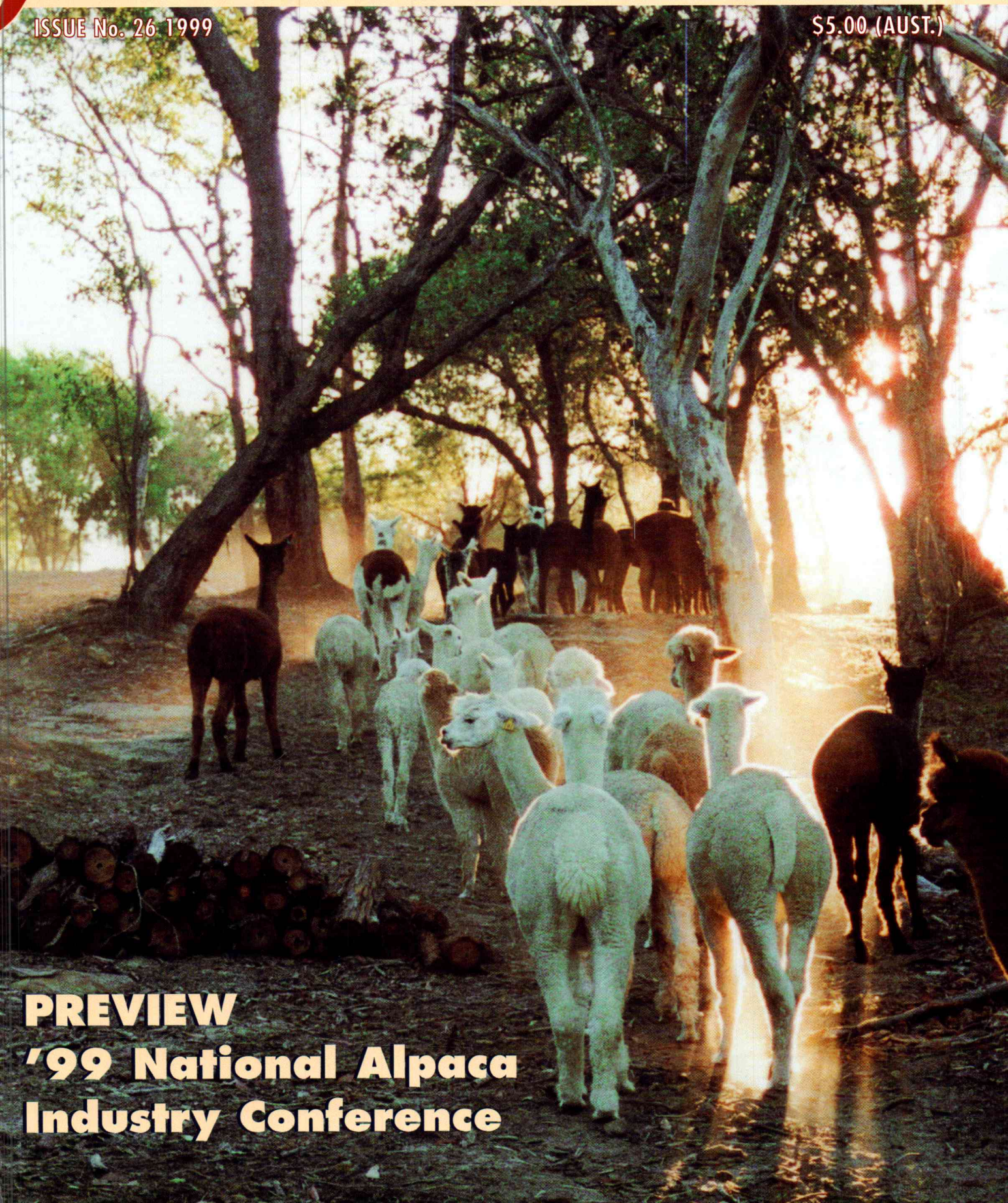


Alpacas

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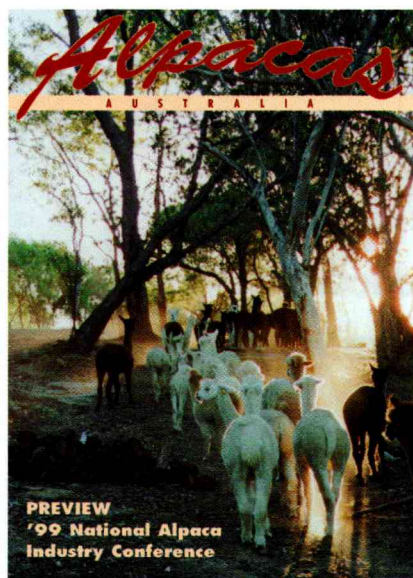
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A.S. Traders Desert Reign



Cover. Susie Clark, Chachani Alpacas.

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A message from the President

It is very pleasing to report that the National Committee elected in September 1998 has accepted the challenge of leading the alpaca industry into the new century with considerable enthusiasm, commitment and vision.

Its members have accepted the need for a more pro-active style of management that is more inclusive of members than in the past and have embraced a concept of Standing Sub-committees as a viable structure on which to grow both the Association and industry.

There is no doubting their commitment and energy.

It is exciting and rewarding to work with this group of people. Members can also enjoy the ride by becoming more involved in the activities of the National Committee through closer contact with its members.

A special sub-committee has been formed to look into the need for restructuring the national body. Mindful of its responsibilities under the Rules of the Association, the committee broadened the scope of the original motion from the 1998 Annual General Meeting to incorporate an evaluation of the potential of various organisational models that might better suit the needs and aspirations of the Association and the industry.

This sub-committee has drawn upon expertise from within the membership and the National Committee, but has been very deliberately kept at arm's length from both the Executive and the National Committee in its deliberations and recommendations.

The sub-committee has taken on a significant task and is currently running to schedule according to Chairperson, Carol Mathew.

A contribution of \$20,000 to the Rural Industries Research and

Development Corporation (RIRDC) is the first step in a long-term commitment to the development of the alpaca industry.

With Government subsidies, this contribution will turn into a \$100,000 benefit for us which will ensure that significant research is undertaken in areas that we believe are both commercially and academically important. The value of this commitment will become more and more important as we race toward the commercialisation of a healthy, viable and prosperous primary industry.

It is gratifying to know that the National Committee is taking its responsibilities both to the membership of the AAA and the alpaca industry very seriously.

Each member works long hours and devotes considerable energy to the demanding positions he/she has accepted in the management structure of the organisation.

AAA members can rest assured that they have a diligent and focused group working on their behalf.

The National Committee has already instigated change in the way it carries on its business, has accepted the challenge and responsibility of meeting the expectations and hopes of their industry colleagues and is actively planning for the future.

Please support your National Committee in its endeavours by becoming aware of, and involved in, the future of our Association and our industry.

Our success will be determined by the value of our individual contributions in these very challenging times.

Ian Watt
President

Alpacas
AUSTRALIA

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It's not an easy journey...

BEING PUT THROUGH THE MILL

.....
by Carol Hosking

*There's more to processing
alpaca than switching on
the machines. Elite Fibre
mill is still busy refining its
techniques.*

Three weeks before Christmas I drove down to Fellmongers Road in Geelong to meet Alan Hamilton and catch up on developments at the Elite Fibre mill.

Elite Fibre Pty Ltd was formed around 18 months ago by the Hamilton-Bridges group of companies for the purpose of establishing a processing facility for elite fibre. The group, as initial investor, has been joined by the Alpaca Co-operative, business people and alpaca industry members.

The project in Geelong is an ambitious one: to offer full processing facilities for small lots of elite fibre and to become involved in developmental work.

Breeders and entrepreneurs have long recognised the need for home-grown processing facilities. For the alpaca industry at least, these are essential to its long term aim of creating not merely a fibre growing industry, but a value-added fibre industry for Australia. The spectre of Australian made alpaca being exported raw, only to return as an imported made-up product at a premium price is one that sends universal shudders of dread down the spines of growers.

Easy to set the value-add goal – very hard work to achieve it.

For Alan, I suspect that the trigger for setting up Elite Fibre was provided by his involvement with the Alpaca Co-



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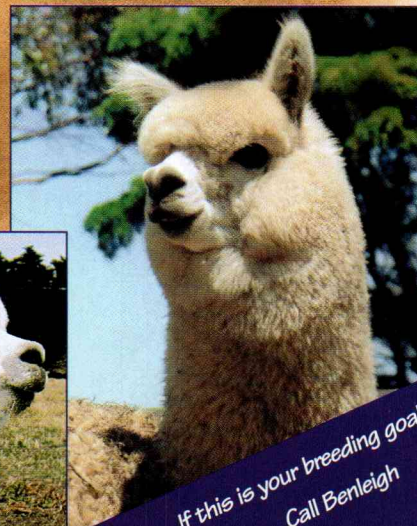
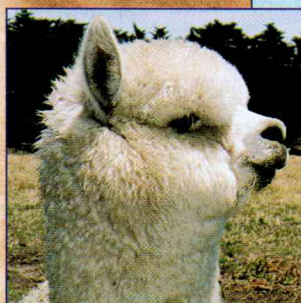
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operative, which has been developmentally hamstrung by not having access to a 'one stop' processor that is also able to assist in product development.

If one regards the establishment of an Australian commercial alpaca fibre industry as a series of steps, the mill may turn out to be one of the biggest.

When the remaining bugs are ironed out and the plant fully operational, the mill will be unique in Australia in that no part of the process, including scouring, will be outsourced.

According to Alan, the mill is about six months behind schedule. While this is obviously frustrating for Alan and his staff, it is probably not surprising. Setting up is a painstaking exercise of trial and error, compounded by a distinct lack of models to use as a benchmark. For the mill to succeed, it must be capable of producing a product whose quality will impress a world market. Alan believes that, on present indications, Elite Fibre product will be at least equal to that of Italy and Germany, considered to be the best in the world. That the undertaking has proven more expensive than originally envisaged is also no surprise.

The first machines purchased were sourced from sales of equipment by other processors by Robert Pearce, founder of Woolshed Yarns, and were installed in 1997. Additions have been made, with more plant to be installed early in the new year (mainly additions to improve existing facilities).

The process of machine adjustment – wool to alpaca, initially, continues. Problems arise – solutions are sought, tested, refined and incorporated into the process. I was given an example by Alan: that carding was causing alpaca fibre to break. Easing strain on the fibre was achieved by running the carding machine at a slower rate than would be normal for wool.

I was given a guided tour of the mill, first by Alan (who took me as far as the first spinning machine) and then by Stuart Macpherson, the mill's production manager, who took me through the rest of the plant.

From Stuart I learned that a lot of work has been put into controlling the amount of static electricity generated during spinning – always a problem in this process.

The first port of call was the scourer. This is where the raw fibre is washed, rinsed and dried. There is work being done on the scourer with some additional equipment to be installed, including completing the waste treatment plant. When it is finished, the computerised waste treatment plant will be the most sophisticated in Australia with the capacity to separate waste into water, fibre grease and compostable sludge. The water will be of sufficient quality to be discharged straight into the Barwon sewerage system.

Once the fibre has been scoured, it is ready to be carded. The difference between the clumps of alpaca that I saw after scouring what comes out of the carding machine is quite phe-

nomenal. The carding process turns these clumps into a web-like sheath of alpaca fibre.

The gilling process straightens the fibre and combing removes any residue of vegetable matter. It also removes short fibres which are known as noils. These are left as matted-looking little clumps of fibre which are discarded.

Through each process of gilling and combing, the fibre loses more and more of its unwanted contaminants and bulk. There is a noticeable increase in the softness of feel of the fibre. At the end of this stage, before spinning, the fibre is known as 'tops'. In this state, it can be stored.

Stuart Macpherson told me that it was wise to maintain a good store of tops in order to allow the mill to accommodate customer requests. Colours and micron ranges ensure adequate stocks for the processing of various types of yarns that might be asked for.



Stuart Macpherson at the gilling machine.



It's not often you see so much alpaca fibre in one spot!



White with light fawn looks really good.

Some work has been done in colour combining (white with light fawn looks really good).

Fibre blending will become an area of involvement for the mill. Alpaca and lambswool and alpaca and silk are the most obvious blends for development. I asked Stuart about the possibility of cotton and alpaca blends. This is more difficult because cotton fibre is much shorter than that of alpaca and the mill is geared to the production of worsted yarn which

requires a longer fibre.

The spinning machines are a very complex version of the spinning wheel. The tops are fed in and the machine does the job of 'teasing' out the fibre and creating an even yarn.

Different spinning machines are used for different micron ranges of fibre: 28 micron probably destined to outerwear, 23micron for knits and the finest fibre for weaving. The machines are designed to minimise breakages by varying the length between the tops feeder and where the yarn is wound on to cones. For the finest yarn, that length is shortest.

Next on the itinerary was the quality control machine that can spool through 700 metres of yarn per minute. It has a sensor that can detect slubs (lumpy or knotty bits in the yarn). On detection, the section of the machine that is dealing with the yarn stops, cuts out the slub, rejoins the yarn and continues spooling.

Twisting plays an important part in fibre processing. The sample I was shown looked quite fine, to my untrained eye: two fine yarns twisted together. Stuart said that the finer the yarn, the more twists it requires to strengthen it, preventing it from breaking.

Elite Fibre has facilities to dye fibre. The dyers were located near the scouring plant when I visited. For this, yarn is made into hanks and put into the dyers. The dye is a soluble powder added to water which is circulated multi-directionally within the dyers, ensuring that even coverage is achieved.

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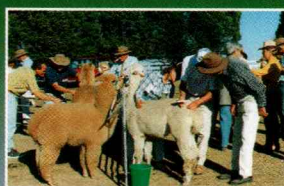
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Interestingly, the old problem of variation between dye lots (the bane of knitters) still remains.

There are machines to wind yarn into hanks (long, loose bundles) for dyeing and to wind the dyed hanks onto reels. (The latter reminding me, for some reason, of electrified cartoon hair – lots of bits of wire sticking up at odd angles).

Right at the back of the mill was the 'relaxing' machine. Not for the staff... Stuart explained that, after the rigours of processing it is necessary to relax the fibre. This is done by a process of controlled steaming and drying.

'Why doesn't it shrink?' I asked, remembering the odd laundry disaster. Stuart's explanation made the reason for those laundry problems suddenly clear. Shrinkage and that awful matting aren't caused by heat. (Mum, you were wrong!) They are actually caused by a combination of heat and agitation – precisely the actions of everyone's washer and tumble dryer.

I doubt Alan Hamilton could have chosen a better production manager than Stuart Macpherson. He has been involved with fibre all his life, first with wool as a youngster. One of his earliest schemes was to organise value-adding to wool grown on the family farm and sell the resultant product at field days and other country events. He is also a qualified wool classer. He has been involved in the processing of mohair which, he says, is very difficult to work with because it is such a smooth fibre. He hasn't yet experienced suri!

The spinning and twisting machines look extraordinarily 'mechanical' with their feeders, spools, aprons and other moving parts – in fact, rather comfortably solid – and not a computer screen in sight. But their machine-green and grey exteriors hide some very sophisticated electronics that control their highly specialised tasks.



Outside Elite Fibre mill at Geelong.

Our conversation turned to technology and the impact that it has on 'old' skills.

'Will it all be done, one day, by a computer that knows exactly how fibre should handle, look and perform, do you think?' I asked him.

Maybe I'm old fashioned, but I find it an awful thought to hand to a mere machine the final control of a product as important as processed fibre. The character of a fibre product – especially clothing – is too bound up with our individual personalities to be determined by totally non-subjective assessment. It takes a human to appreciate the quality of an end product – and a human to give it a final imprimatur. Imagine a machine as a fashion designer, for goodness sake! Similarly, the real processor, I believe is the human being – aided by the machine.

The look on Stuart's face – even before he replied – confirmed my view.

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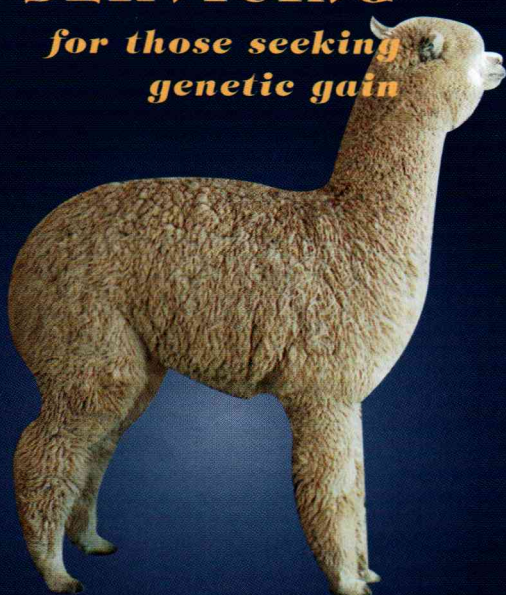
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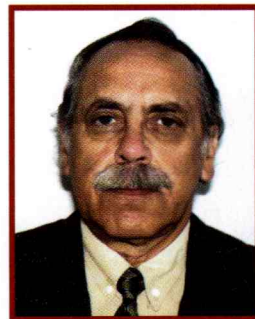
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Dr Julio Sumar



.....
By Dr Jane Vaughan

*A brief profile of a world
authority on alpacas.*

Dr Vaughan is a veterinarian who has worked with alpacas for 10 years. She has just taken up the RIRDC-funded PhD position at the University of Central Queensland in a new project to develop a mating protocol for alpacas.

