



The Economics of a Commercial Cashmere Goat Enterprise

Should cashmere goats be part of your farming operation?

A report for the
Rural Industries Research and Development Corporation
by
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Foreword

Keeping goats for cashmere has been profitable for a growing number of farmers in Australia. Many have found it a lucrative addition to the core business of their farms.

But, like any business ventures, there are efficient ways to do things and pitfalls to avoid.

This report looks in detail at the proposal to establish a goat enterprise and delves into important questions such as the right country for cashmere goats, capital requirements, financial returns, price risks, sensitivity to management error.

It also looks at the side benefits of keeping goats such as saving on weed control costs, how other enterprises benefit from the pasture possible with cashmere goats.

This project – along with its companion report *The Economics of a Commercial Angora Goat Enterprise* – is part of RIRDC's new animal products program which encourages the development of viable new industries in this field.

Peter Core

Managing Director

Rural Industries Research and Development Corporation

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SUMMARY

This paper looks at the steps that a commercial grazier should consider in deciding whether or not cashmere goats are a justifiable enterprise to include on their property. The analysis indicates that, on the basis of current Gross Margin returns, a cashmere enterprise may be viable for many Australian graziers.

INTRODUCTION

The basic questions that should be asked by a commercial grazier considering a new cashmere goat enterprise, are:

- Is my country suitable for cashmere goats?
- What are the capital requirements?
- Will goats make me more money than my present enterprise?
- What is the price risk involved?
- Can cashmere goats save weed control costs?
- Do other enterprises benefit from the pasture management possible with cashmere goats?
- How would the cashmere enterprise combine with other enterprises in terms of labour and grazing management?
- How sensitive are returns from the cashmere to management error?
- What will my neighbours and other family members think?

The likely returns from cashmere goats compared to other enterprises is of paramount importance. If the cashmere goat can produce superior Gross Margin returns on a per unit of carrying capacity for a sustained period of time. Carrying capacity is measured in Dry Sheep Equivalents or DSE¹. A considerable amount of the prejudice that many landholders seem to have against goats would disappear if superior returns are proved. This is covered in more detail in the returns section of this booklet.

Profitable adoption of a cashmere enterprise by some of the established graziers in a district is the fastest way to decrease prejudice against the industry.

An economist would evaluate the possible introduction of a cashmere enterprise in four main steps:

1. Calculate and compare Gross Margins on a per DSE basis and on a per \$100 of livestock capital basis.
2. If Step 1 looks attractive, estimate the capital required to get into the venture.
3. Prepare a partial budget to calculate the return on capital from your investment.
4. If the partial budget is favourable, look to the longer term. Prepare a cash flow projection and use discounting to calculate a net present value for the project and an internal rate of return. This should be compared to other possible projects on the property.

Details using examples of this approach are covered in a later section.

The Beginning

Cashmere production was first recognised as a possible industry for Australia in the early 1970's. Dawson's International made considerable efforts to establish an industry here in the 1980's which led to the formation of the Australian Cashmere Growers Association (ACGA) and the marketing body the Australian Cashmere Marketing Association (ACMC). Feral goats mainly from pastoral areas of Australia were used as the initial stock. The first sale by the ACMC was in 1986 and sales have been made regularly from their Sydney based depot ever since.

The Fibre - Price Stability.

Cashmere is recognised as a luxury fibre, commanding some of the highest prices in the world for textiles. The finer portion of the cashmere goes into luxury knitwear (called hosiery) products, sometimes as a blend with silk. The coarser products are used in the weaving trade for items such as scarves, travel rugs and cloth for luxury coats and suits. The uncertainty and speculation which surround the production and availability of cashmere have increased its appeal, sometimes sending prices soaring upwards. The type of person who buys cashmere is not usually deterred by price. Unlike mohair, which are more subject to the vagaries of fashion, cashmere has a high proportion of perennially loyal consumers. However, the cashmere sector is not immune from market forces. The market is affected by price rises and fashion can still swing price. (Watkins and Buxton 1992)

Prices paid for cashmere have shown considerable instability over the past decade. The major cause was a loss of confidence in the industry caused by the major producer, China, launching a policy in the latter part of the 1980's to devolve buying and selling to individual provinces away from a centralised control. This policy change occurred at a time when there was high demand for cashmere. Opportunist stockpiling occurred and sometimes blending with inferior product occurred. Many buyers stopped buying as a result so that by 1990 there was an oversupply of the fibre. Provinces began to undercut official prices and prices collapsed. The Chinese attempted to again establish a centralised control and now partially process or completely process most of their production.

Prices paid have fluctuated considerably. Weighted average prices for hosiery (<16.7?m) and weaving (16.7?m) reported by the ACMC since their inception in 1986 is reported in Graph 1.

Graph 1

It is shown in graph 1 that prices were relatively stable during the 1988 to 1990 period, however, prices then fell significantly until a recovery in 1994. In 1992 there were no sales and producers that shored their goats were without a cashflow for this period. It is hoped the set of circumstances that lead to the complete price collapse will not occur again, however, the price variability is such that most commercial farmers would not wish to have a large portion of their income reliant on cashmere prices.

It has been pointed out, however, that there are often quality problems with production from other areas of the world, particularly China, and reliable supplies of good quality product from Australia is being encouraged by a number of countries. Jim Coleman of Forte' Cashmere company in talking about highlighting the unique characteristics of Australian and New Zealand cashmere has said "...the Australian clip is too small, fragmented and unpredictable to centre important products around. As such, we have no choice but to modify our offers to the market so we can offer "ANZ style blends" to expand our offering capability.

We try to maintain the inherent characteristics of Australian cashmere in these blends. We're hopeful that in the future, production will increase to levels that will allow the re-establishment of 100% Australian Cashmere." (Coleman 1995).

Australian Production

The estimated volume of cashmere delivered to the ACMC has been calculated from their records by subtracting the volume of cashgora² delivered and making allowances for any unsold fibre. (Graph 2)

Graph 2: Estimated volume of Cashmere fleece lines delivered to the Australian Cashmere Marketing Corporation.

It is shown in graph 2 that the quantity of cashmere delivered peaked in 1988 and has fallen since. This is despite prices remaining relatively high until 1990. Droughts, high wool prices around 1988 and then lower cashmere prices have all contributed to the decline. The rate of decline has slowed during 1995 and deliveries are now expected to increase. Trends in goats numbers in Australia as reported by the Australian Bureau of Statistics are presented in Graph 3. Unfortunately reporting has differed over time and it is not possible to isolate cashmere goats from Angora and milk goats. As the cashmere type goat is a significant part of the overall goat population, it can be assumed that the trends in the overall goat population are similar to what has happened to the cashmere goat. It is evident from Graph 3 that there has been a significant decline in the goat¹ population with numbers reported by farmers in 1993 less than half the number reported in 1988. Significant reductions have occurred in all states. Obviously recent droughts have played their part but so too has the comparative returns to other enterprises.

Graph 3: Trends in Goat numbers by State 1987/88

² Cashgora is a fleece with three component fibre types, a fine down, a courser intermediate fibre which is longer and shinier and course guard hair. In contrast, cashmere does not have the intermediate fibre type. Mean fibre diameter of cashgora is generally higher.

The Returns

Down Production:

There is a very high correlation between the micron and the amount of down (actual cashmere) produced. As micron increases so too does down weight. The quotations on down weight that follow are all from producers who are attempting to keep their micron sufficiently low to attract the higher prices received for these lines.

Before looking at a gross margin, an examination of the likely production from the range of genetics available is required. Producers considering getting into cashmere goat production still have the choice of:

- starting from a group of feral animals or
- a flock from someone that is going out of the industry, or
- buy surplus or cast for age³ females.

Goats that are already domesticated will be much easier to keep behind fences. If feral goats are purchased, a rule of thumb is that 50% of the does would be worth shearing after kidding has been synchronised.

There is very little documented yield information from feral goats, however, Western Australian estimates put the average production at 60g/hd for stock of feral origin increasing to 90,120,150,170 and 190g for each subsequent generation. (Burnage 1995)

Production at these levels is only possible with very good management and the use of good bucks.. Producers who I interviewed have all been selecting for cashmere for at least four years and recent production has ranged from around 80g/hd to 170g per head. Some of the lower figures are from drought affected areas.

Kevin Cole of Bruce Rock in Western Australia is cutting from 150 to 200g per head (average micron for the major adult line was 16.88 micron) with almost all of it in the WW⁴ category. He thinks in the very long term it would be possible to go as high as 500g per head, as there are currently some does that are achieving these levels. These would most probably be coarser fibre than average.

Several producers in NSW are currently averaging 150g per head from their commercial does and may achieve more with better seasonal conditions. Andrew James who has a farm between Toowoomba and Brisbane generally expects from 150 to 180g per head. This year in drought conditions he has achieved the following results.

1st shearing	100g	14.8 micron.
2nd shearing	140g	16.3 micron
3rd shearing	140g	16.7 micron

James (1995) in reporting earlier work by Browne (1989) stated that production from his top 16 micron goats would average 220 grams where as 388 grams could be expected from a top animal producing 19 micron down

Jim Browne who until 1995 had a Cashmere stud at Merton in Victoria and reports averaging 200g of down at 16.8 micron from his does in 1989. ¹He now has the top 20% of the breeding does producing between 250 and 300 g of down. The top does are producing over 400 g of down. (Browne 1995, p.20)

Bess Vickers of Carcoar has a flock currently producing an average of 150g/hd at less than 16.7 micron. Her maiden does averaged over 200g/hd in 1995.

It is estimated that new entrants into the industry could average around 60g/hd from stock of feral origin and around 140g/hd for stock from an established producer who has been using selected bucks. Further selection should improve production further. The general conclusion at this stage is that producers should be aiming for producing a cashmere fibre type which is just finer than 16.7 microns. (James 1995)

Meat prices

With high kidding percentages achievable under good management, a considerable portion of the income from goats can come from sale of surplus kids as meat. In the Eastern States, goat meat demand is spasmodic with peaks in prices being received just prior to Christmas and Easter. Prices on farm, however, are variable and depend to an extent on the proximity to market, the number available and the negotiating skills of the individual.

At the time of writing - October 1995 - prices for surplus young goats has recently varied from an average of \$5 to \$15 on farm. Prices paid for feral animals are currently up to \$17.50 delivered abattoir for animals that dress over 18 kg, however this price is expected to fall during summer as feral goats become more available because they can be trapped on water⁵.

If there is a market for wethers to be used by other farmers for weed control up to \$20 can be achieved for them but this market is not always available. Prices for cast for age animals has also varied but on average a price delivered to the abattoir is generally around \$7.

Capretto: The situation for surplus young animals in Western Australia is markedly different. They have developed a market for capretto where the kid goat slaughtered from 8 to 10 weeks of age. These carcasses are mostly frozen and sold to European markets.

- Dressed weight of carcasses must be from 5 kg to 9 kg,
- liveweight 12 kg to 19 kg)
- condition score 2 to 3, and
- kid goats must still be suckling their mothers.

The prices received for animals that made the specifications were \$23 per head delivered to the abattoir. Severe penalties are in place for anything that does not make the grade,

³ Older females no longer required by a farmer as they retained younger does to take their place.

⁴ White cashmere with white guard hair. This line is divided further on diameter and yield.

⁵ Water is generally only available in the larger dams and with proper fencing goats can be trapped when they come into drink.

however, the current rejection rate is very low as farmers have learnt how to deliver the quality required. This market places an excellent floor price for the goat industries. Some producers are focussing solely on this market and not aiming for fibre production as well.

The largest producer of capretto in Western Australia is running goats from feral origin but is not shearing them mainly because it is a busy time of the year for his cropping operations. For those seeking to advance their cashmere herds the capretto market is posing an interesting challenge. Surplus female goats are also sold to this market which means that farmers have little time to select their best breeding stock. A mechanism to identify the better cashmere producers in the female kids is a priority area that is being researched in Western Australia.

There is also considerable interest across Australia to use the Boer⁶ goat for goat meat production. I see very little advantage in using a Boer goat for the capretto market unless;

- a premium is paid (a Boer cross kid could go higher than 9 kg dressed and still be accepted, or
- the kidding percentages were significantly higher from Boer cross does.

The Boer goat will have a place, however, if other premium markets can be developed for larger goats or if they can become a dual purpose animal. Boer goats do grow cashmere and there is more distinction between the cashmere and the guard hair. Levinge (1995).

If useful quantities of cashmere cannot be grown on a Boer type goat, the emergence of the Boer goat is likely to be a threat to the expansion of the cashmere industry. Producers who are considering a goat enterprise may be attracted to the larger more robust goat which should attract higher meat prices. Even for weed control, producers may view the Boer goat as a stronger goat more able to control their weed problems.

