



Merry Christmas



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- Embryo Transfer Update
- Camelids In Mosaics
- Alpaca Webinars
- Make A Snowman Wreath
- Poisonous Plants
- AAA Updates

CAMELID CONNECTIONS

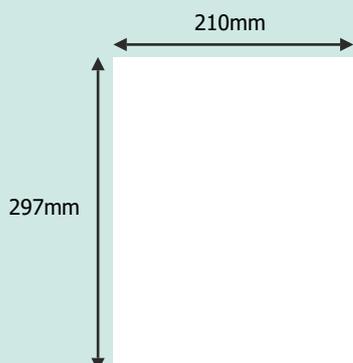
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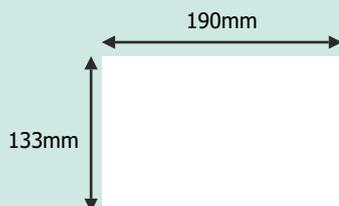
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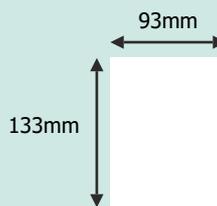
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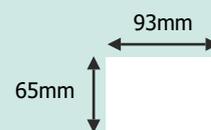
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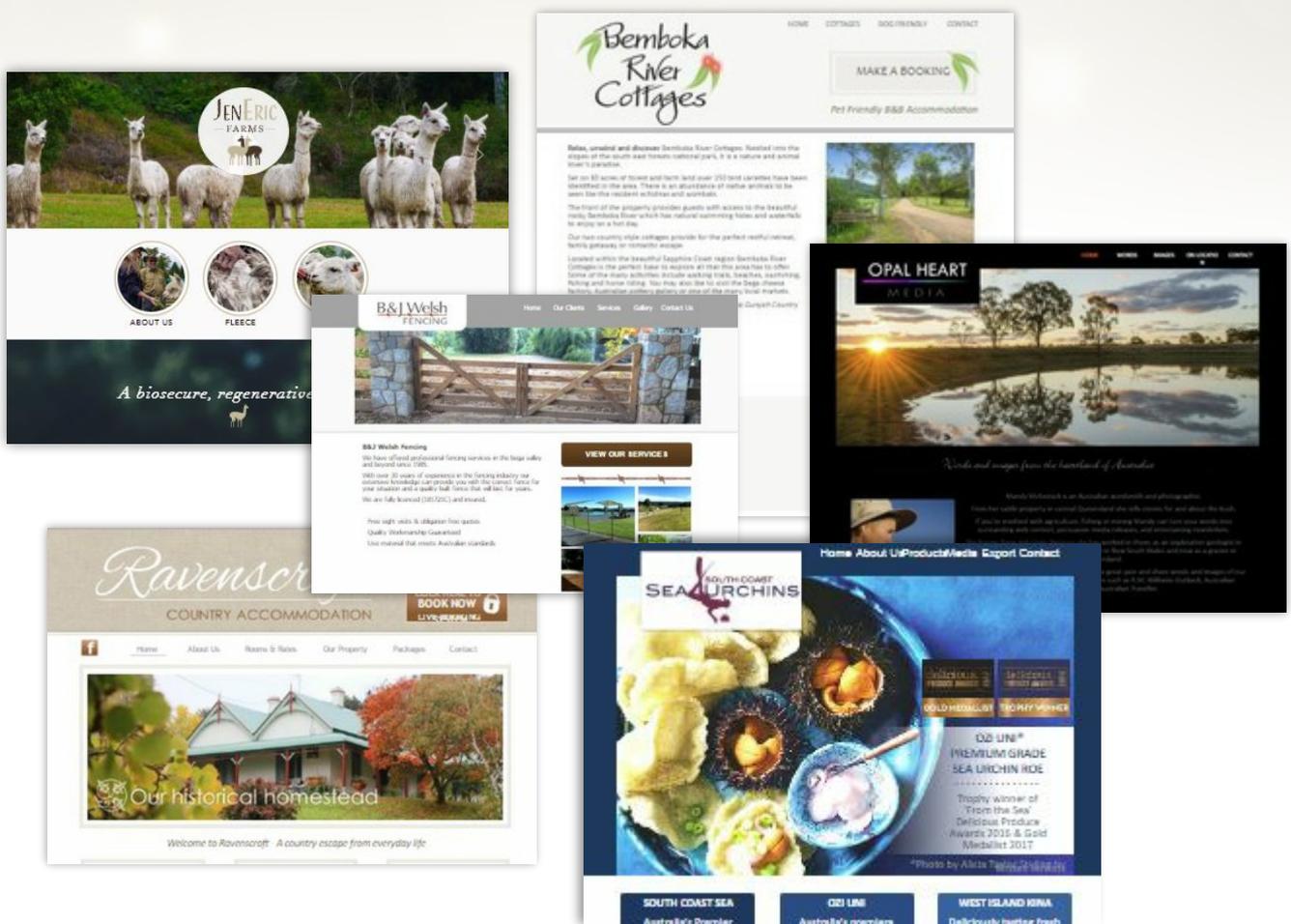
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Welcome to Camelid Connections

Like, I'm sure, most of our readers I shall not be sorry to see the end of 2020. With bushfires, floods and Covid 19 it has not been a year to reflect on with pleasure, here's hoping 2021 will bring a better year for all.

Here at Camelid Connections we have kept the magazine running to give our readers something to look forward to in lockdown and with the nation opening up in time for Christmas we hope this issue will give you some ideas for decorations and gifts with an article on making a Snowman Christmas Wreath by Angela Smith and suggestions for alpaca gifts.

An interesting article on ET (embryo transfer) may help some of you decide whether this is something you would like to take on board and veterinarian Dr Jamie McNeil's article "The Three Amigos" helps us understand the importance of phosphorus, calcium and vitamin D in keeping our camelids healthy. An article from Mourne Alpacas in Ireland tells how Covid started them in a new direction and we publish information on Bio Security, quad bike safety and noxious weeds all to keep you up to date.

We welcome an association with the Australian Alpaca Association and each issue there will be news and information on what is going on with the Association and it's members.

Enjoy the Christmas season and wishing you all a happy and safe 2021.

Thank you for your ongoing support by reading, sharing & subscribing to Camelid Connections - being a subscriber is 100% FREE & it allows us to keep this magazine a freely available resource by attracting advertisers because we can show them we have a strong readership.

A big thankyou to our advertisers - without you we could not afford to keep Camelid Connections free to read!

Meet The Team



Esme Graham - Editor

My husband and I have bred suri alpacas for over 20 years, I was heavily involved with both regional committees and the national board of the Australian Alpaca Association for a number of years and had the honour of being selected as a life member of the Association.

My major interest has been in marketing and education and to this end I was editor of Alpacas Australia magazine for six years and I hope that the experience I gained editing that publication can be extended to educate and inform a wider range of alpaca and llama breeders who are not necessarily association members but have a love of all things camelid.



Julie McClen - Designer/Editor

A breeder of ultrafine Huacaya alpacas for over 19 years, I have a passion for fine fibre and the genetic connection to the most diminutive and finest of the camelids - the wild Vicuna.

I strongly believe that education in any industry is the key to success, so with Camelid Connections we hope to provide interesting and informative articles to assist all camelid owners in getting the most out of their animals and businesses.

I also own Oak Grove Graphics a web and graphic design agency which is producing this magazine, and also allows me to connect with many different people in the camelid related world through my design and web work.

www.oakgrovegraphics.com.au

MOSAICS

By Beverley Bird - Mosaicaura



The art of painting with glass

My love of glass began many years ago as a child. Our annual holiday to the magical Isle of Wight, a small ferry ride from the South East coast of England would always involve a trip to the Isle of Wight Glass studio where I would watch with rapt fascination, while the masters of their art would turn molten glass into beautiful glassware. Pocket money would be spent on tiny little glass fruits or toad stalls to treasure.

It wasn't until 30 years later that after moving to Queensland and feeling a little lost and homesick, I joined a small group of ladies who met up once a week to make mosaic.

The group was a great introduction to the basics of mosaic but I wanted to do more interesting art and decided to try copper foiling which is a craft, very similar to lead lighting that was used by Tiffany who created the world famous Tiffany lamps. Here I was introduced to the beauty of stained glass but I was frustrated by the art which requires precise adherence to a pattern and not much room for artistic freedom. I loved using the glass and started searching the internet for mosaic artists who were using glass as their medium who could inspire me. The incredible images of mosaics made from glass had me hooked and so began my obsession.

