
Gr86	24	28	117	29.6	51.7
Hy87	22	36	164	28.2	50.2
SAM84	16	27	169	29.6	53.3
WD91	15	27	180	31.0	52.3
WS90	14	19	136	30.0	51.1
Total	**267**	**403**	**151**	**29.2**	**50.8**

**link sires*

*** adjusted for age (83 days weaning, 183 days October) for single wethers*

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LETTER TO THE EDITOR

It seems to me that the start (some rams were born ten years ago) and end of the MCPT trial brackets a fundamental shift in the way we should think about sires (whether maternal or terminal). When the trial began industry did so with the classic idea that sheep breeds differed in their abilities to produce lambs of different qualities. The trial aimed to quantify these differences so people could make informed decisions about using rams from different breeds for different purposes. This kind of test represented the culmination of 200 years of thought about sheep breeding and showing.

The end of the trial sees a radically new view of sheep breeding - the breed is essentially irrelevant. What matters are the EBVs, i.e. the genetic makeup, of the ram used. So for a particular purpose you need rams of a certain DNA composition, no matter what their external appearance says about their breed. When the trial began it seems to me industry was still not totally confident about the merits of the EBV analysis and the trial has totally vindicated it. The results show that genetic variation within breeds is greater than the variation between breeds, and that the EBV is the greatest predictor. The normal stuff that is being measured in LAMBPLAN generally, and the trial in particular - growth, muscling, fat, worm resistance etc – are characteristics of *Ovis aries* as a species. That is as long as you compare rams with the same EBVs for growth, say, from different breeds, the outcome will be the same. Traditionally people have believed that particular breeds were inherently 'good' for say muscling or leanness or fertility. This is clearly not true. It is possible (but unlikely) that some breeds may have less variation, or even a significantly different mean but this would be extremely difficult to demonstrate. Even breeds with very small numbers probably have as much variation as big breeds, and whatever selection for invisible features went on prior to LAMBPLAN is unlikely to have been effective enough to significantly change variation in, say, muscling.

Another way to summarise the trial results is that if you took a sample of rams now, one from each breed, and selected in order to have exactly the same set of EBVs, and put them over a set of ewes, the resulting lambs would not be different statistically for any of the measures being used. So when someone is choosing a ram they should in theory look purely at EBVs. In reality they won't of course, because factors such as availability and lamb buyer prejudice will also be involved. But there may be other reasons for choosing one breed rather than another, and it seems to me that future work might look at what those reasons might be (eg. frame size, maternal ability, temperament, hardiness, husbandry costs etc.) and whether they are measurable. We do know that breeds look different to greater or lesser degrees. It is possible that the selection process that worked on appearance also had some linked and unexpected effect on some non-visible features of breeds. Inadvertent selection may also have occurred. For example in choosing animals for show you are likely to pick big singles rather than smaller twins, more likely to pick docile animals than stroppy ones, more likely to choose those with flat backs than those heavy in the shoulders All those selection processes, if the breed as a whole relied on show success to identify top rams, could have affected breed performance. This seems to me a possibly fruitful line of enquiry.

Congratulations on a mighty achievement (and a lot of hard work!).

Regards
David Horton
Pickwick Wiltshire HornSheep Stud

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ERRATTA

There were some minor errors in several of the graphs on pages 2-5 of the last issue of ***Dynamic Dams*** **(No. 22)**. This did not change the essence of the results but did change some of the values on the graphs. The corrected graphs and the associated changes in the text have been made to the Newsletter on the website and were incorporated in the recent article in *The Muster* journal.
If you wish to receive the corrected version of the article please contact the Editors. We apologise for these errors.

READER FEEDBACK

Thank you to those 41 readers (10%) who returned the feedback survey that was included in the last Newsletter. Some 39% of respondents were ram contributors or seedstock breeders, 39% lamb producers and 17% consultants or advisors.

The Newsletter was valued with 83% rating it very high or high value. Most readers were satisfied with the presentation with 80% rating the style and layout very good or good. The amount of detail contained in the newsletter was considered to be generally right (64%). One reader thought there was too little detail, no one thought there was too much detail and 34% expressed no opinion.

Almost all respondents (85-100%) rated as high or of moderate importance the expression of results for sires as EBVs for lamb growth and carcase merit and various measures of 1stX ewe performance, except for 1stX wool (65%). The EBVs of greatest importance were number of lambs weaned (83% rated as high) and lamb growth and carcase merit (78% rated as high). The$returns, $ gross margin/ewe (60% rated as high) and $gross margin/DSE (65% rated as high) rated a little lower. Other suggestions for expression of results included: lamb survival, ability to lamb at 1 yr old, indicators of longevity of breeding ewes and seasonality.

Some 58% of respondents rated the impact of MCPT on industry as very high or high with 27% moderate and 10% little. However most of the respondents showing moderate and little impact indicated that this was the current impact and future impact on industry would be very high or high.

Asked to list the 2 main *Take Home Messages* from MCPT, responses fell into 3 broad categories: variation between and within breeds; profitability of improved genetics; and lamb survival and growth. Some of the typical responses included: "select genetic excellence within breed that is best suited to your environment and management", "selection and not necessarily breed/cross type are important profit drivers", and "maternal side of the industry offers huge gains if used correctly". Many respondents saw the "importance of the number of lambs weaned", how it "affects returns dramatically" and how it can be "improved by genetics and management".

Most respondents (76%) had changed the way they ran their business because of the results of MCPT. For most of these it involved a change in genetics or adding breeds (45%), sourcing better ewes/contract mating (13%), developing self-replacing flocks (7%), changed lambing time, feeding (10%) and using results in advice (17%).

Most respondents also made comments on MCPT and how the results can be best applied in industry. These comments and the other feedback are very useful in putting together the Final Report and extension of the results to industry. Your support is greatly appreciated.

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Maternal sire entries - details

Year	Site	Sire Code	Tag	Stud	Breed	Entrant	Phone No.
1997	Cowra	BoL1	920047	Struan	Booroola Leicester	PIRSA	08 8762 9100
		BL2	950137	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Fi3	940001	Yamba	Finnsheep	M & L Burns	03 5798 1583
		Cr4	940364	Maluka	Corriedale	P Secker	02 4848 1244
		Cp5*	940449	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		EF6	94B021	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Fi7*	930057	Warrayure	Finnsheep	GM & MA Wake	03 5574 1254
		BL8	950181	Inverbrackie	Border Leicester	CE & LJ Arney	08 8538 0031
		Fi9	935010	Warrayure	Finnsheep	Knight & Bottcher	03 5578 7250
		WS10	910058	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
		Cr11	930097	Coora	Corriedale	Coora Partnership	02 4848 1244
		BL12*	94S291	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
1997	Hamilton	BL13	950246	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Ro14	930146	Claymour	Romney	Rouch & Gillman	03 5727 1552
		BoL15	924287	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cp16	930069	Narrambla	Coopworth	D Wigan	03 5577 2321
		Fi17	950054	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		Cp18	940421	Oaklea	Coopworth	J Keiller	03 5526 5248
		EF19	94B026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Cr20	880491	Stanbury	Corriedalo	Cole & Risbey	03 5593 9278
		Fi21	980002	UNSW	Finnsheep	S & D Jones	03 5122 3328
1998	Struan	Fi22	890049	ATC	Finnsheep	Jaydee Stud	08 8764 2065
		Fi23	930049	Tambaroora	Finnsheep	Jaydee Stud	08 8764 2065
		BL24	960348	Gleneith	Border Leicester	CE & LJ Arney	08 8536 0031
		BL25	980188	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Cp26	960210	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Cr27	921586	Coora	Corriedale	Coora Partnership	03 5578 6267
		EF28	960133	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Hy29	960028	Cowra	Hyfer	NSW DPI	02 6391 3813
		Hy30	960128	Cowra	Hyfer	NSW DPI	02 6391 3813
		PD31	960110	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		BL32	95T138	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		WS33	951470	Galaxy Park	White Suffolk	AWSA/Gale	08 6210 5230
1998	Cowra	BoL34	950029	Caveton Park	Booroola Leicester	PIRSA	08 8762 9100
		BL35	940765	Retallack	Border Leicester	BLA(NSW)/Grinter	02 6974 1153
		Cp36	980067	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cp37	940274	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cc38	960621	Coronga	Coronga Composite	Premier Breed. Tech	02 6365 8207
		EF39	94B040	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FL40	941016	Wycombe	Finn x Leicester	R & L Coddington	02 6775 5225
		Gr41	955551	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		WS42	940069	Leahcim	White Suffolk	AWSA/Micheel	08 8865 2085
1998	Hamilton	BoL43	960322	Struan	Booroola Leicester	PIRSA	08 8762 9100
		EF44	960026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		EF45	94B019	Glenspean	East Friesian	S & J Cameron	03 5286 1455
		Cr46	950161	Gundowringa	Corriedale	HJ & CJ Prell	02 4848 1244
		EF47	950509	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FiF48	960086	Gippfinn	Finn x Friesian	S & D Jones	03 5122 3328
		Ro49	920089	Evergreen	Romney	C Duncombe	03 5264 5170
		Tx50	949002	Coolana	Texel	Coolana Rural	03 5350 5531
		WS51	900429	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1999	Cowra	BL52	920070	Kegra	Border Leicester	BLA(NSW)/Golder	02 6977 1339
		BL53	960102	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		BL54	970030	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BoL55	950203	Struan	Booroola Leicester	PIRSA	08 8762 9100
		M58	890183	Centre Plus	Merino	L Mortimer & Sons	02 6892 8259
		EL57	960043	Ostlers Hill	English Leicester	ELAssoc/Stephenson	03 5764 1298
		WH58	960505	Clifton Hills	Wiltshire Horn	AWHSBA/Ballantyne	03 5145 8225
		EF59	970100	Silverstream	East Friesian	A. Baillieu	03 5597 8598
		WS60	974842	Linden Genetics	PLG White Suffolk	Linden Genetics	02 6386 2020
1999	Hamilton	BL61	970188	Wongajong	Border Leicester	AD & CM Wilson	02 5882 3338
		BL62	98X050	Kelso	Border Leicester	GB Starrtt & Son	03 5829 0144
		BoL63	950160	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cr64	910415	Coolana	Corriedele	PG Munro	03 5575 3240
		Cp65	978431	Ceshmore Park	Coopworth	J Keiller	03 5526 5246
		Ch66	910L92	Grand Ridge	Cheviot	RN Waddell	03 5626 4244
		Fi67	960085	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		EFP68	981019	Yollom	East Friesian x Perendale	MF & ML Molloy	03 5596 2077
		EFR69	970175	Price	East Friesian x Romney	EJ & KJ Price	03 5527 1110
1999	Struan	BL70	970310	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL71	97W290	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		M72	930051	Merinotech Mid	Merino	Merinotech Mid North	08 8665 4019
		EL73	950T82	Koenarl	English Leicester	CR Taylor	03 5595 0272
		Cp74	970101	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Hy75	960215	Cowra	Hyfer	NSW DPI	02 6391 3813
		FiF76	960132	Gippfinn	Finn Friesian	S & D Jones	03 5122 3328
		EF77	960138	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		SHD78	970155	Tauranga	South Hampshire Down	S & M Macmillan	03 5596 2251
		PD79	970101	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		WS80	970172	Koonawarra	White Suffolk	AWSA	08 8210 5211
2000	Struan	BL81	960327	Morton	Border Leicester	JD & CM Corbin	08 8765 8058
		BL82	980260	Johnos	Border Leicester	NW & JI Johnson	08 6756 6053
		BL83	980085	Johnos	Border Leicester	NW & JI Johnson	08 8758 6053
		SAM84	980046	Jeancourt	SAMM	W & M Heddle	08 8271 7080
		Cp85	980091	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Gr86	980144	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		Hy87	940278	Cowra	Hyfer	NSW DPI	02 6391 3813
		Fi88	538	Gippfinn	Finn	S & D Jones	03 5122 3328
		EFP89	981071	Yollom	East Friesian x Perendale	Karioi Seed Stock/Udy	03 5597 6621
		WS90	960513	Langley Heights	White Suffolk	AWSA	08 8210 5211
		WD91	990906	Axis	White Dorper	B & L Mawson	08 8537 0615

** Link sires used at each site each year*

Dynamic Dams
Ewe genetics for the future

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In This Issue

Editors: Neal Fogarty & Lynette McLeod
NSW Agriculture
Orange Agricultural Institute
Orange, NSW 2800
Ph: (02) 6391 3813
Fax: (02) 6391 3922
Email: neal.fogarty@agric.nsw.gov.au

*Dynamic Dams reports on the project **Maternal sire Central Progeny Test** (MCPT), which is part of the **MLA Lamb Program**, and provides other information for lamb breeders to improve their maternal genetics.*
Contributions from readers are welcome.

MCPT – IN THE HOME STRAIGHT

The final drop of 2ndX lambs in the MCPT was born at Rutherglen in March/April (see MCPT Update). The slaughter of these lambs later in spring and the shearing of the 1stX ewes and sampling for feed intake will complete collection of all the data from MCPT. While many of the results of the evaluation have been published progressively in *Dynamic Dams*, there is much more that will come from a detailed analysis of all the data.

Veronica Ingham (who has been employed jointly by NSW Agriculture and the Australian Sheep Industry Cooperative Research Centre at Orange) is undertaking much of this analysis over the next year or so. Some interesting results from these analyses to date for 1stX lamb growth, carcase performance and other traits are summarised in this issue of *Dynamic Dams*.

Jayce Morgan, who managed the sheep at Cowra, has also been undertaking a detailed analysis of the milking data collected at Cowra as part of MRurSc studies through the University of New England. Other members of the team are also undertaking detailed analysis of various aspects of the data.

The Final Report on MCPT is required for MLA by the end of December. The results will be summarised in a Technical Bulletin, including the major findings and Take Home Messages, which will form part of the Final Report. The Technical Bulletin will be distributed to all the ram contributors and those on the *Dynamic Dams* mailing list, as well as being put on the web.

Reader Feedback: *A separate sheet is enclosed with this issue and your feedback will help us prepare a more user friendly and useful Technical Bulletin for you. Please take a few minutes to fill out the Reader Feedback and let us know your views and thoughts about how you would like the results presented. Your responses (fax or post) will be greatly appreciated.*

NSW Agriculture

State Government Victoria Department of Primary Industries

SARDI South Australian Research and Development Institute

LAMBPLAN Excellence in breeding and production

MEAT & LIVESTOCK AUSTRALIA

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MATERNAL SIRES – 1STX PERFORMANCE

Neal Fogarty

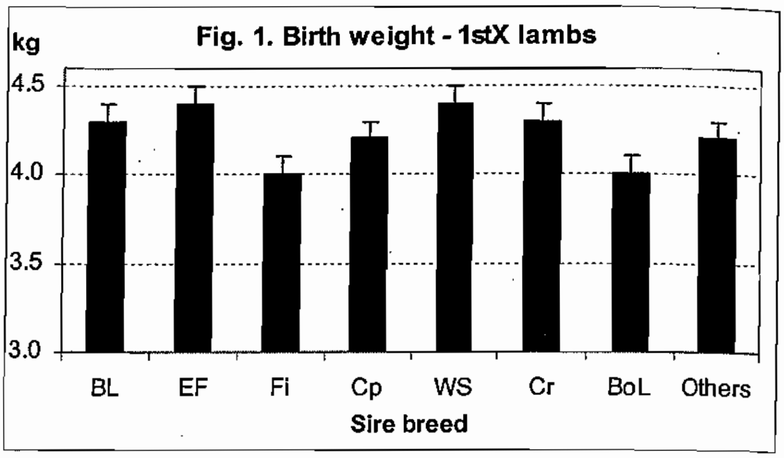
Results previously published in *Dynamic Dams* have clearly shown very large differences in performance between the sire progeny groups for most production traits. The 91 maternal sires that have been progeny tested across the various sites have been from several breeds. The breeds with the most sires tested included: Border Leicester (18), East Friesian and crosses (12), Finnsheep and crosses (12), Coopworth (9), White Suffolk (7), Corriedale (6) and Booroola Leicester (6). Other breeds with fewer sires tested included: Hyfer, English Leicester, Gromark, Merino, Romney, Poll Dorset, Cheviot, SAMM, South Hampshire Down, Texel, White Dorper and Wiltshire Horn as well as a composite breed (Coronga).

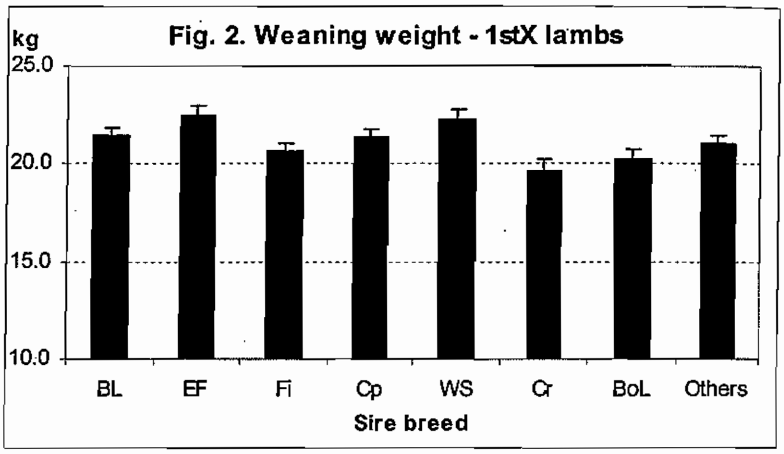
Most of the sires have current LAMBPLAN EBVs. For most traits these sire EBVs cover a very large range within their breed. The MCPT sire average EBVs for yearling weight were generally 1.5 to 2 kg higher than the average for all animals of their breed, with the White Suffolk sires averaging 3.6 kg higher than the Terminal sire average. For most other traits the average EBVs for the MCPT sires were reasonably close to the breed means. See below under LAMBPLAN EBVs for some exceptions and more details.

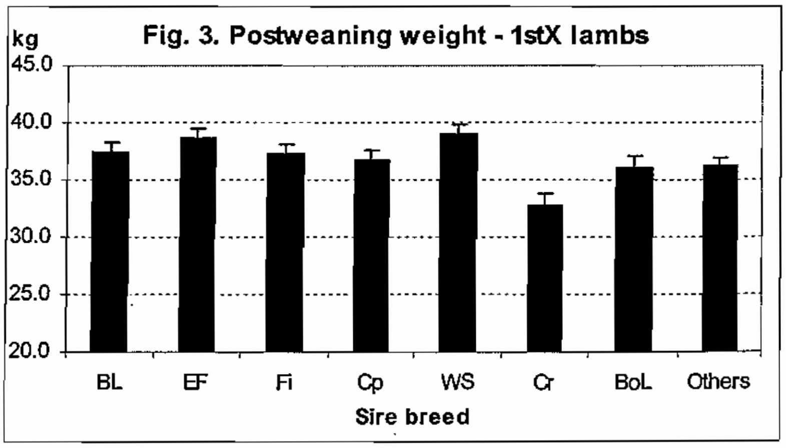
The following results are from the overall analysis completed so far for the more than 6000 1stX lambs weaned and almost 3000 1stX wethers slaughtered. The results show differences between the average 1stX progeny of sires for the breeds that had at least 6 sires tested (with the remainder of the sires combined under "Other"). While there are important and significant differences between the breed averages for the various traits it must be remembered that the differences between individual sires within the breeds were large with a considerable overlap between the breeds. There were also only relatively small numbers of sires of each breed that were progeny tested.

1stX lamb growth

There were significant differences between the breed averages for birth weight (Fig. 1), weaning weight (Fig. 2) and post weaning weight (Fig. 3) of the 1stX ewe and wether progeny. The White Suffolk and East Friesian cross lambs were







LEGEND

Sire breeds: BL = Border Leicester; EF = East Friesian; Fi = Finnsheep; Cp = Coopworth; WS = White Suffolk; Cr = Corriedale; BoL = Booroola Leicester; Others = All other breeds combined

Figs: The mark (T) above each bar on the figure indicates the standard error of the mean. For two means to be significantly different they need to differ by more than the sum of their standard errors.

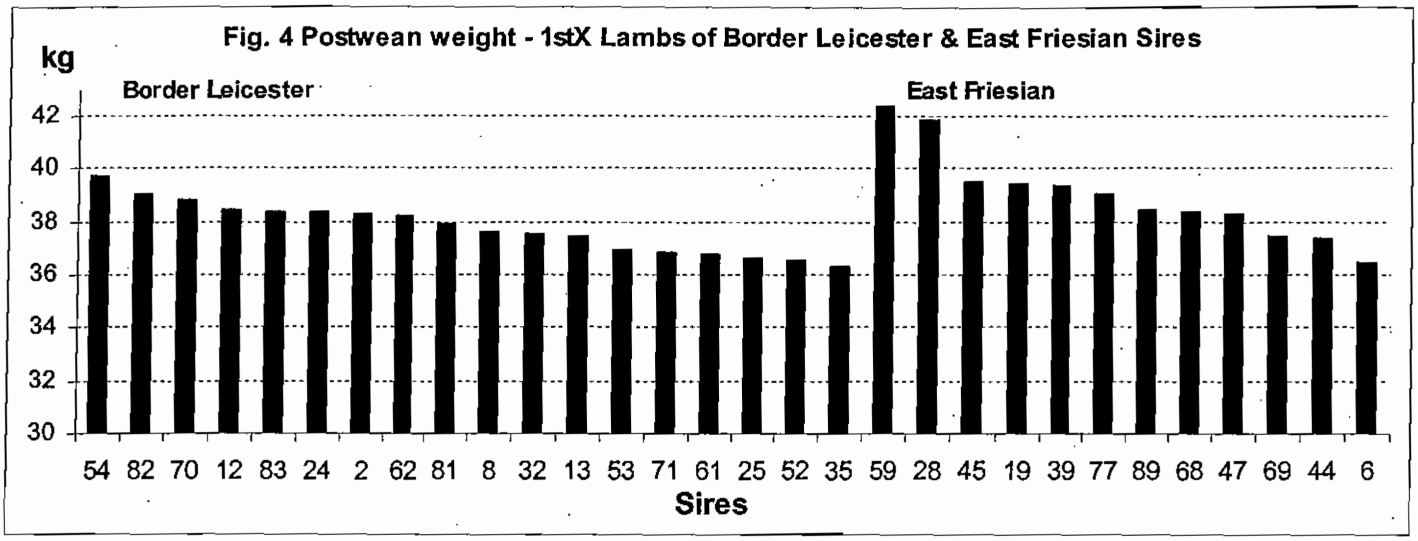


Fig. 4 Postwean weight - 1stX Lambs of Border Leicester & East Friesian Sires

heaviest at all ages, while the Finnsheep and Booroola Leicester cross were lightest at birth and weaning together with the Corriedale cross at weaning and post weaning. The range from the lightest (Corriedale 32.8 kg) to heaviest (White Suffolk 39.0 kg) at post weaning (adjusted for type of birth and rearing and age, 214 days) was over 7 kg. There was also a large range among the progeny averages of the sires within the breeds with considerable overlap across the breeds. For example the progeny averages for post weaning weight of the 12 East Friesian sires ranged from 36.5 to 42.4 kg whereas the range for the 18 Border Leicester sires was from 36.3 to 39.7 kg (Fig. 4).

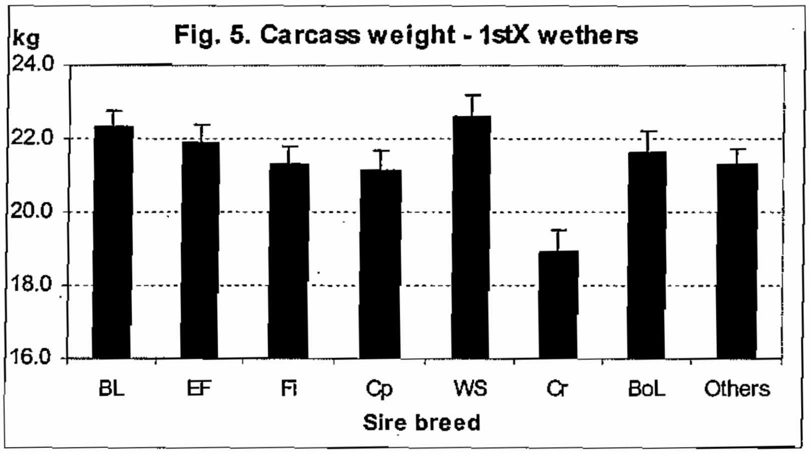


Fig. 5. Carcass weight - 1stX wethers

1stX carcase

The differences in growth rate between the breeds led to a range in carcase weight across the breeds of 3.7 kg (Fig. 5). While the White Suffolk 1stX wethers were the heaviest (22.6 kg) they were not significantly different from the Border Leicester (22.3 kg) or East Friesian (21.9 kg) carcases. Dressing yield increased with higher carcase weight (about 0.4 %/kg), but there were no significant differences between the breeds, when they were compared at the same carcass weight.

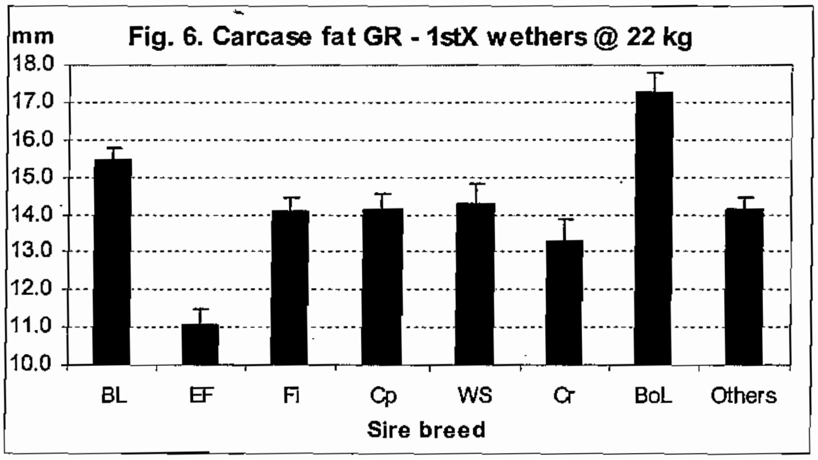


Fig. 6. Carcase fat GR - 1stX wethers @ 22 kg

There was a very large range in carcase fat levels (6.1 mm GR or more than one fat score) between the breed averages (Fig. 6) when compared at the same weight (22 kg). The East Friesian carcases were very lean (11.1 mm GR), with the Corriedale also being relatively low (13.3 mm GR), while the Booroola Leicester was the highest (17.2 mm GR) and the Border Leicester high (15.4 mm GR). As with growth, there was considerable variation among the individual sire progeny groups for carcase fat levels. The 12 East Friesian sires ranged from 9.7 to 13.5 mm GR and the 18 Border Leicester sires ranged from 13.1 to 17.5 mm GR). Even with the extreme differences between the averages of these two breeds there was an overlap between the individual sire groups. For the 1stX wether carcases the leanest Border Leicester sire group was leaner than the fattest East Friesian sire group.

There was a smaller range among the breeds for eye muscle area (Fig. 7), although there were significant breed differences when carcases were compared at the same weight (22 kg). The White Suffolk (14.2 cm²) and Corriedale (13.8 cm²) had significantly larger eye muscle area than the Border Leicester (13.2 cm²) 1stX carcases. There were no significant differences between the breed averages for meat colour or meat pH, which are indicators of meat quality.

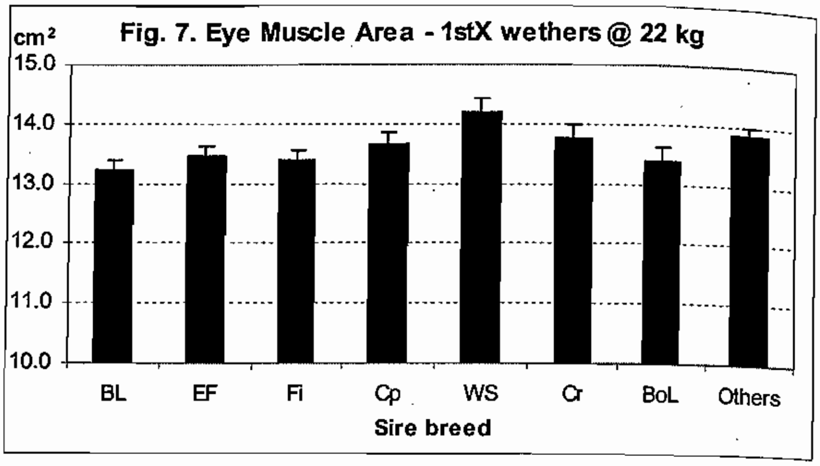
1stX ewe wool

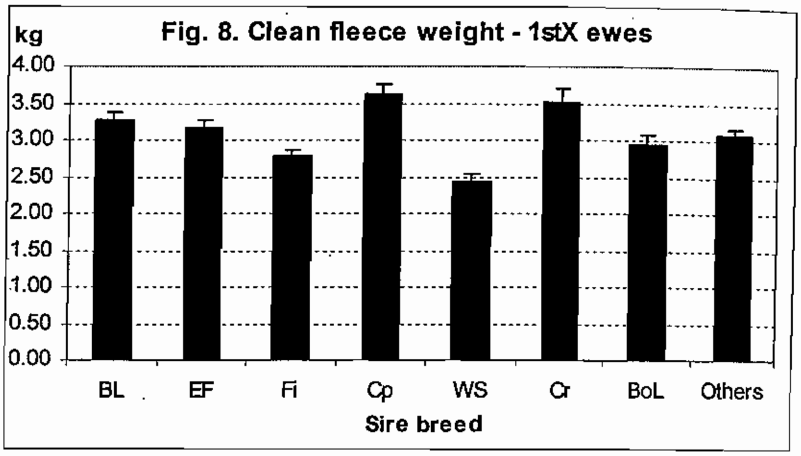
There were large differences between the breed averages for wool production (Fig. 8) and fibre diameter (Fig. 9) for the 1stX ewes at their hogget shearing. The Coopworth cross ewes had the highest average clean (and greasy) fleece weight (3.6 kg), with the Corriedale (3.5 kg) and Border Leicester (3.3 kg) cross ewes also relatively high, while the Finnsheep (2.8 kg) and White Suffolk (2.4) cross ewes were low. There were significant differences between the breeds for yield ranging from 77% for the Coopworth and Border Leicester to 72% for the White Suffolk cross ewes.

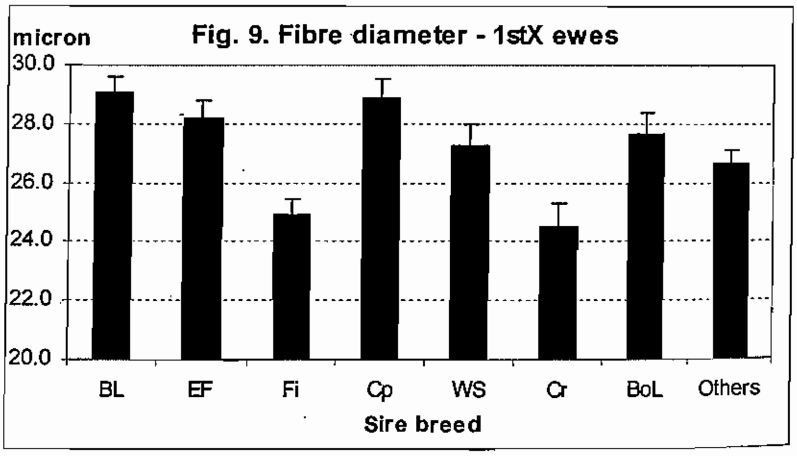
Average fibre diameter ranged from 24.5 microns for the Corriedale and 24.9 microns for the Finnsheep to 28.9 microns for the Coopworth and 29.1 microns for the Border Leicester 1stX ewes.

1stX lamb survival

The base Merino ewes (and Corriedale ewes at Hamilton) were treated with hormones prior to their mating with the maternal sires using artificial insemination. This resulted in a high proportion of multiple births, with an average of 1.8 lambs born per ewe lambing. Survival was higher for single (87%) than twin (77%) and triplet (60%) born lambs. There were significant differences between the breeds of sire for survival of the crossbred lambs, ranging from 70 to 77% (Fig. 10), after accounting for differences in type of birth. The highest survival was for the Border Leicester, Finnsheep and Coopworth sired lambs, with the East Friesian, White Suffolk and Corriedale sired lambs having the lowest lamb survival. Dystocia and a high proportion of ewes requiring assistance at lambing contributed to the poorer lamb survival for the East Friesian (10.1%). The White Suffolk sires (6.3%) also had a higher proportion of ewes requiring assistance (relative to 3% for all other ewes).







1stX - other traits

The genotype of the lamb is more important than the dam in determining gestation length and there were significant differences between the sire breeds of the 1stX lambs (Fig. 11). The Finnsheep 1stX lambs had a shorter gestation (147.6 days) than other crosses, which accounts in part for their lower birth weight. The Corriedale (150.5 days), Booroola Leicester and White Suffolk 1stX lambs had a longer gestation length of about 150 days, while the other breed cross lambs were about 149 days.

There were no significant breed differences for worm resistance among the 1stX ewe lambs, although there were large differences between individual sire groups as reported previously.

Fig. 10. Survival % - 1stX lambs

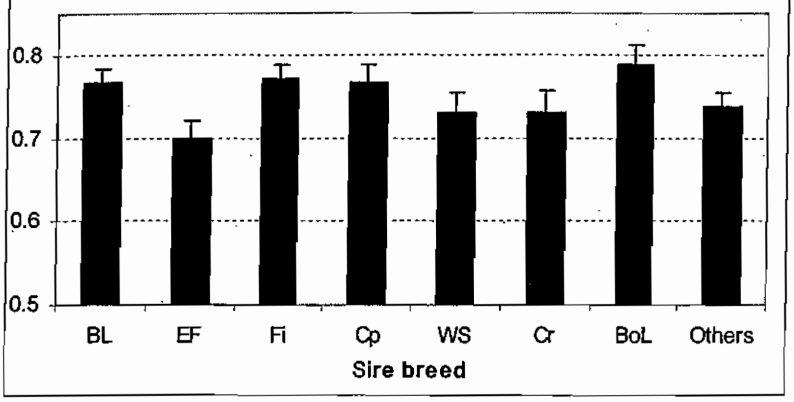
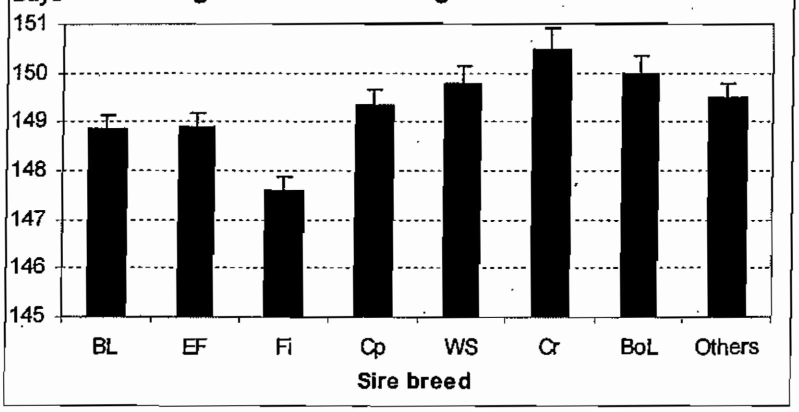


Fig. 11. Gestation length - 1stX lambs



LAMBPLAN EBVs of the sires

We have looked at the LAMBPLAN EBVs (Sept 2003) for those sires that are in the LAMBPLAN database to get some idea of how they compare with the other animals currently in their breed for a range of traits. The sires generally covered a very large range in EBVs for the various traits, eg. the 18 Border Leicester sires had LAMBPLAN EBVs for yearling weight that ranged from -1.7 to +5.4 kg.

In general the average of the maternal breed sires that were progeny tested had higher average EBVs for yearling weight (by about 1.5 to 2 kg) compared to the average for all animals of their breed, while the White Suffolk sires averaged 3.6 kg higher than the Terminal sire average. For most other traits the average EBVs for the maternal sire breeds were reasonably close to the breed averages. The few exceptions included; lower average EBVs for fat and muscle for the East Friesian sires, higher average EBV for reproduction for the Coopworth sires and higher average EBV for wool weight for the Corriedale sires. These differences between the sire and breed average values were small relative to the range in EBVs for the individual sires. The MCPT sires were generally born between 1994 and 1998 and were selected and entered by breeders between 1997 and 2000. At this time there was less information in the LAMBPLAN database than currently exists and animals born more recently have higher EBVs especially for weight. This reflects the genetic trends and improvement that has occurred in the breeds over recent years. The LAMBPLAN data indicates that even though the sires were selected they are generally representative of the breeds in the Australian industry and they cover a reasonable range of the genetic merit available for the economically important traits in lamb production. The correlations between individual ram EBVs and their crossbred progeny performance is currently being analysed.

The lambing performance of the 1stX ewes and the growth and carcase performance of their 2ndX lambs is currently being analysed and will be reported in later issues. Detailed analysis of milk production of the 1stX ewes will also be reported in later issues of *Dynamic Dams*.

Take home messages

- There are important differences between breeds for: -growth, carcase (especially fat), wool weight and fibre diameter

- The variation between sire groups within breeds is considerably greater than the differences between the breed groups i.e. there is overlap between the breeds for most traits

- Most breeds had high performing sires

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MCPT UPDATE

RUTHERGLEN (Gervaise Gaunt)

Seasonal Conditions

Rutherglen has experienced a dry autumn with a very late break in mid-May. By mid-June the region received 128 mm rainfall which is only half the average rainfall normally experienced at this time of year and similar to rainfall experienced in the drought last year. Due to low rainfall, pasture availability was low (0.4-0.6 t/ha) until early May but is now estimated at 0.9-1 t/ha due to the recent rain. Supplementary feeding has continued since early March and the ewes (and lambs) are currently being fed 900g/head/day wheat/barley with supplements and 5 kg/head/week, clover/ryegrass hay.

Ewes and lambs will be supplementary fed until weaning and since pasture availability is low the lambs will be weaned early this year in July. The decision to continue supplementary feeding lambs will be made depending on pasture availability at weaning.

Lambing and Marking

Weather conditions during lambing (April/May) were mild. Lambing commenced March 25th 2004, with ewes lambing in individual plots on the basis of sire group and 84% of lambs being born in the first two weeks. There was an active fox-baiting program, and although there were still some losses due to foxes overall the lamb losses between lambing and marking were reasonably low (11%) compared to previous years, particularly considering the high overall lambing percentage of 171% (Table 1)

The 2000-drop ewes have now completed three lambings. Conception rates (number of ewes pregnant / ewes joined) averaged 95%. Several ewe sire groups achieved 100% conception rate ie. BL82, CP85, Fi7, SAM84, WD91.

Average lambing percentage (number of lambs born / ewe joined) for the 2000-drop ewes was high this year ie. 171% compared to previous years 126% (2002) and 140% (2003). Lambing percentages (Figure 12) ranged from 125% (GR86) to 197% (Fi7).

Lambs were marked in mid-May and achieved overall growth rate from birth to marking of 201 g/day. The growth rate is lower for the same period in previous years, which can be contributed to the high rate of multiple births and poor seasonal conditions. The overall marking percentage was 153% (Figure 12) with marking percentages ranging from 117% (GR86) to 180% (WD91).

Table 1 shows mean marking weight which has been adjusted to the weight for 40 days of age. There is a considerable difference of 4kg liveweight between the mean marking weights per sire group with a range from 15.5kg (Fi7) to 19.5kg (WD91 and WS90).

Fig 12. Lambs born and marked / ewe joined (2000 drop)

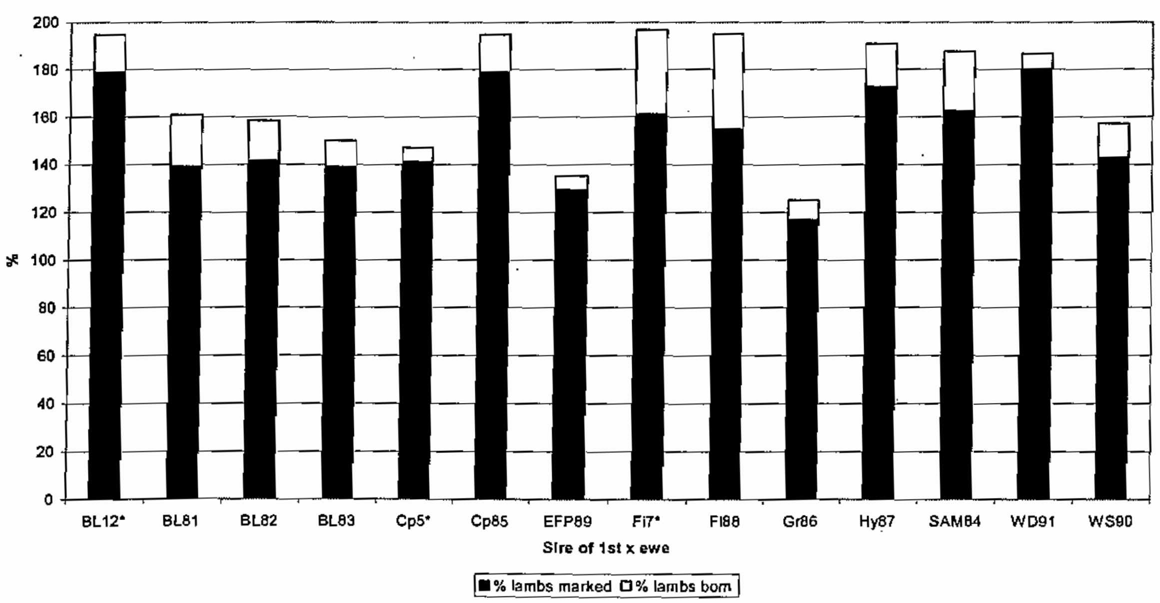

Table 1. **Lambing and marking percent and marking weight for 2000-drop ewes.**

Sire Code	No. ewes joined	No. ewes lambed	Lambs born/ ewes joined (%)	Lambs marked/ ewes joined (%)	Marking Wt** (kg)
BL12*	19	18	195	179	18.5
BL81	23	21	161	139	17.7
BL82	12	12	158	142	18.3
BL83	18	16	150	139	19.4
CP5*	17	15	147	141	16.2
CP85	19	19	195	179	18.8
EFP89	17	15	135	129	18.3
Fi7*	31	31	197	161	15.5
Fi88	20	19	195	155	16.4
Gr86	24	22	125	117	18.6
Hy87	22	21	191	173	17.5
SAM84	16	16	188	163	17.9
WD91	15	15	187	180	19.5
WS90	14	13	157	143	19.5
Total	**267**	**253**	**171**	**153**	**18.0**

**link sires*

*** adjusted for age (40 days) for single wethers*

***Take Home Messages*:**

These results have once again shown that large differences are evident between sires and within breeds and there is enormous potential within the lamb industry for improvement in:

- Conception rate
- Lambing percentage
- Marking percentage
- Weaning weight

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From 1 July 2004, NSW Agriculture will become the ***NSW Department of Primary Industries***, through an amalgamation of NSW Agriculture, NSW Fisheries, the Department of Mineral Resources and NSW State Forests.

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Maternal sire entries - details

Year	Site	Sire Code	Tag	Stud	Breed	Entrant	Phone No.
1997	Cowra	BoL1	920047	Struan	Booroola Leicester	PIRSA	08 8762 9100
		BL2	950137	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Fi3	940001	Yamba	Finnsheep	M & L Bums	03 5798 1583
		Cr4	940364	Maluka	Corriedale	P Secker	02 4848 1244
		Cp5*	940449	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		EF6	94B021	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Fi7*	930057	Warrayure	Finnsheep	GM & MA Wake	03 5574 1254
		BL8	950181	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Fi9	935010	Warrayure	Finnsheep	Knight & Bottcher	03 5578 7250
		WS10	910058	Leahcim	White Suffolk	AWSA/Michael	08 8885 2085
		Cr11	930097	Coora	Corriedale	Coora Partnership	02 4848 1244
		BL12*	94S291	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
1997	Hamilton	BL13	950248	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Ro14	930146	Claymour	Romney	Rouch & Gillman	03 5727 1552
		BoL15	924287	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cp16	930069	Narrambla	Coopworth	D Wigan	03 5577 2321
		Fi17	950054	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		Cp18	940421	Oaklea	Coopworth	J Keiller	03 5526 5248
		EF19	94B028	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Cr20	880491	Stanbury	Corriedale	Cole & Risbey	03 5593 9278
		Fi21	960002	UNSW	Finnsheep	S & D Jones	03 5122 3328
1998	Struan	Fi22	890049	ATC	Finnsheep	Jaydee Stud	08 8764 2065
		Fi23	930049	Tambaroora	Finnsheep	Jaydee Stud	08 8764 2065
		BL24	980346	Gleneith	Border Leicester	CE & LJ Arney	08 8536 0031
		BL25	960188	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Cp26	960210	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Cr27	921586	Coora	Corriedale	Coora Partnership	03 5578 6267
		EF28	960133	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Hy29	960028	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Hy30	980128	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		PD31	960110	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		BL32	95T138	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		WS33	951470	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1998	Cowra	BoL34	950029	Caveton Park	Booroola Leicester	PIRSA	08 8762 9100
		BL35	940765	Retallack	Border Leicester	BLA(NSW)/Grinter	02 6974 1153
		Cp36	960067	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cp37	940274	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cc38	980621	Coronga	Coronga Composite	Premier Breed. Tech	02 6365 8207
		EF39	94B040	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FL40	941016	Wycombe	Finn x Leicester	R & L Coddington	02 6775 5225
		Gr41	955551	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		WS42	940069	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
1998	Hamilton	BoL43	960322	Struan	Booroola Leicester	PIRSA	08 8762 9100
		EF44	960026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		EF45	94B019	Glenspean	East Friesian	S & J Cameron	03 5286 1455
		Cr46	950161	Gundowringa	Corriedale	HJ & CJ Prell	02 4648 1244
		EF47	950509	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FiF48	960086	Gippfinn	Finn x Friesian	S & D Jones	03 5122 3328
		Ro49	920089	Evergreen	Romney	C Duncombe	03 5264 5170
		Tx50	949002	Coolana	Texel	Coolana Rural	03 5350 5531
		WS51	900429	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1999	Cowra	BL52	920070	Kegra	Border Leicester	BLA(NSW)/Golder	02 6977 1339
		BL53	960102	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		BL54	970030	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BoL55	950203	Struan	Booroola Leicester	PIRSA	08 8762 9100
		M56	890183	Centre Plus	Merino	L Mortimer & Sons	02 6892 8259
		EL57	960043	Ostlers Hill	English Leicester	ELAssoc/Stephenson	03 5764 1298
		WH58	960505	Clifton Hills	Wiltshire Horn	AWHSBA/Ballantyne	03 5145 8225
		EF59	970100	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		WS60	974842	Linden Genetics	PLG White Suffolk	Linden Genetics	02 6386 2020
1999	Hamilton	BL61	970188	Wongejong	Border Leicester	AD & CM Wilson	02 5882 3338
		BL62	98X050	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		BoL83	950160	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cr64	910415	Coolana	Corriedale	PG Munro	03 5575 3240
		Cp65	978431	Cashmore Park	Coopworth	J Keiller	03 5526 5248
		Ch66	910L92	Grand Ridge	Cheviot	RN Waddell	03 5626 4244
		Fi67	960065	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		EFP68	961019	Yollom	East Friesian x Perendale	MF & ML Molloy	03 5596 2077
		EFR69	970175	Price	East Friesian x Romney	EJ & KJ Price	03 5527 1110
1999	Struan	BL70	970310	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL71	97W290	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		M72	930051	Merinotech Mid	Merino	Merinotech Mid North	08 8665 4019
		EL73	950T82	Koenarl	English Leicester	CR Taylor	03 5595 0272
		Cp74	970101	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Hy75	960215	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		FiF76	960132	Gippfinn	Finn Friesian	S & D Jones	03 5122 3328
		EF77	960136	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		SHD78	970155	Tauranga	South Hampshire Down	S & M Macmillan	03 5596 2251
		PD79	970101	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		WS80	970172	Koonawarra	White Suffolk	AWSA	08 8210 5211
2000	Struan	BL81	960327	Morton	Border Leicester	JD & CM Corbin	08 8785 8058
		BL82	980280	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL83	980065	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		SAM84	980046	Jeancourt	SAMM	W & M Heddle	08 8271 7080
		Cp85	980091	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Gr86	980144	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		Hy87	940278	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Fi88	536	Gippfinn	Finn	S & D Jones	03 5122 3328
		EFP89	981071	Yollom	East Friesian x Perendale	Karioi Seed Stock/Udy	03 5597 6621
		WS90	960513	Langley Heights	White Suffolk	AWSA	08 8210 5211
		WD91	990906	Axis	White Dorper	B & L Mawson	06 8537 0615

** Link sires used at each site each year*

Dynamic Dams
Ewe genetics for the future

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In This Issue

Editors: Neal Fogarty & Lynette McLeod
NSW Agriculture
Orange Agricultural Institute
Orange, NSW 2800
Ph: (02) 6391 3813
Fax: (02) 6391 3922
Email: neal.fogarty@agric.nsw.gov.au

Dynamic Dams reports on the project *Maternal sire Central Progeny Test (MCPT)*, which is part of the *MLA Lamb Program*, and provides other information for lamb breeders to improve their maternal genetics.
Contributions from readers are welcome.

PSSST! WANT TO MAKE $40,000?

Neal Fogarty, NSW Agriculture, Orange

Its no secret, that is the extra profit you could make from the top 1stX ewes in the MCPT!

This issue of *Dynamic Dams* includes a comprehensive summary of the results to date from the Rutherglen site. The outstanding feature is the large range in profitability among the groups of 1stX ewes by different maternal sires. There is an average range of over $40 in gross margin/ewe/year across all the groups. This means an additional profit of $40,000 per year for a 1000 ewe enterprise or an extra $200,000 over the lifetime of the ewes by ensuring you have the best crossbred ewes for your enterprise. *That's a better return than fertiliser!* These ranges in returns from the Rutherglen 1stX ewe groups at are very similar and back up the results from Cowra shown in earlier issues of *Dynamic Dams*.

Take home messages

- An average range of more than $40 gross margin/ewe/year between the top and bottom performing 1stX ewe groups by different maternal sires
- Several maternal sire breeds had high performing 1stX ewe progeny
- There was considerable variation between sires within breeds
- Generally taking account of differences in feed requirements made little difference in rankings of the 1stX ewe groups, with some exceptions
- The best sire group may vary with production system (eg. domestic or export lamb market; autumn or spring joining)
- Selection of the best maternal genetics for your lamb production enterprise means considerably more $$$s profit

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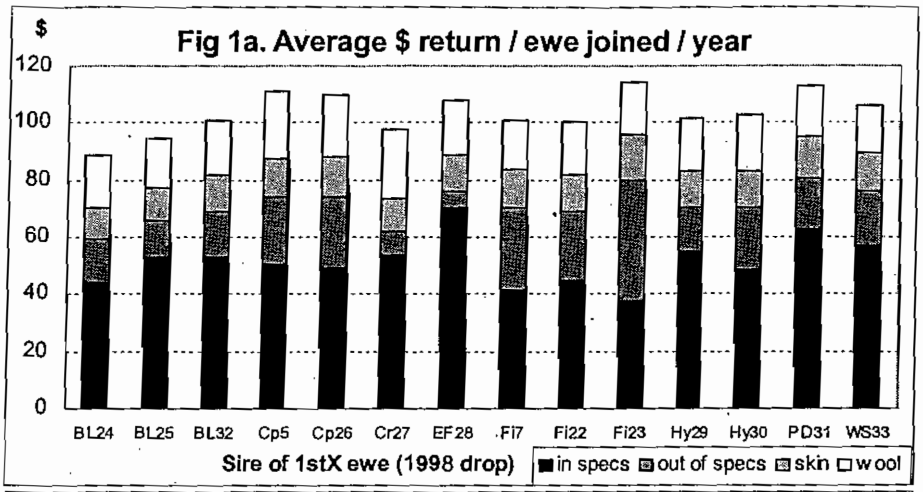
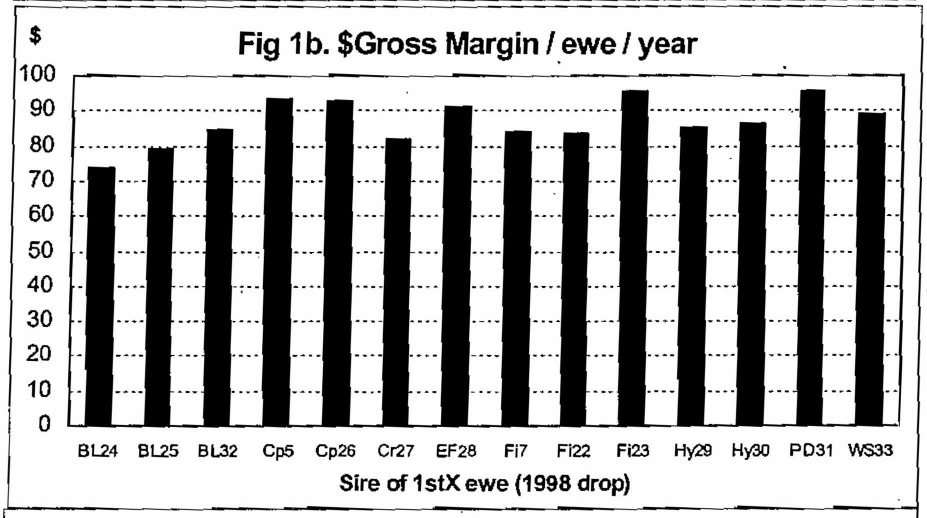
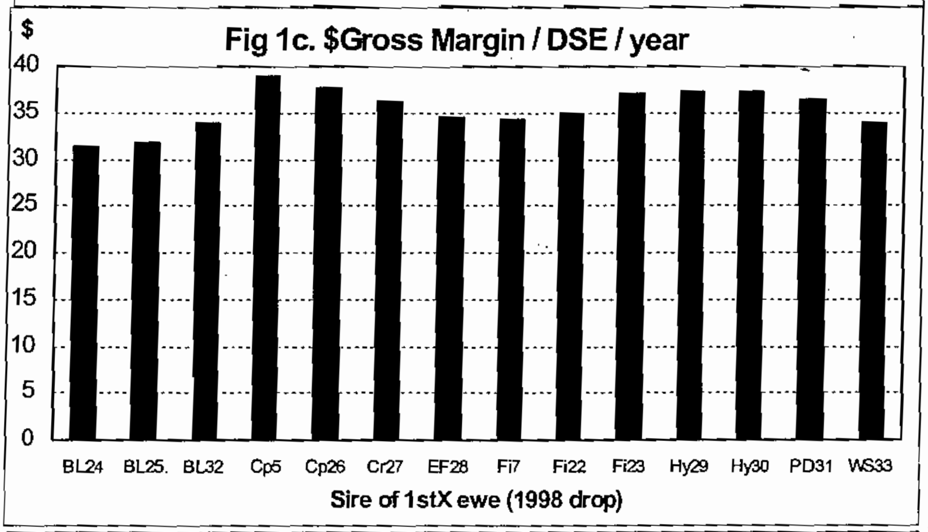
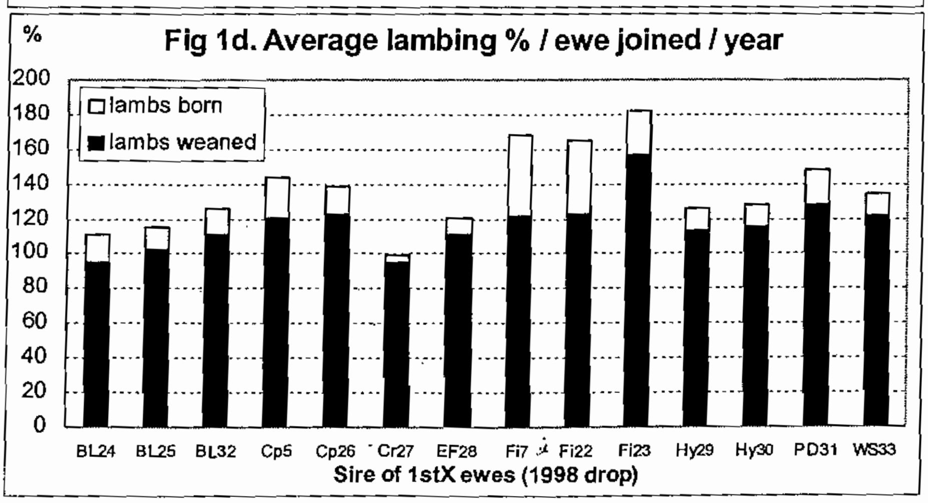








RUTHERGLEN SUMMARY

The 1stX ewes at Rutherglen were bred at Struan SA out of South Australian Merino ewes in June 1998, 1999 and 2000. Each drop was transferred to Rutherglen at about 11 months of age and joined to top LAMBPLAN tested White Suffolk rams in Nov/Dec over 3 years (the 2000 drop 1stX ewes have only completed 2 lambings to date). The results presented are from a large data set representing a total of 880 1stX ewes and 2440 2ndX lamb carcasses.