I consider it is in the interests of the cashmere and Angora industries to develop a capretto market in Eastern Australia as soon as possible. Even though both industries are currently wanting to see the younger animals retained for shearing because they have finer fleeces, a capretto market will help under pin the returns by providing a much needed base from which the industry can develop.

There is considerable potential for a live export trade in goats (for meat) to the middle eastern and south east Asian markets in particular. Unlike the live sheep trade which is used to feed poorer Arabs, live goats/goat meat of good quality (young/lean/entire male) would reach the higher priced upper class Arab market. (Kelly et. al. 1987) Australia and New Zealand appear the best placed to supply a quality market with Western Australia having a geographic advantage by being closer to the market.

It is interesting that Toseland (1995) thought the ‘...primary production focus’ for the Boer goat would be ... “the kid market with a carcass weight of between 6 and 16 kg’.

The present capretto payment structure developed in Western Australia offers no real incentive to change to Boer bloodlines because the weights can be achieved by other breeds of goat. There may be an advantage if the Boer goat actually resulted in a higher proportion of kids that make the grade. Most established producers, however, are making

the grade with either Cashmere or Angora type goats. It is significant that the winner of the prize for the best capretto in a Western Australian carcass competition this year was an Angora kid.

Kidding and Weaning Percentages

Under good management, kidding percentages can be as high as 170%, however, most producers I spoke with said that there can be considerable losses just after kidding from predation and sometimes from cold snaps in colder areas or exposed areas. Actual weaning percentages tend to be about 90 per cent to 120 per cent with lower results in drought. There are isolated higher results.

In periods of drought, pregnant goats can abort without supplementary feeding. The majority of producers kid in late winter and aim to wean their kid before Christmas. Does are then free of offspring during the cashmere growing season from Christmas to the end of June. The capretto market established in Western Australia is ideal for this.

Many producers have used shepherd dogs to good effect. Kevin Cole of Bruce Rock WA has used a shepherd dog for nine years and average weaning percentages were 135% to 150%. Last year the guard dog died and weaning percentage fell to 100%.

It does take time and work to train a shepherd dog. Producers are using both Maremma and Karabash breeds of guard dogs to good effect. All producers interviewed acknowledged predation as a major problem. Foxes were the most common predator mentioned which was generally controlled by baiting with 1080. You cannot bait, however, if a shepherd dog is being used. Control was backed up by shooting in open areas. Electric fences can help to an extent because if a fox attempts to drag a kid out of the paddock they will get a shock and be less likely to return. Eagles are also a problem in some areas and in the case of Bruce Cosh in mountainous country north of Roma in Queensland he has additional problems with dingoes and pigs. Shepherd dogs are used to very good effect here.

Andrew James from near Toowoomba found that last year due to drought, the does had to be locked into a small paddock where excellent supervision and predator control could be achieved. He achieved a kidding percentage of 150 per cent where as normally 120 per cent is achieved and sometimes as low as 80 per cent. He puts the difference down to predation.

The use of shepherd dogs amongst goat producers is now very common and most producers highly recommend the practice. Training can be time consuming and there is the need to see that the guard dog has feed. Most use a self feeder in conjunction with dry feed for the dog. There are several instances of successfully using donkeys to deter predators as well.

Weed Control

It has been widely reported in other literature the range of weeds that can be controlled by goats. See for example Allen *et. al* (1993) and May *et. al* (1995). What is not so readily available is estimates of the actual savings in weed control costs that have been saved by farmers. In talking with goat farmers all emphasised the role that goats played in their general pasture management and in weed control.

The most significant areas where goats have impacted on weed control costs is in areas infested with blackberry or briars. This occurs in much of the tablelands and higher rainfall country of eastern Australia. Some farmers using goats are in a tight financial position and claim that without goats the carrying capacity of their property would have reduced. Others have reclaimed paddocks with severe infestations of blackberry or briar into a very productive paddock.

Murray Sherf of Emmaville on the Northern Tablelands of NSW started spending \$15,000 per year on contract blackberry spraying prior to getting goats. He estimates it would require three to four years of spraying at this level of cost before the infestations reduced significantly and a lesser amount could be spent to keep the problem under control. A similar story came from Noel Waters again on the NSW northern Tablelands east of Armidale. He estimated that the chemical costs in controlling blackberries would have been \$2,000 to \$4,000 per year for about five years and then the bill would gradually reduce.

In both cases these costs have ceased with the introduction of goats. However, at Emmaville extra fencing will be required to get goats into one particular area. Spraying will not be necessary because he knows when the fencing is done he has the means to eliminate the weed.

At Glen Innes on the northern Tablelands of NSW, Norm and Penny Whittaker were issued with a notice from the local Rural Lands Protection Boards to control blackberries on one of their properties. They requested the Board wait for 12 months following the introduction of goats and then decide if another notice was warranted. The inspection was made and they have not heard from the Board since.

Cashmere goats have also been used to very good effect in other areas for weed control. Bruce Cosh on his property north of Roma in Queensland has used goats to very good effect on regrowth control.

Andrew James has used goats successfully to control the weed Lantana on his property between Toowoomba and Brisbane. He warns that due to toxicity other feed must also be available.

Goats are also used for scrub control in some of the more arid areas of Western NSW and Queensland. Under these circumstances, the presence of feral animals means that a selective breeding program aimed at improving cashmere production is not easily achieved.

Use of goats at lower stocking rates to control selected weed species should be regarded as an environmentally friendly method of control - especially when the alternative is regular use of chemical. An additional benefit is use of goats to control weeds such as blackberry that can be a harbour for rabbits.

Gross Margin Estimates.

Anyone contemplating cashmere production should buy progeny from a low disease risk flock where there has been selection for cashmere production over a number of years. Down weight and micron should both be considered when selecting a flock. Goats that have been domesticated will have the advantage of being easier to contain, but good fencing will still be required.

Starting from a feral base may initially be cheaper. It is likely to take at least 6-8 years to get to the same stage as you could from purchasing surplus stock from another producer. A best estimate of returns from goats purchased from another breeder is that average production should commence at about 120 g of cashmere down. The potential will be for production to go higher with further selection. The use of bucks that have been fully fleece tested⁷ preferably as a two year old is highly recommended.

A critical factor in the comparison of cashmere enterprises to other enterprises is the dry sheep equivalent (DSE) rating used. A DSE is the estimated energy requirement to maintain an adult wether Merino sheep weighing 45 to 50 kg. See Table 1 for examples of the DSE ratings for various sheep (White and Bowman 1981)

Table 1a. Dry sheep equivalents for different classes of livestock based on a daily feed requirement basis. Assumes that a 2 year old dry sheep weighing 45 kg requires 7.2 MJ ME/day = 1 DSE).

Class of stock	Dry sheep equivalents (DSE) at specified liveweight	
	15 kg	25 kg
Sheep		
Weaned Lambs		
gaining 100g/day	1.0	1.3
gaining 200g/day	1.5	1.9
¹Mature sheep		
	40 kg	50 kg
dry ewes, wethers,	0.9	1.1
gaining 100g/day	1.5	1.8
pregnant ewes until last 6 weeks	0.9	1.1
pregnant ewes last 6 weeks (single)	1.1	1.3
pregnant ewes last 6 weeks (twin)	1.3	1.5
Ewes with lambs at foot	2.4	3.1

Using these figures as approximations for goats the following are calculations for two cashmere enterprises. **Table 1b** is where all progeny are retained for a year and shorn. **Table 1c** shows the DSE requirements for an enterprise where 90 per cent of male progeny and half of the female progeny are sold as capretto. In both situations it is assumed that kidding is 150 per cent, weaning percentage is 125 per cent and that the average weight of the doe is 37 kg.

⁷ An analysis of fibre diameter and yield (% cashmere) of fleece.

Table 1b DSE requirements for a 100 doe flock where weaning percentage is 125 per cent, all kids are retained until after the first shearing and average doe weight is 37 kg.

Flock Status	time (months)	Average DSE	Numbers	Dse Rating
Dry Doe	4.0	0.88	100	29.33
Early Pregnancy	3.5	0.88	95	24.38
Late Pregnancy (single)	1.5	1.07	40	5.35
Late pregnancy (twin)	1.5	1.25	55	8.59
non pregnant	1.5	0.88	5	0.55
lactating	3.0	2.30	95	54.63
non lactating	3.0	0.88	5	1.10
weaned kid	9	1.10	125	103.13
Total				227.06
DSE per doe				2.27

Table 1c DSE requirements for a 100 doe flock where weaning percentage is 125 per cent, 90 per cent of all male kids and half the female kids are sold at 10 weeks to the capretto market. Average doe weight is 37 kg.

Flock Status	time (months)	Average DSE	Numbers	Dse Rating
Dry Doe	4.5	0.88	100	33.0
Early Pregnancy	3.5	0.88	95	24.38
Late Pregnancy (single)	1.5	1.07	40	5.35
Late pregnancy (twin)	1.5	1.25	55	8.59
non pregnant	1.5	0.88	5	0.55
lactating	2.5	2.30	95	45.52
non lactating	2.5	0.88	5	0.92
weaned kid	9	1.10	38	31.35
Total				149.66
DSE per doe				1.5

It can be seen from the above calculations that a cashmere enterprise focusing on the capretto market is rated at 1.5 DSE per breeding doe compared to an enterprise where all progeny are carried through which is rated at 2.27 DSE. The difference may be even more pronounced, because in most areas of Australia autumn or winter is the most limiting time of the year. This is the time when the maintenance requirements of the weaner kids is higher because they are getting bigger.

Gross margin budgets have been calculated on the two cashmere enterprises details of which can be found in Appendix 1. The results are summarised in Table 2 and compared to returns currently received from other enterprises.

Table 2: Gross Margin Returns from Cashmere, Angora, Sheep and Beef Enterprises.

Enterprise	Assumpitons Used	Gross Margin per head	GM per DSE	GM per \$100 of livestock capital
Cashmere from flocks with at least 8 years selection budget (pp24-25)	kids weaned 125 per cent, cashmere yield from adults 140g/hd, adult cashmere price \$95/kg.	\$26.77	\$11.79	\$103
Cashmere from feral flock in second year of breeding (pp26-27)	kids weaned 125 per cent, cashmere yield from adults 75g/hd, adult cashmere price \$95/kg.	\$16.50	\$7.27	\$64
Cashmere/capretto (currently only available in WA) (pp28-29)	As above, except that 90 per cent of wether kids and 50 per cent of doe kids are sold to the capretto market at 10 weeks of age at \$22 net of freight. Currently only available in WA).	\$29.80	\$19.86	\$115
Angora (intensive kidding)	Price adult mohair \$5.00/kg gross, kid weaning 110 per cent, mohair production per adult 3kg. shearing, DSE rating is 2.12 per breeding doe.	\$31.38	\$14.80	\$89
Angora wether	Fleece weight each year 6.5kg. Price \$5.00/kg gross.	\$14.53	\$14.53	\$85
Merino ewe 21 micron fibre*	EMI 589c/kg clean, 80 per cent lamb weaning, wool cut 5kg/ewe. DSE rating 2.1.	\$26.37	\$12.55	\$95
Merino wether 21 micron fibre*	EMI 589 c/kg clean, wool cut \$5.94, purchase price \$25, sale price \$12.	\$12.55	\$12.55	\$68
Beef Yearling budget	Weaning 86 per cent, steers sold 12- 15 months at 380kg at 90c/kg, DSE rating 17.62.	\$213	\$12.12	\$63

* Source Crean (1996)

The above analysis shows that producers are clearly in front using goats that have already been selected for cashmere production for at least eight years. They are even further in front if they have access to the capretto market. In the capretto budget 57 per cent of income comes from meat and only 43 per cent from fibre. In the main cashmere budget 38 per cent of income comes from meat where as 62 per cent comes from fibre. With half of the female progeny being sold, however, it does mean that genetic progress may be slower unless the best cashmere producing kids can be successfully screened in the first 8 to 10 weeks .

The cashmere enterprises were comparable with other enterprises and ranked highly on a gross margin per \$100 of livestock capital basis. This is of particular relevance for producers who are coming out of drought with low stock numbers and have limited capacity to finance purchase of stock.

The returns from a capretto based cashmere industry highlights the significance the development of such an industry could mean to producers. The Skillecorn report (1993) warns however, that ... 'in a period when fibre returns are very low,... the temptation will arise to switch goat breeding over to meat production, rather than using the Boer goat as a terminal sire, as occurs with Dorset bloodlines in the sheep industry. This would result in a long-term downgrading of the Australian goat fibre production sector. The end result would be a further diminution of the volume of goat fibre produced in Australia, particularly cashmere.'

The cashmere industry will have to market the advantages of a dual purpose animal in competition with the aggressive marketing that is likely to emanate from the Boer goat industry. They should also be looking closely at the cashmere potential from the Boer goat. If Boer goats are judged as having significant cashmere potential the industry should work closely with interested Boer goat producers to produce a line of Boer goats that can also produce cashmere.