“ The art
of painting
with glass ”



To even begin to make a glass mosaic, you need glass. Most specialised glass suppliers will sell glass sheets in a plethora of colours, no two sheets will be the same and for that reason alone, serious artists will always prefer to go to the supplier to pick the exact piece that is required for the planned artwork. Once you have your glass (in every colour because you will always need the one colour you don't have) a few tools are needed. Most importantly the wheeled glass cutter which you use to cut up your glass into the hundreds and thousands of tiny pieces that will become the 'palette' and 'brush strokes' of your glass mosaic. A glass grinder if you have the budget will make those details that may be hard to perfect a bit more achievable but by no means a necessity.

The hardest part for any artist is usually the inspiration. For a while I tried making mosaics I thought other people would like but my heart was never in it and sales were slow. One thing that was always a huge stumbling block was the many hours involved to produce a piece were never really appreciated so I decided to make art for me. That was when I started selling, and facilitating workshops became a natural and wonderful addition to my life and MosaicAura was born. An unexpected benefit, better than selling my art is the amazing lifelong friends I have found through teaching this wonderful craft many of whom are regular visitors to the MosaicAura studio. I consider myself to be very privileged to have met so many wonderful souls through a love of art.

Why Camels and Alpacas? I have no idea really other than I have a love of animals and colourful traditional cultures. They are undeniably one of nature's most expressive creatures and once decorated, they become my perfect subject. To me, the most important part of an artwork that has a living being as its subject, is the eyes, which must be full of life and expression. This is always where I will begin a new mosaic. Each glass sheet is chosen for its variation of colour and the subtle variations are utilised for highlights and shadows. Consideration is given to the "adamento" (direction or flow) of the glass cuts, for example in the case of the alpaca, long thin shards of glass were needed to give the impression of fleece. "Camilla" the camel artwork, needed a combination of andamento cuts to give the impression of a more smooth coated animal.

Colour and detail is always a big part of my art as in my Carousel Horses, but I am always looking to expand on this and have recently begun experimenting with a limited palette. "Bright side of the Moon" at the start of this article is my newest work and it has been a joy to create something a bit different.

To see more mosaic art by myself and my very talented students please join us at www.facebook.com/mosaicaura



Regenerative Farming Using Alpaca Manure

By Eric & Jenny Masters – JenEric Farms

We are a small breeder running approximately twenty five alpacas (although we are growing quite quickly), although we have approximately 40 hectares, at present we have seven paddocks covering around ten hectares. During winter at Jen Eric Farms, we usually have crias at the teat and mothers lactating. As we all know, these feeding mothers require at least 1.5 times the nutritional feed of other alpacas, but during the colder, slow growth months, higher nutrition grasses are at their worst. This requires us to supplementary feed, which is becoming more and more expensive. Paying \$35 to \$40 for a square bale of lucerne – in addition to providing cracked lupins, whole lupins and alpaca mix ‘muesli’ – means our feed bills are eating up our profits.

What is our solution? Grow our own lucerne in concentrated areas to supply our winter requirements, using our own ‘home-brewed’ fertilisers.

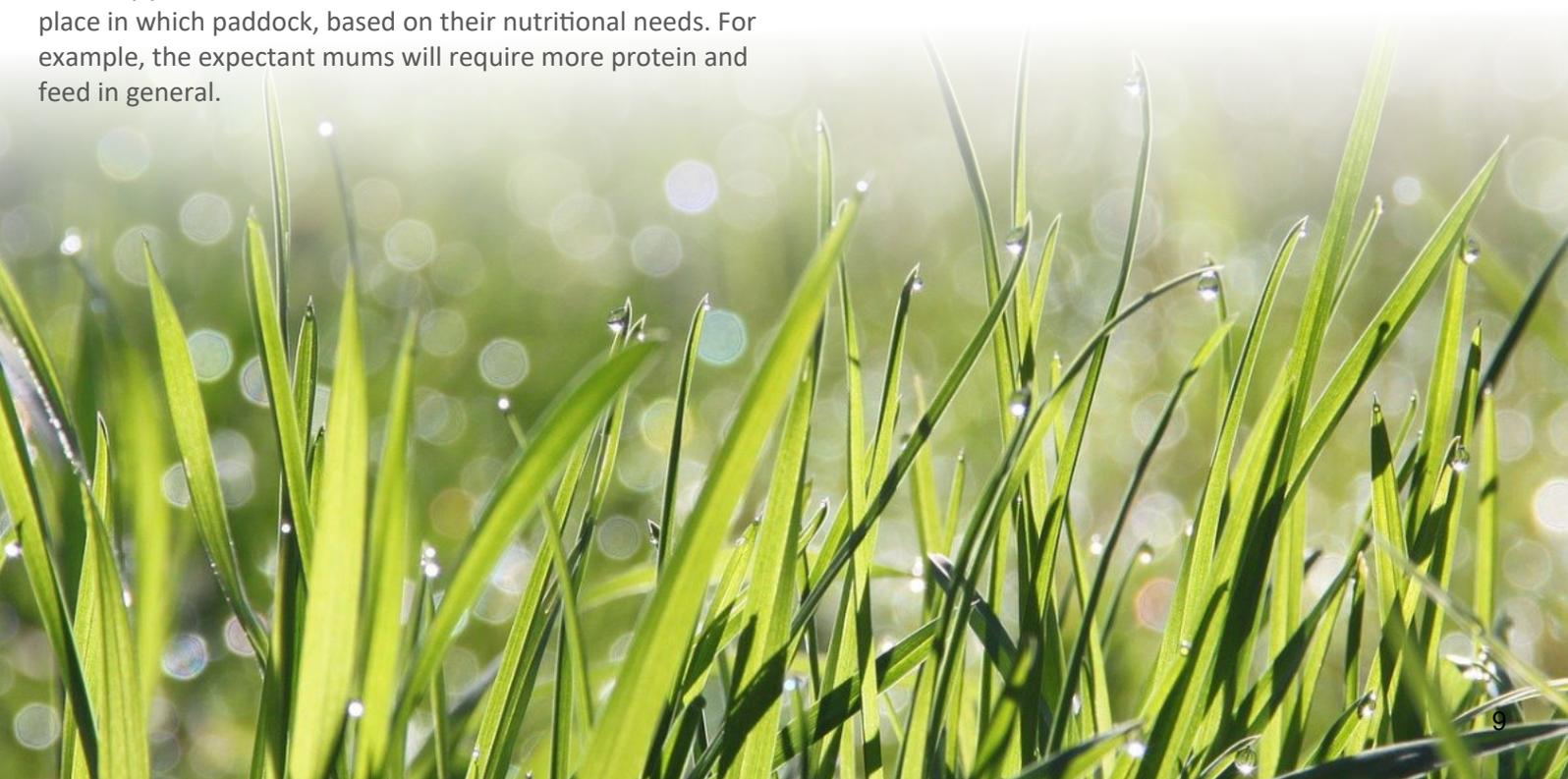
All of our main paddocks have wild-dog fencing for herd protection. Leading off each of these secure paddocks are a number of ‘day paddocks’ of a simpler ‘4 blue wire’ construction, where alpacas can graze during the day, before being led back to the main paddocks at night.

Recently, to lower costs and provide the animals with fresh, highly nutritious feed, we decided to grow strips of lucerne in each day paddock. This allows us to decide which herd to place in which paddock, based on their nutritional needs. For example, the expectant mums will require more protein and feed in general.

The main paddocks have a mixture of protein and higher fibre grasses, including Rhodes and Paspalum, and this meets our requirements in the spring and summer grass growth period. The addition of lucerne strips provides us with our own source of supplementary feed during the slower growth period, as the climate and ground temperature change. This is where the alpaca manure, alpaca ‘poo tea’, and most importantly, alpaca compost soil, come to our aid.

JenEric Farms is a biosecure regenerative property. No chemical fertilisers are used, and nor are they necessary. By combining the alpaca compost with the initial lucerne seeding, then overlaying the ground with alpaca manure, followed by a ‘tea’ spray, we have achieved remarkable results.

The growth rate of the lucerne on our property has been nothing short of miraculous, as verified by other farmers who grow lucerne every year. The standard period for lucerne seeds to germinate and raise above the soil is about 2 weeks. We have shortened this considerably, bringing shoots well above the ground in 5 days. This means our lucerne paddocks are ready to use in about 3 weeks, as opposed to a month to 6 weeks – the norm when using standard commercial fertilisers.