Professor Julio Sumar graduated in Veterinary Science from the San Marcos University in Lima, Peru. This university was established in 1554, and he proudly boasts that it is the oldest university in America!

Professor Sumar worked as part of the Peruvian foot and mouth disease eradication campaign before travelling to Sweden for 12 months in the late 1960s to study camelid reproduction and obtain a Diploma in Animal Reproduction. Over the ensuing 30 years, he continued his studies on the reproduction of camelids at the Veterinary Institute for Tropical and High Altitude Research, San Marcos University, based near Cusco, whilst collaborating with veterinarians from North America and Europe.

In 1983, Dr Sumar completed a Masters Degree in studies on reproductive pathology in alpacas at the Swedish University of Agricultural Sciences. Throughout the mid-late 1980s at La Raya Research Station in Peru, he collected data for a Doctor of Philosophy dissertation.

La Raya Research Station had been attacked by terrorists in 1983. However, the damage had been repaired allowing research into camelid reproduction to continue.

One night, during 1989, a big soccer match between Peru and Brazil was to be played. The staff at La Raya decided to go town to watch the game on television. Not a great fan of soccer, the professor had planned to stay at the

station and work. The cook, who would have liked to see the game, decided he could not, in all conscience, leave Dr Sumar alone without food. Feeling guilty about depriving the cook of an opportunity to watch the match, the professor changed his plans and both went into town with the rest of the staff.

While the disappointment of seeing Peru beaten by Brazil was keen among workers at the La Raya station, it was nothing compared to their dismay at the calamity that greeted them on their return. Some buildings had been razed, others were still burning fiercely. The terrorists had struck again.

While the trip to see the soccer match may have saved the lives of Professor Sumar and his colleagues, the action of the terrorists ensured that all the information collected by the professor had been lost.

Professor Sumar has a keen interest in alpaca genetics. He believes there are three main reasons why the genetic base of the industry has become so narrow and possibly the cause of many problems that are suspected to be inherited.

First, when the Spaniards arrived in Peru during the 16th century, they brought cattle and sheep with them. Because local farmers believed it contributed to their status to graze these imported ruminants rather than indigenous camelids, alpaca numbers declined.

Secondly, during twelve years of terrorism in the late 1970s and throughout the 1980s, many alpaca farmers were driven from their land. Consequently, many years of breeding programs and genetic improvement were lost.

Thirdly, many of the alpaca farmers were poor and had small herds. They could not afford to regularly replace their breeding machos, often keeping the same male in a herd for ten years or more.

Dr Sumar has pioneered the education of alpaca farmers in Peru. With the help of local agricultural bodies, farmers are now learning to look objectively at their machos – selecting for good fibre, but also considering conformational aspects such as sound skeletal structure, teeth and reproductive soundness.

This interest in breeding has led him to become an alpaca judge. He judges regularly at the four major Peruvian festivals and is now recognised internationally for his judging expertise.

In October, he flew into Melbourne to judge in Australia for the first time at the National Alpaca Spring Classic Show. Dr Sumar invited alpaca breeders, aspiring judges and veterinarians to

join him in the ring. This generous gesture provided a marvellous opportunity to see a master at work, and to tap into his great knowledge of camelid reproduction and genetics.

During his stay, Professor Sumar also spoke to veterinarians interested in camelids at the Victorian Institute of Animal Science, in a highly informative session organised by the Association.

He spoke about the reproductive capacities of hembras and machos and described various breeding strategies used in Peru (paddock mating vs. single-sire pen mating).

He commented that paddock mating can be a problem with alpacas. Machos have high libido and breed well for about 7 days, but after that they establish a hierarchical system.

This means the dominant macho becomes too busy fighting to breed, whilst the subordinate machos are prevented from breeding by the dominant macho. To counteract this and achieve

maximum conception rates, males are rotated every seven days effectively preventing them from working to establish their hierarchy.

The professor also discussed hembra ovarian follicular dynamics, induction of ovulation, artificial insemination and embryo transfer techniques and their success. [Ed. see more on this, page 10.]

Professor Sumar lives in Cusco and works part-time at the San Marcos University. For the past 2 years, he has been consulting with the alpaca breeders in Peru and advises on conformational issues and fleece characteristics.



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ALPACA REPRODUCTION SEMINAR REPORT

.....
By Carol Mathew

*Much work is being done
on this important aspect
of alpaca management.
This report presents some
of the latest information.*

At the same time as the 1998 National Spring Classic was held in Melbourne, a seminar on alpaca research was organised by Melbourne University Veterinary Scientists. The group invited Dr Julio Sumar, who was in Melbourne to judge at the Spring Classic Show, to participate in the seminar. It was held at Werribee and attended by academics from Queensland and Victoria, and some camelid veterinary practitioners from Victoria. This report is an overview of the presentations.

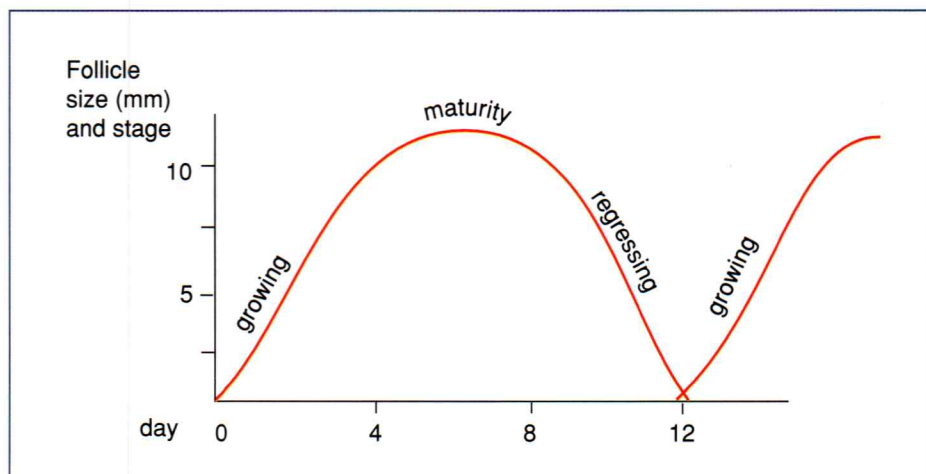
The Seminar opened with an introduction by Professor Michael D'Occhio of the University of Queensland. Michael was followed by Dr. Sumar, Dr Jane Vaughan, and Professor David Galloway all presenting research information for round table discussion purposes. The major focus was on reproduction of the alpaca, and the following is a summary of the information presented.

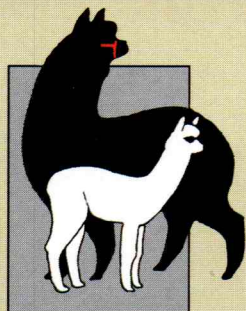


Background to alpaca reproduction

As we are aware, the alpaca female has a follicular wave pattern similar to that of other ruminants, but the female alpaca differs in that she is receptive to mating during most days of the wave pattern. Also, the alpaca is an induced ovulator, but ovulation only occurs if mating is during the right time in the follicular wave cycle.

Diagram 1. Follicular wave pattern

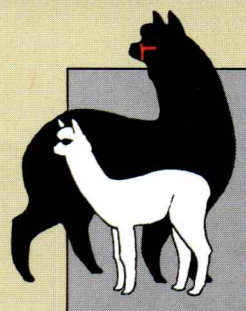




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Alpaca Stud

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Leading the Way

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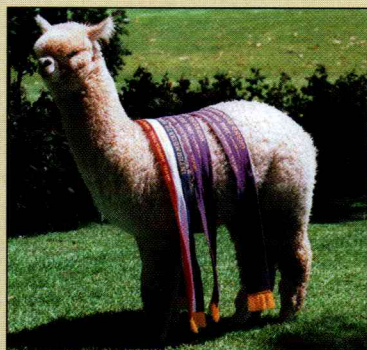
1997-98 PERTH ROYAL SHOW 1996-97 ALBANY SHOW

Outstanding Sires At Stud



Shanbrooke Elite

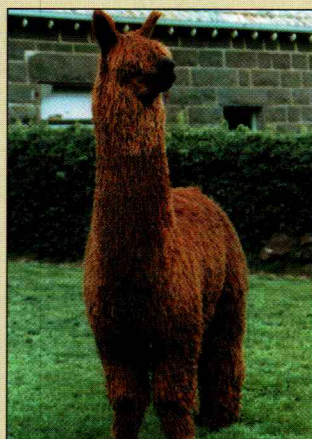
His record speaks for itself. Winner of 7 championships T/O Aust. Incl. National Classic
3 Supreme Championships in WA. Res. Champion Fleece National Classic 1997 & 1998



Swan Valley Majestic

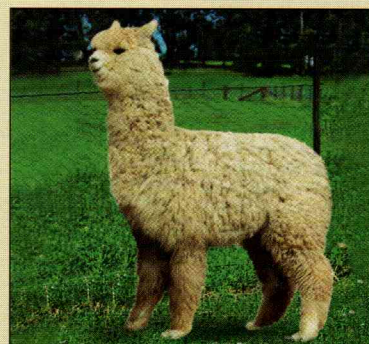
Supreme Champion 1998 Perth Royal Show
& Albany Show. Outstanding genetics.

Sire: Peruvian Sonoma
Dam: Purumbete Portia



Two Ways Royal Russet

A rare and outstanding solid
brown pure suri, incredible
handle and lustre.



Ellenvale Peruvian Valley Prince

Extremely fine fleece, superb conformation
with extreme density and coverage.

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Dr. Sumar reported that recent research has demonstrated that the wave cycle in camelids is much shorter than previously thought. It is a twelve day pattern rather than the previously accepted twenty day pattern. The wave pattern is indicated in Diagram 1.

After conception occurs, the female exhibits a dip in the progesterone levels after day 10. Peruvian research has indicated that if a progesterone supplement is given seven days after mating it may assist in maintaining in the pregnancy in maidens (although it does not have an effect in mature females). The dose rates of the progesterone were not given at the seminar.

Among non-domesticated alpacas in their natural environment in Peru, the breeding season occurs in January and February as this coincides with the green pasture growth of summer. Each male has a harem of up to twenty females.

However, in 'managed' mating, the situation is necessarily different. In the Paddock Breeding Programs of the Co-operatives, the tendency is to work small teams of males, each animal having two days with the females followed by a rest day. Each team works for around four weeks before being replaced by a fresh group of males.

Single matings in Peru have a 30% success rate and it is usual to have three matings before a successful pregnancy occurs. Best results occur if the male is only used twice a day. Overall fertility rates in Peru run at about 75%.

Dr. Sumar contends that the male is the limiting factor in the fertility rates in the alpaca. The testes are small, therefore the semen production is small and storage is limited.

For example, a ram's testicle may weigh 300 grams compared with 25 grams in the Alpaca. As well, the semen is very viscous; consequently sperm motility is low.

An analogy could be to imagine Dawn Fraser or Kieren Perkins competing in a pool of Aeroplane jelly.

Needless to say, their race times would be very much reduced!

Australian research

Male alpaca fertility

We are fortunate in having Prof. David Galloway conducting research into male alpaca fertility in Australia. He reports that testicular under-development (hypoplasia) may be as high as 10% in Peru. David's research involves taking clinical measurements of the testicles and relating these to testicular weight and the maturation of sperm production, determined microscopically after castration. Total scrotal width in alpacas 12-13 months of age varies greatly (1.3-5.8 cms), and at eighteen months 2-6.5 cms. While some well fed males can be producing sperm at 14 months, many are still not showing the mature pattern of sperm production at 24 months. By 40 months, maturity was present in all normal animals studied so far. After 12 months of age, males with scrotal width less than 3.5 cm appear to be abnormal.

Further work is required on factors such as nutrition and genetics to determine the reasons for such wide variation in testicular development. Semen analysis will be needed to define excellent, mediocre and abnormal testicular development and function.

Oestradiol protocol

Dr Jane Vaughan is the main researcher working on a new project recently funded by the RIRDC (Rural Industries Research and Development Corporation) Rare Natural Fibres Committee. The aim of the project is to develop an oestradiol protocol for the alpaca industry. [Ed. see issue 24.]

Initial research has established that the administration to a female alpaca of 17 Beta oestradiol (a quick acting oestrogen) can cause regression to occur in the follicular wave cycle. Because of the correlation between the regression stage and the new growing stage (see Diagram 1), a basis is established for

predicting when the next mature egg should be present. The implications of this discovery are important for the industry. Optimising chances of pregnancy at a first mating saves a breeder precious time, allows more economical use of stud sires and also reduces risk of damage to female reproductive systems.

Presently, the research is using oestradiol rather than progesterone, apparently more suitable because alpacas are induced ovulators. Other aspects of the research will involve the conducting of steroid analysis during the follicular wave cycle and, later, experimentation with the use of progesterone and various oestrogens to achieve safe super-ovulation. (Dr Sumar reported that some early super-ovulation experiments in Peru caused tearing of membranes surrounding the ovaries of experimental animals and resultant infertility.)

While the prospects are good, there is still some way to go before the process of super-ovulation can be mastered. This mastery is crucial if there is to be an efficient embryo-transplant technology developed for industry use.

In summary, we have some very interesting and critical research occurring in Australia which will be of great benefit to the industry.

The R&D challenge

One of our challenges is to reach agreement on what research is to be funded by the industry. Alpacas are seen as one of the few domesticated animals that have not been investigated and about which many mysteries remain.

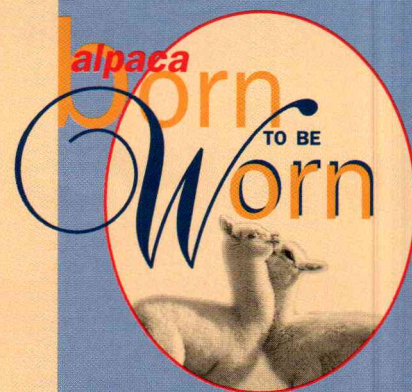
Therefore, enthusiasm in research fields is high and the research possibilities are seemingly limitless. Unfortunately budgets are not.

The recently formed Research & Development sub-committee of the AAA has the task of formulating a R&D plan for the industry. This will be reported as it develops.

National Alpaca Industry Conference

9-11 July, 1999

at Glenelg, South Australia



Fondly known by the locals as 'The Bay', Glenelg is close to the airport and within easy reach of everything Adelaide has to offer.

The conference will be held at the gracious Stamford Grand, situated on the beachfront. It offers international standard resort style accommodation and ideal conference facilities.

For those who prefer alternative accommodation, a vast range of motels, holiday units, backpackers, bed & breakfasts, cabins and a caravan park are just a short distance away.

If you haven't been across to SA recently, a few extra days will give you an excellent chance to catch up with great attractions in and around Adelaide.

Among them are the HMS Buffalo, a full size replica of the ship that brought the first Governor to South Australia. It also houses a multi-award winning museum and restaurant. There's the historic Town Hall erected in 1875 and the Old Gumtree where Governor Hindmarsh formally proclaimed the new province of South Australia in 1836.

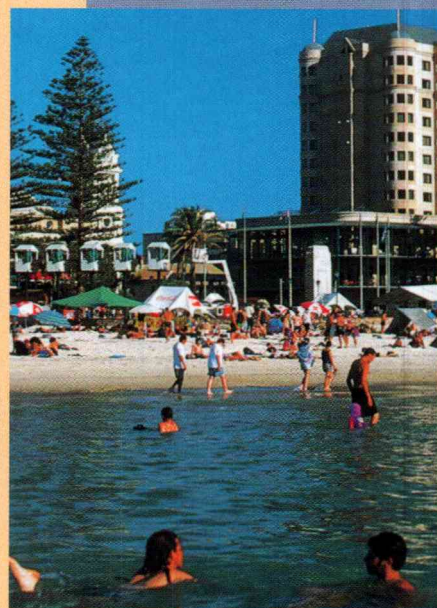
You can even catch a tram (Victorians will feel at home!), from Glenelg to the city.

If you want to venture a little further afield, try the tranquil Adelaide Hills, unique Kangaroo Island or the rugged Flinders Ranges.

At the business end of proceedings is the Conference. Whether you are in the throes of investigating the industry, have newly become a part of it, or are an 'old hand', the conference committee positively guarantees information, stimulation and challenge... along with a good dose of enjoyment.

As usual, there will be an excellent mix of lectures and hands-on sessions covering a wide range of topics.

Look for an invitingly plump envelope in your mail box any day now. Apart from containing the full Conference program and that all-important registration form, you'll also find out how you can become a sponsor of one of the biggest annual events on the alpaca calendar. And, for those who have businesses that offer products or services to the industry, don't miss out on your trade site booking!