What areas suit cashmere goats?

Cashmere goats are run in a range of environments ranging from quite arid to the tablelands. They are generally not recommended in very wet coastal areas. In the more arid areas goats are generally not shorn as cashmere production is unreliable. Breeding is also difficult in these areas because fencing is not generally good enough to exclude feral bucks. Some graziers specifically run goats in the arid areas for scrub or regrowth control and occasionally sell the surplus. Others catch and sell feral goats when they have the opportunity.

What are the Capital Costs?

Besides the cost of the animals, other capital expenses could also be significant. Major costs may be needed to upgrade fences and to provide a shearing facility if one is not available and this can be very expensive. In cold areas kidding should be carried out in a sheltered area.

Livestock purchase expenses: Costs of purchasing stock at present is generally cheaper than for other livestock enterprises. The costs of buying surplus doe hoggets at around \$22 on farm - \$10 per DSE- is cheaper than a ewe and on a per DSE basis. They are much cheaper than breeding cows where, depending on enterprise where between \$30 and \$50 per DSE is invested in livestock.

Fencing costs: Cashmere goats require good fences particularly for feral flocks. With successive generations and with a fair bit of handling, goats will learn to respect fences more. Cull goats that will not stay behind fences. Most cashmere farmers interviewed had upgraded their fences considerably.

If a new fence is being built, a seven wire fence with 3 hot wires is recommended. However, many producers have successfully upgraded existing fences by adding a live outrigger wire 20cm out and 20cm above the ground. Fencing costs can vary from depending on terrain and type of fence - from more than \$3,000 per km for an elaborate new fence to around \$300 per km for an outrigger. Some producers train goats to respect electric fencing in a small training paddock which has a very good electric fence. Once they respect the fences they are moved to other areas.

New entrants into the cashmere industry have a responsibility to be able to retain their goats behind their fences. If they are in doubt they should seek local information from the State Government livestock advisory service or from the local branch of the Australian Cashmere Grower's Association.⁸

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Many goat producers point out that the benefits of improved fencing go beyond the goat enterprise. Sam Pratten of Murrurundi in the Upper Hunter Valley of NSW estimates that he now has only 10 per cent of the kangaroos he used to have prior to erection of the fences. He also has fewer feral pigs. For more information on fencing see NSW Agriculture Agfact A7.2.1 *Fencing for goats*.

With adequate feed, goats tend to become quite territorial. They like to stay in the one area and after they become used to an area, they are less likely to roam. Fences must be checked regularly after goats have been moved to a new area. As they mature and get stronger, wether goats will test fences more than does.

Costs for other structures: Shearing facilities are required. As a cashmere goat is generally shorn standing up with the aid of a goat bail they can be shorn by the owner. Richard Arnott of Coolah on the northern end of the Central Tablelands of NSW has actually shorn goats at the far end of his property in a tent. Marine plywood was the floor and some modified lamb marking yards were used. They used an electric generator and everything worked satisfactorily.

Sheep shearing sheds are quite suitable. However, with increasing awareness of contamination between fibres, a thorough cleaning is required in switching from sheep to goats and vice-versa. Cashmere fibre is particularly difficult to eliminate because it is so light. After considerable negotiation, it is now possible for goat producers to be eligible to qualify for the Elder's Clip Care Quality Assurance Program for wool even though goats have been shorn in the same shed.

Where two properties have been amalgamated, there is often more than one shearing shed. One shed could be used for cashmere shearing. Goats do travel relatively easily on a truck so it is feasible to truck them to a nearby shed for shearing.

Although the cost of a new shed can be considerable, some producers have built sheds especially for shearing the goats. Some have been built out of second hand material, but the cost is still considerable - especially if the cost of the labour is considered. Large capital outlays are difficult to justify unless a substantial number of goats are going to be run.

⁸ For up to date information on contacts contact the ACGA headquarters at 30 Cann St., Guildford, NSW 2161, ph. 02 9632 7476.

Upgrading of yards may also be required. If sheep yard rails are low they may need to be raised. Yards are much better if they do not have a flat surface on top rail onto which a goat can jump. The top is best as a wire rather than a rail. Cattle yards can be used but mesh or netting is required around the lower portion of the fence and under the gates. While a sheep race is often used, many prefer to use a special race which costs around \$1000 to \$2000). Others use a VE®9 handler if foot paring is required. If this operation is used other tasks like vaccinating and drenching are carried out at the same time.

What are the labour requirements?

A cashmere goat enterprise requires labour at shearing time and for the usual husbandry practices that are carried out in an area. Lice treatment and drenching can be necessary.

As some farmers do not like handling goats it may be possible to arrange for other workers to do the physical handling of the goats. Region 21 members of the Australian Cashmere Growers Association actually undertook in 1994 to shear goats on the Northern Tablelands of NSW for other graziers in return for half of the proceeds. The income generated was then used for region 21 promotions. In 1995 the proceeds are to be 60 per cent to the landholder and 40 per cent to region 21.

There is no reason why a similar commercial arrangement cannot be considered by the landowner and by someone who is happy to work with goats. Someone could undertake a complete share farming agreement where they do all of the goat management in return for a proportional share of the proceeds from the goat enterprise. The advantage to the landholder is that they have an additional income source with no labour inputs. Income can be reduced if other stock numbers have to be reduced as the goats are introduced. Capital outlay is restricted to fencing and yards. The landowner can also be benefiting substantially from an environmentally friendly form of weed control.

Perceptions by other landholders

There is a considerable amount of negative sentiment about goats in certain areas. There are some good reasons for this negative attitude, however much of it is through lack of understanding. Most ill feeling is based on goats not being kept in by adequate fencing or being poorly managed, resulting in lice, worm and foot rot problems.

There are many instances where a grazier has not had adequate fences to restrain the goats allowing some to go feral in country that previously did have goats. Others have simply turned goats free when no longer wanted. Feral goats in a fragile environment is viewed by the general public as highly undesirable. This poor image also flows on to peoples' regard for domesticated goats.

The best way for other grazier's to accept goats is to show that they are paying their way - either directly in terms of the gross margin or in conjunction with a weed control program. The perceptions are aided considerably if a well respected grazier starts a cashmere enterprise and is prepared to praise the virtues of the enterprise.

Variable Costs

Costs of running cashmere goats are likely to be lower than sheep, mainly because shearing can be done by the owner and there is no crutching and no fly strike problems.

Lice and drenching should be the same although some graziers use a higher drenching dose rate with goats. Goats are also susceptible to trace element deficiencies in particular, iodine, copper, cobalt and selenium problems can occur.

As a guide to the time required for shearing, Norm Whittaker of Glen Innes generally shears about 30 in a two hour run. Some of this time is also involved in classing the fleece.

Capretto producers have less costs than other cashmere enterprises because they sell kids before any vaccination, drenching or marking costs are incurred.

Requirements for supplementary feeding will vary between seasons and regions. In most situations a paddock should be reserved for goats to use at kidding time so that disturbance at this time is minimised. If conditions are poor at kidding time supplementary feeding may be required. In the temperate or Mediterranean climates of southern Australia, including the south of Western Australia - supplementation may be required in the late Autumn and early winter period. This is especially so on improved pasture areas,

Benefits in land and pasture reclamation

In addition to the gross margin benefit, goats can also have other benefits for the property. In some situations goats may be very useful for weed control purposes. There are some very good references on weed control (see for example Allan *et al.* 1993), Holst (1995)

On improved pastures, McGregor (1990) in an experiment using Angora goats and sheep at various stocking rates found that goats actually suffered in high stocking mixed grazing situations with sheep. At 12.5 animals/ Ha (10 was recommended) sheep actually had higher condition scores and fleece cuts, however, mohair production per head declined. The goats required increased supplementary feeding and were more vulnerable to cold stress.

In more recent research McGregor (1994) showed that nutrition in mid pregnancy and during lactation were important for a large number of reasons. The conclusion drawn was that goats should at least maintain weight during mid pregnancy and allow maximum energy intake during lactation. With lactation generally running into the spring period, nutrition at this stage is generally not a problem, however, maintenance of weight during a winter pregnancy is a concern and may require supplementary feeding.

The main economic point to draw from studies of dual grazing of goats and other animals is that while some supplementary feeding costs should be included for a valid comparison, any additional productivity from the sheep and cattle should be attributed to the goats. Many comments that goats sweeten pastures, especially for cattle have been recounted in speaking with farmers running either Angora and cashmere goats.

In highly improved pasture situations no increase in carrying capacity is expected. This applies to a substantial portion of the improved country of southern Australia. Increases in carrying capacity are expected where there is a proportion of browse material produced that is not eaten by other species. Briar areas and blackberry areas are the two most common examples. In these areas estimates of the safe increase in carrying capacity usually range from 10 per cent to 15 per cent, depending on the level of infestation. In some instances paddocks considered virtually useless because of dense infestations of

briar have been transformed into productive paddocks. Arnott (1995) has reported on his property near Coolah on the northern end of the central tablelands of NSW that as a result of pasture management using goats in areas thick with blackberry and briar “country given up as useless is now carrying over 7 DSE/Ha.”

There was also considerable anecdotal evidence that using goats in conjunction with sheep can actually reduce vegetable matter contamination in wool. A number of producers mentioned that the shearers can pick which mobs of sheep have been run in paddocks with goats compared to other mobs that are in areas without goats. John Body from near Murrurundi estimates that in some years the difference in vegetable matter in his wool can be around 2 per cent in areas where goats are run and 4 per cent in other areas. In other years the difference is much less. Wool International in providing details for the April to June quarter of the 1994/95 wool selling season state that for wool of good top making, B length fault free 20.6 to 22.5 micron category, the discount for category C wool (3.1 per cent to 7 per cent vm) is 44 cents compared to category B (1.1 per cent to 3 per cent vm) The average difference between category B and category C is 4 per cent meaning that over this range each 1 per cent decrease in vegetable matter percentage results in a price rise of 11 c/kg clean or around 8 cents greasy. A 1 per cent decrease in vegetable matter would result in an improvement in the gross margin of 55 cents per breeding ewe. On the basis of this calculation, a 2 per cent decrease in vegetable matter in a 2000 merino ewe flock would result in an additional \$2,200 of income.

Nutrition must be good for best fibre production. A concern is that with the winter period generally being the most limiting, that cashmere goats having a role of controlling blackberry or briar will be competing directly with other stock during the winter because these weeds lose their leaves during winter. A saved paddock for goats in the winter may be desirable so that they do not have to compete directly with sheep for short green grass.

AN ECONOMIST’S APPROACH TO MAKING A DECISION ABOUT COMMENCING A CASHMERE ENTERPRISE.

An economist would evaluate the possibility of introducing a goat enterprise in four main steps. These are:

1. Calculate and compare gross margins on a per DSE basis and on a per \$100 of livestock capital basis.
2. If step 1 looks attractive, estimate the capital required to get into the venture.

3. Prepare a partial budget to calculate the return on capital from your investment.
4. If partial budget is favourable, look to the longer term, prepare a cash flow projection and use discounting to calculate a net present value for the project and an internal rate of return. This should be compared to other possible project on the property.

In order to demonstrate the first three steps, four different situations are examined. The results in Table 3 show that depending on the situation, the partial budget using October 1995 gross margin returns results can vary from negative returns to attractive returns. Situation 4 shows a negative return while situation 2 is just positive. Situations 1 and 3 show returns on capital of 39 per cent and 31 per cent respectively. A return of 39 per cent was achieved when there were an abundance of weeds that goats could utilise and the capital requirements for improvements were not that high. Results are highly dependent on the relative size of the gross margins used. These are only a few of an almost infinite range of possibilities that may be available. A return on capital of at least 15 per cent is generally recommended in order to justify the risks. This will only be possible where the introduction of goats leads to one or more of the following situations;

- when overall carrying capacity is increased because there is a lot of browse available on the property.
- when weed control costs are reduced.
- when meat prices are attractive.
- when the capital outlay to commence an cashmere enterprise is low.
- when the gross margins per DSE are higher for goats than the competing enterprises.
- when the introduction of goats will improve the returns from another enterprise.
- when the main labour requirements periods for the goat enterprise do not clash significantly with the labour requirements of other enterprises.

Table 3. Four example Partial budgets Using Goats.