Additionally, the grass regrowth is strong, with an established crop producing fresh lucerne for more than 5 years. Once we have seeded all the day paddocks with lucerne strips, quality feed will be available to our alpacas when we want it, in quantities we can control. Lucerne is also drought tolerant, as it spreads its roots quite deep and will hibernate until watered, springing back to life again and lasting for about 5 years before re-seeding is needed. Sometimes this can be longer, depending on the soil condition, weather and other factors.

As previously mentioned, the feed is specific to each herd, so having our own lucerne paddocks makes it easier, cheaper and more efficient to deliver the appropriate feed. This is very handy when it comes to separating the herd into mobs, such as the weaners, mothers and their cria, males, and expectant females. We can alternate days when we want to provide a nutrition boost, while not upsetting their digestive system, as they are already used to eating lucerne.

The growing procedure is quite simple. We prepare the paddock by weeding (lucerne seed does not like weeds to begin with), digging a little to ensure the soil is soft and receptive. Any edible grasses present in the strip are left to work with the lucerne. Alpacas enjoy multiple types of grasses and it is good to provide a wide mix for nutritional choice. Following sowing as per the supplier's instructions for an irrigated paddock, (Note – the lucerne seeds can be rolled lightly to press the seed to the soil, however, we have found this unnecessary) the seeds are covered with about 1cm of alpaca compost soil, rich in all the nutrients that the germinating seeds require, and nothing else. (Note, lucerne seed does not require deep seeding, but a light soil cover only.)

We then add a winter primary annual that we may want to include in the alpacas' winter feed. We usually use oat grass as it is succulent, grows easily and is safe for alpacas. On the downside, it seems to require reseeding in April, to be ready for winter. By contrast, rye grass - which is used by some alpaca breeders - hibernates over summer and regrows around April. However, there is debate around whether rye grass is safe for alpacas' digestion. This year, we are trying lupins, as we feed our alpacas cracked and whole lupins as a treat in the afternoons - a bit like a cocktail, as our alpaca mentor, Barbara Linley says. So why not let them graze on the young lupins as well during winter? We will be trying this.

The seeds are covered with alpaca compost soil that has been brewed for about 8 months in a large container. We use an old 1000 litre water tank with a hole in the base to drain the alpaca tea for use in the final soil mix and as a very useful additive to our vegetable garden plants. The following process can of course be ramped up according to the area you wish to cover. The compost - alpaca poo from our piles placed into the water tank is kept moist and regularly fed alpaca manure and a little water to feed the worm base. Avoid over watering the compost as the worms can be

drowned. The compost is covered with a hessian bag to aid worm growth. The compost soil turns to a rich, dark brown, with a lovely soft texture when it has matured sufficiently.

Since we don't usually have enough compost to completely cover the seeded area to the required depth we add an alpaca manure mix. This is simply made up of crushed alpaca poo beans, with some good soil, just enough to add a light cover to the lucerne seeds. The soil is gathered from under the manure pile so it too is rich in alpaca manure. The beans can be crushed by allowing them to breakdown with soil and water, or mulched when dry using a mulcher. To enrich the mixture we add a bit of alpaca tea brewed from the alpaca compost. Add just enough to moisturise the mix.

Then the watering begins. Like most grass seeds, approximately 1.5cm of water is required per day initially. This begins the germination process. Important to note, we fence the area to keep the alpacas and/or chickens away from the fresh mix because the soil is very soft and contains lots of worms, which is very attractive to chickens! Also, alpacas, being opportunistic grazers (as well as downright curious about anything new) will most likely eat the shoots when they rise.



Why does it work so well?

JenEric Farms composted manure is "brewed" for over 8 months from our own alpacas and "pooed locally" in Larnook NSW.

- **All natural:** An additive-free, pesticide-free, herbicide-free, weed-free solution for healthier plants.
- **Comes complete** with live worms.
- **Improved soil structure:** High quality physical soil structure which helps retain moisture and positively impacts the nutrient cycle in a soil ecosystem.
- **Balanced formula:** This weed-free product is perfectly balanced for robust growth and budding.

Alpaca compost soil is high in nutrients, including nitrogen, phosphorus, and potassium. Alpaca manure is one of the best organic fertilisers for paddock grasses, vegetable and flower gardens, lawns and houseplants. It has a higher nutritional content than other livestock manure, including cow and horse manures, and will not burn the plants or seeds.

These photos show the results, from day zero, through to about 3 weeks.



LIVESTOCK MANURE COMPARISON

ANIMAL	NITROGEN %	PHOSPHORUS %	POTASSIUM %
ALPACA	1.7	0.69	0.66
CHICKEN	1.0	.08	.04
COW	.06	.015	.045
GOAT	2.0	.05	.06
HORSE	.07	.025	.055
PIG	.05	.035	.04

JenEric Farms is a Biosecure Alpaca Farm in Larnook, New South Wales, Australia. www.jenericfarms.com.au



QUAD BIKE SAFETY

By University Of Sydney

There is a growing concern world-wide over the number of deaths and serious injuries associated with the use of quads in agriculture.

Although developed as recreational vehicles, most quads are being used in agriculture for work-related purposes. Their ability to operate in a range of conditions, including muddy conditions, without leaving a 'footprint' has provided practical advantage in many rural settings. Their farm use includes; personal travel around the farm, mustering livestock, inspecting crops, pastures, fences, water and livestock and supervising workers.

Although used for these purposes, the risk of a rollover increases if the quad is towing an attachment, crossing slopes, travelling at high speed, travelling over rocky or uneven ground or carrying a heavy or unstable load, for example chemical for spraying, all of which lead to an increased likelihood of death or injury.

Tragically, in the past 6 years, 54 people have lost their lives due a quad related incident on a farm across Australia, with many more seriously injured. Consequently, Kerri-Lynn Peachey, AgHealth Australia, says "quads are now the leading cause of injury/death on Australian farms (outranking tractors)".

Most deaths are due to asphyxiation and/or crush injury associated with quads rolling over, or by injury associated with the victim being flung onto a hard surface as a result of a crash. "Therefore, I urge farmers and farm workers to think carefully about their use of quads by taking into account the safety risks. In the majority of cases, quads are not fit for purpose for the tasks required by farmers and more suitable vehicles should be used," Peachey says.

Where possible, select a vehicle that has a low risk of rollover. Consider vehicles fitted with a rollover protective structure and operator restraint for example; side by side vehicle or ute, as many jobs on farm can be undertaken using alternative vehicles to quads.

“If quads are still to be used as the vehicle of choice on farm, a crush protection device should be fitted,” Peachey says. A crush protection device (CPD) is mounted on a quad to minimise the risk of someone being crushed between the vehicle and the ground if the bike rolls over. It does not enclose the rider.

To best manage quad safety, farmers should do the following:

- Do not allow passengers on quads.
- Do not allow children under 16 years to operate or be carried as passengers on quads of any size.
- Provide a suitable helmet and ensure that it is worn.
- Remember the instability of quads makes them unsuitable for carrying loads or towing.
- Make sure operators of quads are trained to operate the machine safely.
- Make sure operators receive a thorough induction to safe operation of the vehicle on your specific property.
- Make sure quad is well maintained.



Peachey says, “Acknowledging the high numbers of death and serious injury around quads some states work health and safety authorities are working with farmers to provide a retro-fitting rebate schemes to assist farmers make safety improvements to quads, purchase helmets, upgrade to a side by side vehicle and training, consequently would encourage farmers to take up the opportunity of rebate scheme available.”



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LOCKDOWN LEARNING



Dr. Michelle Dunniece of Mourne Alpacas in Northern Ireland tells us how Covid-19 restrictions concentrated her mind to create a world first in webinar learning for the alpaca community and her plans for learning and research on the road ahead.

Writing now in November as we continue in a second lockdown across the island of Ireland, and having spent since March working from home, it seems almost impossible to think that over 7 months ago, we were certain that news would be very different by Christmas. Rather, we are more entrenched, with hopes of vaccines riding what seems to be an eternal +/- wave. So we keep learning and enjoying camelid time!

Setting the scene.

We are the very lucky family owners of a large alpaca herd (by Irish rates), nestled at the foot of Slieve Croob on the inner side of the Mourne Mountains in Co Down.

Our numbers average around 150, and we run a stud breeding farm, and a fibre enterprise, with great demand for our yarn across Europe and the USA. It was shaping up to be a normal manic Spring for us all here in Mourne Alpacas. Plans for an alpaca research conference were in early stages, mixed with preparations for the 4-day regional Balmoral Show that we exhibit at every year, together with 4 teenagers (very) slowly warming up to sit AS, GCSE and other exams. Add to the mix 2 day jobs, and a recently added wolfhound pup getting bigger and bolder, we thought we were in our normal version of family and farm mayhem. No one knew what monumental changes lay ahead.