Above: Glenelg foreshore (Stamford Grand to the right).

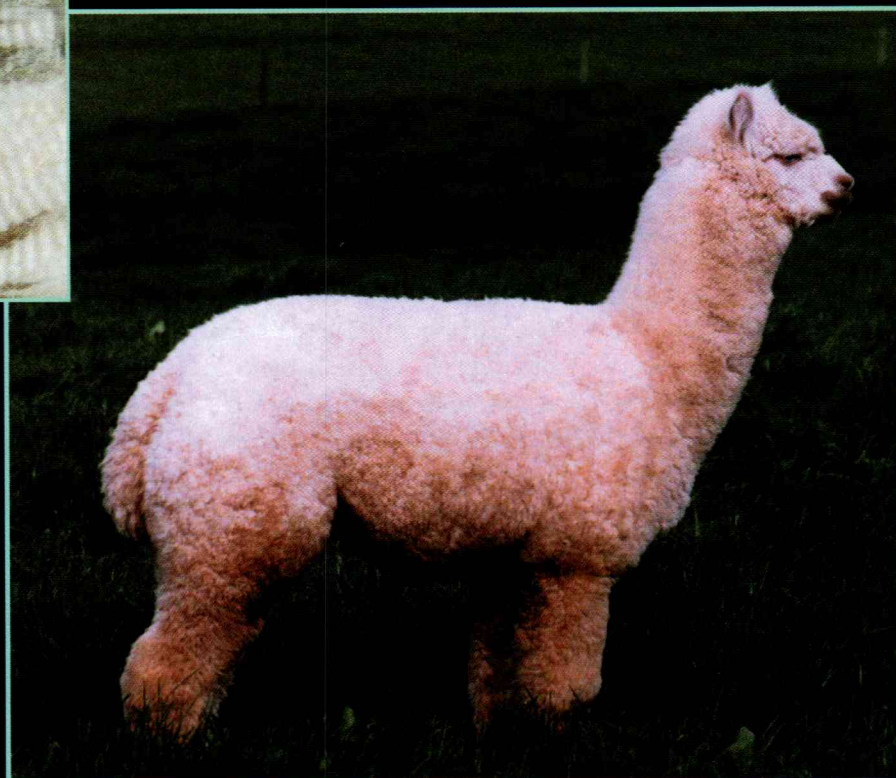
Below: Light's vision (commemorating the founder of Adelaide).



Blue Grass Alpacas

SUPREME CHAMPION FLEECE

Benleigh Ringleader

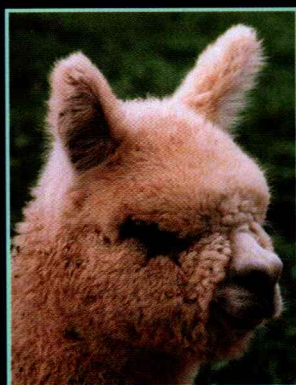


Sire:
Purrumbete Inti

Dam:
Purrumbete
Sweet Freedom

18.4 μ , 3.6 s.d., 19.6 c.v. – 0.6% of fibres over 30 μ

Supreme Champion Fleece
Sydney & Canberra Royals '98
Stud Fee: \$1,000



Introducing
Blue Grass Leading Lady
Supreme Champion of the Charles
Ledger Alpaca Show 1998 at
6.5 months of age

Introducing
Blue Grass Liebling



Whole herd tested JD negative

Photography: Portfolio, Young NSW

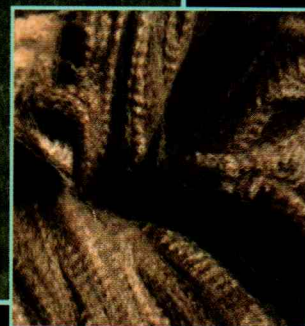
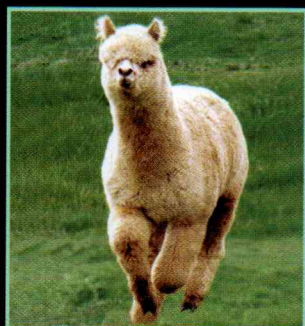


Blue Grass Alpacas



THE CHAMPION OF CHAMPIONS

Shanbrooke High Society



Sire:
Purrumbete
Ledgers
Dream

Dam:
Purrumbete
Flamingo Gold

18.8 μ , 3.9 s.d., 20.7 c.v. – 1.1% of fibres over 30 μ

National Supreme Champion
World Record Price \$190,000

This male has an excellent conformation and is extremely well covered with a dense even fleece which extends under the belly and up the neck to the bonnet. The fleece has a merino sheep-like quality which will increase the fleece weights of his offspring. The well formed staples are boldly crimped, whilst soft and lustrous. He is the type of animal we are looking for to sire future champions.

Bill Robbins, National Judge (Nov. '97)

Stud Fee: \$1,500

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Suri Fiber Processing

.....
based on an article

by Juan Pepper

Export Manager,

Michell Group

Suri - a unique species

Suri is among the rarest and finest fibers of the South American camelids. This animal is a unique species within the family of alpacas. Short in size, pretty in looks and owner of magnificently lustrous and curly fleece, the suri type is a very scarce animal, compared to its cousin the huacaya.

The name of this type of alpaca originated from an Andean bird from the ostrich family (*Pterocnemia pennata*, lesser rhea), which has very shiny and silky feathers and which is called *suri*.

Although statistics in Peru are not very precise, the population of suris is estimated to be under 60,000 animals, most of which live in the Southern Region of Puno. They give a total yearly fiber production of around 550,000 lbs. of greasy fiber.

Suri lock structure

Suri clearly differs from huacaya in its fleece structure. Suri fibers are grouped in locks which hang down in spirals to both sides of the body, leaving the back bared (which some authors address as the main cause of their fragility and high rate of cria deaths).

Some breeders like to emphasize the close relationships between lock structure and density of the fleece as determining the pureness of the animal. It is well known that some locks hang down as ringlets to the right and some to the left, although some breeders believe that is more common to see turns to the right, calling these animals *quercas*.

It is very difficult to reach any firm conclusion about the direction of the ringlets and its influence on the textile processing of the fiber.

Sorting the fiber

Suri is sorted in the same way as huacaya and certain fiber characteristics must be taken as basic criteria: luster, color, fineness, silkiness, tensile strength and length.

Suri is also sorted into three main qualities.

Baby suri

This is the finest quality, with a range of 21 to 23 microns in fiber diameter, and an average length of 70/75 mm. This quality is extremely soft, but represents only 5 per cent of the animal's fleece. Consequently baby suri is rarely sorted as it is commercially unviable to do so.

Suri fleece

This quality averages 25-27.5 microns in fiber diameter, and a length of 75-85 mm. The fleece represents the standard quality of suri and it is about 55% of the animal's total fiber.

Coarse fiber

This type of quality, which comes from an adult animal, has fibers above 30 microns. It is very coarse and is normally blended in with the huacaya coarse alpaca qualities. It does not have a great value alone because of the small weights available and its lack of lustre compared to normal suri fleece.

Colors

In our experience at Michell Group, 80% of suri production is concentrated in two colors: raw white and light fawn (B, LFX). The remaining 20% is made up of 15% for chocolate browns such as GCC, CC, COM, GC, and just 5% for black and dark brownish shades COM/N, CON.



Processing suri

Due to its fiber characteristics, suri is the more difficult alpaca fiber to process. Its oiliness, straightness and lack of crimp create more than one headache for technicians, who have the tasks of carding, combing and spinning the fiber.

Combing suri

Scouring and carding are quite simple processes which do not require such careful attention as later processes. For combing 100% Suri fiber, the machines have to be especially set to a lower speed, and the feeding cylinders need proper control to avoid fiber sliding off the main sliver.

Extra anti-static oils are required and humidity must be set at a good 75% in the main room. Machines need to be stopped regularly, pin drafting especially, to clean their inside rollers and combs. Consequently, yields of suri after processing are somewhere around 10% to 15% lower than those of huacaya or llama.

Most technicians find double combing particularly difficult but, with patience and proper care, a good sliver of lustrous and shiny suri fiber is able to be transformed into a top, the raw material used for spinning the yarn.

Spinning suri

This process perhaps is the most difficult to achieve. It requires much expertise to spin a regular and uniform suri yarn.

Humidity and anti-static oils play a major role, and the speed of the process is significantly less than that used for spinning huacaya. Most spinning mills have created their own techniques to spin suri and do not like to share them with others. However, the problems are common to all:

- lack of fiber cohesion in the sliver;
- greater specific weight compared to huacaya;
- high degree of nervousness and fiber slipping;
- twist fixing in the yarn;
- fiber dyeing difficulties.

These factors influence the obtaining of yarns with good regularity and optimum tensile strength. Because of the difficulties in spinning suri, it is advisable not to process a yarn beyond a metric count of 1/18nm or a coarser count than 1/9nm. This last one due to the fact that suri, being a heavy fiber, slips off easily.

Main uses for suri

Knitting

Flat or circular knitting is definitely not suitable for suri. Once the stitches are formed, they tend to slide off and loosen up, due to the suri's silky and oily structure. To overcome this problem, some knitters have developed special blends.

Wool, in particular, helps to bind in and enhance the structure of the yarn without losing the fine characteristics of suri. But even this is generally difficult to knit.

Weaving

Weaving suri into fabrics is by far the best final use for this precious fiber.

Numerous prestigious houses in Europe and Japan have contributed to expand the use of suri by creating a wide array of brushed velour type fabrics, thinly sheared with many patterns and designs. Ladies' coat wear is the most common end product nowadays. Houses including Fujii Keori, Hoso-kawa, Fujimata, Nayatake Keori and others in Japan create the most fascinating diversity of fabrics to tailor coats that retail for between \$US2,000 and \$US3,000 in top department stores such as Mitsukoshi, Takashimaya and Sogo.

Lanerie Agnona from Italy are the leaders in the world for top quality fleece fabrics from suri, which are mainly used for ladies' coats and blankets. Other Italian houses that use suri to create prestigious fabric collections are Ricceri, Loropiana, Colombo and Piacenza.

'Does Benleigh Ringleader have two sires?'

'No it was a typo in the last issue!'

'That's good! I thought we may have had yet another camelid mystery!'



No mystery and not good because we managed to confuse a few readers. To set the record straight, Benleigh Ringleader is sired by Purumbete Inti. We got it wrong (two sires were listed) in the Blue Grass Alpacas advertisement last issue. But it's right in this issue (see p. 14). [*Mea culpa*, Ed.]



PUREBLOOD

PART 2

by Mike Safley

In this second article of his series, Mike discusses a most important aspect of breeding alpacas, selection.

This is the second article in the 'Pure Blood' series. Part I was published in the December 1998 issue. The remaining parts will be published in successive issues of *Alpacas Australia*. I would like to hear from any of you who have questions or can suggest interesting books which may bear on these topics.

I have engaged the services of a geneticist to help Northwest Alpacas formulate a sound breeding program. If any of you have questions that I can't answer, I will be happy to direct your questions to the geneticist and, hopefully, together we will be able either to provide you with the information you are seeking or direct you to the source of the answers.

I have also created a new section on my Northwest Alpacas website, <http://www.alpacas.com/~nwa>, entitled 'Plantel Genetics' where you will find numerous articles on genetics, including Part I and II of this series. The website also has a glossary of breeding terms and reviews of books on genetics and animal breeding.

It is every breeder's dream to select and breed beautiful, productive alpacas. If you closed your eyes and pictured your pastures populated with perfect alpacas, what would they look like? Everyone's vision would be a little different. Some would see suris, others huacayas. Colors would change and size might vary. If you walked out into this mythic pasture of your mind, your ideal alpaca fleece might vary a bit from your neighbor's, but I am sure you could conjure up just how you would like it to look and feel.

These alpacas that you have in your mind's eye need not remain pure fantasy. Anyone with the passion for breeding alpacas can learn to breed his/her ideal. It will take time because alpacas don't have litters and it will take patience, because the rules of inheritance depend a little on mathematical chance. But if you are willing to understand the basics of genetics and how to make selection work for you, the alpacas of your dreams can end up in the pasture behind your home.

Pure blood or pure money

The terms pure blood and pure bred are often used, but little understood terms in the alpaca industry.

Webster's Collegiate dictionary defines pure as:

unmixed with any other matter; of pure blood and unmixed ancestry; homozygous in, and breeding true for one or more characters

Animal breeders have always varied in their definition of the term pure blood. Back in 1881, one of the most successful pioneers of the Australian merino industry, John Hughes, had this to say about his competitor, William Macarthur, whose family was credited as being the original developer of the fine wool merino breed in Australia:

When I owned Bundaleer I went to Sydney, and saw some of the most valued Merino rams. I visited Camden, where Mr. William Macarthur showed me the fleeces of their best pure-bred wool, which they were then about to send to the Exhibition in Paris. He frankly gave me every information as to weight of fleece and price last realised per pound. I asked why he bred such sheep when mine in similar climate and country yielded me, as I showed him, nearly doubly the money per fleece. He told me with an air of pride that they bred the pure blood. I replied that in South Australia we bred for the pure money, which he characterised as a Yankee way of looking at it.

The Peppin merino, which Hughes championed, eventually became the most productive sheep in the world. The point being that, in a sense, pure



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(Below)
Australian Centeno
Sunrise
Reserve Junior
Champion Female,
1997 Royal
Melbourne Show
Second in Class,
National Classic
Show

Sire: Peruvian
Centeno
Dam: World Class
Dawn (Chilean)



PERUVIAN CENTENO

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blood or pure bred is in the eye of the beholder. People have different opinions about what's pure and what's not. One breeder may be satisfied to create a 'pure bred' animal that is individually outstanding, an alpaca which will do well in the show ring. Another breeder's aim may be to create uniform alpacas that have high breeding value, passing on their superior traits to their offspring. This is a different ideal and requires creating an animal whose blood is pure or genetically homozygous for certain positive characteristics that the breeder deems desirable.

For the purposes of these articles, we will be discussing pure blood within the context of creating genetically superior alpacas that will breed true for such quantifiable characteristics as fleece weight, body size, fineness, conformation, and fleece characters such as luster, crimp, lock, and staple length.

As breeders, we need to answer questions such as: How do we identify prepotent studs? Which traits are heritable and repeatable? Will our offspring exhibit a high degree of variability or will they breed true and uniform? How do we select for a particular type of alpaca? Is progeny testing an answer? How can we avoid genetic defects?

Measurement

Record keeping is a must in every breeding program. If a breeder is not weighing fleeces on an annual basis, taking samples for histograms, and measuring staple length, any improvement is, in large part, by chance.

Don Julio Barreda cautions against using our eye as a microscope and our arm as a scale. Without measurement, we are simply choosing animals as a show judge does, according to what pleases the eye. Without measurement, trying to improve a herd is like trying to steer a rudderless ship. Success is often found in the details.

Prepotency

The search for superior stock is a common goal among breeders. Every livestock industry has its legendary sires. Everyone is looking for the perfect male. Too often in the alpaca business this means the best looking stud with the lowest micron count as reflected on a histogram. What breeders should be looking for is a prepotent or dominant male with the ability to transmit his excellence to the next generation. This means identifying a male who has homozygous genes for as many of the heritable traits under selection as possible and then using him as often as possible.

Heritability

Almost everyone has heard of heritability. In the broadest sense, heritability is defined as a measure of the strength of the relationship between performance or phenotypic values and genotypic values for a trait in a population. Breeders often assume that if a trait is genetically determined, it is heritable. That is not always the case. The concept of heritability involves identifying the difference in performance, for a specific trait, that can be transmitted to offspring.

For instance, an alpaca always has four legs. There is never any difference for the number of legs. Therefore, heritability for leg count is zero. Fleece weight, on the other hand, varies from alpaca to alpaca and the difference in this weight or performance is heritable, probably highly heritable. High heritability indicates there is a strong correlation between phenotypic values and breeding values in a population.

Heritability relates to certain traits in a population, such as crimp in huacayas or luster in suris. Other examples of heritability in populations include speed in race horses, egg production in chickens, milk production in cows, and

litter size in pigs. In alpacas most, if not all, fleece characteristics are thought to be moderately to highly heritable. Heritability in a population should not be confused with the breeding value of a particular animal.

Typical heritability estimates for a number of traits and species are listed in Figure 1. As a rule, traits with heritabilities below 0.2 are considered lowly heritable, traits with heritabilities between 0.2 and 0.4 are considered moderately heritable, and traits with heritabilities above 0.4 are considered highly heritable.

If you study Figure 1, you will see that traits related to fertility and survivability tend to be lowly heritable. 'Production traits,' such as fleece weight and fineness, tend to be moderately to highly heritable. The most highly heritable traits are typically those related to structural size and mature body weight.

The heritability of phenotype among relatives

If a particular trait is highly heritable, all the relatives of animals exhibiting the trait tend to look alike. You have all seen this phenomenon in families of people as well as alpacas. Why? Relatives share the same genes. Close relatives – full siblings, half siblings, parents and their progeny – share a large portion of their parents' genes, fifty per cent, twenty-five per cent, and fifty per cent respectively. When relatives share genes, they also share the effect of the genes. This creates a higher degree of uniformity.