<p>Situation 1: 300 does run on country with briar. No reduction in other stock numbers required. Saved spray costs \$3000. Cost of capital improvements \$20,000.</p> <table border="0"> <tr><td>Capital purchase costs</td><td>\$</td><td></td></tr> <tr><td>300 does @ \$22</td><td>6600</td><td></td></tr> <tr><td>6 bucks @ \$300</td><td>1800</td><td></td></tr> <tr><td>Capital improvements</td><td>20000</td><td></td></tr> <tr><td>Net cost of change over</td><td>(A) 28400</td><td></td></tr> <tr><td colspan="3"> </td></tr> <tr><td>Gross margin does @ \$26.77/hd.</td><td>8031</td><td></td></tr> <tr><td>plus saved spray costs</td><td>3000</td><td></td></tr> <tr><td>Net Benefit</td><td>(B) 11031</td><td></td></tr> <tr><td>Return on capital (B)/(A)*100</td><td>39%</td><td></td></tr> </table>	Capital purchase costs	\$		300 does @ \$22	6600		6 bucks @ \$300	1800		Capital improvements	20000		Net cost of change over	(A) 28400					Gross margin does @ \$26.77/hd.	8031		plus saved spray costs	3000		Net Benefit	(B) 11031		Return on capital (B)/(A)*100	39%		<p>Situation 2: 300 does run on highly improved pasture will replace 300 ewes. Cost of capital improvements \$6000.</p> <table border="0"> <tr><td>Capital purchase costs</td><td>\$</td><td></td></tr> <tr><td>300 does @ \$22</td><td>6600</td><td></td></tr> <tr><td>6 bucks @ \$300</td><td>1800</td><td></td></tr> <tr><td>Capital improvements</td><td>6000</td><td></td></tr> <tr><td></td><td>14400</td><td></td></tr> <tr><td colspan="3"> </td></tr> <tr><td>Less sale of ewes @ \$20</td><td>6000</td><td></td></tr> <tr><td>Less sale of rams</td><td>600</td><td></td></tr> <tr><td></td><td>(A) 6600</td><td></td></tr> <tr><td colspan="3"> </td></tr> <tr><td>Net cost of changeover</td><td></td><td>7800</td></tr> <tr><td colspan="3"> </td></tr> <tr><td>Gross margin does @ \$26.77</td><td>8031</td><td></td></tr> <tr><td>Less gross margin Ewes @ \$26.37</td><td>7911</td><td></td></tr> <tr><td>Net Benefit</td><td>(B) 120</td><td></td></tr> <tr><td>Return on capital (B)/(A)*100</td><td></td><td></td></tr> </table>	Capital purchase costs	\$		300 does @ \$22	6600		6 bucks @ \$300	1800		Capital improvements	6000			14400					Less sale of ewes @ \$20	6000		Less sale of rams	600			(A) 6600					Net cost of changeover		7800				Gross margin does @ \$26.77	8031		Less gross margin Ewes @ \$26.37	7911		Net Benefit	(B) 120		Return on capital (B)/(A)*100																				
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<p>Situation 3: Similar to situation 2 except the enterprise selected is a cashmere/capretto. 300 does will replace 230 merino ewes. Cost of capital improvements is \$6000.</p> <table border="0"> <tr><td>Capital purchase costs</td><td>\$</td><td></td></tr> <tr><td>300 does @ \$22</td><td>6600</td><td></td></tr> <tr><td>6 bucks @ \$300</td><td>1800</td><td></td></tr> <tr><td>Capital improvements</td><td>6000</td><td></td></tr> <tr><td></td><td>14400</td><td></td></tr> <tr><td colspan="3"> </td></tr> <tr><td>Less sale of ewes @ \$20</td><td>4600</td><td></td></tr> <tr><td>Less sale of rams</td><td>460</td><td></td></tr> <tr><td></td><td>5060</td><td></td></tr> <tr><td colspan="3"> </td></tr> <tr><td>Net cost of changeover</td><td>(A) 9340</td><td></td></tr> <tr><td colspan="3"> </td></tr> <tr><td>Gross margin does @ \$29.80</td><td>8940</td><td></td></tr> <tr><td>Less gross margin Ewes @ \$26.37</td><td>6067</td><td></td></tr> <tr><td>Net Benefit</td><td>(B) 2873</td><td></td></tr> <tr><td>Return on capital (B)/(A)*100</td><td>31%</td><td></td></tr> </table>	Capital purchase costs	\$		300 does @ \$22	6600		6 bucks @ \$300	1800		Capital improvements	6000			14400					Less sale of ewes @ \$20	4600		Less sale of rams	460			5060					Net cost of changeover	(A) 9340					Gross margin does @ \$29.80	8940		Less gross margin Ewes @ \$26.37	6067		Net Benefit	(B) 2873		Return on capital (B)/(A)*100	31%		<p>Situation 4: Cashmere does to be used to replace 100 beef breeders producing yearlings. Capital required for improvements \$50,000. Remaining 200 breeders are estimated to improve gross margin by \$10 per head. Saving in weed costs \$2000.</p> <table border="0"> <tr><td>Capital purchase costs</td><td>\$</td><td></td></tr> <tr><td>630 does @ \$22</td><td>13860</td><td></td></tr> <tr><td>6 bucks @ \$300</td><td>1800</td><td></td></tr> <tr><td>Capital improvements</td><td>40000</td><td></td></tr> <tr><td></td><td>55660</td><td></td></tr> <tr><td colspan="3"> </td></tr> <tr><td>Less sale of cows & bulls</td><td>51600</td><td></td></tr> <tr><td colspan="3"> </td></tr> <tr><td>Cost of changeover</td><td>(A) 4060</td><td></td></tr> <tr><td colspan="3"> </td></tr> <tr><td>Gross margin does @ \$26.77</td><td>16865</td><td></td></tr> <tr><td>less GM cattle @ \$213</td><td>21300</td><td></td></tr> <tr><td>plus improvement in GM/hd @ \$10</td><td>2000</td><td></td></tr> <tr><td>plus savings in weed control costs</td><td>2000</td><td></td></tr> <tr><td>Net Benefit</td><td>(B) -435</td><td></td></tr> <tr><td>Return on capital (B)/(A)*100</td><td>-11%</td><td></td></tr> </table>	Capital purchase costs	\$		630 does @ \$22	13860		6 bucks @ \$300	1800		Capital improvements	40000			55660					Less sale of cows & bulls	51600					Cost of changeover	(A) 4060					Gross margin does @ \$26.77	16865		less GM cattle @ \$213	21300		plus improvement in GM/hd @ \$10	2000		plus savings in weed control costs	2000		Net Benefit	(B) -435		Return on capital (B)/(A)*100	-11%	
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Conclusion

A cashmere goat enterprise is a realistic enterprise choice for many farmers seeking diversification and for farmers with specific weed problems that goats are known to control or eliminate. The present general public aversion to chemical weed control means that there is a very big opportunity to promote goats as an environmentally friendly method of achieving weed control and in making income at the same time. The market for the cashmere fibre was depressed in the early 1990's, however, industry sources reveal that there are reasonable price prospects for Australian cashmere, especially if volumes can be increased to a point where firms can market cashmere products that can be marketed as uniquely Australian cashmere. Cashmere is a true luxury fibre which should always be in demand by the world's increasing numbers of affluent people. There is also potential for more income to be made from a well directed marketing push into higher priced quality meat markets. The capretto market developed by the Western Australians is a good example and has made gross margins per DSE for goat enterprises equal to or superior to other livestock enterprises. Development of a similar outlet in the Eastern States would provide an excellent base income from which both the cashmere and mohair industries would ultimately develop into larger industries.

The biggest impediments to larger goat industries are currently the capital required to get the fencing right and altering negative perceptions that is wide spread throughout the grazing communities. Those in the industry that want to see it expand have a role to play in educating prospective new entrants about the fencing requirements, the management and a true indication of the returns received. The basic framework is present for the cashmere industry to promote itself and to determine marketing and other initiatives for the future. It will, however, take a concerted effort by more than just a few dedicated producers to see the industry achieve the status of a major world supplier of cashmere.

References For general information about goats it is strongly recommended you should read the publication “Integrating Goats” by May et. al. Is very good. For information on weed control the article “Weed Control Using Goats” by Allen et. Al is highly recommended.

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CASHMERE ENTERPRISE Replacements retained until after first shearing.
Lloyd Davies, Economist, NSW Agriculture, Maitland.

Oct-96

This budget is based on domesticated feral does that have been running as a managed flock for at least eight years and are mated to selected bucks. All progeny are retained until after the first shearing .

Assumptions

Number of does			200
Number of ages in does			5
Down production & prices	Down Yield	Down Price	
	g/hd	\$/kg	
Kids	100.00	110.00	
Does	140.00	95.00	
Bucks	160.00	95.00	
Buck percentage (%)			2%
Sale price (\$/hd)	- wethers		10
	- cull doe maidens		20
	- does c.f.a.		8
	- bucks c.f.a.		12
Buck purchase price (\$/hd)			300
Kids weaned (%)			125
Death rate (%)	- adults		3%
	- kids		3%
Running costs: (\$/head); incl. 1 shearing (done by owner with casual assistance); drenches 2 adults, 4 young stock; lice control; 2 vaccinate, predator control & sundry			5.00

Returns (net)

\$

<u>Cashmere</u>			
does			2660.00
kids			2750.00
bucks			60.80
<u>Sales</u>			
wether weaners	121		1210.00
doe hoggets	81		1619.52
does c.f.a.	39		310.21
bucks c.f.a.	1		12.00
		Total	862

Variable costs

running costs (does + kids)		2250.00
buck purchase		300.00
cashmere selling costs -Pool 8%, research 1%, promotion 3%*		656.50
	Total	320

GROSS MARGIN

	flock	doe	d.s.e.*
	\$	\$	\$
returns	8623	43.11	
variable costs	3206	16.03	

GM

5416

27.08

11.9

* See comments above and on the next page.

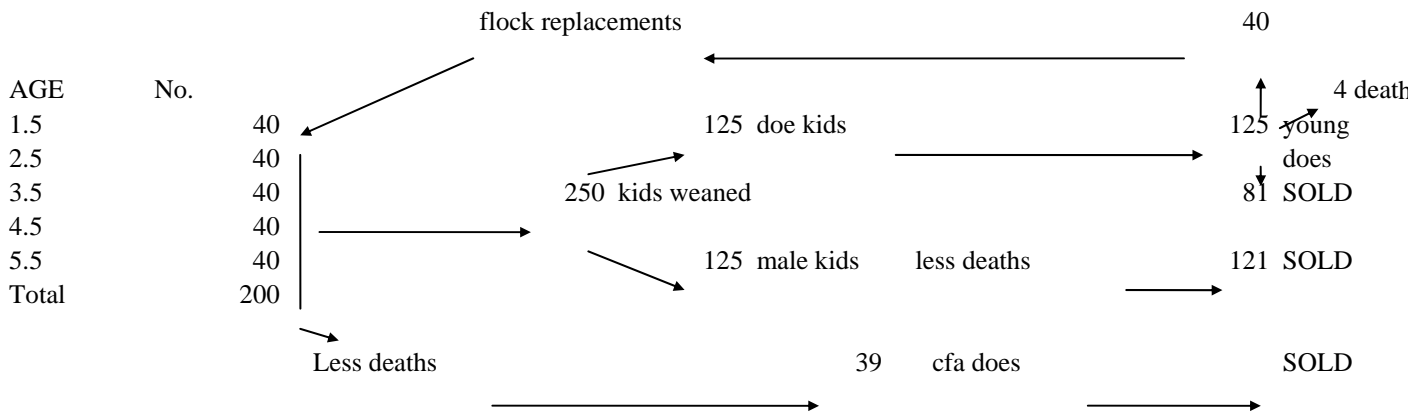
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EFFECT OF CASHMERE PRICE AND PRODUCTION ON GROSS MARGIN PER HEAD

Cashmere production changes	*	Price Variation in Cashmere (%)				
		-30	-15	0	15	30
*****	*****	*****	*****	*****	*****	*****
-30	*	14.80	17.33	19.86	22.39	24.91
-15	*	17.33	20.40	23.47	26.54	29.61
0	*	19.86	23.47	27.08	30.69	34.30
15	*	22.39	26.54	30.69	34.84	39.00
30	*	24.91	29.61	34.30	39.00	43.69

CASHMERE GOAT BREEDING FLOCK STRUCTURE

No. ages in flock	5
Death rate (%) - does	3%
- kids	3%
Kid rearing (%)	125
Flock size	200



CASHMERE ENTERPRISE Replacements retained until after first shearing.
Lloyd Davies, Economist, NSW Agriculture, Maitland.

Oct-96

This budget is based on domesticated feral does that have been running as a managed flock for two years and are mated to selected bucks. All progeny are retained until after the first shearing .