The performance is presented in several ways within the 3 drops of the 1stX ewes (1998, 1999 and 2000). The ***average $ returns per ewe joined per year*** over their first 3 lambings (2 lambings for the 2000 drop) which also shows the contributions to total $ returns from 2ndX lamb carcasses (in specs and out of specs), lamb skins and wool from the 1stX ewes.

The $ returns are based on the actual number of 2ndX lambs slaughtered (per ewe) and their carcass weights and fat measurements together with the clean wool produced from the 1stX ewes. The only adjustment to carcass weight was for sex to account for any differences in the proportion of wethers and ewes between the groups. Therefore the $ returns reflect the differences in value on the farm of ewes lambing earlier and having heavier lamb carcasses than those lambing later, multiple born and reared lambs will be lighter than singles but their carcass weights are added together. The prices for lambs and wool are detailed in the box.

The $ returns only tells part of the story as the different costs associated with production and marketing the lamb carcasses and wool need to be deducted so the ewe groups can be compared on a ***$ gross margin per ewe joined per year*** basis. The costs used for calculation of the $ gross margins are shown in the box.

Another consideration is feed requirements of the ewe and her lambs during lactation and subsequent lamb growth to slaughter, which may affect stocking rate. Heavier ewes with higher lambing percentage and faster growing lambs to higher slaughter weight will have higher feed requirements. To examine the effect of this the total annual feed requirements for the ewes and their lambs have been estimated from their actual performance over the 3 years and put on a dry sheep equivalent (DSE) basis and expressed as ***$ gross margin per DSE per year***.

There needs to be some care in interpretation of these DSE values as the implicit assumption is that the feed required for all the phases of the production cycle and in the various seasons costs the same. In the real farm situation this is obviously not true. For example (a) the cost of high quality feed for lactating ewes or weaned lambs will generally be higher than that required for maintenance of dry ewes and (b) the feed required for lambing at the start of the spring flush effectively costs a lot less than the same feed required for lambing in winter or before the autumn break.

The other figures show various measures of performance that contribute to the $ returns from the 1stX ewes and their 2ndX lambs. The ***average lambing %*** of the 1stX ewes (lambs born and lambs weaned per ewe joined over 3 years, except 2 years for the 2000 drop ewes) shows the differences in lambing rate and lamb survival to weaning. Most lambs that reached weaning subsequently survived and were slaughtered.

The ***2ndX lamb weaning weight*** shows the differences due to genes passed onto the lamb for growth ***and*** genes passed onto the 1stX ewe for milk production and nurturing. These weights have been adjusted to twin reared lambs at 90 days of age to account for the non genetic effects due to differences between the groups in the proportions of multiples, being born earlier or later in the drop and sex.

Fig 2a. 2ndX Lamb Weaning Weight

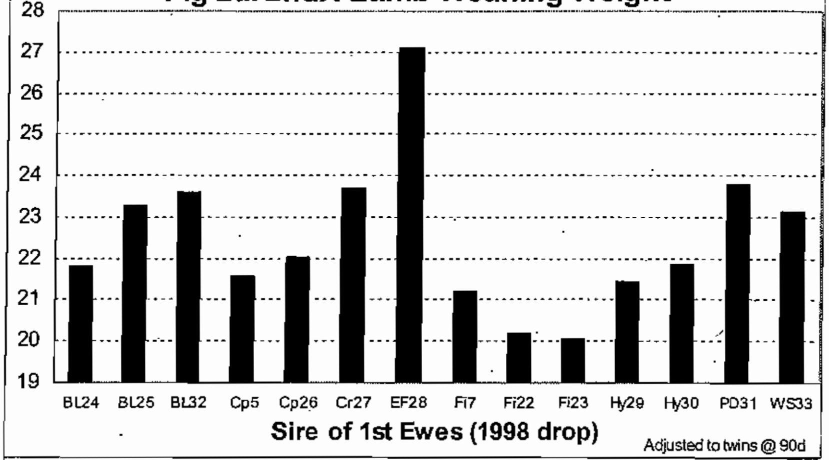


Fig 2b. 2ndX Lamb Postweaning Weight

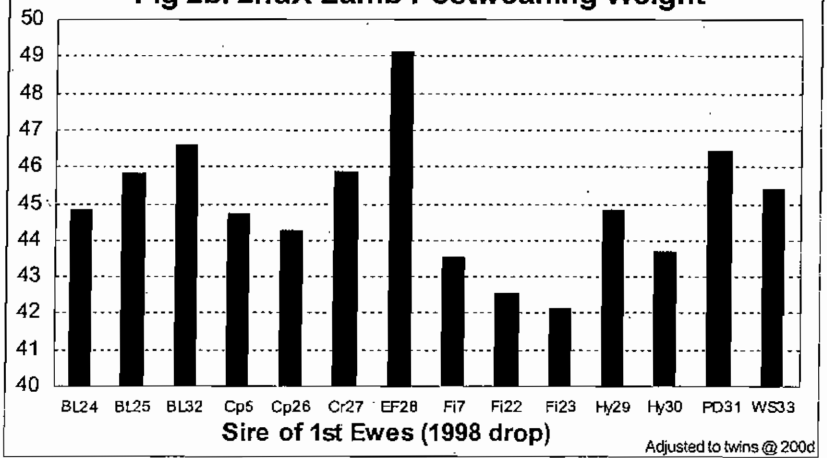


Fig 2c. 2ndX Lamb Carcass - Fat GR

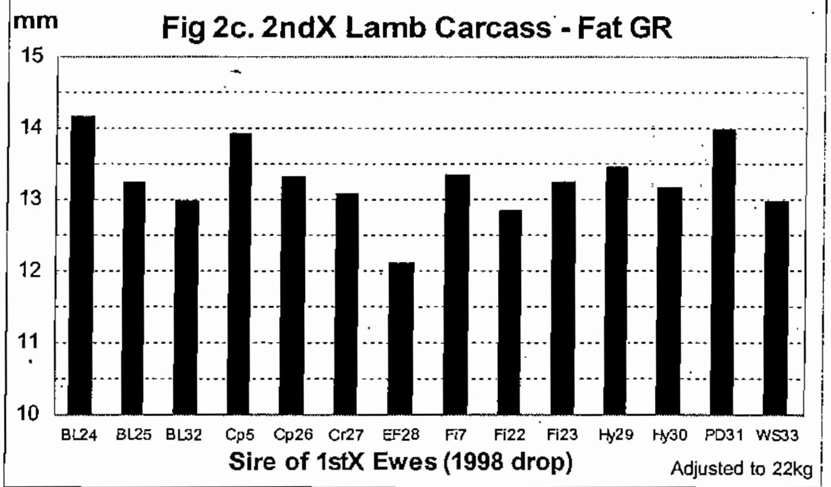


Fig 2d. 2ndX Lamb Carcass - Eye Muscle Area

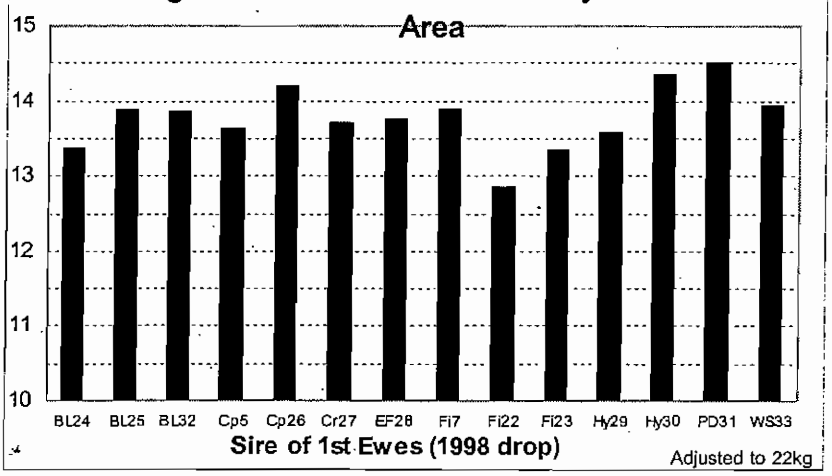


Fig 3a. Average $ return / ewe joined / year

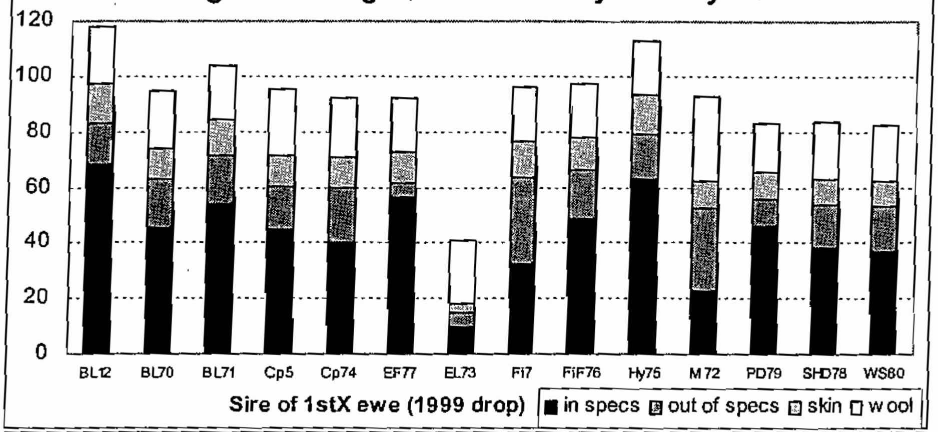


Fig 3b. $Gross Margin / ewe / year

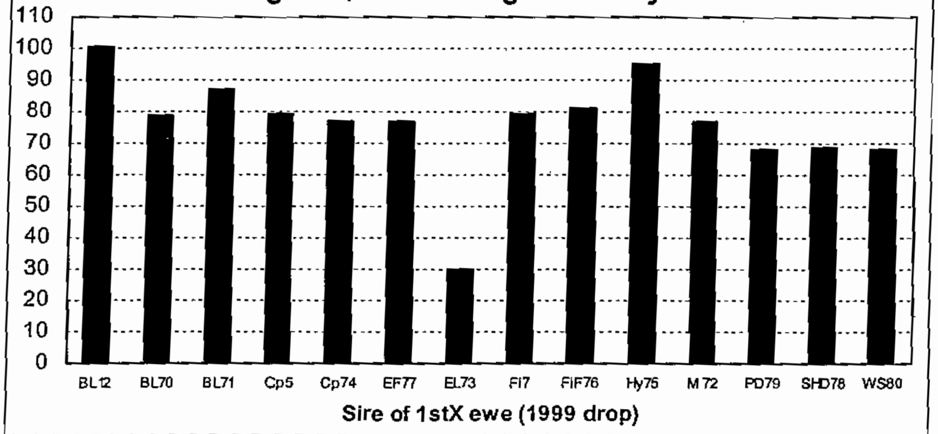


Fig 3c. $Gross Margin / DSE / year

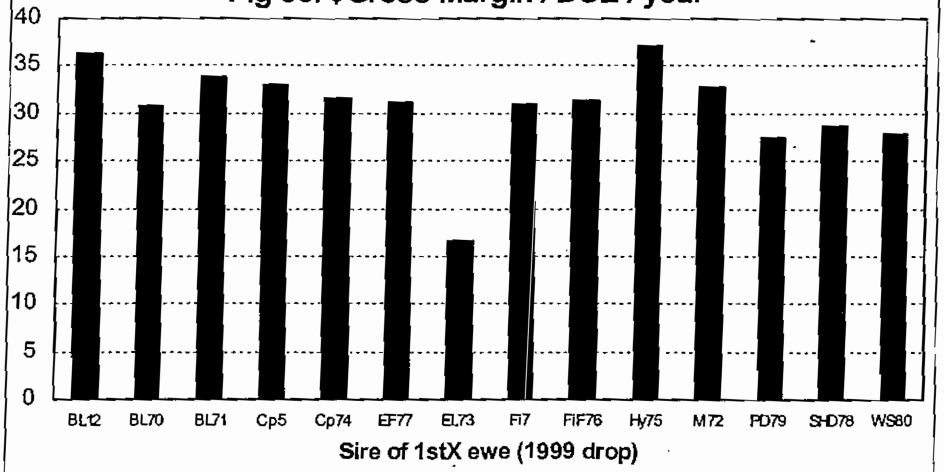
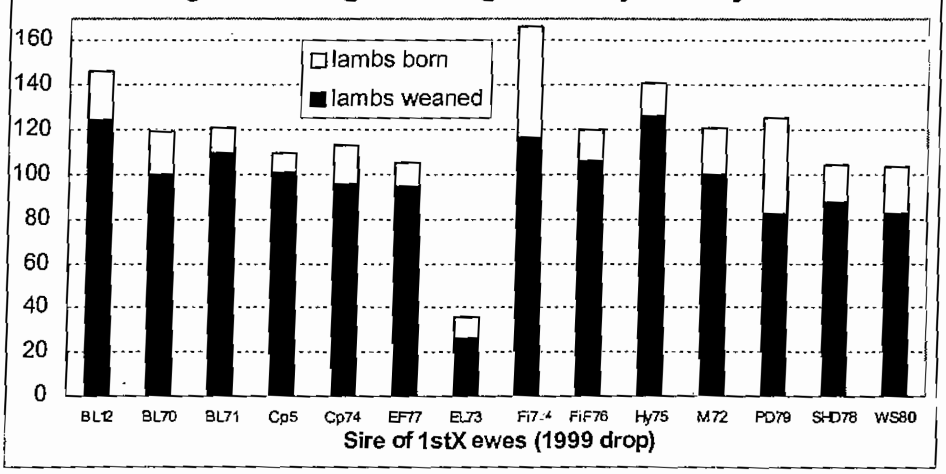


Fig 3d. Average lambing % / ewe joined / year



The ***2ndX lamb post weaning weight*** shows the differences in genes for growth to slaughter that have been passed onto the lamb from the 1stX ewe, including the effects carried over from pre-weaning. These weights have been adjusted to twin reared lambs at 200 days of age to account for these non genetic effects.

The ***2ndX lamb carcass fat*** shows the differences in genes for carcass fat at the GR site. These have been adjusted to 22 kg carcass weight so they are compared on the same basis.

The ***2ndX lamb carcass eye muscle area*** shows the differences in genes for carcass muscle. These have been adjusted to 22 kg carcass weight so they are compared on the same basis.

$ returns

The average $returns per ewe per year over the 3 lambings for the 1998, 1998 and 2 lambings for the 1999 drop 1stX ewe groups are shown in Figs. 1a, 3a and 5a respectively. There was considerable variation among the different 1stX ewe sire groups with the range between top and bottom in each drop of ewes being $25.40 (1998), $77.60 (1999) and $42.85 (2000).

Approximately 80% of the annual returns were from lamb (carcasses in and out of specs and skins with only 20% from ewe wool. The returns from wool were as low as 15% in some of the groups with high lamb returns and as high as 33% for the Merino sire group (M72, Fig 3a). For the BL cross groups, wool ranged from 17 to 22% of the total returns.

There were also large differences in the proportion of lamb carcass in specs (>20 kg and fat score 2-4) and out of specs. An example of this is the contrast between the EF28 and Fi23 sire groups (1998 drop ewes - Fig 1a). The two groups had similar total carcass returns ($76 for EF28 and $80 for Fi23), with less than half the carcasses from Fi23 being in specs whereas almost 95% of those from EF28 were in specs.

There were several reasons for this: firstly the Fi23 ewes had a much higher average lambing % (157% v 111% weaned, see Fig. 1d) with more lambs slaughtered per ewe joined; however the lambs grew more slowly (even when type of birth and rearing differences were taken into account – see Figs. 2a and 2b) which meant the average carcass weight was considerably lower (19.4 kg v 24.5 kg) so more than half the lambs from the Fi23 group did not make the weight spec; the EF28 group had fewer but heavier carcasses that were very lean (see Fig. 2c) and almost all were within the weight and fat specs. The contrast between these groups shows that different production and marketing systems may need crossbred ewes with particular genetics to best match the requirements.

The large range in $ returns for the 1999 drop (Fig. 3a) was in part due to low returns from the EL73 sire group because of very low lambing % (see Fig. 3d). This indicates that this group of ewes may not be suited to joining out of season in the spring and summer.

It is also worth noting that while lambing % is a major driver of $ returns, survival and growth rate of lambs and their ability to meet carcass specs (and ewe wool production) also contribute to profitability of the enterprise. It is important to match the genetics of the ewe (and ram) flock to the production and marketing requirements of the enterprise.

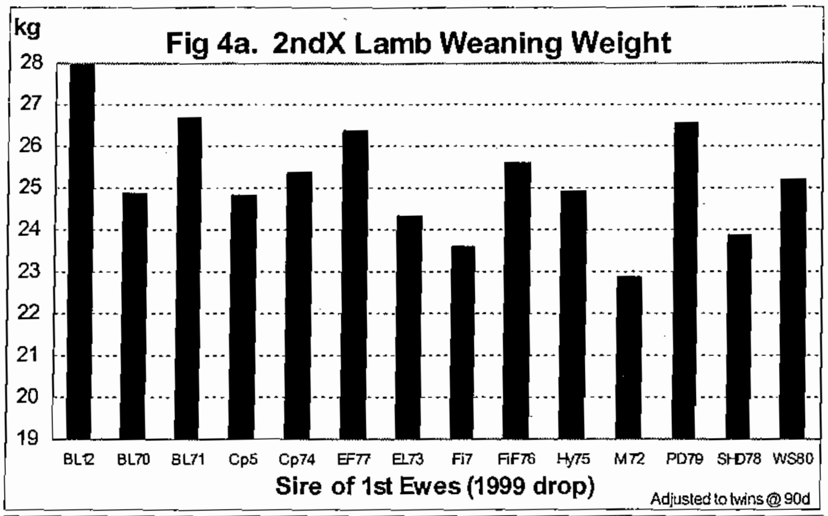


Fig 4a. 2ndX Lamb Weaning Weight

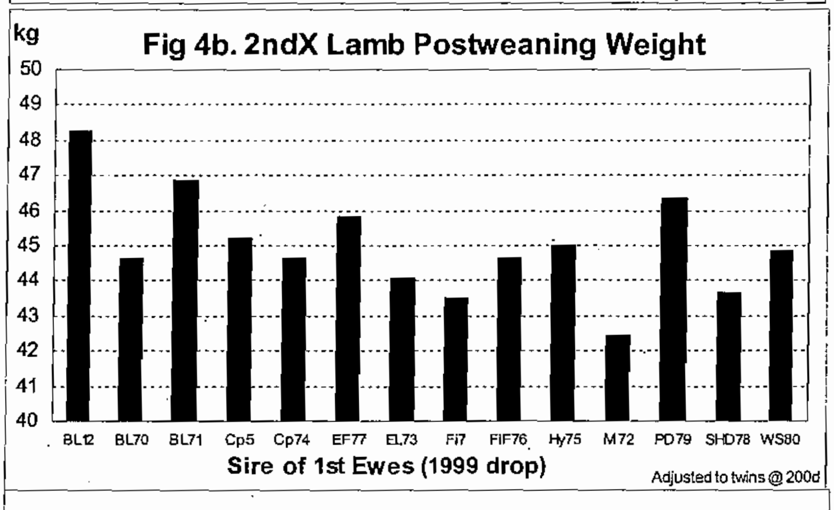


Fig 4b. 2ndX Lamb Postweaning Weight

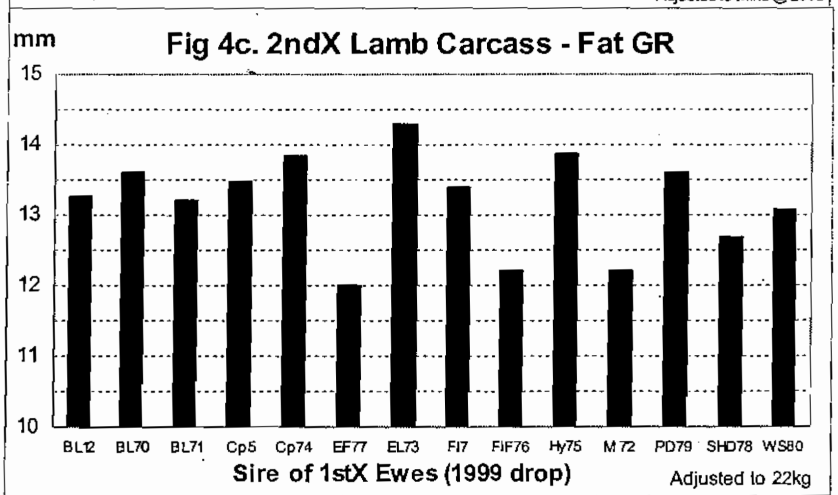


Fig 4c. 2ndX Lamb Carcass - Fat GR

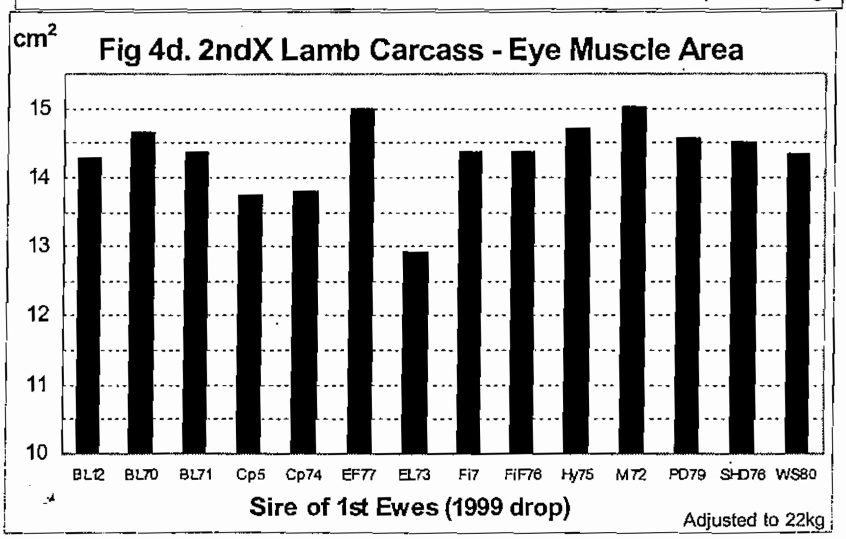


Fig 4d. 2ndX Lamb Carcass - Eye Muscle Area

Fig 5a. Average $ return / ewe joined / year

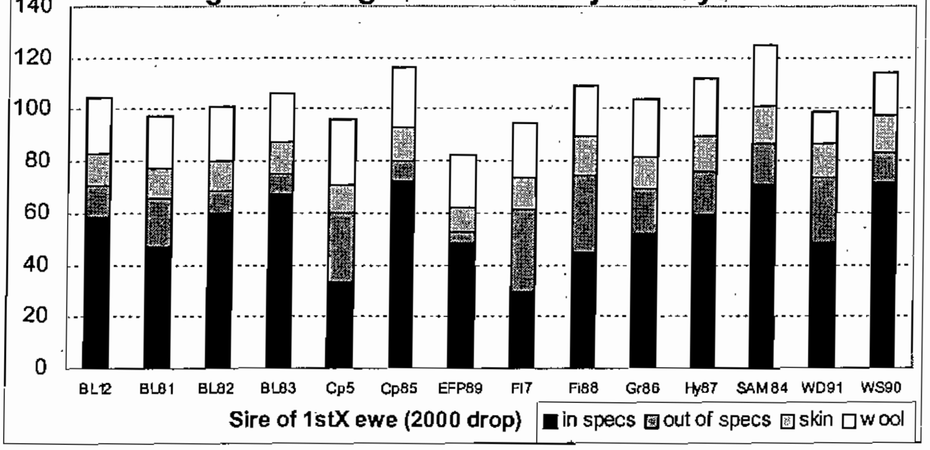


Fig 5b. $Gross Margin / ewe / year

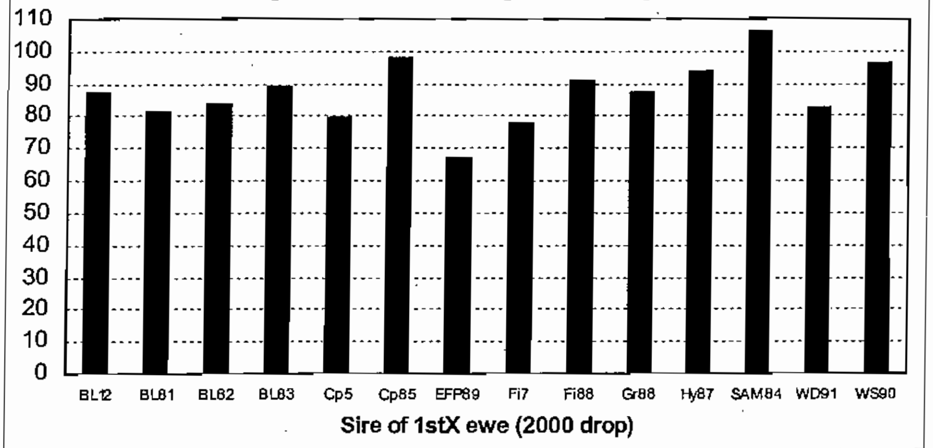


Fig 5c. $Gross Margin / DSE / year

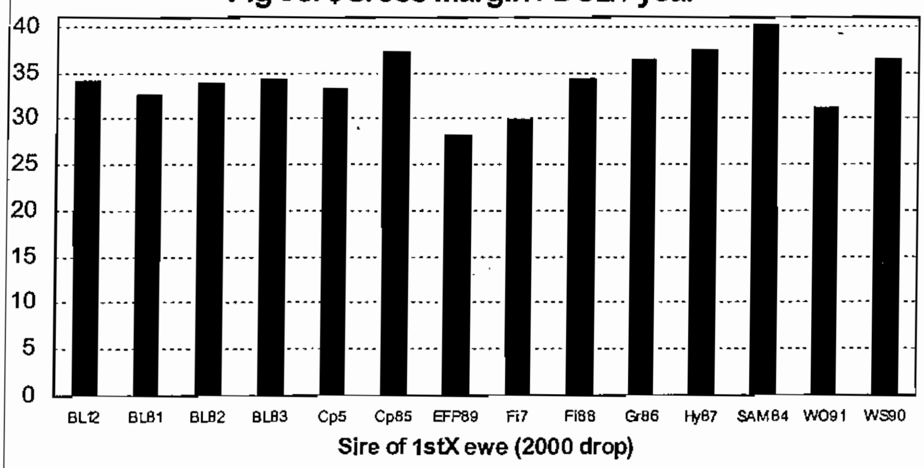
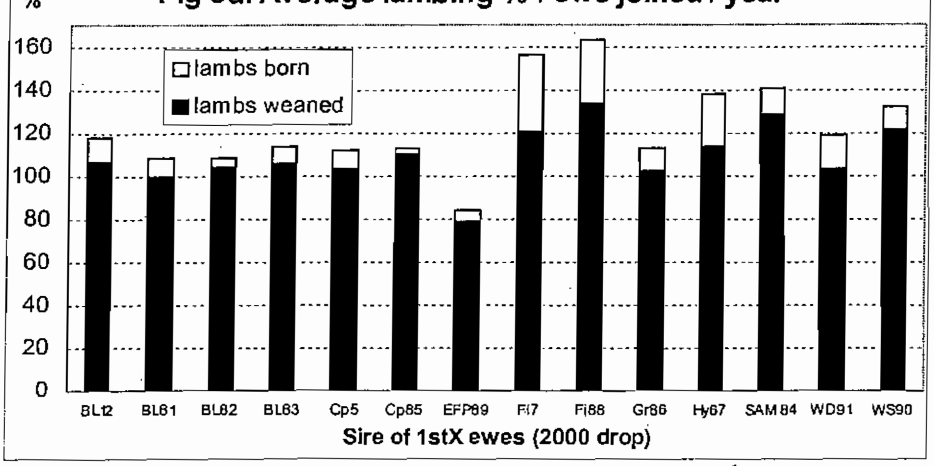


Fig 5d. Average lambing % / ewe joined / year



$ gross margins (GM)

The average $GM per ewe per year over the 3 lambings (2 for 2000 drop) for the 1stX ewe groups are shown in Figs. 1b, 3b and 5b. Taking account of the costs and expressing the results as $GM per ewe per year had little effect on the proportions of differences between the groups or the relative rankings of the sire groups compared with the $ returns.

The range in $GM between the highest and lowest group of 1stX ewes in each drop varied from $22 to over $70 and averaged over $40/ ewe/year. This represents a difference in annual profitability of $40,000 for a 1000 ewe enterprise. Some of the differences are due to breed of sire but most of the differences are due to variation among individual sires of the 1stX ewes. This is clearly illustrated by the variation among the BL sire groups. Some BL sire groups are among the top performing groups while others have much lower performance. Most of the other breeds with several sires compared show similar variation.

$ GM / DSE

The average DSEs for the ewe and her lamb(s) to slaughter ranged from 1.5 to 2.5 DSE for the 1stX ewe groups. The feed requirements for the ewe maintenance were about 54%, gestation, lactation and lamb growth to weaning about 25% and lamb growth from weaning to slaughter about 21% of the total annual requirements.

The average $GM per DSE per year over the 3 lambings (2 for 2000 drop) for the 1stX ewe groups are shown in Figs. 1c, 3c and 5c. Within most of the drops there was a range in average weight of the 1stX ewe groups of about 10 kg. The range in average $GM per DSE per year between the 1stX ewe groups was over $13 GM/DSE. Generally there were only small changes in the relative performance and rankings of the 1stX ewe sire groups when they were compared on a $GM/DSE basis rather than $GM/ewe.

However changes to a couple of groups are worth noting, including Cr27 (1998 drop Fig 1c) and M72 (1999 drop Fig. 3c). These groups of ewes were lighter than most other groups in their drop which means they had lower feed requirements for maintenance throughout the year. They also had lower lambing % (lower feed requirement for lactation and lamb growth), which was compensated for by higher wool value (Fig. 1a and 3a). This means that they ranked relatively higher among their drop when compared on a $ GM/DSE than $GM/ewe basis, although they were still outperformed by several other groups. These results again emphasise the need to carefully consider your production system and select the ewes with the best genetics for your lamb enterprise.

1stX ewe lambing %

The average lambing % for the 3 drops of 1stX ewes are shown in Figs. 1d, 3d and 5d. The ewes were joined in Nov/Dec which is earlier than the peak of the breeding season that is in autumn. In spring some ewes may not be cycling and not mate, while those that do mate will have lower ovulation rates or fewer ewes will have twins than if they were mated later. However there were still several ewe groups that had over 150% of lambs born and weaned over 125% of lambs per ewe joined. The Finn cross ewes had the highest lambs born %, but they also had high lamb losses which meant they did not always have the highest lamb weaning %. There was considerable variation in lambing % and lamb survival among the Finn cross sire groups as well as among the other breed sire groups.

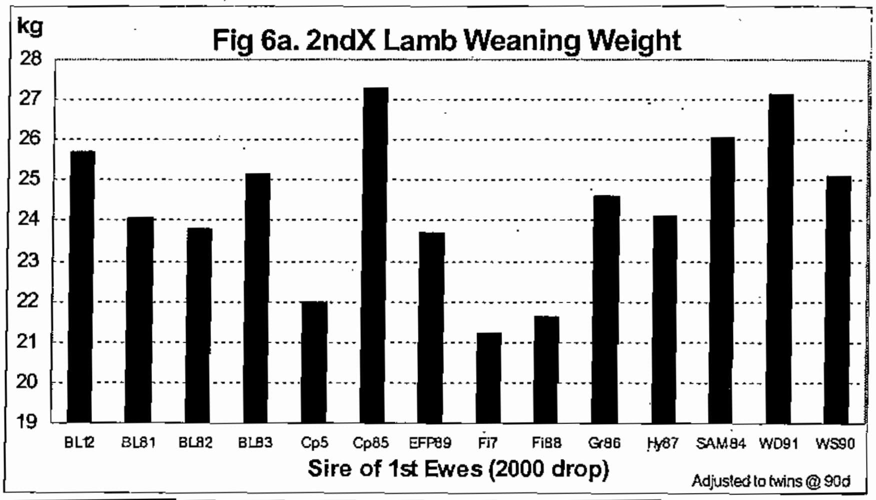


Fig 6a. 2ndX Lamb Weaning Weight

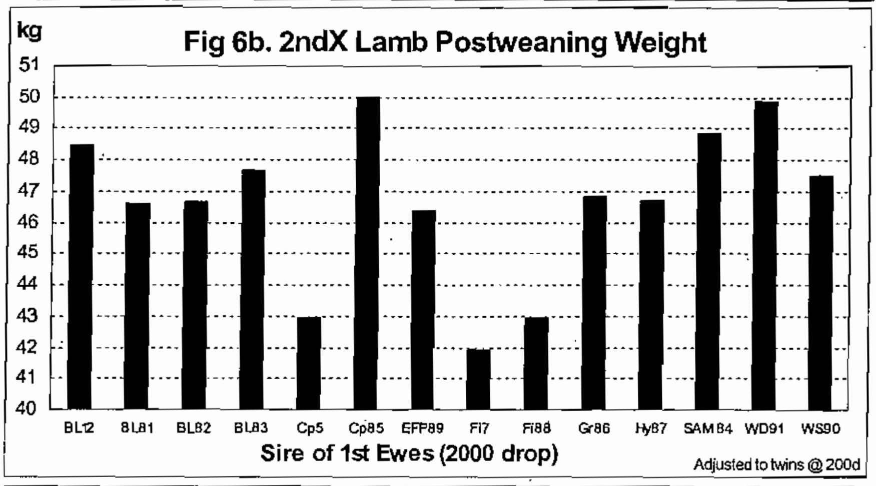


Fig 6b. 2ndX Lamb Postweaning Weight

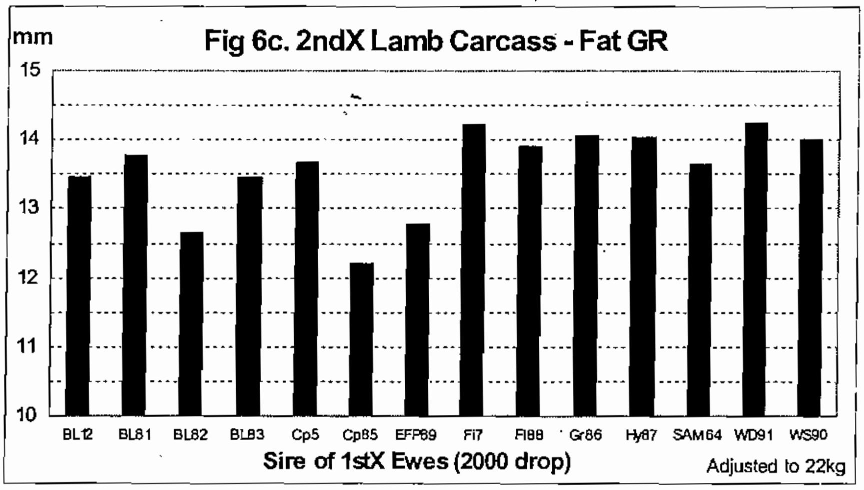


Fig 6c. 2ndX Lamb Carcass - Fat GR

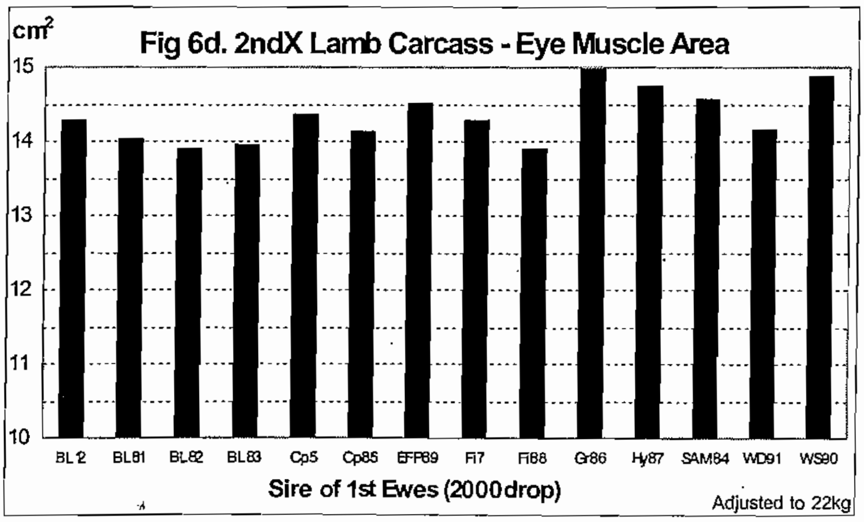


Fig 6d. 2ndX Lamb Carcass - Eye Muscle Area

2ndX lambs

Growth – Average weaning weights of the 2ndX lambs from the ewe groups are shown in Figs. 2a, 4a and 6a and average post weaning weights in Figs. 2b, 4b and 6b. The difference between the heaviest and lightest group within each drop averaged 6 kg for weaning weight and 7 kg for post weaning weight, which resulted in an average difference of over 4 kg carcass weight. The 2ndX lambs are all by the same White Suffolk rams and the 1stX ewes were all out of the same line of Merino ewes, so the only difference in genetics of the lambs is the maternal sire. The weights have been adjusted for differences in proportion of multiples, age and sex so the differences are due solely to the genes passed on from the maternal sires, i.e. genes for growth of the lambs and for milking and nurturing of the ewe.

Carcass fat- Average fat levels (GR) for the 2ndX carcasses are shown in Figs. 2c, 4c and 6c. Within each drop the difference between the leanest and fattest carcass group is over 2 mm GR which is almost half a fat score. These fat levels have been adjusted to 22 kg so the genotypes can be compared free of the effect of differences in carcass weight.

Carcass muscle - Average eye muscle area for the groups of 2ndX carcasses are shown in Figs. 2d, 4d and 6d. There was a range of almost 2 cm^2 in eye muscle area within each drop of 1stX ewes. These muscle measurements have also been adjusted to 22 kg so the genotypes can be compared free of the effect of differences in carcass weight.

These 2ndX lamb results show that the genetics of the ewe can have a considerable affect on the growth and carcass merit of their lambs. Differences in growth and dressing % can result in over 4 kg higher carcass weight ($12 more per lamb) or lambs having to be kept considerably longer to reach a particular target weight. In addition there are significant differences in carcass fat and muscle. The differences in fat represent almost half a fat score at the same carcass weight, which may affect the proportion of lambs meeting a particular carcass spec and the price received.

****

PRICES AND COSTS USED FOR $ RETURNS AND $ GROSS MARGINS

Prices

2ndX lamb carcass: $3/kg for in specs (= or > 20 kg and fat score 2-4)
Discount grid for out of specs ($/kg):

wt / FS	1	2-4	5
<16 kg	-1.50	-1.50	-1.50
16-19.9 kg	-0.75	-0.15	-0.50
> 20 kg	-0.75	0	-0.50

Carcasses 16-19.9kg, fat scaore 2-4 were only given a small discount because they would normally be sold in the trade market or kept longer and sold at heavier weights.
2ndX lamb skins: < 20.1 kg carcass weight $9.75; 20.1-24 kg $12.00; >24 kg $12.50.
1stX ewe wool: Average 2001/02 wool prices for the various micron categories were used to estimate wool returns. The individual ewe wool return was multiplied by 0.9 to account for the lower price of the skirtings and oddments.

Costs

The average costs applied to individual ewes and lambs for management and marketing were:
1stX ewes: $7.20 (shearing, crutching, health, wool freight) + 7.25% of wool $ (tax, testing, selling costs);
2ndX lambs: $3.66 (health, freight) + 4.5% of carcass $ (selling costs).

MCPT UPDATE

RUTHERGLEN (Gervaise Gaunt)

Seasonal Conditions

Rutherglen has experienced average summer climatic conditions. The ewes were weighed early February (mid-pregnancy) and averaged 75 kg (2000-drop) with an average fat score of 3+ to 4. The ewes have maintained weight (excluding lamb weight *in utero*) since the rams were removed in December. Supplementary feeding commenced early March and the ewes are currently being fed 100g/head/day lupins and 125g/head/day barley with supplements and 2.75kg per day; clover/ryegrass hay.

1stX Ewes – Conception

The 2000-drop ewes are due to start their third and final lambing in early April 2004.

They were shorn in mid October and joined to high performance White Suffolk rams for a six-week period commencing early November. All rams were harnessed and raddle marks were recorded twice weekly. There was a high incidence of ram activity early in the joining period and we expect the lambing pattern will be similar to last year, with about 90% of lambs being born in the first 3 weeks of lambing.

Table 1. Foetal scan: 2000-drop ewes joined Nov/Dec 2003 to commence lambing April 2004.

Sire Code	No. Ewes Joined	% pregnant	Av. foetuses/ pregnant ewe	Potential lambs /ewe joined %
BL12*	19	95	2.0	189
BL81	24	92	1.8	163
BL82	12	100	1.7	167
BL83	18	89	1.9	172
CP5*	17	88	1.9	165
CP85	19	100	1.9	195
EFP89	17	88	1.7	147
Fi7*	33	100	2.2	216
Fi88	22	95	2.3	218
Gr86	24	92	1.5	133
Hy87	22	95	2.0	186
SAM84	16	100	1.8	181
WD91	15	100	2.0	200
WS90	14	93	1.8	164
Total	**270**	**95**	**1.9**	**180**

**link sires*

Table 1 shows pregnancy ultrasound results for 2000-drop ewes with the overall conception rate averaging 95% with a potential lambing percentage of 180%. There are clearly large differences in sire groups for average conception rates and number of foetuses. Potential lambing percentages range from 133% with an average of 1.5 foetus per ewe pregnant (Gr86) compared to 218% with an average of 2.3 foetus per ewe pregnant (Fi88).

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RESEARCH HIGHLIGHTS

Papers presented at the 15th Conference of the Association for the Advancement of Animal Breeding and Genetics (AAABG), held in Melbourne, 6-11th July 2003.

Genetic Opportunities To Improve Lamb Weaning Rates In Merinos

R. Apps, D. J. Brown, A. Ball, R. Banks, S. Field

Opportunities to improve genetic merit for number of lambs weaned (NLW) and scrotal circumference (SC) are relatively untapped by Merino breeders. Data from the Merino Genetic Services (MGS) database was analysed to determine the heritability of yearling and hogget scrotal circumference and number of lambs weaned as well as their genetic correlations. NLW was found to be lowly heritable at 0.06. Scrotal circumference at yearling and hogget ages was moderately heritable at 0.37 and 0.36 respectively. The genetic correlation between yearling SC and NLW was moderately positive at 0.35 (0.30) suggesting that yearling SC may be a useful indirect selection tool for NLW. The standard error associated with these correlations suggests that more data is needed to more accurately describe this relationship. Examination of the range in estimated breeding values (EBV) within the MGS database illustrates significant genetic variation for these traits. Among the 256,000 Merinos in this database the range in NLW EBV is 77.3%. That is, the daughters of a ram at the high end of the range are expected to wean, on average, 38.6% more lambs than the daughters a ram at the low end of the EBV range. The range in yearling scrotal circumference EBV is 6.3cm. Given the estimated genetic variation in NLW and SC and the genetic parameters derived from this data set there appear to be significant genetic opportunities for improved lamb weaning rates in Merino sheep.

Genetic Parameters For Weight, Fat And Eye Muscle Depth In South Australian Merino Sheep
V. M. Ingham, R. W. Ponzoni, A. R. Gilmour and W. S. Pitchford

Data from the SARDI Selection Demonstration Flocks were used to estimate heritability of and genetic correlations between live weight, fat depth and eye muscle depth at five months of age under an animal model. Two models, with and without weight adjustment, were used for fat and eye muscle depth. Heritability estimates were 0.28 (0.08), 0.26 (0.06) and 0.35 (0.07) for weight, adjusted fat and adjusted eye muscle depth, respectively. Phenotypic correlations ranged from 0.27 to 0.66 and genetic correlations ranged from 0.16 to 0.73. The estimates reported here are similar to those previously reported for other sheep breeds. This suggests that sufficient genetic variation exists to enable selection to improve these traits for Merinos. Moderate heritabilities and correlations for weight adjusted traits suggest that there is potential for improvement in fat depth and eye muscle shape in Merinos. The similarity of these estimates to those reported for other sheep breeds indicates that selection used for meat breeds may be directly applicable to, or easily adapted for Merinos.

Preliminary Genetic Parameters for Live Weight and Ultrasound Scan Traits in Merinos
B.E. Clarke, D.J. Brown and A.J. Ball

The Australian Merino has traditionally been bred as a wool-producing sheep, however it also contributes significantly to prime lamb and mutton production. To breed for improved growth and carcase characteristics (such as live weight, fat depth and eye muscle depth) accurate genetic parameters are required. This paper reports on estimates of the heritabilities and genetic and phenotypic relationships between these traits. Results show that all traits are moderate to highly heritable. There are moderate genetic and phenotypic correlations between fat depth and eye muscle depth at both yearling and hogget age. These results indicate that there is merit in selecting Merinos for better growth and carcase traits using available genetic technologies of estimated breeding values.

Genetic Parameters And Trends In Merino Lines Divergently Selected For Multiple Rearing Ability
S.W.P. Cloete, A.R. Gilmour, J.J. Olivier and J.B. van Wyk

Reproduction, greasy fleece weight (GFW) and live weight (LW) were analysed for Merino ewes that were divergently selected for (H line) or against (L line) multiple rearing ability. Estimates of h^2 were 0.10±0.02 for number of lambs born (NLB), 0.04±0.02 for number of lambs weaned (NLW), 0.04±0.02 for weight of lamb weaned (TWW), 0.57±0.06 for GFW and 0.49±0.06 for LW. Respective ewe permanent environment (PE) variance ratios were 0.07±0.03, 0.11±0.03, 0.12±0.03, 0.14±0.05 and 0.25±0.06. Genetic correlations of reproduction traits with GFW were low and generally negative. Genetic correlations of reproduction with LW were positive and high for TWW. PE correlations of NLW and TWW with GFW and LW weight were negative in sign, but not significant. Genetic trends (expressed as percentage of overall means) in the H line increased annually with 1.3% for NLB, 1.5% for NLW, 1.8% for TWW and 0.06% for LW. Corresponding trends in the L line were –0.6%, –1.0%, –1.3% and –0.17% per year. Substantial genetic progress in lamb output was attainable, despite low h^2 estimates.

Comparisons Of Quantitative Trait Loci (QTL) Detected For Fat Deposition In Sheep Using Computed Tomography
C.R. Cavanagh, G. Attard, M. Jones, D. Palmer, P.C. Thomson, I. Tammen and H.W. Raadsma

New genetic technologies have enabled us to begin the process of unravelling the underlying genetic architecture for complex traits. We report on the identification of quantitative trait loci (QTL) for seven fatness traits at various depots derived by computed tomography (CT) scanning. Progeny (n=164) from a backcross between Merino and Awassi sheep were used in an attempt to exploit the differences that exist in the fat attributes between the two breeds. A genome-wide scan using 117 informative microsatellite markers was used. With the exception of fat depth and %internal fat, all fat traits were found to be highly correlated. Six key QTL areas were detected with one in common to all traits highlighting the polygenic nature of fatness.

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LETTER TO THE EDITOR

EBV$ CALCULATOR

I had a play with your EBV calculator and tried it on a number of rams in last year's sale catalogue. The Pwwt EBV is about equally shared between first and second cross breeders, otherwise the advantage is all for the 2nd cross breeder. The total return in your calculator is about the same value we get from the Border $ index x 200. This is what the clients have been using, but without the insight that most of the benefit goes to the 2nd cross breeder.

I found it useful to convert each EBV into dollar terms, which provides a quick rule-of-thumb. (I used some different parameters to the default model). For instance, Mwwt of +1 is worth about $200 to the 2nd cross breeder and nothing to the first-cross breeder. Pwwt of +1 is worth about $200 equally shared and Nlw of +1% (or 0.01) is worth about $100 to the 2nd cross breeder. Very good rams might have Mwwt +1, Pwwt +5 and Nlw +10%, which would breed $2200 extra lamb.

Perhaps the next calculation could be on how much extra each breeder might pay for their stock to give some equity to the three tiers of breeders - sires, First cross and 2nd cross. About 60% of our rams go to breeders who capture both 1st and 2nd cross benefits. The others go to first-cross breeders who on-sell to others. We are starting to see a premium in the market for the ewe bred from higher index rams of perhaps $5 per head. My rough calculation is that it should be about $15 a head to equalise the benefit. Do you have a more objective way of working it out?

The first-cross breeder also has to pay extra for the rated sires. However, in one case at my ram sale, one pair of first and 2nd cross breeders, who trade together on an ongoing basis, shared the cost of the rams. That is another example of how breeders might work together.

Thanks for your work and for sharing the calculator with me.

Allan Wilson
Wongajong Border Leicester Stud, Deniliquin NSW

Ed. To try and answer your question, lets assume the additional $s earned ($2200) from the use of your very good ram are shared equally by breeders and producers at each level. This would mean that the 2ndX producer would pay an extra $14.20 for the 1stX ewes (based on 60 1stX ewes) and the 1stX producer would pay an extra $675 for the good ram. This would give each of the 1stX and 2ndX producers a marginal return of 100% on their investment in better genetics.

Under a more conservative approach to risk where the producer takes 2/3 and the breeder 1/3 of the additional $s earned (ie a marginal return of 200%), the 2ndX producer would pay an extra $9.45 for the 1stX ewes and the 1stX producer would pay an extra $356 for the good ram. If the market premium for ewes by these rams is currently $5 the 2ndX producer is achieving a marginal return of over 400% on his investment in better genetics.

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Maternal sire entries - details

Year	Site	Sire Code	Tag	Stud	Breed	Entrant	Phone No.
1997	Cowra	BoL1	920047	Struan	Booroola Leicester	PIRSA	08 8762 9100
		BL2	950137	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Fi3	940001	Yamba	Finnsheep	M & L Burns	03 5798 1583
		Cr4	940364	Maluka	Corriedale	P Secker	02 4848 1244
		Cp5*	940449	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		EF8	94B021	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Fi7*	930057	Warrayure	Finnsheep	GM & MA Wake	03 5574 1254
		BL8	950181	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Fi9	935010	Warrayure	Finnsheep	Knight & Bottcher	03 5578 7250
		WS10	910058	Leahcim	White Suffolk	AWSA/Michael	08 6865 2085
		Cr11	930097	Coora	Corriedale	Coora Partnership	02 4848 1244
		BL12*	94S291	Kelso	Border Leicester	GB Starritt & Son	03 5629 0144
1997	Hamilton	BL13	950246	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Ro14	930146	Claymour	Romney	Rouch & Gillman	03 5727 1552
		BoL15	924287	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cp16	930089	Narrambla	Coopworth	D Wigan	03 5577 2321
		Fi17	950054	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		Cp18	940421	Oaklea	Coopworth	J Keiller	03 5526 5248
		EF19	94B026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Cr20	880491	Stanbury	Corriedale	Cole & Risbey	03 5593 9278
		Fi21	980002	UNSW	Finnsheep	S & D Jones	03 5122 3328
1998	Struan	Fi22	890049	ATC	Finnsheep	Jaydee Stud	08 8764 2065
		Fi23	930049	Tambaroora	Finnsheep	Jaydee Stud	08 8764 2065
		BL24	960346	Gleneith	Border Leicester	CE & LJ Arney	08 8536 0031
		BL25	960188	Johnos	Border Leicester	NW & JI Johnson	08 6758 6053
		Cp26	960210	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Cr27	921566	Coora	Corriedale	Coora Partnership	03 5578 6267
		EF28	960133	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Hy29	960028	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Hy30	960128	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		PD31	960110	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		BL32	95T138	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		WS33	951470	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1998	Cowra	BoL34	950029	Caveton Park	Booroola Leicester	PIRSA	08 8762 9100
		BL35	940765	Retallack	Border Leicester	BLA(NSW)/Grinter	02 6974 1153
		Cp36	960067	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cp37	940274	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cc38	960621	Coronga	Coronga Composite	Premier Breed. Tech	02 6365 8207
		EF39	94B040	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FL40	941016	Wycombe	Finn x Leicester	R & L Coddington	02 6775 5225
		Gr41	955551	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		WS42	940069	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
1998	Hamilton	BoL43	960322	Struan	Booroola Leicester	PIRSA	08 8762 9100
		EF44	960026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		EF45	94B019	Glenspean	East Friesian	S & J Cameron	03 5286 1455
		Cr46	950181	Gundowringa	Corriedale	HJ & CJ Prell	02 4848 1244
		EF47	950509	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FiF48	960086	Gippfinn	Finn x Friesian	S & D Jones	03 5122 3328
		Ro49	920089	Evergreen	Romney	C Duncombe	03 5264 5170
		Tx50	949002	Coolana	Texel	Coolana Rural	03 5350 5531
		WS51	900429	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1999	Cowra	BL52	920070	Kegra	Border Leicester	BLA(NSW)/Golder	02 6977 1339
		BL53	960102	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		BL54	970030	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BoL55	950203	Struan	Booroola Leicester	PIRSA	08 8762 9100
		M56	890183	Centre Plus	Merino	L Mortimer & Sons	02 6892 8259
		EL57	960043	Ostlers Hill	English Leicester	ELAssoc/Stephenson	03 5764 1298
		WH58	960505	Clifton Hills	Wiltshire Horn	AWHSBA/Ballantyne	03 5145 8225
		EF59	970100	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		WS60	974842	Linden Genetics	PLG White Suffolk	Linden Genetics	02 6388 2020
1999	Hamilton	BL61	970188	Wongajong	Border Leicester	AD & CM Wilson	02 5882 3338
		BL62	98X050	Kelso	Border Leicester	GB Starrttt & Son	03 5829 0144
		BoL63	950160	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cr64	910415	Coolana	Corriedale	PG Munro	03 5575 3240
		Cp65	978431	Cashmore Park	Coopworth	J Keiller	03 5526 5248
		Ch66	910L92	Grand Ridge	Cheviot	RN Waddell	03 5626 4244
		Fi67	960085	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		EFP68	981019	Yollom	East Friesian x Perendale	MF & ML Molloy	03 5596 2077
		EFR69	970175	Price	East Friesian x Romney	EJ & KJ Price	03 5527 1110
1999	Struan	BL70	970310	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL71	97W290	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		M72	930051	Merinotech Mid	Merino	Merinotech Mid North	08 8665 4019
		EL73	950T82	Koenarl	English Leicester	CR Taylor	03 5595 0272
		Cp74	970101	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Hy75	960215	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		FiF76	960132	Gippfinn	Finn Friesian	S & D Jones	03 5122 3328
		EF77	960136	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		SHD78	970155	Tauranga	South Hampshire Down	S & M Macmillan	03 5596 2251
		PD79	970101	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		WS80	970172	Koonawarra	White Suffolk	AWSA	08 8210 5211
2000	Struan	BL81	960327	Morton	Border Leicester	JD & CM Corbin	08 8765 8058
		BL82	980280	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL83	980085	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		SAM84	980046	Jeancourt	SAMM	W & M Heddle	08 8271 7080
		Cp85	980091	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Gr86	980144	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		Hy67	940278	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Fi88	538	Gippfinn	Finn	S & D Jones	03 5122 3328
		EFP89	981071	Yollom	East Friesian x Perendale	Kariol Seed Stock/Udy	03 5597 8621
		WS90	960513	Langley Heights	White Suffolk	AWSA	08 8210 5211
		WD91	990908	Axis	White Dorper	B & L Mawson	08 8537 0615

* Link sires used at each site each year

Dynamic Dams
Ewe genetics for the future

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In This Issue

Editors: Neal Fogarty & Lynette McLeod
NSW Agriculture
Orange Agricultural Institute
Orange, NSW 2800
Ph: (02) 6391 3813
Fax: (02) 6391 3922
Email: neal.fogarty@agric.nsw.gov.au

Dynamic Dams reports on the project **Maternal sire Central Progeny Test (MCPT)**, which is part of the **MLA Lamb Program**, and provides other information for lamb breeders to improve their maternal genetics.
Contributions from readers are welcome.