We have been very fortunate to enjoy alpacas in large

numbers in our lives for many years now, and have reared four children into teenage years surrounded by crias, football playing stud boys, and lots of females permanently in various stages of pregnancy or cria care. It is all hands on here on the farm for the six of us, with the usual husbandry, peppered in strong doses at all times with my passion for research and learning informing our decision making processes and plans for farm growth and diversification.

When we started, we had no avenues for support at home, so I wrote personally to any registered alpaca owners identified to me by the British Alpaca Society, and I founded the regional group of the BAS here in Northern Ireland. I completed a foundation stage BAS judges' course, a parasitology, a handling and husbandry and a neonates course and attended the BVCS Camelid Vets conference to learn all I could. Research has always come before action in my life!

As we slowly grew in alpaca numbers, we started to sell some, a significant step for us to take. From the first sales, we have been very conscious of the importance of supporting our new owners with training to give them a sense of confidence as they begin their alpaca journey. Every new owner has become a member of our Mourne Alpacas Club, through which they are offered free (now BAS affiliate) training courses by us, in order that they feel supported and we can be assured we have done our best to secure great homes for our alpacas.

“ The need for training, developed from research and experience based content, continues to drive the design and delivery of our activities ”



Coupled with the development of our Club, and mirroring the work in my third sector day job, we linked the opportunity to use the ownership of alpacas and the good will of our club members, and created a Mourne Alpacas fundraiser partner with the Northern Ireland Children's Hospice, chosen by our children for personal family reasons, and as a focus for benefit from our alpaca family activities. We are very proud of the latest handover, at £4,400. More work to be done here as we are very concerned at the lack of opportunity for fundraising during lockdown for many worthy charities.

The need for training, developed from research and experience based content, continues to drive the design and delivery of our activities, never more so in the face of increased dependence on social media sources as a 'go to' place for advice and information. A concern, amplified in continued lockdowns, is that many rely heavily on these sources and perhaps may not be receiving more than personal opinions, unfortunately broadcast as fact. As a researcher by profession, this is a very worrying development.

The Genesis of Mourne Alpacas Webinar Series 1 & 2.

On 13th March, my work went into lockdown, and everything ground to a halt. Most of the very talented people I have the privilege of researching and creating with daily were the first to go into lockdown, due to the nature of their different abilities and physical conditions. We here at home 'locked' the farm gates, and like everyone else, held our breath.

With lots of training cancelled, a new route to learning to replace our conference was needed. Desk-based research moved to the 'phone, and long conversations with camelid professionals in New Zealand, Australia, UK and across Europe of varied backgrounds ensued. Programming skills were honed, and PR and marketing plans were set in place.

With no idea if we would even be able to interest, never mind secure an audience, we chatted, budgeted, planned, and created a schedule of webinars originally as one per month. When lockdown became a reality across the globe, we shifted to fifth gear, added more subjects, balancing veterinary sessions with more eclectic and narrative subjects, and we had a 10-week program on our hands. We settled on 8pm BST weekly as go-live, and, well, the rest is, quite



literally - history! We have now moved in to scheduling series 2, running from October to December 2020, and interest across 4 continents is as high as with series 1. We are featuring Australian camelid specialist Jane Vaughan twice in this series, and enjoying playing with time zones and having presenters ready to go very early some mornings!

Our choice of platform, our bombardment of Facebook groups (for which we still say thanks for your patience) and the absolute hunger of alpaca owners, old and new, across the globe, has allowed us to make history. Here in Mourne Alpacas, at the foot of the beautiful Slieve Croob mountain in Co. Down, we continue through series 1 and now 2 to broadcast live weekly to 4 continents. Audiences have engaged on subjects about birthing, cria care, fertility, lifestyle options, handling, and camelid training, fibre processing and breeding, therapeutic applications, and parasites – a whirlwind of alpaca topics. The first and current second series have proved a huge interest to many diverse audiences from the island of Ireland, to the British Isles, Washington State, Tennessee, Western seaboard of the US, Canada, South Africa, Australia, New Zealand and across Europe with strong learning pods in Denmark and Finland. We are delighted to even have audience members and camelid researchers joining us from Peru!

For further information visit www.mournealpacas.com





Correct Halter Fit

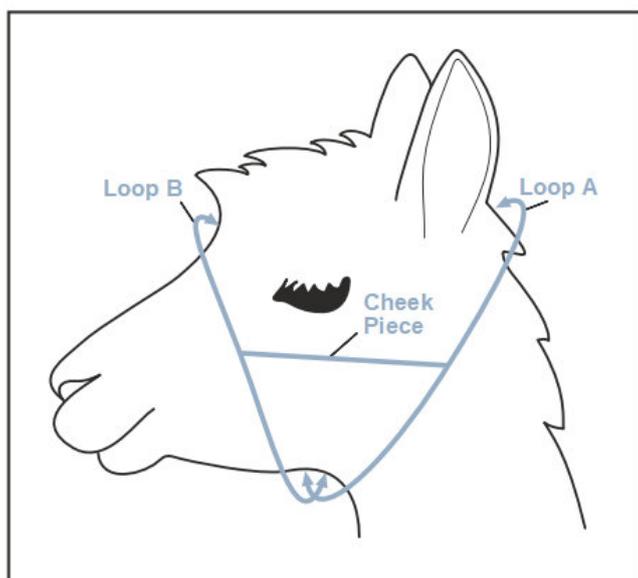
By Marty McGee Bennet - Alpaca Dynamics

Alpacas have a frighteningly short nose bone (see photo), in fact most of what we call the nose is cartilage not bone. The nose bone on most adult alpacas ends about an inch or so in front of the eyes.

Not very much bone to hang a halter on! In fact the bone is so short that we ought not be using it at all for actual fitting. That's right leave the nose out of it!

Most people have trouble fitting a halter because they are trying to fit the nose and there just isn't enough nose to fit. Instead of fitting the nose bone I suggest that we focus instead on fitting the rear part of the jaw-bone and the back of the head. Almost every halter is composed of two loops, one that goes around the back of the jaw and behind the head (crown piece - throatlatch, loop A on drawing) and a second loop that goes around the nose (noseband, loop B on drawing) and connected by a short piece on each side called the cheek piece. Some halters feature adjustments in both of these loops others are sized according to the size of the noseband (a bad idea). In order to fit a halter that is not going to slip forward and off the bone we must begin by fitting loop A, and loop A MUST be reasonably snug because the nose bone is so short.

The adjustment of loop A is the one that prevents the noseband from slipping forward off the bone. Here is the kicker, loop B THE NOSE BAND must be large enough that it doesn't interfere with the fitting of loop A. If loop B is not big enough,



Extract from original article entitled: *Care and feeding of the Alpaca Head*



Correctly fitted halter.



This halter does NOT fit. It is restricting the animals ability to chew and is not resting on bone but on cartilage.



You can see what happens when a halter that is fitting in this way is actually used to control the alpaca the cartilage is compressed and the airway is compromised. When taking these photos I could hear the sound of her breathing become much louder and more obvious.

ET

Is it right for you?

By Ian Braithwaite – Patagonia Alpacas

World First in Australia

The birth of the world's first group of commercially conceived embryo transfer cria was announced from Victoria's Benleigh Alpaca Stud near Geelong in 2002. This ground breaking achievement partnered locally advanced animal science with quality Australian farming. Bellarine vet Dr David Hopkins, a pioneer in horse and cattle ET transfers, and well known alpaca veterinarian Dr Jane Vaughan, asked leading breeders Allan & Carolyn Jinks to be part of the embryo transfer trial they hoped would change the future. This followed on from work done in the USA at Paul & Sally Taylor's Ranch in the early '90s.

Our ET Journey at Patagonia Alpacas

Late in 2004 we decided to experiment with the advanced reproductive technique of embryo transfer. It was a big decision to make for our small stud as the technique had only recently evolved from an experimental research challenge in alpaca breeding to a potentially useful commercial breeding tool. We have used ET periodically up to 2017 when prolonged drought forced us to stop using ET.

The following discussion highlights some of the issues, challenges and thoughts over our ET journey.

What is Embryo Transfer – ET?

ET is a reproductive technology where a donor female alpaca is given a natural mating and any resulting embryos are collected and implanted into the uterus of recipient females. It is important to emphasise that the ET technology developed in the USA but utilised in Australia is a nonsurgical technique designed to minimise trauma to both alpacas and their owners! There are two forms of ET, single ovulation and multiple ovulation.