Assumptions

Number of does			100
Number of ages in does			5
Down production & prices	Down Yield	Down Price	
	g/hd	\$/kg	
Kids	60.00	110.00	
Does	75.00	95.00	
Bucks	160.00	95.00	
Buck percentage (%)			2%
Sale price (\$/hd)	- wethers		10
	- cull doe maidens		20
	- does c.f.a.		8
	- bucks c.f.a.		12
Buck purchase price (\$/hd)			300
Kids weaned (%)			125
Death rate (%)	- adults		3%
	- kids		3%
Running costs: (\$/head); incl. 1 shearing (done by owner with casual assistance); drenches 2 adults, 4 young stock; lice control; 2 vaccinate, predator control & sundry			5.00

Returns (net)

\$

<u>Cashmere</u>			
does			712.50
kids			825.00
bucks			30.40
<u>Sales</u>			
wether weaners	61		610.00
doe hoggets	40		799.76
does c.f.a.	19		155.11
bucks c.f.a.	1		6.00
		Total	31

Variable costs

running costs (does + kids)		1125.00
buck purchase		150.00
cashmere selling costs -Pool 8%, research 1%, promotion 3%*		188.15
	Total	14

GROSS MARGIN

	flock	doe	d.s.e.*
	\$	\$	\$
returns	3139	31.39	
variable costs	1463	14.63	

G M

1676

16.76

7.

* See comments above and on the next page.

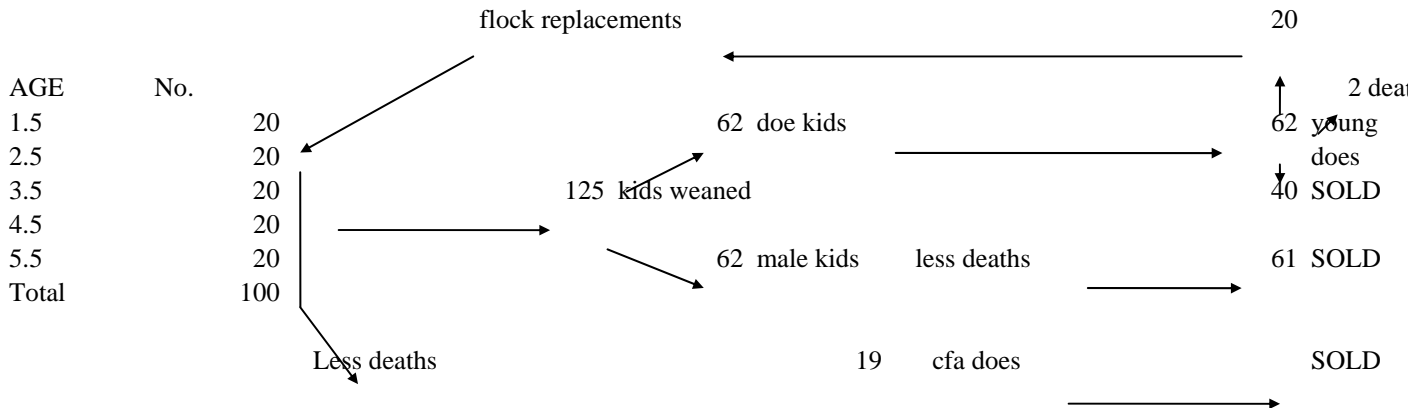
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EFFECT OF CASHMERE PRICE AND PRODUCTION ON GROSS MARGIN PER HEAD

Cashmere production changes	*	Price Variation in Cashmere (%)					
		*	-30	-15	0	15	30
*****	*****	*****	*****	*****	*****	*****	*****
-30	*		9.72	11.17	12.62	14.07	15.51
-15	*		11.17	12.93	14.69	16.45	18.20
0	*		12.62	14.69	16.76	18.83	20.90
15	*		14.07	16.45	18.83	21.21	23.59
30	*		15.51	18.20	20.90	23.59	26.28

CASHMERE GOAT BREEDING FLOCK STRUCTURE

No. ages in flock	5
Death rate (%) - does	3%
- kids	3%
Kid rearing (%)	125
Flock size	100



COMMENTS

* A cashmere doe and kid is rated at 2.27 d.s.e in this budget.

CASHMERE ENTERPRISE 90% of male progeny and 50% females sold to capretto market..**Lloyd Davies, Economist, NSW Agriculture, Maitland.**

May-96

This budget is based on domesticated feral does that have been running as a managed flock for at least six years and are mated to selected bucks. 90% of male kids and half of the female kids are sold to the capretto market. Note that at present this market only exists in Western Australia.

Assumptions

Number of does			200
Number of ages in does			5
Down production & prices	Down Yield	Down Price	
	g/hd	\$/kg	
Kids	100.00	110.00	
Does	140.00	90.00	
Bucks	160.00	90.00	
Buck percentage (%)			2% % sold as capretto
Sale price (\$/hd)	- wether kids (capretto)		22 90%
	- cull doe kids (capretto)		22 50%
	- cull doe hoggets		20
	- wether hoggets		10
	- does c.f.a.		8
	- bucks c.f.a.		12
Buck purchase price (\$/hd)			300
Kids weaned (%)			125
Death rate (%)	- adults		3%
	- kids		3%
Running costs: (\$/head); incl. 1 shearing (done by owner with casual assistance); drenches 2 adults, 4 young stock; lice control; 2 vaccinate & sundry			5.00
Running costs on kids sold as capretto			0

Returns (net)

			\$
<u>Cashmere</u>			
does			2520.00
kids			825.00
bucks			57.60
<u>Sales</u>			
wether kids capretto	112		2464.00
doe kids capretto	63		1386.00
wether hoggets	13		130.00
doe hoggets	18		360.00
does c.f.a.	36		288.00
bucks c.f.a.	1		12.00
		Total	8043

Variable costs

running costs (does + kids)		1375.00
buck purchase		300.00
cashmere selling costs -Pool 8%, research 1%, promotion 3%*		408.31
	Total	2083

GROSS MARGIN

	flock \$	doe \$	d.s.e.* \$
returns	8043	40.21	
variable costs	2083	10.42	
G M	5959	29.80	19.86

* See comments above and on the next page.

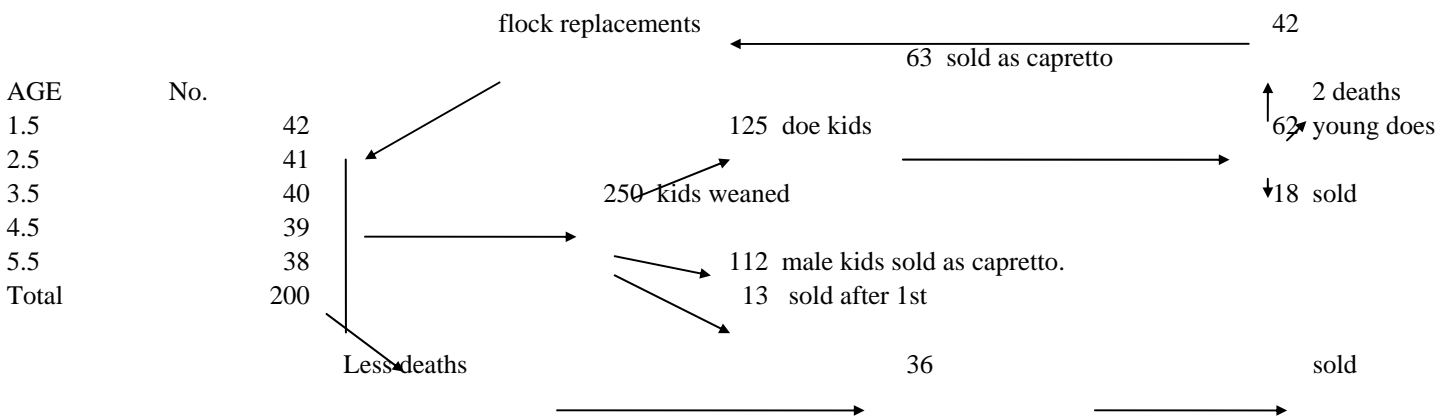
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EFFECT OF CASHMERE PRICE AND PRODUCTION ON GROSS MARGIN PER

Cashmere production changes	*	Price Variation in Cashmere (%)				
		* -30	* -15	* 0	* 15	* 30
*****	*****	*****	*****	**	*****	
-30	*	22.16	23.73	25.31	26	28.45
-15	*	23.73	25.64	27.55	29	31.37
0	*	25.31	27.55	29.80	32	34.29
15	*	26.88	29.46	32.04	34	37.21
30	*	28.45	31.37	34.29	37	40.13

CASHMERE GOAT BREEDING FLOCK STRUCTURE

No. ages in flock	5
Death rate (%) - does	3%
- kids	3%
Kid rearing (%)	125
Flock size	200



COMMENTS

* A cashmere doe and kid is rated at 1.5 d.s.e in this budget.

Appendix 4: Summary of Case Studies

Case Study Number, rain, location	Main activity	Goat Nos	Reasons for Goats	Comments
1. 900mm rainfall Upper Hunter NSW.	sheep, cattle	800	weed and additional income	good for scrub and blackberry control, more fencing necessary to use some areas.
2. 950mm rainfall Upper Hunter NSW	cattle	500	Blackberry control and improving the productivity of the country	Excellent saving in weed control of \$500 per year
3. 700 mm rainfall at Barraba in NW NSW	Cattle	700	Weed control, especially thistles and additional income from stud.	Estimated saving in weed control of \$5000 per year.
4. 725mm rainfall. North of Roma Qld	Cattle		For regrowth control and income.	Savings of \$2000 plus labour for each 160 ha paddock cleared.
5 Between Toowoomba & Brisbane, Qld	Goats		For weed control and income	Excellent results with the weed Lantana.
6. 500mm rainfall south of Cooma NSW	Sheep, cattle	200, plans for 1000	Briar control	Good results with sweet briar. Also an impact on other weeds including poa tussock. Good predator control is necessary.
7. 850 mm Armidale NSW	sheep, cattle	250	Blackberry control at first now other weeds	Significant saving on weed control and work well in pasture management with cattle.
8. 800mm rainfall. N. Tablelands of NSW	Cattle, sheep	700	Briar and blackberry control	Spectacular results on briars and blackberries. Predator control is important. Some selenium deficiency problems.
9 800mm on Northern Tablelands of NSW	Sheep, cattle	600	Blackberry control	Excellent control. Finds goats easy to muster but does not like handling them in yards.
10 450mm Bruce Rock 220 km west of Perth WA	Cropping sheep	300	Income	Prefers to work goats than sheep. Capretto market makes goats much more attractive.
11. 650mm Naracoorte SA	Cropping sheep	up to 1400	Income, pasture management	Interested in breeding. Have done an excellent job in cleaning up pastures.

Case study 1: John Body, Wingen NSW

Location: Wingen near Murrurundi, 150km NW of Newcastle NSW

Rainfall: 900mm slightly summer dominant.

Main Enterprises: Sheep, cattle

Current Goat Numbers: 800

In 1978 John purchased feral goats from Cobar at a cost of \$5. They were to control the noxious weed scotch broom on another property near the Barrington Tops, about 50km north of his present property. An area that was predominantly scotch broom, *Cytisus scoparius*, was fenced off with a very expensive deer type fence. The goats first ate the wild raspberry, then blackberry and briar and then the scotch broom.

They had a significant impact on the broom, but due to its toxicity at certain times of the year, some goats died. It was concluded from this experiment that goats would have a significant impact on scotch broom. But, they must have other feed to choose from so that they could avoid the scotch broom when it is toxic.

The Wingen property consists of 2630 ha which includes 600 ha of lower country and 1830 ha of higher country separated by a cliff line. He normally runs 5500 wethers, 300 Angus breeders producing vealers and around 800 goats. Current numbers are down because of the recent drought.

The bottom area contains poorer soils whereas the top section is of basalt origin. The lower country should receive 250 kg per ha of single super and Mo annually. The balance should receive 60 kg per ha of SF45 every second year. Topography of most of the property would be undulating to steep.

John has been constantly upgrading his cashmere flock by purchasing bucks from studs. At first he followed suggestions that he should use an Angora buck to get an all white flock. In retrospect this has been a bad move because he is now at least four generations away from a cashmere flock. He still has fleeces that he has to class in the lower priced cashgora categories.

There is a trade off in production between fineness and quantity of down produced. He doubts the wisdom of going too fine as yield drops off even more. John also suspects the finer the flock, the less the ability to control weeds.

One 200 ha paddock is very heavily timbered with regrowth after a previous clearing. In its present state it provides little grazing for conventional animals and would not generally be used. A mob of wether goats is now run in this paddock for the bulk of the year. They are taken out in summer when there is generally a fair bit of feed available in other areas. The goats have made a noticeable impact on most of the smaller shrubs and have eaten up most of the scrub as far as they can reach. This has been sufficient to allow some pasture to grow. In time the density of some scrub may reduce as plants like wattles die of old age. If future finances permit, and if approval can be obtained to knock down the scrub, the right level of goat stocking would keep any regrowth under control.

Fencing is a thing that John considers is very important with goats. He uses electric fencing in all goat areas and stresses that it is extremely important to have a powerful enough unit to do the job. Most of the fences consist of seven wires, three of which are live. John has three different energisers. Two are mains powered and one is solar/wind powered. For the area away from mains power a combination of a large solar panel and a wind generator was chosen. This area can have a week of cloudy or misty weather where solar may run out of power. However, in this type of weather there is generally a breeze to provide power via the wind generator.