Among relatives, the tendency to look alike actually has less to do with heritability and more to do with pedigree. Breeding value is increased when like or homozygous genes are concentrated in the animals under selection. Conversely, you can expect less uniformity among distant relatives.

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Figure 1. Typical heritability estimates for a number of traits and species

Trait	Heritability
<i>Cattle (beef)</i>	
Calving interval	.05
Birth weight	.40
Weaning weight	.30
Yearling weight	.40
Mature weight	.65
Feed conversion	.40
Scrotal circumference	.50
Backfat thickness	.40
<i>Cattle (dairy)</i>	
Calving interval	.10
Milk yield	.25
% fat	.55
% protein	.50
Udder support	.20
Teat placement	.30
Rear leg set	.15
Stature	.50
<i>Horses</i>	
Wither height	.40
Cannon bone circumference	.45
Temperament	.25
Walking speed	.40
Time to trot one mile	.45
Time to run one mile	.35
Pulling power	.25
Cutting ability	.12
<i>Sheep</i>	
Number born	.15
Birth weight	.30
60-day weaning weight	.20
Yearling weight	.40
Loin eye area	.45
Grease fleece weight	.40
Fiber diameter	.40
Fleece grade	.35
Staple length	.50

Breeding value

Elite herds are built through the selection and retention of superior producing parents who transmit their qualities genotypically. This is breeding value, as opposed to phenotypic or aesthetic value. Remember, a castrated male can possess a perfect phenotype, but it can't reproduce. Selecting and retaining for your breeding program animals that transmit their qualities to their offspring are the essence of creating a productive breeding herd of elite alpacas.

Breeding value is defined as (a) the value of an individual as a genetic parent, and (b) the part of an animal's genotypic value that is due to independent and, therefore, transmittable gene effects. An alpaca has high breeding value when it breeds true or produces offspring which resemble itself.

Repeatability

Repeatability is a measure of the consistency or reliability of the relationship between repeated records which measure phenotypic values of a trait in a population. Repeatability can be determined for any trait in which individuals commonly have more than one performance record.

Figure 2. Typical repeatability estimates for a number of traits and species

Trait	Repeatability
<i>Cattle (beef)</i>	
Calving date (trait of dam)	.35
Birth weight (trait of dam)	.20
Weaning weight (trait of dam)	.40
Body measurements	.80
<i>Cattle (dairy)</i>	
Services per conception	.15
Calving interval	.15
Milk yield	.50
% fat	.60
Udder support	.50
Teat placement	.55
Rear leg set	.30
Stature	.75
<i>Horses</i>	
1/4-mile time	.32
1-mile time (flat races)	.57
1-mile time (trotters)	.39
1-mile time (pacers)	.45
Cutting score	.22
<i>Sheep</i>	
Number born	.15
Birth weight (trait of the dam)	.35
60-day weaning weight (trait of dam)	.25
Grease fleece weight	.40
Fleece grade (fineness)	.60
Staple length	.60

The examples in Figure 2 illustrate repeatable traits, which include milk yield in dairy animals, racing perfor-

mance in horses, litter size in swine, and fleece weight in sheep.

Like heritability, repeatability is a population measure, or a characteristic of a trait in a population. It is not a value to be associated with an individual animal. Geneticists refer to the repeatability of racing performance in horses, but it is an incorrect use of the term to refer to a particular horse's repeatability for racing performance.

Like heritability, repeatability is not fixed. It varies from population to population and from environment to environment. A number of factors will contribute to variation in most production characters throughout the life of an alpaca. Factors such as age, season, and pregnancy can all affect measurements of a trait like fleece weight from year to year. In selecting alpacas, we often choose animals based on their superiority early in life, and hope that they retain that superiority throughout their life.

The extent to which this early-life superiority can be maintained is termed the repeatability of the character. There have been few, if any, repeatability studies done for alpacas. Research has established the repeatability of many key aspects of sheep production, a summary of these is seen in Figure 3. A repeatability of 1.0 indicates perfect agreement between the rankings of young animals on that character and the rankings of those same animals in later life. A repeatability of 0 indicates no relationship.

Figure 3. Estimates of repeatability for production characteristics in sheep

Characteristics	Age first assessment	
	weaning	later ages
Greasy fleece weight	0.4 - .05	0.5 - 0.8
Clean yield	0.4 - 0.5	0.5 - 0.8
Body weight	0.3 - 0.8	0.5 - 0.8
Fiber diameter	0.2 - 0.5	0.5 - 0.8

Figure 3 indicates that repeatability tends to be lower when animals are assessed for superiority as weaners (3 to

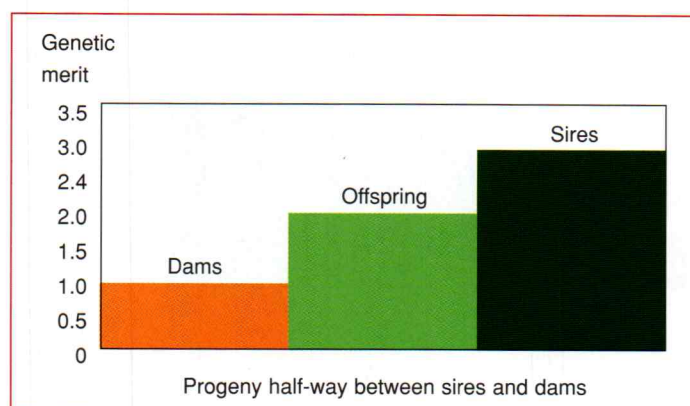
6 months of age). This is due to the influence of environmental effects on the animals at this age. High repeatability does not mean that an animal will have exactly the same level of a character every year. It means that an animal will tend to consistently rank the same, relative to other animals within its age group, even though the average value of the characters change.

The measurement of an alpaca's fleece at the second shearing, for both fineness and density, is thought to be the most repeatable. Histograms, for fineness, from samples of six month old crias' fleece are not nearly as reliable as those taken at two years of age.

Variability

Based on the general rules of Mendelian inheritance, all discreet populations of alpacas, if mated randomly, will eventually breed to the mean of their genetic merit. On average, the herd will resemble the average of their ancestors. Figure 4 illustrates this concept.

Figure 4. Genetic merit of progeny



Consider for a moment the most beautiful alpaca stud imaginable. His qualities are extreme in every regard. His fleece has high luster, low micron, abundant crimp, and weighs 20 pounds after one year. He will win in the show ring every time. But, for breeding purposes, his phenotype will be of little value if his genes were passed on from below-average parents whose genes were inherited from ancestors that included llamas. This macho may simply be the product of a lucky mathematical combination, rather than the solid expression of high quality, high frequency homozygous traits transmitted from genotypically similar parents. The offspring of this beautiful stud would probably, on average, be ordinary or worse.

On the other hand, consider a rather ordinary stud, a bit small, not very dense. His fleece may be fine, but his legs are crooked. If you didn't know that his parents were the superior offspring of superior parents, that his dam had died when he was one month old, and that his owner didn't bottle feed him,

fearing the creation of a berserk male, it would never occur to you that he might be a superior breeding stud. The difference between the potential breeding value of these two males is simply the relative variability of their ancestors.

Variability creates the opportunity, when combined with genetic selection, to create rapid change for certain heritable characters. Understanding breeding value, heritability, and variability will provide breeders with the opportunity of selecting breeding stock based on genotype, rather than phenotype. These factors, when combined with selection, are the first step to creating blood which is pure in the sense that it has a high proportion of homozygous genes.

The concept of selection

Selection is the process of breeders exercising their control over which alpacas will become parents, how many offspring they will produce, and how long a given animal will remain in the breeding program. When under the control of humans, this process is artificial or arbitrary, as opposed to the control exercised by Mother Nature, who selects by survival of the fittest.

There are three ways to select animals. The most common method is based on phenotypic selection or how the animal looks. The second option is for selection to be based on pedigree or an analysis of an alpaca's ancestors. The final option is to progeny test or select based on the dam or sire's production. Often, elements of each of these methods are combined when breeders are making mating decisions.

The aim of selection is to make the next generation of alpacas better than their parents. This is not as simple as it may sound. Breeders must be careful to select for traits that can be measured and gains recognized. Phenotypic traits are heavily influenced by the environment and may not always be heritable or repeatable. For selection to be ultimately effective it must be based on an alpaca's breeding value or ability to transmit superior characters genetically.

Culling

Culling is the other side of the selection coin. Animals not selected as parents for a particular herd are, in essence, culled. New alpaca breeders 'cull' by rejecting animals they are looking at with the intent of purchasing. In South America, culling results in the selection of alpacas meant to be *sacare* or meat to be sold and eaten.

Currently, in North America, existing breeders cull by gelding unworthy males and by selling females rather than adding them to their breeding programs. That is not to say that every female sold is a cull and, remember, the buyer selected the female, rather than 'culling' or rejecting her. Some breeders sell all – or almost all – of their female production, which means that the purchaser, not the seller, is making all of the individual culling decisions. Ultimately breeders differ in their objec-

tives and choose alpacas for different reasons. This difference of opinion creates variety and is the best way for our industry to experience improvement.

Most alpaca breeders consider whether they keep or sell their offspring, but few determine whether to keep or sell the parents of inferior stock. An adult female who produces marginal progeny should be every bit as much a culling candidate as the cria itself. The same goes for a stud male.

The myth of phenotypic selection

Selection which is based solely on the evaluation of an alpaca's phenotype is the least reliable. Consider what Dr. A.L. Hagedorn had to say over fifty years ago in his classic book *Animal Breeding*:

It is very clear nowadays that personal merit, individual quality, is no guarantee of breeding value. The experienced breeders, aided by the geneticists, are gradually substituting methods of evaluating the genotype of each animal, its inherited make-up, for the old methods of trying to guess that breeding value from its other qualities.

Most breeders assume that breeding superior animals is the process of mating the best to the best. They believe that the superior characteristics will automatically transfer to the offspring. It may come as a shock to some, but this is generally not true. If it was true, we could turn thoroughbred horses into Shetland ponies just by selecting the smallest stallions and mating them to the smallest mares.

The main reason that straight phenotypic selection is unreliable is simple – the environment. An alpaca's phenotype is at least fifty per cent environment. An undernourished cria may be a runt, but that has nothing to do with his genes. The same alpaca on a higher protein diet will be bigger, coarser, and cut more fleece, but each are equal as breeding stock.

Most breeders underestimate the role of the environment in an alpaca's phenotype. This is particularly true when evaluating fleece histograms which many breeders seem to believe are the quantitative evaluation of an alpaca's fiber genotype. This concept is illustrated in Figure 5.

Most breeds of animals are relatively stable. That is why they are considered pure bred. They breed true. Straight selection based on phenotype will do little to change the average of a breed in any dramatic fashion. Substantial

change depends on breeding animals with significant genetic variation from the mean or average of the herd. Cross breeding uses variation in this manner to create new breeds. The Corridale sheep, for instance, was created by breeding a Merino with a Lincoln.

Selection can only be effective if it identifies as parents, alpacas with a group of genes that is different from the general run of genes found in the breed as a whole. In other words, genetic variation is the most significant basis for improvement.

Figure 5.

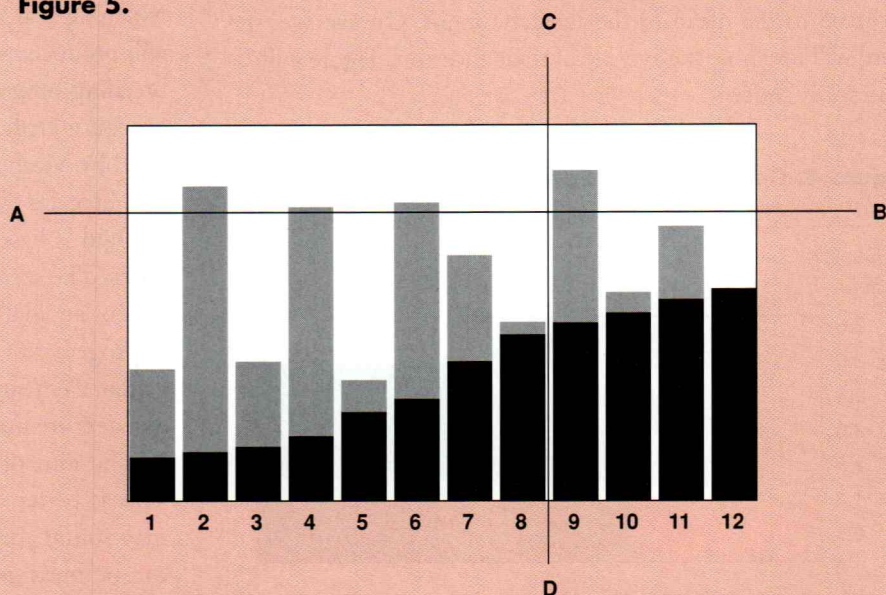


Figure 5 shows the difference between genotype and phenotype as a basis for selection. The height of the black part of each column (which represents an individual) represents the part played by the inherited make-up in the development of the character appreciated. The grey part shows the part played by environmental (non-inherited) factors. The total height of each column shows the quality. Twelve individuals are arranged according to their genotype.

When we select the four individuals that show the character (phenotype) in the most perfect way, we select according to the line A-B, and the individuals selected are Numbers 2, 4, 6, and 9. When we select according to the best genotype, for instance by means of a progeny test, we select according to the line C-D, and we actually get the four individuals most valuable for breeding the next generation (9, 10, 11, 12)

When we select first according to appearance, this group (2, 4, 6, 9) only contains one of the really good breeders. It is safer to select according to genotype from the very beginning.

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Selection systems

Selection of animals for breeding can take many forms. They all share the common goal of improving the breed. Selection methods differ, and this is where the skill of the breeder is challenged. Most breeders have a fair idea of the meaning of selection, but have only a vague notion of the kinds of selection which can be employed.

The best results are obtained when it is possible to select for a single, easily recognized character, such as density. This approach produces the nice upward curves found in genetic textbooks. Remember, the more traits under selection at any given time, the less progress you can expect for any one trait. There are several problems with single trait selection. The first is numbers. To obtain the maximum progress, large numbers of each generation's progeny must be examined with only a few being ultimately selected, say thirty per cent. This is often impractical for a slow breeding animal like the alpaca.

The second problem is more fundamental. Breeders are rarely, if ever, in a position where they can concentrate solely on one character. Many characters have to be considered together if all-round excellence is to be achieved. You cannot afford to ignore fleece weight in pursuit of fineness, nor size and conformation, in pursuit of vigor and fertility.

An alternate long term plan to single trait selection might be to select first for one trait and then, later, for another. This is called the 'tandem' method. Unfortunately, this approach also has failings. For instance, considerable time is required to obtain results, even when only selecting for a few characters. It is often difficult to maintain the excellence of the early characters while selecting for the later characters. Deterioration of the first trait usually sets in when subsequently improving the second.

Whatever the selection method

employed, the breeder must have, from the beginning, a clearly defined goal or breed standard in mind so that selection can continue generation after generation. It is fatal to chop and change between generations. That does not mean that a breeder should bravely follow a bad plan. Part of the skill of animal breeding is to know when to change. I will discuss breed standards and selection goals more fully in Part IV of this series of articles.

Independent selection levels

Another method of selection, also based on phenotype, is to retain only those individuals which meet certain standards for a number of distinct characters. This method involves setting independent culling levels. It allows many characters, such as density, size, fineness, fleece character, and conformation, to be considered simultaneously. It is also easy to apply once an objective grading scale is created. The culling level for any individual character might be high or low. If an alpaca fails to meet the standard for any independently evaluated character, it is culled. One problem with this approach is that if selection levels are set too high, too many offspring will be rejected to form the next generation. The same problem occurs if large numbers of characters are considered simultaneously.

One advantage of using individual culling levels is that breeders are compelled to focus on the various characters which contribute towards the ideal alpaca. They must also observe how these traits vary from animal to animal. But there is a better way.

The selection index

The most effective method of phenotypic selection involves creating an index which is used to score the individual alpacas. This approach is a little more complicated to operate than a system with independent culling levels. The first step is to decide which characters should be scored. Next, each

character must be 'weighted' or assigned a certain amount of points to be included in the total. Once this is done a total score for the ideal alpaca can be created.

One of the advantages of the total score or index method is that there is no limit to the number of different characters which can be scored. In fact, it is advisable to include as many as possible, because a relatively minor character may later turn out to be important.

I created the score card in Figure 6 from the one I originally authored for the Alpaca Registry. That form has been amended over time, but was used very successfully in the ARI import screening program. I've made further changes in the form to adapt it for my own breeding program. As you can see, I place a high value on fleece qualities. They make up seventy per cent of the score. This form can be adapted for use in your breeding program.

There are many ways to influence the overall score. You can weight the various factors differently and put more emphasis on such traits as fineness or size. You can add your own criteria, such as color, which could even achieve additional points if the ancestors were also of the desired color. You could also add a section of negative traits, such as eye color, lack of coverage, or poor bite. Please note that, in my system, an alpaca can never score more than one hundred points or lose more points than are allotted for a particular trait.