What is a single ovulation ET in alpacas?

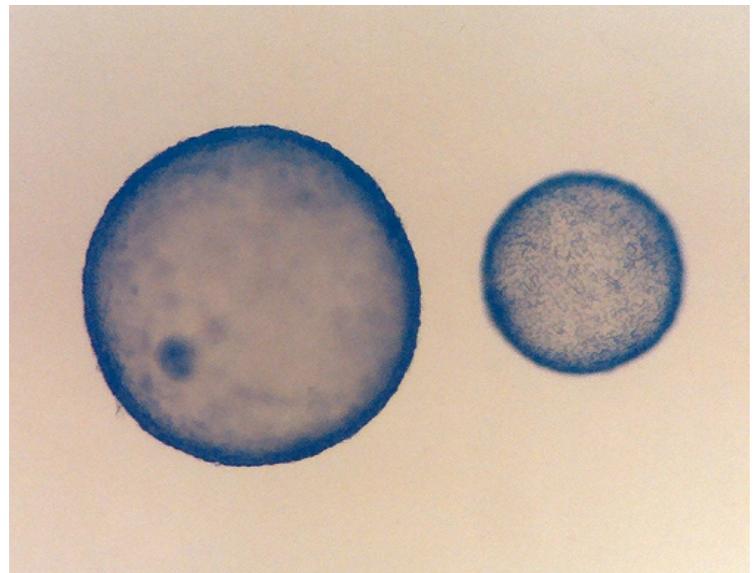
Single ovulation ET occurs when a donor female (most likely to be a maiden but does not have to be) is given a natural mating and the embryo is flushed from the donor and implanted into a recipient female. Originally, the fieldwork by

Dr Jane Vaughan and Dr David Hopkins used single ovulations. This allowed both vets to obtain expertise in the non-surgical flushing and transplanting of embryos. Once the technique had been mastered, both vets then focused on developing a safe and efficient protocol for super ovulation in alpacas.

What is multiple ovulation ET in alpacas (MOET)?

MOET is a hormonal treatment to increase the number of follicles developing in the ovaries of the donor female alpaca. At the appropriate stage, the donor female is given a natural mating and about four recipient females are prepared by hormone injections to synchronise their reproductive status with the donor female. Then some days later, the donor female is flushed and any recovered embryos are individually assessed for quality and then implanted into the uterus of receptive recipient females.

The number of embryos collected can vary widely although the average has gradually increased due to a combination of refined superovulation protocols, breeders adjusting their day-to-day management practices and learning how individual donors and recipients respond to the technique.



The two embryos are seen through the microscope and the black dot is where the cria development is occurring.

Developments in ET over the last 18 years

In recent years a number of Australian breeders have received intensive training to enable them to undertake their own single ovulation programmes. If breeders can achieve average or better embryo stick rates then the cost of progeny on the ground would be lower than doing MOET and relying on an outside vet to undertake the flush and transfer of embryos. The costs involved in ET still acts as a deterrent from the wide scale use of the technique in the alpaca industry.

The difference between ET and cloning

ET does not produce identical clones in terms of fleece attributes and colour. It merely accelerates the number of progeny that can be produced in any given period of time but the progeny will exhibit the same degree of variation that we already see in our natural breeding programmes.

The aim of either single or multiple ovulation ET is to increase the number of offspring produced from high grade females by increasing selection pressure on the female side of the breeding equation. As an industry, one of the barriers to increasing the rate of genetic improvement is the idea that we do not need to apply any selection pressure on the female side.

ET provides a means to improve your herd through using superceded females that still have three key traits – good mothering ability, high fertility (fall pregnant on the first or second mating), and easy birthing.

Why consider using ET?

The aim of either single or multiple ovulation ET is to increase the number of offspring produced from high grade females by increasing selection pressure on the female side of the breeding equation. As an industry, one of the barriers to increasing the rate of genetic improvement is the idea that we do not need to apply any selection pressure on the female side. ET provides a means to improve your herd through using superceded females that still have three key traits – good mothering ability, high fertility (fall pregnant on the first or second mating), and easy birthing.

Challenges associated with using ET

It is important to also be aware of some of the challenges associated with ET. Ultimately a decision to try ET or not is dependant on how you weigh up the pros and cons of the technique for your business.

Clean lab set-up showing an embryo in a holding dish.



ET requires very detailed planning well in advance of the start of a programme. Issues that need to be considered are:

- 1) what type of ET process suits your business - single ovulation, multiple ovulation or a mix of both?;
- 2) how many donors to use in each program?;
- 3) which males to use – will you need to rely on your own males or do you need to use outside males of higher quality than you already have in your herd?;
- 4) how many recipients do I need? So which females am I willing to temporarily retire from the natural mating pool for one season or more. Do I need to acquire some new recipients? How can I be confident that these recipients will become pregnant? Finally will they be capable of providing a good maternal pre and post natal environment?;
- 5) if using MOET, what number of progeny would you like to have from each donor if we had that luxury of choice (on the flush day you must decide this issue based on the number of embryos already recovered, the pool of available recipients and the number of donor females yet to be flushed); and
- 6) do I have the required standard of donor females and stud males to justify the investment and risk in using ET? This last point is very important to consider as the cost of ET progeny is higher than non ET progeny particularly if you are using an outside vet to do the procedure. So, you need to be aware of the potential value of the offspring produced from any ET programme to decide whether ET is viable for your business.
- 7) Due to the number of times you need to inject the donors in MOET, the females do become reluctant to come into your injection area in the morning and evening. This means that you may need to change or improve your infrastructure leading to your injection area and have special feed incentives for the donors. On our farm we had to build a new lane system in conjunction with new paddocks, new watering points and a new dedicated ET facility where the donors are flushed and recipients are implanted.

- Making a commitment to give ET a go does takes a lot of time, labour and attention to detail. Additionally, it is a wild emotional roller coaster with significantly high and low moments. This is because of a number of unknowns: 1) how will animals respond to the programme?; 2) how many embryos will they produce?; 3) what is the stick rate of embryos going to be like in the recipients; and 4) 12-18 months later when you see the progeny, how good were your ET mating decisions? The risk with ET is that you can bulk up your bad mating decisions as well as your good decisions!



- Under ET programmes, you need to increase the nutrition plane of your males, donors and recipients at least one month before the start of any programme. Then you are committed to an injection schedule across several weeks of the following month leading up to the flush date.
- A common problem across other livestock as well as alpacas is the variability of response to the multiple ovulation drugs combined with some recipients having a poor history of retaining an ET pregnancy. Some donor females may over respond to the hormones and produce too many low grade embryos, other females may not respond at all, finally some donors respond inconsistently between programmes.
- ET success relies on a degree of luck as well as more importantly, calm management of animals. Stress does play a role in influencing a donor's response to the ovulation drugs as well as impacting the stick rate in recipients. The first 60 days after implanting is a critical period for recipients. This has implications for a number of normal management activities including weaning, shearing, spit-offs and injections that require any form of mustering or upsetting the social hierarchy between animals.

Finally, I believe you need to be sensitive to animal welfare issues. It is very common for people who assist on the ET flush day to remark that they were surprised how stress-free the flushing and implant procedure was and wish that it was a shame that shearing day could not be as stress free! However, an area that Cathi and I feel strongly about is that donors are allowed to have some opportunity to raise their own crias naturally.

(Our thanks to Ian Braithwaite Patagonia Alpacas – for updating his earlier article – Reflections on ET)



Further Views on ET by Taryn Mathews

Precision Alpacas

Here at Precision, we do a small amount of embryo transfer (ET) every year. This is a way for us to maximise the number of progeny from our elite females, thus accelerating our herd improvements. Our donor females are very carefully selected. Firstly, they must be highly fertile to ensure we maximise the productivity of our embryo transfer program, and also because fertility is a heritable trait which we are mindful must be preserved. They must be from lines with excellent milk production as this is also a highly heritable trait which seriously impacts the overall health and vitality of a herd. They obviously must be very well conformed and exhibit exceptional fibre traits. Finally, they must have proven their ability to pass these positive traits onto their progeny.

With these strict criteria in place, ET helps to ensure a larger number of high-quality progeny are being produced each season.

We can utilise ET in two ways.

We can do what are called “single” flushes, where no hormones are required and the females are mated as normal with only one embryo (in rare cases twin embryos) being produced. The advantage of this method is that we can produce cria from multiple sires in one year from the one female. By doing this you can switch up your males - if there are multiple males you’d like to try over one female - and you don’t want to have to wait years for this to happen naturally.