A critical part of John's equipment is his volt meter. This is used to regularly test the electric fences and faults are quickly rectified. So much so that John says that there are now fewer problems with stock getting out than with conventional fencing - often the fault has been found before the animals get out.

Electric fencing also reduces the number of kangaroos that come into the property. Most kangaroos will push under a fence and provided the electric wires are correctly erected it will generally be a barrier to entry. It is difficult to gauge just how much kangaroos are eating in these situations. John's father observed that after fencing adjacent to a national park the paddock was carrying more cattle in the 1980 drought than it had in better seasons prior to the erection of the fence.

An additional advantage is that maintenance of an electric fence is often much easier. Faults such as branches falling over the fence can be fixed more quickly with an electric fence compared to a conventional fence. There

is a further advantage in that they are better in controlling bulls. The first couple of weeks after the erection of an electric fence requires quite high maintenance as stock and wildlife adapt to it.

Goats are shorn in late July or August and kid from the first week of September. Shearing is much easier if the does are a bit more rounded due to pregnancy. John shears them himself at the rate of 120 to 130 per day. In 1994 he shored 450 goats for 53kg of down. He expects to do better this year. The top 50 goats would be producing 350g of cashmere at 16.5 micron.

Shearing is done in the shearing shed but John is very conscious of contamination problems with wool. After the goat shearing he uses a high pressure fire fighter pump to completely wash out the shed.

His recent cashmere production levels and kid survival levels have been very low due to the drought. Last year his kid weaning percentage was only 20 per cent as most does simply walked away from their kid at birth. In retrospect John thinks this was a wise move because at least he still has most of the does. Kidding percentage is usually around 125 per cent.

He had least problems with kidding when a Karabash shepherd dog ran with the goat herd. But predator control must also be very good.

There has been great success in getting on top of blackberries, briars and thistles - especially saffron thistle. Goats have also helped control woody weed regrowth. In sections where timber has been cleared for a track or a fence line it is obvious that any regrowth is being immediately controlled.

Vegetable fault in the wool where sheep are run with goats is sometimes reduced significantly. John estimates that sheep run on country with goats would have around 2 per cent vegetable matter fault. Those in areas without goats have around 4 per cent vegetable matter. The advantage will vary from season to season but there is some advantage every year.

Goat numbers may be built up to about 800. More of the fences will be electrified so that goats can be used as part of the pasture control program. Other than a restraint for shearing, John does not have any special goat handling equipment but admits the Rob Connell race would be very useful.

John still spends about \$5000 per year on weed control. In reality in the last two years he would not have spent more money on weed control if he did not have goats. But without goats, the carrying capacity of the property would be gradually falling in the absence of a fertiliser program and pasture improvement program. These were put on hold due to drought and low prices.

In the longer term, John expects to retain about 10 to 15 per cent of his carrying capacity as goats. John rates goats at a quarter of a sheep when run with sheep and at the level of goats that he has, he thinks they have no impact on the number of cattle that he can run.

Production details are as follows:

Year	No Shorn	\$ of cashmere	Cashmere av. \$/hd	No Sold	Sales \$	Sales av. \$/hd
94	530	5028.65	9.49	118	1375.38	11.66
93	650	nil		247	1894.28	7.67
92	700	2281.24	3.26	200	952.29	4.76
91	800	2174.07	2.72	125	496.83	3.97
90	800	7509.74	9.39	171	1243.21	7.27
89	750	8648.72	11.53	335	4702.00	14.04

Case study 2: Sam Pratten, Murrurundi NSW

Location: Murrurundi NSW 160km NW of Newcastle

Rainfall: 950 mm. Slightly summer dominant.

Usual Enterprise: Cattle

Number of goats: 500

Sam started in goats in a fairly cautious way by seeing the effect that they would have in a 25 ha paddock that was badly infested with blackberries. At the time of introduction blackberries covered about 20 per cent of the paddock especially along the better creek lines. Some 250 feral goats from Cobar were bought in 1987. After three years of quite intensive grazing of goats, the results were dramatic and convinced Sam that goats could be an integral part of further pasture development.

The property is 1700 ha of undulating to relatively steep country of basalt soils with an average 950mm rainfall. Fencing was very old and most had to be replaced. This enabled Sam to take stock of the situation and design the paddock system from scratch. He decided that the primary fence lines would follow the dominant spur line that ran for 6 km through the centre of the property.

Two creeks - Singles Creek and Boyd Creek - travelled the length of the property next to the main spurline. Subdivision fishbone-like fencing divides the spurline fence at strategic intervals. This is usually on the ridge between each watercourse that feeds into the two creeks.

Sam developed paddocks with excellent fences - starting at the homestead end and gradually working towards the other end of the property. This development is continuing.

The fencing used has all been electric powered by three separate energisers. One is solar and the other two are mains powered. Most of the fences have been eight wire fences with three hot wires. Sam's primary enterprise is cattle and he has found that sometimes a young calf will get through a plain wire fence and then is not able to get back. The ideal fence in his country is a combination of netting fence for the first 600 mm, supported by an electric fence of three wires - one hot - above it. The fence is also supported by a live trip wire 20 cm out and 20 cm above the ground. Sam's ideal fence would cost about \$4500 per km to build. The original fences cost \$2500 per km.

Electric fencing must be kept free of weeds so herbicide is used at least once a year to achieve this.

While it is extremely important to have excellent fences for goats, the benefits of good fencing are also reaped by the property's other enterprises. As Sam has progressively developed fences on his property he extends his 'exclusion zone' at the same time. The numbers of kangaroos in the two valleys are such that professional shooters no longer come into the area. Sam estimates that he only has about 10 per cent of the kangaroos now that he had previously. Fences have also been very important in stopping feral pigs.

At the 1995 Rural Lands Protection Board annual conference a motion was considered to force landholders to get approval for their boundary fences as suited to goats. The motion was finally not put. Sam thinks that in future a similar motion may be considered and he will support a motion that paddocks used for goats must be approved as suitable for restraining goats. He feels that it is too severe to require the whole property to be adequately fenced especially where there is a deliberate staged development over some time.

On some farms there would be areas where it never intended to run goats. Having goat proof fencing around the whole boundary could be very expensive and a severe impediment to new entrants into the goat industries.

Blackberry canes are burnt in August. This encourages lush regrowth and gives the goats easy access to all shoots. After three years 85 per cent to 95 per cent of the blackberries are totally eliminated. The paddock then requires only the occasional grazing to control any subsequent germination.

Sweet briar is the first preference of goats followed by blackberry. Paterson's curse is not controlled by goats in his environment and is still controlled chemically.

Sam will generally run about 350 beef breeders producing vealers. Due to the drought it is down to about 250 breeders in spring 1995. He feels that he can comfortably carry at least 500 goats on the property without affecting the number of cattle that he can carry.

With pasture improvement, the carrying capacity of this farm can increase significantly. Using goats has meant that Sam is more confident that he has found a sustainable control system without a huge chemical bill.

Sam has used chemical weed control in the lower section of some paddocks for these are the last areas in a paddock to be worked by goats. Sam did not have the stock to apply sufficient pressure to do the job quickly enough with goats alone.

In recent times Sam has not been able to make the most out his cashmere enterprise. The shearing facilities are at the homestead end of the property. Shearing is July-August at a time when winter feed is scarce, so Sam has been reluctant to bring the goats back into this part of the farm on to his best cattle paddocks.

A possible alternative will be to build goat handling facilities in the areas where the goats are currently working. Shearing is also at the same time as calving. He will reassess the situation if he gets to a season where there is not a winter shortage and if cashmere prices are reasonable.

Sam has been shearing weaners and using good bucks. The micron of his weaners has fallen from 16.2 to 15.8 in three seasons.

A problem with breeding and selection in rugged country is that there are always feral bucks who will be trying to get to the does. It is easy to loose a year's breeding if this happens.

Case study 3: Tony and Judy Brown, Barraba, NSW

Location: 30km northeast of Barraba NSW

Rainfall: 700 mm. Summer dominant but recently very variable.

Main Enterprise: Cattle

Number of Goats: 700

Tony and Judy Brown have a 960ha property 30km north east of Barraba. Soil types are red and grey trap soils. The only cropping is oats which is grazed or, if the season is right, it is let go through to grain and harvested. The main enterprise is 300 breeding cattle.

The cashmere project is run along stud lines. There are 700 cashmeres with 600 does joined. They are split into small mating groups of about 45 and run with one buck. Generally bucks are bred on the property but there has been some use of outside bucks.

Kidding per cent is generally around 120 per cent but last year was only 75 per cent due to the drought. With older mobs of does kidding can be up to 160 per cent to 170 per cent. Without diligent control, foxes can take all the kids. Eagles can also be a problem. Baiting is not carried out within 1 km of the house because of the sheep dogs. In 1995 more than 600 chicken head baits at 15¢ each were put out for foxes.

Most of the wether portion is sold off the mothers at 10 to 16 weeks of age to the Sydney domestic goat meat trade at around \$10 on-farm. There is a reasonable market at Christmas and Easter. Those that do not make the Christmas market are held over for Easter. Surplus doe hoggets are generally sold in March at 20-24 weeks of age. Sometimes there is a market for the better surplus does for others starting a herd. Sometimes breeders in kid are sold in May.

Does are culled on performance. They are visually checked at shearing time for quantity and quality of down. If they are to be sold they are marked at this stage. They bring from \$10 on-farm in December.

Running costs include lice treatment is 27¢, drench 60¢, and vaccine making an all-up cost of \$1.19.

The 10 per cent urea blocks put out for cattle are liked by goats though they are not supposed to need urea. You can't use roller drums with molasses/urea because goats can bend their neck around and actually slurp it up.

Shearing is in June-July. It actually takes three weeks. This is longer than would be the case in a commercial herd because of the recording that is done. They also comb out some of the vegetable matter fault using a specially adapted tool. This is a shearing comb mounted on a short piece of pipe pulled through the fleece to cut out the vegetable matter. This job can sometimes take up to 20 minutes but can be justified on a good cutting animal because the price penalty of high vegetable matter is significant. The more cashmere down that an animal has, the more likely it is to have a high amount of vegetable matter in its fleece. When this fault is really bad they do not comb the lower back legs. Burr fault is camp burr and clover burr.

Kidding is in September. There is no special labour at kidding. The does spread out and are left to their own resources. They have lost some goats after shearing in some years. By shearing the goats early they do grow some down to keep warm during the rest of the winter and during kidding. Shearing in August is a risk for the weather they can stay cold until Christmas,.

On weed control Tony estimates a saving of around \$5000 per year. The goats help to control sifton bush *Cassina spp.* and thistles. Even though sifton bush is listed in the RIRDC booklet *Weed Control using Goats* as 'isolated plants eaten occasionally', Tony found goats at least prevent further encroachment in some areas. In other areas it has been reduced or almost eliminated by the goats.

Most of the fences were good before goats were introduced. There is a timber mill on the property so the posts and droppers have been obtained from the farm. The fences are six wires with two wires electrified. The ironbark droppers are well insulated so there is no need for additional insulation.

As with most other goat producers, a voltage meter is a permanent inclusion in the farm's 4-wheel-drive. Electric fences are also good for cattle, especially bulls. Boundary fencing and some main subdivision fencing have rabbit proof netting and one electric wire.

Average return from cashmere in 1994 was \$10 per head. Some brown goats from Armidale were estimated to have cut 240 g of cashmere down. The Browns are not classing to get the WW lines. The price differential is currently not great enough. One person is employed at shearing at a cost of \$1000. They catch, pen up and let go.

The Browns have no sheep - they do not like the fly problem. A small shearing shed especially for the goats has been built. It is next to the cattle yards that serve as the holding pens. The handling race is stepped in from the usual 500 mm top and 120 mm bottom, but overall width is adjustable either way. The race has a hinged guard over the top to prevent goats from jumping but there are sufficient gaps to enable access to the goats.

The shed consists of a small catching pen about 2.5m by 2.5m opening to a shearing area about 3.5m by 2.5m which contains three head stalls. The stalls enable one person to shear while the other sites are being used for combing or holding.

The classing room has a classing table and a special light. Here the fleeces are sorted into their various lines and packed into bags. This shed was self built and most of the materials were obtained from sales, however it is very effective and it is well protected from breezes which is very important with cashmere. Mesh grating is used in the shearing shed and on the ramps rather than wooden grating which gets very slippery if goats are brought in with a full stomach.

Case study 4: Bruce Cosh, Roma Qld

Location: North of Roma in Queensland 500 km north west of Brisbane.

Rainfall: 725mm average. Summer dominant.

Main Enterprise: Cattle

Bruce has a property above Roma in 725 mm rainfall country that is quite mountainous. It is actually on the eastern side of the great divide.

Goats are of feral origin and run on country where he has knocked down timber. He usually clears 160 ha at a time and fences the goats on to the area.