MATERNAL SIRE EBVS – HOW MUCH ARE THEY WORTH?

Neal Fogarty, NSW Agriculture, Orange

Maternal sires such as Border Leicester rams that have been tested through LAMBPLAN have estimated breeding values (EBVs) available at sale. Some questions for ram buyers are:

- how much more is a ram with superior EBVs worth?
- how can rams with varying EBVs for different traits be compared?

To help in making these decisions we have developed a computer program (*EBV $ Calculator* ©) that calculates the additional $s generated over the lifetime of the ram (and his 1stX and 2ndX progeny) compared to a ram with all EBVs = 0. Maternal sires have EBVs for several traits including:

- maternal weaning weight (EBVmwwt)
- live weight (EBVwt)
- fat GR (EBVfat)
- eye muscle depth (EBVemd)
- number of lambs weaned (EBVnlw)
- greasy fleece weight (EBVgfw)

Use of rams with superior EBVs for these traits will result in progeny (1stX and 2ndX) that have higher performance and have higher returns. Each of the traits will contribute different amounts of $ because they contribute to different products from 1stX and/or 2ndX progeny. For example, rams with positive EBVwt will have heavier progeny which will have higher returns from both 1stX and 2ndX lambs, whereas positive EBVnlw means better lambing rate from the 1stX ewes and more 2ndX lambs sold.

The returns will be different for the 1stX and 2ndX enterprises. They will also vary with the breeding structure, production system and prices in each enterprise. Where maternal sires are mated to Merino or other base ewes

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Table 1. Additional value from Band 10 BL sire EBVs

1stX enterprise	$	2ndX enterprise	$
1stX wethers		Maternal weaning wt	509
1stX weight	144	2ndX weight	448
1stX fat	13	2ndX fat	40
1stX ewes		1stX ewe lambing rate	1136
1stX weight	146	1stX ewe wool	172
Total 1stX	**303**	**Total 2ndX**	**2305**
		Total (1stX+2ndX)	**2608**

in the 1stX enterprise, the wether progeny are sold for slaughter and the ewe progeny are sold for breeding. In the 2ndX enterprise the 1stX ewes are mated to terminal sires and all 2ndX lambs are sold for slaughter with additional returns from the 1stX wool.

Total returns from better production of the progeny of the ram depends on the superiority of the EBVs as well as other factors such as the number of years the ram is mated, the number of base ewes, their lambing rate, the carcass weight of progeny, price of lambs, carcasses and wool and fat discounts etc. The computer program allows all of these factors in the breeding structure, production system and prices to be varied to suit your situation.

The additional $ returns for a Border Leicester ram using the standard breeding structure, production system and prices (see box) are shown in Table 1. The EBVs used are for the Band 10 of the Border Leicester LAMBPLAN analysis of 15 Sept 2003 (ie a ram in the top 10% of Border Leicesters). The $ values shown are the additional $ contributed for each trait in both the 1stX and 2ndX enterprises compared with using a ram with all EBVs = 0. In this breeding structure the ram produces 60 1stX wethers and 60 1stX ewes over 3 years and his 60 1stX daughters produce 330 2ndX lambs plus wool over 5 years.

In the 1stX enterprise the 60 1stX wethers from this ram would be heavier and slightly leaner (less carcasses discounted for fat score 5) and the 60 1stX ewes would be heavier when sold. This would result in $303 more returns than if a ram with EBVs = 0 was used.

In the 2ndX enterprise there are gains in carcass weight of the 330 2ndX lambs from maternal weaning weight (additional milk and nurturing) and weight as well as leanness (less carcasses discounted for fat score 5). The 60 1stX ewes also produce more lambs (from EBVnlw) and wool (from EBVgfw) over their 5 years in the flock. The total additional value in the 2ndX enterprise is $2305.

The results highlight that the great majority (88%) of the additional returns from maternal sires with superior EBVs are in the 2ndX enterprise. This is because many of the economically important maternal traits (maternal weaning weight, lambing rate and wool) are only expressed in the 2ndX enterprise and there are also a lot more expressions of performance (60 1stX ewes x 5 years). The important contribution of increased lambing rate is also highlighted.

Table 2. Additional value of BL sire EBVs in 1stX and 2ndX enterprises

BL sire	EBV mwwt	EBV pwwt	EBV pfat	EBV pemd	EBV nlw	EBV gfw	**Total$ 1stX**	**Total$ 2ndX**	***Total $***
Band10	1.92	3.38	-0.40	0.59	0.08	0.23	**303**	**2305**	***2608***
Band 20	1.45	2.72	-0.31	0.37	0.06	0.15	**243**	**1732**	***1975***
Band 50	0.53	1.55	-0.06	0.00	0.02	0.04	**135**	**656**	***790***
Band 75	-0.16	0.56	0.12	-0.26	0.00	-0.03	**44**	**-3**	***41***

The EBVs for animals in the various bands of the

EBV $ Calculator for Maternal Sires ©

The breeding structure, production system and prices used in the standard parameter set are:

1stX enterprise

Maternal ram mated to 50 Merino ewes x 3 years with a lamb weaning rate of 80%;

1stX wethers sold at 22 kg carcass weight (dressing 45 %) at $3.20/kg with fat discounts of $1/kg (FS1) and $1.50/kg (FS5), with the average fat level being 15mm GR;

1stX ewes sold for breeding at $1.44 /kg liveweight;

2ndX enterprise

1stX ewes mated to terminal sires x 5 years with an average lamb weaning rate of 110%;

2ndX lambs sold at 24 kg carcass weight (dressing 45 %) at $3.50/kg with fat discounts of $1/kg (FS1) and $1.50/kg (FS5), with the average fat level being 15mm GR and lamb skins $12;

1stX ewe wool production x 5 years at $5.00/kg greasy

BL LAMBPLAN analysis (15 Sept 2003) are shown in Table 2, along with the additional $ returns in the 1stX and 2ndX enterprises from use of a BL ram with these EBVs under the standard breeding structure and prices. The additional value from 1stX and 2ndX progeny of a BL ram with Band 10 EBVs (ie top 10%) is $1818 (ie 2608-790) more than if a ram with Band 50 EBVs (ie top 50%) was used.

Acknowledgement: The *EBV $ Calculator for Maternal Sires* © was developed by Neal Fogarty and Lynette McLeod with assistance from Elke Hocking and support from Meat and Livestock Australia and the Australian Sheep Industry CRC. It is used in the Edge Workshop: *Money Making Mums.*

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HOW DO I BUY GENETICALLY SUPERIOR EWE LAMBS?

Tim Demeo, Victoria DPI, Bendigo

There is plenty of evidence both anecdotal and scientific that good first cross ewes with high reproductive performance pay for themselves over and over. The traditional open auction system will lag behind in delivering high performance ewes and therefore individuals must work together to achieve mutual benefit.

Lamb producers who purchase superior genetics should aim to achieve greater than 110% selling percentage from maiden ewes (at 14 months of age) and greater than 150% from the second lamb onwards.

A potential way to purchase high performance ewes is to have the ewes' bred for you on a contract basis. The contract can specify the maternal ram source and type and the maternal ewe genetics. The mutual benefit is that the breeder is guaranteed a sale price (sometimes negotiated on a $ per liveweight basis) and the purchaser the better genetics. Other benefits could include assistance with key animal husbandry periods (ie. lamb marking and weighing).

What are the benefits of a contract:

- Price security
- Availability of labour for lamb marking etc
- Increase in confidence to change practice (ie. buy better maternal rams based on LAMBPLAN data)
- Feedback on ewe performance
- Security of sale for years production

How is the price established:

- Dollars per kilogram of liveweight at point of sale (based on historical sale price data – usually from the open auction system)
- Agreed liveweight. Ewe lambs need to be a minimum of 50 kilograms and fat score 3 plus at joining time to achieve high conception rates
- Agreed delivery date
- Agreed method of weighing (ie. weigh the truck load)
- Culling percentages (eg 10% of ewe flock can be culled by purchaser)

Options for ram selection (and who pays):

- LAMBPLAN used to select sires
- Ram purchased by first cross ewe purchaser
- Cost to producer of purchasing superior genetics reimbursed (eg $100 paid to breeder to encourage them to purchase better rams)
- Contract price for delivery of ewe lambs sufficient to justify expense of superior genetics.

Animal Management Requirements

(insurance that you are getting a quality product):

- Vaccination (6 in 1) twice in six weeks
- Mulesing
- Shearing date
- Weaned / Not weaned
- Lambing time
- Disease status
- Drenching program – resistance
- Heliotrope
- Selenium
- Footrot
- Lice
- OJD

Conclusion

Find a like first cross breeder who wants to guarantee some income security and compromise to achieve mutual benefit for both parties.

Take Home messages:

- Do not wait for the industry to deliver better first cross ewes at special sheep sales
- Only buy ewes with known genetic merit
- Identify a suitable first cross ewe breeder who you can work with and compromise to achieve mutual benefit for both parties
- Be prepared to pay an attractive contract 12 or 18 months in advance based on the fact that you will achieve an economic response for up to six years from the ewes

Reprinted from the *Marksmen News*, Vol 14(2), Winter 2003.

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MCPT UPDATE

RUTHERGLEN (Gervaise Gaunt)

Seasonal conditions

In contrast to drought conditions earlier in the year, seasonal conditions in North-East Victoria improved considerably during winter and spring, resulting in an excellent finishing season. Timely rainfall (359 mm June-October compared to 140 mm for the same period in 2002) contributed to good pasture growth and supplementary feeding of lambs ceased at weaning in late July.

Second-cross Lambs

The 2003-drop lambs were the fourth year's production of MCPT lambs. Three years of progeny from the 1998 and 1999-drop ewes and two groups of progeny from the 2000-drop ewes have now been slaughtered.

Lambs were weaned late July (average 100 days of age) and weaning weights are shown in Table 3. So that no lambs are disadvantaged by their sex (male or female), birth and rear type (eg. single or multiple) or date of birth (early vs late) the data has been adjusted and reported as single wethers averaging 100 days of age. Lamb growth rates remained excellent throughout the year resulting in an overall growth rate from birth to slaughter of 282 g/day. There is a considerable variation between sire groups for growth rate (Table 3) which range from 269 g/day (EL73 and Fi7) to 306 g/day (BL12) for 1999 sires and 261 g/day (Fi7) to 311 g/day (WD91) for 2000 sires.

Excellent seasonal conditions and good lamb growth rates contributed to lambs being slaughtered in early October, one month earlier than previous years. Lambs were processed at Penny and Lang, Carrisbrook and we are grateful for their cooperation and assistance with the collection of data from the lambs in the trial. More detailed information on carcase measurements including fat and eye muscle, and financial returns will be reported in the next issue of Dynamic Dams.

Figures 1 & 2 show final liveweight and carcase weight for the 1999 & 2000-drop ewes (adjusted for single wethers, average 178 days of age). The 2003 lambs averaged 55.2 kg full liveweight, carcase weight 26.2 kg and dressing percent of 47%. There was a 5.8 kg range between the heaviest average carcase weight per sire group ie. 29.5 kg (White Dorper 2000-drop) and the lowest carcase weight average was 23.7 kg for the Finn (Fi7 2000-drop) progeny group.

Table 3. Average liveweight at weaning (100 days) and growth rate (birth-slaughter) for sire groups.

1999 sires	Wean wt (kg)**	Growth rate (g/day)***	2000 sires	Wean wt (kg) **	Growth rate (g/day)***
BL12*	41.8	306	BL12*	42.0	282
BL70	38.4	280	BL81	41.8	283
BL71	41.4	297	BL82	41.3	284
Cp5*	38.2	288	BL83	42.0	285
Cp74	38.7	284	Cp5*	39.1	263
EF77	38.4	275	Cp85	44.5	293
EL73	37.8	269	EFP89	41.3	279
Fi7*	36.2	269	Fi7*	37.8	261
FiF76	38.6	280	Fi88	38.5	268
Hy75	37.8	274	Gr86	41.8	285
M72	36.3	272	Hy87	49.0	278
PD79	46.0	296	SAM84	43.6	295
SHD78	37.6	280	WD91	45.8	311
WS80	38.4	283	WS90	41.9	284
Average	**38.6**	**282**		**41.6**	**282**

** Link sires*
*** adjusted for age (100 days) for single wethers*
**** adjusted for age (178 days) for single wethers*

Joining

Ewes from the 2000-drop have been weighed and fat scored prior to joining which commenced early November. Pre-joining ewe liveweights and fat scores were excellent with the 2000-drop ewes averaging 73.3kg (averaged 66 kg in 2002), fat score 3+.

Feed Intake

The 1998 and 1999-drop ewes have now completed the MCPT trial and the final data collected from these ewes involved feed intake measurements. The aim of the feed intake trial is to quantify genetic variation in feed

Figure 1. Final Liveweight and Carcase Weight (kg) for 1999 drop ewe progeny

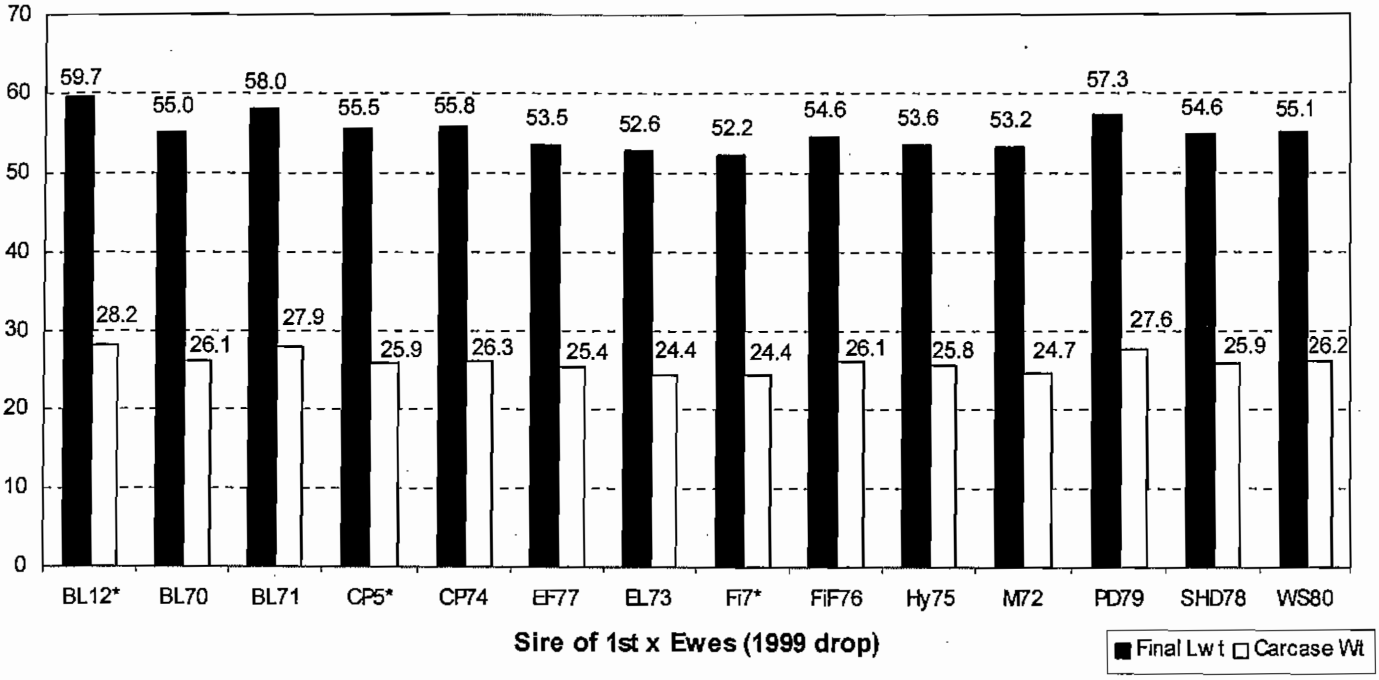
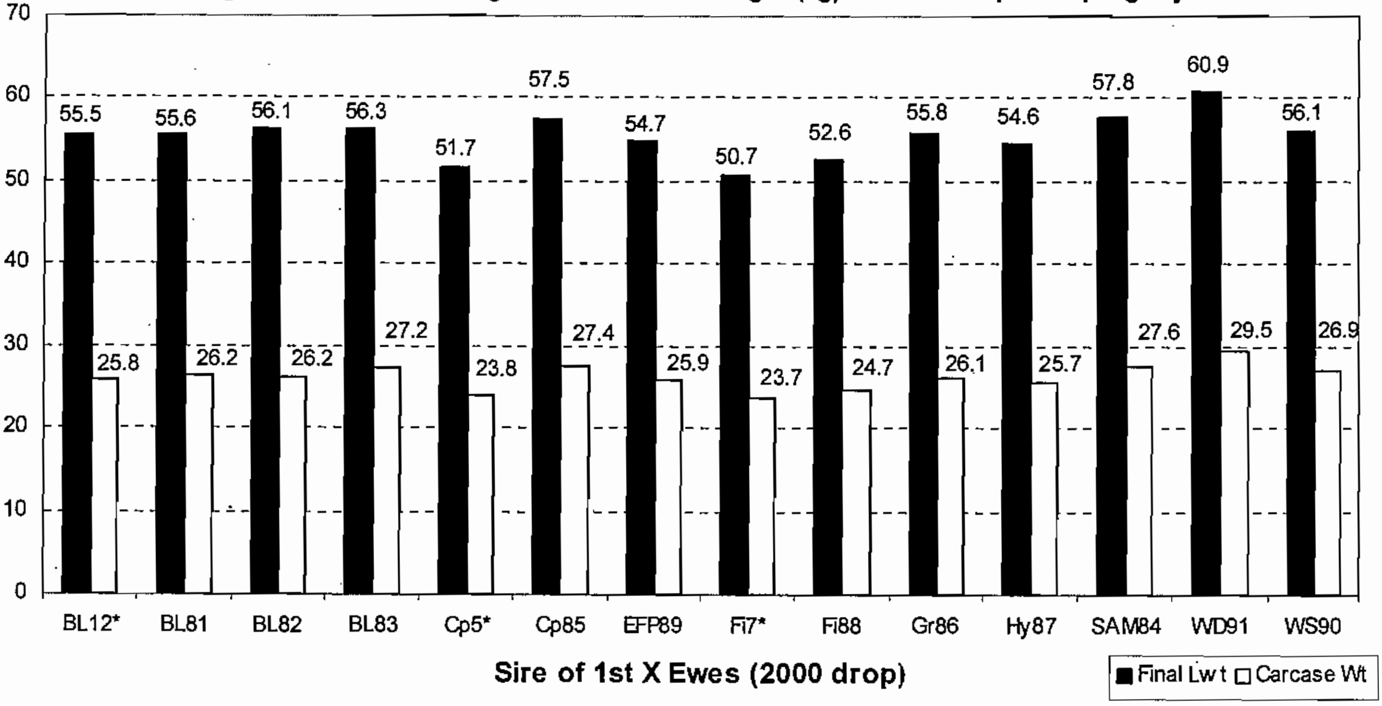


Figure 2. Final Liveweight and Carcase Weight (kg) for 2000 drop ewe progeny



intake for meat sheep and provide estimates of heritability and genetic correlations with the other production traits already collected in the MCPT. Faecal samples and pasture samples are being processed and will be sent to a commercial laboratory for analysis. Information on the feed intake will be reported when results are obtained.

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COWRA (N Fogarty, J Morgan, L McLeod)

Seasonal conditions

Fairly good rain fell in July and August. Rain in September was sparse but seemed to come at the right time to keep pastures going. Rainfall since has been scattered coming mostly from storms. The 2ndX lambs weaned in early July grew well averaging about 250g/d growth rate and were ready for slaughter 23 September. Average carcase weight was 25.1 kg.

The 99 drop 1stX ewe spring joined group was used in the final grazing intake study which was conducted from 22 August to 10 September. Shearing was in early October and final fleece weights were collected for this group. Some of the ewes were displayed in sire groups at the Cowra station's Centenary celebrations on the 6 November. All experimental aspects of the MCPT are now complete at the Cowra site.

$ gross margins

The overall performance of the 1stX ewe groups has previously been presented as average $ returns per ewe joined per year. These Figs in *Dynamic Dams* 17 (Nov 2002) showed the contributions to total $ returns from 2ndX lamb carcasses (in specs and out of specs), lamb skins and wool from the 1stX ewes averaged over their first 3 lambings (at the time the 1999 drop 1stX ewes had only completed 2 lambings and they are now shown here for the average of 3 lambings in Figs 3 and 4).

The $ returns only tells part of the story as the different costs associated with production and marketing the lamb carcasses and wool need to be deducted so the ewe groups can be compared on a gross margin ($GM) basis. To do this the average costs applied to individual ewes and lambs were: ewes $7.20 (shearing, crutching, health, wool freight) + 7.25% of wool $ (tax, testing, selling costs); lambs $3.66 (health, freight) + 4.5% of carcass $ (selling costs). The average $GM per ewe per year over the 3 lambings for the 1997, 1998 and 1999 drop 1stX ewe groups joined in autumn and spring are shown in Figs. 5, 7, 9, 11, 13, 15 respectively.

Fig 3. Average $ return / ewe joined (autumn) / year

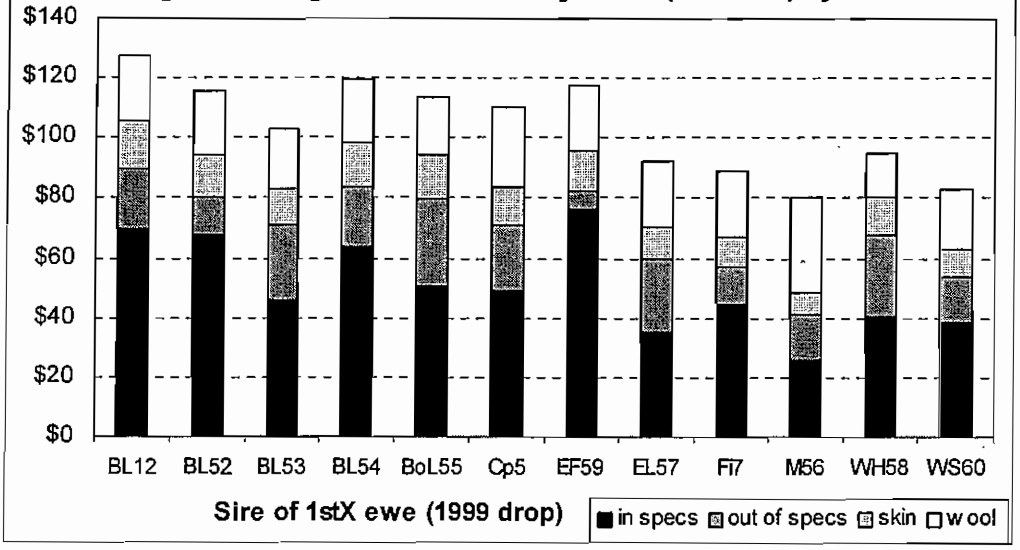
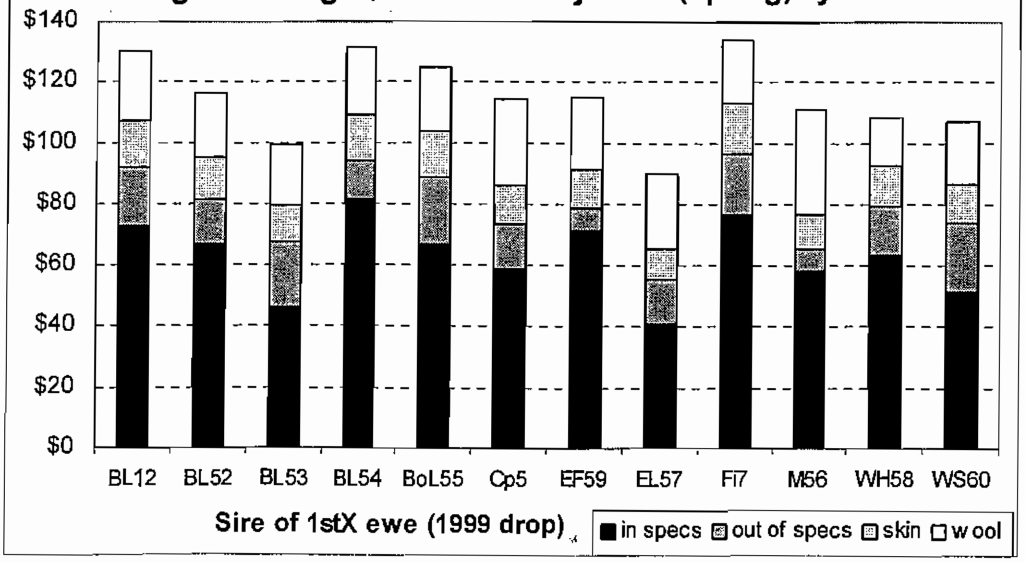


Fig 4. Average $ return / ewe joined (spring) / year



Taking account of the costs and expressing the results as $GM per ewe per year had little effect on the proportions of differences between the groups or the relative rankings of the sire groups compared with the $ returns.

The range in $GM between the highest and lowest group of 1stX ewes in each drop x season varied from $30 to $69 and averaged over $46/ewe/year. This represents a difference in annual profitability of $46,000 for a 1000 ewe enterprise.

Some of the differences are due to breed of sire but most

Take home messages

- There was a range of more than $46 gross margin/ewe/year between the top and bottom performing 1stX ewe groups
- Several maternal sire breeds had high performing 1stX ewe progeny
- There was considerable variation between sires within breeds
- The best sire group varied with production system (eg. autumn or spring joining)
- Generally taking account of differences in feed requirements made little difference in rankings of the 1stX ewe groups, with a couple of notable exceptions
- Selection of the best maternal genetics for your lamb production enterprise means considerably more $$$s profit

of the differences are due to variation among individual sires of the 1stX ewes. This is clearly illustrated by the variation among the BL sire groups. Some BL sire groups are among the top performing groups while others have much lower performance. Most of the other breeds with several sires compared show similar variation.

Autumn v Spring joining

The autumn and spring performance can not be compared directly as the 1stX ewes lambed at different ages. The autumn joined ewes were first joined at 7 months of age, whereas the spring joined groups were older and first joined at 14 months of age. Lambing performance increases dramatically with age and was higher in the first year from the older spring joined ewes which resulted in higher $ gross margin (Table 4). The differences between the seasons were reduced in later years among older ewes and varied from year to year.

Generally after their first year the ewes had more lambs born from the autumn than the spring joinings, because autumn is the peak of the breeding season when all ewes were in season and the highest ovulation rates occur. This meant more ewes lambed with a higher number of multiple births. However lamb survival was lower in July and August (autumn joining) than in March and April (spring joining) because of poorer weather conditions and more predation, especially among triplet and quad born lambs. These seasonal differences meant that the relative performance of the various sire groups of 1stX ewes varied with season or production system.

The results highlight that the most suitable 1stX ewe depends on the production system in your enterprise. For example among the 1997 drop 1stX ewes the BL2 group had a $23 higher $GM/ewe/year than the Fi3 group when joined in the autumn (Fig. 5. $110 v $87), but was $2 lower when joined in the spring (Fig. 7. $116 v $118). The reasons for the differences were that the BL2 1stX ewes had more lambs weaned from the autumn joinings than the Fi3 1stX ewes (133% v 122%), even though they had less lambs born (154% v 170%), because they had higher lamb survival (85% v 73%) and less triplet and higher order births (average lambs born per ewe lambing or litter size 1.86 v 2.15). In contrast from the spring joinings the BL2 1stX ewes had less lambs weaned than the Fi3 1stX ewes (136% v 157%), as they had fewer lambs born (151% v 193%) and lower litter size (1.64 v 2.08) despite better lamb survival (91% v 81%). The other point to note is that the 2ndX lambs from the BL2 1stX ewes were heavier than those from the Fi3 1stX ewes (see *Dynamic Dams* No. 16, Fig. 2a and 2b) and more met carcass specifications which almost made up the difference in $GM despite the lower lamb weaning % (spring join).

Table 4. Average $ gross margin / ewe joined in autumn or spring of years 1, 2, 3 and overall mean

Season	Autumn join				Spring join			
Year	1	2	3	Mean	1	2	3	Mean
'97 drop	53	100	100	**84**	76	109	119	**101**
'98 drop	59	103	93	**85**	79	111	112	**101**
'99 drop	50	92	120	**87**	88	103	102	**98**
Mean	54	98	104	**86**	81	108	111	**100**

Feed requirements

Another consideration is feed requirements of the ewe and her lambs during lactation and subsequent lamb growth to slaughter, which may affect stocking rate. Heavier ewes with higher lambing percentage and faster growing lambs to higher slaughter weight will have higher feed requirements. To examine this effect of the total annual feed requirements for the ewes and their lambs have been calculated from their actual performance over the 3 years and put on a dry sheep equivalent (DSE) basis.

The average DSEs for the ewe and her lamb(s) to slaughter ranged from 1.9 to 2.7 DSE for the 1stX ewe groups for most drop x season groups. The feed requirements for the ewe and lamb(s) to weaning were about 75% and lamb growth from weaning to slaughter about 25% of the total annual requirements.

The average $GM per DSE per year over the 3 lambings for the 1997, 1998 and 1999 drop 1stX ewe groups joined in autumn and spring are shown in Figs. 6, 8, 10, 12, 14, 16 respectively. Within most of the drop x season groups there was a range in average weight of the 1stX ewe groups of about 10kg.

The range in average $GM per DSE per year between the 1stX ewe groups was over $12 GM/ DSE. Generally there were only minor changes in the rankings of the 1stX ewe sire groups when they were compared on a $GM/ DSE basis relative to $GM/ewe. However there were a couple of notable exceptions to this generalisation.

Fig 5. $Gross Margin / ewe / year (Autumn join)

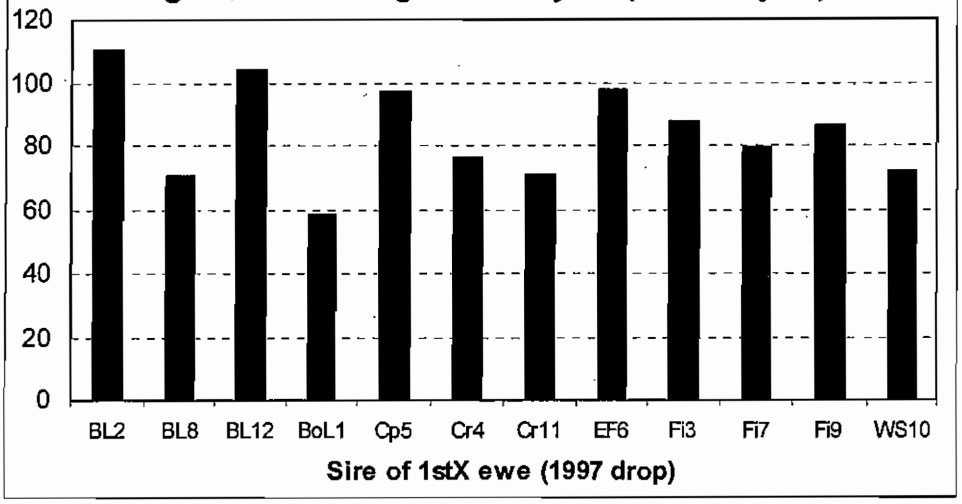


Fig 7. $Gross Margin / ewe / year (Spring join)

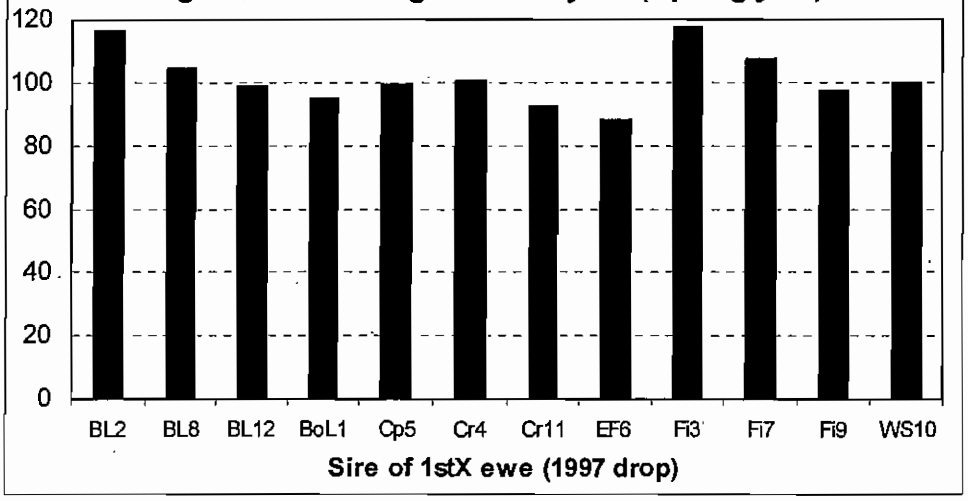
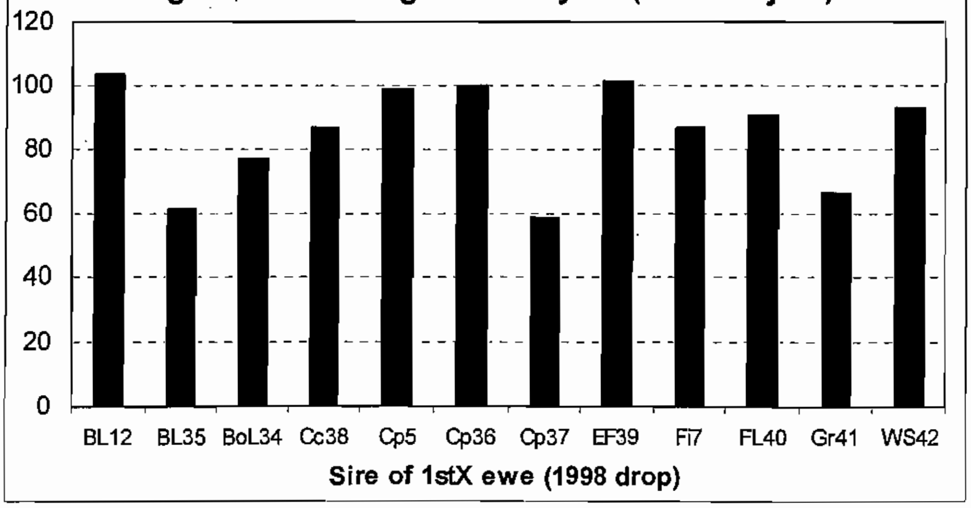
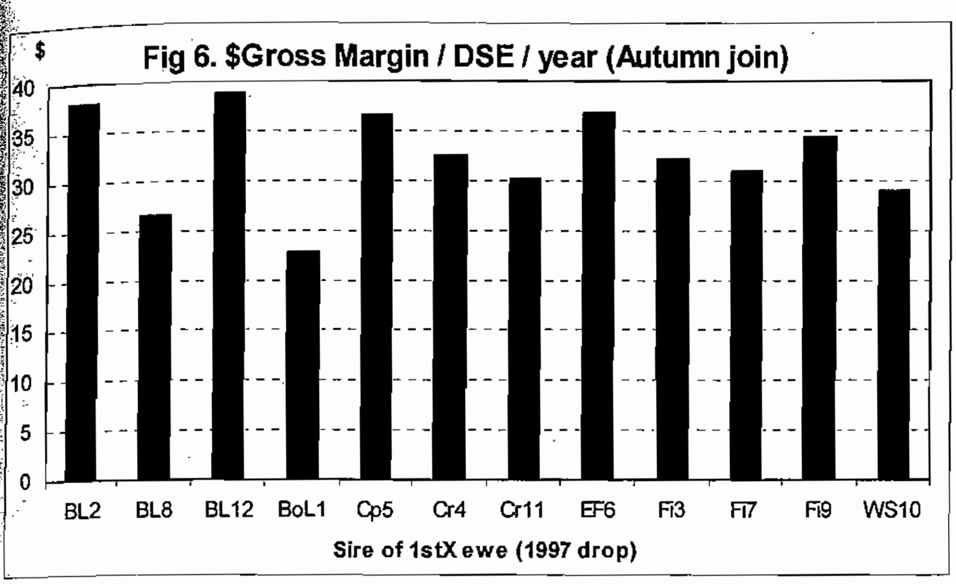
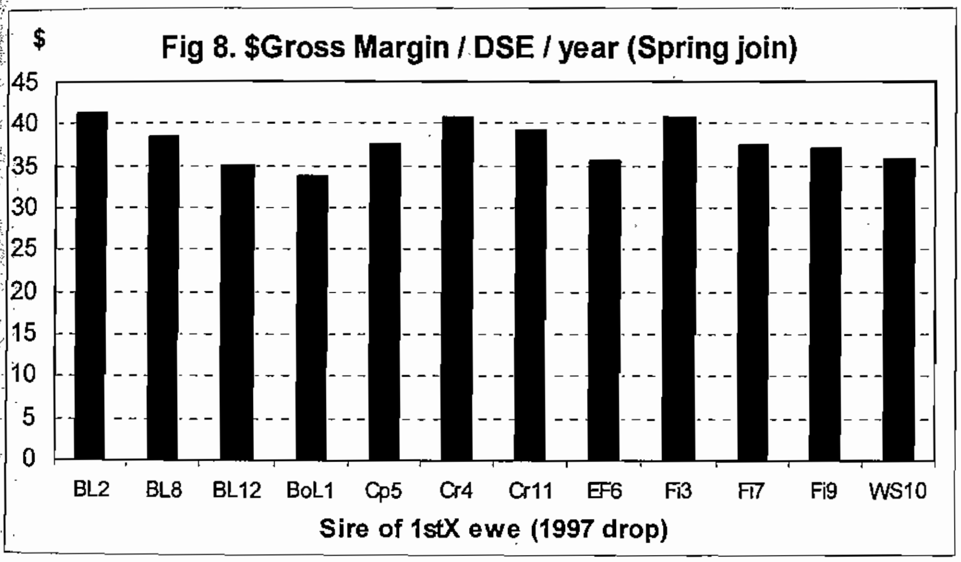
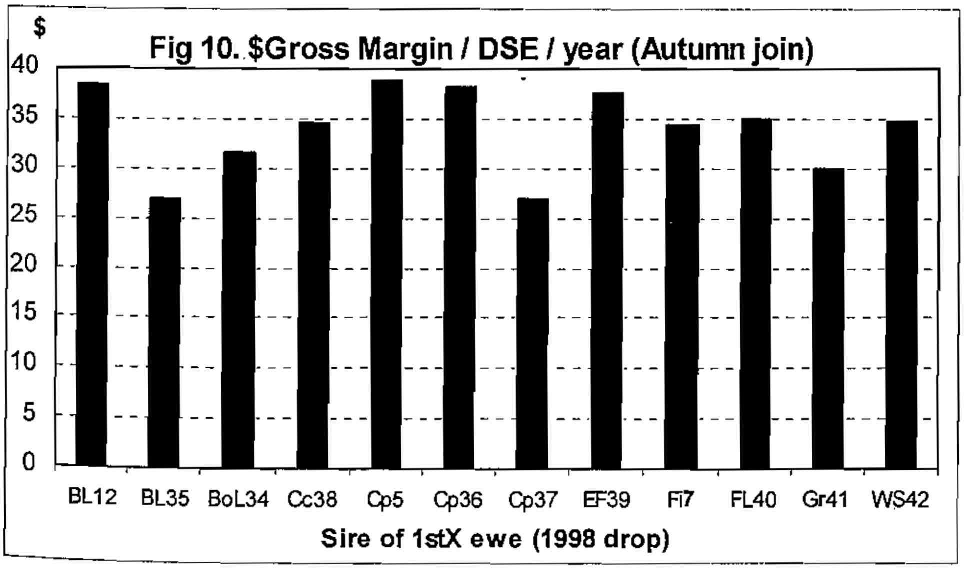


Fig 9. $Gross Margin / ewe / year (Autumn join)









The most striking exception was the higher ranking on a $GM/DSE basis for the Merino sire M56 group (1999 drop), especially for the spring joined 1stX ewes (Fig. 16). There were several reasons for the change in ranking, with the following values taken from the spring joined group.

The ewes were lighter, 63.4 kg at their last joining compared with an average of 72 kg for all the 1stX ewe groups, which means they had lower feed requirements for maintenance throughout the year. These M56 ewes also had lower lambing % than the other 1stX ewe groups with most lambs reared as singles. All these factors contributed to a lower total feed requirement of 2.16 DSE per year compared to an average of 2.5 DSE for all the other 1stX ewe groups. They had fewer lambs slaughtered at a lighter weight (23 v 25 kg carcass weight) and were lean, with most meeting the carcass specification. This meant that total lamb $ returns were lower than most other groups, although the average annual $ returns from wool were considerably higher ($34.5 v $22.9 /ewe, see Fig. 4).

There was also an improvement in ranking on a $GM/DSE basis for the Corriedale CR4 1stX spring joined ewe group (1997 drop, Fig. 8). The reasons were similar to those outlined for M56 above although they were generally smaller in magnitude. These results again emphasise the need to carefully consider your production system and select the ewes with the best genetics for your lamb enterprise.

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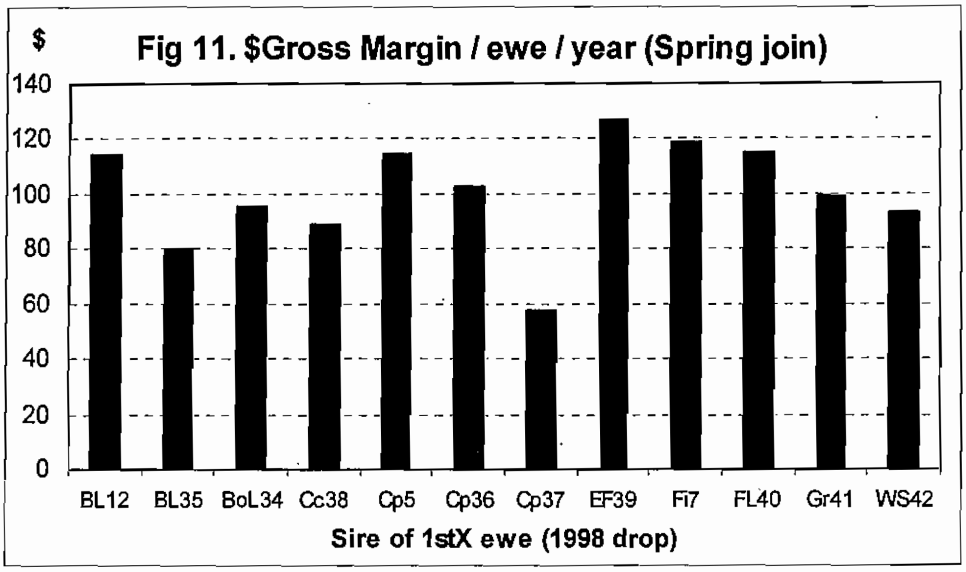
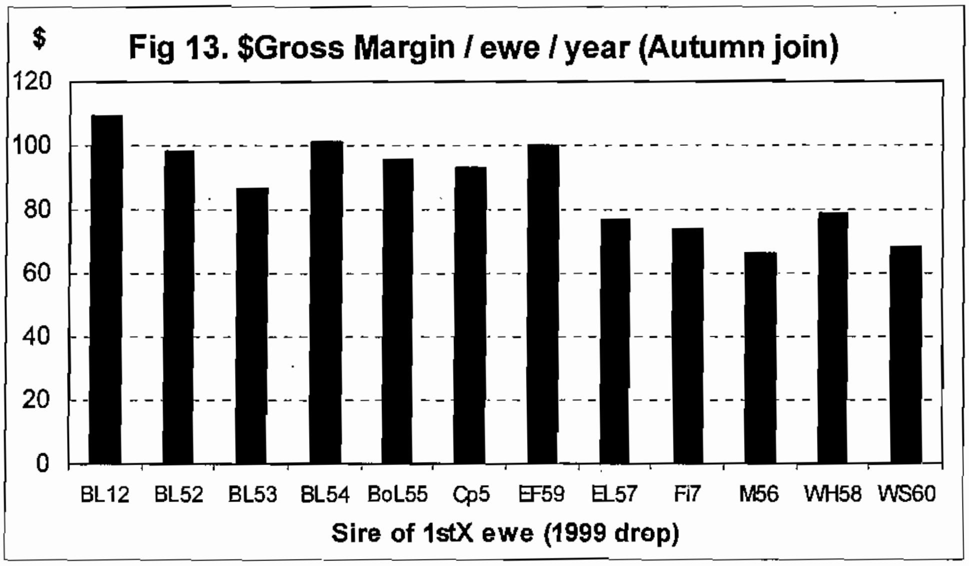

$
Fig 11. $Gross Margin / ewe / year (Spring join)
140
120
100
80
60
40
20
0
BL12
BL35
BoL34
Cc38
Cp5
Cp36
Cp37
EF39
Fi7
FL40
Gr41
WS42
Sire of 1stX ewe (1998 drop)


$
Fig 13. $Gross Margin / ewe / year (Autumn join)
120
100
80
60
40
20
0
BL12
BL52
BL53
BL54
BoL55
Cp5
EF59
EL57
Fi7
M56
WH58
WS60
Sire of 1stX ewe (1999 drop)

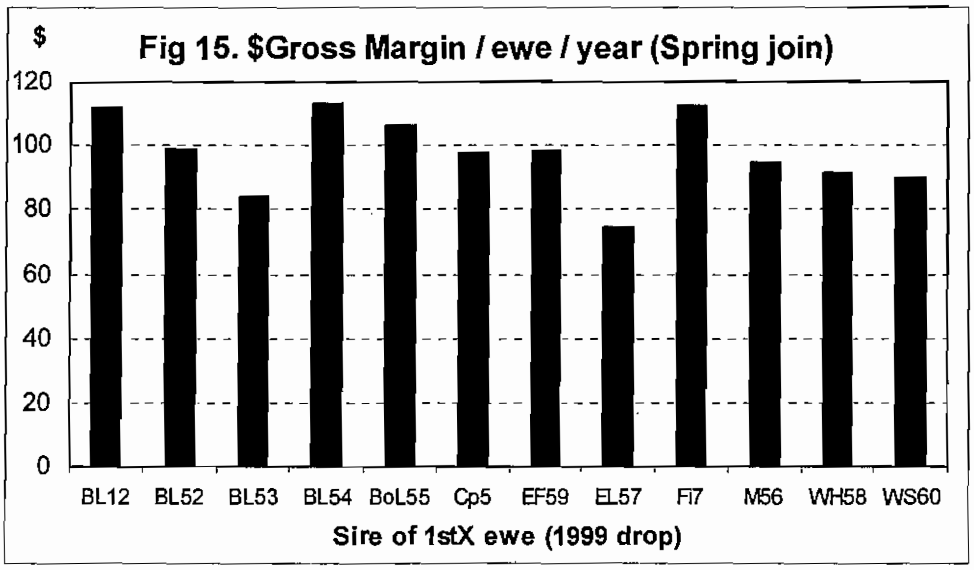

$
Fig 15. $Gross Margin / ewe / year (Spring join)
120
100
80
60
40
20
0
BL12
BL52
BL53
BL54
BoL55
Cp5
EF59
EL57
Fi7
M56
WH58
WS60
Sire of 1stX ewe (1999 drop)

Fig 12. $Gross Margin / DSE / year (Spring join)

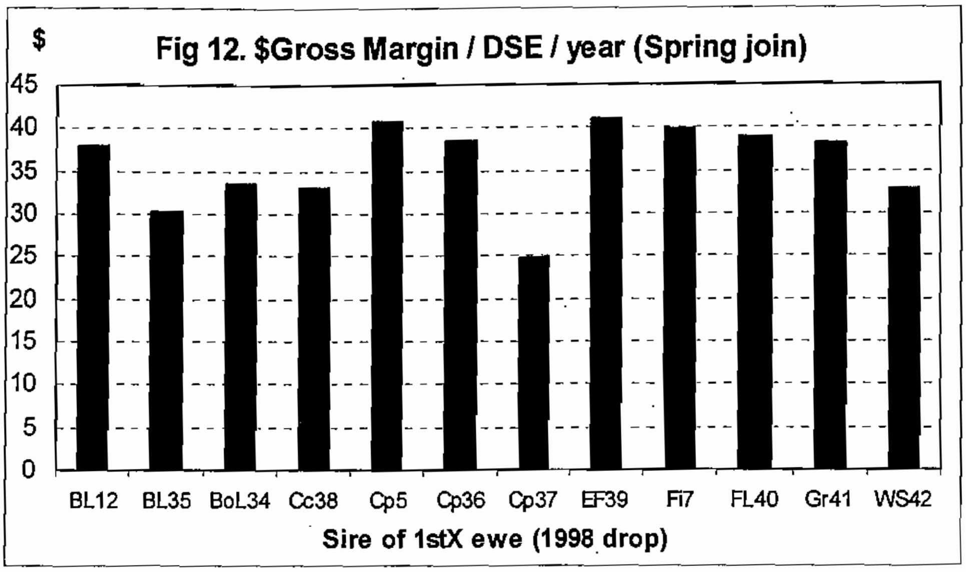


Fig 14. $Gross Margin / DSE / year (Autumn join)

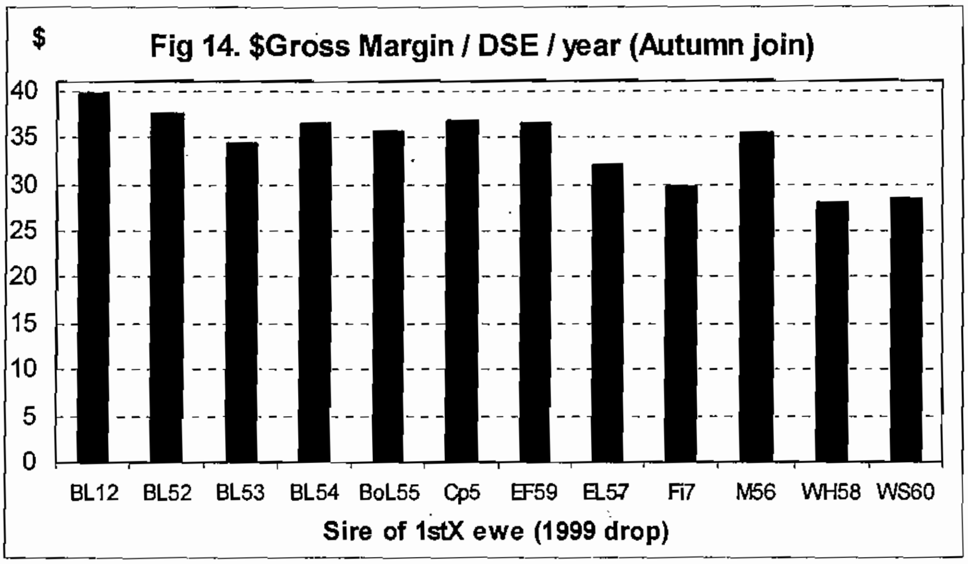
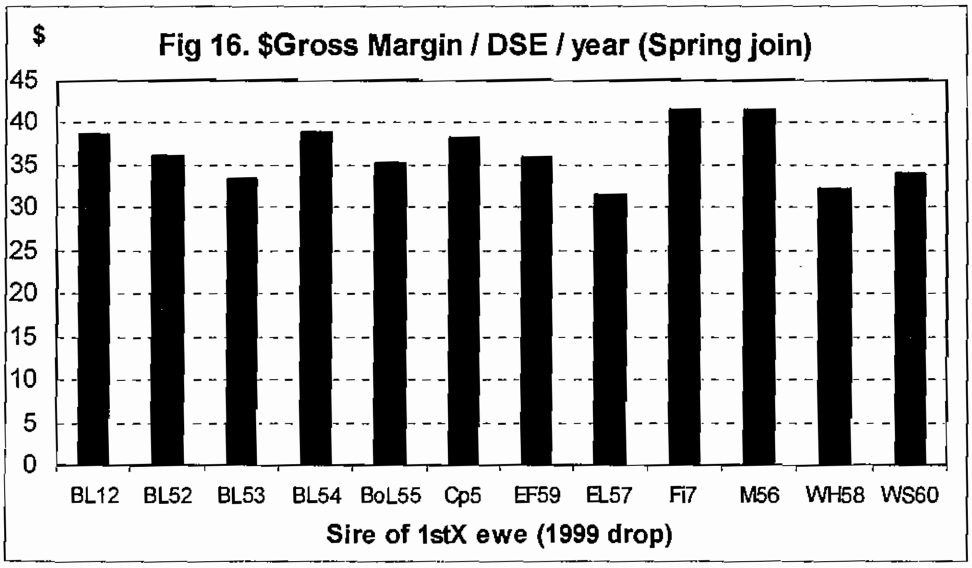


Fig 16. $Gross Margin / DSE / year (Spring join)



Maternal sire entries - details

Year	Site	Sire Code	Tag	Stud	Breed	Entrant	Phone No.
1997	Cowra	BoL1	920047	Struan	Booroola Leicester	PIRSA	08 8762 9100
		BL2	950137	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Fi3	940001	Yamba	Finnsheep	M & L Burns	03 5798 1583
		Cr4	940364	Matuka	Corriedale	P Secker	02 4848 1244
		Cp5*	940449	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		EF6	94B021	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Fi7*	930057	Warrayure	Finnsheep	GM & MA Wake	03 5574 1254
		BL8	950181	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Fi9	935010	Warrayure	Finnsheep	Knight & Bottcher	03 5578 7250
		WS10	910058	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
		Cr11	930097	Coora	Corriedale	Coora Partnership	02 4848 1244
		BL12*	94S291	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
1997	Hamilton	BL13	950246	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Ro14	930146	Claymour	Romney	Rouch & Gillman	03 5727 1552
		BoL15	924287	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cp16	930069	Narrambla	Coopworth	D Wigan	03 5577 2321
		Fi17	950054	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		Cp18	940421	Oaklea	Coopworth	J Keiller	03 5526 5248
		EF19	94B026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Cr20	680491	Stanbury	Corriedale	Cole & Risbey	03 5593 9278
		Fi21	960002	UNSW	Finnsheep	S & D Jones	03 5122 3328
1998	Struan	Fi22	890049	ATC	Finnsheep	Jaydee Stud	08 8764 2065
		Fi23	930049	Tambaroora	Finnsheep	Jaydee Stud	08 8764 2065
		BL24	960346	Gleneith	Border Leicester	CE & LJ Arney	08 8536 0031
		BL25	960188	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Cp26	960210	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Cr27	921586	Coora	Corriedale	Coora Partnership	03 5578 6267
		EF28	960133	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Hy29	960028	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Hy30	960128	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		PD31	960110	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		BL32	95T138	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		WS33	951470	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1998	Cowra	BoL34	950029	Caveton Park	Booroola Leicester	PIRSA	08 8762 9100
		BL35	940765	Retallack	Border Leicester	BLA(NSW)/Grinter	02 6974 1153
		Cp36	960067	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cp37	940274	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cc38	960621	Coronga	Coronga Composite	Premier Breed. Tech	02 6365 8207
		EF39	94B040	Silverstream	East Friesian	A. Baillieu	03 5597 8596
		FL40	941018	Wycombe	Finn x Leicester	R & L Coddington	02 6775 5225
		Gr41	955551	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		WS42	940089	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
1998	Hamilton	BoL43	960322	Struan	Booroola Leicester	PIRSA	08 8762 9100
		EF44	960026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		EF45	94B019	Glenspean	East Friesian	S & J Cameron	03 5286 1455
		Cr46	950161	Gundowringa	Corriedale	HJ & CJ Prell	02 4848 1244
		EF47	950509	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FiF48	960088	Gippfinn	Finn x Friesian	S & D Jones	03 5122 3328
		Ro49	920089	Evergreen	Romney	C Duncombe	03 5264 5170
		Tx50	949002	Coolana	Texel	Coolana Rural	03 5350 5531
		WS51	900429	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1999	Cowra	BL52	920070	Kegra	Border Leicester	BLA(NSW)/Golder	02 6977 1339
		BL53	960102	Inverbrackie	Border Leicester	CE & LJ Arney	06 6536 0031
		BL54	970030	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BoL55	950203	Struan	Booroola Leicester	PIRSA	08 8762 9100
		M56	890183	Centre Plus	Merino	L Mortimer & Sons	02 6692 6259
		EL57	960043	Ostlers Hill	English Leicester	ELAssoc/Stephenson	03 5764 1296
		WH58	960505	Clifton Hills	Wiltshire Horn	AWHSBA/Ballantyne	03 5145 8225
		EF59	970100	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		WS60	974842	Linden Genetics	PLG White Suffolk	Linden Genetics	02 6388 2020
1999	Hamilton	BL61	970188	Wongajong	Border Leicester	AD & CM Wilson	02 5882 3338
		BL62	98X050	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		BoL63	950160	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cr64	910415	Coolana	Corriedale	PG Munro	03 5575 3240
		Cp65	978431	Cashmore Park	Coopworth	J Keiller	03 5526 5248
		Ch66	910L92	Grand Ridge	Cheviot	RN Waddell	03 5828 4244
		Fi67	960085	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		EFP68	961019	Yollom	East Friesian x Perendale	MF & ML Molloy	03 5596 2077
		EFR69	970175	Price	East Friesian x Romney	EJ & KJ Price	03 5527 1110
1999	Struan	BL70	970310	Johnos	Border Leicester	NW & JI Johnson	08 8758 6053
		BL71	97W290	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		M72	930051	Merinotech Mid	Merino	Merinotech Mid North	08 6665 4019
		EL73	950T82	Koenarl	English Leicester	CR Taylor	03 5595 0272
		Cp74	970101	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Hy75	960215	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		FiF76	960132	Gippfinn	Finn Friesian	S & D Jones	03 5122 3328
		EF77	960138	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		SHD78	970155	Tauranga	South Hampshire Down	S & M Macmillan	03 5596 2251
		PD79	970101	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		WS80	970172	Koonawarra	White Suffolk	AWSA	08 8210 5211
2000	Struan	BL81	960327	Morton	Border Leicester	JD & CM Corbin	08 8765 8058
		BL82	980260	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL83	980085	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		SAM84	980048	Jeancourt	SAMM	W & M Heddle	08 8271 7080
		Cp85	980091	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Gr86	980144	Yangoora	Gromark	Yangoora Gromarks	02 8383 3254
		Hy87	940278	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Fi88	538	Gippfinn	Finn	S & D Jones	03 5122 3328
		EFP89	981071	Yollom	East Friesian x Perendale	Karoi Seed Stock/Udy	03 5597 6821
		WS90	960513	Langley Heights	White Suffolk	AWSA	08 8210 5211
		WD91	990906	Axis	White Dorper	B & L Mawson	06 8537 0615

* Link sires used at each site each year

Dynamic Dams

Ewe genetics for the future

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In This Issue

Editors: Neal Fogarty & Lynette McLeod
NSW Agriculture
Orange Agricultural Institute
Orange, NSW 2800
Ph: (02) 6391 3813
Fax: (02) 6391 3922
Email: neal.fogarty@agric.nsw.gov.au

Dynamic Dams reports on the project **Maternal sire Central Progeny Test (MCPT)**, which is part of the **MLA Lamb Program**, and provides other information for lamb breeders to improve their maternal genetics.
Contributions from readers are welcome.