Or, we can do what are called “super” flushes where hormones are used to cause the female to super-ovulate. This allows us to potentially get many full siblings at once, which is an advantage when you know a particular breeding works consistently.

Overall, ET is not a large part of our program but we consider it to be a highly valuable addition to natural breedings. We have experienced much success with our ET program in the short time we have been doing it, however it is important for breeders to remember to consider all traits when choosing a donor female, not just fibre. ET offers the ability for some females to be far more influential to the Australian herd than others, and with this capability comes the responsibility of breeders to be breeding strong livestock into the Australian herd, not just an award-winning fleece.

Another viewpoint from Natasha James

Wesuri Alpacas

Our journey with embryo transfer began in 2005 with mum and I travelling to Montana to be taught by Llama breeders Paul and Sally Taylor. Paul and Sally had adapted the Bovine ET procedure to suit the South American camelids and were more than willing to share their knowledge with us. We became good friends and I have since returned to Montana several times to catch up with them, work on their embryo freezing research and let them know how our ET is progressing. They in turn have been to Australia and worked with us here in Western Australia and presented at the International Alpaca Conference in Sydney. Since then time has flown by and I have in turn become an alpaca ET teacher here in Australia as well as in the US. I have taught veterinarians as well as breeders the process of ET. I have been to the US several times since the breeders voted to include the registration of ET cria in their registry, to teach and undertake ET for breeders, which has been a wonderful experience. Word has made it to Europe about my ET business, and I have been invited to Germany to undertake an ET program with a breeder there. Unfortunately, due to covid, that has been postponed until 2021, but there are still many breeders around the world that are keen to undertake ET and fast track their herd improvement program.



Jude Anderson (Pucara Intl.) and Rhonda Deschener (Tierra Prometida Alpacas) in the US working on their new ET pathway under instruction from Natasha James (Wesuri Alpacas).

ET has worked wonders for the sheep and cattle industries here in Australia allowing the fast tracking of quality genetics by using females as 'studs'. We all have those females in our herd that are wonderful mothers, but are not the best genetically, they can be an invaluable resource carrying the babies of those females that are genetically superior. Those exceptional females that cannot carry babies or tend to be poor 'doers' during pregnancy could still have babies without the stress of carrying them to term. Those females that you would love to see combined with more than one male but are too impatient to wait those couple of years to see which mating has the best result, that female can have cria to each of those males in one season..... We all know that the dam contributes more than her fair share of quality genetics to the offspring, we should use that to our advantage and fast track herd development through ET.



Jude Anderson from Pucara alpacas setting up to look for embryos. Al and Jude were pivotal in changing the US registry encouraging people to embrace ET and as a result the US breeders had a vote in 2016 and ET cria were finally allowed onto the registry.

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Farm Biosecurity

is Everyone's Business

By the AAA Animal Health & Welfare Panel

As the peak national industry body for alpaca producers or owners, the Australian Alpaca Association seeks to provide leadership and education in the area of biosecurity for all alpaca owners - whether they be commercial producers, stud enterprises, pet or herd guard owners.

The Association is a member of Animal Health Australia (AHA) - see www.animalhealthaustralia.com.au. This membership enables our industry to keep up to date with matters affecting farm biosecurity as well as other issues impacting on animal health and welfare.

Some key issues to consider in securing your farm are provided below. This material is summarised from the website of Farm Biosecurity - see www.farmbiosecurity.com.au. Farm Biosecurity is a joint initiative of Animal Health Australia (AHA) and Plant Health Australia (PHA) both of which have a significant stake in preventing pests and diseases taking hold in Australia.

What is biosecurity?

The term biosecurity refers to the management of risks to the nation's economy, the environment, and the community, of pests and diseases entering, emerging, establishing or spreading.

Biosecurity measures can be implemented off-shore (eg through the activities of government agencies), at Australia's borders and on-farm.

Australia's geographic isolation has, to a large degree, provided protection from many of the pests and diseases that affect agricultural industries overseas. Freedom from these exotic pests and diseases is a vital part of the future profitability and sustainability of Australian agriculture.

What is farm biosecurity?

Farm biosecurity is a set of measures designed to protect a property from the entry and spread of pests, diseases and weeds. Farm biosecurity is your responsibility, and that of every person visiting or working on your property.

Producers play a key role in protecting Australian plant and livestock industries from pests and diseases by implementing sound biosecurity measures on-farm. If a new pest or disease becomes established on your farm, it will affect your business through increased costs (for monitoring, production practices, additional chemical use and labour), reduced productivity (in yield and/or quality) or loss of markets.

Early detection and immediate reporting of an exotic pest or disease increases the chance of effective and efficient eradication. The Farm Biosecurity Program is an important part of Australia's emergency animal disease and exotic plant pest surveillance systems. Surveillance allows us to preserve existing trade opportunities and provides evidence of Australia's pest and animal disease status to support access to international markets.



By implementing the recommended measures in your day-to-day operations, you will improve your own biosecurity and that of your region, while minimising production losses and unnecessary costs.

Alpacas (and other South American camelids, including llamas) are susceptible to a number of endemic diseases (eg the bovine strain of Johnes' disease) as well as exotic emergency animal diseases, the latter including foot and mouth disease, FMD.

An understanding of the biosecurity risks to our industry and the risks alpacas themselves may pose to other grazing livestock industries, led to the development of industry bio security programs including QAlpaca, which is currently undergoing an extensive review process. The AAA has also been working with AHA and ISC to further develop the National Livestock Identification Scheme (NLIS) to include South American Camelids. However, every alpaca grower/owner needs to be aware of biosecurity, their legal responsibilities, and measures they can take to protect their own properties, animals, businesses and lifestyle.

The link to the SAC health dec and waybill can be found at <https://www.farmbiosecurity.com.au/wp-content/uploads/2019/03/South-American-Camelid-Declaration-and-Waybill.pdf>

It is a legal requirement in all Australian states and territories for properties on which one or more alpacas are kept to have a unique Property Identification Code, or PIC. PICs provide one of the foundations for efficient and effective livestock traceability systems such as NLIS. For more information on requirements in your locality, visit the website of your state/territory primary industry department or equivalent. These sites and the Farm Biosecurity website (see www.farmbiosecurity.com.au) contain a wealth of information to assist producers in plant and animal industries.



Farm Biosecurity Essentials and Farm Biosecurity Toolkit

The best defence against pests and diseases is to implement sound biosecurity practices on your farm. Quick and simple measures built into everyday practice will help protect your farm and your future. These can be categorised under the following headings:

- Farm inputs
- People, vehicles and equipment
- Production practices (e.g. routine vaccinations, paddock management, etc)
- Feral animals, pests and weeds
- Farm outputs
- Training, plans and record keeping

A few things to consider and pointers to good practice on each of these areas are covered below. Where applicable, reference is also made to resources (e.g. standard templates/forms) available and downloadable from the Toolkit menu of the Farm Biosecurity website - see www.farmbiosecurity.com.au.

Farm inputs

Anything moved onto your property can be a source of pests and diseases. Monitor animals, plant materials, sources of water, feed and fertiliser that enter the property.

You have an important role to play in protecting your region and the entire industry from biosecurity threats. Keep records of all farm inputs (and outputs) so that you can trace-back or trace-forward in the event of a pest incursion or disease outbreak.

For example, when purchasing feed, ensure you know the expiry date and use it before that date or dispose of it safely. Inspect purchased feed to ensure it does not contain a high ratio of weed seeds that could propagate on your property. Keep feed in a clean, dry storage area as poor food storage encourages pests and diseases which may contaminate the feed, reduce its usefulness or even harbour disease organisms that may harm your livestock.

People, vehicles and equipment

Anything that moves can carry diseases, pests and weeds. People, vehicles and equipment pose a high biosecurity risk and should be managed. Visitors and workers can unintentionally carry diseases, pests and weeds. Anyone visiting your property including suppliers, vets, transporters, stock agents, itinerant workers, researchers, contractors and social guests as well as anyone who lives on the property can pose a risk.

Signs may be used to inform visitors of your biosecurity status and what you require from them. You cannot assume that visitors know the appropriate biosecurity measures for your property. A farm gate sign is now available for purchase



from AHA and can be a valuable part of your farm biosecurity toolkit. See www.farmbiosecurity.com.au for details of how to obtain one of these signs for your property. Knowing who has entered your property allows possible sources of diseases, pests or weeds to be tracked.