It generally takes about three years to clean up a paddock. Eucalyptus seeds generally only last for about 18 months. The goats will eventually kill any eucalyptus, bloodwood or wilga under 2 m high. He usually stocks the goats at 2.5 to the hectare. Normal carrying capacity is one breeding cow to 4-8 ha, depending on the amount of pasture improvement.

Goats can get cancer eye and does can get cancer around the vulva. Bruce takes care to select goats with dark skin colour. He has got bucks in the past from Jim Brown in Victoria and Bess Vickers in NSW.

Vegetable matter can be a problem in good years, especially flannel weed, but it is not generally much of a worry. Goats have been shorn most years and he normally gets about \$5-\$8 net per head from them. There are many eagles and some pigs as well as dingo and foxes. He uses a shepherd dog to very good effect.

The boundary fence has only one hot wire as an outrigger. Those that escape are not much of a problem anyway because the dingoes get them. Bruce only sells them when he has a semitrailer load.

Estimated saving in spray for each paddock at least \$2000 plus labour. Goats are only mustered for marking and shearing.

Case study 5: Andrew James, Toowoomba Qld

Location: Between Brisbane and Toowoomba, Qld.

Main Enterprise: Goats

Andrew has had great success in using goats to control Lantana. As long as there is a choice of vegetation other than Lantana in the diet, it seems to be safe. As Lantana is relatively short lived, goats have significantly reduced the height and quantity of the weed which can get very tall. After the goats eat the bottom, it tends to collapse in time and they can get at more of it. They also chew the bark which can damage the plant.

Andrew thinks that cashmere goats are suited to the bulk of Queensland. They are present as far as the Atherton Tablelands but are probably not suited to the extreme eastern fringe.

He believes a lot of the problem about managing goats in general, is that they are a secondary farm project and, as such, the priorities are given to the major enterprises.

Andrew took over the remnants of the Queensland Department of Primary Industries cashmere breeding project. Cashmere down production ranges from 150 g to 180 g. There are a few animals that will be going around 300g. He had most of his does fleece tested in WA. Details of 1995 down yields are:

1st shearing	100 g	14.8 micron.
2nd shearing	140 g	16.3 micron
3rd shearing	140 g	16.7 micron

Before the drought they averaged close to 200 g at 16.3 micron.

Dingoes are a major problem and the use of a shepherd dog is probably necessary. Fencing is another problem. In cattle country - dingo country - most of the fencing is four strands with the first wire 40-45 cm off the ground then the others every 30 cm. The top two are usually barb wires. To make this a goat proof fence, put live wires at around 12 cm and 24 cm above the ground. Another live wire is placed between the first and second original wires - about 55-60 cm - to complete a very good fence.

Kid weaning last year was 150 per cent. This was achieved when they were locked up and feed them during drought. He was very surprised at the result and thinks that predation and other losses are generally higher than people think. Normally kid weaning percentages have been 120 per cent and have been as low as 80 per cent. He uses Maremma shepherd dogs very successfully. An automatic feeder is used.

There is a good market for yearling goats, however many marketing problems exist - particularly the continuity of supply.

As far as carrying capacity is concerned there is enormous variability. There are no common rules of thumb. The main thing is to look closely at what is happening and adjust the rates accordingly.

Andrew does not class for top WW line (white cashmere and white guard hair) as in 1995 there was only \$3/kg in it. He still thinks it is worth having because Australia is the only country that can offer the line.

Case Study 6 Darvall and Trish Dixon, Cooma, NSW

Location: 30 km south of Cooma, 120 km SE of Canberra on the NSW Southern Tablelands.

Rainfall: 500 mm, elevation 1100 m

Main Enterprises: Sheep, cattle.

Numbers of Goats: 200 but plan to increase.

Darvall and Trish Dixon have a 1400 ha property at Bobundra, 30km south of Cooma. It is predominantly basalt soils in 500 mm rainfall country. Despite being very close to the Snowy Mountains, the property is in a rain shadow on the eastern side, away from the prevailing westerlies. Highest rainfall months are generally December and January.

The property is an amalgamation of two rather run down soldier settler blocks plus part of another. The present carrying capacity is 1500 merino ewes producing 21.5 micron wool and 1500 wethers producing 20.5 micron wool. The main reason for the difference is that ewes are generally run on the better country. Some 100 Angus and Angus cross cows produce vealers for the domestic trade.

A relatively new technology of direct drilling stony country has Darvall confident that, with improved pastures and SF45 or gypsum, carrying capacity can double.

The Dixons decided to run goats because of increasing weed problems. The combination of fertilizer needs, the seasons, lack of finance and time had seen a proliferation of many weeds. These include sweet briar, poa tussock, mustard weed, flannel weed, horehound, lambs tongue, grey scotch thistle and saffron thistle.

Goats have had an impact on all these weeds, particularly sweet briar. Some other weeds are only eaten at specific times of the year, mainly at flowering or seeding time. Poa tussock is eaten down to 7-10 cm and at this level it allows a lot of light through to promote other more desirable species.

Thistles are mainly eaten when they are flowering, however the Dixons are confident that in time its prevalence will diminish because of limited seeding. Goats have limited impact on Bathurst Burr and will only eat the flowering parts of Serrated Tussock. This weed is fast becoming the number one weed problem in the district.

A paddock of 69 ha with large infestations of sweet briar was chosen as the first paddock to try goats. The fencing was electrified using timber and fibreglass lean to droppers resting on the top of the existing fence line. Two electric wires were attached, one about 20 cm above the ground and the other 45 cm above the ground. Darvall thinks the fence would be further improved if an earth wire was added approximately 10 cm from the ground to further discourage kangaroos.

In 1993 the Dixons bought 150 cashmere goats from the Crookwell district. They were three generations bred-on from the feral animals. Darvall got veterinary advice to ensure there was no disease or footrot problems. The goats have been in the same 69 ha paddock for two years and results have been dramatic. The majority of briar has been killed and the remaining living plants are very weak. Not only are the leaves eaten but during the winter the goats ringbark the stems.

About 400ha on the properties that has briar problem and these areas will be targeted next.

At present Darvall and Trish are confident that goats can handle all the weed problems except Serrated Tussock. He will therefore be concentrating his efforts on keeping on top of the Serrated Tussock. The other weed problems on his property will be kept under control with strategic use of goats.

In the first winter Darvall shorn the goats, which are mainly classed as white coloured animals, and obtained \$1200 for the 180 shorn. They have elected not to shear in 1995 because of the season and the fear that the stress will cause some losses. This occurred after the first shearing. Phil Graham, Livestock Advisor with NSW Agriculture at Yass, thinks that it may be better if the goats are shorn in May, before the peak of winter. There may be a little lost down but the remaining down grown after shearing will help keep the animals warm in very cold weather.

There are three shearing sheds on the property that is a legacy of the soldier settler days. One shearing shed will be reserved for goats so that contamination of wool will not be a problem. Shearing will be easier when he has proper facilities set up.

Eventually Darvall wants up to 1000 goats on the property. As numbers build up he will upgrade the fencing. He is confident that the property will continue to be able to carry the existing numbers of sheep and cattle. The sheep may even do better because of the ability of the goats to sweeten up the pastures - especially in areas where there is poa tussock.

At this stage they are keeping all goats including wethers to build up numbers as quickly as possible. The Dixons will continue to use good quality bucks to improve the breeding flock

Kidding is timed for August 1. He carries out a regular fox baiting program to reduce the level of predation of both goats and lambs.

Darvall finds goats easy to muster - however he breeds and enters his Kelpies in sheep dog competitions. A drop type race would make drenching much easier. He also plans a raised board in the shearing shed to make it easier for the classer.

Case study 7 Owners: Noel and Ros Waters, Armidale, NSW

Location: 35km east of Armidale on the Northern Tablelands of NSW.

Rainfall: 850mm.

Main Enterprises: Sheep, cattle

Numbers of goats: 250

Noel and Ros Waters have two properties. The main one is in two blocks and goats are used over the whole area. The other property is further east and next to the dingo fence. Some repairs to the fences are required to reduce the impact of the dingoes. Wethers are used when goats are required in this area.

Stock is 1800-1900 fine wool sheep, 80-100 cattle and, 250 goats. On this country about 0.8 goats equal one sheep because of the goat's browsing ability. Goats run with cattle form an ideal combination. Goats keep the grass level and leave for the cattle most of the succulent pasture, such as young clover. Goats and sheep also run well together.

Soil types are two-thirds podzols and one-third basalt. The major weed on property: was Blackberry, which is now well under control thanks to the goats. Other weeds are black thistle, biddy bush (*Cassina spp.*) and wild verbena.

The first goats were purchased in 1978 as ferals at \$13 a head. Since then the goats have been mainly run as a closed herd with a very limited infusion of bucks from other breeders. The goats are run over the whole of main property in two mobs.

Bucks fleeces are AWTA tested before they are used in the flock. Excess bucks are sold. Does are visually classed at shearing time with culling is based on the quantity of down, early shedding of down, micron, and general conformation. Colour is a secondary consideration as some coloured does produce the most down..

In 1994, 300 were shorn, averaging 150 g of down. Gross was \$3616 and the average was \$12.05. Net return was put at \$3067, giving an average net per head \$10.22. Composition of the herd was 60 per cent white, 40 per cent coloured.

Weaning percentages are normally about 90 per cent, however there have been some very poor percentages in recent years due to drought. Last year the weaning percentage was only 50 per cent and the year before it was only 30 per cent.

Prices received for surplus animals are \$8 per head for the cast for age does and culls. Sometimes there is a market for wethers required by other landholders. Prices of up to \$20 on-farm are received when this market is available.

The timing of drenches and the type of drench used is that recommended for the local area by NSW Agriculture for sheep but rates used are 1.5 times the sheep rate. No dipping or vaccination were carried out and no problems were evident with either sheep or goats.

Joining is in mid-April for a mid-September kidding. Cashmere shearing is in August between the two sheep shearings. Merino ewes are shorn in July and Merino wethers are shorn in September. Noel likes to have at least a month between each shearing.

Careful attention is given to thoroughly cleaning out the shed between each shearing. This includes treating the floor with wet sawdust or wet wool locks to pick up any fibres, and cleaning out under the shed and raking the manure to ensure that all fibre is covered. Noel has managed to continue certification for the Elders Clip Care quality assurance program even though both goats and sheep are shorn in the one facility.

Shearing is a one person operation and can be done at the rate of around 15 an hour. It takes very little time for a new person to adapt to the technique. Culls are identified with an ear mark at shearing time.

There is no special handling equipment except a head stall used for shearing. Goats are drenched in the sheep race. Although more difficult to handle than sheep, they can be managed. Often a goat is turned side on to block any goats facing the wrong way. A dog with good heading and holding ability is required. Noel breeds his own Kelpies that are ideal for the job.

Excellent control of blackberry and briar has been achieved. Good results on black thistle and woody regrowth are also obtained. A little control on bidy bush is reported, but there has been no impact at all on wild verbena. Noel estimates that to control the blackberries chemically on his property he would have had to spent \$2000 to \$4000 on chemical for about five years. The amount required would then reduce as you reduced the size of the infestation.

There has been some modification to fencing. With the traditional six or seven plain wire fence being inadequate for goats, an offset electric fence was installed and this has worked well. Any new fences have been six wires internally with two live - and hingejoint on the road.

On this country, about 0.8 of a goat equals one sheep because of the browsing ability. Goats run with cattle form an ideal combination. Goats keep the grass level and leave the cattle most of the succulent pasture, including young clover. Goats and sheep also run together.

Case study 8: Norman and Penny Whitaker , Glen Innes NSW

Location: Northern Tablelands of NSW. Main property 30km west of Glen Innes, another property 30 km east of Glen Innes.

Rainfall: West 800mm, East 900 mm.

Main Enterprise: Cattle

Number of Goats: 700

The western property is 600 ha with basalt soils. The eastern one is 250 ha of granite soil. Major weeds to the west are briar, saucy jack, Bathurst burr, blackberry and thistles. To the east, blackberry and gorse are the major problem weeds. Stock run is 400 cattle including 300 breeding cows, 500 wethers, 350 does, 350 yearling goats - mainly does.

Goats are run on both properties. Ferals were first introduced in November 1986. Production details include 236g per head, hair in. Weaners gave 227g, yearlings 357g and does 267g. This year they expect better results because of a higher cull in 1994.

Production of cashmere and value of cashmere 1988-94

	Gross \$/hd	Comment	Nett \$/hd	Cashmere production (grams/hd hair in)
1988	5.20		4.32	229
1989	7.23		6.07	266
1990	8.34		6.69	360
1991	2.19	Some cashgora	2.10	378
1992			2.22	245
1993	4.32	Selective shearing	3.35	370
1994	5.41		4.45	236

In 1994 there were 335 kids from 465 does - 72 per cent. In the first year they got 100 per cent. They wet and dry the does and estimate that probably 90-95 per cent dropped a kid. The difference is due to predation.