BREEDING FROM SECOND CROSS EWE LAMBS

Neal Fogarty, NSW Agriculture, Orange

Finding good replacement crossbred ewes can be difficult. In recent years many of the best ewes have been slaughtered as lambs and the drought has resulted in further shortages. As producers restock, ewes will be at a premium and suitable quality crossbred ewes may be very difficult to obtain. Some producers have found a solution right on their own property by breeding from selected second cross ewes.

The second cross ewes are available without a cash outlay (although there is the opportunity cost of forgone lamb sales) and they are of known genetic background and health status. Breeding from them may seem like heresy to some in Australia, where we have a long history of using Border Leicester X Merino (BLM) first cross ewes, but it is common practice overseas to retain multi-cross ewes. There are however some important implications that need considering;

- breed effects and genetics,
- hybrid vigour,
- management changes,
- ram selection for your target lamb market,
- wool production and quality,
- longer term breeding goals.

How important is the ewe?

Productivity of the ewe flock has a major impact on profitability of the lamb enterprise. The genetic merit of the dam sets her potential lamb turnoff and milk production for early lamb growth. The dam also contributes genes, equally with the sire, for growth and carcass merit of the lamb. Results at Cowra have shown a range of \$50/ewe/year in gross margins between groups of first cross ewes by different sires (see Fig. 1).

NSW Agriculture | State Government Victoria Department of Primary Industries | SARDI South Australian Research and Development Institute | LAMBPLAN Excellence in breeding and production | Meat & Livestock Australia

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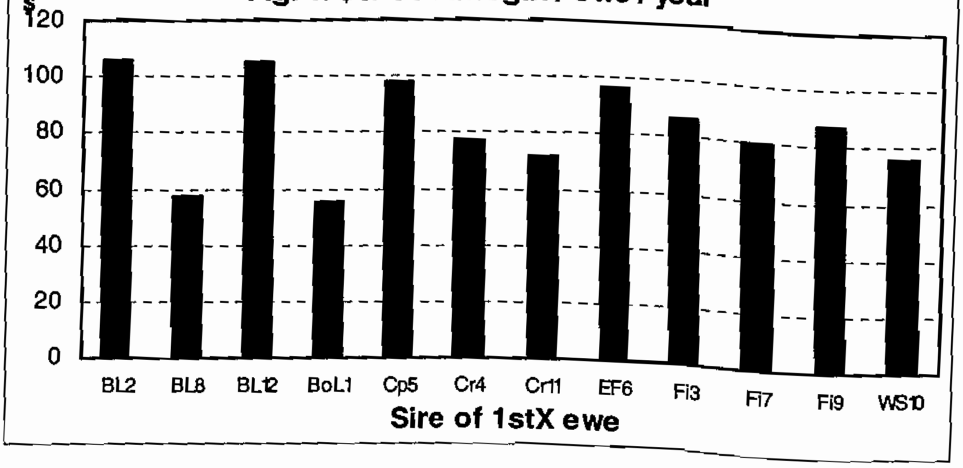
Fig. 1. $Gross Margin / ewe / year



Mating ewes at 7-9 months with pregnancy scanning also allows the sale of any dry ewes into the lamb market. There are no detrimental affects on subsequent performance from lambing ewes at one year of age, providing they have adequate nutrition during pregnancy to continue growing.

Ram selection - a different breed of terminal sire will retain maximum hybrid vigour for lamb survival and growth, although the same breed will still retain about half the hybrid vigour. You may also need to consider the genetics or estimated breeding values (EBVs) of the rams to produce lambs for a specified target market, as the genetics of the ewe will be different.

No one maternal breed cross has all the answers and there is considerable variation between sires within all the maternal crossing breeds. It is important to source crossbred ewes that are by sires with high genetic merit and bred from a high performing base ewe flock. The ewe genotype has a marked influence on lambing rate, lamb growth rates and carcass traits.

Implications of breeding from second cross ewes

Selection of the best ewe lambs to retain is important for success. Ewe progeny from scanned twin bearers would be a good group to retain. Faster growing lambs will reach puberty earlier and can be mated younger. Dorset cross ewes may also join more successfully and earlier in the spring than BLM ewes because of their naturally longer breeding season.

Hybrid vigour is greatest for lambing rate and survival, moderate for growth and wool and very small for carcass traits. Using second cross ewes exploits maximum hybrid vigour for maternal traits. It may be worth considering a different breed of terminal sire ram to retain maximum hybrid vigour for growth among their lamb progeny (see Ram selection below).

Management to ensure ewes are well grown (minimum 42 kg and preferably up to 50 kg live weight) to mate successfully at an early age. Some groups of first cross ewes weaned 100% of lambs from an autumn mating at 7 months of age at Cowra. Success requires the ewes to have genetics for early púberty and to be well grown. Results from mating young ewes in the spring and early summer are much more variable than mating in the autumn.

Rams must be healthy, active and fertile. Better results will be achieved if the rams are experienced, a high percentage is used and the joining period extended a couple of weeks longer than for mature ewes.

Wool - second cross ewes will generally produce 0.5 to1.0 kg less clean wool of 1-2 microns lower fibre diameter than comparable BLM first cross ewes.

Long term breeding goals – development of a composite breed line to supply replacement ewes requires a well planned breeding program to be successful.

Take Home Messages

- Breeding from second cross ewes may be a short term strategy to find suitable crossbred ewes.
- The genetics and performance of the ewe flock is a major driver of lamb productivity and profitability (up to $50/ewe/year)
- There are several implications that need to be considered for success.

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MCPT TECHNICAL MEETING

The site managers, scientists and advisors involved in MCPT met at Orange in May. Progress was reviewed and plans developed for analysis of the complete data set and further application of the results in industry.

Veronica Ingham has been employed jointly through NSW Agriculture and the Australian Sheep Industry Cooperative Research Centre (CRC) and is undert ing a large part of the in-depth analysis of the data. Veronica has moved from SA where she underto PhD studies with SARDI and the University of Adelaide, so she has good experience for the ta

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MCPT UPDATE

COWRA (N Fogarty, J Morgan, L McLeod)

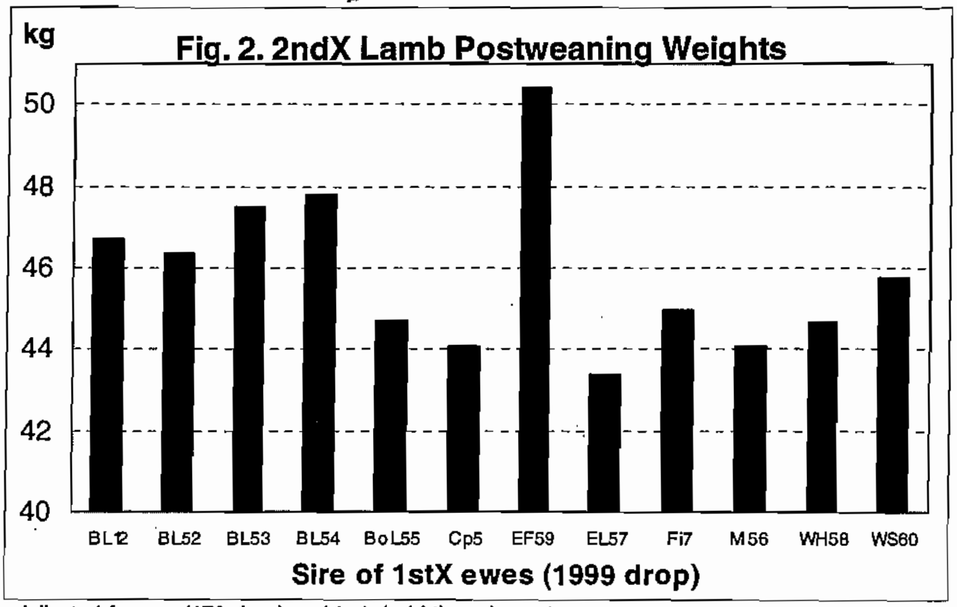
Seasonal conditions

Good rain in February resulted in moderate pasture growth in the lambing paddocks and grain supplement ceasedin the first week of lambing in March/April.

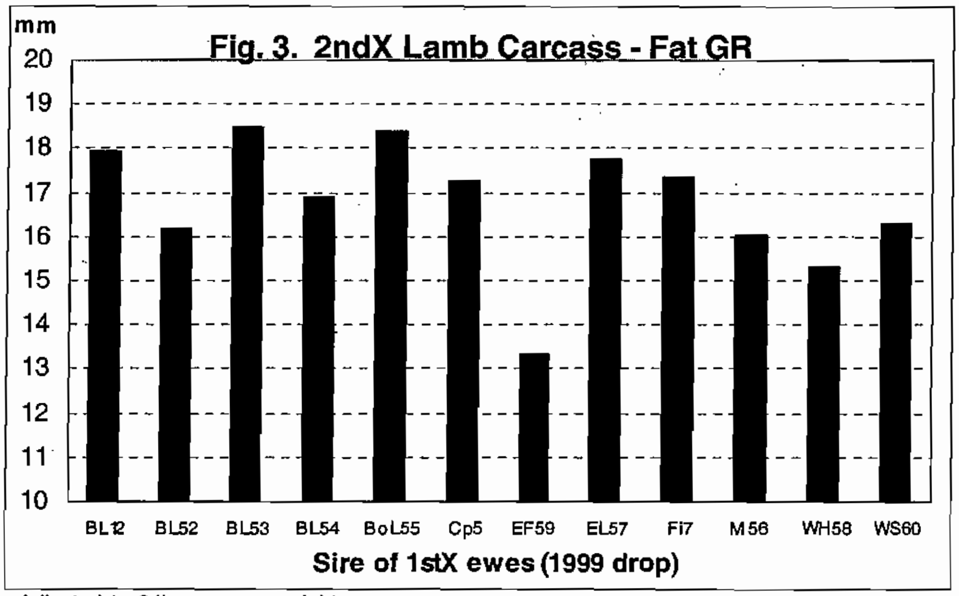
Since marking, the ewes and lambs have had the pick of the pastures, and although the season has remained dry, they are doing well. Weaning is scheduled for early July and lambs will be grown out for slaughter in late September. These 99drop ewes are the only ewes remaining to be faecal sampled for the grazing intake and feed requirements trial.

2ndX lamb slaughter

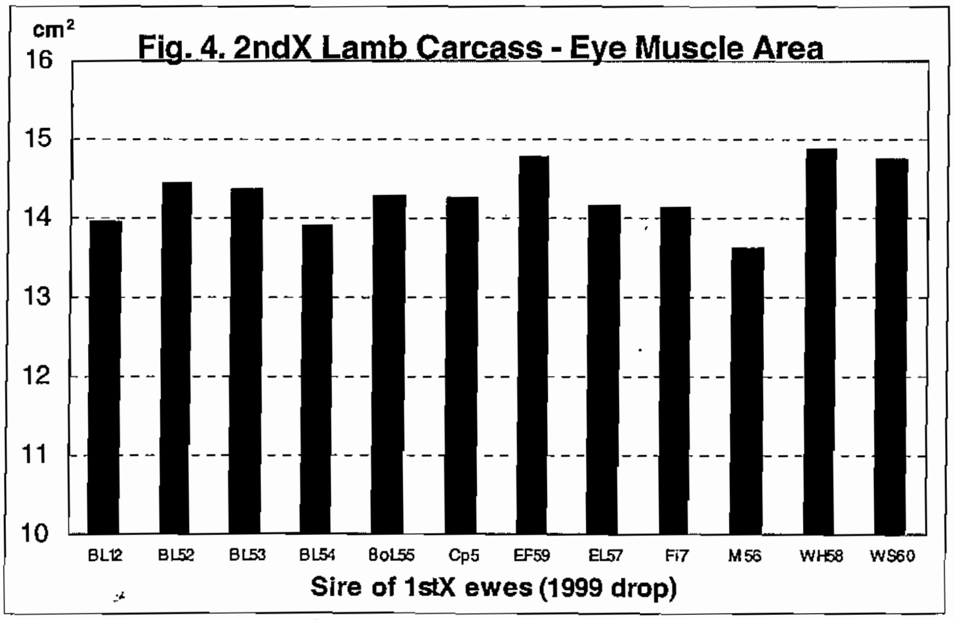
The 2ndX lambs from the 1999 drop ewes autumn joined in 2002 were slaughtered in January 2003. The average fasted preslaughter weights showed a range of almost 7 kg between the 1stX ewe groups (Fig. 2), with progeny from EF59 ewes being heaviest. The weights are adjusted to twin born and reared at 170 days of age and averaged over ewes and wethers. The average carcass weight of the lambs was 23.1 kg. There was a very large range between the ewe groups for average carcass GR depth (Fig. 3). This represents a difference of over one fat score due to the sire of the dam alone. Progeny from EF59 1stX ewes were extremely lean, although the range among all the other groups was still over 3mm when they were compared at the same carcass weight. The range among the groups in eye muscle area was smaller (Fig. 4). These results are generally consistent with previous slaughters from these ewes (see Dynamic Dams 16).



Adjusted for age (170 days) and to twin birth and rear type.



Adjusted to 24kg carcass weight.

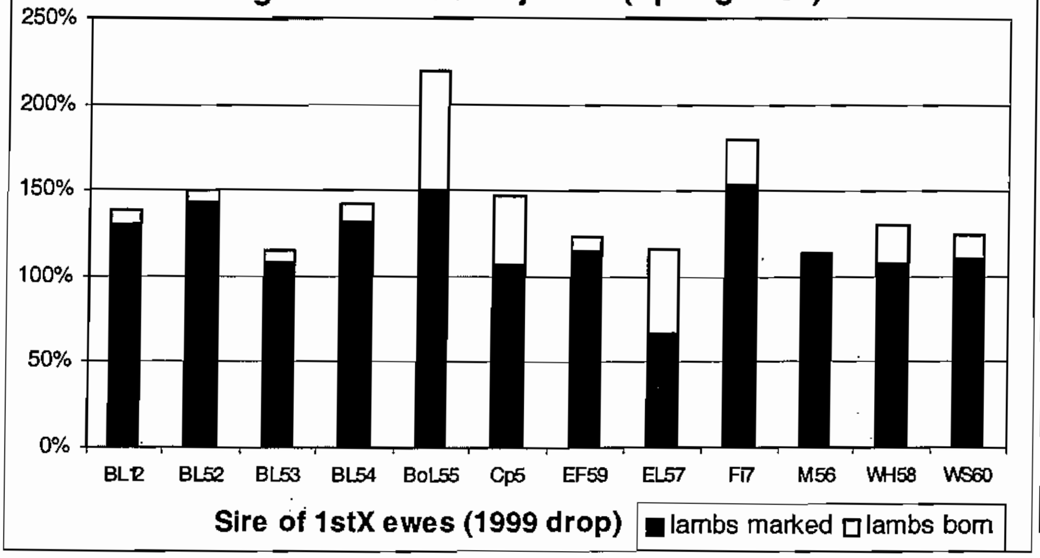


Adjusted to 24kg carcass weight.

Spring join lambing

The final joining at Cowra occurred in spring 2002 for the 1999 drop ewes. The lambing is complete with the last born 29 April 2003. The lambs born and marked are shown in Fig 5. There was considerable variation in performance between the 1stX ewe sire groups. Average lambs born per ewes joined was 142%, with three sire groups (BoL55, Fi7 and BL52) over 150%. Survival of lambs to marking was good in most sire groups with M56 suffering no losses. The sire group BoL55 suffered the greatest lamb loss but still marked 150% owing to its high proportion of multiples. Poor lamb survival was also evident from the EL57 and Cp5 sire groups. The average lambs marked per ewe joined was 120%.

Fig. 5. Lambs / ewe joined (Spring 2002)



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HAMILTON (Trevor Pollard)

Seasonal Conditions

South West Victoria has had a very good, if not entirely normal start to the pasture growing season and subsequent entry into winter. In February, rainfall at the Pastoral and Veterinary Institute was almost double the long-term mean at 56mm. This was followed in March by 63 mm which was again almost double the long-term average. While these falls were welcomed, particularly as much of the rest of the state was in still in drought or near-drought conditions, many growers were sceptical in the early stages that the season had broken in this area. April and May then produced 60% and 40% of the monthly mean so represented quite a dry period. Pastures however "hung on" and with falls of 82 mm in June to date (25% above average) many growers have referred to the season here as excellent. Pasture growth has now fallen somewhat with the advent of colder weather but soil temperatures remain above average.

2ndX lambs

Progeny of all 1998 and 1999-drop ewes (dropped spring 2002) were finished initially on good quality strawberry clover/perennial grass pasture on peat-swamp paddocks and subsequently on good quality sub-clove/ryegrass pasture supplemented with grain. Average live weights on 8 April and 9 May are shown in Table 1. Both groups were slaughtered at Colac on 30 May and carcass measurements collected. The data collected is currently being assembled and analysed. Blood samples have been collected for DN analysis from all the ewes in the MCPT project and also from all progeny prior to slaughter. Feed intake data has also been collected from the ewes.

Table 1. Average live weight (kg) of 2ndX l

Ewe Group	No.	April	May
1999-drop	176	38	46.0
1998-drop	182	41	48.6

RUTHERGLEN (Gervaise Gaunt)

Seasonal conditions

The autumn season at Rutherglen has been mild with few frosts and warm sunny days. There was minimal rain from January to early May (77 mm) however it has improved with an additional 37 mm since mid-May. Due to the drought, pasture availability was low (0.4-0.6 t/ha) until early May but is now estimated at 0.9-1 t/ha due to the recent rain and mild weather.

Supplementary feeding of ewes and lambs is continuing and currently they are being fed *ad-lib* clover/ryegrass hay and 800g/day wheat. With the improvement of pasture growth the quantity of supplementation will be reduced. Ewes and lambs will be supplementary fed until weaning, and the decision to continue supplementary feeding lambs will be made depending on pasture availability at weaning.

Lambing and Marking

Weather conditions during lambing (April/May) were mild. Lambing commenced 1st April 2003, with ewes lambing in individual plots on the basis of sire group. Although there was an active fox-baiting program, there were still some losses due to foxes, particularly with lambs from the multiple births. The poorer mothering ability of some ewes also contributed to lamb loss. Ewes and lambs were drifted from plots into their mobs one to two weeks post-lambing.

The 1999-drop ewes have now completed three lambings and the 2000-drop have completed two lambings. Conception rates (number of ewes pregnant /ewes joined) averaged 90% for both drops of ewes. Several sires achieved 100% conception rate ie. BL12, CP74, WS80 (1999-drop), BL82, GR86, Hy87, SAM84, WD91 and WS90 (2000-drop).

The MCPT has once again shown that large differences are evident between sire groups for lambs born and lambs marked (Tables 2 and 3). These ranges are indicative of the potential ranges that exist in the lamb industry. Average lambing percentage (number of lambs born / ewes joined) for the 1999-drop ewes is 142%. Lambing percentages (Fig. 6) ranged from 43% (EL73) to 171% (BL12, Fi7). The 2000-drop ewes averaged 135% and ranged from 95% (EFP89) to 178% (Fi7) (Fig. 7). Although the lambing percentages for link sire Fi7 were the highest for both 1999 and 2000-drop, the lamb death rate between lambing

Table 2. Lambing and marking percent and marking weight (kg): 1999-drop ewes.

1stX group	EJ (n)	EL (n)	LB/EJ (%)	LM/EJ (%)	Mark wt (kg) **
BL12*	14	14	171	143	20.3
BL70	23	20	139	126	19.1
BL71	21	20	143	129	20.4
Cp5*	28	27	143	139	19.0
Cp74	14	14	150	136	18.3
EF77	14	13	129	114	19.4
EL73	23	9	43	30	18.5
Fi7*	24	22	171	121	17.6
FiF76	31	28	145	139	18.9
Hy75	22	21	164	145	19.7
M72	13	11	154	138	17.5
PD79	12	11	150	83	20.1
SHD78	18	17	133	106	18.7
WS80	15	15	147	133	18.3
Total	**272**	**242**	**142**	**120**	**19.0**

*EJ=ewes joined, EL=ewes lambed, LB=lambs born, LM=lambs marked. * Link sires*
*** adjusted for age (40 days) for single wethers*

Table 3. Lambing and marking percent and marking weight (kg): 2000-drop ewes.

1stX group	EJ (n)	EL (n)	LB/EJ (%)	LM/EJ (%)	Mark wt (kg) **
BL12*	21	18	133	119	20.1
BL81	24	19	117	108	19.9
BL82	12	12	125	125	19.7
BL83	18	15	117	111	20.8
Cp5*	17	13	118	112	18.0
Cp85	19	17	121	111	21.7
EFP89	19	13	95	89	18.9
Fi7*	32	28	178	134	16.9
Fi88	25	23	176	136	17.7
Gr86	24	24	121	104	18.6
Hy87	22	22	150	114	19.8
SAM84	16	16	150	131	20.1
WD91	14	14	150	129	21.4
WS90	14	14	143	121	20.2
Total	**277**	**248**	**135**	**117**	**19.6**

*EJ=ewes joined, EL=ewes lambed, LB=lambs born, LM=lambs marked. * Link sires*
*** adjusted for age (40 days) for single wethers*

Fig.6. Lambs born and marked / ewe joined (1999-drop)

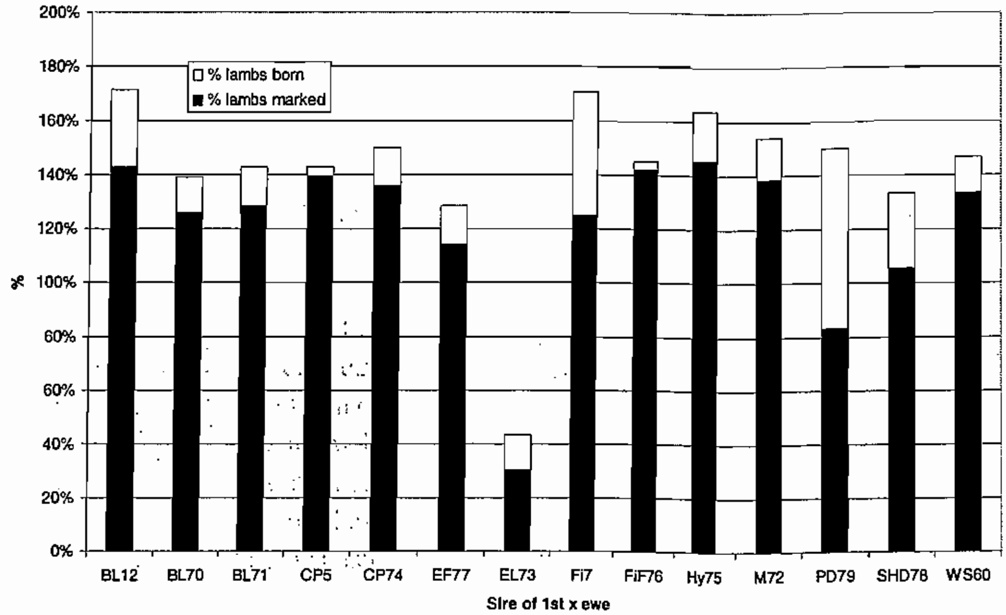
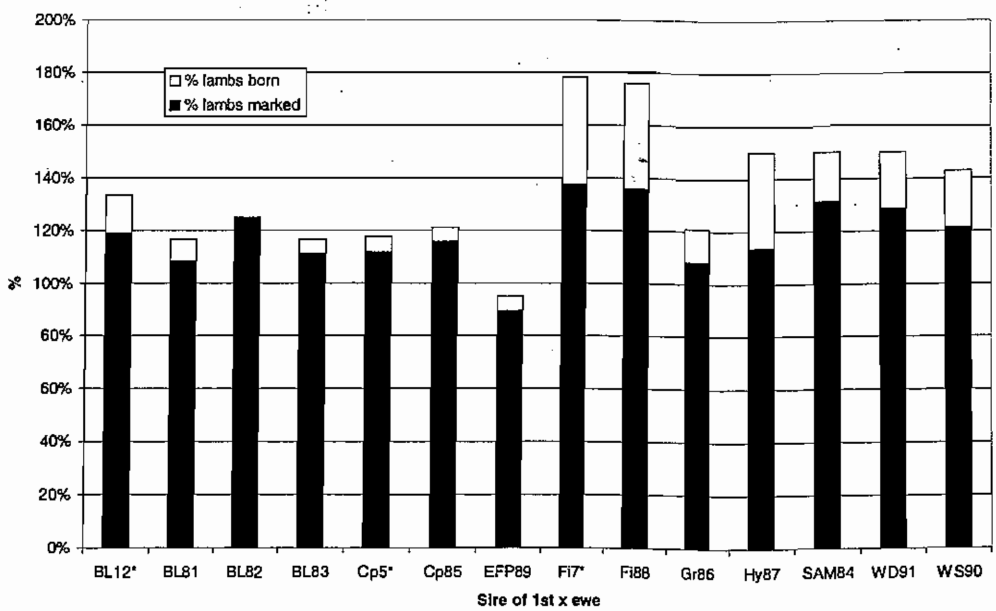


Fig. 7. Lambs born and marked / ewe joined (2000-drop)



and marking for Fi7 was also among the highest with 27% and 23% for 1999 and 2000-drop ewes respectively resulting in marking percentages of 125% and 138% respectively.

Lambs were marked in mid-May and achieved good growth rates from birth to marking of 289 g/day and 277 g/day for the 1999 and 2000-drop ewes respectively. Marking rates averaged 120% and 117% for the 1999 and 2000-drop ewes respectively (Fig. 6 and 7). There was only one sire group ie. BL82 (2000-drop) that had 100% lamb survival between birth and marking. Tables 2 and 3 show average marking weight which has been adjusted for 40 days of age. Marking weights vary from 17.5kg (M72) to 20.4kg (BL71) for 1999-drop progeny and 16.9kg (Fi7) to 21.7kg (CP85) for the 2000-drop progeny.

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RESEARCH HIGHLIGHTS

Papers presented to the 7th World Congress on Genetics Applied to Livestock Production, held in Montpellier, France, August 2002.

Contribution of CT Scanning to Genetic Improvement in a Terminal Sire Sheep Breeding Programme.

G.B. Nicoll, N.B. Jopson and J.C. McEwan.

Rates of genetic improvement in a terminal sire sheep breeding programme were compared where breeding values had been estimated from predictor trait sets using either liveweights, ultrasonically scanned fat depth and *longissimus dorsi* dimensions, or additionally including measurements from computed tomography (CT) scanning. Incorporating CT data enhanced annual rates of genetic improvement ($P<0.05$) in lean growth index (+68.8¢) and weight of carcass fat (-87.6g). Genetic gains in weight of carcass lean meat (+41.7g), *longissimus dorsi* area (-0.01cm2) and liveweight at 8 months (-0.04kg) were not significantly affected by use of CT data. Improvement rates were generally similar to or less than reported predicted values. Over time, routine use of CT scanning enhanced aggregate economic merit.

Genetic Variation in Maternal Behaviour Score and Lamb Survival.

J.M. Everett-Hincks, N. Lopez-Villalobos, H.T. Blair and K.J. Stafford.

Heritability and repeatability estimates were derived for maternal behaviour score (MBS), litter survival as a trait of the dam (LSD) and lamb survival as a trait of the lamb (LSL). MBS and LSD were measured on 1786 and 2193 dams respectively, for a maximum of four parities. LSL was measured on 4137 lambs born from 1997 through to 2000. Animals involved in the study comprised straightbred Coopworth and East Friesian Coopworth crosses. The heritability and repeatability for MBS was 0.05 and 0.07 respectively. Both heritability and repeatability for LSD as a trait of the dam were zero. For LSL, the heritability attributed to direct effects was 0.14 while the heritability attributed to maternal effects was 0.07. The genetic correlation between maternal and direct effect for LSL was –0.93. These results suggest there is little benefit attempting to select for improved MBS, LSD and LSL.

Genetic Relationships of Ram Libido Score with Ewe Reproduction of Four Sheep Breeds.

G.D. Snowder, J.N. Stellflug and L.D. Van Vleck.

Estimates of genetic correlations of ram libido score with number of lambs born and litter weight weaned were derived for Columbia, Polypay, Rambouillet, and Targhee sheep breeds. Estimates of direct heritability for ram libido are larger for Columbia and Polypay breeds (0.31 and 0.30, respectively) compared to Rambouillet (0.14) and Targhee (0.17). The estimate of the genetic correlation between ram libido and number of lambs born is small and positive in the Columbia breed (0.24). This estimate is near zero for the other breeds and ranged from - 0.09 to 0.02. The estimate of the genetic correlation between ram libido and litter size weaned is small and positive for the Columbia and Targhee breeds (0.28 and 0.32, respectively) and nil for the Polypay breed. However, for the Targhee breed the estimate is small and negative(- 0.17).

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Maternal sire entries - details

** Link sires used at each site each year*

Year	Site	Sire Code	Tag	Stud	Bread	Entrant	Phone No.
1997	Cowra	BoL1	922047	Struan	Booroola Leicester	PIRSA	08 8762 9100
		BL2	950137	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Fi3	940001	Yamba	Finnsheep	M & L Burns	03 5798 1583
		Cr4	940364	Maluka	Corriedale	P Secker	02 4848 1244
		Cp5*	940449	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		EF6	940B21	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Fi7*	930057	Warrayure	Finnsheep	GM & MA Wake	03 5574 1254
		BL8	950181	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Fi9	935010	Warrayure	Finnsheep	Knight & Bottcher	03 5578 7250
		WS10	910058	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
		Cr11	930097	Coora	Corriedale	Coora Partnership	02 4848 1244
		BL12*	94S291	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
1997	Hamilton	BL13	950246	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Ro14	930146	Claymour	Romney	Rouch & Gillman	03 5727 1552
		BoL15	924287	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cp16	930069	Narrambla	Coopworth	D Wigan	03 5577 2321
		Fi17	950054	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		Cp18	942297	Oaklea	Coopworth	J Keiller	03 5526 5248
		EF19	940B26	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Cr20	880491	Stanbury	Corriedale	Cole & Risbey	03 5593 9278
		Fi21	960002	UNSW	Finnsheep	S & D Jones	03 5122 3328
1998	Struan	Fi22	890049	ATC	Finnsheep	Jaydee Stud	08 8764 2065
		Fi23	930049	Tambaroora	Finnsheep	Jaydee Stud	08 8764 2065
		BL24	960346	Gleneith	Border Leicester	CE & LJ Arney	08 8536 0031
		BL25	960188	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Cp26	960210	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Cr27	921586	Coora	Corriedale	Coora Partnership	03 5578 6267
		EF28	960133	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Hy29	960028	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Hy30	960128	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		PD31	960110	Wyndarnah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		BL32	95T138	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		WS33	951470	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1998	Cowra	BoL34	950029	Caveton Park	Booroola Leicester	PIRSA	08 8762 9100
		BL35	940765	Retallack	Border Leicester	BLA(NSW)/Grinter	02 6974 1153
		Cp36	960067	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cp37	940274	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cc38	960621	Coronga	Coronga Composite	Premier Breed. Tech	02 6365 8207
		EF39	B40	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FL40	940016	Wycombe	Finn x Leicester	R & L Coddington	02 6775 5225
		Gr41	955551	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		WS42	940069	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
1998	Hamilton	BoL43	96P6322	Struan	Booroola Leicester	PIRSA	08 8762 9100
		EF44	960026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		EF45	0019	Glenspean	East Friesian	S & J Cameron	03 5286 1455
		Cr46	950161	Gundowringa	Corriedale	HJ & CJ Prell	02 4848 1244
		EF47	950509	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FiF48	960086	Gippfinn	Finn x Friesian	S & D Jones	03 5122 3328
		Ro49	9200089	Evergreen	Romney	C Duncombe	03 5264 5170
		Tx50	949002	Coolana	Texel	Coolana Rural	03 5350 5531
		WS51	900429	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1999	Cowra	BL52	920070	Kegra	Border Leicester	BLA(NSW)/Golder	02 6977 1339
		BL53	960102	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		BL54	970030	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BoL55	955203	Struan	Booroola Leicester	PIRSA	08 8762 9100
		M56	900183	Centre Plus	Merino	L Mortimer & Sons	02 6892 8259
		EL57	960043	Ostlers Hill	English Leicester	ELAssoc/Stephenson	03 5764 1298
		WH58	960505	Clifton Hills	Wiltshire Horn	AWHSBA/Ballantyne	03 5145 8225
		EF59	970100	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		WS60	970842	Linden Genetics	PLG White Suffolk	Linden Genetics	02 6386 2020
1999	Hamilton	BL61	970188	Wongajong	Border Leicester	AD & CM Wilson	02 5882 3338
		BL62	980050	Kelso	Border Leicester	GB Starrttt & Son	03 5829 0144
		BoL63	955160	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cr64	910415	Coolana	Corriedale	PG Munro	03 5575 3240
		Cp65	978431	Cashmore Park	Coopworth	J Keiller	03 5526 5248
		Ch66	920L91	Grand Ridge	Cheviot	RN Waddell	03 5626 4244
		Fi67	960085	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		EFP68	981019	Yollom	East Friesian x Perendale	MF & ML Molloy	03 5596 2077
		EFR69	970175	Price	East Friesian x Romney	EJ & KJ Price	03 5527 1110
1999	Struan	BL70	970310	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL71	970290	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		M72	933051	Merinotech Mid	Merino	Merinotech Mid North	08 8665 4019
		EL73	950T82	Koenarl	English Leicester	CR Taylor	03 5595 0272
		Cp74	970101	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Hy75	960215	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		FiF76	960132	Gippfinn	Finn Friesian	S & D Jones	03 5122 3328
		EF77	960136	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		SHD78	970155	Tauranga	South Hampshire Down	S & M Macmillan	03 5596 2251
		PD79	970101	Wyndarnah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		WS80	970172	Koonawarra	White Suffolk	AWSA	08 8210 5211
2000	Struan	BL81	960327	Morton	Border Leicester	JD & CM Corbin	08 8765 8058
		BL82	980260	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL83	980085	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		SAM84	980046	Jeancourt	SAMM	W & M Heddle	08 8271 7080
		Cp85	980091	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Gr86	980144	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		Hy87	940278	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Fi88	538	Gippfinn	Finn	S & D Jones	03 5122 3328
		EFP89	981071	Yollom	East Friesian x Perendale	Kanoi Seed Stock/Udy	03 5597 6621
		WS90	960513	Langley Heights	White Suffolk	AWSA	08 8210 5211
		WD91	990906	Axis	White Dorper	B & L Mawson	08 8537 0615

Dynamic Dams

Ewe genetics for the future

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In This Issue

Editors: Neal Fogarty & Lynette McLeod
NSW Agriculture
Orange Agricultural Institute
Orange, NSW 2800
Ph: (02) 6391 3813
Fax: (02) 6391 3922
Email: neal.fogarty@agric.nsw.gov.au

***Dynamic Dams** reports on the project **Maternal sire Central Progeny Test (MCPT)**, which is part of the **MLA Lamb Program**, and provides other information for lamb breeders to improve their maternal genetics.*
Contributions from readers are welcome.

CONTRACT MATING: A TOOL TO OBTAIN SUPERIOR CROSSBRED EWES

Gervaise Gaunt, Rutherglen Research Institute

The MCPT has shown a range in returns of $50/ewe/year from 1stX ewes by different sires. This means there is potential to generate an additional $125,000 in returns by using superior compared to average crossbred ewes in a 1000 ewe enterprise over their 5 year productive life. Hence additional investment in high performance dams is justified and better dams will more than return any additional cost.

One of the best ways to obtain high performance ewes is through contract mating. This allows you to obtain high performance ewes that are bred specifically for your production system and marketing objective.

Contract mating is an agreement between various partners for the production and supply of crossbred ewes. The contract is organised well in advance and is written to have a win/win arrangement between partners. There is no limit to the number of partners that can be involved, which can include ewe breeders, ewe buyers, maternal seedstock producers, processors and agents. It can also be between groups of buyers and breeders and can include strong involvement from a group of seedstock breeders that supply the maternal sires.

All partners need to consider several issues before a contract is developed. For example, 1stX ewe buyers need to consider their market objective for the 2ndX lambs eg trade, export, heavy export, and what breed of terminal sire they will be using over the 1stX ewe. These considerations are important when determining the suitability of available 1stX ewe genetics.

NSW Agriculture

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MEAT & LIVESTOCK AUSTRALIA

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For 1stX ewe buyers additional genetic considerations are:

- What maternal sire breed and Merino bloodlines are desirable.
- What objective measurements have been used by the 1stX ewe breeder for selection of the maternal sires and Merinos?
- What indexes and/or emphasis on EBVs have been used when purchasing their replacement stock?

Some additional considerations for the Merino component of 1stX ewes are:

- What is the breeder's criterion when selecting Merino ewes to produce 1stX ewes eg good/poor growth, fine/strong wool, reproduction rates?
- What class of dams are used for breeding the 1stX ewes eg CFA, young ewes?
- What performance records are kept eg. wool micron and quality, growth rates, health eg faecal egg count (FEC)?

Components of the contract can include health, management, delivery and pricing. Some examples of factors to consider when determining a contract are:

Health - Determine and agree on:

- OJD status – is OJD status required, if yes, what status eg MN1, MN2?
- Mulesed – Yes/No
- Vaccination – Yes/No, if yes - what type of vaccination ie. 6:1, selenium, scabby mouth. How often are they to be vaccinated eg. When they are to be marked, weaned and within what time period?
- Feet soundness – who assesses ie. breeder, buyer or independent eg agent?
- Drench – Yes/No, if yes what type will be used, will a FEC test be done, if yes, who pays? Do you need to know the drench resistance status, if yes, who pays?

"Improving genetics of 1stX dams, wethers and 2ndX lambs will result in a superior breeding and meat product"

Management - Determine and agree on:

- Do the management practices such as time of lambing, age at lambing, age at weaning and time of shearing suit the 1stX ewe buyer? If not, what flexibility is there to change practices?
- If the management practices of the 1stX ewe buyer are different to the breeder, determine who pays for additional management practices required, such as mulesing.
- Is the buyer willing to provide labour to contribute to management practices, particularly if additional labour is required for a practice that is not normally done eg. Mulesing, classing?
- If supplementary feeding is required who pays for additional supplementary feeding?
- What is the minimum/maximum age of weaning?
- Determine optimum ewe growth rate required to obtain desired delivery weight.
- What monitoring procedures will be taken to ensure 1stX ewe lambs will be at agreed weight and fat score at point of sale?
- Is the property where the ewes are to be purchased from required to be FLOCKCARE accredited?
- If sheep are to be shorn, determine shearing date.

Delivery - Determine and agree on:

- Number of ewes to be delivered.
- Date ewes required to be delivered.
- How will weight be assessed eg ewes are weighed on the property of origin after a minimum of 3 hours off feed?
- Culling percent – Is there an agreement on the buyers' right to cull and what is the criterion for culling eg teats, under/overshot, structure, poor feet?

Price - Determine and agree on:

- Price to be paid for ewes. Is the price to be paid on for example, liveweight per kg or liveweight per head?
- Determine basis of pricing, for example
- current meat value at delivery plus compensation for breeding value
- set the price at joining based on meat price at the time or use a 5 year average (c/kg cwt or $ head saleyard)
- use a base price plus additional price per LAMBPLAN index point (ie. paid on merit)

Miscellaneous:

- Will an agent be involved, if yes, in what capacity eg. assessor, assist with formation of the contract etc.
- Who writes the contract and what is the responsibility of each party for determining the contract is fulfilled.

Advice and follow up service:

- What service do various partners supply, for example do maternal seedstock producers provide advice on selection of sires and do they follow up on their seedstock performances?

Advantages of contract mating are numerous. Incentives are provided to 1stX breeders to improve genetics and implement additional management practices. Increased feedback and enhanced communication flow will lead to continuous genetic improvement. Participation in contract mating ensures known flock health status, a guaranteed market and assists in financial planning. Improving genetics of 1stX dams, wethers and 2ndX lambs will result in a superior breeding and meat product that will provide partners with greater marketing advantages and increased profitability. For a contract to be successful, good communication and trust between partners is essential.

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MCPT UPDATE

HAMILTON (Trevor Pollard)

Seasonal Conditions

The summer has been drier than normal, but we haven't had the drought conditions experienced in other areas. There was good rain in late February and March. This provided a good autumn break, although we do need follow up rains now.

Lambing

The 1stX ewes have now completed their lambing evaluations, with the last drops of the 2ndX lambs to be slaughtered in late April or early May. Blood samples for DNA analysis have been collected from all ewe groups.

Feed Intake Trial

The 1998 and 1999 drop 1stX ewes have also had feed intake measurements taken to determine their feed requirements at maintenance. This involves inserting capsules into the rumen. The capsules contain CrO_2 which is released at a constant rate. Faecal samples are collected and analysed for CrO_2 concentration. This allows the pasture intake for individual ewes to be estimated while they are in a weight maintenance regime. Pasture samples are also taken to measure the digestibility of feed on offer.

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COWRA (N Fogarty, J Morgan, L McLeod)

Seasonal conditions

Zero recorded rainfall for October 2002 set the stage for a fairly dismal summer- hot and very dry. Good rains did fall in February – 131.6mm for the month so things are looking very green at the moment. Lambs from the 99drop autumn joined ewes born July/August 2002 were grown out in a feedlot situation and slaughtered 14 January 2003.

Spring join lambing

The spring joined 99drop ewes have started their third lambing (late March). They are being supplemented with some grain in their lambing paddocks, as there is still not any bulk of feed in the paddocks. The ewes were ultrasound scanned in January. The percent of pregnant ewes averaged 86% and ranged from 77 to 100% (Fig 1). There was a very large range in the average number of foetuses per pregnant ewe from 1.2 to 2.3, with the average of all groups being 1.6 (Fig 2). Some of this large range is due to differences between breeds although there was still a considerable range among the four BL sire groups of 1.2 to 1.8 foetuses per pregnant ewe. Again we will see a considerable range in the final lambing rate, with the potential based on the scanning being 108 to 180%.

Fig. 1. Pregnant % / 1stX ewes joined

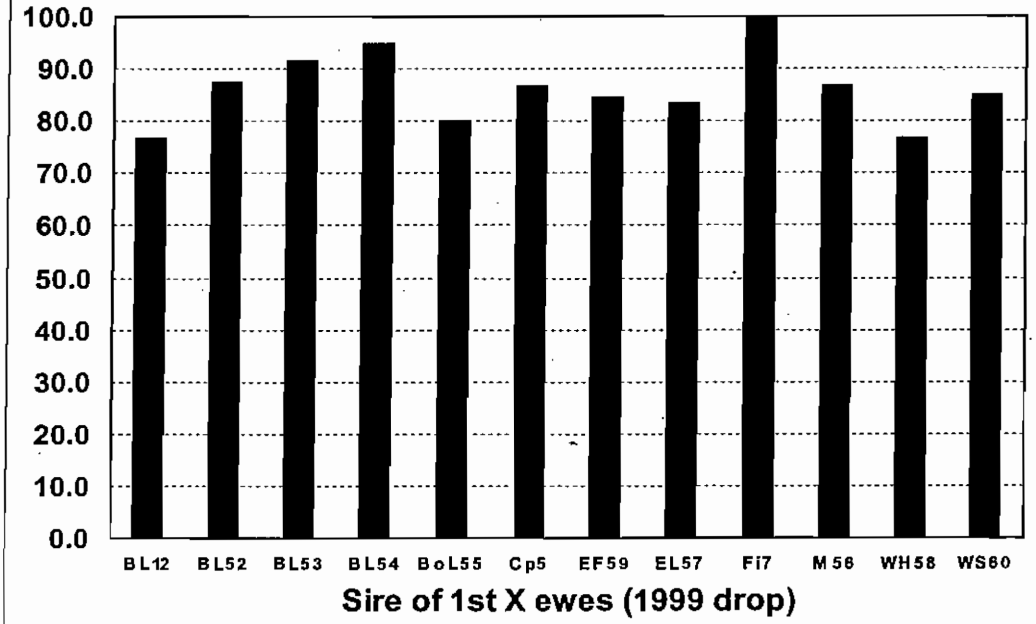
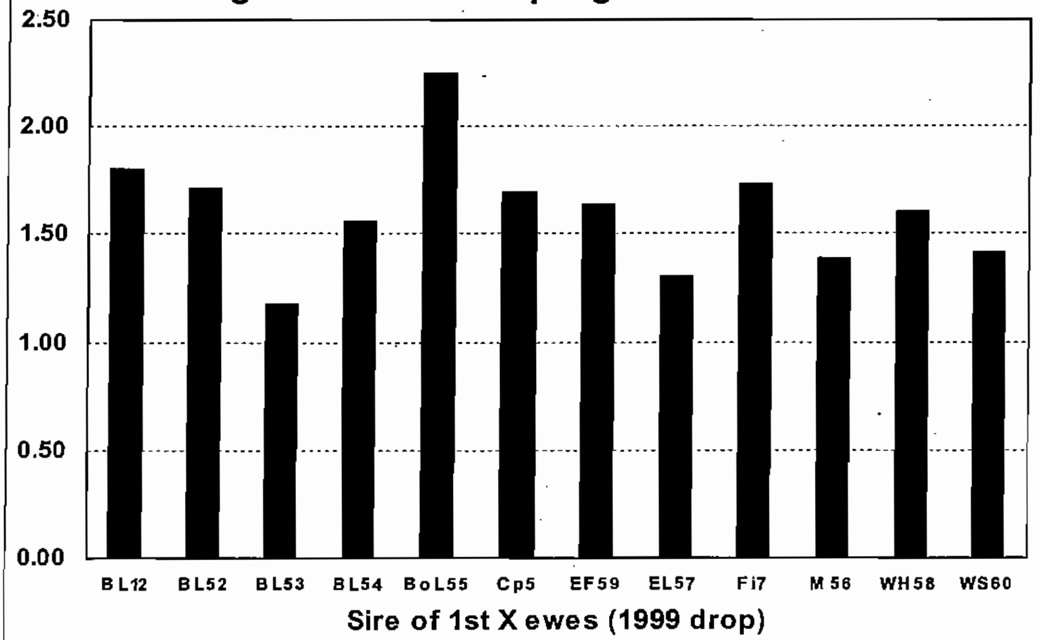


Fig. 2. Foetuses / pregnant 1stX ewe



RUTHERGLEN (Gervaise Gaunt)

Rutherglen has now completed 3 years of 2ndX lamb carcase assessment. Progeny from the 1998-drop ewes were processed in Nov 2000, 2001 and 2002, progeny from the 1999-drop ewes were processed in 2001 and 2002 and progeny from the 2000-drop ewes were processed in 2002. The 1998-drop ewes have now completed the MCPT trial and 1999 and 2000-drop ewes are due to lamb over a 6-week period commencing early April 2003.

Seasonal Conditions

Drought conditions continue at Rutherglen and ewes have been supplementary fed clover/ryegrass hay at 4 kg/head per week from February to March. Additional feeding of wheat (500 g/head) and ad-lib hay commenced in early March 2003. Despite the poor season the ewes have continued to gain weight (additional to lamb weight *in utero*) since the rams were removed in December. Ewes were weighed late February (mid-pregnancy) and averaged 79 kg and 69 kg for the 1999 and 2000-drop respectively with a fat score average of 2+ to 3.

2ndX lambs

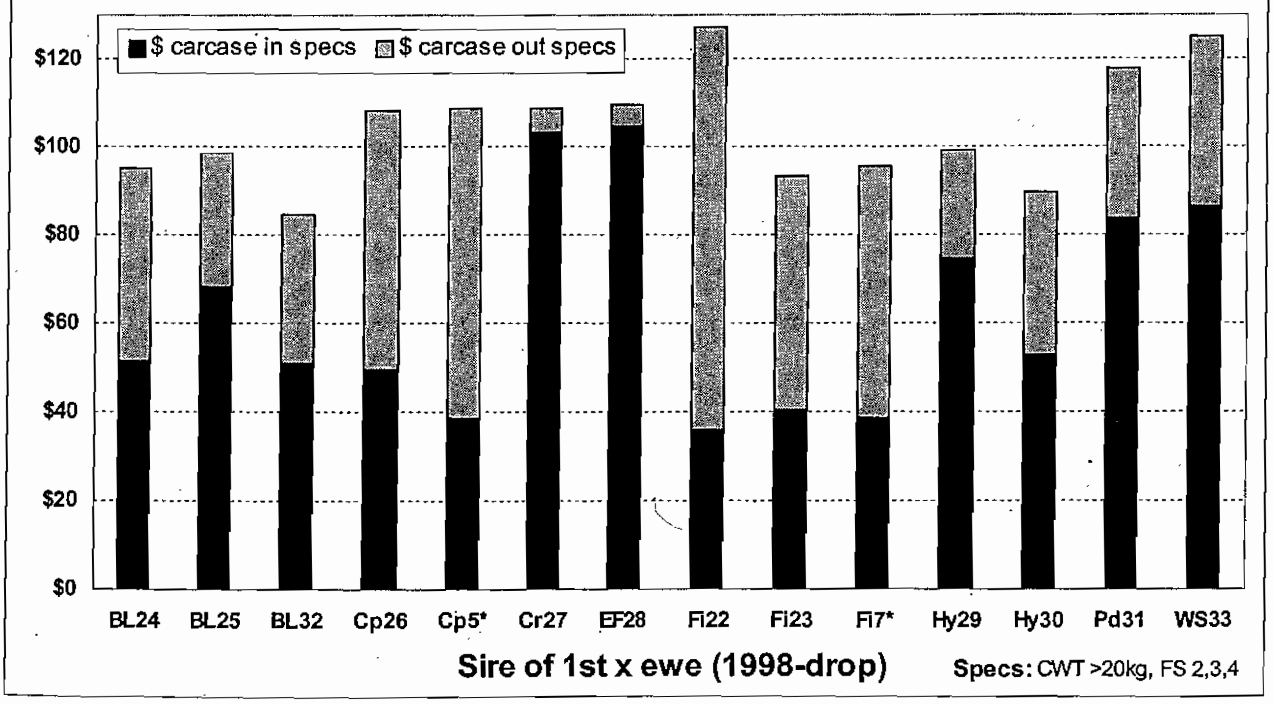
The 2002-drop lambs were the third year's production of MCPT lambs and their liveweight average was heavier than previous years. The 2002 lambs averaged 50.5 kg full liveweight and 47 kg fasted liveweight and had an average growth rate of 230 g/day from birth to slaughter. Given the poor season these weights were considered quite acceptable.