Also, limiting the number of vehicle access points to your property will limit the potential disease, pest and weed entry sites and allow you to monitor these areas closely. Another essential part of your farm biosecurity toolkit should be a well maintained Visitor Register. A register of visitors to your property can be complemented by use of the Visitor/ Staff Risk Assessment form to aid identification of high risk movements. Visitor Register and Risk Assessment templates can both be downloaded from the Toolkit section of the Farm Biosecurity website

Production (farm management) practices

You can reduce the risk of spreading pests and diseases by implementing simple biosecurity measures as part of your everyday farm management practices. Matters to be considered under this heading include but are not limited to:

- **Fencing** - ensure fencing, particularly boundary fencing is in good order. Work with neighbours to resolve any boundary fencing and straying stock issues.
- **Vaccinations and drenching** - keep records of all animal treatments to ensure a herd health history and information on any changes. You should ensure that your own and your workers' tetanus immunisation status is up-to-date. Shearing time in particular may pose a greater than usual tetanus risk when handling large numbers of animals/fleeces.
- **Quarantine** or dedicated areas should be maintained for introduction of new stock (purchased or on agistment), and for stud stock visiting for joining purposes.
- **Chemicals** should be stored and used appropriately and records kept of all chemical use on farm.

Feral animals, pests and weeds

Feral animals, plant pests and weeds are a widespread nuisance and can harm your business, so they need to be actively controlled.

Wildlife and feral animals can mix with your livestock and cause disease. Work with neighbours in developing a control plan for unwelcome vermin including pigs and foxes.

Weed species are significant biosecurity problems in their own right, as well as having the potential to make livestock sick (e.g. Patterson's curse, St John's wort, fireweed).

Property and land destruction through fire, flood, storms etc can provide an opportunity for pests and weeds to become established, and for feral animals to enter. To ensure this does not become an issue, regularly inspect your property for the presence of diseases, pests, weeds and ferals, particularly any areas that have been recently landscaped (e.g. new roads or dams) or affected by flood/fire resulting in damage to fences, etc.



Patersons Curse (inset)

St John's Wort

Farm outputs

You have a responsibility to ensure things that leave your property do not pose a biosecurity risk.

The measures in place on your property support biosecurity in the industry and broader community. You have an important role to play in protecting your region, the alpaca and other livestock industries from biosecurity threats.

Within a region, every farm may be affected in the event of a pest incursion or disease outbreak. Good biosecurity practice will help protect your reputation and your business. Things to consider and manage when moving animals off your property include:

- If the animals are showing signs of disease, don't spread it further;
- Ensure animals are fit for travel before loading;
- Keep a record of where your stock have gone;
- Supply a National Vendor Declaration (NVD) and stock health statement where applicable;
- Seek advice from your vet on the best way to assess livestock health;
- Be aware of cleaning and hygiene practices of transport providers;
- After taking animals to shows and sales, isolate returning stock for 10 days. This will allow time for anything they may have picked up to show symptoms/signs and thus mitigate the risk of transferring disease to your other stock.

Train, plan and record

You should ensure everyone who works on your farm is trained in regard to biosecurity risks and responses, and also that you can trace where animals, plants and visitors come and go. Keeping good records of training, animal or feed or water purchases, sales and movements is an essential component of farm biosecurity.

Regular monitoring of your property, crops and/or livestock gives you the best chance of identifying a new pest or disease before it becomes established on your property.

Make sure you are familiar with common diseases, pests and weeds so you can tell if you see something different. Seek out expert assistance if required. Promptly report anything unusual or worrying to the appropriate authorities (e.g. relevant primary industry department, local council or livestock health and pest authority).

A property owner or manager should be able to 'trace back' and 'trace forward' if there is a disease, pest or weed incursion on the property.

A biosecurity action plan will help you prioritise the implementation of biosecurity practices relevant to your property. After you have ranked your priorities, you may also like to consider which ones you can achieve in the short and long term.

As a guide, short-term activities can:

- be planned and conducted within 12 months
- help your business comply with regulatory requirements
- be financially feasible in the short-term
- fit in with the time commitments of your enterprise.
- On the other hand, long-term activities:
 - are planned and conducted over more than one year.
 - need additional financial or personnel resources that are not currently available.
 - enhance the overall quality of service, aesthetics and reportable administrative procedures.

To further assist you in developing your farm biosecurity action plan, a useful acronym to remember is "SMART" - i.e. actions to be taken should be Specific, Measurable, Achievable, Realistic and Timely.

S.M.A.R.T

While the discussion above covers many of the issues alpaca owners should be aware of and consider, it is by no means complete. For more details on how to compile a biosecurity action plan for your farm, see www.farmbiosecurity.com.au. While the concept of implementing farm biosecurity may seem burdensome at first, once thought through and actions prioritised as suggested above, they should readily fit in to your farm/property routines.

Biosecurity not only protects your investment and business but is every alpaca owner's responsibility. As recent experiences with communicable diseases in human as well as animal populations have shown, there's no room for complacency when it comes to biosecurity.

The 3 Amigos

Phosphorus, Calcium & Vitamin D

By Dr Jamie McNeil - 2020

At the time of originally writing this article in 2005, there was misinformation circulating about how best to manage the common finding of low phosphorus levels in Australian alpacas. Scientific research was being ignored, alpaca owners were receiving incorrect treatment advice and animal welfare was being compromised. As a vet who was dealing with large numbers of alpacas, I wrote this article to get the correct information back in the hands of the breeders. Fast forward 15 years, where we now have alpacas that struggle even more to get sunlight onto their skin due to selectively breeding for dark fleece colours, increased fleece density and coverage. This article is potentially even more relevant today than it was in 2005.

The key issue in this discussion is to understand that phosphorus has some very close relationships with calcium and in particular Vitamin D. Just looking at one without considering the others can lead to some incorrect conclusions; one must truly take a wider look to get the right answers.

The Relationship between Phosphorus, Calcium & Vitamin D

The body needs calcium and phosphorus for many essential functions and chemical reactions in the body. Most obviously calcium and phosphorus are essential in bone formation. Calcium and phosphorus levels in the blood are controlled by a complex situation involving many hormones such as vitamin D, calcitonin and parathyroid hormone. These hormones change the level of calcium and phosphorus in the body by

Increasing/decreasing the amount absorbed by the intestine
(or excreted in faeces)

Increasing/decreasing the amount being excreted in urine

Increasing/decreasing the amount of each in bone.

From our point of view, vitamin D is of the most importance if we want to influence the calcium or phosphorus levels as none of the other hormones are readily available to administer.

Vitamin D – Background

Vitamin D is a fat soluble vitamin whose main action is to increase the amount of phosphorus and calcium that is being absorbed by the intestine. In normal animals, vitamin D levels are achieved by oral consumption or by a chemical reaction that occurs from sunlight (U.V. light) hitting the skin. Vitamin D occurs in many forages but is naturally highest in sun dried feed such as hays. It is important to note that lush green feed such as grasses contain chemicals that may decrease the amount of vitamin D available to the animal. This then puts a much greater emphasis on the ability of the animal to make its own vitamin D to meet its daily needs. Scientific research has shown that alpacas struggle to perform this chemical reaction very well leaving them very susceptible to phosphorus deficiency. Without adequate vitamin D levels, very little phosphorus will be absorbed from the intestine and the animal will suffer low phosphorus levels. Therefore to achieve necessary phosphorus (as well as calcium) levels in the body, alpacas need to have both adequate phosphorus (and calcium) intake and suitable vitamin D levels at all times of the year.

Vitamin D, Phosphorus & the Research

Alpacas have long been shown to have trouble maintaining adequate phosphorus levels in their bodies. Fowler back in 1990 described a rickets syndrome in young alpacas and llamas, 3 to 6 months of age. Affected cria presented showing decreased growth rates, a reluctance to move, shifting or varying limb lameness and joint enlargement, most commonly in the front carpus or “knee” joint. The only consistent clinical finding was that the affected animals had low blood phosphorus levels.

Fowler assumed that since the cria were still suckling that they would be getting enough calcium and phosphorus from the milk (rickets is due to either low blood levels of calcium, phosphorus or both). He also assumed that there would be enough Vitamin D being produced from the action of UV light on the skin and hence made an untested conclusion that the low serum phosphorus levels and subsequent bone abnormalities were due to inadequate phosphorus intake.