This form assumes that the alpacas being considered for selection are free of genetic defects. No animals should be selected that lack vigor or exhibit a llama-like characteristic, such as large banana shaped ears.

All the traits shown on the form are considered to be heritable in alpacas, even though there have been no heritability studies in alpacas. But characters, such as crimp, fineness, luster, density, uniformity, conformation, and size are all heritable in other species.

My experience, based on observation, is that these characters are certainly heritable in alpacas. Crimp, for instance, is highly heritable among the alpacas in the Northwest Alpacas' breeding program.

Selection by pedigree

A pedigree which details an alpaca's ancestors is a helpful selection aid, but only to a limited extent. With a pedigree, we may be able to research the phenotypic characteristics of the dam and sire and, if the information is available, the grand dam and grand sire. This alone does not allow us to assess the breeding value of a given alpaca.

Pedigrees for particular offspring also have a limited value in the selection process. They don't reveal any information about the siblings of a particular animal. The dam and sire's production are not noted. Estimates of breeding value based solely on pedigree are not very accurate. Pedigrees can be helpful in identifying family members from families known to have high breeding values for certain traits. But the truth of the matter is that the only accurate way to determine the breeding value or dominance of a particular parent is to research the progeny.

Selection and progeny testing

How can we effectively marry the selection index, which is based on phenotype, with the concept of selecting alpacas based on their breeding value? There is only one sure fire way – progeny testing. This means that a stud's offspring must be measured for important traits, such as fleece weight and density. All of the offspring, or a random sample large enough to ensure accuracy, must be measured – not just his outstanding cria. This testing, to be accurate, must also be done in an environmentally neutral manner.

There are two approaches to progeny testing. The first method is to test the male's progeny as described above. The second method involves using the dam's statistics to create an index that measures how much a sire improves the cria over the dam. This process is far more complex. Analyzing just the male's progeny is easier and testing all the offspring, or a representative random sample, of a particular male creates a high degree of selection accuracy for breeding values.

Successful progeny testing

Many livestock industries have successfully adopted progeny tests. Dairy cows are bred by prospective bulls and their daughters are milked to determine volume and fat content before the bull is put into general service. Boar pigs are bred to a limited number of sows to determine their influence on litter size, survivability, and weaning weight before they are used further. The same system is employed in poultry breeding operations.

Figure 6. Alpaca characteristics evaluation form

Two Year Old Alpaca Alpaca Characteristics Evaluation Form	
A total of 100 points is available. An alpaca receiving a score of 80 to 85 points or more is considered excellent	
Characteristic	Points Available
<i>Conformation and Type</i>	
1. Shape of head and muzzle, shape and size of ear	5
2. Size - height and weight	10
3. Leg conformation	10
4. Wool cap and leg coverage	<u>5</u>
<i>Huacaya Fiber Characteristics</i>	
1. Micron count (deduct 10 points or fraction thereof for every micron over the 26-micron maximum)	20
2. Standard deviation (deduct 5 points or fraction thereof for every 0.5 micron over maximum)	10
17 or less: max. std. deviation = 3.5	
17.1-19: max. std. deviation = 4.0	
19.1-21: max. std. deviation = 4.5	
21.2-23: max. std. deviation = 5.0	
23.1 and up: max. std. deviation = 5.5	
3. Density (5 points for light fleece, 10 points for medium fleece, 20 points for heavy fleece)	20
4. Per cent of fiber over 30 microns (deduct 5 points for every percentage point in excess of 5% of fleece – i.e., 7% of fleece over 30 microns would result in loss of 10 points)	10
5. Luster or sheen (subjective score, 1-5)	5
6. Crimp (subjective score, 1-5)	<u>5</u>
<i>Suri Fiber Characteristics</i>	
1. Micron count (deduct 10 points or fraction thereof for every micron over the 27-micron maximum)	20
2. Standard deviation (deduct 5 points or fraction thereof for every 0.5 micron over maximum)	10
17 or less: max. std. deviation = 4.0	
17.1-19: max. std. deviation = 4.5	
19.1-21: max. std. deviation = 5.0	
21.2-23: max. std. deviation = 5.5	
23.1 and up: max. std. deviation = 6.0	
3. Density (5 points for light fleece, 10 points for medium fleece, 15 points for heavy fleece)	15
4. Percent of fiber over 30 microns (deduct 2 points for every percentage point in excess of 5% of fleece)	5
5. Luster (subjective score, 1-10)	10
6. Lock structure (subjective score 1-10)	<u>10</u>
Total Points <u>100</u>	

Why is progeny testing not more widely used in the alpaca breeding business? I believe the show ring often gets in the way. At shows, animals are judged strictly on their phenotype and how well they are presented. The animals in the ring have often received special attention, preparation, the best nutrition, and husbandry. Alpaca purchasers and breeders are often guilty of putting way too much emphasis on show points and awards when making breeding decisions. The show ring is primarily a promotional vehicle and should not be viewed as a substitute for sound selection based on genetic principles.

To succeed, progeny testing must be applied rigorously. It is of little value if a breeder measures only the best cria or only cria from his best dams. Alpaca shows have a class called 'get-of-sire' [*Ed. Sires Progeny in Australia*] where three offspring are shown together, hopefully representing the male's production capacity. As a breeder looking

to purchase a replacement male, would you rather base your buying decision on the three offspring that the exhibitor brought to the show or a survey of the cria from the stud's entire production?

Don't misunderstand, I love to show my alpacas and I believe shows are a critical part of our industry's success. There is no other class that I would rather win than Get-of-Sire! Halter class shows have historically played an important promotional role in many livestock breeds. Anyone who has been to their local county fair understands that Americans love to show their animals. But shows should not be the basis for selection in an alpaca breeding program.

Another essential ingredient for effective progeny testing is an accurate registry. The alpaca industry is fortunate to have an elite registry, the Alpaca Registry, Inc. (ARI). It is possible, even easy, to accurately determine the number of a particular stud's offspring. From these records one can research

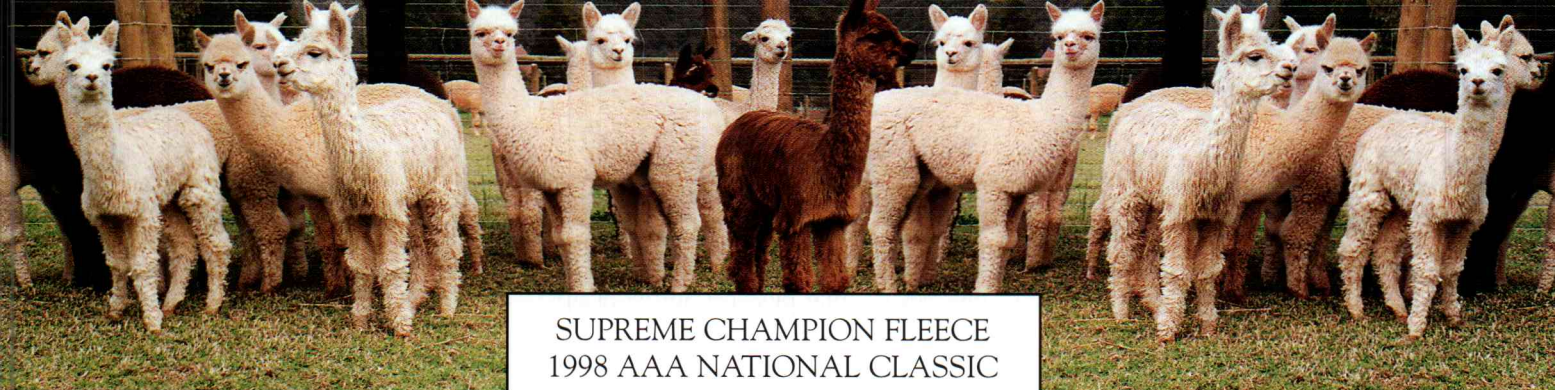
ownership and inquire about the offsprings' qualities. This can be done by computer by simply accessing the ARI website at www.alpacaregistry.net.

Large operations should keep their records by stud and make them available to prospective purchasers. At Northwest Alpacas, we analyze each of our male's statistics and make breeding decisions accordingly.

In practice, breeding a prospective male to ten or twenty females and then waiting for the offspring to mature is crucial. These progeny can then be assessed before using the male across a large number of females. If this method is employed using several males, a breeder avoids using males with low breeding values across his entire herd. The males that are finally chosen and most frequently used will have higher breeding values. So will their offspring over time.

Progeny testing is not just a strategy for large breeders. Small breeders can use the concept to choose service sires





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Windsong Valley Royal Inca – Nuie#48

Standing at Stud at Coricancha – Victoria

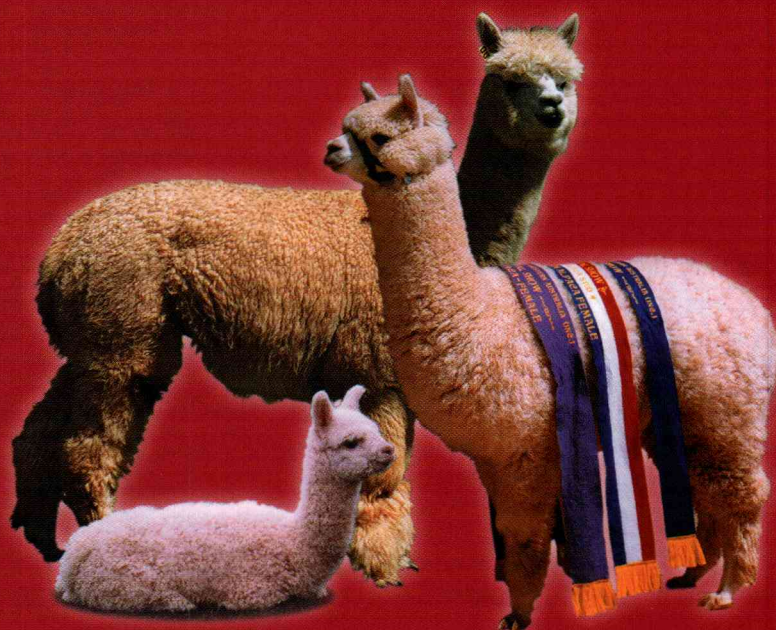
Purrumbete Ledgers Dream
Windsong Valley Royal Inca
Peruvian Conquistador (Suri)

Purrumbete Highlander
Windsong Valley Snow Legend
Aymara Talisman

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- **GRAND CHAMPION FEMALE**
Windsong Valley 'Stardust'
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'Peruvian Conquistador'
- **INTER. CHAMPION FEMALE**
Windsong Valley 'Stardust'
- **RES. CHAMPION SENIOR MALE**
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with her Dam and sister 'Starburst'



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for outside breeding. Purchasers can use it to select foundation breeding stock. If employed industry wide, the rate of genetic gain would accelerate dramatically.

Warning blood

Everyone in the alpaca business wants to avoid genetic defects. Many birth defects arise from environmental factors, but others are the result of bad or lethal genes. Defects, such as holes in the heart, choanal atresia, and atresia ani, are all deadly. It would be best for the breed if none of these genes were passed on to progeny.

Many lethal defects are thought to be double recessive genes found at a single location on the DNA map. In other words, a cria would have to be homozygous for lethal genes to die. Another theory of genetic defect holds that lethals are polygenic and that a larger number of genes combine to influence or create the defect. This could mean that a cria could inherit 95% of the lethal genes from one parent and 5% from the other. Once there is a critical mass of genes present, the lethal defect engages and the cria dies.

The problem with identifying these lethal genes is that many animals are heterozygous for them or, in the case of polygenic traits, are below the threshold levels for expressing them and do not manifest the defect. In other words, they are carriers. There are no blood tests for genetic defects in alpacas.

A sure fire way to identify warning blood and eliminate lethal recessives is to test mate. Livestock industries, such as the dairy industry, use this approach to certify that a bull is not a heterozygous carrier of genetic defect.

One of the most effective test mating methods involves breeding the sire to his daughters several times. Geneticists' opinions vary on the number of breedings required before a male can be considered free of defects. Eleven is thought to be the average

number required. Eleven matings should ensure that a male is ninety-eight per cent free of defects. Any matings beyond that push certainty toward one-hundred per cent.

The incidence of even one such defect from a father-daughter test mating is a strong indication that the sire is a carrier. The good thing about this approach is that it tests for all lethal genes simultaneously.

This may seem like an aggressive remedy, but it is far preferable to having a carrier male spreading defective genes throughout a population. The masking effect of heterozygosity is compounded when entirely unrelated animals are bred. Defects do not often manifest until they become frequent throughout the population.

Breeding as an art

Animal breeding is not all science. Most major breeds were created before Mendel ever thought of breeding his sweet peas. Think of the individual breeder as a painter who uses genes as pigment and germ cells as oil. The breeder-artists use genetics as their palette from which they paint animals according to their personal vision.

The score card in Figure 6 was composed to help me create an alpaca with a certain form and function. For instance, I allocated five points to wool cap and leg coverage because I think they create a pleasing appearance and also correlate to density. Head and ear shape are important because they allow me to guard against huarizos and I allocated 5 points for these traits. I put heavy emphasis on fineness and density, giving a total of forty (huacaya) points out of one hundred for these two characteristics. I also think luster is an important quality for both huacaya and suri and I have allocated points accordingly.

You will also notice that I have put less emphasis on conformation. This is because I have been able to achieve

consistently well structured animals and am now able to focus on fleece. The point is that you need to adjust your own selection index to reflect what's possible in your herd. If conformation is a problem, you should place greater emphasis on this trait. In general, I think it is wise to put emphasis on 'cash value' characteristics, such as fineness in huacayas and luster in suris. I will discuss the concept of cash value characteristics in a later article.

As a breeder, you need to firmly establish a vision of your ideal alpaca. Then, by crafting your selection priorities in that image, you will begin to take control of the creative process. The alpacas that flow from this approach will be pleasing to your eye and produce in the manner you deem appropriate. This is the art of animal breeding.

Following the geneticists' advice

The alpaca industry is in a unique position to take the advice of geneticists. There are currently no traditional breeding systems established. Most breeders come to alpacas from other fields of endeavor. There is no vested interest in ignoring science and practising genetically unsound methods.

If alpaca breeders pursue the identification of an alpaca's breeding value rather than merely assessing phenotype, they will make rapid gain for specific characteristics. Selection should be environmentally neutral and breeders need to focus on cash value traits, such as fleece, weight, fineness, character, and staple length. Vigor, conformation, and fertility should not be ignored. The next article will focus on specific breeding systems, which can be combined with selection to accomplish the goal of creating elite alpacas. We will look at linebreeding, outcrossing, and like-to-like breeding.

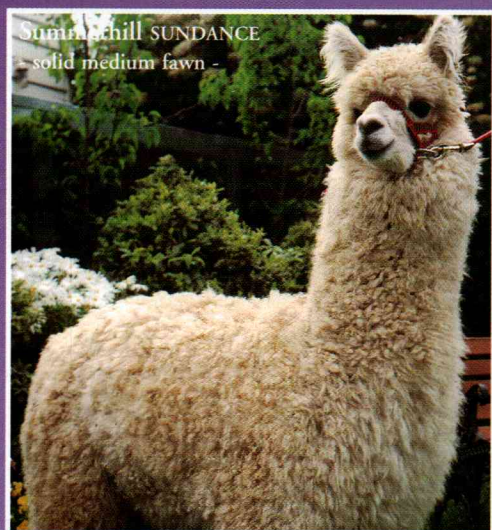
The third article in this five-part series will appear in the next issue.



ALPACANDES ALPACAS

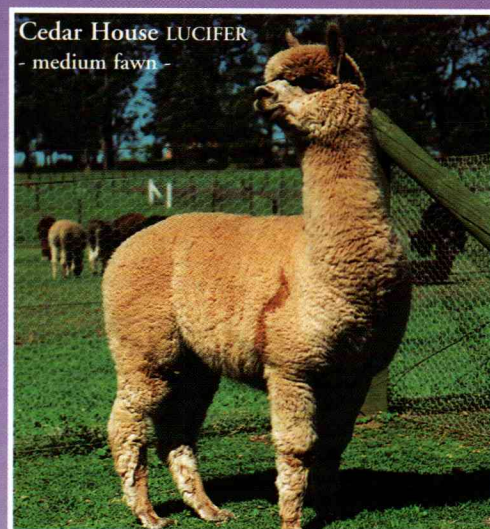
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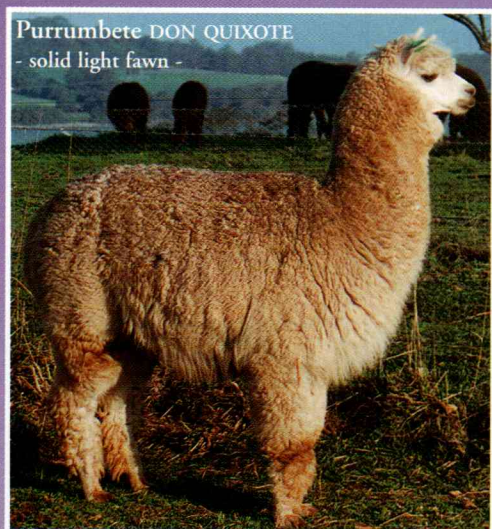
Summit Hill SUNDANCE
- solid medium fawn -

SUNDANCE, a beautiful upstanding young male by Purrumbete El Dorado & out of Purrumbete Flamingo Sunrise (Purrumbete Showpiece). This boy oozes style, density, coverage, crimp & a lovely soft fine fleece. We are confident Sundance will add some outstanding genetics and stunning cria to any herd.