For surplus animals they get \$6.00 per head on-farm.

A 5-in-1 + selenium vaccination is given to all goats at marking. Worm drench is given when stock is held in a confined area. Goats are the first animal to show up a mineral deficiency. Selenium deficiency showed up in the goats first.

Kid does are weaned at five months and are trucked to the other property for 12 months. They are back loaded when the next lot of doe kids come out.

They are joined on the other property and those that are to be retained join the main flock. They are trucked back about a month before they are shorn to give them a chance to get all the muck off them. The better the cashmere fleece the more it picks up vegetable matter.

Joining commences on April 1 for six weeks for a September-October kidding. Shearing is in June-July. This timing can compete with calving but it is best done early.

Weaning should be in the first week in January. If this is delayed this means that cashmere production is reduced.

The Whitakers stress that as with other enterprises everything must be on time to get the most out of the flock. A paddock must be set aside with reasonable feed for kidding. Having feed at this time of the year is not easy. The goats are disturbed as little as possible because does will hide their kids and if disturbed, can lose the kid.

Predator control is important and baiting for fox is carried out. August-September can be the worst time of the year for losses because it is a period when you can go from warm to extremely cold.

When goats are in the yards the Whitakers recommend that dogs should be kept out. The race must not be too long as they tend to go down. During mustering the more noise made the more distracted the goats become and the harder it is to get them to go in the direction desired. 'If you try to fight them you end up the loser'.

Generally about 30 per two hour run are shorn. Does are checked visually for conformation, fleece quality and lactation at shearing time and those to be culled are marked by cutting the tip off the left hand horn.

Weed control of both blackberry and briar has been spectacular. The Whitakers have some before and after photos to clearly show the effect. They were involved in spraying programs. In one instance where a control program had ceased for about five years, the briar problem was just as bad as it ever was.

On the eastern block, the Rural Lands Protection Board actually served a notice that blackberries must be sprayed. After some negotiations the Whitakers were given 12 months to show what goats could do. Another inspection at the appointed time gave them the 'all clear' and the board has not been back.

Spraying briars is an exercise in futility as five years after spraying ceases they are as thick as they were originally. Little success has been achieved with Bathurst burr control.

There have been improvements to the fences, part of which can be attributed to the goat enterprise. Electric fencing is used with an outrigger common on existing fences. The ideal fence is one with three hot wires in the fence and an outrigger approximately 25 cm out and 20 cm up. The Whitakers view that fencing improvements required to keep goats also benefit the beef enterprise but the goats are paying for it.

There are currently no sheep on the property. There is a shearing shed near the house presently used specifically for goats. The shed was built originally for sheep and they have modified a race similar to Tony Brown's unit described in Case 3. When they have shorn sheep as well as goats, they use high pressure hoses to clean out the shed.

Goats consume about 60 per cent by browsing (selecting roughage) and 40 per cent from pasture. In winter when feed is scarce, goats become a bit more competitive. When I was there in August 1995, they had eaten the tufts of phalaris down quite close to the ground.

The goats run satisfactorily with cattle. They leave the pasture sweeter for the cattle than do sheep.

Kid goats can drown in round concrete water troughs. Generally something is put in the bottom of the trough so that if they fall in they can get back out again.

Case study 9: Murray Scherf

Location. Emmaville, Northern Tablelands of NSW.

Rainfall: 800mm

Main enterprise: Sheep

Numbers of goat: 600

The property is 1200 ha in total. It is really two farms, each of 600 ha, run as one. Soils are granite based. Two lots of goats were bought in 1988, with about 200 head in each lot. They have used cashmere bucks bred by Vimpany's ever since. Numbers increased up to 1000 but are now back to about 600. A total 356 does was joined in 1995. Other enterprises include 4500 sheep in total producing 18.5 micron wool. There are also 250 cattle on the property.

The main purpose for the goats has been for blackberry control. Up to 1988 they were spending \$15,000 on contract sprayers to control the blackberries. The area of blackberries was decreasing but it was going to take four to six years of spraying at \$15,000 a year to get right on top of them.

Not all the farm is stocked with goats. There is still 800 acres next to the Severn River that needs goats, however, it must be fenced first.

There has not been much fencing specifically for goats. After a time the goats become accustomed to electric fencing and a hot wire is generally sufficient. They have generally used insultimber cross overs or fibreglass stand offs for outriggers. After a while goats get very territorial.

Ferals are a problem nearby. 'You get an extremely bad name if you introduce goats to an area and do not control them properly.'

Kidding percentage has been around 100 per cent. Murray thinks that it is possible to go for two kiddings every second year if the nutrition is good. However, if shearing is being considered, a single joining period would be used. Kidding and lambing is due to start in early September and fox control is carried a week or two earlier.

Weeds controlled, other than blackberry, included slender thistles, which were a problem on the top of some hills. Briar is the top preference for the goats. They really like blackberries best in January and February. The goats also do a good job on fleabane but also help spread it. Goats do not control tree of heaven or wattle regrowth on their property but Murray notes that goats do a good job on wattle in other areas.

Goats are generally stocked at moderate numbers in a paddock until the job is done. However, if there is a thistle problem in a particular paddock they will be used strategically.

Last year he sold goats for \$5 per head on-farm. It was drought time and his bargaining position was not that good, Murray said. They usually go to Dorrigo abattoir.

Shiv is the main fault in the wool. There is very little benefit from goats as most of the grass seeds come from species that go to head very quickly. It is impossible to manage this with goats.

Murray does not like working goats in the yards because the facilities are inadequate. It would be very useful to have a set of yards closer to the river to reduce mustering time. He thinks a combined set of yards for cattle, sheep and goats is what he is after. He would build a specialist goat race if necessary.

Handling out in the paddock is no problem 'as long as you take it easy'. Usually it is best to drive around a hill initially. Goats will run to the top of the hill and getting them down is a bit difficult. Once on the flat they are all right to drive.

Goats are easy to load on to a truck. Murray notes, however, that sheep are very difficult to put onto a truck that has goats on it already, because they do not like the smell of the goat. There is no problem in separating the sheep from the goats. 'You drive them along and they naturally drift apart to a stage where you can split them.'

Goats have a bad habit of lying down in a race so do not put too many in, or have too long a race. Murray drenches goats in a crate about 3 m long. Drenching is based on the NSW Agriculture recommended Wormkill program. Lice are not common. He uses Clout as required.

There are two shearing sheds on the property, so goats are shorn in the second shed to eliminate any chance of contamination.

Case study 10: Kevin Cole, Bruce Rock, WA

Location: Bruce Rock WA 220 km East of Perth.

Main Enterprises: winter cropping, sheep

Number of Goats: 300

Kevin's property is mainly a winter cropping property of 2834 ha with 1700 ha of the area each year devoted to winter crops. Stock is carried on the balance and on the stubble areas. Sheep numbers total 1500 ewes and 1200 lambs. The number of goats in mid-1995 was about 250-300.

Cashmere production is currently around 150g to 200 g per head. The largest adult fleece line tested at 16.88 micron. Maximum production could go as high as 500 g per head in the long term. Currently some does that are doing this level, however, they are likely to be the stronger in micron. Some goats originated from crossbred mohair types. Bucks are generally bought from other producers.

Kidding percentages are generally high by industry standards generally from 135 per cent to 150 per cent. The 1995 percentage was 108 per cent, mainly because a shepherd dog was not used. An Annetolia Karabash backed up with fox control had been used very successfully for 8-9 years, but it died. The time required to train another was the main reason why it has not been replaced.

The dog was used for both sheep and goats. They bring the flock together at night and do an excellent job with predator control. Shooting is the best form of fox control in this country, Kevin believes.

Kidding is in late July. Shearing is in June. For some reason in 1995 there was quite a bit of shedding of down before they were shorn. This may bring this years average down. Kevin has not experienced any losses after shearing but protection is provided by bush in the paddock he uses for the goats following shearing.

There is a lot of interest in the capretto market in WA. Both cashmere types and Angora types have found a ready market. They are worth \$23 delivered to the abattoir. Because of their size, freight costs back to the abattoir near Perth is less than \$1 per head -160 fitted on a ute and a trailer! Slaughter age of 8-10 weeks is critical in retaining the pale meat colour.

Many people in WA are interested in the Boer goat for meat production. At present prices Kevin thinks that Boer progeny will still go to the capretto market, although there is no premium for the heavier weights. They will just get to market size a bit earlier.

Kevin has had a market lately for the surplus doe hoggets. These goats will be used primarily to produce kids for the capretto market. It is unlikely that they will be shorn. The Boer goat may be a bit big for the Angora doe and would not be used with maiden does.

Fences usually involve an outrigger. This is not required for sheep. The race has been altered to be narrower at the bottom so that the goats cannot turn around easily. The sheep yards were quite high and have been satisfactory for goats without modification.

Kevin prefers to work goats rather than sheep. With sheep you have to push all the time where as goats will move themselves. Drenching goats is not that easy. They are done in a small pen in the shearing shed.

Kevin thinks that on the areas where sheep are run about 10 per cent of goats could be added without reducing sheep numbers because of their different dietary preferences.

There has been no lice for a couple of years - if necessary he will use Clout S. Vaccination is done at marking time. Those that go for capretto do not require any treatments.

Case study 11: Richard Levinge, Naracoorte, SA

Location: Naracoorte SA

Main Enterprises: Cropping, sheep

Numbers of goats: up to 1400.

Richard is in country that is perhaps a bit wet to be ideally suited to goats but he runs a large number of them. In some years he has made more from goats than he has from his sheep. When cashmere prices were high Richard was getting up to \$21,000 for his cashmere for 1400 goats shorn.

He is not sure of his average yields but this year has shorn 480 kg off 1120 goats including 400 kids. Allowing for an average of 35 per cent yield - adults 29 per cent to 33 per cent, kids 40 per cent - the average cashmere down production is 150 g. All goats including some crosses are totally shorn. The average of the better does would be around 250 g.

There is considerable potential for a meat goat enterprise, Richard believes: 'people need to eat more than they need the fibre.' If the Boer goat can produce both then all the better. The cashmere samples have been fairly encouraging and the difference between the guard hair and the down is greater which makes visual recognition and possibly machine dehairing easier.

Richard thinks that there is scope for the Boer to be used in the capretto market. If they were serious in the market they would extend the specifications, because the Boer goat can go beyond 12 kg dressed and still be of high quality. Boer goats dress out at 49 per cent to 52 per cent compared with others at 39-41 per cent.

Richard is putting a half Boer buck to his cashmeres. In the long term he wants to develop more cashmere on a Boer-like frame.

Cashmere kidding percentages are around 170 per cent. Natural losses at birth are 8 per cent with another 5 per cent natural losses through to weaning. As the weaning percentage is 100 to 140 per cent, the difference is due mostly to foxes. Richard is using a Maremma dog with good results. He also shoots and baits to lessen the impact of foxes.

There are not as many vegetable matter problems in South Australia compared to some areas of NSW or Queensland. In many agricultural areas, goats have to compete head-to-head with other enterprises because their access to forage not eaten by other animals is limited.

Pastoral areas have traditionally been anti-goats. However, sentiment may be changing a little as harvesting feral goats is one of the few enterprises that have generated income over the last couple of years.

Goats have been a good management tool. They give excellent results cleaning pastures following a canola crop. Goats clear up the country fairly well. They also help promote clover regeneration and reduce thistles.

Richard thinks there is a lot more woody weeds and general weed problems in some Mallee country, such as Pinnaroo and goats can have a role to play in management of this type of country.

Eight wire fencing is used on his property. When the time comes for upgrading poly droppers are used and from bottom to top the wires are organised Earth(E), Hot(H), E,H,E,E,H,E.

Richard thinks that this fence is also useful in fox control for his sheep. When the fox drags a lamb out of the paddock they get a shock and are reluctant to come back again.

Glossary of Terms:

Capretto: the carcass from an unweaned kid goat less than 12 weeks of age. Meat must be pale in colour.

Cashmere: the fine, soft undercoat prevalent on some goats. It is an unmedullated down fibre with a mean fibre diameter of less than 19 microns

Cast for age: A term used for sheep and goats when the breeding female is sold to make way for a younger breeding female. This usually occurs at four or five years of age.

Boer Goat. A large meat type goat recently imported from South Africa.

Guard Hair: The coarse medullated fibre with a diameter of more than 60 microns. This is the longer “coat” of the goat.

Shiv: A grass seed problem in wool.

Vegetable Fault: Contamination of seeds or other vegetable matter in fleeces results in a discount that increases as the percentage of vegetable matter increases. Vegetable fault can occur in wool, cashmere or mohair.

Wet and dry: A technique used to see if a doe has a kid. Udders are checked to see if there is milk present.