The lambs were slaughtered at Gundagai Meat Processors in November 2002. Coles once again provided their support by allowing access to slaughter and the boning room for collection of data. Carcase weights averaged 20.7 kg, 20.4 kg and 21.2 kg for 1998, 1999 and 2000-drop (maiden) ewes respectively with an average fat score 3 (GR 12.5). Although the liveweights indicated potentially higher carcase weights, the dressing percentage of lambs was well down on previous years being only 41% on final and 44% on fasted liveweights. Dressing percentages (for fasted liveweight) from previous years were 50% and 47% for 2000 and 2001 respectively.

There was a 6.6 kg range between the heaviest average carcase weight per sire group ie. 23.7 kg (White Dorper 2000-drop) and the lowest carcase weight average was 17.1 kg for the Finn (Fi7 2000-drop) progeny group.

Figs. 3 to 5 show the carcase returns ***per ewe joined*** for the 38 sires assessed in 2002, the proportion of lambs that were within or outside specifications is also shown for each sire. Prices are based on those received in November 2002, at the time of slaughter: \$3.00/kg for carcases 20 kg and over, fat score 2, 3 and 4 (within specifications) and \$2.80 for carcases <20 kg and/or fat score 1 or 5 (outside specifications).

Fig. 3. Carcase returns (\$) / ewe joined (1998-drop)



Price includes skin value of $14.10 for lambs 20 kg carcase and over and $13.30 for carcases under 20 kg. Returns ($8.90) from 2ndX progeny of the 1999-drop English Leicester sire (EL73) are significantly lower than other sires. This is due to the low number of lambs slaughtered (n=3) from 23 ewes joined. The breeding cycle of the English Leicester is strongly seasonal and may be better suited to an autumn joining and spring lambing.

There was a difference of ***$42 per ewe joined*** between the top (Fi22 $127.20) and the bottom (BL32 $84.74) 1998-drop sire groups, for one year of production. This would result in a difference of $210 per ewe joined over their lifetime of 5 joinings between the top and bottom sire groups. A maternal sire produces approximately 100 ewes (and 100 wethers) in his lifetime, so the difference between using the top and bottom sire in the 1998-drop trial alone, would be $21,100 and this doesn't take into account the income from wether progeny.

Fig. 4. Carcase returns ($) / ewe joined (1999-drop)

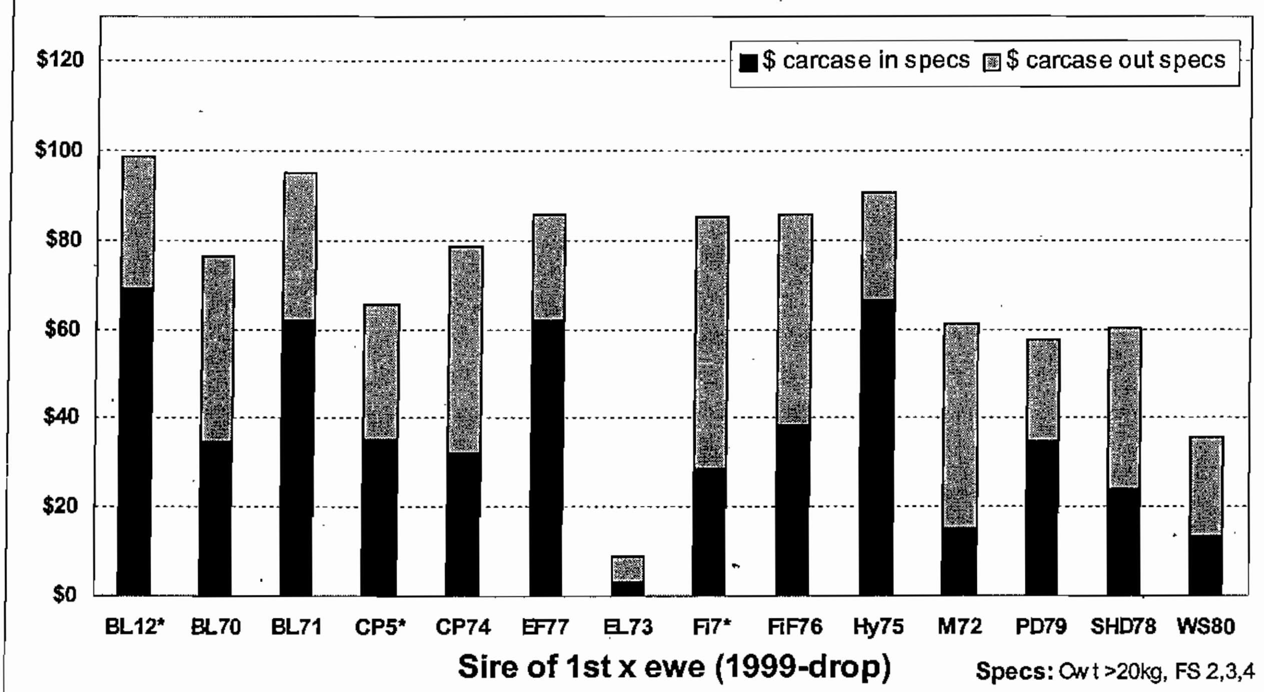
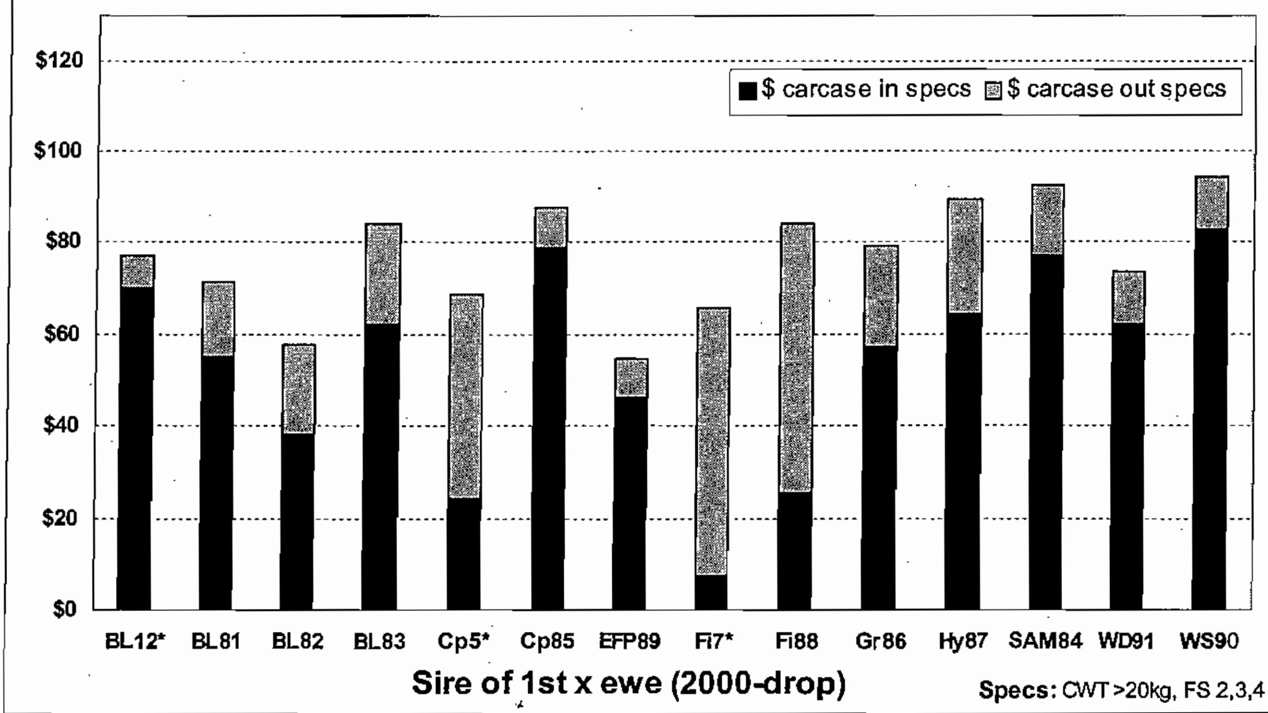


Fig. 5 Carcase returns ($) / ewe joined (2000-drop)



The results reinforce previous findings that the genetics of the prime lamb mother has a major impact on the profitability of enterprises.

1stX Ewes – Conception

Ewes were shorn in late October and joined to high performance White Suffolk rams for a six-week period commencing early November. All rams were harnessed and raddle marks were recorded twice weekly. There was a high incidence of ram activity early in the joining period and I would have expected conception rates to be higher than the pregnancy scan results show. However, feedback from commercial pregnancy scanners this year indicates conception rates in northern Victoria are well down on previous years. This is probably due to the seasonal influence resulting in lower joining weights and poorer conception. Generally seasonal conditions during the previous year's lactation have a large influence on conception the following year.

Tables 1 and 2 show ultrasound pregnancy results for the 1999 and 2000-drop ewes. Overall the average pregnancy rates were 89% for 1999-drop and 2000-drop ewes. There are clearly large differences in sire groups for average conception rates and number of foetuses. The potential lambing percentages range from 43% to 179% for the 1999-drop and 84% to 175% for the 2000-drop ewes.

Table 1. Foetal scan: 1999-drop ewes joined Nov/Dec 2002

Sire Code	No. Ewes Joined	% pregnant	Av. foetuses/ pregnant ewe	Potential lambs/ ewe joined %
BL12*	14	100	1.71	171
BL70	23	87	1.60	139
BL71	21	95	1.60	152
CP5*	29	97	1.57	152
CP74	15	93	1.50	140
EF77	14	93	1.38	129
EL73	23	39	1.11	43
Fi7*	24	92	1.95	179
FiF76	31	90	1.68	152
Hy75	22	100	1.68	168
M72	13	85	1.91	162
PD79	13	92	1.67	154
SHD78	18	94	1.35	128
WS80	15	100	1.53	153
Total	**275**	**89**	**1.61**	**144**

**link sires*

Table 2. Foetal scan: 2000-drop ewes joined Nov/Dec 2002

Sire Code	No. Ewes Joined	% pregnant	Av. foetuses/ pregnant ewe	Potential lambs/ ewe joined %
BL12*	22	86	1.74	150
BL81	24	79	1.53	121
BL82	12	100	1.33	133
BL83	18	83	1.47	122
CP5*	17	76	1.46	112
CP85	19	89	1.35	121
EFP89	19	63	1.33	84
Fi7*	33	88	2.00	175
Fi88	25	92	1.74	160
Gr86	24	100	1.29	129
Hy87	22	100	1.50	150
SAM84	16	100	1.81	181
WD91	15	100	1.53	153
WS90	14	100	1.43	143
Total	**280**	**89**	**1.57**	**140**

**link sires*

Maternal sire entries - details

*Link sires used at each site each year

Year	Site	Sire Code	Tag	Stud	Breed	Entrant	Phone No.
1997	Cowra	BoL1	922047	Struan	Booroola Leicester	PIRSA	08 8762 9100
		BL2	950137	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Fl3	940001	Yamba	Finnsheep	M & L Bums	03 5798 1583
		Cr4	940364	Maluka	Corriedale	P Secker	02 4848 1244
		Cp5*	940449	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		EF6	940B21	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Fl7*	930057	Warrayure	Finnsheep	GM & MA Wake	03 5574 1254
		BL8	950181	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Fi9	935010	Warrayure	Finnsheep	Knight & Bottcher	03 5578 7250
		WS10	910058	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
		Cr11	930097	Coora	Corriedale	Coora Partnership	02 4848 1244
		BL12*	94S291	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
1997	Hamilton	BL13	950246	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Ro14	930146	Claymour	Romney	Rouch & Gillman	03 5727 1552
		BoL15	924287	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cp16	930069	Narrambla	Coopworth	D Wigan	03 5577 2321
		Fl17	950054	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		Cp18	942297	Oaklea	Coopworth	J Keiller	03 5526 5248
		EF19	940B26	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Cr20	880491	Stanbury	Corriedale	Cole & Risbey	03 5593 9278
		Fl21	960002	UNSW	Finnsheep	S & D Jones	03 5122 3328
1998	Struan	Fl22	890049	ATC	Finnsheep	Jaydee Stud	08 8764 2065
		Fl23	930049	Tambaroora	Finnsheep	Jaydee Stud	08 8764 2065
		BL24	960346	Gleneith	Border Leicester	CE & LJ Arney	08 8536 0031
		BL25	960188	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Cp26	960210	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Cr27	921586	Coora	Corriedale	Coora Partnership	03 5578 6267
		EF28	960133	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Hy29	960028	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Hy30	960128	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		PD31	960110	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		BL32	95T138	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		WS33	951470	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1998	Cowra	BoL34	950029	Caveton Park	Booroola Leicester	PIRSA	08 8762 9100
		BL35	940765	Retallack	Border Leicester	BLA(NSW)/Grinter	02 6974 1153
		Cp36	960067	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cp37	940274	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cc38	960621	Coronga	Coronga Composite	Premier Breed. Tech	02 6365 8207
		EF39	B40	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FL40	940016	Wycombe	Finn x Leicester	R & L Coddington	02 6775 5225
		Gr41	955551	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		WS42	940069	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
1998	Hamilton	BoL43	96P6322	Struan	Booroola Leicester	PIRSA	08 8762 9100
		EF44	960026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		EF45	0019	Glenspean	East Friesian	S & J Cameron	03 5286 1455
		Cr46	950161	Gundowringa	Corriedale	HJ & CJ Prell	02 4848 1244
		EF47	950509	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FiF48	960086	Gippfinn	Finn x Friesian	S & D Jones	03 5122 3326
		Ro49	9200069	Evergreen	Romney	C Duncombe	03 5264 5170
		Tx50	949002	Coolana	Texel	Coolana Rural	03 5350 5531
		WS51	900429	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1999	Cowra	BL52	920070	Kegre	Border Leicester	BLA(NSW)/Golder	02 6977 1339
		BL53	960102	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		BL54	970030	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BoL55	955203	Struan	Booroola Leicester	PIRSA	08 8762 9100
		M56	900183	Centre Plus	Merino	L Mortimer & Sons	02 6892 8259
		EL57	960043	Ostlers Hill	English Leicester	ELAssoc/Stephenson	03 5764 1298
		WH58	960505	Clifton Hills	Wiltshire Horn	AWHSBA/Ballantyne	03 5145 8225
		EF59	970100	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		WS60	970642	Linden Genetics	PLG White Suffolk	Linden Genetics	02 6386 2020
1999	Hamilton	BL61	970168	Wongajong	Border Leicester	AD & CM Wilson	02 5682 3336
		BL62	960050	Kelso	Border Leicester	GB Starrttt & Son	03 5829 0144
		BoL63	955160	Struan	Booroola Leicester	PIRSA	06 8762 9100
		Cr64	910415	Coolana	Corriedale	PG Munro	03 5575 3240
		Cp65	976431	Cashmore Park	Coopworth	J Keiller	03 5526 5248
		Ch66	920L91	Grand Ridge	Cheviot	RN Waddell	03 5626 4244
		Fi67	960085	Gippfinn	Finnsheep	S & D Jones	03 5122 3326
		EFP68	981019	Yollom	East Friesian x Perendale	MF & ML Molloy	03 5596 2077
		EFR69	970175	Price	East Friesian x Romney	EJ & KJ Price	03 5527 1110
1999	Struan	BL70	970310	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL71	970290	Kelso	Border Leicester	GB Starritt & Son	03 5629 0144
		M72	933051	Merinotech Mid	Merino	Merinotech Mid North	08 8865 4019
		EL73	950T82	Koenarl	English Leicester	CR Taylor	03 5595 0272
		Cp74	970101	Oaklea	Coopworth	DW & IA Peglar	06 8738 9291
		Hy75	960215	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		FiF76	960132	Gippfinn	Finn Friesian	S & D Jones	03 5122 3328
		EF77	960136	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		SHD78	970155	Tauranga	South Hampshire Down	S & M Macmillan	03 5596 2251
		PD79	970101	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		WS80	970172	Koonawarra	White Suffolk	AWSA	08 8210 5211
2000	Struan	BL81	960327	Morton	Border Leicester	JD & CM Corbin	06 8765 8058
		BL82	980260	Johnos	Border Leicester	NW & JI Johnson	08 6756 6053
		BL83	980085	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		SAM84	980046	Jeancourt	SAMM	W & M Heddle	08 8271 7080
		Cp85	980091	Oaklea	Coopworth	DW & IA Peglar	08 6738 9291
		Gr86	960144	Yangoora	Gromark	Yangoora Gromarks	02 6363 3254
		Hy87	940276	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Fl88	538	Gippfinn	Finn	S & D Jones	03 5122 3328
		EFP89	981071	Yollom	East Friesian x Perendale	Karioi Seed Stock/Udy	03 5597 6621
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Editors: Neal Fogarty & Lynette McLeod
NSW Agriculture
Orange Agricultural Institute
Orange, NSW 2800
Ph: (02) 6391 3813
Fax: (02) 6391 3922
Email: neal.fogarty@agric.nsw.gov.au

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Contributions from readers are welcome.

MERINO - MEAT GENETICS

Neal Fogarty, NSW Agriculture, Orange

Merino breeders are tapping into the expanding lamb market to make more dollars from meat. Meat traits are heritable and can be improved by selection. In commercial Merino flocks higher lambing rates mean more ewes can be mated to meat rams resulting in more lambs slaughtered and higher gross margins. Merino breeders should also consider contract mating for the supply of superior 1stX ewes.

SHEEPMEAT INDUSTRY TRENDS

Despite the recent sharp decline in prices due to widespread drought conditions, the long-term prospects for lamb and sheepmeat markets are good. Lamb markets continue to expand - an extra 4 million heavy slaughter lambs per year are likely to be required by the end of the decade. This means considerably more Merino and 1stX ewes need to be mated to meat sires, higher lamb turnoff rates achieved and lambs finished to heavier weights.

The Merino contributes over 50% of the genes in the national lamb slaughter, with 20% of the lambs being straight-bred Merino. Many Merino breeders are interested in improving the meat production from their flocks. Specialist lamb producers are also seeking better genetic merit Merino flocks to produce their crossbred dams, which provides further incentives for Merino breeders to include meat traits in their breeding programs. The Merino dominates mutton production and improvement in the genetic merit for carcass and meat quality traits could substantially increase its value.

What is the scope for improved meat production and what are the implications for Merino breeders?

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MEAT GENETICS IN MERINOS

Compared to meat breed crosses, the Merino is slower growing and produces carcasses that are leaner with similar eye muscle area (when grown together and compared at the same carcass weight). There is however considerable variation between individual Merino sires. Research has shown Merino carcasses may have higher meat pH and poorer acceptability than other crosses, which may be related to greater susceptibility to pre-slaughter stress. Recent results from the Trangie QPLU$ project (supported by Meat and Livestock Australia) highlight the moderate to high heritabilities for several meat production and quality traits in the Merino.

Heritability for Merino meat traits

Liveweight (hogget)	0.51
Dressing %	0.39
FatGR	0.33
FatC	0.20
Eye muscle depth	0.27
Eye muscle area	0.23
Muscle pH	0.27
Muscle colour	0.14

The estimates of heritability are in the moderate to high range indicating considerable change can be achieved through selection for carcass traits in Merino flocks. The heritability of liveweight is higher than that among most meat breeds so that rapid progress from selection would be expected. These heritability estimates for carcass traits are similar to those previously reported for other sheep breeds. Merino breeding programs should put greater emphasis on muscle than fat because the Merino is generally leaner than other meat breeds at the same carcass weight. The lower heritability for FatC than FatGR reflects the importance of ensuring the animals are not too lean when measured, which reduces accuracy.

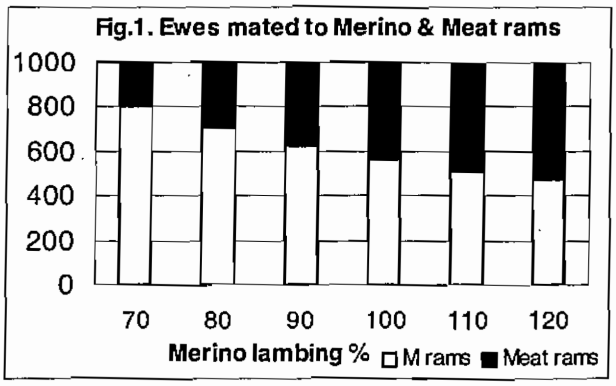
> *"Merino breeders should consider including meat as well as wool traits in their breeding objective"*

The study provided the first heritability estimates for meat quality traits in sheep. They indicate there is moderate scope for genetic improvement in meat quality through pH and possibly meat colour. The genetic correlation between muscle pH and colour was favourable. There were also significant favourable genetic correlations between wool weight and leaness and between mean fibre diameter and meat colour. This means selection for wool weight and reduced fibre diameter will also tend to improve meat quality.

Merino stud breeders whose clients derive significant income from meat production, should consider should including meat as well as wool traits in their breeding objective. In particular, body weight should be included with carcass traits and reproduction possibly considered.

IMPLICATIONS FOR COMMERCIAL FLOCKS

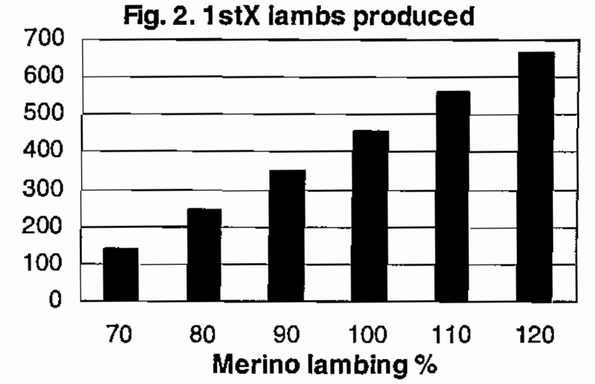
More Merino breeders are mating a portion of their ewes to meat rams. In fact most of the extra lambs slaughtered in recent years (4m pa) are 1stX. This has implications for maintaining the Merino ewe flock in the long-term and the gross margins of the enterprise.



Flock structure – a key factor determining the proportion of ewes that can be mated to meat rams is the lambing % in the Merino flock. Fig. 1 shows the number of ewes that need to be mated to Merino rams to sustain a 1000 ewe Merino flock over the long-term, with a culling level of 20% for young replacement ewes. At a lamb weaning rate of 70%, 806 ewes need to be mated to Merino rams simply to maintain the Merino flock. Whereas at 110% lambing only 513 ewes need to be mated to Merino rams. The remainder can be mated to meat rams to produce 1stX lambs for sale or slaughter.

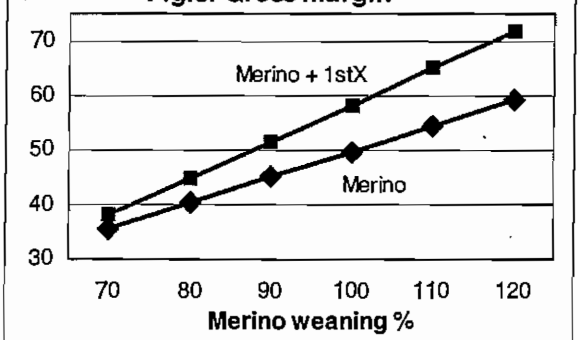
Lambing % - the reproductive rate or lambing percentage of the ewe flock affects the total number of lambs produced. The number of 1stX lambs produced from a 1000 ewe Merino flock is shown in Fig. 2, after allowing for breeding the young straight-bred Merino ewe replacements. A higher lambing % means more ewes are available to be mated to meat rams. These ewes will also produce about 10% more 1stX lambs than if they had been mated to Merino rams, because of hybrid vigour.

Fig. 2. 1stX lambs produced



Gross margin – the gross margin per ewe in a Merino flock increases with lambing %. At higher lambing % a greater proportion of the flock can be mated to meat rams, whilst still maintaining the ewe flock and turning off more 1stX lambs. The gross margin, based on a 21 mm Merino flock at 2002 values and $70/1stX lamb, is $10/ewe higher at 110% lamb weaning rate when surplus ewes are mated to meat rams (Fig. 3).

Fig.3. Gross margin



It is important that lambs meet market specifications. Good management and nutrition and the use of high genetic merit sires are required to acheive success in the meat enterprise.

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LETTER TO THE EDITOR

LAMB LOSSES

In the last Dynamic Dams Jayce Morgan reported little apparent effect of alpacas in preventing lamb loss, in contrast to our experience. Some reasons may include: entire males may be more effective than wethers, two weeks may be insufficient time for the alpacas to bond with their flock, and alpacas in adjacent paddocks may be distracted from fox guarding.

Alpacas are not a total insurance against foxes. Breeders need to realise that ewes lambing in relatively crowded flat paddocks with short grass and no physical features for protection, is not a natural situation and is an invitation to foxes. Any ewe in this situation, no matter how good she is at mothering, will have difficulty protecting lambs in the first 24 hours. The lambing paddock should be one in which the ewe can find a lambing site where she has some chance of protecting her lambs and not be disturbed by other ewes. It is also important to get ewes used to human activity prior to lambing so they are easier to handle and are used to non-threatening human presence. There is not much point in putting effort into selecting matings, managing joining groups, and feeding and caring for the pregnant ewes, if large numbers of lambs are lost. Not good economy!

David Horton

Pickwick Wiltshire Horn Sheep Stud

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Under the Privacy Act your consent is required for us to keep personal information e.g. name, address and other contact details. If there is a consent form enclosed with this newsletter that means we have not received one from you!

PLEASE RETURN this CONSENT FORM

If you do not return this form your name will be removed from the Dynamic Dams mailing list.

MCPT UPDATE

COWRA (N Fogarty, J Morgan, L McLeod)

Seasonal conditions

Very little rain has fallen this winter and spring. The autumn drop lambs from the '98 and '99 drop spring joined 1stX ewes were weaned in early July and put onto oat crops with lupin supplement. They were in a feedlot situation for the last 4 weeks before slaughter at the end of September and early October.

The '99 drop autumn joined 1stX ewes lambed in July/August in pasture paddocks with no supplementary feeding. With some rain and by saving the best paddocks for this group we were able to avoid supplementary feeding until weaning in early November. The lambs averaged 30.4 kg at weaning and are now in a feedlot situation until slaughter, unless we are lucky enough to get some summer storms and green lucerne.

Currently our last joining for the project is underway for the '99 spring joined 1stX ewes. The ewes are joining well with over 50 raddled in the first week.

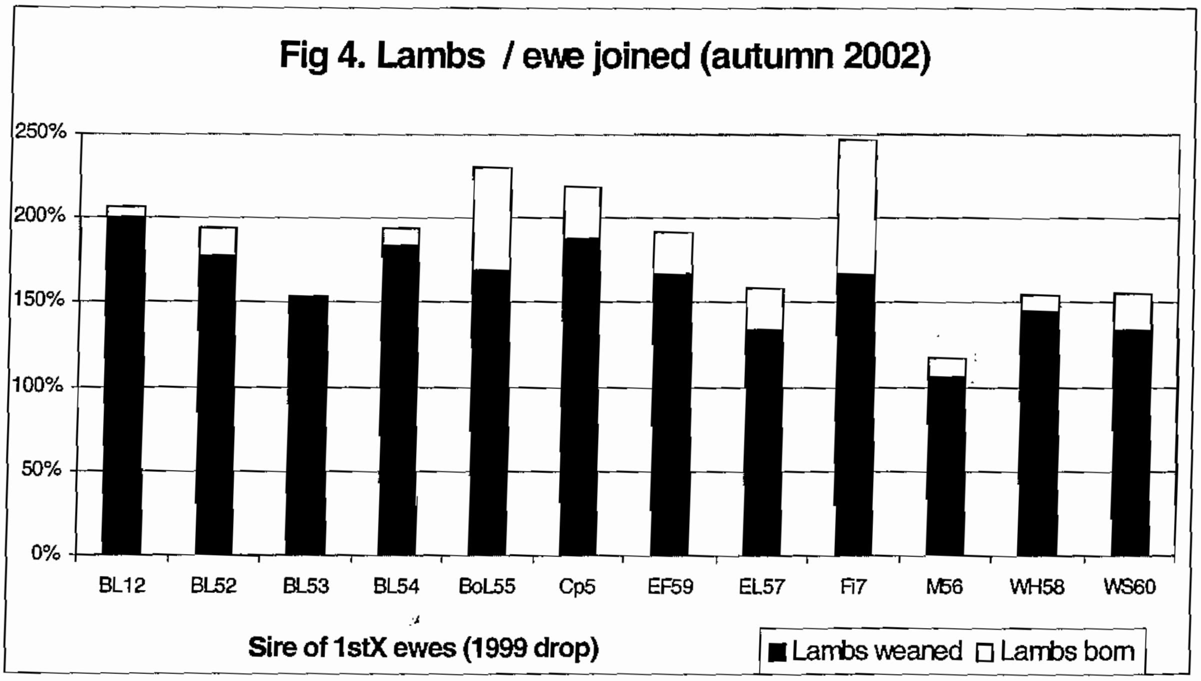
Faecal sampling for a further 3 groups of 1stX ewes that have completed their lambing evaluations were carried out in September and October. Analysis of these samples will provide estimates of feed intake and feed requirements for maintenance. The study will provide information on the genetic variation for feed requirements over and above that expected from differences in live weight of the ewes.

Lambing - autumn joining 2002

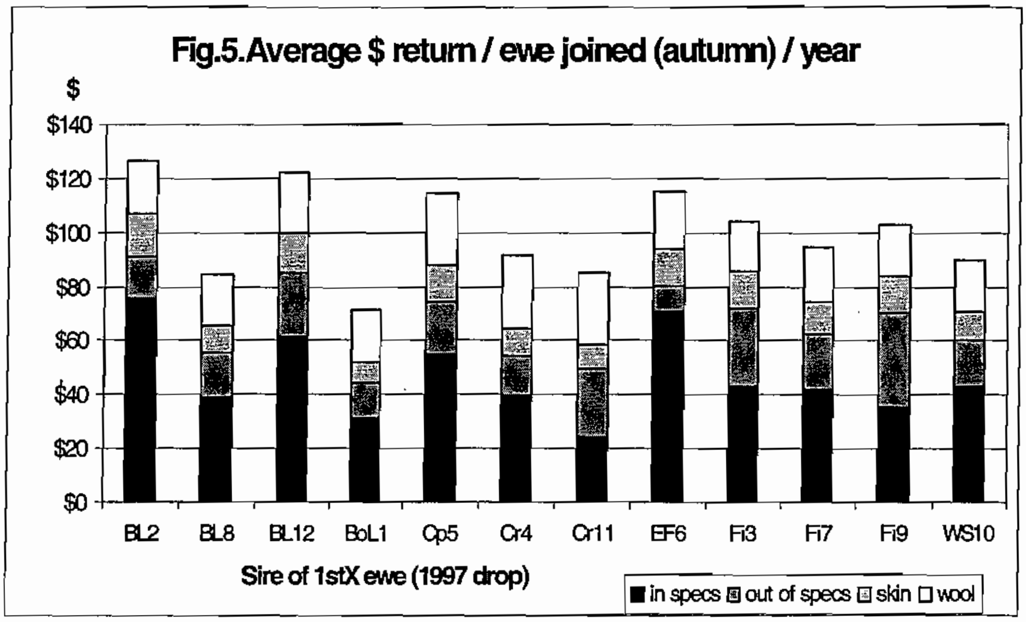
The final lambing results from the 1999 drop 1stX ewes were excellent with 161% lambs weaned of ewes joined in autumn across all groups. Of the ewes that lambed they had an average of twins. Again there was considerable variation in performance between the 1stX ewe sire groups (Fig. 4). The BL12 group weaned 200% lambs with another 3 groups weaning over 175% (Cp5, BL54 and BL52). Most of the ewes in these groups became pregnant and lambed an average of twins. Two other groups had a higher proportion of multiples and more lambs born (BoL55, 2.73 and Fi7, 2.47 lambs born /ewe lambing) but lower lamb survival. Although they still weaned over 165% of lambs.

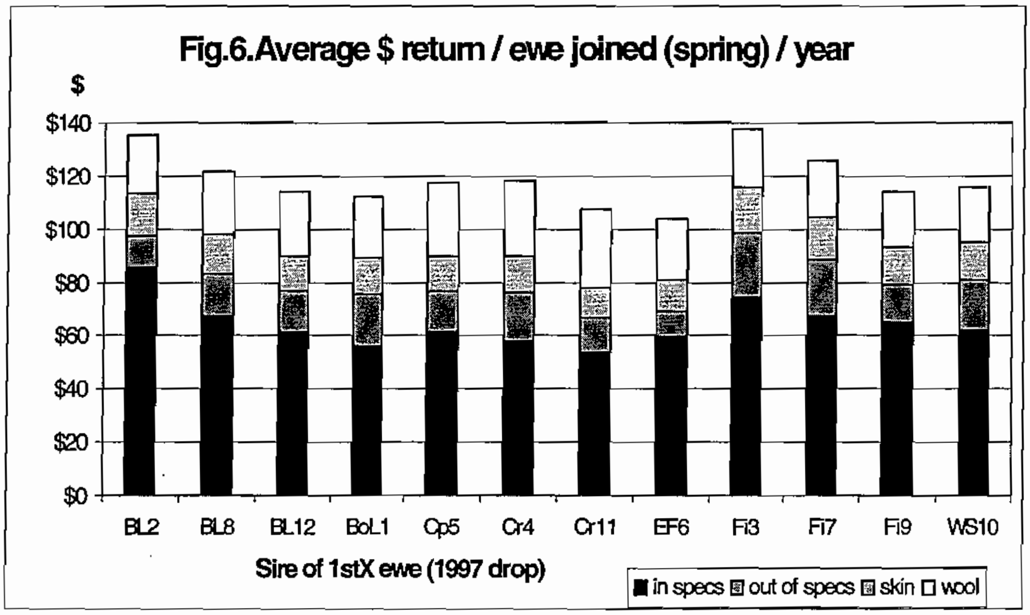
$ Returns

There is a range of over $50/ewe/year in average gross $ returns between the highest and lowest 1stX ewe sire groups among most of the contemporary groups (see Figs. 5 to 10). This means a prime lamb producer with a 1000 ewe flock could achieve $50,000 per year in extra returns by ensuring the ewes are of the highest genetic merit for the enterprise.
For the 1997 and 1998 drop groups the $ returns are based on performance over 3 years (ie 3 lambings and 3 shearings) and the 1999 drop ewes have only 2 years performance at this time. The autumn joined ewes were first joined at 7 months of age and lambed at 1 year of age. The spring joined ewes were older and first joined at 15 months of age, so the $ returns



from the two seasons can not be directly compared. The $ returns have used average 2002 values for the 2ndX lamb carcasses and skins and wool from the 1stX ewes. 2ndX lambs that met the specifications of 20 kg or more carcass weight and fat score 2, 3 or 4 (6-20 mm GR)were $3.00/kg with discounts for lambs outside this specification. Further details of the prices and calculations are shown in the $Returns box (page 7).





The results highlight several important messages:

- genetic merit of the ewe flock can have a considerable impact on $ returns (>$50/ewe/year)

- 80% of $ returns from lamb carcases, skins and 20% from wool (some groups with lower lamb production had >30% of returns from wool)

- annual wool returns averaged $23/ewe (range of $19 to $27 for most sire groups)

- proportion of lambs meeting carcasses specs varied considerably – some groups had almost all lambs in specs while others had <50%, mainly because of lower growth rate which meant they were <20 kg carcass weight

- 1stX ewe groups with the highest $ returns were from several maternal sire breeds

- considerable differences in $ returns between sire groups within breeds eg. the range for BL sires averaged $33/ewe/year

- the major driver for $ returns was the number of lambs finished for slaughter per ewe joined, with 2ndX carcass weight (lamb growth rate) and fat level and 1stX ewe wool (mainly weight) also contributing

Autumn v spring joined

The results highlight some important differences between the two seasons. These need to be taken into account when relating the results to different production systems. The autumn and spring performance can not be compared directly as the 1stX ewes lambed at different ages. The autumn groups were first joined at 7 months of age, whereas the spring groups were older and first joined at 14 months of age. Lambing performance of ewes increases dramatically with age, especially in the first year or two. Hence part of the reason for higher $ returns from some of the spring joined groups is that they were 8 months older at each lambing.

We can get a better idea of the seasonal effect by looking at the lambing performance of the ewes as adults ie. only the second and third joinings, when the effect of the age difference is less. As adults there was little difference between the seasons for the percentage of ewes lambing when averaged across all the groups.

Ewes joined in autumn had more lambs born (1.9 v 1.6 lambs/ewe lambing) due to higher ovulation rates and more multiple births. Lamb survival was lower for ewes joined in autumn than spring (75% v 88%) which reflects the poorer weather conditions at lambing in July/Aug than March/April and more multiple births, especially triplets and higher order (and high fox predation in 2001). This combined to give a slightly higher average lamb weaning rate from the spring (129%) than the autumn joinings (126%) for the ewes.

In general, the 1stX ewe groups that had more lambs born had relatively better $ returns from the spring than the autumn joining. For example, among the 1997 drop spring joined 1stX ewes (Fig. 6), the Fi3 group had the highest $ returns ($138/ewe/yr), but their sisters joined in autumn only ranked fifth behind BL2, BL12, EF6 and Cp5 1stX ewe groups (Fig. 5). For adult ewes joined in the autumn, the Fi3 1stX ewes averaged 2.33 lambs born / ewe lambing, 68% of lambs surviving for a weaning rate of 133% lambs weaned /ewe joined. In contrast from the spring joinings the Fi3 1stX ewes averaged 2.15 lambs born / ewe lambing, 83% of lambs surviving for a weaning rate of 174% lambs weaned /ewe joined. The Fi3 1stX ewes were obviously better suited to the spring joining system as they produced slightly fewer multiples (lower ovulation rate in the spring) and lambing conditions were much more benign than for the autumn joining production system.There were also 1stX ewe groups that performed very well when joined in the autumn. For example from the 1997 drop adults the BL2 1stX ewes averaged 1.96 lambs born / ewe lambing, 88% of lambs surviving for a weaning rate of 153% lambs weaned /ewe joined.

Fig.7.Average $ return / ewe joined (autumn) / year

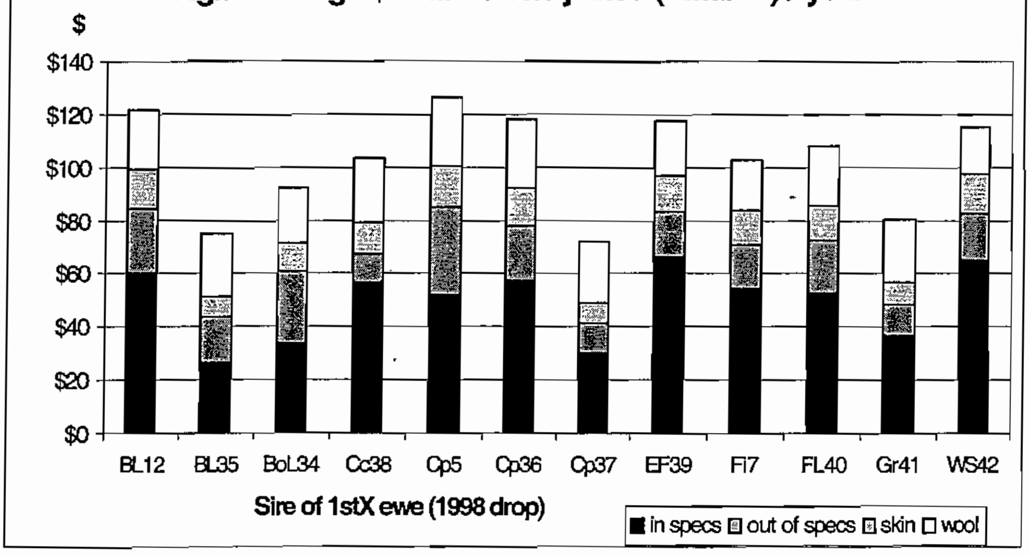
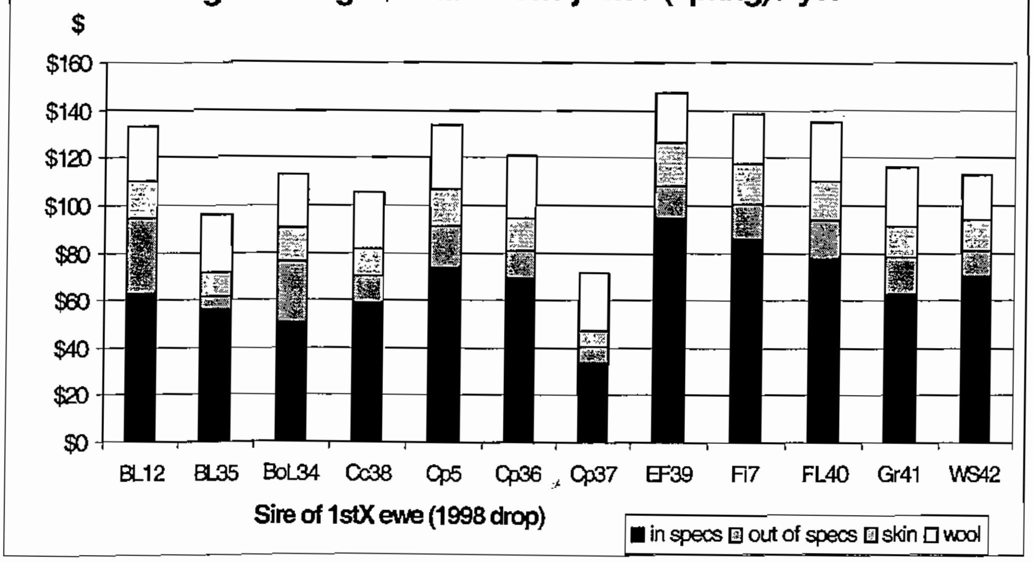


Fig.8.Average $ return / ewe joined (spring) / year



Results highlight:

- ***large variation in performance for different traits from 1stX ewes by different maternal sires***
- ***the best 1stX ewe for an enterprise depends on the production system.***

Fig.9.Average $ return / ewe joined (autumn) / year

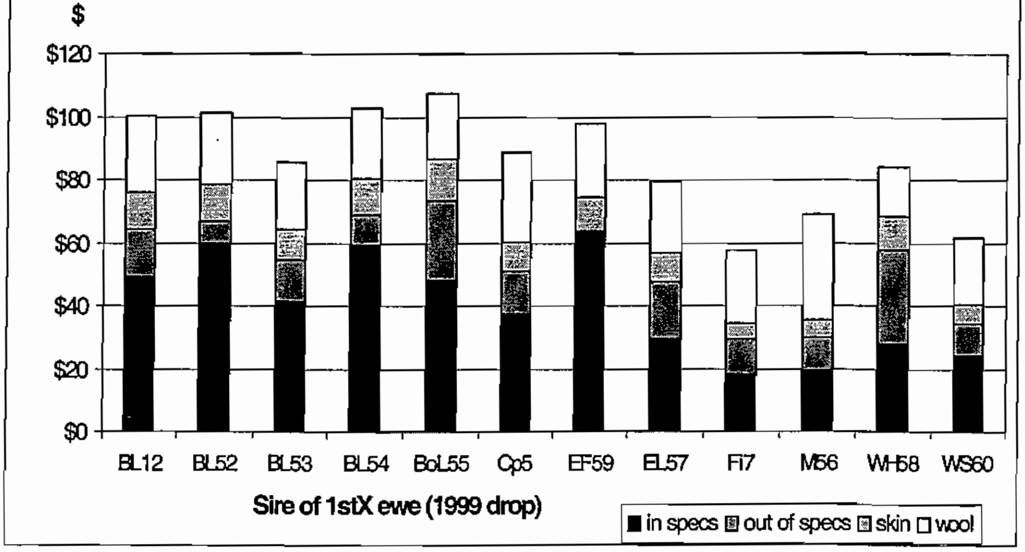
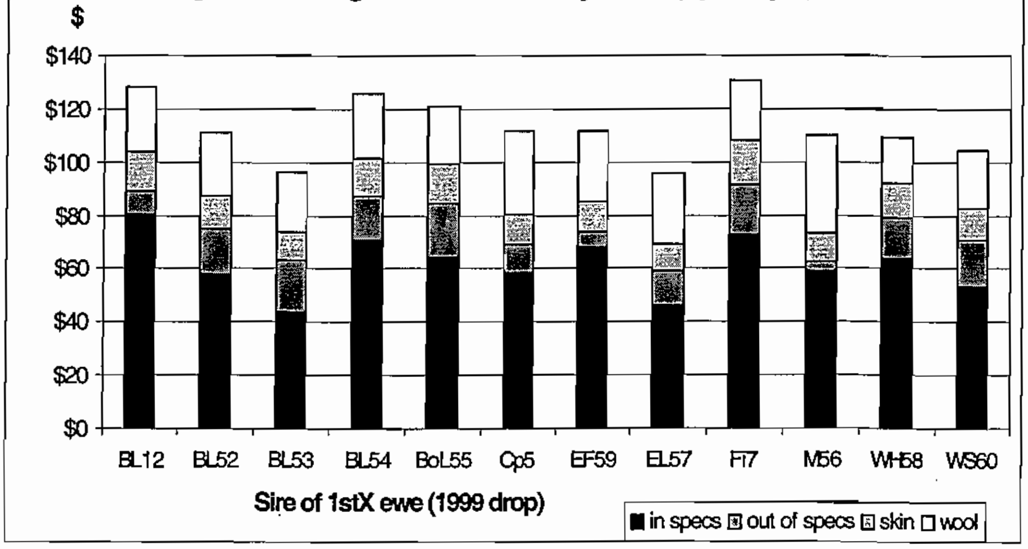


Fig. 10.Average $ return / ewe joined (spring) / year



ETURNS

casses - 2ndX lambs: base price of $3.00/kg for those meeting the specification 20+ kg and fat score 2-4, with ollowing $ discounts for those out of specs:

Wt/FS	1	2	3	4	5
<16kg	-1.50	-1.50	-1.50	-1.50	-1.50
16-19.9	-0.75	-0.15	-0.15	-0.15	-0.50
=>20	-0.75	0	0	0	-0.50

weight carcasses (16-19.9kg) were only given a small discount (-0.15 $/kg) because they would normally be the trade market or kept longer to reach a heavier weight. Large discounts were given to light (<16kg) and nd 5 carcasses.

kins: average prices were $9.75, $12.00 and $12.50 for <20, 20.1-24 and >24 kg carcasses.

e Wool: average 2001/02 prices (c/kg clean) for the various micron categories were used to calculate the turn for each 1stX ewe. This was multiplied by 0.9 to account for the lower price of the non fleece portion. t (1st) shearing: all ewes were tested for average fibre diameter and yield. Wool return for each 1stX ewe: easy fleece weight x yield x price.

2nd & 3rd) shearings: each bin line was measured for fibre diameter (and yield) to determine average price in line. Wool return for each 1stX ewe was greasy fleece weight x (bin line yield and price).

HAMILTON (Leo Cummins)

Seasonal Conditions

South West Victoria is one of the few areas experiencing near normal pasture conditions this spring. In spite of relatively low rainfall for the whole year, September and October have been close to average. Pasture availability at present is quite good and the ewes and lambs are looking good.

Conditions were quite tight in late winter and early spring and there were widespread worm problems in the district. This was due to the good rain in late spring last year, allowing a much higher worm carryover. This was compounded by the stress caused by perennial ryegrass staggers in summer and autumn and a tight feed supply through winter.

Lambing

Lambing occurred in July/August and lamb marking in September. The results for the 1stX ewes are summarized in Table 1 (1998 drop) and Table 2 (1999 drop).

Table 1. 1998 drop 1stX ewes - 2002 lambing.

1stX group	EJ (n)	EL/EJ (%)	LB/EL (%)	LM/EL (%)	Birth wt(kg)	Mark wt(kg)
BL12	20	75	153	153	5.2	16.7
BoL43	10	60	183	133	4.7	15.4
Cp5	15	93	171	150	5.0	15.7
Cr46	17	76	146	123	4.9	16.1
EF44	12	83	150	140	5.4	18.3
EF45	14	86	208	192	5.2	16.1
EF47	8	100	138	138	5.5	18.1
Fi7	10	100	190	110	3.6	13.5
FiF48	14	100	1.79	164	4.7	14.4
Ro49	16	63	150	110	5.1	14.4
Tx50	15	87	185	162	4.4	15.2
WS51	12	83	180	150	4.8	17.3

EJ=ewes joined, EL=ewes lambed, LB=lambs born, LM=lambs marked

The relatively high mean litter size at birth in both groups probably reflects the good condition that the ewes were in at the start of mating back in mid-February. Although rams went into both groups at the same time, the 1998 group mated up more quickly and lambed slightly earlier. By the end of mating very few ewes had failed to mate however the percentage of non-pregnant ewes was high. Mustering for the last couple of mating observations and removal of the rams was quite difficult due to perennial ryegrass staggers. I believe it is highly likely that the toxin ergovaline (from the endophyte-infected ryegrass) contributed to the high percentage of non-pregnant ewes. The toxin can cause heat stress which can induce early embryonic mortality. New Zealand data suggest that ergovaline will reduce fertility. In looking through the data it is apparent that some sire groups have performed poorly in terms of % ewes lambing. These include BoL43 and Ro49 in the 1998 drop (Table 1) and Cr64, Cp65, BL12 and EFR69 in the 1999 drop (Table 2). New Zealand data also suggests that the clinical condition of perennial ryegrass staggers has a genetic component, which might indicate there are real genetic differences between sires. Severe outbreaks of perennial ryegrass staggers, such as this year, are not very common, but are the subclinical effects having an impact in most years?

Table 2. 1999 drop 1stX ewes - 2002 lambing.

1stX group	EJ (n)	EL/EJ (%)	LB/EL (n)	LM/EL (%)	Birth wt(kg)	Mark wt(kg)
BL12	29	52	1.67	140	4.6	14.1
BL61	7	100	1.43	129	4.7	14.2
BL62	13	69	2.11	133	4.3	11.7
BoL63	15	87	2.08	131	3.7	12.9
Ch66	22	91	1.40	110	4.2	11.7
Cp5	19	89	1.76	147	4.2	11.2
Cp65	23	65	1.73	140	4.3	12.7
Cr64	22	50	1.45	98	2.8	10.5
EFP68	16	81	1.85	108	4.1	12.5
EFR69	16	63	2.10	140	3.6	13.5
Fi7	20	75	1.87	80	3.3	11.9
Fi67	13	92	1.33	75	3.6	10.4

EJ=ewes joined, EL=ewes lambed, LB=lambs born, LM=lambs marked

The range in lamb marking % (LM/EL) for the 1998 group was 82%, or comparing the best 3 sire groups with the worst 3 sire groups the difference was 58%. Similarly for the 1999 group the range was 73%, or comparing the best 3 sire groups with the worst 3 sire groups, the difference was 62%. These apparent differences in lambing rate are very large.

Lamb survival and lamb weights from the 1999 1stX ewes have clearly been lower than from the 1998 1stX ewes. The 1999 ewes required extra drenching and were also given a copper supplement and it is likely that these differences are due to paddock effects (shelter, timing, trace elements and worms).

Lamb slaughter

The lambs born in 2001 were managed in batches according to the age group of their dams. 2ndX lambs from the 1997 and 1998 drop 1stX ewes were finished in feedlots on whole oaten grain and lucerne hay ration fed *ad-lib*. They were slaughtered in April (from 1998 1stX drop ewes - Table 4) and May (from 1997 1stX drop ewes - Table 3). The lambs from the 1999 1stX ewes were finished on a turnip crop and slaughtered at the CRF works at Colac in June.

Table 3. 2ndX carcasses from 1997 1stX ewes.

1stX group	Carcass wt (kg)	FatGR (mm)	FatC (mm)	EMA (cm^2)
BL12	23.1	16.0	5.4	14.6
BL13	24.1	18.6	6.5	15.7
BoL15	22.8	16.7	6.3	15.0
Cp5	20.6	14.0	5.3	13.3
Cp16	21.1	14.5	5.7	13.7
Cp18	21.8	14.2	5.5	14.3
Cr20	20.8	13.2	5.9	14.0
EF19	22.3	13.1	5.5	15.1
Fi7	19.8	13.7	4.5	13.8
Fi17	19.4	14.1	5.2	13.5
Fi21	19.5	13.6	4.8	13.3
Ro14	20.3	12.2	5.5	13.6

EMA = eye muscle depth x width x 0.8

The average dressing percentage for the lambs (1998 drop ewes) was 42% so the carcass weights are slightly lower than we anticipated. Lower dressing percentages were common in lambs from this region this year, but part of our problem may have been overfull rumens in grain feed lambs in spite of 50 hours between yarding and slaughter.

The lambs from the fodder crop (1999 drop ewes) were the heaviest and oldest lambs and tended to be overfat (Table 5). They averaged one fat score more

Table 4. 2ndX carcasses from 1998 1stX ewes.

1stX group	Carcass wt (kg)	FatGR (mm)	FatC (mm)	EMA (cm^2)
BL12	19.7	12.8	4.4	13.3
BoL43	19.3	12.7	4.3	13.2
Cp5	19.1	11.1	4.2	13.1
Cr46	19.7	13.1	4.7	13.8
EF44	21.0	10.2	3.4	13.4
EF45	22.3	10.6	3.6	13.2
EF47	19.9	10.6	3.7	13.5
Fi7	17.8	9.4	2.8	12.0
FiF48	20.4	11.9	4.8	12.5
Ro49	19.8	11.4	3.6	12.6
Tx50	19.6	10.9	3.5	14.6
WS51	20.0	12.4	4.4	14.1

EMA = eye muscle depth x width x 0.8

than those from the 1997 ewes. Within each batch of lambs the range in carcass weight from best to worst grandsire groups was around 4.6 kg, the range in fat score was around 1 (4 to 6 mm GR), and the range in eye muscle area 2.4 to 3 cm^2. These ranges are typical of what we have seen before. The slaughter data for the 2ndX lambs in Tables 3, 4 and 5 are unadjusted.

Table 5. 2ndX carcasses from 1999 1stX ewes.

1stX group	Carcass wt (kg)	FatGR (mm)	FatC (mm)	EMA (cm^2)
BL12	23.7	21.2	8.4	15.3
BL61	23.9	21.5	7.8	16.4
BL62	23.7	20.2	7.7	15.3
BoL63	23.1	22.5	7.3	15.4
Ch66	21.0	18.0	6.9	15.5
Cp5	21.8	19.9	7.4	14.8
Cp65	22.7	21.4	7.6	15.3
Cr64	19.8	16.3	5.9	13.3
EFP68	24.1	21.1	8.1	16.4
EFR69	21.7	18.4	7.9	15.4
Fi7	19.5	17.8	6.3	13.6
Fi67	20.0	16.3	5.8	13.1

EMA = eye muscle depth x width x 0.8

RUTHERGLEN (Gervaise Gaunt)

Seasonal conditions

Seasonal conditions in NE Victoria have continued to be very dry with little rainfall over winter and spring. Ewes (and lambs) were supplemented with triticale (600g/hd/d) and hay *ad-lib* from pre-lambing to weaning, which contributed to good lamb growth rate (250g/d). Following weaning, supplementary feeding of lambs continued with wheat and triticale (200g/hd/d) and hay *ad-lib*. With the steady decline in pasture quality and quantity since weaning, lamb growth rates dropped to 230g/day at the start of October. Considering the drought conditions these growth rates are still quite acceptable.