Cedar House LUCIFER
- medium fawn -

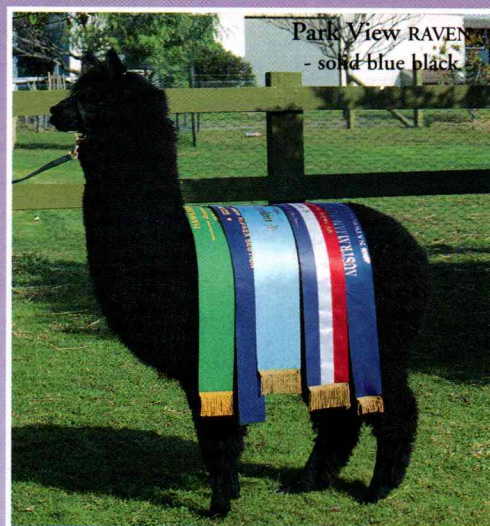
LUCIFER (son of the famous Purrumbete Highlander) has stunning apricot fleece with beautiful character, density & lustre. Some show results – Supreme Alpaca Picton '97, Champion Fleece Castle Hill '97 & Hawkesbury '97, Champion Adult Fleece Sydney Royal '97, Res. Champion Adult Fleece Sydney Royal '98, Champion & Res. Champion Adult Fleece Hawkesbury Spring Show '98.



Purrumbete DON QUIXOTE
- solid light fawn -

The legendary DON QUIXOTE needs little introduction. His outstanding fleece qualities can still be seen in his offspring, proving that at a regal 14 years of age he continues to impress.

RAVEN still retains the beautiful soft, lustrous, crimp & dense fleece which has brought him numerous blue and Championship ribbons at shows up to National levels. His cria exhibit superb conformation and soft handling lustrous fleece of great character.



Park View RAVEN
- solid blue black -

Manna-Gum's moved... into merino country

In the summer edition of Alpacas Australia in 1994, we ran a story about Tracy Emerson and Jerry Krupa who, having entered the industry two years previously, had opened 'The Alpaca Shop' in Kyneton, Victoria.

Since that time, the couple has been particularly active in the affairs of the Association. Tracy has been president of Victoria's Central Region and contributed much to the success of the Spring Classic in November. A great organiser, she managed arrangements for workshops, clinics, the members' dinner, sponsors' lounge and was responsible for the 'welcome kits'.

Tracy and Jerry's latest venture has taken them into the heartland of merino country. Needing more acreage, they recently moved Manna-Gum farm and their herd of alpacas to a larger property of 200 acres. Formerly a Merino sheep farm, it is located at Marnoo in the Wimmera.

The change, says Tracy, has been extremely good for the alpacas.

'The pasture here is ideal. There's good mineral content and we don't need to feed out mineral supplements. The pregnant females and cria are grazing on lucerne pasture, therefore removing the need to introduce other forms of protein into their diet.

'We have observed a dramatic improvement in the growth rate of the cria which we had not achieved by introducing protein supplements into

hard feed while in Kyneton. It's also a much hotter climate. In fact, the alpacas cope with it much better than we do – they're really thriving.'

Right in the heartland of the Merino, Manna-Gum has wasted no time in flying the flag for alpacas.

According to Tracy, 'The area has merino breeders, croppers and, around Stawell, Ararat and Horsham, quite a lot of hobby farmers. We decided we could tap into this potential alpaca market by letting people know about us and inviting them to come and have a look.'

Manna-Gum and its alpacas have certainly attracted local interest. There has even been a sale of wethers to a sheep breeder for herd protection. That breeder is presently seriously considering diversification into the alpacas.

'I think we've been made very welcome in the area,' Tracy commented. 'There's nothing like the old bush telegraph to get news around. Even if they've seen alpacas before, I don't think many farmers in this district really know much about them. So we're quite an event. *The Wimmera Farmer*, which is delivered free in the Wimmera-Mallee area, took photos and ran an article on us and we think the paper will cover our first open day here on 14 March.'

Victoria's Central Region covers a large area and it can be difficult for breeders in outlying areas to attend centralised functions. Tracy and Jerry

have taken on the role of area contact, contributing to a regional strategy aimed at setting up area networks. The open day, apart from its marketing aspects, is also part of network strengthening.

Envisaged by Tracy and Jerry as the first of regular events, the open day will display all aspects of the alpaca industry – from animals to end product.

They have invited a number of breeders in the district to participate in a day of displays and activities, including their closest neighbour, Kristen Mogenson of Anicca Alpacas in the Grampians area.

The Elite Fibre Mill, Alpaca Co-operative, AAFMO will all be represented with displays and personnel. Both huacayas and suris will be on display.

The local footy club – a very versatile organisation – will do the catering. Curiously, this arrangement came about as the result of the club being



contracted to erect fencing for the Manna-Gum property. With any luck, there'll be a few converts to alpacas among club members, who are also local farmers.

Tracy and Jerry are committed to producing black fibre and have undertaken a breeding program designed to increase density and fineness.

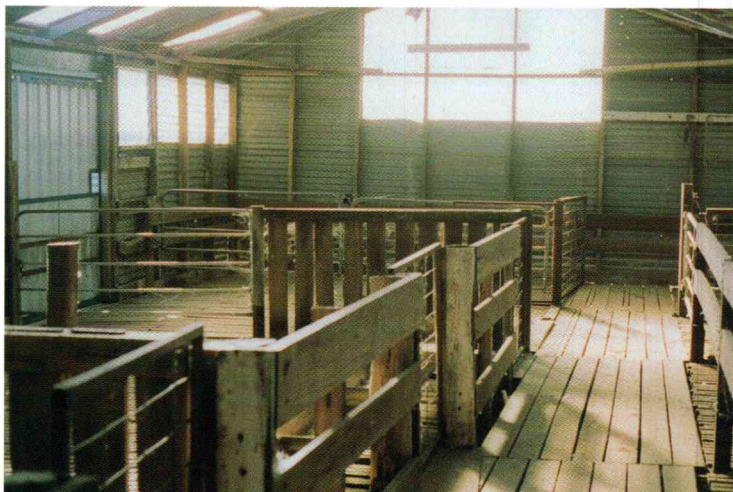
Because black is generally coarser than light coloured fibres, they decided to introduce new Peruvian genetics into their stud. While they own one stud sire, Falconstooop Monty (presently standing at Pucara), they have also used Australian Alpacas' Peruvian Centeno. His first cria is due in April.

They are also planning to use another Peruvian sire in the near future.

Jerry and Tracy see the temporary sacrifice of colour as a necessary step in the process of achieving their aims.

'May all your crias be female' is not something you'd wish for Manna-Gum just at the moment. They are hoping that, among the new cria produced as the result of their breeding program they will get some good males who will not only continue to improve fibre quality, but help to re-establish black as the predominant colour.

Tracy's final comment summed it all up very well, 'Nothing's short term in this industry.'



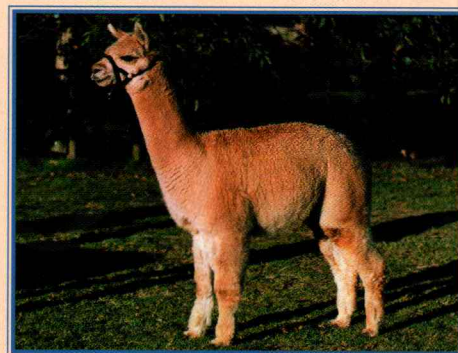
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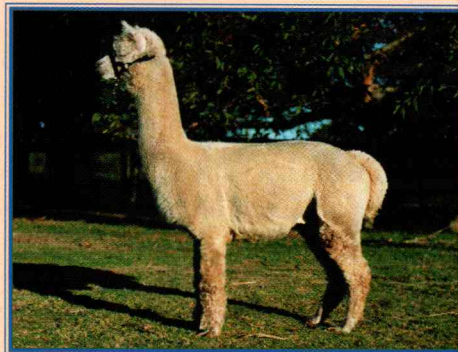
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WORTH A TRIP TO W.A.?



AAFMO advancing Australian alpaca fibre

The Australian Alpaca Fibre Marketing Organisation Pty. Ltd. (AAFMO) was incorporated in early 1997. The brainchild of a few AAA members who were impatient to start the ball rolling, this private commercial venture aims to collect, class, sort and market Australian alpaca fibre.

In a letter that introduced AAFMO to Australian alpaca growers, the directors stated, 'We have chosen a private corporate structure... because it risks no-one else's money apart from those who propose it. We are confident of the long term viability of the alpaca fibre industry. We have therefore chosen to advance our own capital to establish an infrastructure which will be accessible to all alpaca breeders, without involving them in any financial risk.'

In its first year of operation AAFMO received and classed over 9 tonnes of fibre. And in April last year took orders for 330 kgs of fibre in a variety of lines.

When fibre is received, it is weighed nett and later adjusted to tare weight when the fibre is sorted and classed. The individual contributions of growers to each line are recorded as classing proceeds and payment made on a pro-rata basis as the lines are sold.

Also in its introductory letter, AAFMO set out its aims, among them: '...gathering and distributing quality product at a fair market price, whilst providing to the grower a predictable and regular return for fibre produced, as well as classing information, fibre statistics, and education'.

Almost two years later, AAFMO has its registered office in Canberra and directors in New South Wales and Victoria. Its classing facility, located at Narrandera, is owned and run by the Australian Mohair Marketing Organisation Ltd (AMMO).

According to AAFMO Director, Dr Ian Davison, the company has received fleece from all over Australia, with the main bulk coming from New South Wales and Victoria.

By February this year, it had sold 93 kgs of fine, 209 kgs of medium and 300 kgs of strong fibre. It also held orders for 500 kgs of 26 micron fibre and for 100 kg of fine white fibre

finished to tops.

Price-wise, AAFMO reports that fibre has sold for around \$7 kg for strong, \$22.50 for medium and up to \$35 kg for fine fibre.

AAFMO is not limiting its horizons to national only, it is pursuing overseas markets. Interest from China resulted in a bale being sent across for testing against Peruvian fibre. Before leaving Australia, the bale was core tested by the Australian Wool Testing Authority. It was found to have an average fibre diameter of 26.7 microns, a CV of 27 per cent and a washing yield of 93.3 per cent.

Obviously, the Chinese were impressed with the quality of this bale, because they requested a further two bales late last year. The finalisation of the sale of this fibre (256 kgs) is imminent.

A further bale of fine Australian alpaca fleece has also been classed by AAFMO for an undisclosed buyer, for despatch to the UK and processing into product. This bale represents arguably the best alpaca fibre yet classed in Australia, and samples of the fibre reviewed by processors in Italy and the UK have been extremely well received.

AAFMO has now collected over 12 tonnes of fibre, covering 71 lines. Skirtings, overgrown or short lengths account for slightly less than 50 per cent. Some 6 to 7 tonnes are of com-



mercial quality. Demand is greatest for fine lines in lengths of 75 to 150 mm.

Not surprisingly, AAFMO cannot satisfy the demand for fine fibre and is unlikely to be able to do so for the time being. White, fawn and light grey, especially under 26 micron, are the most sought after colours – but there is a specialist market for short fibre of any micron in large quantities.

The value of the best quality fibre is undoubted. Buyers will pay up to \$40 per kilo. But, even for a kilo of skirtings, buyers will pay \$6.00. 'The wool industry might be understandably envious,' says Ian Davison with ill-concealed pride.

Active on all fronts, AAFMO has also embarked on its education program. It has published a manual on fleece preparation, recording and standards and organised two seminars.

The first, in August last year, was held at Cambewarra, NSW and run by Ian Knox, from the Gordon Institute in Geelong. Drawing on his long association with the Merino wool industry and his more recent association with alpaca, Ian staged a challenging day of theory and practicalities. Aptly named 'Ian Knox on Fibre', the seminar offered some interesting experiences for participants, involving them with many fibre types – including qiviut, which is the 12-18 micron fibre of the arctic musk ox.

A more ambitious undertaking was the November 7 seminar conducted by AAFMO and the CSIRO. Ian Davison had met CSIRO Public Relations Manager, Dr Pat Wilson, at the 1998 Sydney RAS. 'It occurred to me that much of the fibre research done in the wool industry by the CSIRO may have relevance to our own alpaca industry – especially as both industries face similar challenges and problems.' It was arranged to draw on CSIRO expertise in a series of intensive lectures.

Held in Prospect, near Sydney, 'Lessons from the Wool Industry' was attended by over 60 people. The topic range was broad: fibre processing; fibre metrology; nutrition and fibre production; the effects of management and environment; genetic improvement; animal evaluation; genetic selection; and planning a breeding program. The keynote address was a



tour de force of marketing issues in the Australian wool industry. The conclusion, a summary and overview of the day, was given by Dr Laurie Piper, CSIRO Animal Production Chief Research Scientist, who also contributed some ideas on future industry directions.

Ian Davison says that the seminar was well received and that requests have been received to take the seminar 'on the road'. Apparently, this could be possible if there were sufficient pressure brought to bear. One way of evaluating the content, for those of you who may be interested, is to obtain a copy of the proceedings of the seminar. It contains each of the lectures and makes for extremely interesting reading.

In the meantime, AAFMO is continuing to solicit and collect fibre. It is also negotiating with its classing facility landlords, AMMO, to have this experienced mohair marketing body take over the selling of the AAFMO clip for a trial period. At time of going to press, contracts are being drawn up. Ian Davison believes that this arrangement will help significantly to increase AAFMO sales.

[To obtain a copy of the proceedings of the AAFMO/CSIRO Seminar, please forward a cheque for \$25.00 to: The Secretary, AAFMO, PO Box 764, Seymour Vic 3661.]



KNOCKING OFF WORK TO CARRY BRICKS

.....
by David Johnson

What does the General Manager of the Australian Alpaca Association do on his Christmas break? You may think he would take a break from the hustle and bustle of the world of alpacas and enjoy a quiet beach holiday, attempt to hit a little white ball around a golf course or even find a big shady tree and spend a few lazy hours reading a good book. The answer is, 'No!' He takes a trip to the far away altiplano of South America to discover more about farming alpacas in their traditional habitat and more about their fibre, its trade and processing.

This article is the first of two about this trip and what I discovered. It describes a visit to the Michell and Company breeding farm and an ambitious project to develop a 'state of the art' alpaca breeding enterprise. Even Australians, used to remote places would call the location for this enterprise the 'middle of nowhere'.

The Michell family has over 80 years of involvement in the alpaca fibre trade in Peru. Fundo Malkini (*fundo*, ranch; *malkini*, 'place of the mighty') is not the first alpaca farm to be owned by the family. A previous farm was destroyed by terrorists some years ago and the land was subsequently sold.

Fundo Malkini was acquired by the Michell family from the estate of a reclusive farmer who, the story goes, succumbed to the bottle. The farm workers found his body a week after his death. Taking over the farm, they removed anything and everything of value, including fencing. Much negotiation was required to resume the land, with a Mabo style claim being made by the farm workers. This resulted in the local Indians retaining the best 500 hectares of the 3500 hectare ranch.

Until socialist agrarian reforms some 25 years ago Malkini was a large ranch of over 30000 hectares. It is typical of most of the ranches in altiplano region. The socialists subdivided the large ranches into much smaller holdings, making many of them uneconomic to run – a policy that spawned many of the problems inherent in the alpaca industry in Peru today.

The Michell family's plan is to develop Malkini into an alpaca breeding and genetics centre. Its aim is to develop and promote genetic excellence and to

offer training in alpaca management to local and international industry personnel. Another facet of the planned operation is eco-tourism, giving international visitors an opportunity to experience the unique flora and fauna of the altiplano as well as abundant trout in the local streams.

Early January found me en route.

To the 'place of the mighty'

I had travelled by aeroplane from Lima to Arequipa (where I spent New Year's Eve) and then to Cuzco, where I caught up with our 1998 National Classic judge, Dr Julio Sumar.

Little did I know what was in store during my trip to Fundo Malkini. My instructions from Ignacio Garaycacha, General Manager of the enterprise were that I was to be picked up by the farm manager, Jose Luis Gallegos at 8.30 am, on the morning of Saturday 9 January, at my hotel. (He was formerly a senior fibre buyer for the Michell Group.)