2ndX Lambs

Table 6 shows average liveweight of 2ndX lambs for each maternal sire group at 1/10/02. Lambs are due to be slaughtered early November with an anticipated average carcase weight of 21 kg. There is considerable variation between maternal sire groups which range from 38.0 – 45.9 kg (7.9kg) for 1998 sires, 37.1 – 44.5 kg (7.4kg) for 1999 sires and 33.7 - 46.7 kg (13kg) 2000 sires. Note the weights have not been adjusted for age, sex or birth/rearing status.

Table 6. 2ndX lamb weights (kg) from 1998, 1999 and 2000 drop 1stX ewe groups - (1/10/02).

1998	Wt	1999	Wt	2000	Wt
BL24	40.9	BL12*	44.5	BL12*	45.8
BL25	41.8	BL70	40.5	BL81	43.7
BL32	41.6	BL71	42.8	BL82	44.7
Cp5*	40.4	Cp5*	40.7	BL83	43.3
Cp26	39.5	CP74	39.1	Cp5*	38.7
Cr27	45.8	EF77	42.6	Cp85	46.7
EF28	45.9	EL73	37.6	EFP89	44.7
Fi7*	39.8	Fi7*	38.6	Fi7*	33.7
Fi23	38.3	FiF76	40.1	Fi88	37.0
Fi22	38.0	Hy75	41.6	Gr86	44.5
Hy29	43.4	M72	37.1	Hy87	44.6
Hy30	41.4	PD79	40.9	SAM84	46.0
Pd31	45.2	SHD78	40.9	WD91	46.0
WS33	43.4	WS80	38.9	WS90	43.5
Average	**41.7**		**40.8**		**42.2**

*Link sires

Joining

Ewes from the 1999 and 2000-drop have been weighed and fat scored in preparation for joining which will commence early November. Pre-joining ewe liveweights and fat scores were excellent with 1999-drop ewes averaging 71.7kg, fat score 3/4 and the 2000-drop ewes averaging 65.8kg fat score 3+.

Milk Production

A sample (n=6 per sire group) of the 2000-drop maiden ewes was milked at 3, 4 and 10 weeks after lambing. All ewes milked had single lambs. Table 7 shows milk yields at the various stages of lactation. Ewes averaged 2.1 litres / day at 3 and 4 weeks lactation and 1.2 litres / day at 10 weeks lactation. The White Dorper group (WD91) produced the highest quantity of milk throughout lactation until weaning.

Table 7. Milk yield (litres per day) of 2000-drop 1stX ewes at 3 and 4 and 10 weeks lactation.

Maternal Sire	3/4 wks	10 wks
BL12*	2.1	1.3
BL81	2.2	0.8
BL82	2.1	1.3
BL83	2.0	1.3
Cp5*	1.8	0.9
Cp85	2.1	1.5
EFP89	2.0	1.4
Fi7*	1.8	0.8
Fi88	1.8	1.0
Gr86	2.2	1.0
Hy87	2.2	1.0
SAM84	2.0	1.3
WD91	2.6	1.5
WS90	2.6	1.1
Average	**2.1**	**1.2**

*Link sires

Feed Intake

The 1998-drop ewes have now completed the MCPT trial and the final data collected from these ewes involved feed intake measurements. The aim of the feed intake trial is to quantify genetic variation in feed intake for meat sheep and provide estimates of heritability and genetic correlations with all other production traits already collected in the trial. Faecal samples and pasture samples are being processed and will be sent to a commercial laboratory to be processed. More information on the feed intake trial will be reported when results are obtained.

RESEARCH HIGHLIGHTS

Production and Financial Comparison of Prime Lamb Finishing and Breeding Systems in High Rainfall Regions of NSW

A.K. White, G.J. Salmon and G.M. Salmon

The production and financial consequences of operating a prime lamb breeding system and finishing system are examined on a 400 ha grazing property on the NSW Central Tablelands. Fodder budgets were used to generate typical production levels for the two systems upon which economic analysis was completed. Ten thousand lambs were marketed from the finishing system compared to 2,500 from the breeding system. The finishing system allowed stocking rate, pasture utilisation and kilograms of lamb marketed per hectare to be increased. Profit per hectare was higher for the finishing system ($204/ha) than the breeding system (-$16/ha). The environmental and financial risk associated with the lamb finishing system is greater and a higher level of flexibility in grazing management is required.

Paper presented to the 24th Biennial Conference of the Australian Society of Animal Production, held in Adelaide, July 2002.

Improving Carcass Traits in Crossbred Dam Line Lambs through Selection of the Crossing Sires

A.M. van Heelsum, R.M. Lewis, M.H. Davies and W. Haresign

The association was studied between liveweight, ultrasonic fat and muscle depth and gigot conformation scores of 21-week old lambs of a crossing sire breed (Bluefaced Leicester (BFL)) and traits measured at finished condition and on carcasses of their 'Mule' wether offspring. Data were available on 3075 BFL lambs born between 1997 and 2000, and 2192 Mule lambs born between 1998 and 2000. Crossing rams were selected to represent the full spectrum of lean index (including weight and ultrasonic measurements) and conformation scores. Heritabilities of the BFL traits were between 0.18 and 0.34 with genetic correlations between 0.63 and 0.72. The regression of the crossbred traits on lean index of the sire and the genetic correlations between purebred and crossbred traits showed that selection including ultrasonic measurements in the purebreds can improve carcass composition in the crossbreds.

Paper presented to the 7th World Congress on Genetics Applied to Livestock Production, held in Montpellier, France, August 2002.

****

Maternal sire entries - details

** Link sires used at each site each year*

Year	Site	Sire Code	Tag	Stud	Breed	Entrant	Phone No.
1997	Cowra	BoL1	922047	Struan	Booroola Leicester	PIRSA	08 8762 9100
		BL2	950137	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Fi3	940001	Yamba	Finnsheep	M & L Burns	03 5798 1583
		Cr4	940364	Maluka	Corriedale	P Secker	02 4848 1244
		Cp5*	940449	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		EF6	940B21	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Fi7*	930057	Warrayure	Finnsheep	GM & MA Wake	03 5574 1254
		BL8	950181	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Fi9	935010	Warrayure	Finnsheep	Knight & Bottcher	03 5578 7250
		WS10	910058	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
		Cr11	930097	Coora	Corriedale	Coora Partnership	02 4848 1244
		BL12*	94S291	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
1997	Hamilton	BL13	950246	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Ro14	930146	Claymour	Romney	Rouch & Gillman	03 5727 1552
		BoL15	924287	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cp16	930069	Narrambla	Coopworth	D Wigan	03 5577 2321
		Fi17	950054	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		Cp18	942297	Oaklea	Coopworth	J Keiller	03 5526 5248
		EF19	940B26	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Cr20	880491	Stanbury	Corriedale	Cole & Risbey	03 5593 9278
		Fi21	960002	UNSW	Finnsheep	S & D Jones	03 5122 3328
1998	Struan	Fi22	890049	ATC	Finnsheep	Jaydee Stud	08 8764 2065
		Fi23	930049	Tambaroora	Finnsheep	Jaydee Stud	08 8764 2065
		BL24	960346	Gleneith	Border Leicester	CE & LJ Arney	08 8536 0031
		BL25	960188	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Cp26	960210	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Cr27	921586	Coora	Corriedale	Coora Partnership	03 5578 6267
		EF28	960133	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Hy29	960028	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Hy30	960128	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		PD31	960110	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		BL32	95T138	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		WS33	951470	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1998	Cowra	BoL34	950029	Caveton Park	Booroola Leicester	PIRSA	08 8762 9100
		BL35	940765	Retallack	Border Leicester	BLA(NSW)/Grinter	02 6974 1153
		Cp36	960067	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cp37	940274	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cc38	960621	Coronga	Coronga Composite	Premier Breed. Tech	02 6365 8207
		EF39	B40	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FL40	940016	Wycombe	Finn x Leicester	R & L Coddington	02 6775 5225
		Gr41	955551	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		WS42	940069	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
1998	Hamilton	BoL43	96P6322	Struan	Booroola Leicester	PIRSA	08 8762 9100
		EF44	960026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		EF45	0019	Glenspean	East Friesian	S & J Cameron	03 5286 1455
		Cr46	950161	Gundowringa	Corriedale	HJ & CJ Prell	02 4848 1244
		EF47	950509	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FiF48	960086	Gippfinn	Finn x Friesian	S & D Jones	03 5122 3328
		Ro49	9200089	Evergreen	Romney	C Duncombe	03 5264 5170
		Tx50	949002	Coolana	Texel	Coolana Rural	03 5350 5531
		WS51	900429	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1999	Cowra	BL52	920070	Kegra	Border Leicester	BLA(NSW)/Golder	02 6977 1339
		BL53	960102	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		BL54	970030	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BoL55	955203	Struan	Booroola Leicester	PIRSA	08 8762 9100
		M56	900183	Centre Plus	Merino	L Mortimer & Sons	02 6892 8259
		EL57	960043	Ostlers Hill	English Leicester	ELAssoc/Stephenson	03 5764 1298
		WH58	960505	Clifton Hills	Wiltshire Horn	AWHSBA/Ballantyne	03 5145 8225
		EF59	970100	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		WS60	970842	Linden Genetics	PLG White Suffolk	Linden Genetics	02 6386 2020
1999	Hamilton	BL61	970188	Wongajong	Border Leicester	AD & CM Wilson	02 5882 3338
		BL62	980050	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		BoL63	955160	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cr64	910415	Coolana	Corriedale	PG Munro	03 5575 3240
		Cp65	978431	Cashmore Park	Coopworth	J Keiller	03 5526 5248
		Ch66	920L91	Grand Ridge	Cheviot	RN Waddell	03 5626 4244
		Fi67	960085	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		EFP68	981019	Yollom	East Friesian x Perendale	MF & ML Molloy	03 5596 2077
		EFR69	970175	Price	East Friesian x Romney	EJ & KJ Price	03 5527 1110
1999	Struan	BL70	970310	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL71	970290	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		M72	933051	Merinotech Mid	Merino	Merinotech Mid North	08 8665 4019
		EL73	950T82	Koenari	English Leicester	CR Taylor	03 5595 0272
		Cp74	970101	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Hy75	960215	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		FiF76	960132	Gippfinn	Finn Friesian	S & D Jones	03 5122 3328
		EF77	960136	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		SHD78	970155	Tauranga	South Hampshire Down	S & M Macmillan	03 5596 2251
		PD79	970101	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		WS60	970172	Koonawarra	White Suffolk	AWSA	08 8210 5211
2000	Struan	BL81	960327	Morton	Border Leicester	JD & CM Corbin	08 8765 8058
		BL82	980260	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL83	980085	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		SAM84	980046	Jeancourt	SAMM	W & M Heddle	08 8271 7080
		Cp85	980091	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Gr86	980144	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		Hy87	940278	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Fi88	538	Gippfinn	Finn	S & D Jones	03 5122 3328
		EFP89	981071	Yollom	East Friesian x Perendale	Karioi Seed Stock/Udy	03 5597 6621
		WS90	960513	Langley Heights	White Suffolk	AWSA	08 8210 5211
		WD91	990906	Axis	White Dorper	B & L Mawson	08 8537 0615

DYNAMIC DAMS

Ewe genetics for the future

Editors: Dr Neal Fogarty & Lynette McLeod *NSW Agriculture, Agricultural Institute, Orange, NSW 2800*
Ph: (02) 6391 3813 *Fax:* (02) 6391 3922 *Email:* neal.fogarty@agric.nsw.gov.au
http://www.lambplan.com.au/mcpt/

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Dynamic Dams reports on project **Maternal sire Central Progeny Test (MCPT)**, part of the *MLA Lamb Program and provides other information for lamb breeders to improve their maternal genetics. Newsletters are posted on the website. If you wish to be on the mailing list, please contact the Editors.*
Contributions from readers are welcome.

Contents

HOW MUCH IS TOO MUCH FOR A PRIME LAMB DAM?

Gervaise Gaunt, DNRE, Rutherglen

Over the last year prime lamb producers have enjoyed record returns from their lamb enterprises. The down side is that prices for replacement stock have increased. Producers question the gains from spending more money on replacement breeders. In other words what is the difference in returns from an *average* priced dam compared to a higher priced and generally *more highly productive* dam?

Research results strongly support paying a higher price to obtain high performance dams compared to average dams. Investing in 1000 "superior" dams can result in an extra **$100,000** in gross returns over 5 years compared to buying 1000 "average" dams. High performance dams usually return the additional cost in their first year.

High performance dams can be obtained by purchasing structually sound stock from breeders who use performance records and objective measurements eg. LAMBPLAN® in their ewe breeding enterprise. Producers are advised to rank the production traits (eg. reproduction, growth, leanness and wool) that have the greatest impact on their lamb enterprise. Contract matings can provide more control over dam genetics.

Over the last decade, State Governments and Meat and Livestock Australia have funded breeding improvement programs, eg. MCPT. Results show that the maternal sire has a significant impact on lamb enterprise profitability. Early results from the first year's 12 sires has shown gross returns from ewe progeny groups of top sires are worth 23% more than the average of all ewe progeny in the trial. The top sire returned $88, compared to the bottom sire $53 / year / ewe joined ($68 average of all ewes). Prices are based on national 5-year average for lamb carcases ($1.95 kg), skins and wool (1995-2000). The difference would be greater with current high lamb prices.

The major driver of dollar returns is the number of lambs slaughtered (ie. weaning percentage), with other traits of growth, fat and wool also contributing. In the MCPT overall, lamb carcases contribute to 62% of returns, lambs skins 12% and 26% for wool from 1stX ewes. The average weaning percentages from 1stX adult ewes from different maternal sire groups have ranged from 82% to 167%. Several breeds are represented in the top trait leaders, and the same breeds are also represented in the lowest ranks.

Progressive 1stX ewe breeders buy maternal sires for crossing using LAMBPLAN® EBVs

NSW Agriculture | State Government Victoria Department of Natural Resources and Environment | SARDI South Australian Research and Development Institute | LAMBPLAN | MEAT & LIVESTOCK AUSTRALIA

Supported by Meat and Livestock Australia

MCPT UPDATE

Cowra (Jayce Morgan & Lynette McLeod)

Seasonal Conditions

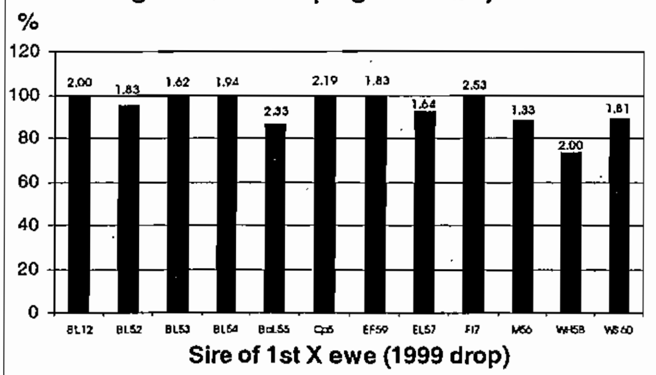
Autumn rainfall has been below average but the rain seems to have come at opportune times. No hand feeding of the lambing ewes was necessary. However winter feed conditions will be tight if more substantial falls of rain do not come soon. The autumn joined 99 drop ewes are due to begin their last lambing in the middle of July.

1stX ewes – autumn joined

The 1999 drop 1stX spring joined ewes were mated to high LAMBPLAN index Poll Dorset rams for 6 weeks from late February 2001. This is the third and final lambing for the '99 drop autumn join ewes. The ewes were scanned in June with pregnancy and number of foetuses shown in Fig. 1. The average conception rate was over 93%.

Pregnancy rates for the 12 sire groups of '99 drop 1stX ewes (Fig.1) ranged from 73 to 100%. The average number of foetuses per pregnant ewe ranged from 1.33 to 2.53, with five of the groups averaging twins or more.

Fig. 1. 1st X Ewes pregnant / ewe joined



Numbers above bar show average foetuses per pregnant ewe.

2ndX Lambs – slaughter

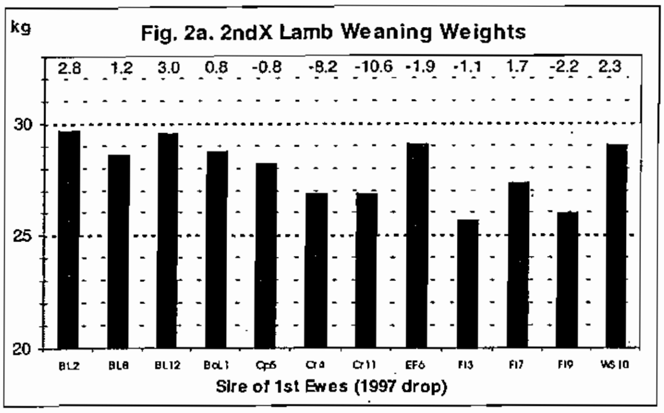
The 2ndX lamb growth and carcass performance is shown in the following Figs 2, 3 and 4. All 2ndX lambs produced to date from the 1stX ewes have been included in the analyses. Lamb weights have been adjusted for age (90 days at weaning and 200 days postweaning, prior to slaughter), type of birth and rearing and sex. Carcass fat depth at the GR site and eye muscle area at the 12th rib are also shown, adjusted to 24kg carcass weight for wethers. All progeny from the 1997 drop 1stX ewes have now been slaughtered and included (1350 lambs ie an average of 113 lambs per grand sire group). There is still one group of 2ndX lambs to be slaughtered from the 1998 drop ewes in Oct, with an average of 94 lambs per group in Fig 3. The 1999 drop 1stX ewes are based on an average of 40 lambs per group (Fig. 3).

The 1stX EBVs for weight, fat and muscle are also shown on the Figs 2, 3 and 4 for comparison. The EBVs are from the analysis based on the lamb growth and carcass performance of the wethers from all 1stX lambs across all sites (see *Dynamic Dams 14*). The 1stX EBVs and the 2ndX performance can not be strictly compared because they are not the same traits and the 2ndX lambs also have the influence of maternal effects from the 1stX ewe on their performance, which would be expected to be important, especially for weaning weight. However there is quite a good relationship between the 1stX EBVs and 2ndX performance for most sire groups. That is the sires with higher 1stX EBVs generally have higher 2ndX performance. Although there are a few individual sires that have changed their relative rankings.

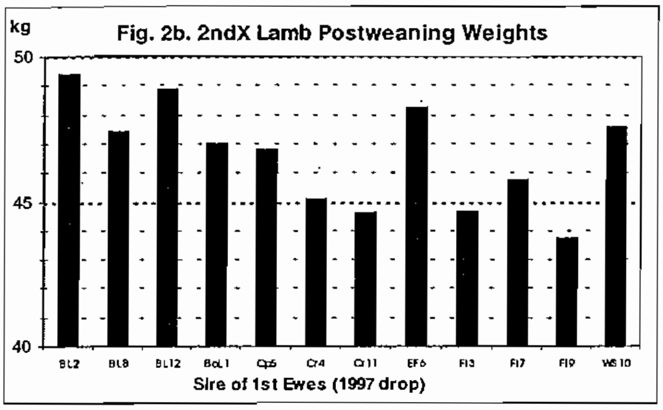
There are large differences between the 2ndX lamb groups from the different maternal grand sires. This is the only genetic difference as all the 2ndX lambs were by the same group of Poll Dorset high index rams. There is a similar range in liveweight of over 5kg between the groups within each 1stX ewe drop. Similarly for carcass fat there is a range of almost 4mm GR within each drop. The range in eye muscle area is significant, although quite a bit smaller than fat.

The results clearly show that the genetics of the 1stX ewe can have a large affect on the growth and carcass performance of 2ndX lambs.

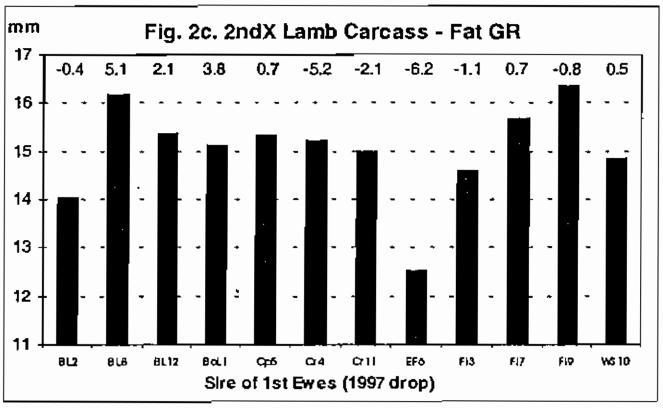
It should also be remembered that these genetic effects are only due to the maternal grand sire or ¼ of the genes of the 2ndX lamb. Obviously the terminal sire is important, but also the genetics of the base Merino (or other breed) dam of the 1stX ewe will also contribute.



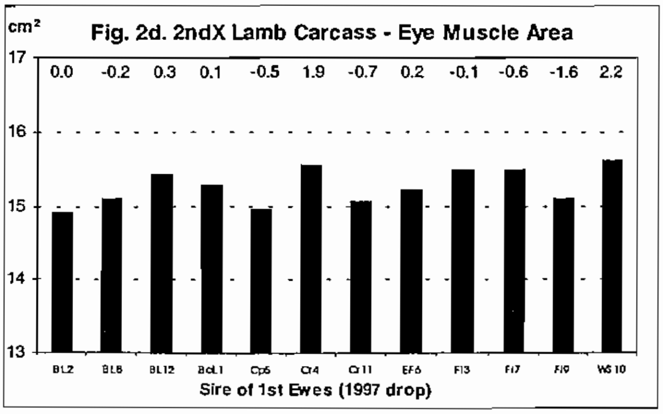
Adjusted for age (90 days).
Numbers above bar show 1stX EBVs for weight (kg).



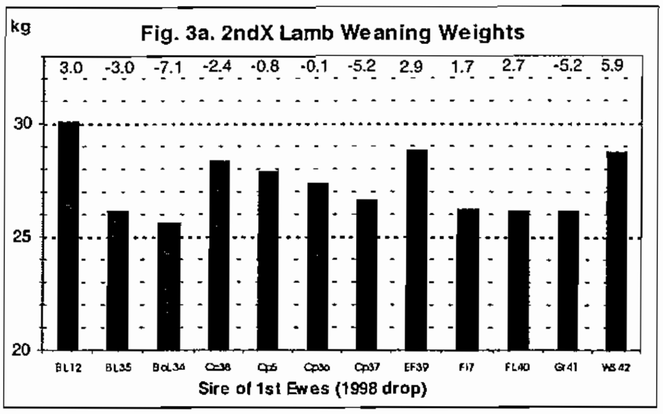
Adjusted for age (200 days).



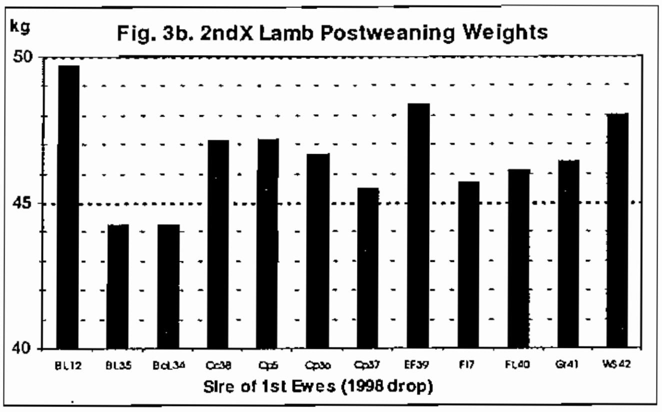
Adjusted to 24kg carcass weight for wethers.
Numbers above bar show 1stX EBVs for fat GR(mm).



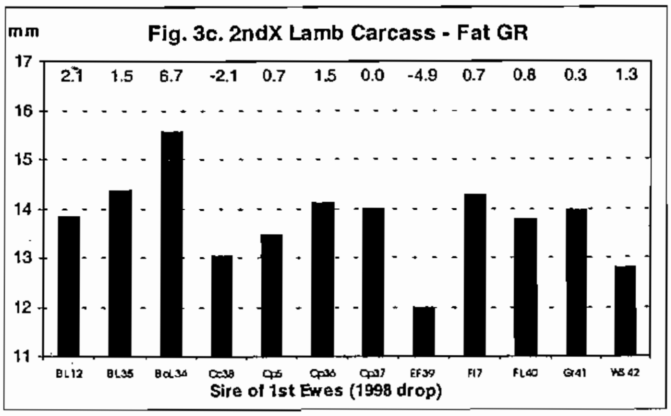
Adjusted to 24kg carcass weight for wethers.
Numbers above bar - 1stX EBVs for eye muscle depth (mm).



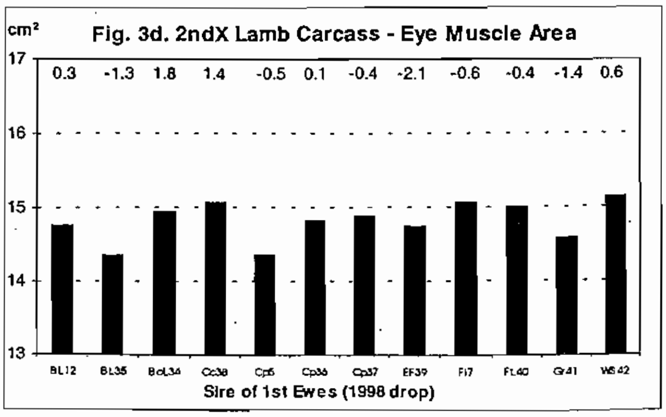
Adjusted for age (90 days).
Numbers above bar show 1stX EBVs for weight (kg).



Adjusted for age (200 days).



Adjusted to 24kg carcass weight for wethers.
Numbers above bar show 1stX EBVs for fat GR (mm).



Adjusted to 24kg carcass weight for wethers.
Numbers above bar - 1stX EBVs for eye muscle depth (mm).

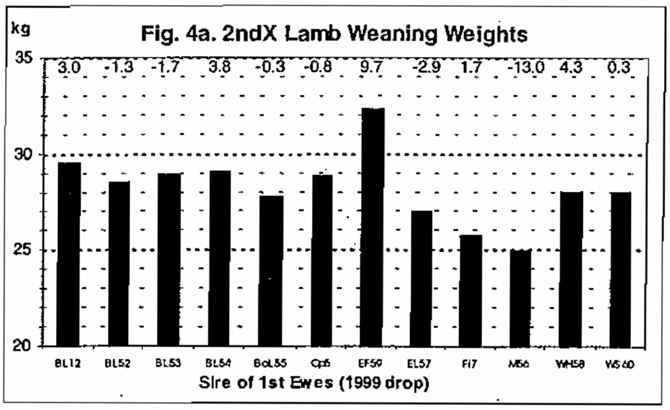


Fig. 4a. 2ndX Lamb Weaning Weights

Adjusted for age (90 days).
Numbers above bar show 1stX EBVs for weight (kg).

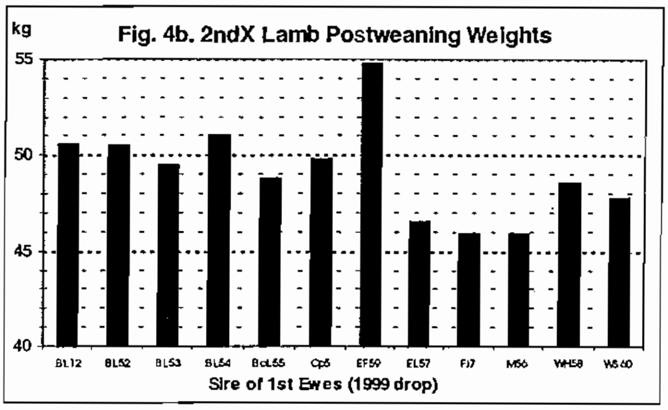


Fig. 4b. 2ndX Lamb Postweaning Weights

Adjusted for age (200 days).

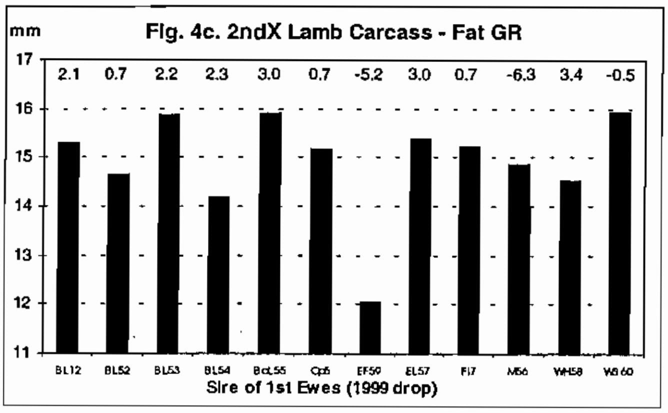


Fig. 4c. 2ndX Lamb Carcass - Fat GR

Adjusted to 24kg carcass weight for wethers.
Numbers above bar show 1stX EBVs for fat GR(mm).

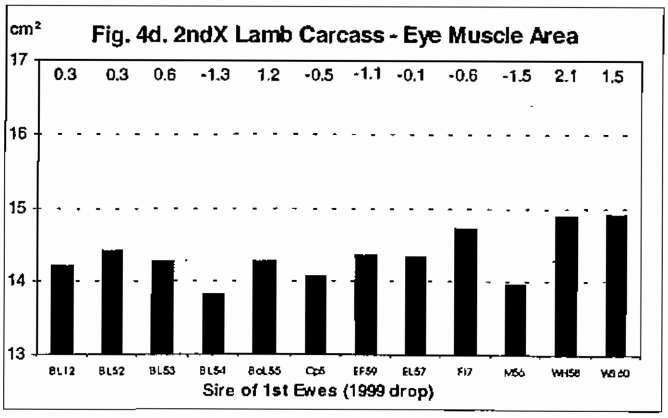


Fig. 4d. 2ndX Lamb Carcass - Eye Muscle Area

Adjusted to 24kg carcass weight for wethers.
Numbers above bar - 1stX EBVs for eye muscle depth (mm).

Alpaca Experience at Cowra (Jayce Morgan)

At the July/August 2001 lambing we experienced high losses due to primary predation by foxes. Of 690 lambs born, 210 died or were missing at marking (30%), with 143 post mortemed. Of those, 29% showed fox predation as the primary cause of death and 34% had fox activity but there was not sufficient left to prove the cause of death. These losses occurred despite multiple spotlighting during lambing and gassing burrows.

It was decided to try Alpacas as these are reported to keep the foxes away. Advice given on use of Alpacas included:

1. Alpacas to be 2yo or older, preferably wethers.
2. Two alpacas minimum per paddock.
3. Alpacas to go into lambing paddock 2 weeks before ewes to establish territory.

We purchased 8 alpacas, 4 were over 2 years and 4 were 12 to 21 months old. The alpacas were placed in paddocks so that there was one older and one younger one in each paddock. They were put into the lambing paddocks at the same time as the ewes.

Despite the presence of alpacas in the lambing paddocks in March/April 2002 there was still fox activity. Some 12% of the 570 lambs born were dead or missing at marking. Of the 55 post mortemed, 25% were primary fox predation and another 22% showed fox activity. The losses were very similar to results from the March/April lambing in 2001 when there were no alpacas, although they were considerably less than the previous winter lambing. Our March/April lambing always has fewer losses than our July/August lambing.

Three spotlighting sweeps were made of the lambing paddocks and surrounds but no foxes were seen. Possible reasons may include wrong time of night or that the presence of the alpacas makes the foxes stealthier. Also it may be that the alpacas are not yet old enough or experienced enough.

Rutherglen (Gervaise Gaunt)

Season

Although the autumn season has been mild, there has been little rain and pasture availability is low (1-1.5t/ha). Weather conditions during lambing (April/May) were mild and sunny. Supplementary feeding of ewes commenced in February and ewes and lambs are currently being fed 600g/head/day of triticale and ad-lib hay. Since pasture availability is low, we intend on weaning lambs a few weeks earlier (ie. 9-10 weeks of age) than they are usually weaned. When pasture availability is low, it is more productive to feed the lambs only. Ewes and lambs will be supplementary fed until weaning, and the decision to continue supplementary feeding lambs will be made depending on pasture availability in early July.

Lambing and Marking

Lambing commenced April 1st 2002, with ewes lambing in individual plots on the basis of their sire group. Although there was an active fox-baiting program, there were still some losses due to foxes, particularly with lambs from the multiple births. The poor mothering ability of some ewes also contributed to lamb loss. Ewes and lambs were drifted from plots into their mobs one to two weeks post-lambing.

The 1998-drop ewes have now completed three lambings, the 1999-drop have completed two lambings and the 2000-drop ewes were maidens at this year's lambing. Conception rates (number of ewes pregnant / ewes joined) averaged 93%, 84% and 86% for the 1998, 1999 and 2000-drop ewes respectively. Several sires achieved 100% conception rate ie. Fi22, Fi23, WS33 (1998-drop), BL12, Hy75 (1999-drop), Hy87, Samm84 and WS90 (2000-drop maidens).

The MCPT has once again shown that large differences are evident between sire groups for lambs born and lambs marked. Average lambing percentages (number of lambs born / ewes joined) for the 98-drop ewes was 165% (Figure 5). Percentages ranged from 133% (BL32 and Cr27) to 212% (Fi22). The 1999-drop ewes (Figure 6) averaged 126% lambs born. Lambing percentages ranged from 30% (EL73) to 188% (Fi7). It is worth noting the lamb death rate between lambing and marking for Fi7 was 42%, resulting in a marking percentage of 129%. The maiden 2000-drop ewes (Figure 7) averaged 126% lambs born and ranged from 74% (EFP89) to 150% (Fi88).

Fig. 5. Lamb % born & marked / ewe joined (1998-drop ewes)

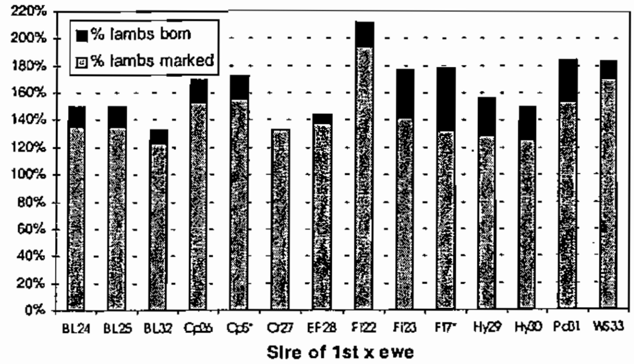


Fig. 6. Lamb % born & marked / ewe joined (1999-drop ewes)

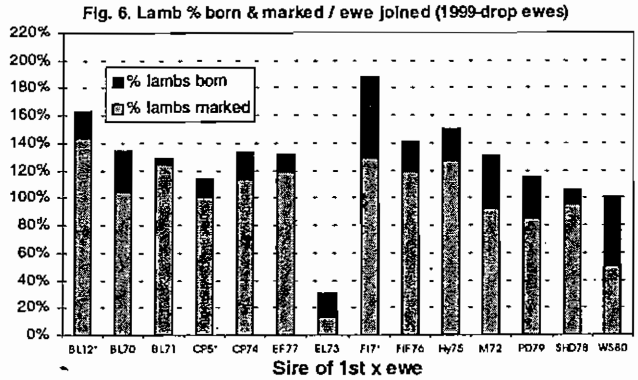
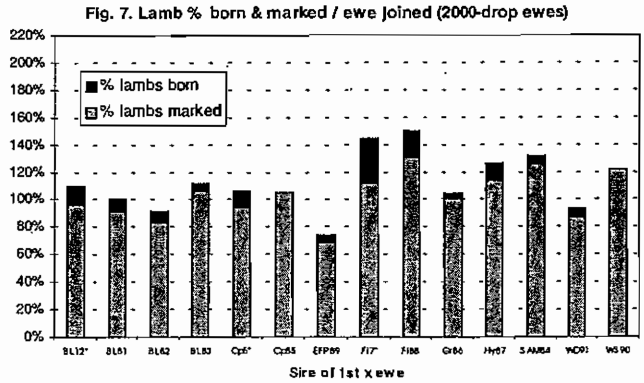


Fig. 7. Lamb % born & marked / ewe joined (2000-drop ewes)



Lambs were marked in early June and achieved good growth rates from birth to marking of 261 g/day, 271 g/day and 278 g/day for the 1998, 1999 and 2000-drop ewes respectively. Average marking rates averaged 143%, 102% and 103% for the 1998, 1999 and 2000-drop ewes respectively (Figures 5-7). There were three sire groups ie. Cr27 (1998-drop), Cp85 and WS90 (2000-drop) that had 100% lamb survival between birth and marking.

Milking

A selection of single bearing 2000-drop ewes, that lambed within a similar time and representing each sire (n=6) have been milked at 3 and 4 weeks post-lambing. These ewes are due to be milked a third time at weaning. The quantity and quality of milk produced ie. protein, fat and lactose will be assessed to determine if there are differences between sire groups.

***Hamilton** (Leo Cummins)*

Mating results for this year have not been satisfactory. At scanning in early June 2002, the 1998-drop ewes had an 18% empty rate to natural mating and the 1999-drop ewes had a 24% empty rate. The scanned twinning rate was 54% of ewes pregnant for the 1998-drop ewes and 61% for the 1999-drop ewes, so the multiple ovulation rate seemed normal. The 1998-drop ewes were visibly affected by ryegrass staggers at the end of the mating period, but this was not so obvious for the 1999-drop ewes.

By way of comparison the 1997-drop ewes, which have been retained and were mated a few weeks later, had an empty rate of 3% and a twinning rate of 69%. These ewes showed no signs of ryegrass staggers.

Anecdotal reports of scanning results in the Hamilton area suggest that pregnancy rates will be lower for ewes joined in autumn 2002 on perennial ryegrass pastures. Summer-autumn 2002 has been one of the worst seasons ever for perennial ryegrass toxicosis.

The second batch of MCPT lambs was slaughtered at Colac at the end of May with an average carcass weight of 21.1 kg, but nearly 20% were fat score 5 ! The final batch is being slaughtered on June 20, 2002.

TTAG MEETING

The Technology Transfer Advisory Group (TTAG) met at MLA in May, along with the LAMBPLAN Advisory Committee. The TTAG members present were Don Peglar, John Keiller and Robert Mortimer. The TTAG was updated on the progress of the project and provided valuable industry feedback and input into ways of getting the main messages from the results to producers and the industry.

Several Agnotes / Tips and Tools documents are being prepared to highlight the major results. A major Sheep Maternal Genetics Workshop for advisors is being planned by MLA later in the year. It will use information generated from MCPT.

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Mailing List – Privacy Act

Many of you returned the Consent Form enclosed with the last Newsletter. If you did not, or if you did and the details were unreadable on the fax owing to the colour of the paper, a Consent Form has been enclosed for your completion and return. Under the Privacy Act your consent is required for us to keep personal information eg name, address and other contact details.

PLEASE RETURN the CONSENT FORM

If you do not return the Consent Form your name MUST be removed from the list and you will not receive future issues of Dynamic Dams.

RESEARCH HIGHLIGHTS

Summaries from selected papers presented to the *14th Conference of the Association for the Advancement of Animal Breeding and Genetics (AAABG)*, held in Queenstown, NZ, July 2001.

INSTALLING A DNA-BASED TRACEABILITY SYSTEM IN THE MEAT INDUSTRY

G.H. Shackell, M.L. Tate and R.M. Anderson

The easiTrace' meat traceability system uses DNA collected in the processing works to trace meat samples from the marketplace back to the farm of origin. To date, easiTrace` has been installed in seven processing plants and applied to over one million animals. Samples from meat cuts selected at random following export have been traced back to individual carcasses. These carcasses were then linked to the farm of origin using the meat company's inventory system. For the first time in the history of the NZ export lamb industry, meat from a normal production batch has been traced from the market place back to the farm of origin in New Zealand.

GENETIC AND PHENOTYPIC RELATIONSHIPS OF REPRODUCTION WITH LIVE WEIGHT AND WOOL TRAITS IN A MEDITERRANEAN ENVIRONMENT

S.W.P. Cloete, J.C. Greeff and R.P. Lewer

An additive genetic variance ratio (h2) for total weight of lamb weaned per breeding ewe over three reproduction opportunities (TWW3) was estimated in a medium wool resource flock. TWW3 was highly variable, with a coefficient of variation of 50 %. The between bloodline variance ratio for TWW3 was significant ($P < 0.05$), but failed to exceed 5 % of the across bloodline phenotypic variation. Within bloodline h2 (± s.e.) was estimated at 0.154 ± 10.040 for TWW3. Within bloodline genetic correlations of TWW3 amounted to respectively 0.58 ± 0.11, 0.26 ± 0.11, -0.24 ± 0.1 land 0. 17 ± 0. 10 with hogget live weight, clean fleece weight, clean fleece weight/kg live weight and fibre diameter. It was concluded that TWW3 would respond to selection in Western Australian Merinos. Genetic correlations with hogget live weight and fleece weight were favourable.

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Maternal sire entries - details

** Link sires used at each site each year*

Year	Site	Sire Code	Tag	Stud	Breed	Entrant	Phone No.
1997	Cowra	BoL1	922047	Struan	Booroola Leicester	PIRSA	08 8762 9100
		BL2	950137	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Fi3	940001	Yamba	Finnsheep	M & L Burns	03 5798 1583
		Cr4	940364	Maluka	Corriedale	P Secker	02 4848 1244
		Cp5*	940449	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		EF6	940B21	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Fi7*	930057	Warrayure	Finnsheep	GM & MA Wake	03 5574 1254
		BL8	950181	Inverbrackie	Border Leicester	CE & LJ Amey	08 8536 0031
		Fi9	935010	Warrayure	Finnsheep	Knight & Bottcher	03 5578 7250
		WS10	910058	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
		Cr11	930097	Coora	Corriedale	Coora Partnership	02 4848 1244
		BL12*	94S291	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
1997	Hamilton	BL13	950246	Inverbrackie	Border Leicester	CE & LJ Amey	08 8536 0031
		Ro14	930146	Claymour	Romney	Rouch & Gillman	03 5727 1552
		BoL15	924287	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cp16	930069	Narrambla	Coopworth	D Wigan	03 5577 2321
		Fi17	950054	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		Cp18	942297	Oaklea	Coopworth	J Keiller	03 5526 5248
		EF19	940B26	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Cr20	880491	Stanbury	Corriedale	Cole & Risbey	03 5593 9278
		Fi21	960002	UNSW	Finnsheep	S & D Jones	03 5122 3328
1998	Struan	Fi22	890049	ATC	Finnsheep	Jaydee Stud	08 8764 2065
		Fi23	930049	Tambaroora	Finnsheep	Jaydee Stud	08 8764 2065
		BL24	960346	Gleneith	Border Leicester	CE & LJ Amey	08 8536 0031
		BL25	960188	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Cp26	960210	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Cr27	921586	Coora	Corriedale	Coora Partnership	03 5578 6267
		EF28	960133	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Hy29	960028	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Hy30	960128	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		PD31	960110	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		BL32	95T138	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		WS33	951470	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1998	Cowra	BoL34	950029	Caveton Park	Booroola Leicester	PIRSA	08 8762 9100
		BL35	940765	Retallack	Border Leicester	BLA(NSW)/Grinter	02 6974 1153
		Cp36	960067	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cp37	940274	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cc38	960621	Coronga	Coronga Composite	Premier Breed. Tech	02 6365 8207
		EF39	B40	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FL40	940016	Wycombe	Finn x Leicester	R & L Coddington	02 6775 5225
		Gr41	955551	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		WS42	940069	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
1998	Hamilton	BoL43	96P6322	Struan	Booroola Leicester	PIRSA	08 8762 9100
		EF44	960026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		EF45	0019	Glenspean	East Friesian	S & J Cameron	03 5286 1455
		Cr46	950161	Gundowringa	Corriedale	HJ & CJ Prell	02 4848 1244
		EF47	950509	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FiF48	960086	Gippfinn	Finn x Friesian	S & D Jones	03 5122 3328
		Ro49	9200089	Evergreen	Romney	C Duncombe	03 5264 5170
		Tx50	949002	Coolana	Texel	Coolana Rural	03 5350 5531
		WS51	900429	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1999	Cowra	BL52	920070	Kegra	Border Leicester	BLA(NSW)/Golder	02 6977 1339
		BL53	960102	Inverbrackie	Border Leicester	CE & LJ Amey	08 8536 0031
		BL54	970030	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BoL55	955203	Struan	Booroola Leicester	PIRSA	08 8762 9100
		M56	900183	Centre Plus	Merino	L Mortimer & Sons	02 6892 8259
		EL57	960043	Ostlers Hill	English Leicester	ELAssoc/Stephenson	03 5764 1298
		WH58	960505	Clifton Hills	Wiltshire Horn	AWHSBA/Ballantyne	03 5145 8225
		EF59	970100	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		WS60	970842	Linden Genetics	PLG White Suffolk	Linden Genetics	02 6386 2020
1999	Hamilton	BL61	970188	Wongajong	Border Leicester	AD & CM Wilson	02 5882 3338
		BL62	980050	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		BoL63	955160	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cr64	910415	Coolana	Corriedale	PG Munro	03 5575 3240
		Cp65	978431	Cashmore Park	Coopworth	J Keiller	03 5526 5248
		Ch66	920L91	Grand Ridge	Cheviot	RN Waddell	03 5626 4244
		Fi67	960085	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		EFP68	981019	Yollom	East Friesian x Perendale	MF & ML Molloy	03 5596 2077
		EFR69	970175	Price	East Friesian x Romney	EJ & KJ Price	03 5527 1110
1999	Struan	BL70	970310	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL71	970290	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		M72	933051	Merinotech Mid	Merino	Merinotech Mid North	08 8665 4019
		EL73	950T82	Koenart	English Leicester	CR Taylor	03 5595 0272
		Cp74	970101	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Hy75	960215	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		FiF76	960132	Gippfinn	Finn Friesian	S & D Jones	03 5122 3328
		EF77	960136	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		SHD78	970155	Tauranga	South Hampshire Down	S & M Macmillan	03 5596 2251
		PD79	970101	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		WS80	970172	Koonawarra	White Suffolk	AWSA	08 8210 5211
2000	Struan	BL81	960327	Morton	Border Leicester	JD & CM Corbin	08 8765 8058
		BL82	980260	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL83	980085	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		SAM84	980046	Jeancourt	SAMM	W & M Heddle	08 8271 7080
		Cp85	980091	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Gr86	980144	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		Hy87	940278	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Fi88	538	Gippfinn	Finn	S & D Jones	03 5122 3328
		EFP89	981071	Yollom	East Friesian x Perendale	Kanoi Seed Stock/Udy	03 5597 6621
		WS90	960513	Langley Heights	White Suffolk	AWSA	08 8210 5211
		WD91	990906	Axis	White Dorper	B & L Mawson	08 8537 0615

DYNAMIC DAMS

Ewe genetics for the future

Editors: Dr Neal Fogarty & Lynette McLeod *NSW Agriculture, Agricultural Institute, Orange, NSW 2800*
Ph: (02) 6391 3813 *Fax:* (02) 6391 3922 *Email:* neal.fogarty@agric.nsw.gov.au
http://www.lambplan.com.au/mcpt/
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Dynamic Dams reports on project **Maternal sire Central Progeny Test (MCPT)**, part of the ***MLA Lamb Program*** *and provides other information for lamb breeders to improve their maternal genetics. Newsletters are posted on the website. If you wish to be on the mailing list, please contact the Editors.*

Contents

Contributions from readers are welcome.

THE LAMB REVOLUTION

Neal Fogarty, NSW Agriculture

Record lamb prices have capped off a remarkable decade of successful change for the lamb industry. Lamb and the industry have been transformed.

All sectors of the industry have gone through a revolution. Lamb has a greater appeal and consumer profile and farm productivity has been lifted to new highs. There is now a professionalism among all those involved in the chain from production of animals in the paddock to the exciting and healthy meal on the plate.
Some of the achievements include:

- the value of lamb production to farmers has increased by over 150% to more than $1 bill
- lamb exports have more than doubled to be now over 35% of production
- average lamb carcass weights have increased by 14% to almost 20 kg
- fat levels have been reduced by over 10%
- the decline in domestic per capita consumption has been turned around
- lamb has new, exciting and healthier products, a high image with consumers and is now established on fine dining menus

Successful revolutions don't just happen. They require planning, cooperation, organisation, dedication, persistence and commitment to succeed. In the late 1980's the industry was fragmented and dispirited, with low prices for lambs, products that were loss leaders in supermarkets and regarded as too fat and wasteful by consumers, consumption was declining rapidly (5% pa), the domestic market dominated and lamb was seen as a by-product of the wool industry.

How did the lamb revolution occur?
The lamb revolution is a remarkable success story of rural Australia, in which all the stakeholders, producers, processors, retailers, scientists and service providers, have played a significant role.

A coordinated national program of research, production and product development, marketing and promotion was developed in the early 1990's. The program aimed to arrest the declining domestic consumption and boost exports. The Meat Research Corporation, now Meat and Livestock Australia (MLA), coordinated and funded the program with NSW Agriculture and other state Departments taking a leading role in the research, production and marketing areas. The early successes in demonstrating commercial advantages and production possibilities for heavier and leaner carcasses led to a combined effort by all stake-holders to develop a common strategy.

NSW Agriculture
State Government Victoria Department of Natural Resources and Environment
SARDI South Australian Research and Development Institute
LAMBPLAN Excellence in breeding and production
MEAT & LIVESTOCK AUSTRALIA

Supported by Meat and Livestock Australia

To ensure a clear vision for the future and strategies to get there, the lamb industry developed a strategic plan that covered all sectors in 1994, which was revised in 1998 to include all sheepmeat. This had the desired effect to focus all participants on the key strategies for success. Profitable export markets were developed by processors with considerable promotional support from MLA, especially the FARL (Fresh Australian Range Lamb) program into north America. So successful was it that the USA imposed quotas and tariffs for 3 years, but even this could not stem the increased demand in the market! Major domestic promotions recognised changed consumer expectations (eg Trim Lamb).

The challenges were to provide producers with the information, technology and skills to supply larger and leaner carcasses on a year-round basis and to facilitate changes in marketing that rewarded those who matched the new market specifications.

Genetic improvement

Genetic improvement was a key strategy for producing heavier and leaner carcasses from faster growing lambs. The national genetic evaluation program, LAMBPLAN, was launched in 1989. NSW Agriculture developed and implemented the program with industry funding and the later enhancement in the mid 1990's. The R&D included estimation of genetic parameters for a range of growth, carcass, wool and reproduction traits in Australian meatsheep. It also involved development of state of the art statistical procedures and computer software to allow estimated breeding values (EBVs) to be compared across flocks, implementation of live animal scanning for muscle and fat and their incorporation into practical genetic improvement programs on-farm. LAMBPLAN now tests over 70% of terminal sires used in Australia, producers pay significant premiums for high EBV rams and genetic trends are currently increasing at over 4% per year. LAMBPLAN is now an operating division of MLA with strong industry ownership.

Sire and breed type evaluation and demonstration were also key components of industry R&D in the 1990s, together with development of management and lamb finishing systems. These programs were conducted across Australia in a series of coordinated projects and led to widespread industry adoption. R&D programs continue with state Departments of Agriculture undertaking MLA supported projects to achieve greater genetic improvement in the maternal breeding sector, better lamb production management systems and more consistent and better eating quality.

Producer groups and alliances

Another major initiative was lamb producer and marketing groups and development of alliances with processors and retailers. These aimed to improve profitability and the consistency of lamb quality and supply. Value based marketing was widely adopted with the percentage of NSW lambs traded over-the-hooks (OTH) increasing from less than 5% to almost 35% in 2000. There has been a decline in OTH trading recently due to the record saleyard prices in 2001/02. However the benefits of OTH trading are expected to see a return to higher levels in the future. Key elements of this success include training producers in live lamb assessment skills, implementation of fat probe measurements and electronic ticketing of carcasses in abattoirs, facilitating producer groups and meat chain alliances, development of grid based selling systems, OTH trading and forward contracts and development of new trim cuts and retail butcher training and demonstrations.

Meat science R&D has highlighted the importance of pre and post slaughter handling on meat quality. Recently we have seen the development and implementation of video image technology (VIAscan) in abattoir slaughter chains to estimate lean meat yield of lamb carcasses.

Culture shift

The past decade has seen a major culture shift. Lamb is now an industry in its own right and all players in the production chain are professionals in the food and entertainment business. This is not to say the industry has solved all its problems and can rest on its laurels. Future challenges include:

- an ongoing need to improve eating quality of lamb and its consistency of quality and supply;
- maintaining a high level of food safety;
- developing new products and markets; and
- continuing to reduce the cost of production by improved genetics and on-farm management and adoption of processing innovations.

Current issues are to maintain lamb supply to meet expanding markets with a smaller total sheep population and recognition of the importance of the Merino and its improvement for meat. Many of these areas have on-going R&D programs and are in the new Sheep Industry CRC.

MAINTENANCE REQUIREMENTS OF EWES

MLA has agreed to support a new project within the MCPT to determine the relative feed requirements or grazing intake of the 1stX ewes. The project will also determine the amount of genetic variation in meatsheep that can be exploited by selection to improve feed efficiency.

The feed for simply maintaining the ewe flock throughout the year and growing out replacements accounts for over 65% of the total feed required to produce lamb carcass weight. Genetic improvement of efficiency allows higher carrying capacity and/or growing lambs to heavier weights with the same amount of feed. It is likely there are differences in feed requirements over and above that due to the range of over 10kg in average mature weight of the 1stX ewes from the various sire groups. This no doubt affects the maintenance feed requirements and relative carrying capacity of the groups. Studies in beef cattle and Merino sheep have shown moderate genetic variation with estimates of heritability of about 0.12 for feed intake of Merino sheep under grazing conditions.

The study will provide estimates of heritability and genetic correlations with other production traits. These will be added to LAMBPLAN to allow EBVs for feed efficiency to be calculated and included in breeding programs.

An estimate of feed intake for dry mature ewes will be obtained from all 1stX ewes in the MCPT after they have completed their 3 years of evaluation of lamb production. Feed intake of the ewes grazing pasture will be estimated using chromium sesquioxide capsules and faecal sampling. The first group of ewes were sampled at Hamilton (1997 drop) in February and the first group at Cowra will be sampled in April. Other groups will be sampled as they complete their lambing evaluation at each site.

LETTER TO THE EDITOR

Saw the latest results from Cowra with interest. Given the differences between the trait leaders in relation to carcase/production (including FEC) qualities on the one hand and wool qualities on the other it seems to me that choices of breeds for maternal sires will inevitably be either a compromise or a choice based on particular enterprises. I wonder therefore whether you will be looking at maintenance costs for the first cross ewes. It seems to me for example that with the Wiltshire cross, what you lose on the wool value you might well gain on less costs for external parasite control, and crutching and dagging. This has been the experience of our breeders. While we have concentrated on the Wiltshire in two functions (a) terminal sire (b) production, by back-crossing. of low maintenance cost shedding ewes for prime lamb production starting from merinos or first cross ewes, there has long been a belief that the breed could have a role as a producer of first cross ewes. (Another reason for this belief is the high fertility and good mothering of the breed, features which may well be inherited by the cross breds, but obviously you will be analysing breeding performance). I guess producers of other breeds would also see different features as valuable in the crosses they are producing, and I wondered how detailed is the analysis of the performance versus cost of the first cross ewes you are able to do. We also need to distinguish (if possible) between outcomes that are breed characteristic (eg. wool qualities) and those which may just be a function of the particular sire in the trial. This is very difficult to do, especially when there are unequal numbers of rams of different breeds. People using the figures should beware of saying that a particular breed has a particular feature (eg. offspring relatively high in fat, or poor in worm resistance) unless it is clearly a breed characteristic. A future trial might choose rams from different breeds with similar EBVs for the main features in order to distinguish breed characteristics.

David Horton
Pickwick Wiltshire Horn Stud, Gundaroo, NSW

PS Alpacas are really as good as they say for fox protection, in reference to your losses. For two years in a row we have lost no lambs to foxes after getting alpacas, in an area with very abundant foxes, where both neighbours lose many lambs every year.

MCPT UPDATE

Cowra (Jayce Morgan & Lynette McLeod)

Seasonal Conditions

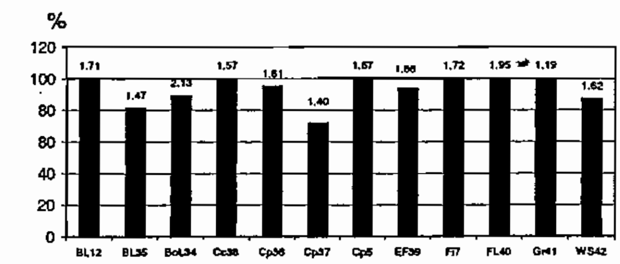
The summer has been very dry and very wet. There was no effective rain from mid Dec to the end of Jan. Consequently the 2001 spring lambs needed supplementary feeding through Jan and were slaughtered in early Feb. Both groups of lambs were surprisingly lean at slaughter. Slaughter data will be presented in the next issue.

No adult sheep were supplemented. Rain came in Feb and it rained and rained (14 wet days and 176mm). Conditions totally turned around with feed everywhere, though it is almost as dry now as it was before the rain.

The autumn joining is almost complete with 85% ewes raddled after the first fortnight. Autumn lambing has commenced. We are trialing Alpacas as a fox deterrent after the bad losses at the winter lambing. We'll keep you posted.

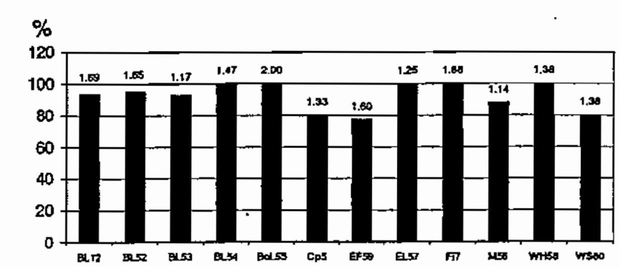
1stX ewes – spring joined

Fig.1. 1st X Ewe pregnant / ewe joined



Sire of 1st X ewe (1998 drop)

Fig. 2. 1st X Ewes pregnant / ewe joined



Sire of 1st X ewe (1999 drop)

Numbers above bar show average foetuses per pregnant ewe.

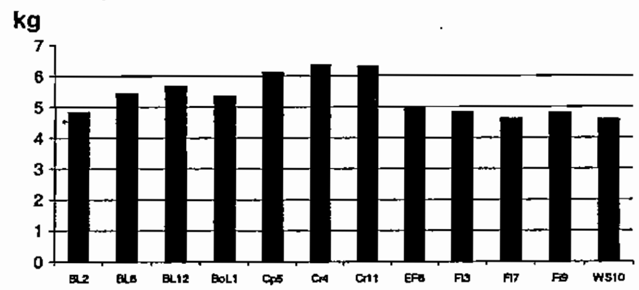
The 1998 and 1999 drop 1stX spring joined ewes were mated to high LAMBPLAN index Poll Dorset rams for 6 weeks from late October 2001. This is the third and final lambing for the '98 drop spring join ewes, and the second lambing for the '99 drop spring join ewes. The ewes were scanned in January with pregnancy and number of foetuses shown in Figs. 1 and 2. The average conception rate was over 92%. They have just started lambing and will finish in early May.

Pregnancy rates for the 12 sire groups of '98 drop 1stX ewes (Fig.1) ranged from 71 to 100%. The average number of foetuses per pregnant ewe ranged from 1.19 to 2.13, with half of the groups averaging more than 1.67. The BoL34 sire group averaged more than twins. The 1999 drop ewes (Fig. 2) also had high conception rates ranging from 77 to 100%. The range in average number of foetuses per pregnant ewe was1.14 to 2.00.

1stX ewes – shearing

All 1stX ewes were shorn in early October. Greasy fleece weight and classing bin line were recorded. The average greasy fleece weight of all ewes was 5.3 kg. Among the 1997 drop ewes (Fig. 3) the sire groups ranged from 4.6 to 6.3 kg with Cr4, Cp5 and Cr11 groups being the highest.

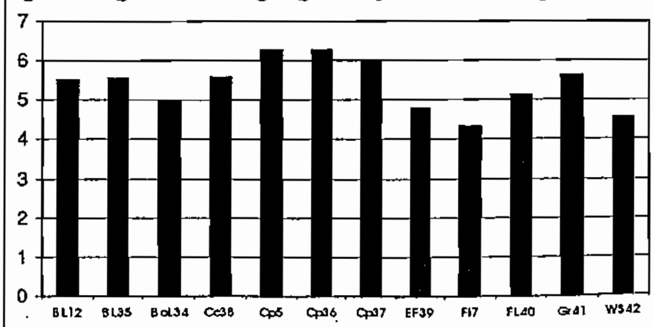
Fig. 3. Average greasy fleece weight



Sire of 1st X ewe (1997 drop)

The average greasy fleece weights for the 1998 drop ewes (Fig. 4) ranged from 4.3 to 6.3 kg with the three Coopworth sire groups (Cp5, Cp36 and Cp37) having the highest fleece weights.

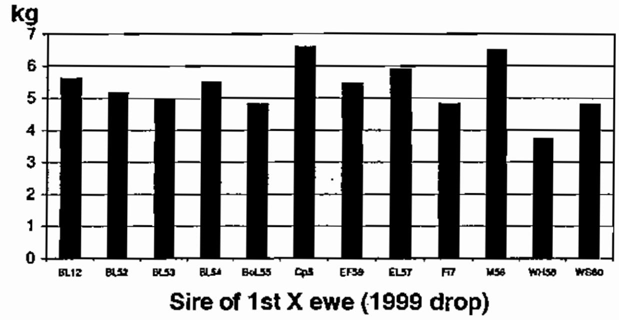
Fig.4. Average greasy fleece weight



Sire of 1st X ewe (1998 drop)

The greasy fleece weights for the 1999 drop 1stX ewes (Fig. 5) ranged from 3.7 to 6.6 kg with the Coopworth (Cp5) and the Merino (M56) sire groups having the highest fleece weights.

Fig. 5. Average greasy fleece weight



Hamilton (Leo Cummins)

The late summer and early autumn period at Hamilton have been reasonably mild but very dry. There has been some quite serious and widespread plant toxicity problems in the region, presumably associated with these seasonal conditions (including the green early summer). The two that have affected us were lesser loosestrife (*Lythrum hyssopifolia*) poisoning, which killed 7 lambs grazing stubbles and perennial ryegrass staggers (due to neurotoxins caused by endophyte infection). These have made grazing management difficult. The lambs have been set back a little. The progeny of the 1997 and 1998 ewes have been moved to a feedlot and the 1999 group are grazing turnips. The ewes have been grazing on Phalaris dominant pastures.

The 1997 drop ewes have been involved in an intake study. This involved treating them with slow release chromium capsules and then taking a series of faecal samples and pasture measurements. The ewes were also weighed and scanned at the start and end of the period. This will allow us to calculate the actual intakes of the animals. At the end of this they have been joined. These ewes have now finished their period in the MCPT trial but they have been rejoined.

The 1998 and 1999 ewes were joined, starting on the 19th Feb. The 1998 ewes joined up quickly, but the 1999 ewes were a little slower (Table 1). The rams will be withdrawn straight after Easter.

Table 1. 1stX ewes joined and marked to mid-March 2002.

1998 1st X ewes			1999 1st X ewes		
Sire	Mark	Join	Sire	Mark	Join
FiF 48	14	14	BoL 63	15	16
Cr 46	16	17	Cr 64	13	22
WS 51	9	12	Fi 67	8	13
Tx 50	13	15	Cp 65	14	24
BoL 43	10	12	BL 62	9	13
BL 12	17	20	BL 12	25	29
Fi 7	9	10	EFR 69	15	18
Cp 5	11	16	BL 61	8	8
EF 44	10	12	Ch 66	15	22
Ro 49	16	16	Fi 7	18	20
EF 47	8	8	EFP 68	10	15
EF 45	11	13	Cp5	16	19

The lamb weights at the start of the feedlot or fodder crop periods (27/2/02) are shown in Table 2. The lambs from the 1999 sires are several weeks younger. Within each group there are differences between sires progeny groups of between 6.0 and 7.7 kg.

Table 2. 2ndX lamb liveweights (kg) 27/2/02

1997 Sires	Wgt	1998 Sires	Wgt	1999 Sires	Wgt
BL 12	35.2	FiF 48	36.6	BoL 63	29.7
BL 13	36.8	Cr 46	35.4	Cr 64	26.0
Ro 14	31.4	WS 51	35.5	Fi 67	26.5
Cp 5	31.7	Tx 50	33.3	Cp 65	29.0
BoL 15	33.8	BoL 43	34.8	BL 62	30.9
Cp 16	32.0	BL 12	35.0	BL 12	29.4
Fi 7	31.6	Fi 7	32.2	EFR 69	29.8
Fi 17	29.2	Cp 5	33.9	BL 61	32.0
Cp 18	33.4	EF 44	37.7	Ch 66	26.4
EF 19	33.7	Ro 49	35.5	Fi 7	26.3
Cr 20	32.5	EF 47	38.7	EFP 68	30.9
Fi 21	30.6	EF 45	39.9	Cp 12	27.1

Rutherglen (Gervaise Gaunt)

Rutherglen has now completed 2 years of 2ndX lamb carcase assessment. Progeny from the 1998-drop 1stX ewes were processed in November 2000 and 2001 and progeny from the 1999-drop ewes were processed in November 2001. All 1stX ewes (1998,1999 and 2000-drop) are due to lamb over a 6-week period commencing early April 2002.

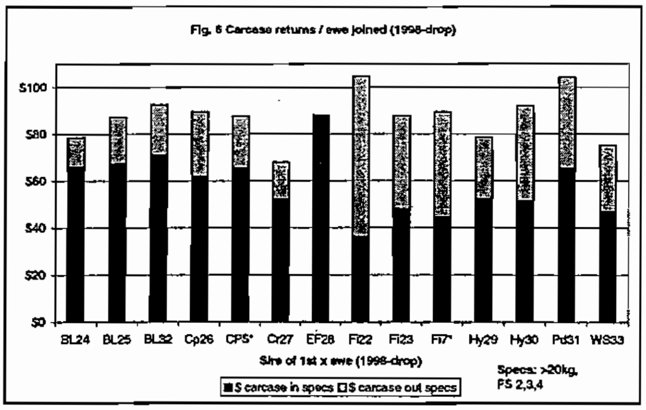
Season

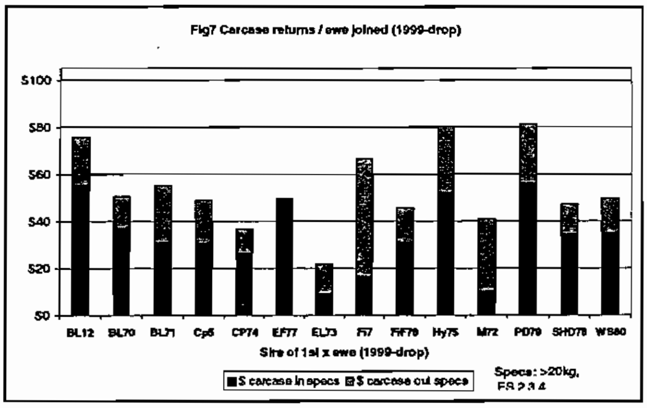
The mild spring and early summer of 2001 resulted in a one month longer growth phase of pasture, which is not normally experienced at this time of year. As a consequence, ewes were in peak condition for joining with average fat score 3+, and pre-joining liveweight averages of 64 kg, 60 kg and 56 kg (off-shears) for 1998, 1999 and 2000-drop ewes respectively. Following the normal seasonal pattern, pasture availability and quality declined in January. Supplementary feeding of triticale (600g/head) and ad-lib hay commenced in early February 2002 after an introductory phase.

2ndX Carcase:

Second cross lambs were slaughtered at Gundagai Meat Processors in November 2001. Coles once again provided their support by allowing access for collection of data at slaughter and during boning room processing. Lambs averaged fat score 2 and carcase weight averaged 21.5 kg and 21.1 kg for 1998 and 1999 (maiden) ewes respectively. There was a 6.2 kg difference between the heaviest average carcase weight per sire ie. 24.7 kg (East Fresian 28) and the lowest carcase weight average was 18.5 kg for the Finn (Fi7) and Merino (M72) progeny groups.

Figs. 6 and 7 show the carcase returns ***per ewe joined*** for the 26 sires assessed in 2001, the proportion of lambs in and out of specifications is also shown for each sire. Prices are based on those received in November 2001, at the time of slaughter: $3.00/kg for carcases 20kg and over, fat score 2, 3 and 4 (in specifications) and $2.80/kg for carcases <20kg and/or fat score 1 or 5 (outside specifications). Price includes the skin values received for lambs; 20 kg carcase and over ($14.10) and <20 kg ($13.30).





There was a substantial difference of ***$37 per ewe joined*** between the top ($104.59) and the bottom ($67.95) 1998-drop sire groups (n=14), for one year of production. This means a difference of ***$183 per ewe joined*** over their lifetime of 5 joinings between the top and bottom sire groups. A maternal sire produces approx. 100 ewes (and 100 wethers) in his lifetime, so the difference between using the top and bottom sire in the 1998-drop trial alone, would be $18,500 and this doesn't take into account the income from wether progeny.

The results reinforce previous findings that the genetics of the prime lamb mother has a major impact on the profitability of your enterprise.

1stX Ewes – Conception

Ewes were shorn in late October and joined to high performance White Suffolk rams for 6 weeks from early November. All rams were harnessed and raddle marks were recorded twice weekly. There was a high incidence of ram activity early in the joining for the 1998 and 2000-drop (maidens). The 1999-drop ewes (2nd joining opportunity) had a very low rate of joining in the first weeks, even though all ewes had similar treatment pre-joining, their joining rates improved however, later in the joining period. A possible reason for delay could be due to a higher proportion of maternal sires with ewe progeny that are reliant on season for fecundity.

Tables 3-5 show pregnancy results following ultrasound scanning for the 1998, 1999 and 2000-drop ewes. Results show pregnancy rate averages of 95% for 1998-drop, 88% for 1999-drop and 87% for the 2000-drop maiden ewes. The lower than expected conception rate for the 1999-drop ewes can mainly be attributed to the English Leicester sire group (EL73), as only 43% of his 1stX daughters were pregnant.

Table 3. Ewes pregnant and foetuses per ewe joined Nov/Dec 2001 (1998-drop 1stX ewes).

Sire Code	No. Ewes Joined	% pregnant	Average Foetuses (n)
BL24	20	95	1.5
BL25	20	90	1.5
BL32	9	78	1.3
Cp26	23	96	1.8
Cp5*	18	94	1.7
Cr27	15	93	1.4
EF28	16	88	1.4
Fi22	17	100	2.1
Fi23	18	100	1.9
Fi7*	31	90	1.7
Hy29	25	96	1.6
Hy30	28	100	1.5
Pd31	26	96	1.7
WS33	24	100	1.8
Total	290	95	1.7

*link sires

Table 4. Ewes pregnant and foetuses per ewe joined Nov/Dec 2001 (1999-drop 1stX ewes).

Sire Code	No. Ewes Joined	% pregnant	Average Foetuses (n)
BL12*	16	100	1.8
BL70	23	83	1.3
BL71	21	90	1.3
CP5*	29	90	1.2
CP74	15	87	1.3
EF77	16	94	1.2
EL73	23	43	0.5
Fi7*	24	92	2.0
FiF76	32	88	1.4
Hy75	22	100	1.5
M72	13	92	1.4
PD79	13	100	1.4
SHD78	18	94	1.2
WS80	16	94	1.4
Total	281	88	1.3

*link sires

There are clearly large differences in sire groups for average conception rates and number of foetuses. Potential lambing rates range from 133-206% for the 1998-drop, 52-196% for the 1999-drop and 74-144% for the 2000-drop ewes.

Table 5. Ewes pregnant and foetuses per ewe joined Nov/Dec 2001 (2000-drop 1stX ewes).

Sire Code	No. Ewes Joined	% pregnant	Average Foetuses (n)
BL12*	22	86	1.1
BL81	24	88	1.0
BL82	12	83	1.0
BL83	18	83	1.2
Cp5*	17	82	1.1
Cp85	19	89	1.1
EFP89	19	63	0.7
Fi7*	34	85	1.4
Fi88	26	88	1.4
Gr86	26	88	1.0
Hy87	23	100	1.3
SAM84	16	100	1.4
WD91	15	87	1.1
WS90	14	100	1.3
Total	292	87	1.2

*link sires

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Mailing List – Privacy Act

Many of you returned the Consent Form enclosed with the last Newsletter. If you did not, or if you did and the details were unreadable on the fax owing to the colour of the paper, a Consent Form has been enclosed for your completion and return. Under the Privacy Act your consent is required for us to keep personal information eg name, address and other contact details.

PLEASE RETURN the CONSENT FORM

If you do not return the Consent Form your name MUST be removed from the list and you will not receive future issues of Dynamic Dams.

RESEARCH HIGHLIGHTS

Summaries from selected papers presented to the 14th *Conference of the Association for the Advancement of Animal Breeding and Genetics (AAABG),* held in Queenstown, NZ, July 2001.

SURVEY OF HIGH PERFORMING SHEEP FARMERS: LAMB REARING PERFORMANCE

J.M. Everett-Hincks, K.J. Stafford and H.T. Blair

Data from 181 New Zealand sheep farmers were collected and segregated into two production groups based on mixed age breeding ewe lambing percentage: high *(150%* and greater) and low (less than *150%).* High lamb rearing success was observed in high and low lambing percentage farms, which is not surprising considering high performing sheep farmers were surveyed. Average lambing percentage for the respondents surveyed was 143% compared to the national lambing percentage average of *115%.* Shepherding frequency was significantly higher with high lambing percentage farmers compared with the low lambing percentage farmers.

GENETIC PARAMETERS FOR PASTURE INTAKE AND WOOL GROWTH EFFICIENCY IN MERINO SHEEP

G.J. Lee, K.D. Atkins and A.A. Swan

In this report, all of the known estimates of the genetic parameters for pasture intake by Merino sheep and its relationship with Production traits were combined. Combining these estimates improved the precision of the genetic parameter estimates. The pooled estimates of heritability of digestible organic matter intake (DOMI), wool growth, wool growth efficiency and fibre diameter were 0. 12 ± 0.04, 0.37 ± 0.05, 0.25 ± 0.05 and 0.66 ± 0.08, respectively. The genetic relationships of wool growth efficiency with wool growth and fibre diameter were 0.84 ± 0.20 and -0.03 ± 0.12, respectively, while those for feed intake (as DOMI) with wool growth and fibre diameter were -0.02 ± 0. 17 and 0.40 ± 0.15.

IMPROVEMENTS IN WORM RESISTANCE CAN BE PASSED FROM STUDS TO CLIENT FLOCKS

A.M. Bell and S.J. Eady

Four commercial ram buying clients drafted their normal purchase of rams from four New England Merino breeders into two groups based on their faecal egg count estimated breeding value (FEC EBV). These rams were group-mated in 'resistant' or 'susceptible' sire groups to a random draft of property flock ewes and the progeny were run together after lamb marking or weaning. Progeny faecal egg counts (FECs) at an average age of 34 weeks revealed that there was a favourable significant difference in FEC on one property. No other significant differences were found, although the trend in egg counts was in a favourable direction with resistant sires on average having lower egg counts. This information is encouraging as it demonstrated that improvements in parasite resistance can be passed from the stud breeding level to the commercial level.

MAJOR GENE EFFECTS ON RESISTANCE TO BODY STRIKE AND FLEECE ROT IN MERINO SHEEP REVISITED

S.I. Mortimer, J.M. Henshall and B. Tier

Segregation analyses of fleece rot and body strike records from divergent lines of Merino sheep selected for increased (Susceptible line) and reduced (Resistant line) expression of fleece rot and body strike were used to examine the possibility of major gene effects influencing the expression of resistance to these disease traits. Analyses were based on a Markov Chain Monte Carlo algorithm that accounted for the categorical nature of the traits by sampling variables from an unobserved underlying continuous distribution. The analyses suggest that the data were consistent with a model that includes a major gene influencing both resistance to fleece rot and body strike. Under this model, the proportion of the phenotypic variance due to a major gene was 20% for fleece rot and 15% for body strike incidences. The desirable alleles for both traits were dominant and at high gene frequencies.

GENETIC PARAMETERS FOR LIVEWEIGHT, WOOL GROWTH AND LITTER SIZE AND THE ASSOCIATIONS AMONG THESE TRAITS IN CORRIEDALE SHEEP

D.J. Brown, B. Tier, A. Reverter, A. Ball and R. Banks

The Corriedale is a dual-purpose breed and as a result selection targets production and reproduction with a diverse range of traits for growth rate, wool growth, carcass quality and litter size. This paper reports estimates of the genetic and phenotypic relationships between these traits. Litter size at birth and during suckling, and dam age, have significant effects on hogget liveweight, fleece weight and fibre diameter. A maternal genetic effect on liveweight and fleece weight was found. Fibre diameter was negatively correlated with litter size while liveweight and fleece weights were positively correlated with litter size. These results highlight the importance of utilising the modem genetic technology of EBVs which account for all these effects and relationships between traits.

GENETIC VARIATION IN REPRODUCTIVE PERFORMANCE OF FINE WOOL MERINOS

A.A. Swan, L.R. Piper, H.C. Brewer and 1.W. Purvis

Genetic variation in reproduction rate was investigated in a flock of fine wool Merino sheep. Predicted means for reproduction traits were 0.81 for fertility (ewes lambing per ewe joined), 1. 12 for litter size (lambs born per ewe lambing), 0.82 for survival (lambs weaned per lambs born), and 0.72 for lambs weaned (number of lambs weaned per ewe joined). Predicted means for eleven bloodlines represented in the flock ranged from 0.61 to 0.82 for lambs weaned. Estimated heritabilities for reproduction traits were low, ranging from 0.02 to 0.08. Lambs weaned was strongly correlated with its component traits, with estimated genetic correlations ranging from 0.66 to 0.91. The trait was also moderately correlated with body weight, with an estimated genetic correlation of 0.35.

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Maternal sire entries - details

* Link sires used at each site each year

Year	Site	Sire Code	Tag	Stud	Breed	Entrant	Phone No.
1997	Cowra	BoL1	922047	Struan	Booroola Leicester	PIRSA	08 8762 9100
		BL2	950137	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Fi3	940001	Yamba	Finnsheep	M & L Burns	03 5798 1583
		Cr4	940364	Maluka	Corriedale	P Secker	02 4848 1244
		Cp5*	940449	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		EF6	940B21	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Fi7*	930057	Warrayure	Finnsheep	GM & MA Wake	03 5574 1254
		BL8	950181	Inverbrackie	Border Leicester	CE & LJ Amey	08 8536 0031
		Fi9	935010	Warrayure	Finnsheep	Knight & Bottcher	03 5578 7250
		WS10	910058	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
		Cr11	930097	Coora	Corriedale	Coora Partnership	02 4848 1244
		BL12*	94S291	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
1997	Hamilton	BL13	950246	Inverbrackie	Border Leicester	CE & LJ Amey	08 8536 0031
		Ro14	930146	Claymour	Romney	Rouch & Gillman	03 5727 1552
		BoL15	924287	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cp16	930069	Narrambla	Coopworth	D Wigan	03 5577 2321
		Fi17	950054	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		Cp18	942297	Oaklea	Coopworth	J Keiller	03 5526 5248
		EF19	940B26	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Cr20	880491	Stanbury	Corriedale	Cole & Risbey	03 5593 9278
		Fi21	960002	UNSW	Finnsheep	S & D Jones	03 5122 3328
1998	Struan	Fi22	890049	ATC	Finnsheep	Jaydee Stud	08 8764 2065
		Fi23	930049	Tambaroora	Finnsheep	Jaydee Stud	08 8764 2065
		BL24	960346	Gleneith	Border Leicester	CE & LJ Amey	08 8536 0031
		BL25	960188	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Cp26	960210	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Cr27	921586	Coora	Corriedale	Coora Partnership	03 5578 6267
		EF28	960133	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Hy29	960028	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Hy30	960128	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		PD31	960110	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		BL32	95T138	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		WS33	951470	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1998	Cowra	BoL34	950029	Caveton Park	Booroola Leicester	PIRSA	08 8762 9100
		BL35	940765	Retallack	Border Leicester	BLA(NSW)/Grinter	02 6974 1153
		Cp36	960067	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cp37	940274	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cc38	960621	Coronga	Coronga Composite	Premier Breed. Tech	02 6365 8207
		EF39	B40	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FL40	940016	Wycombe	Finn x Leicester	R & L Coddington	02 6775 5225
		Gr41	955551	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		WS42	940069	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
1998	Hamilton	BoL43	96P6322	Struan	Booroola Leicester	PIRSA	08 8762 9100
		EF44	960026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		EF45	0019	Glenspean	East Friesian	S & J Cameron	03 5286 1455
		Cr46	950161	Gundowringa	Corriedale	HJ & CJ Prell	02 4848 1244
		EF47	950509	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FiF48	960086	Gippfinn	Finn x Friesian	S & D Jones	03 5122 3328
		Ro49	9200089	Evergreen	Romney	C Duncombe	03 5264 5170
		Tx50	949002	Coolana	Texel	Coolana Rural	03 5350 5531
		WS51	900429	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1999	Cowra	BL52	920070	Kegra	Border Leicester	BLA(NSW)/Golder	02 6977 1339
		BL53	960102	Inverbrackie	Border Leicester	CE & LJ Amey	08 8536 0031
		BL54	970030	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BoL55	955203	Struan	Booroola Leicester	PIRSA	08 8762 9100
		M56	900183	Centre Plus	Merino	L Mortimer & Sons	02 6892 8259
		EL57	960043	Ostlers Hill	English Leicester	ELAssoc/Stephenson	03 5764 1298
		WH58	960505	Clifton Hills	Wiltshire Horn	AWHSBA/Ballantyne	03 5145 8225
		EF59	970100	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		WS60	970842	Linden Genetics	PLG White Suffolk	Linden Genetics	02 6386 2020
1999	Hamilton	BL61	970188	Wongajong	Border Leicester	AD & CM Wilson	02 5882 3338
		BL62	980050	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		BoL63	955160	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cr64	910415	Coolana	Corriedale	PG Munro	03 5575 3240
		Cp65	978431	Cashmore Park	Coopworth	J Keiller	03 5526 5248
		Ch66	920L91	Grand Ridge	Cheviot	RN Waddell	03 5629 4300
		Fi67	960085	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		EFP68	981019	Yollom	East Friesian x Perendale	MF & ML Molloy	03 5596 2077
		EFR69	970175	Price	East Friesian x Romney	EJ & KJ Price	03 5527 1110
1999	Struan	BL70	970310	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL71	970290	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		M72	933051	Merinotech Mid	Merino	Merinotech Mid North	08 8665 4019
		EL73	950T82	Koenari	English Leicester	CR Taylor	03 5595 0272
		Cp74	970101	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Hy75	960215	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		FiF76	960132	Gippfinn	Finn Friesian	S & D Jones	03 5122 3328
		EF77	960136	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		SHD78	970155	Tauranga	South Hampshire Down	S & M Macmillan	03 5596 2251
		PD79	970101	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		WS80	970172	Koonawarra	White Suffolk	AWSA	08 8210 5211
2000	Struan	BL81	960327	Morton	Border Leicester	JD & CM Corbin	08 8765 8058
		BL82	980260	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL83	980085	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		SAM84	980046	Jeancourt	SAMM	W & M Heddle	08 8271 7080
		Cp85	980091	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Gr86	980144	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		Hy87	940278	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Fi88	538	Gippfinn	Finn	S & D Jones	03 5122 3328
		EFP89	981071	Yollom	East Friesian x Perendale	Karioi Seed Stock/Udy	03 5597 6621
		WS90	960513	Langley Heights	White Suffolk	AWSA	08 8210 5211
		WD91	990906	Axis	White Dorper	B & L Mawson	08 8537 0615

DYNAMIC DAMS

Ewe genetics for the future

Editor: Dr Neal Fogarty, *NSW Agriculture, Agricultural Institute, Orange, NSW 2800*
Ph: (02) 6391 3813 *Fax:* (02) 6391 3922 *Email:* neal.fogarty@agric.nsw.gov.au
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Dynamic Dams** reports on project* **Maternal sire Central Progeny Test (MCPT)**, part of the *MLA* ***Lamb Program** and provides other information for lamb breeders to improve their maternal genetics. Newsletters are posted on the website. If you wish to be on the mailing list, please contact the Editors.* ***Contributions from readers are welcome.

Contents

1STX EBVS 2001 – MEAT, WOOL

The 1stX EBVs for meat traits and wool traits for all 91 sires are shown in Table 2, with the trait leaders in Table 1 (sire codes p18). Some interesting trends are showing up in the results. In particular, there is a considerable range in sire EBVs for weight and fat. Several breeds are represented among the leaders for all traits and clearly there is a lot of variation between individual sires within the breeds. The leading sires are generally different for the various traits. The East Friesian sires are all very lean.

Table 1. Trait leaders 2001 - 1stX EBVs

Sire	Weight (kg)	Sire	Fat (mm)	Sire	Muscle (mm)	Sire	Wool (kg)	Sire	Diam (um)
EF59	9.7	M56	-6.3	Tx50	3.9	Cp5	1.63	M56	-10.3
EF28	8.0	EF6	-6.2	PD31	3.7	EL73	1.22	M72	-7.9
PD31	7.2	EF59	-5.2	Cp65	3.2	Cp36	1.10	Fi7	-6.9
WS33	6.2	Cr4	-5.2	WS33	3.1	Ro14	1.05	SAM84	-6.8
WS42	5.9	EF39	-4.9	Hy75	2.5	BL12	0.87	WD91	-6.1
PD79	4.7	EF19	-4.8	WS10	2.2	Cp18	0.83	Fi22	-5.8
WH58	4.3	EF28	-4.8	WH58	2.1	Cp37	0.78	Cr11	-5.4
EFP89	3.9	EF44	-4.7	PD79	1.9	Cp74	0.72	Fi23	-5.0
Cp85	3.9	M72	-4.2	WS90	1.9	Cr64	0.63	Hy75	-4.2
BL54	3.8	EF45	-4.2	Cr4	1.9	Cp26	0.58	Cr27	-4.2
WS80	3.8	SAM84	-4.1	BoL34	1.8	Cp85	0.58	Cr46	-4.1
EF19	3.7	EFP89	-3.7	Cp26	1.5	M56	0.56	Cr20	-4.1
BL70	3.6	Cr64	-3.6	WS51	1.5	EL57	0.52	Hy87	-3.9
WS51	3.6	EF47	-3.4	WS60	1.5	Cr20	0.52	Cr64	-3.7
SHD78	3.2	EF77	-3.3	BL71	1.5	BL35	0.51	Fi88	-3.7
WS90	3.1	EFP68	-2.7	Cc38	1.4	Cr4	0.48	FL40	-3.6
BL12	3.0	Cr20	-2.6	BoL15	1.4	Ro49	0.44	Cr4	-3.6
EF77	3.0	Ro14	-2.3	WS80	1.4	BL8	0.43	Fi21	-3.5
EF39	2.9	Cp85	-2.3	Gr86	1.3	M72	0.41	Fi9	-3.3
BL24	2.9	Fi88	-2.2	BoL55	1.2	BL54	0.41	Fi67	-3.3

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Table 2. 1stX EBVs 2001 for meat, wool and worm resistance (FEC)

Sire	Weight (kg)	Fat (mm)	Muscle (mm)	Clean wool (kg)	Diameter (um)	FEC
BoL1	-0.8	3.8	-0.1	0.40	-3.3	2.2
BL2	2.8	-0.4	0.0	0.19	3.6	-0.1
Fi3	-1.1	-1.1	-0.1	-0.52	-3.0	0.7
Cr4	-8.2	-5.2	1.9	0.48	-3.6	0.0
Cp5	0.8	0.7	0.5	1.63	-1.0	-1.4
EF6	-1.9	-6.2	0.2	0.28	0.8	0.6
Fi7	1.7	0.7	-0.6	-0.99	-6.9	0.2
BL8	1.2	5.1	-0.2	0.43	2.9	0.8
Fi9	2.2	-0.8	-1.6	0.62	-3.3	0.8
WS10	2.3	0.5	2.2	-0.63	0.8	0.0
Cr11	-10.6	-2.1	-0.7	0.29	-5.4	-0.1
BL12	3.0	2.1	0.3	0.87	3.7	0.3
BL13	1.1	5.4	-0.4	-0.33	-0.8	-0.1
Ro14	-3.2	-2.3	-1.3	1.05	1.8	-1.3
BoL15	-0.4	4.2	1.4	-0.53	0.0	-1.2
Cp16	-1.2	0.1	0.7	0.34	3.8	0.5
Fi17	0.9	0.6	1.1	-0.21	-1.8	-0.7
Cp18	-4.7	-0.2	0.3	0.83	3.1	0.7
EF19	3.7	-4.8	-1.9	0.12	2.5	-1.0
Cr20	-6.2	-2.6	-1.2	0.52	-4.1	2.0
Fi21	0.7	-0.8	-0.8	-0.36	-3.5	-0.1
Fi22	-0.7	-0.9	-4.5	-0.38	-5.8	
Fi23	-0.8	-1.4	0.8	-0.32	-5.0	
BL24	2.9	3.5	-0.5	0.20	3.5	
BL25	-1.4	2.1	-0.3	0.27	5.6	
Cp26	1.2	1.0	1.5	0.58	0.6	
Cr27	-6.3	-2.0	-0.9	0.39	-4.2	
EF28	8.0	-4.8	-3.6	0.09	1.9	
Hy29	-5.4	0.9	0.2	-0.38	-1.5	
Hy30	-5.8	-1.7	0.8	-0.15	-1.4	
PD31	7.2	1.2	3.7	-0.24	-0.2	
BL32	0.5	1.3	-0.4	0.39	3.7	
WS33	6.2	-0.2	3.1	-0.43	2.2	
BoL34	-7.1	6.7	1.8	-0.32	1.0	0.7
BL35	3.0	1.5	-1.3	0.51	1.5	-0.9
Cp36	-0.1	1.5	0.1	1.10	1.0	0.1
Cp37	-5.2	0.0	-0.4	0.78	5.8	-0.4
Cc38	-2.4	-2.1	1.4	-0.14	2.1	-1.3
EF39	2.9	-4.9	2.1	-0.15	1.9	1.1
FL40	2.7	0.8	-0.4	-0.10	-3.6	0.8
Gr41	-5.2	0.3	-1.4	-0.02	-2.3	0.0
WS42	5.9	1.3	0.6	-1.06	2.5	-1.5
BoL43	-0.8	4.5	0.9	-0.36	-0.6	-0.4
EF44	-0.5	-4.7	-2.5	-0.07	0.2	1.2
EF45	2.7	-4.2	0.0	0.12	-0.6	0.5
Cr46	-5.6	-0.6	-1.2	0.40	-4.1	0.2
EF47	0.9	-3.4	-0.6	0.15	1.9	-0.5
FiF48	2.1	-0.5	0.4	-0.34	-2.7	-0.4
Ro49	-0.6	-0.1	-0.6	0.44	0.5	0.3
Tx50	1.0	0.3	3.9	0.11	1.6	-1.6
WS51	3.6	0.6	1.5	-0.06	2.0	-1.2
BL52	-1.3	0.7	0.3	0.07	1.4	-1.2
BL53	-1.7	2.2	-0.8	-0.12	2.0	0.2
BL54	3.8	2.3	-1.3	0.41	2.8	-0.9
BoL55	-0.3	3.0	-1.2	-0.66	-0.1	-0.8
M56	-13.0	-6.3	-1.5	0.56	-10.3	2.3
EL57	-2.9	3.0	-0.1	0.52	2.1	0.0
WH58	4.3	3.4	2.1	-1.61	3.6	-1.6
EF59	9.7	-5.2	-1.1	0.23	0.4	0.2
WS60	0.3	-0.5	1.5	-0.52	1.3	-0.5
BL61	-1.4	-0.9	0.7	0.01	2.0	1.6
BL62	1.7	4.0	-1.6	0.07	1.1	0.6
BoL63	-4.7	5.7	-0.1	-0.05	0.3	1.3
Cr64	-5.9	-3.6	-1.0	0.63	-3.7	2.0
Cp65	0.4	1.4	3.2	0.28	2.6	-2.6
Ch66	-2.0	-1.2	0.6	-0.21	-0.7	-3.3
Fi67	2.6	0.8	0.3	-0.30	-3.3	1.8
EFP68	1.6	-2.7	-0.1	-0.05	1.0	1.5
EFR69	-1.6	-1.3	0.5	-0.22	0.9	-0.7
BL70	3.6	1.7	-0.3	0.28	2.7	
BL71	1.9	3.4	-1.5	0.23	2.8	
M72	-4.7	-4.2	-2.8	0.41	-7.9	

Sire	Weight (kg)	Fat (mm)	Muscle (mm)	Clean wool (kg)	Diameter (um)	FEC
EL73	0.2	-0.3	-0.9	1.22	4.3	
Cp74	-2.3	-1.0	-0.2	0.72	1.8	
Hy75	-2.3	2.2	2.5	-0.75	-4.2	
FiF76	0.5	-0.9	-1.9	-0.54	-0.7	
EF77	3.0	-3.3	-2.8	-0.12	1.8	
SHD78	3.2	2.3	0.4	-0.34	-0.4	
PD79	4.7	2.2	1.9	-0.67	0.7	
WS80	3.8	0.1	1.4	-0.23	0.0	
BL81	1.5	6.0	0.8	0.39	2.9	1.9
BL82	2.8	1.8	0.8	0.25	2.5	0.7
BL83	1.7	5.9	0.1	-0.15	2.7	0.6
SAM84	-2.8	-4.1	-0.3	-0.41	-6.8	2.9
Cp85	3.9	-2.3	1.7	0.58	1.0	-0.4
Gr86	-1.4	0.0	1.3	0.36	-2.1	0.9
Hy87	0.4	-0.7	0.5	-0.35	3.9	0.2
Fi88	-0.8	-2.2	-1.5	-0.83	-3.7	-0.7
EFP89	3.9	3.7	0.2	-0.02	2.0	0.7
WS90	3.1	0.4	1.9	-0.75	0.8	-0.2
WD91	1.4	0.9	-0.4	2.29	6.1	0.7

Understanding the EBVs

The 1stX EBVs are based on measurements on the 1stX progeny of sires mated at Cowra and Hamilton in 1997, 1998 and 1999 and Struan in 1998, 1999 and 2000. The 1stX wether progeny were slaughtered at heavy weights (23 kg carcass). The 1stX ewe progeny were shorn as hoggets and samples were tested for yield and fibre diameter.

Three common sires (BL12, Cp5, Fi7) were used at all sites in each year to provide genetic links to allow EBVs to be calculated across all data.

Sire EBV for Weight - postweaning (kg)

Data include 1stX ewe and wether weaning and post weaning weights with adjustment for age, dam age and type of birth and rearing.
The EBVweight describes the sires' genes for fast growth to heavy weights.

Sire EBV for Fat (GR mm)

Data include carcass GR depth on 1stX wether progeny, independent of carcass weight.
The EBVfat describes the sires' genes for producing fat (+) or lean (-) carcasses, independent of the carcass weight.

Sire EBV for Eye Muscle Depth (mm)

Date include carcass eye muscle depth on wether progeny, independent of carcass weight.
The EBVemd describes the sires' genes for producing large (+) or small (-) eye muscles, independent of the carcass weight.

This allows comparison of the relative emd and fat for sires with progeny of different carcass weights.

Sire EBV for Clean Wool Weight (kg)

1stX ewe progeny hoggets with samples tested for yield to determine clean fleece weight, adjusted for type of birth.
The EBVwool weight describes the sires' genes for producing high (+) or low (-) clean wool weights.

Sire EBV for Fibre Diameter (µm)

1stX ewe progeny hoggets with samples tested for average fibre diameter, adjusted for type of birth.
EBVfibre diameter describes the sires' genes for producing high (+) or low (-) fibre diameter wool.

Sire EBV for Faecal Egg Count (FEC)

Based on a FEC in 1stX ewes, generally <12 months of age. The units are $\sqrt[3]{}$ (eggs/g) for the EBVs. Samples could not be collected from the 1998 and 1999 drop 1stX ewes at Struan.
The EBVfec describes the sires' genes for resistance to worms. Sires with negative values had progeny with lower egg counts and showed more resistance than sires with positive values.

These EBVs have been calculated solely from 1stX progeny data at the MCPT sites, using LAMBPLAN procedures (OVIS). This means the EBVs are independent and not comparable with LAMBPLAN Across-Flock EBVs .

EBVs for some sires may have changed slightly in the 2001 analysis, because the new LAMBPLAN software (OVIS) was used and more data from link sires and additional groups is available. The data has 6030 1stX progeny (ewes and wethers with weights) of 91 sires. Link sires each had 460-560 progeny and others averaged 51 progeny, with half these for carcass, wool and FEC traits. The accuracy of the EBVs for most sires is >80%.

WHERE WILL THE LAMBS COME FROM IN 2010?

Neal Fogarty, NSW Agriculture

An extra 4 million heavy lambs per year are likely to be required to satisfy expanding markets by the end of the decade. This means considerably more Merino and 1stX ewes mated to meat sires with higher lamb turnoff rates and lambs finished to heavier weights. Can the industry achieve this and what are the implications?

Industry and Market Trends

Exports of lamb, mutton and live sheep are worth over $1 billion. In the last 5 years lamb exports have expanded dramatically and are now 34% of total production (Fig. 1). Important markets for quality product are USA (23% of export tonnage), EU (11%) and Japan (4%), which together account for 63% of the total export value of $440m. Industry programs have turned around the decline in domestic consumption of lamb, with an increase of 2kg/hd over the last 5 years to 12.7 kg/hd. Mutton exports are 68% of production and have a value of $363m. Last year 5.4m live sheep were also exported, mostly to the Middle East, with a value of $206m.

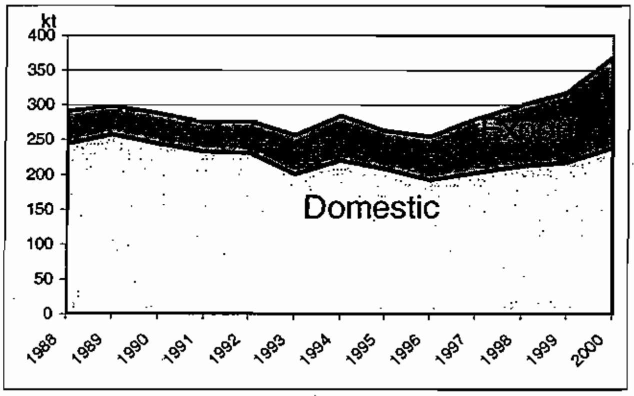


Fig. 1. Lamb production (Source: ABARE)

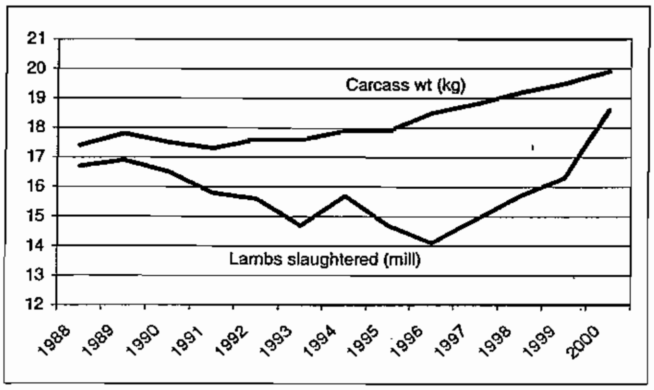


Fig.2. Number of lambs slaughtered and average carcass weight – Australia (Source: ABARE)

Lamb slaughterings have increased dramatically over the last 5 years to 18.6m. During the same period there has also been a steady increase in average carcass weight to almost 20 kg (Fig. 2), largely due to the higher weights required for the new export markets. Over the last decade mutton slaughterings have ranged from 14.4m to 18.8m and were 16.5m in 2000.

The Sheep Flock

The national flock has declined by one third in the last decade to 115.7m sheep. Although the decline has been smaller in the breeding flock to 55.6m ewes (Fig. 3). In 1999/00, 17,200 Australian farms (39% of all farms with >200 sheep) are estimated to derive some income from the sale of prime lambs (Connell and Hooper 2001).

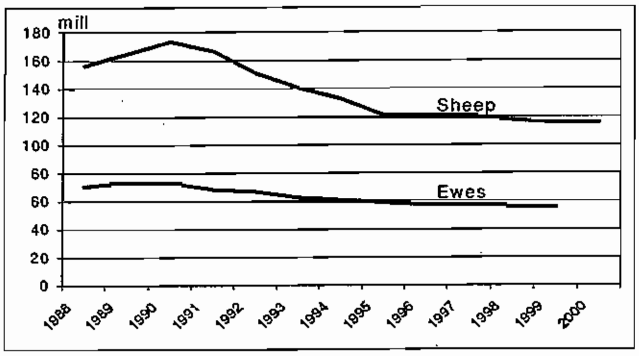


Fig.3. Sheep and ewes- Australia (Source: ABARE)

There has been a considerable increase in terminal sire or short wool (SW) ram matings to Merino ewes with a decline in matings of crossbred (XB) ewes over the last decade. SWxM 1stX lambs are now about 40% and 2ndX 33% of the national lamb slaughter, whereas these groups were about 17% and 44% resp. in 1990. Most of the increase of >4m lambs in the annual slaughter over the last 5 years has been 1stX lambs from Merino ewes.

Estimates of ewe x ram breed matings to generate 18m slaughter lambs are shown in Table 3. The assumptions include: lamb turn off rates of 80% in Merino and 110% in XB flocks, only males are slaughtered from MxM and LWxM matings, other breeds, Coopworth, Corriedale etc are included as part of the appropriate XB or Merino flocks. The recent MLA Lamb Survey (MLA 2001) shows a 19% increase in crossbred ewe matings nationally to produce 2ndX lambs in 2001 (6.5m ewes) compared to 2000, with an increase of 11% to 2.5m ewes in NSW. Most of the increase occurred in autumn 2001 matings, with an extra 0.5m crossbred ewes joined in Tasmania (+200%).

Table 3. Estimated ewe matings and lamb slaughter (millions)

Ram x ewe	Ewes	Lambs
M x M	9.0	3.6
LW[B] x M	3.0	1.2
SW[A] x M	9.0	7.2
SW x XB	5.5	6.0
Total	26.5	18.0

[A] Short wool   [B] Long wool and other

Half the ewe flock is currently mated to produce lambs for the slaughter. Annual replacements for 1stX ewes are 1.2m and ram requirements are 20,000 long wool and 96,700 short wool rams.

The large Merino ewe flock means that additional numbers of 1stX lambs can be produced in the short term. Growing them out to successfully meet carcass specifications is another issue and possibly accounts for the slightly reduced 1stX joinings in the past year (MLA 2001). However in the longer term, joining more ewes to meat rams impacts on the number of replacement ewes available for selection in Merino flocks. Of greater concern is the decline in availability of 1stX ewes.

Implications

With expanding lamb markets, what are the challenges? These comments are speculative, given the volatility of meat and wool markets and the other factors that impact on the industry.

Assumptions. The export market continues to expand rapidly (7.5%/yr – averaged 15%/yr over the last 5 years) and accounts for 50% of production in 2010. The domestic market expands more slowly (1%/yr).

Export carcass specs: 24-30kg, 8-15mm GR, >x% lean meat yield (VIASCAN)

Domestic carcass specs: 19-22kg, 8-15mm GR, >y% lean meat yield (VIASCAN)

A 33% increase in production is required to achieve this, ie 21.7m lambs slaughtered (+17%) at an average carcass weight of 22.6kg (+13%). This means producing 3.8m more heavy export lambs. To do this 1.3m additional crossbred ewes need to be mated (+24%) with an increase in average lamb turnoff from 110% to 125%, over all crossbred ewes, *plus* an additional 1m Merino ewes mated to terminal sire rams (+11%), with an increased average lamb turnoff from 80% to 85%.

Lamb Enterprises in 2010

More specialisation and differentiation is required to meet these challenges, with more specialist enterprises, such as:

Specialist Lamb Production

Almost all lambs OTH (>80%), with a majority on forward contracts. Males targeted to heavy/lean export with early finished ewes to the domestic market. Rams purchased from breeders accredited with the processor, with EBVs to meet contract carcass specs for weight, fat and muscle/yield.

Flock comprises crossbred or composite breed self-replacing ewes with a lamb turnoff >150%. 1stX ewe replacements supplied under contract from a high performance (>110% marking, 60kg mature weight) and disease free accredited Merino flock. The maternal sires selected and supplied by the lamb producer. Alternatively a composite breed self-replacing flock, bred from a selected nucleus with commercial ewes mated to terminal sires. A high level of planning and management is required with regard to breeding, finishing and marketing. Some flocks using accelerated lambing systems.

Specialist Breeder

Several scenarios for medium/broad wool Merino and some crossbred flocks. Reproduction and weight included in Merino breeding objectives.

Merino X terminal sire
- → finish for export market
- → sell to specialist finisher (contract)

Merino X maternal sire
- → finish wethers to export
- → sell wethers to specialist finisher (contract)
- → sell ewes to specialist producer (contract)

Crossbred X terminal sire
- → sell weaners to specialist finisher (contract)

Specialist Finisher and Marketer

Purchase weaners/stores from breeders and finish to contract specs. The finisher will have a contract with the breeder to supply lambs at specified time, live weight and genetics. Some finishers will supply terminal sires with the appropriate EBVs. Some alliances and contracts will provide for profit sharing between the breeder and finisher.

References

Connell, P. and Hooper, S. (2001). Australian Prime Lamb Industry 2001. ABARE, Canberra.

MLA (2001). 2001 Lamb Survey. MLA, Sydney.

MCPT UPDATE

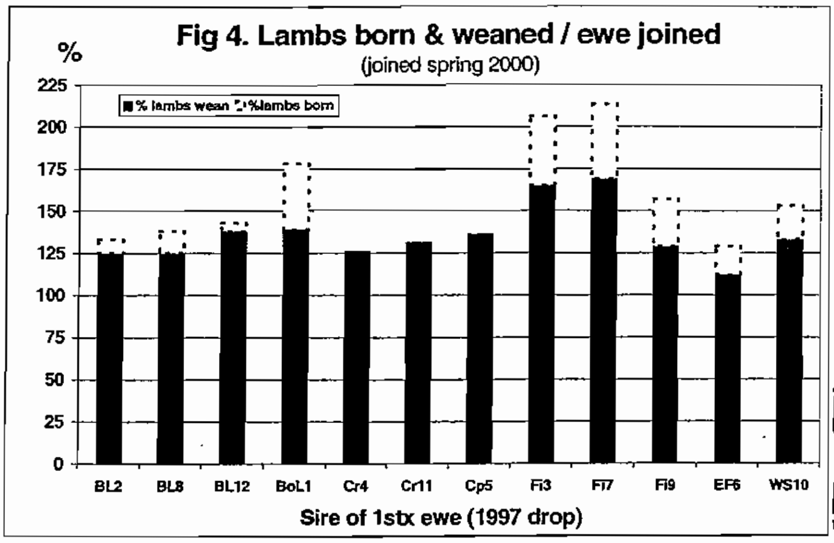
Cowra (Jayce Morgan)

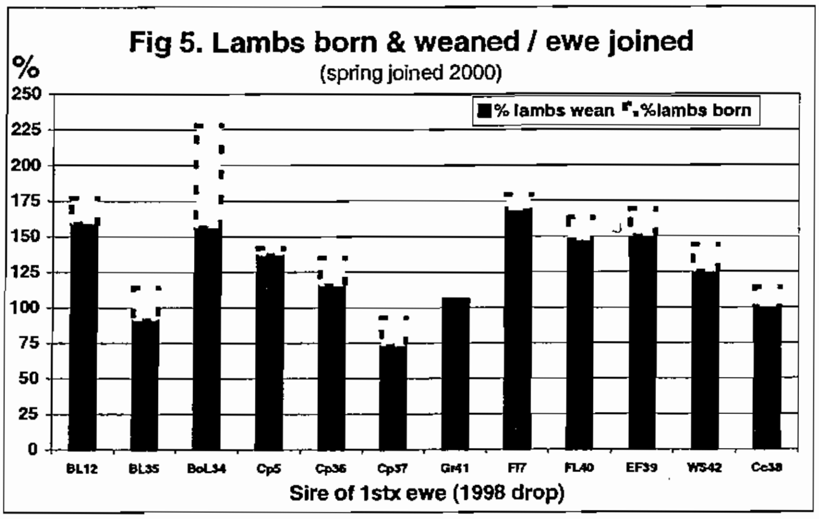
The year has been drier than normal. Ewes lambing in autumn were supplementary fed. Subsequently rain seemed to come just at the right time to keep adequate feed in front of all mobs. Winter was very mild and no feeding was required for lambing. The spring flush has been good but rainfall is below average.

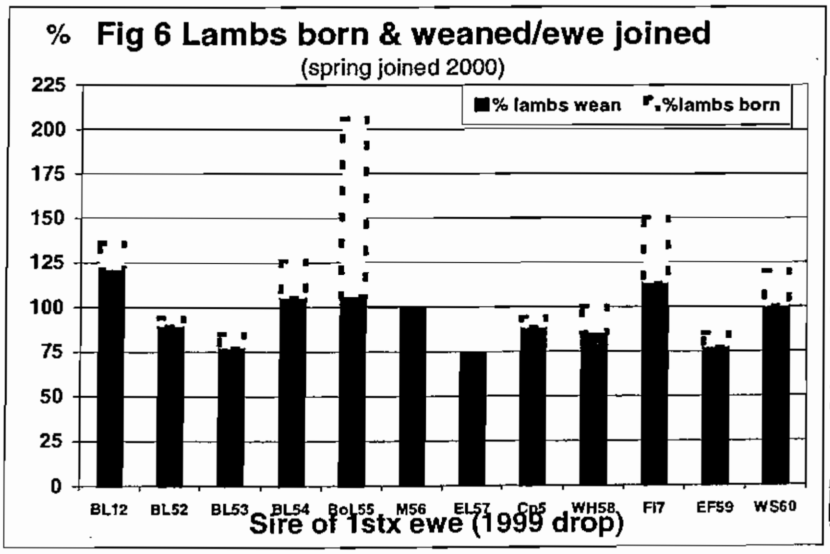
1stX ewes - spring joined 2000

The 3 groups of ewes joined for 6 weeks from mid Oct and lambed Mar/Apr 2001. Lambing was largely uneventful some early fox problems were overcome with a few rounds of spotlighting. The 2ndX lambs were weaned at the end of June and early July and slaughtered Sept and Oct.