Sure enough, at 8.30 am sharp, Jose Luis Gallegos pulled up outside the hotel. Jose Luis, whom I had met some days earlier in Arequipa, speaks little English and I, little Spanish. This'll be a very quiet trip, I thought, until Ignacio walked into the hotel lobby. Ignacio, whom many breeders met at our 1998 National Conference in Perth, has a fine command of English. The 6 hours of the trip were much less quiet – and considerably more educational – than I had expected.

Jose Luis, Ignacio and I set off from Cuzco on a very good road, headed for parts unknown (to me, at least). Our route followed a river up a valley, a very

gradual climb to the altiplano. Amazingly, everywhere around us were eucalyptus trees on the sides of the valley. It was explained that these trees had been introduced from Australia and had adapted very well, providing timber for building and heating. This country appeared very fertile with thriving crops in every possible place on the valley floor. After about one and a half hours, the country began to change: sparser eucalypt plantations, less prosperous crops and increased numbers of alpaca. We had reached the lower levels of the altiplano where little else apart from alpaca and the native vegetation thrive. Leaving Cuzco at an altitude of 3400 metres, we had climbed to an altitude approaching 4000 metres.

Small farms, mudbrick, earthen-floored cottages, stunted crops and underfed cattle were evidence of the subsistence level at which most of the farmers live. There is no power nor are communications available to the majority.

La Reya

An hour later, we arrived at La Reya Research Station, sitting at 4300 metres where the Cuzco and Puno regions have their boundaries. From this point, water flowing east into Puno eventually arrives in the Atlantic and westward it flows to the Pacific. On one side of the boundary, the Research Station is part of the Cuzco University and on the other, it is part of the Puno University.

The research station has provided facilities for much significant scientific research into all forms of livestock. Dr Julio Sumar and Dr Enrique Franco have worked at La Reya on South American camelids over a number of years, and have provided major scientific data for the industry and sometimes under life-threatening conditions. A number of terrorist attacks have left the research station severely damaged.

Lunch with 'silver service'

We arrived in the small town of Ayaviri just after noon. Time for lunch! Where do you go for lunch in a town like this? First we tried 'Johanna's', the local café where the Mayor dines every day! It wasn't open. The Mayor must have been on holidays!

On the other side of the town square, one of the local delicacies was on sale from a street stall: *concacho* – beautifully spiced roasted lamb. As visitors, we were treated to 'silver service' – plastic cutlery and plate with napkins – as opposed to the more normal take away on toilet paper! Nevertheless, the *concacho*, served with a roasted potato, was delicious. In my opinion, KFC and McDonald operators should really be attempting to obtain the recipe – it would be a winner!

Potholes and 'paddock bashing'

Following the sealed road we left Ayaviri. A short time later, just past the town of Pucara we turned on to an unmade road which, combined with 'paddock bashing', made rough riding for the next 3 hours. Major roadworks are in progress everywhere as the national government attempts to improve infra-



Eucalyptus trees thrive in the valley.



Small farms on the way to Fundo Malkini.



David Johnson with La Reya Research station in the distance.



Lunch at Ayaviri square.

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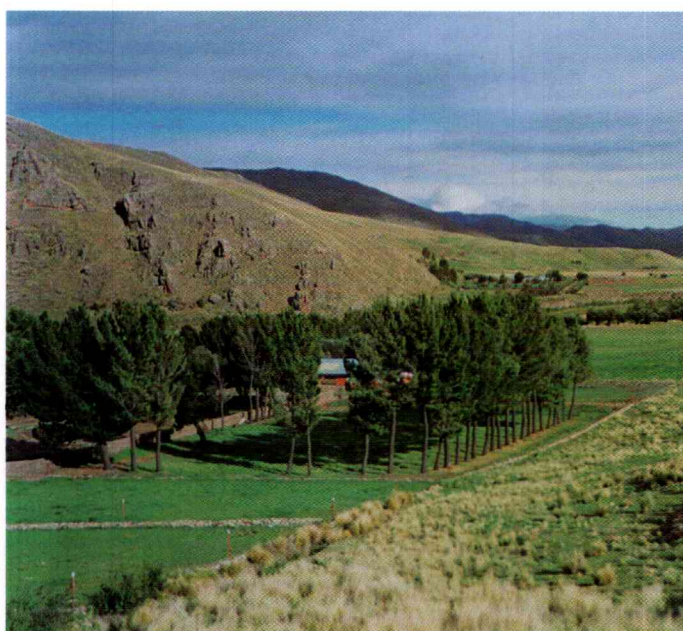
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structure which is minimal in these remote parts. The road project is definitely a step (drive?) in the right direction and will help improve the living standards of the local people. Decent roads will mean easier access to transport so that produce and essential supplies can be carried to and from the larger towns.

New drainage work, involving trucks and heavy earth moving equipment meant we were off the road as often as on it – hence the ‘paddock bashing’ parts of our journey.

Finally, after 350 km and 6 hours of driving, we caught our first glimpse of Malkini, ‘place of the mighty’. After crossing a pebbly, trout-laden stream, we arrived at the front gate. The ranch is set in a magnificent valley – 3960 metres at the homestead and surrounded by steep precipices rising to 4700 metres. It is an amazing sight to see alpaca running in what could be described as their natural state.

What a relief to climb out of the vehicle – I’d had enough bouncing around over potholes!



Fundo Malkini – the farm house – a view from the guest house.

Fundo Malkini

Malkini runs 2000 alpaca with cria and a flock of Corriedale sheep numbering 1500. Cropping is focused on fodder conservation, with oats and lucerne cut for hay and silage to be fed during the harsh winters of the altiplano. In this environment, yield of crops is not great.

The farming of alpacas at Malkini is conducted on two levels. There is an elite breeding program involving some 350 females and the balance of the animals comprises a commercial herd.

Each female in the elite breeding program is pen mated when the time is right with a selected sire from the herd of 40

males on the farm. These females are managed by a shepherd and his family who live close to the breeding yards. Herded into a compound each evening, they roam the nearby terrain by day.

The commercial herd is maintained in groups of about 400 in various parts of the farm in a similar fashion to the elite herd. The males are, however, run with the females. Principally white, the commercial herd is aiming for improvement in cutting weight and fineness, utilising the genetics of the elite breeding program.



The elite breeding pens.

With the assistance of Dr Sumar, the Michells are aiming to produce superior animals in a range of colours. These genetics will be introduced into the commercial herd and, in time, into the herds of other farms in the region (much needed, from all reports).

Securing quality females and males has been a problem for the program. Export pressure has reduced the availability of good animals and made them expensive – up to US\$1500 each. Consequently, the process of building the elite herd has been slow and expensive, at least, by Peruvian standards. Moreover, coloured animals have been even more difficult to procure than white.

Because the original homestead and outbuildings were allowed to degenerate into a state of disrepair, the Michells undertook a major rebuilding program. Facilities are now very comfortable with power provided by generator, no telephone (8km to the nearest). Amazingly, though, television can be received in this remote area.

Already veterinary research projects are being developed, including an artificial breeding program utilising the skills of Dr Sumar and a New Zealand group. This project plans to utilise techniques developed in other species in conjunction with those already being used in Peru.

Most ambitious of all is the building of a luxury guest house. This facility is central to a plan to develop training and education programs for international alpaca breeders. A number of courses are proposed in the near future. The guest house will also provide accommodation for eco-tourism.

Currently there is little opportunity for people to take in the magnificent sights of the altiplano under more than basic conditions. An airstrip is planned to provide easier access to this remote, but beautiful 'place of the mighty'.

Working at Fundo Malkini also has its problems. For example, the only available education is basic primary standard. Farm manager, Jose Luis has sent his family to Arequipa for education. He visits them monthly, for a week, and then returns to Malkini.


After an early night, we arose at 5.30am to inspect the workings of the pen mating program and a number of animals. Following an excellent home-cooked breakfast, an inspection of the farm was followed by a much shorter, but equally rough journey to Puno, via Juliaca.

Such an ambitious project in this remote part of the world is an extraordinarily difficult undertaking. It is a credit to the Michell family who, it seems to me, are also endeavouring to return something to an industry that has been so good to them.



Almost completed, the guest house will provide accommodation for training course participants and for eco-tourists.

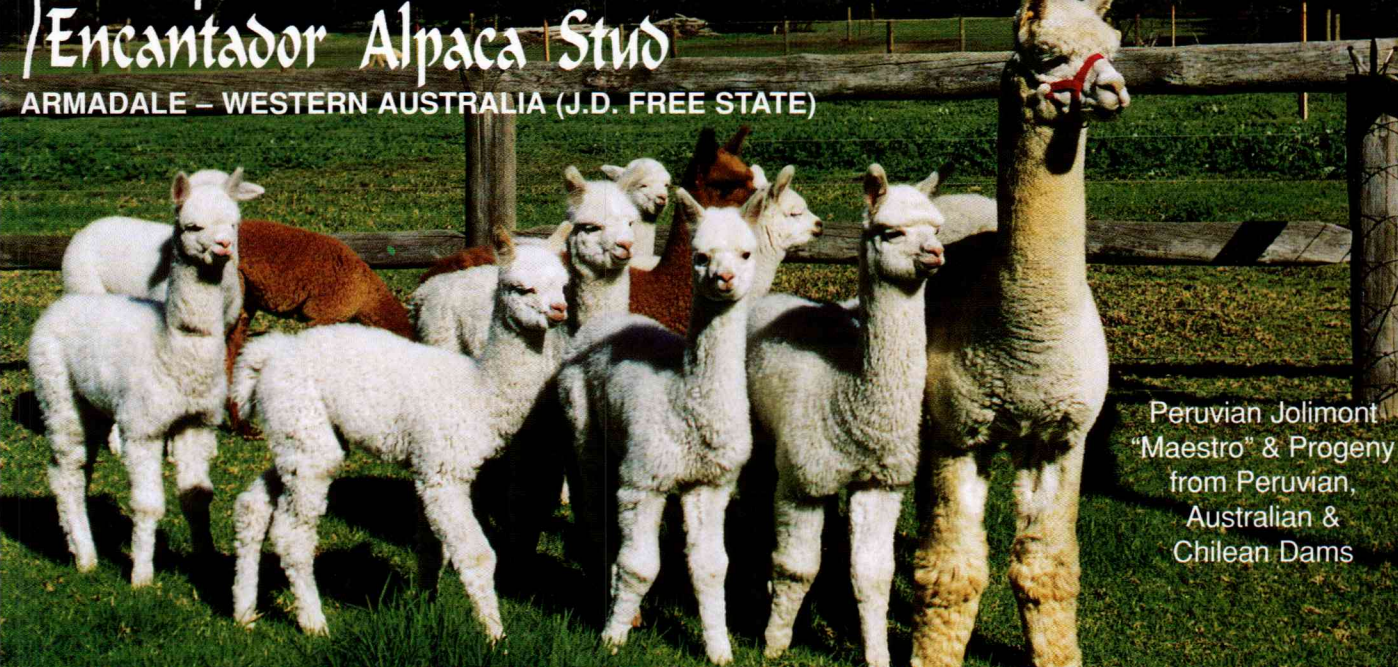
There are many challenges ahead, but given the determination of the family, Ignacio Garaycachea, Jose Luis Gallegos and others, it has an excellent chance of succeeding – and assisting the efforts of the alpaca industry world wide.



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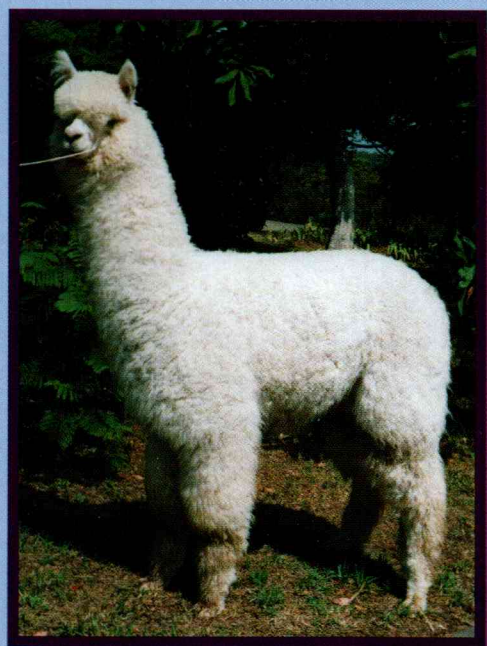
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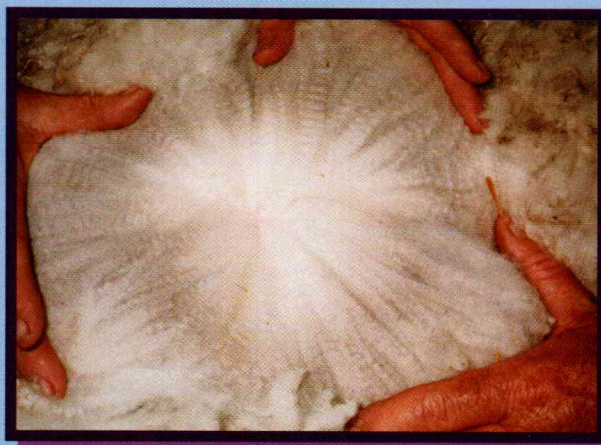
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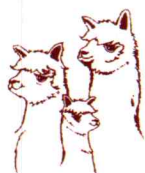
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LIFESTYLE

Alpacas

THINK THE WORST FIRST

message for Australian livestock owners

Australian livestock owners will be the focus of a major campaign in 1999 to raise awareness about potentially devastating animal diseases.

'Protect Australian Livestock Week' will run from March 21 to 27 to encourage livestock owners and producers to be constantly aware of the threat of emergency animal diseases to Australia's valuable livestock industries.

Co-ordinated by Australian Animal Health Council Limited (AAHC), the campaign is targeting cattle, sheep, horse, poultry, pig, goat, deer, alpaca, ostrich and emu industries.

AAHC wants people to watch for unusual disease signs in their animals and to 'think the worst first' when anything unfamiliar is noticed. Immediate help should then be sought from the nearest government veterinary officer, stock inspector or private veterinarian.

An Emergency Disease Watch Hotline is also available for people to promptly report any unusual disease signs and deaths. The number is 1800 675 888.

'Protect Australian Livestock Week' was held for the first time last year. According to a survey of producers carried out afterwards, it resulted in a significant increase in awareness about the need to be alert for certain animal diseases and how to seek help if unusual disease signs were noticed.

The 1999 campaign aims to build on the initial event and will include television and radio advertising, distribution of a leaflet explaining the risks of emergency animal diseases and a media campaign featuring support from respected livestock industry figures.

AAHC Chairman, Dr Roly Nieper said the key messages of the campaign – to 'think the worst first' and report any unusual disease signs immediately – were of vital importance to Australia's multi-billion dollar animal industries.

'Australia is one of the most isolated countries in the world, with an enviable reputation for being free of all the major epidemic diseases which affect many other countries. We have a world-class quarantine system and devote substantial resources to preventing the importation of animals that may carry such diseases,' Dr Nieper said.

'We also have the Australian Veterinary Emergency Plan (AUSVETPLAN) in place, which sets out procedures for a prompt response to an outbreak of significant exotic disease or new disease which may emerge in Australia.

'Any outbreak is potentially disastrous for the Australian economy. Our livestock industry, including meat and livestock products, is worth about \$12 billion each year.



*Dr Roly Nieper,
Chairman Australian
Animal Health
Council Ltd.*

'Diseases can spread quickly no matter how careful and competent we are about managing our livestock,' Dr Nieper said.

AAHC is a non-profit public company which brings together animal industry sectors and Commonwealth, State and Territory governments. It works with the Australian animal health service system to maintain acceptable national animal health standards which meet consumer needs and market requirements at home and overseas, and to improve the nature and delivery of priority animal health services in Australia.