Over 92% of mature ewes lambed with 89% of the '99 drop maidens. Average weaning rate from the '97 ewes (Fig. 4) was 135% with the Fi7 and Fi3 groups over 165% (>200% lambs born). Lamb losses were very low with all lambs surviving from Cr4, Cr11 and Cp5 groups. The '98 ewes (Fig. 5) weaned 128%, with the link Fi7 again the top group at 168%. Lamb losses were also very low for all groups (none for Gr41), except BoL34 which had a very high rate of multiples (228% lambs born with an average of 2.6 lambs per ewe lambing). The '99 ewes (Fig. 6) on their maiden lambing had an average weaning rate of 96%, with the top group being BL12 at 121%. All ewes from the BoL55, M56, and WS60 groups became pregnant and lambed from this maiden joining in the spring. Lamb losses were also very low for all groups (none for M56 and EL57), except BoL55 which had a high rate of multiples (206% lambs born with an average of 2.1 lambs per ewe lambing).







1stX ewes - autumn joined 2001

The '98 and '99 drop ewes were joined in mid Feb 2001 for 5 weeks with 89% and 94% resp. scanned pregnant. These ewes lambed during July/Aug 2001. Lambing was marred by a fox problem. Burrow gassing on ours and neighbours farms and repeated spotlighting did not seem to alleviate the problem. Many of the predated lambs had puncture wounds to the neck and skull with only the nose and tail eaten. This has resulted in high lamb losses.

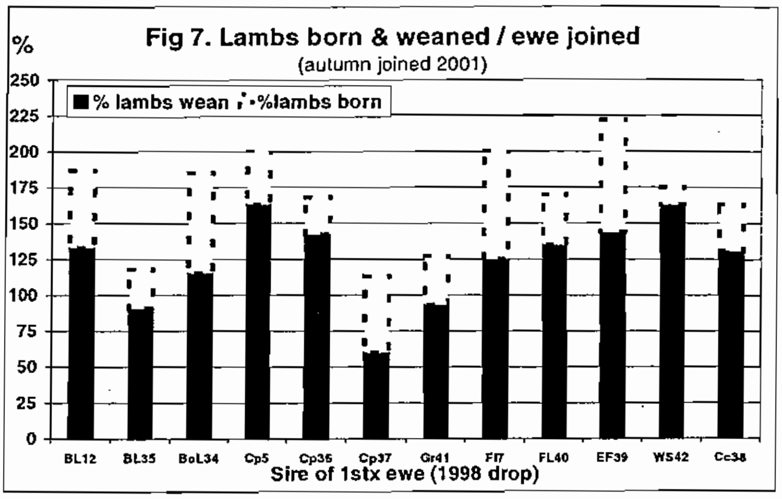


Fig 7. Lambs born & weaned / ewe joined (autumn joined 2001)

Average weaning rate from the '98 ewes (Fig. 7) was 125% with Cp5 and WS142 the top groups at 163% (and over 200% lambs born). The '99 ewes (Fig. 8) only weaned 116% overall, although there were 3 groups over 142% (BL52, BoL55, WH58) and BL54 was 138%. High lamb losses, which were compounded by the fox predation, particularly affected those groups with a high proportion of triplet and quad births.

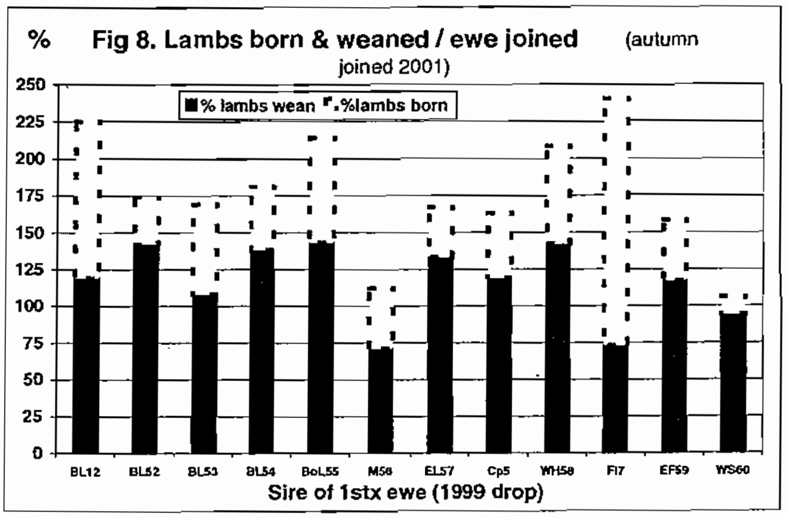


Fig 8. Lambs born & weaned / ewe joined (autumn joined 2001)

While ewes bearing multiples have generally had poor lamb survival, there are exceptions.

The ***mother of the year award*** goes to ewe 2392 from EF39 sire group who raised quads to weaning. All 4 of her lambs were greater than 20kg at weaning for a gross weight of 91kg (the average weaning weight of all lambs was 30kg). Considering the predator problems and no supplementary feeding this was a top effort.

In 2000 she weaned 2 from 4 born and as a 1 year old in 1999 she weaned 1 from 2 born.

Hamilton (Leo Cummins)

Seasonal conditions have generally been very favourable. The 1997 and 1998 ewes started lambing in late July and had quite favourable conditions at lambing but the 1999 ewes had a planned start of mating one cycle later and lambed under very unfavourable conditions (very cold, wet and windy). August rainfall was 70% above average, which contributed to lower lamb survival from the 1999 ewes, of which many were on their first lambing. Spring has continued to provide favourable pasture conditions with record rainfall in October of 150 mm. It is likely that good pastoral conditions will remain until weaning and on into summer.

As could be expected, lamb survival (until marking age) was related to birth weight and litter size (Table 4).

Table 4. Lamb birthweight and survival

Ewe drop	Litter size	Birthwt (kg)	Survival (%)
1997	Single	5.7	92
	Multiple	4.7	80
1998	Single	5.3	92
	Multiple	4.5	85
1999*	Single	4.7	71
	Multiple	3.9	47

*ewes lambed later in worse weather conditions

Lambing results for the 3 groups of 1stX ewes are shown in Tables 5, 6 and 7. In each of the three age groups there are very large differences between the best and the worst groups in lamb marking percentage. Even if we compare the top quartile with the bottom quartile, the difference is 37% for the 1997 ewes, 52% for the 1998 ewes and 52% for the 1999 ewes. Differences of this magnitude will have major effects on profitability. Within age groups there are clearly very large differences between sires within breeds. For example, in the 1997 group, Finn sires show a range of 30% and Coopworth sires a range of 42% and Border Leicesters 1%. In the 1998 group, East Friesian sires show a range of 25% and in the 1999 group, Border Leicesters show a range of 24%, Finns 36% and Coopworths 27%. Clearly in fertility as well as other traits, the individual sire is a major contributor to any genetic differences.

Lamb survival and growth results are shown in Tables 8, 9 and 10.

Table 5. Lambing - 1997 1stX ewes

Sire	Ewe scan	Ewes lamb	Lamb born	Lamb mark	Mark %
BL 12	22	20	32	28	127
BL 13	23	23	33	29	126
Ro 14	27	25	40	33	122
Cp 5	21	21	34	30	142
BoL15	34	33	49	41	120
Cp 16	22	21	34	31	141
Fi 7	38	38	72	48	126
Fi 17	27	27	49	40	148
Cp 18	22	18	25	22	100
EF 19	16	16	26	23	**144**
Cr 20	28	28	31	27	96
Fi 21	22	22	36	26	118

Table 6. Lambing - 1998 1stX ewes

Sire	Ewe scan	Ewes lamb	Lamb born	Lamb mark	Mark %
FiF 48	14	14	26	16	114
Cr 46	17	17	21	19	112
WS 51	12	12	23	19	158
Tx 50	15	13	19	18	120
BoL 43	12	10	20	17	142
BL 12	20	20	39	30	150
Fi 7	10	10	20	14	140
Cp5	16	15	26	23	144
EF 44	12	12	23	21	**175**
Ro 49	16	15	20	18	113
EF 47	8	8	12	12	150
EF 45	13	13	22	21	161

Table 7. Lambing - 1999 1stX ewes

Sire	Ewe scan	Ewes lamb	Lamb born	Lamb mark	Mark %
BoL 63	16	14	33	14	88
Cr 64	22	17	19	12	55
Fi 67	14	13	22	10	71
Cp 65	25	23	35	21	84
BL 62	12	13	18	10	83
BL 12	29	28	39	31	107
EFR 69	18	16	28	18	100
BL 61	8	8	11	6	75
Ch 66	23	22	34	20	87
Fi 7	20	19	32	7	35
EFP 68	15	14	16	11	73
Cp 5	19	18	28	21	**111**

Table 8. Lamb survival and early growth - 1997 1stX ewes

Sire	Birth Wt		Survival		Wt 5/9/01	
	Sin	Mult	Sin	Mult	Sin	Mult
BL12	6.0	**5.0**	88	88	**19.3**	**14.9**
BL 13	5.9	4.9	**100**	80	18.2	14.2
Ro 14	5.6	4.8	80	83	17.0	12.9
Cp 5	6.0	4.8	88	89	16.9	13.6
BoL15	**6.4**	4.9	82	84	18.2	13.7
Cp 16	5.6	4.9	**100**	89	16.0	14.5
Fi 7	5.0	4.0	**100**	61	15.0	11.6
Fi 17	5.2	4.2	86	81	16.6	11.1
Cp 18	5.6	4.9	83	**92**	16.9	12.5
EF 19	5.7	4.8	**100**	85	18.6	13.1
Cr 20	6.0	4.6	92	67	15.2	9.3
Fi 21	4.9	4.2	**100**	64	14.8	11.0

Table 9. Lamb survival and early growth - 1998 1stX ewes

Sire	Birth Wt (kg)		Survival (%)		Wt 4/9/01 (kg)	
	Sin	Mult	Sin	Mult	**Sin**	Mult
FiF48	5.7	3.9	75	59	**18.3**	13.5
Cr46	5.5	4.6	92	88	15.8	13.3
WS51	5.4	4.0	**100**	85	14.6	13.5
Tx50	5.1	4.3	86	**100**	14.8	12.2
BoL43	5.7	3.9	**100**	82	17.0	11.0
BL 12	4.2	4.3	67	78	16.9	13.6
Fi7	4.5	3.5	**100**	68	10.2	9.1
Cp5	5.6	4.4	**100**	86	14.8	13.8
EF44	**5.9**	4.8	**100**	95	14.8	**14.1**
Ro49	**5.9**	**5.2**	90	90	17.3	**14.1**
EF47	5.1	4.9	100	**100**	17.5	12.7
EF45	5.7	4.9	**100**	94	17.4	13.6

Table 10. Lamb survival and early growth - 1999 1stX ewes

Sire	Birth Wt (kg)		Survival (%)		Wt 17/9/01 (kg)	
	Sin	Mult	Sin	Mult	Sin	Mult
BoL43	3.2	3.7	0	44	-	11.5
Cr64	4.9	4.4	73	50	9.9	7.0
Fi 67	4.3	3.5	60	41	10.4	9.3
Cp65	4.6	4.2	73	54	13.0	11.0
BL62	5.0	**4.3**	75	40	14.0	11.8
BL12	4.9	3.8	82	**77**	14.3	10.2
EFR69	4.5	3.6	**100**	57	**15.4**	12.2
BL61	**5.6**	4.0	**100**	17	13.5	**14.2**
Ch66	4.6	3.4	80	50	13.0	8.4
Fi 7	4.2	3.4	38	17	12.5	9.3
EFP68	5.3	4.0	83	50	14.1	12.0
Cp5	5.1	4.2	88	70	12.5	10.4

Milk Production

A small group of ewes, 3 per sire from the 1998 ewe group and 4 or 5 per sire from the 1999 ewe group were milked twice, one week apart at mid lactation. The 1998 ewes had twins and the 1999 ewes mainly had singles. Within each age group the ewes chosen for milking were balanced for lambing date. The results are shown in Table 11.

Table 11. Milk yields

1998 ewes	Milk (l/d)	1999 ewes	Milk (l/d)
FiF 48	1.6	BoL 63	1.3
Cr 46	1.6	Cr 64	1.6
WS 51	2.1	Fi 67	0.8
Tx 50	2.9	Cp 65	1.7
BoL 43	2.4	BL 62	1.5
BL 12	2.5	BL 12	2.0
Fi 7	1.9	EFR 69	1.8
Cp 5	2.2	BL 61	1.7
EF 44	2.8	Ch 66	2.1
Ro 49	2.1	Fi 7	1.4
EF 47	2.3	EFP 68	2.1
EF 45	2.5	Cp 5	1.6

Data Analysis

Mr Khalfan BinAbdulwahab has started to examine some of the data collected in this project for more detailed genetic and statistical analysis than has been attempted so far. Khalfan is a PhD postgraduate student studying with Prof Mike Goddard at Melbourne University.

Promotion

Gervaise Gaunt and Leo Cummins promoted the Maternal Central Progeny Test in a series of talks at the Elmore field days in October. This was in association with the demonstration of contract mating and evaluation of different maternal dams, which has been set up at this site. Posters from the Hamilton and Rutherglen work were also on display at the Meat Profit day at Warragul in October and at the PVI Hamilton community open day in November.

Struan (Nick Edwards & Janelle Hocking Edwards)

The 'on-the-ground' component of the project has now finished at Struan, with the last batch of wethers slaughtered in May and ewes sent to Rutherglen in June. Autumn at Struan was dry but cool with grazing the flood irrigated ryegrass/clover pastures. Although irrigation was suspended in April grazing continued until slaughter or transfer to Rutherglen. During these last few months pasture growth rates were low, reflecting the cooler weather during this time.

Ultrasound scanning

Lambs were ultrasound scanned in April to measure eye muscle (EMD) and fat depth, with a lot of variation between sires in both (Table 12). Values for progeny of sires that have the same rank are not significantly different, eg. EMD for progeny of BL12* is not significantly different from sires ranked 1, 2 and 3. Interestingly, there was no difference between males and females in EMD or fat depth despite differences in live weight (ewes 42.0kg, wethers 43.4kg). However, single progeny tended to be fatter than those raised as twins in all sire groups (3.3 v 3.1mm).

Table 12: Liveweight, eye muscle depth (EMD) and C-site fat depth of 1stX lambs at 300d of age

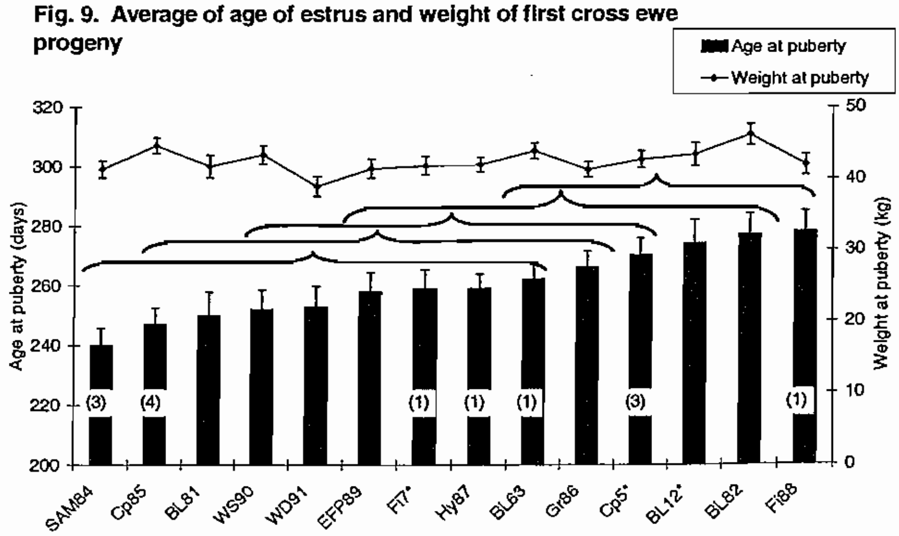
Sire groups with the same rank numbers are not significantly different, for example the difference in progeny weight for BL83 and EFP89 is not significant but it is for BL83 and WD91 .

Sire	Weight (kg)	Rank	EMD (mm)	Rank	Fat (mm)	Rank
BL83	45.1±0.77	1	26.6±0.33	1	3.6±0.13	5 6
Cp85	45.1±0.76	1	25.1±0.30	3 4	2.9±0.13	1 2 3
BL82	45.0±0.98	1	26.9±0.42	1	3.5±0.17	4 5
WS90	44.4±0.87	1 2	27.0±0.37	1	3.7±0.15	5 6
BL12*	43.3±0.73	1 2	26.0±0.31	1 2 3	3.2±0.13	3 4
Hy87	43.2±0.67	1 2 3	26.4±0.29	1	3.4±0.12	4 5
BL81	43.1±0.70	1 2 3	26.9±0.30	1	4.0±0.12	6
EFP89	42.5±0.82	1 2 3	25.1±0.36	3 4	2.6±0.14	1 2
WD91	41.9±0.74	2 3	25.5±0.32	2 3	3.0±0.13	2 3
Fi7*	41.8±0.55	3	24.5±0.24	4 5	2.8±0.10	1 2
Cp5*	41.4±0.70	3	25.3±0.33	2 3 4	3.2±0.12	3 4
Gr86	41.3±0.70	3	26.1±0.30	1 2	3.1±0.12	2 3 4
SAM84	41.2±0.92	3 4	25.5±0.40	2 3 4	2.8±0.16	1 2 3
Fi88	38.7±0.73	4	23.8±0.31	5	2.5±0.13	1

Age of first oestrus

From mid-January teaser wethers, fitted with crayon harness, were run with the ewe lambs to detect their first oestrus. The ewe mob grazed following the wethers around the irrigation for ease of management. At weekly checks marked ewes were drafted, weighed and returned to the wether mob. There was a range of over one month between sire groups in the average age of puberty or first oestrus (Fig. 9). Ewes from 7 sires had not shown oestrus by 11 months of age (Fi7*, Fi88, BL83, Hy87, one ewe each; Cp5*, SAM84, 3, and Cp85, 4 unmarked – numbers on the bars). Age of puberty for sire groups within a bracket were not significantly different, eg. progeny of WS90 reached oestrus earlier on average than progeny of BL12, but

Fig. 9. Average of age of estrus and weight of first cross ewe progeny

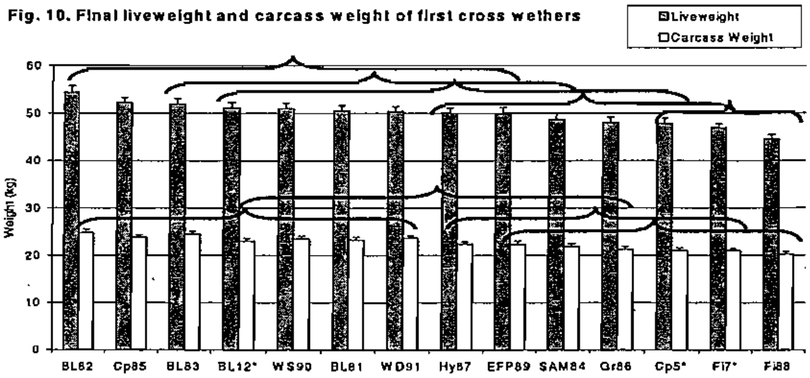


not Cp5. There was no difference between sires in the weight of ewes at first oestrus (line in the graph). This means that there is no tendency for a sire to allow ewes to show oestrus at a lighter weight, however there was a large range of weights within each group (30 to 55kg).

Wether progeny

Wethers were weighed 3 days prior to slaughter (28 May 2001). There were differences in final liveweight and carcass weight between progeny groups (Fig. 10). The brackets show groups that were not significantly different. The sire groups are ranked on liveweight, which is not the same ranking as carcass weight, indicating variation in average dressing percentage (range 44% to 47%).

Fig. 10. Final liveweight and carcass weight of first cross wethers



For the first time in MCPT, carcasses were assessed for lean meat using Viascan at Tatiara Meat Company (TMC). A video image predicts the weight of lean meat expected from individual carcasses. This can be converted to lean meat yield (LMY) which is the % of lean meat obtained from the carcass (ie 100 * lean meat weight / carcass weight). Exporters like to see lambs with a LMY of 54%, however they acknowledge that LMY can be misleading as it may reward carcasses that are light but lean, whereas they want heavy carcasses with a high proportion of lean meat (Table 13). It is likely that processors will implement a grid that rewards heavy carcasses that have a high yield of lean meat, eg. grades being trialed by TMC (Table 14).

Table 13. Examples of carcass weight, lean meat weight and corresponding lean meat yield (LMY)

Lamb	Carc (kg)	Lean (kg)	LMY (%)	TMC grade
Light	20.0	10.8	54	C
Heavy	24.1	12.2	50	B
Ideal	24.1	13.0	54	A

Table 14. TMC lean meat yield grading system

	Carcass weight		
LMY	<20kg	20-24kg	>24kg
<51%	E	D	B
>51%	E	C	A
<6mmGR	F	F	F

There was variation in weight of lean meat between sire groups estimated with Viascan (Table 15). Average weight of lean meat ranged from 10.7 to 12.8kg per carcass with the greatest individual lean meat yield of 17kg coming from a 32 kg carcass.

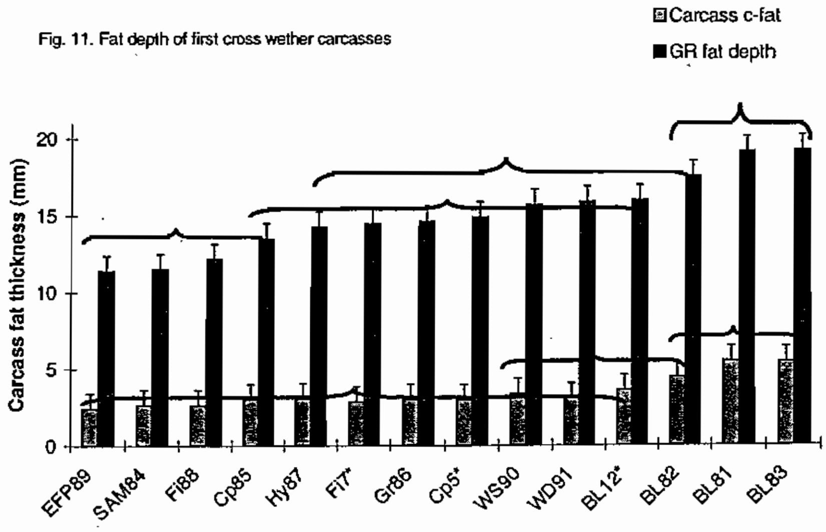
Table 15. Lean meat, lean meat yield (LMY) and number of carcasses for each TMC grade

Sire code	Lean meat (kg)	LMY (%)	TMC A	TMC B	TMC C	TMC D	TMC E
BL82	12.8±0.39	51.8	3	3	2	2	0
Cp85	12.8±0.29	53.8	10	1	7	0	2
WD91	12.6±0.27	53.2	8	1	9	1	2
BL83	12.5±0.31	51.1	6	6	8	2	1
WS90	12.4±0.30	52.8	8	2	7	0	2
BL12*	12.1±0.31	52.5	9	3	6	1	4
BL81	12.0±0.30	51.7	0	7	10	3	1
Hy87	12.0±0.26	53.8	4	1	14	0	4
EFP89	12.0±0.36	53.5	7	0	6	0	3
SAM84	11.9±0.29	54.3	3	1	18	0	3
Gr86	11.4±0.31	53.5	2	0	10	1	3
Fi7*	11.3±0.22	53.9	2	0	10	0	8
Cp5*	11.0±0.28	52.5	3	1	16	4	6
Fi88	10.7±0.26	52.6	0	0	12	3	9

As expected, singles had a greater weight of lean meat than twins. LMY was >51% for a majority of lambs, although most were in the 20-24 kg carcass range. This is not surprising as in most instances 1stX wethers from maternal sires would not be targeted to heavy weight export markets, although some sires had the potential to meet this market. No carcasses were in the TMC F grade.

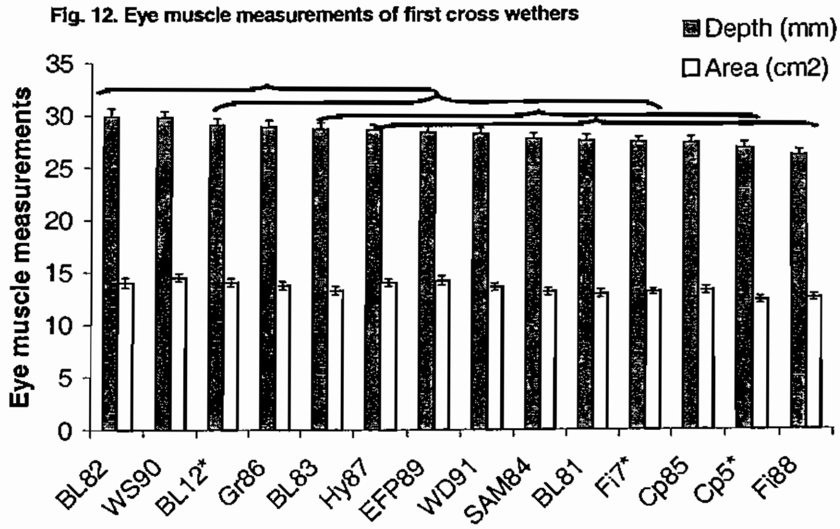
As well as live ultrasound fat and muscle measurements taken on all progeny, carcasses of wethers were measured after slaughter. Both Cfat and GR on the carcasses were measured (Fig. 11). Reflecting the live measurements, there was considerable variation between progeny groups in both fat measures. Similarly, twins were leaner than the single reared lambs.

Fig. 11. Fat depth of first cross wether carcasses



The dimensions of the carcass eye muscle was measured between the 12/13 rib (same place as carcass C-fat) and the area of the eye muscle (EMA) was calculated. As with all preceding measurements, there were differences in the eye muscle measurements between progeny groups and the twins had smaller dimensions than single raised lambs. The results presented in Fig. 12 are sorted on EMD. Only similarities in EMD are shown on the graph, but there are differences in EMA. The trends are not the same between progeny groups. WS90 has the largest EMA, although it is not significantly different from BL12*, BL82, BL83, EFP89, Gr86, Hy87 and WD91.

Fig. 12. Eye muscle measurements of first cross wethers



Conclusion

This final set of data from the Struan component of the MCPT again highlights that a single breed type is not superior in all traits relevant to a 1stX or 2ndX prime lamb producer. The traits which are of most relevance to you are the ones to look for and use as your selection criteria in selecting rams for your enterprise. To do this you would need to use EBVs like those in this issue of Dynamic Dams or supplied by Lambplan.

Since this is the last major set of data we contribute to this project we'd like to take the opportunity to thank everyone for their support during our 15 month sojourn as project leaders at Struan. Furthermore we'd like to encourage the ongoing support of the project in its second phase as data collection continues from the first cross ewes and their progeny and encourage all of you breeders and commercial prime lamb producers to continue your emphasis on the maternal component of your enterprise. We will be looking on with great interest from both a scientific point of view and as commercial prime lamb producers as Dynamic Dams continues its good work in disseminating the great work of this project.

Rutherglen (Gervaise Gaunt)

A total of 900 1stX ewes, bred at Struan, SA, were delivered to Rutherglen Research Institute (RRI) in 1999, 2000 and 2001. The ewes are joined to high performance White Suffolk rams for 6 weeks in Nov/Dec with lambing in mid-April. RRI has completed 2 lambings (1998 and 1999 drop ewes) and 2 slaughters.

2ndX Carcase

The carcase results so far are consistent with findings from Cowra and Hamilton. Fig. 13 shows the carcase returns per ewe joined for the 14 sires assessed in 2000 at RRI. Prices are based on those received in Nov 2000 at time of slaughter ($1.75/kg for carcases of 20kg, fat score 2, 3 and 4 and $1.50 for carcasses <20kg).

There was a substantial difference of $24.55 per ewe joined between the top ($54.00) and the bottom ($29.45) sire groups for just 1 year of production. This means a difference of $123 per ewe

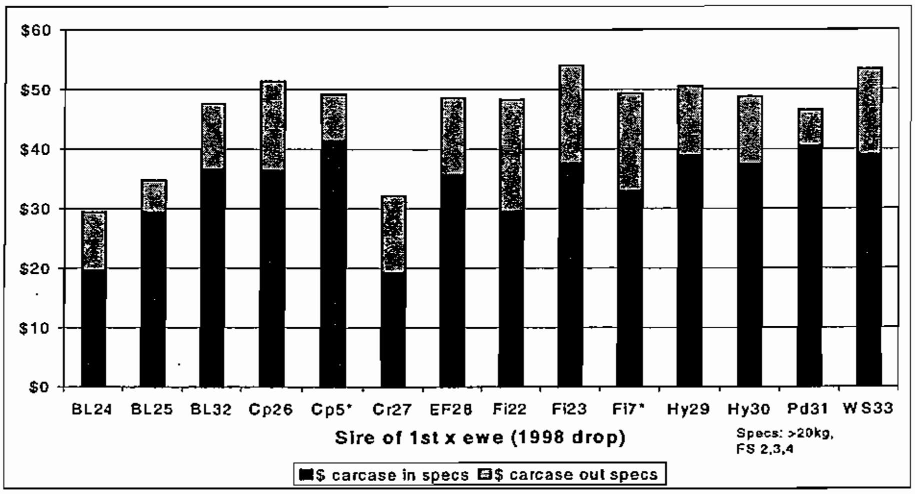


Fig. 13. Carcase returns per ewe joined for sires assessed in 2000 (1998-drop ewes) at RRI

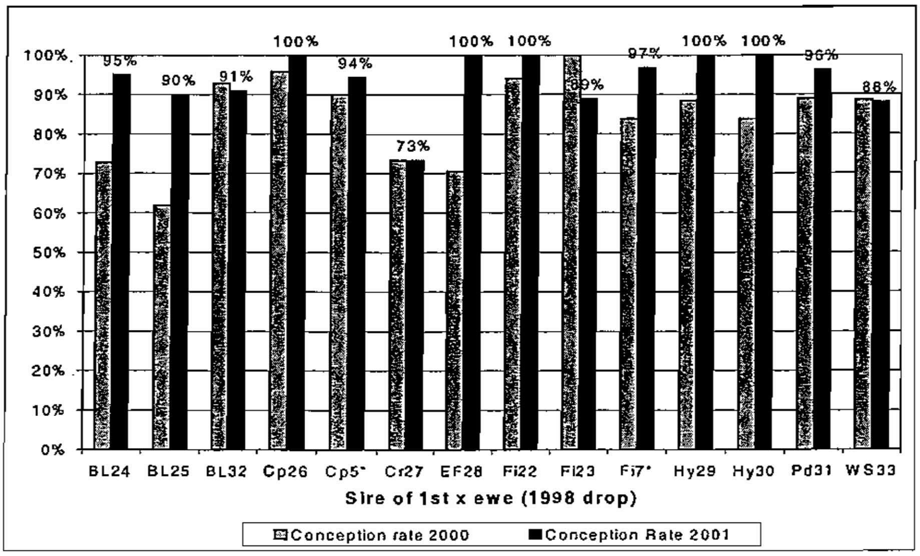


Fig. 14. Conception rate of 1998 drop 1st X ewes assessed in 2000 and 2001 at RRI

over their lifetime of 5 joinings between the top and bottom sires groups. A maternal sire produces approx. 100 ewes (and 100 wethers) in his lifetime, so the difference between the top and bottom sire in this trial alone would be **$12,300** and this does not take into account the income from his wether progeny! These results emphasise the huge differences and profitability achievable in the prime lamb industry from using correct genetics, suited to the specialist production systems.

1stX Ewes - conception

Conception rates for 1998 1stX ewes show a similar trend in 2000 and 2001 for most of the sires (Fig.14). Generally they are higher in 2001 than 2000, especially BL24, BL25 and EF28 which reflects their older age.

There was a large range in conception rate for 1999 1stX ewes (26 to 100%, Fig.15). The low conception rate (26%) for the English Leicester sire (EL73) is likely to be associated with the breed's seasonal cycling ability. These ewes may be expected to cycle better at a later joining.

The higher conception rates of maiden ewes in 2000 (85% 1998 drop) compared to 2001 (69% 1999 drop) is difficult to explain. The 1999 drop maiden ewes were 3kg heavier at joining than the 1998 drop ewes at their maiden joining. All ewes are joined under similar circumstances. It should be noted that although the overall average of the 1999 drop is 69%, PD79 managed a 100% conception rate. The 1998 drop achieved 94% from their second joining that occurred at the same time as the 1999 drop maiden mating.

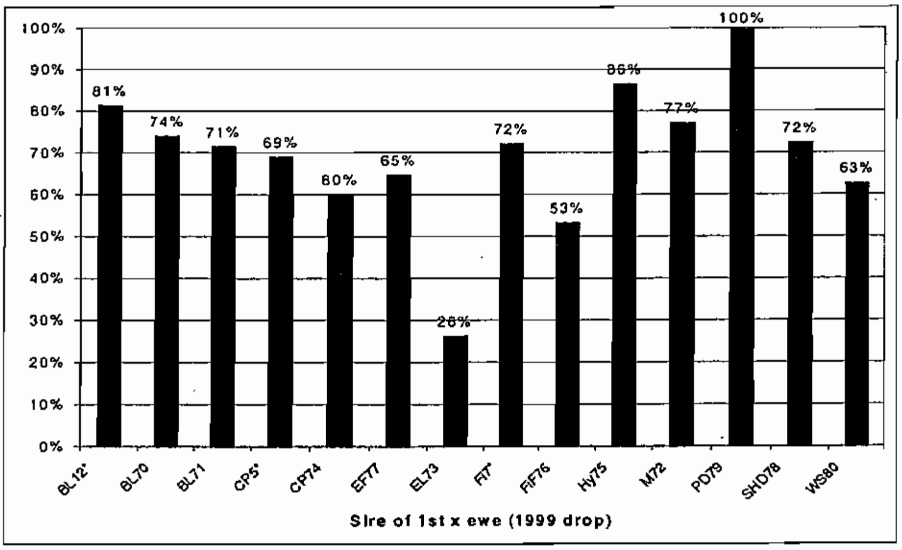


Fig.15. Conception rate of 1999 drop 1stX ewes assessed in 2001 at RRI

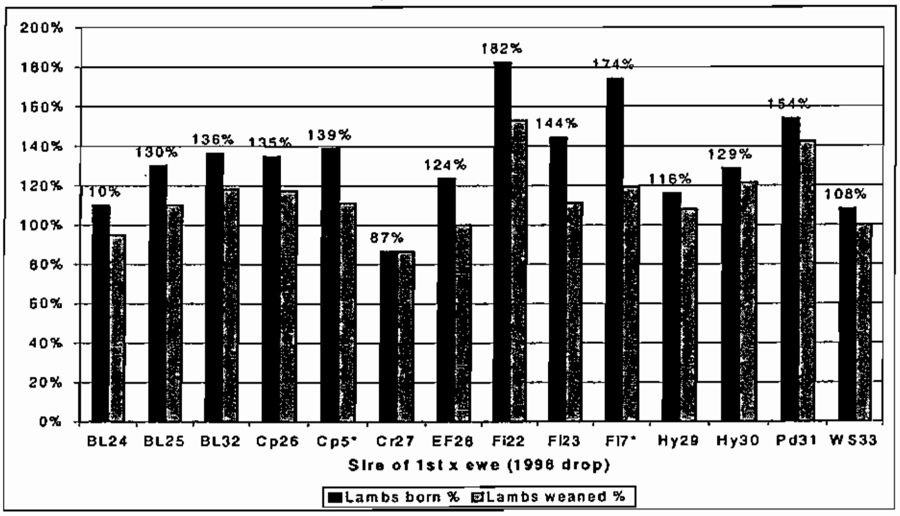


Fig.16. Lambs born and weaned per ewe joined at RRI - 2001

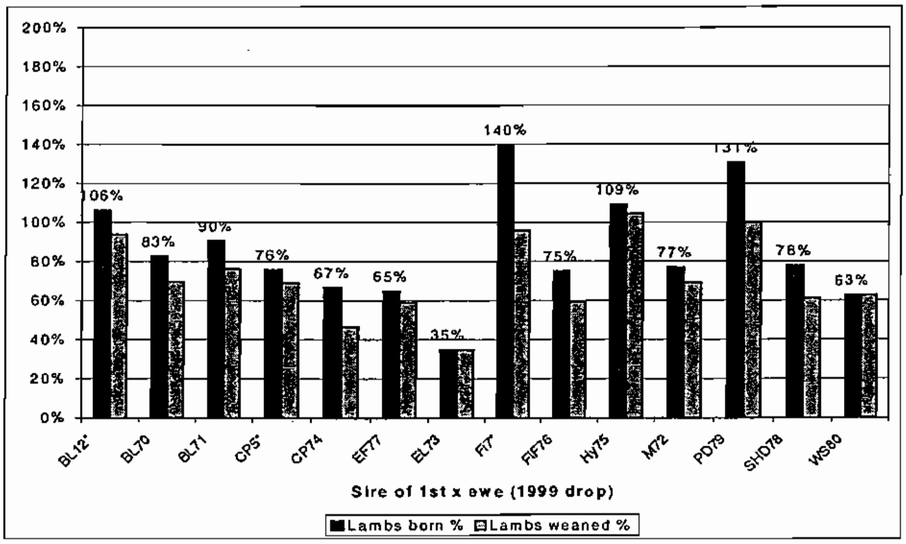


Fig.17. Lambs born and weaned per ewe joined at RRI - 2001

1stX Ewes - Lambing and Weaning %

There was a large range in lambing % among ewe sire groups for the 1998 drop (87 to 182% lambs born, Fig.16) and 1999 drop (35 to 140% lambs born, Fig. 17) 1stX ewes. The 1998-drop ewes follow almost the same trend to the previous year. The FinnX ewes had a high incidence of multiple births, resulting in more lambs turned off per ewe. The poorer survival rate of lambs from FinnX ewes, as shown by lambs weaned/ewes joined, is mainly due to mismothering and is similar to the previous year.

1stX Ewes – Weight of 2ndX lamb weaned

The total weight of lamb weaned per ewe joined for 1998 (Fig.18) and 1999 (Fig. 19) 1stX ewes varied considerably. The weight of lamb weaned takes account of ewe conception rate, multiple births, lamb survival and growth of lambs. There has been no age adjustments made to the lamb data as it is considered a commercial advantage for ewes to be early lambers. There is little weight difference between male and female lambs at this stage. The range among sire groups was 33.4kg (PD31) to 22.1kg (Cr27) for the 1998 drop ewes (Fig. 18) and 25.2kg (PD79) to 7.7kg (EL73) for the 1999 drop maiden ewes (Fig. 19).

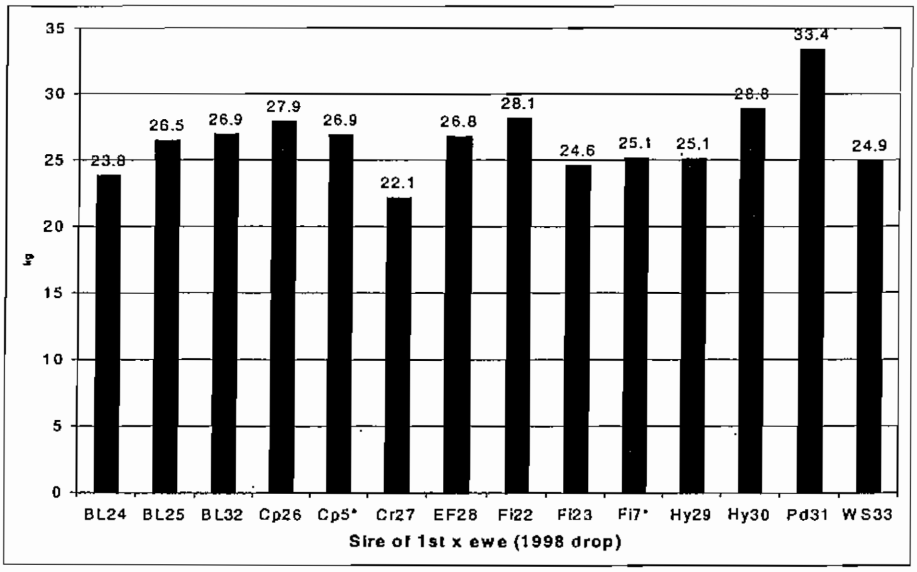


Fig.18. Total weight of lamb weaned per ewe joined – RRI 2001

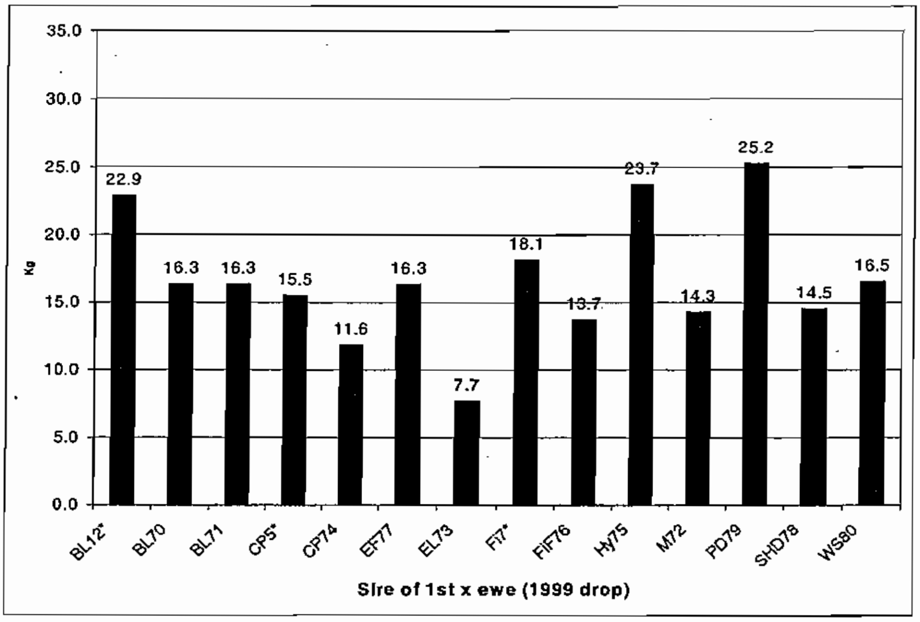


Fig. 19. Total weight of lamb weaned per ewe joined– RRI 2001

Season

Seasonal conditions in 2001 have been poor with minimal feed available in summer and autumn. Heavy supplementary feeding with grain (300g/day/head) and hay occurred in early Autumn and throughout lambing. Supplementary feeding continued until weaning and lambs were fed a small quantity of ad-lib grain for one month following weaning. Pasture growth post-weaning and throughout Spring has improved, but compared to 2000, pasture growth and quality is lower, which is reflected in the lower lamb growth rates of 2001 lambs (average 210 g/day birth-October).

Other

At the RRI Annual Field Day in September 1999 and October 2000, the ewes (and lambs in 2000) were displayed in their sire groups with EBV information provided. The large visible liveweight variation between sires groups was clearly obvious.

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Mailing List – Privacy Act

Many of you returned the Consent Form enclosed with the last Newsletter. If you did not, a Consent Form has been enclosed for your completion and return, if you wish to continue to receive Dynamic Dams. Under the Privacy Act your consent is required for us to keep personal information eg name, address and other contact details.

PLEASE RETURN the CONSENT FORM

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RESEARCH HIGHLIGHTS

Summaries from selected papers presented to the *14th Conference of the Association for the Advancement of Animal Breeding and Genetics (AAABG),* held in Queenstown, NZ, July 2001.

Genetic Parameters For Meat Quality And Carcass Traits In Australian Merino Sheep

E. Safari, N. Fogarty, P. Taylor and D. Hopkins

Data from 1048 rams of three strains of Merino were used to obtain heritability estimates for carcass and meat quality traits fitting an animal model using a REML procedure. Traits analysed were eye muscle depth (EMD), eye muscle width (EMW), tissue depth at GR site (FATGR), fat depth at C site (FATC), pH and colour of the *m. longissimus lumborumi* (*L**, *a**, *b**). Estimates of heritability were 0.33 (± 0.09), 0.20 (± 0.08), 0.27 (± 0.08) and 0.15 (± 0.07) for FATGR, FATC, EMD and EMW respectively. Estimates of heritability for pH, *L**, *a** and *b** were 0.27 (± 0.09), 0.14 (± 0.07), 0.02 (± 0.06) and 0.04 (± 0.06) respectively. The heritability estimates reported here for carcass traits in Merino sheep are reasonably similar to those previously reported for other sheep breeds. This would indicate there is little need to change the parameters currently used for calculating EBVs for meat breeds when Merino data are being processed. It also indicates that there is moderate genetic variation with scope for selection for improvement in meat quality through pH and possibly meat colour.

Response To Selection For Net Feed Intake In Beef Cattle

P.F. Arthur, J.A. Archer, R.M. Herd and G.J. Melville

Direct and correlated responses in postweaning feed efficiency and growth traits resulting from 5 years of divergent selection for net feed intake (NFI) in beef cattle were evaluated. Approximately two generations of selection were achieved in both the high and low feed efficiency selection lines. Direct selection response (high minus low line) in NFI per year was 0.249 kg/day. Correlated responses in yearling weight and average daily gain were not significant. However, annual correlated responses in feed intake (0.24 kg/day) and feed conversion ratio (0.24) were significant ($P<0.05$).

Mode Of Inheritance And Effects On Meat Quality Of The Rib-Eye Muscling (REM) QTL In Sheep

N.B Jopson, G.B. Nicoll, J.M. Stevenson-Barry, S. Duncan, G.J. Greer, WX. Bain, E.M. Gerard, B.C. Glass, T.E. Broad and J.C. McEwan

The *rib-eye muscling (REM* QTL, identified in descendants of Poll Dorset rams from the Carwell stud, NSW, Australia, is known to be located in the same region of sheep chromosome 18 as the hyper-muscling locus, *Callipyge*. *Callipyge* displays a complex inheritance pattern of maternal overdominance and exhibits detrimental effects on meat tenderness. *Carwell* has been shown to increase eye muscle area by approximately 10 percent, but its effect on tenderness and its mode of inheritance have not been reported.

Mode of inheritance for *REM* was estimated by mating five rams heterozygous for *REM* to heterozygous ewes to produce 221 progeny comprising four genotypes, namely animals with no copies of the *REM* QTL, animals with *REM* inherited either maternally or paternally, and those with *REM* inherited from both sire and dam. Rib-eye muscle area was increased in animals carrying the *REM* QTL regardless of the source, when compared to their *non-REM contemporaries*. The mode of inheritance would appear to be dominant.

In a separate experiment, both loins were collected at slaughter from 80 progeny from three sires heterozygous for *REM* and Romney *non-REM ewes*. All carcasses were subjected to accelerated aging and conditioning. One loin was frozen and the other chilled for six weeks. Tenderness was measured using the MIRINZ tenderometer shear force technique. Frozen loins were tender in nonREM carriers and acceptable in REM carriers (3.11 and 4.65 kgF, respectively; $P<0.001$). Chilling and aging increased the tenderness in both non-carrier and carrier (2.15 and 2.39 kgF, respectively; NS). Differences in tenderness between *REM* carriers and noncarriers are therefore small and can be removed by the appropriate post-slaughter treatment.

Implications Of Data Quality On The Accuracy Of Estimated Breeding Values For Weaning Weight In Sheep

D.J. Brown, B. Tier and R. Banks

Accuracy of selection is an important feature for all breeding programs and genetic evaluation systems. Accuracy of estimated breeding values (EBVs) depends on several important parts of data recording and management group structure. This paper illustrates the areas in which breeders can improve the accuracy of EBVs with specific emphasis on data structure and recording. A range of information was generated using the pedigree and observations details and averaged over each flock to compare with average flock accuracy for weaning weight. When only animals with both sire and dam recorded were examined the proportion of animals with both sire and dam unknown, total number of animals, average sire generation interval and the proportion of animals with sire and dam both known were the major determinants. Once full pedigree is recorded the number of animals recorded and pedigree depth become important determinants of accuracy. Breeders can significantly improve the accuracy of their weaning weight EBVs by simply recording more animals and pedigree information.

Genetic Trends In The New Zealand Texel

P.L. Johnson, H.T. Blair, L. Davidson, P.R. Amer and J.C. McEwan

The Texel breed of sheep was imported into New Zealand in the mid-1980's. From their commercial release in 1990 until 1995/96 breeders were in an expansion phase, principally aiming to increase animal numbers with little selection pressure placed on replacements. In 1998, 18 breeders combined to form the New Zealand Texel Sire Referencing Programme. Previously recorded data from these properties were analysed to generate breeding values and genetic trends. The majority of the flocks are making progress in carcass lean weight, although only four are achieving gains close to the predicted rates possible. Only one of the 18 flocks has made genetic progress in both increasing carcass lean weight and decreasing carcass fat weight since 1996. The introduction of the sire referencing programme has come at a crucial time for the breed. Through setting a common breeding objective, and enhanced ability to identify and select the best sires Texel breeders should be able to increase their rate of genetic gain and move towards being the ideal terminal sire breed.

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Maternal sire entries - details

Year	Site	Sire Code	Tag	Stud	Breed	Entrant	Phone No.
1997	Cowra	BoL1	922047	Struan	Booroola Leicester	PIRSA	08 8762 9100
		BL2	950137	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Fi3	940001	Yamba	Finnsheep	M & L Burns	03 5798 1583
		Cr4	940364	Maluka	Corriedale	P Secker	02 4848 1244
		Cp5*	940449	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		EF6	940B21	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Fi7*	930057	Warrayure	Finnsheep	GM & MA Wake	03 5574 1254
		BL8	950181	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Fi9	935010	Warrayure	Finnsheep	Knight & Bottcher	03 5578 7250
		WS10	910058	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
		Cr11	930097	Coora	Corriedale	Coora Partnership	02 4848 1244
		BL12*	94S291	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
1997	Hamilton	BL13	950246	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		Ro14	930146	Claymour	Romney	Rouch & Gillman	03 5727 1552
		BoL15	924287	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cp16	930069	Narrambla	Coopworth	D Wigan	03 5577 2321
		Fi17	950054	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		Cp18	942297	Oaklea	Coopworth	J Keiller	03 5526 5248
		EF19	940B26	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Cr20	880491	Stanbury	Corriedale	Cole & Risbey	03 5593 9278
		Fi21	960002	UNSW	Finnsheep	S & D Jones	03 5122 3328
1998	Struan	Fi22	890049	ATC	Finnsheep	Jaydee Stud	08 8764 2065
		Fi23	930049	Tambaroora	Finnsheep	Jaydee Stud	08 8764 2065
		BL24	960346	Gleneith	Border Leicester	CE & LJ Arney	08 8536 0031
		BL25	960188	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		Cp26	960210	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Cr27	921586	Coora	Corriedale	Coora Partnership	03 5578 6267
		EF28	960133	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		Hy29	960028	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Hy30	960128	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		PD31	960110	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		BL32	95T138	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		WS33	951470	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1998	Cowra	BoL34	0029	Caveton Park	Booroola Leicester	PIRSA	08 8762 9100
		BL35	940765	Retallack	Border Leicester	BLA(NSW)/Grinter	02 6974 1153
		Cp36	960067	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cp37	940274	Narrambla	Coopworth	RJ & PH Lane	02 6362 7115
		Cc38	960621	Coronga	Coronga Composite	Premier Breed. Tech	02 6365 8207
		EF39	B40	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FL40	940016	Wycombe	Finn x Leicester	R & L Coddington	02 6775 5225
		Gr41	955551	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		WS42	940069	Leahcim	White Suffolk	AWSA/Michael	08 8865 2085
1998	Hamilton	BoL43	96P6322	Struan	Booroola Leicester	PIRSA	08 8762 9100
		EF44	960026	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		EF45	0019	Glenspean	East Friesian	S & J Cameron	03 5286 1455
		Cr46	950161	Gundowringa	Corriedale	HJ & CJ Prell	02 4848 1244
		EF47	950509	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		FiF48	960086	Gippfinn	Finn x Friesian	S & D Jones	03 5122 3328
		Ro49	9200089	Evergreen	Romney	C Duncombe	03 5264 5170
		Tx50	949002	Coolana	Texel	Coolana Rural	03 5350 5531
		WS51	900429	Galaxy Park	White Suffolk	AWSA/Gale	08 8210 5230
1999	Cowra	BL52	920070	Kegra	Border Leicester	BLA(NSW)/Golder	02 6977 1339
		BL53	960102	Inverbrackie	Border Leicester	CE & LJ Arney	08 8536 0031
		BL54	970030	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BoL55	955203	Struan	Booroola Leicester	PIRSA	08 8762 9100
		M56	900183	Centre Plus	Merino	L Mortimer & Sons	02 6892 8259
		EL57	960043	Ostlers Hill	English Leicester	ELAssoc/Stephenson	03 5764 1298
		WH58	960505	Clifton Hills	Wiltshire Horn	AWHSBA/Ballantyne	03 5145 8225
		EF59	970100	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		WS60	970842	Linden Genetics	PLG White Suffolk	Linden Genetics	02 6386 2020
1999	Hamilton	BL61	970188	Wongajong	Border Leicester	AD & CM Wilson	02 5882 3338
		BL62	980050	Kelso	Border Leicester	GB Starrttt & Son	03 5829 0144
		BoL63	955160	Struan	Booroola Leicester	PIRSA	08 8762 9100
		Cr64	910415	Coolana	Corriedale	PG Munro	03 5575 3240
		Cp65	978431	Cashmore Park	Coopworth	J Keiller	03 5526 5248
		Ch66	920L91	Grand Ridge	Cheviot	RN Waddell	03 5629 4300
		Fi67	960085	Gippfinn	Finnsheep	S & D Jones	03 5122 3328
		EFP68	981019	Yollom	East Friesian x Perendale	MF & ML Molloy	03 5596 2077
		EFR69	970175	Price	East Friesian x Romney	EJ & KJ Price	03 5527 1110
1999	Struan	BL70	970310	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL71	970290	Kelso	Border Leicester	GB Starritt & Son	03 5829 0144
		M72	933051	Merinotech Mid	Merino	Merinotech Mid North	08 8665 4019
		EL73	950T82	Koenart	English Leicester	CR Taylor	03 5595 0272
		Cp74	970101	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Hy75	960215	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		FiF76	960132	Gippfinn	Finn Friesian	S & D Jones	03 5122 3328
		EF77	960136	Silverstream	East Friesian	A. Baillieu	03 5597 6598
		SHD78	970155	Tauranga	South Hampshire Down	S & M Macmillan	03 5596 2251
		PD79	970101	Wyndamah	Poll Dorset	GJ & BJ Oxley	03 5037 2355
		WS80	970172	Koonawarra	White Suffolk	AWSA	08 8210 5211
2000	Struan	BL81	960327	Morton	Border Leicester	JD & CM Corbin	08 8765 8058
		BL82	980260	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		BL83	980085	Johnos	Border Leicester	NW & JI Johnson	08 8756 6053
		SAM84	980046	Jeancourt	SAMM	W & M Heddle	08 8271 7080
		Cp85	980091	Oaklea	Coopworth	DW & IA Peglar	08 8738 9291
		Gr86	980144	Yangoora	Gromark	Yangoora Gromarks	02 6383 3254
		Hy87	940278	Cowra	Hyfer	NSW Agriculture	02 6391 3813
		Fi88	538	Gippfinn	Finn	S & D Jones	03 5122 3328
		EFP89	981071	Yollom	East Friesian	Karioi Seed Stock/Udy	03 5597 6621
		WS90	960513	Langley Heights	White Suffolk	AWSA	08 8210 5211
		WD91	990906	Axis	White Dorper	B & L Mawson	08 8537 0615

** Link sires used at each site each year*