ALPACA EDUCATION EXPERIENCE

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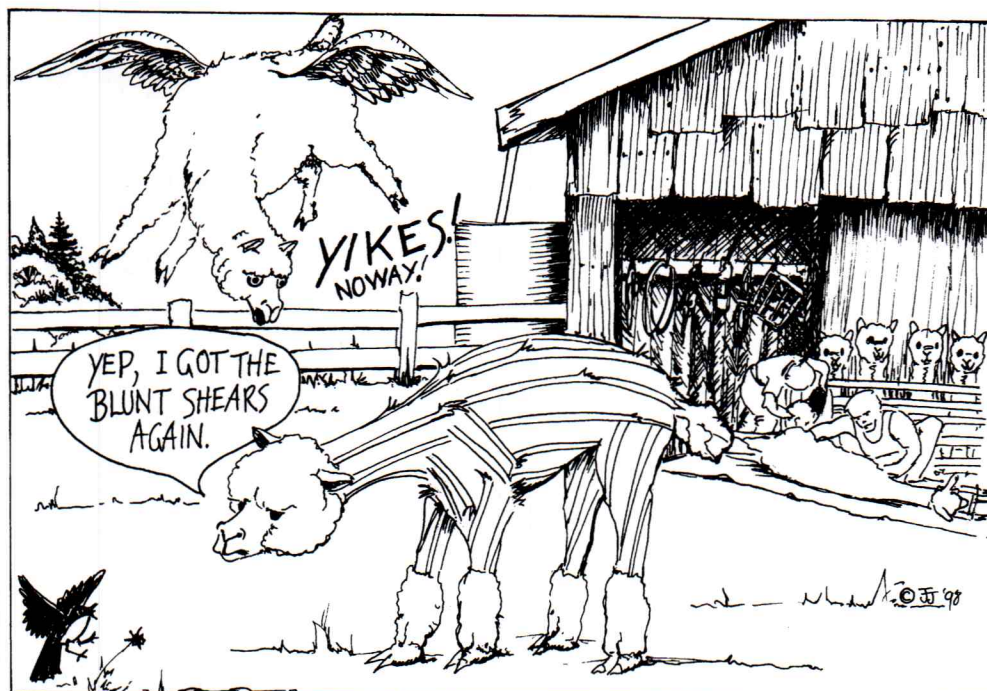
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Limited numbers

Bookings & Inquiries: (03) 5263 3436 or (03) 5253 2870

Heavenly Hal

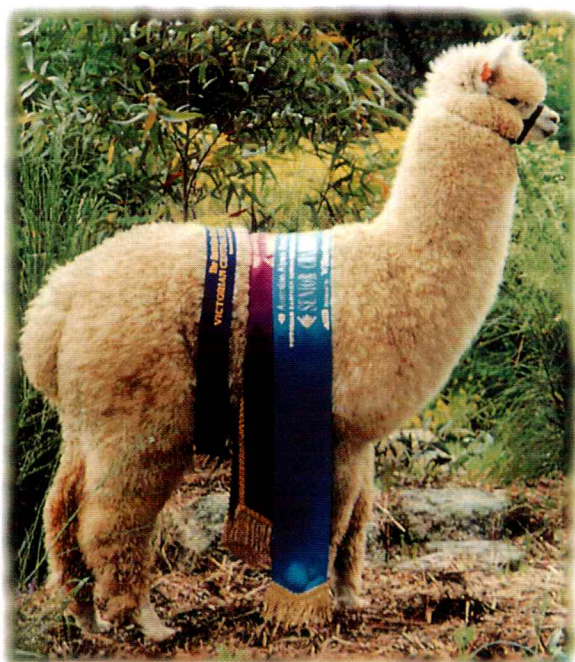


Busy, as usual, fighting for the rights of alpacas everywhere, the winged avenger arrived just minutes too late.

Had he been in time, he would have kicked that blunt handpiece right out of the shearer's hand.

HH took this radical but effective action to save the next intended victim (already on the rack!) from a similar fate.

Unfortunately, dear readers, everyone was too busy diving for cover to capture the action for you. But then, perhaps it was just as well. Such carnage! A scene far too violent for a family magazine.



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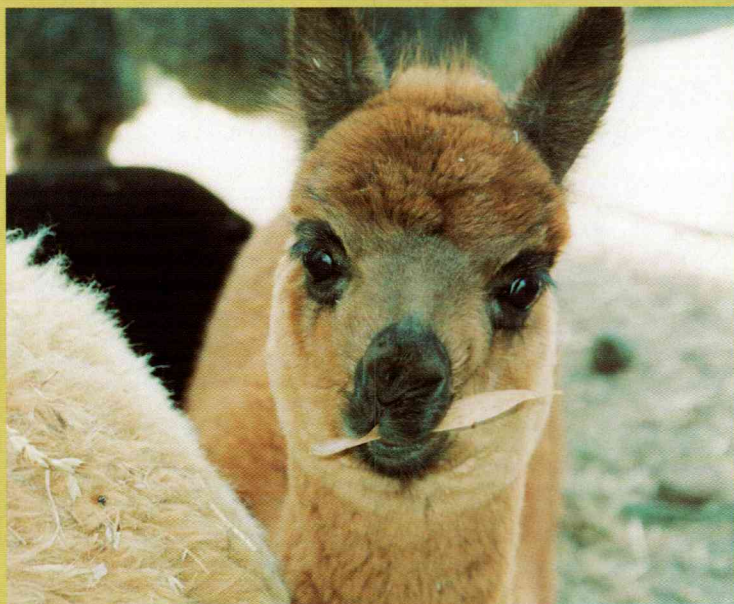
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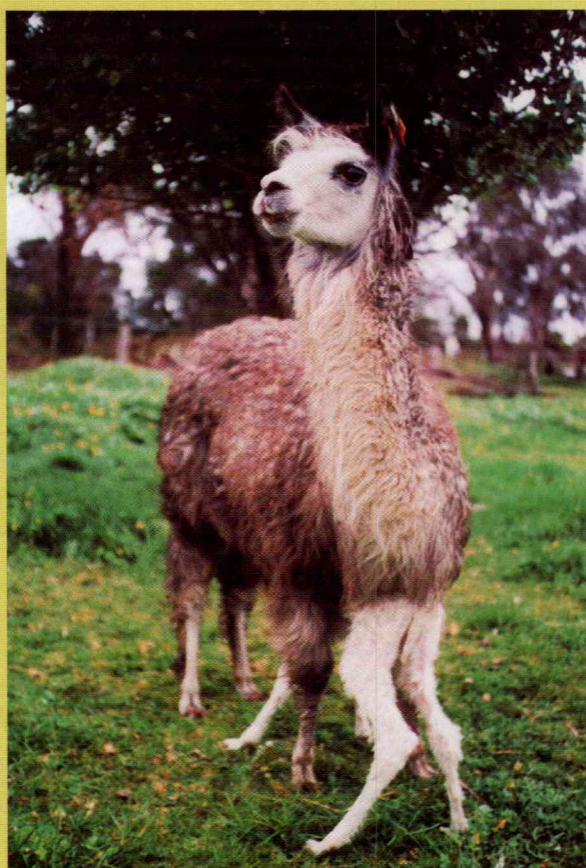
★ ★ ★ ★ ★ ★ ★ ★ ★ ★ *Pick of the Pack* ★ ★



Of course, I'm entering the National Gum Leaf Song Competition!
Mark and Serena Jefferis, Four-Mile Alpaca Stud

Congratulations to our 'Pick of the Pack' winner! who receives \$50.00 with the best wishes of the Association.

Send in your favourite Paca Pic and you'll be in the running for the cash prize. Remember, too, a photo judged good enough to appear on our front cover will win \$150 for the sender.



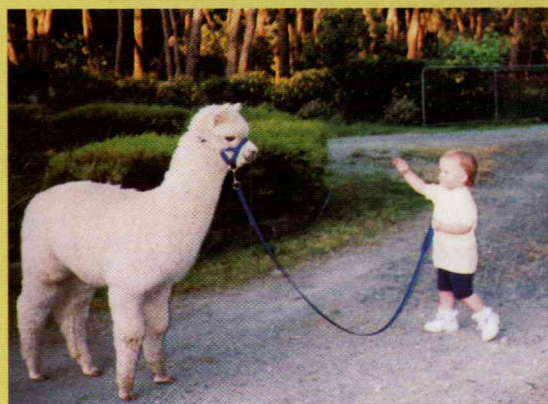
No, I haven't got extra legs – it's just my cria on her first milk-bar search.

Chris and Lindy Mahomed, Luamber Alpacas



This way, Mum – look at the camera!

Robin Keene, Kiah Alpacas



Come on, I'll be gentle.

Gerry and Anita Maas, Gerita Alpacas



No, Mum, I can't find your contact lens.
Ian and Cathy Proctor, Wallaby Ridge Alpaca Stud



No, son, he's the wrong kind.
Nicky and Greg Gleich, Buttercup Alpacas



*Do you think I would
look good in
Melbourne Cup
Fashions on the Field?*
Barbara and Janet
Reid, Doringcomb
Alpacas



Smile! You're on candid camera!
Denise Moysey, Arcadian Alpacas



*It's the fibre that's
important!*
Janice Ward,
Monteagle Alpaca
Stud.

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Paca

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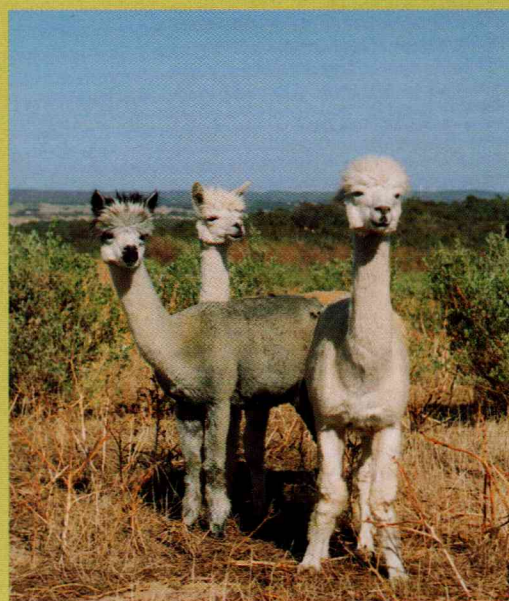
more
Paca



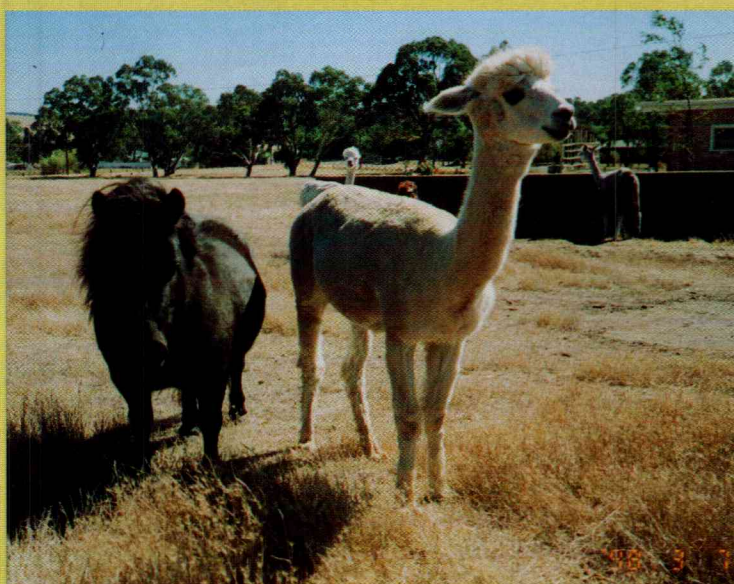
You're not a frog – but I'll give it a go.
Judith Dixon, Berridale Alpacas



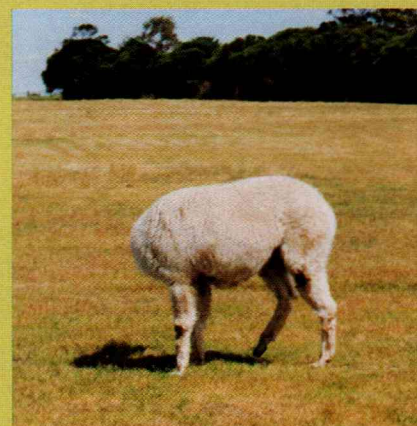
We're just learning!
Marina Pitsonis, 'Ambelli'.



Thar's bandits in them thar hills
Dolly van Zaane, Hope Downs Alpacas



*I'm taller than
you, Shorty*
Heather Austin,
Nyroca Park
Alpacas



*Well, I've heard of the Headless
Horseman, but this is ridiculous!*

Photo taken by Ms V Blackham,
and sent in by Elizabeth Paul

Falling on their feet... the autumn twins

Just as the magazine was about to be 'put to bed', text and pictures announcing the arrival of twin alpacas miraculously appeared on your Editor's Mac. After a certain amount of frenzied reorganisation of the existing magazine layout, the material was transferred straight onto the page exactly as you see it now. Ain't this new technology grand!

On Monday, March 1st, an extremely rare pair of twin alpacas was born to Illawarra Alpacas, an alpaca stud of some 130 alpacas situated in Cambewarra, N.S.W. The first cria was born at 2 pm, and was a fawn female; the unexpected second cria was born 6 hours later, and was a white female. Gestation was calculated at about 335 days, which was almost full term. Crias normally weigh 6 to 10 kgs, but these weighed only 4 and 3.5 kgs respectively.

The incidence of twinning amongst alpacas has been quoted by veterinarian Dr. Julio Sumar, internationally recognised Peruvian camelid expert, as being approximately one in every 50,000 live births.

The twin female alpacas were born to a seven-year-old, fine fibred white Peruvian dam (20 micron), whilst the sire was a similarly fine white Peruvian male. As such, these two females represent a very valuable addition to the herd of Illawarra Alpacas, owned by Dr. and Mrs. Davison and Miss Celia Cook. Both the sire and dam were among the first imported Peruvian livestock to be brought to the Shoalhaven region, around two years ago.



The twins – both photos hot off the email (so please excuse the quality).



Alpacas Australia

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1/3 page	300	280	260	240	95
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Advertising to Suzanne Charles

Specifications are available on request. We can accept camera ready material or will produce advertising material to specification. We cannot guarantee inclusion of late advertisements.

For further information on editorial and advertising matters...

Phone: (03) 9428 9663

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PTW Desktop & Design
Unit 9, 663 Victoria Street
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1999 advertising and editorial deadlines

Issue 27 – Winter

Due: June 1999

Deadline: Friday 16 April

Issue 28 – Spring

Due: September 1999

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Issue 29 – Summer

Due: December 1999

Deadline: Friday 15 October

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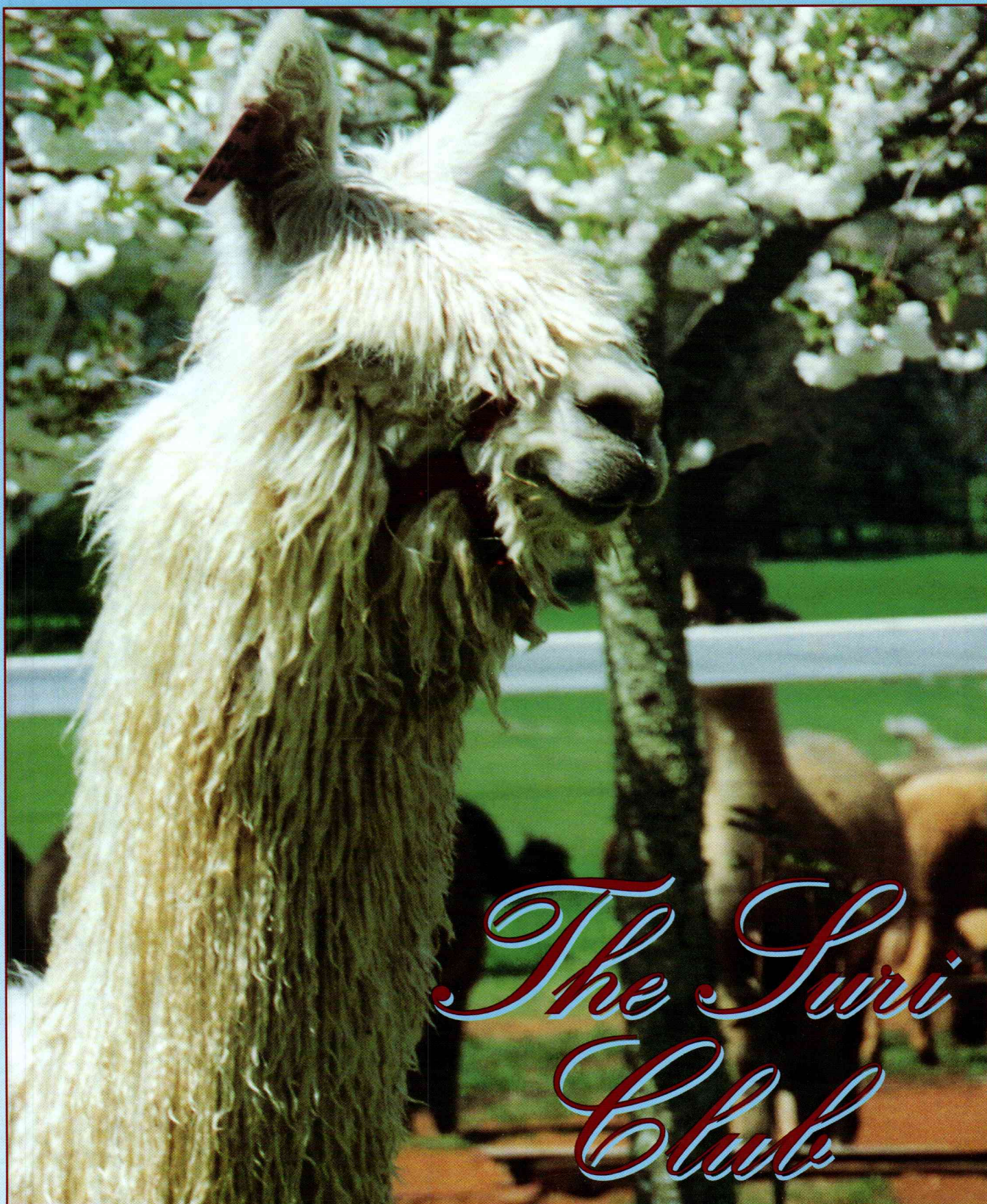
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