A subsequent study by Fowler in 1992 demonstrated that phosphorus supplementation significantly helped “rickets-affected” animals but failed to alleviate the problem altogether. This suggested that phosphorus deficiency alone did not adequately explain the changes and clinical signs being seen in these crias. Also supporting this conclusion is that in neither of these investigations was the author able to identify a particular dietary reason why these animals should have an inadequate phosphorus intake. In fact Fowler himself found that the best supplement to increase phosphorus levels in the affected alpacas was one that contained both phosphorus and vitamin D. Supplements with very high phosphorus levels but no vitamin D did not raise the blood levels of phosphorus as much, demonstrating that both were missing from the diet. It has since been shown by another researcher that just increasing phosphorus intake in alpaca showing signs of rickets does not increase the phosphorus levels as would be expected unless extra vitamin D was also given to the animals.

Dr Brad Smith undertook 3 more significant studies in 1994, 1995 & 1996 which followed on from Fowlers earlier work. In the first of these studies Smith looked not only at blood phosphorus levels but also at blood vitamin D levels. Interestingly, he found in one of these studies that alpacas showing signs of rickets not only had lower phosphorus levels but had over 10 times lower vitamin D levels as well. In the second of these studies he showed that alpacas maintained on a set, well balanced diet showed variation in blood vitamin D and phosphorus levels which were related to the seasons i.e. lower in the low sunlight periods and higher in the sunnier months. Again this supports the importance of vitamin D as the major limiting factor because phosphorus intake was stable. The third study looked at the most suitable levels of vitamin D supplementation required to achieve the necessary body phosphorus levels. Within Australia similar work has been done in 1996 and 1997 which demonstrated the marked seasonal variations in vitamin D levels in alpacas in southern Australia and investigated the required amounts and frequency of vitamin D supplementation to maintain optimum health.



Normal Alpaca Phosphorus Levels

In alpacas we like to see a blood (or more correctly serum) phosphate level in excess of 1.5 mmol/L. Ideally levels of 2.0 mmol/L or above are preferred. Some laboratory reports have normal ranges extending to as low as 0.6mmol/L which is well below the level where clinical signs of rickets can be seen.

The normal phosphorus levels in an animal may vary with the following factors and so they should be taken into account when investigating alpaca blood phosphorus levels

1. **Age** - In normal animals, phosphorus levels will be highest when young then decline rapidly until about 12 months of age at which time they should remain at a constant levels.
2. **Pregnancies +/- Lactation** - These animals have a higher requirement due to phosphorus being lost in milk and being used to form the skeleton of the developing cria. This may lead to lower blood levels
3. **Season** - Higher blood phosphorus levels are seen in the late spring and summer months due to the increase in sunlight (U.V. radiation)
4. **Digestive Upsets such as diarrhoea** - Animals that suffer from intestinal problems can suffer low blood levels of phosphorus due to decreased absorption from the diet & losses into the gut. Common to see low blood phosphorus when alpacas are suffering significant worm burdens
5. **Kidney failure** - Animals with kidney disease will often have very high phosphorus levels as the kidney cannot remove it from the blood stream for excretion in the urine

Phosphorus levels are often used as an indirect “rough” guide to blood vitamin D levels (blood phosphorus is a relatively cheap and simple test whereas blood Vitamin D testing is at least 5 times more expensive and sample collection is more complicated).

Signs of Phosphorus Deficiency

As has been discussed, one of the major signs of phosphorus deficiency is a condition known as rickets. This basically is a situation where the bones are not growing properly because there are insufficient amounts of the raw materials (calcium, phosphorus or both) available to make them. Rickets tends to be a more significant problem in young, growing animals. In mature animals one of the major signs of phosphorus deficiency is anaemia or low red blood cell count. Other signs such as weakness and weight-loss are in part due to the anaemia. This anaemia is due to the red blood cells bursting and one of the other major clinical signs is the presence of



very dark (port coloured) urine due to the large amount of blood cell breakdown “bits” being excreted out of the body. In domestic farmed animals this condition is rarely seen anymore due to the large amount of superphosphate which is applied to pastures (super has heaps of phosphorus in it). In the few cases I have seen in dairy cattle, the disease progresses quickly towards death often despite phosphorus treatment. Death occurs due to the loss of blood due to the ruptured blood cells. In mature animals, phosphorus deficiency appears to be reasonably well tolerated and many animals show very little obvious signs. Therefore the signs discussed above are generally reserved to cases where phosphorus levels are very, very low.

Vitamin D Supplementation

It is generally scientifically accepted that alpacas do require vitamin D supplementation. Studies in the US and Australia have shown that a dose of between 1000-2000 IU D3/kg bodyweight is the necessary amount (D3, often written as Cholecalciferol D3, is a type of Vitamin D). It has also been suggested that in southern Australia that such a dose (1000 IU D3/kg bodyweight) be given to crias in late autumn and again in midwinter and to adult females in midwinter. It is my opinion that this suggestion is a bare minimum and that some alpacas in southern Victoria require additional doses of D3. Animals at greatest risk are young, growing animals often with dark and/or dense fleeces. I do see many animals that despite following the above recommendation struggle to

maintain adequate phosphorus levels and do benefit from a intensive vitamin D dosing regime. Occasionally, I will also use injectable phosphorus as well but normally only if an animal is truly showing signs of rickets. The above finding suggests to me that there may be a genetic influence with some animals being better able to manufacture their own vitamin D than others. I also feel that the genetic improvement in the Australian alpaca fleece particularly the emphasis on density may also be a cause of why traditional vitamin dosing regimes fail on some farms.

Vitamin D can be given in either injectable or oral forms. In principal I prefer oral dosing as it is more natural as the body can pick or choose whether it wishes to absorb it or not versus injectable which gives the body little choice on absorption. Oral dosing is far more labour intensive so we often focus this on the most susceptible age groups i.e. young, growing or clinically affected.

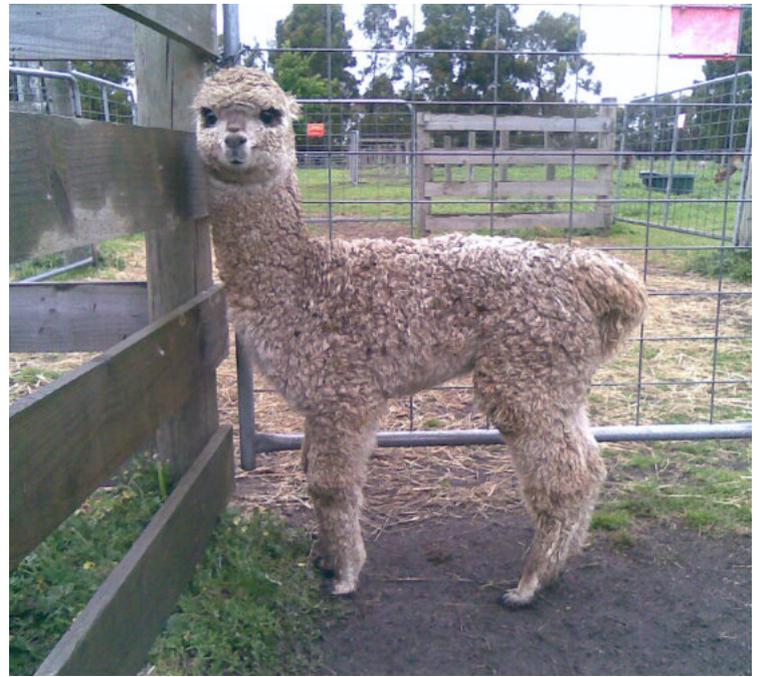
Phosphorus Supplementation

Animals that are on good pasture from well fertilised soil are at a low risk of being truly phosphorus deficient. Maintaining adequate Vitamin D levels will ensure ample phosphorus is absorbed from the intestine. If unsure of pasture phosphorus levels then soil and pasture testing can be undertaken to determine status. Many of the commercial feed supplements contain phosphorus as well. Phosphorus injections are also available if deemed necessary in cases where increased levels

are required rapidly. If phosphorus injections or supplements are used then ensure that adequate Vitamin D is also being given concurrently.

What should you do if you wish to investigate phosphorus/ Vitamin D issues on your property?

1. Undertake a soil and plant tissue test with a reputable soil testing company to obtain baseline information on phosphorus availability on your property. Embarking on a planned soil fertility program is far more cost effective than individually trying to supply each animal with this and that. Remember true phosphorus deficiency in animals that have incredibly high needs for phosphorus, such as dairy cows, is virtually unheard of on improved pasture.
2. Speak to your veterinarian about the logistics of blood testing for either phosphorus (cheaper) or vitamin D levels (dearer). To gain maximum information it is prudent to test a wide range of animals young and old, growing and not growing to see if it truly is having any effects on your animals. You need to work out if it is a herd problem or an individual animal problem.
3. Seek advice from your vet about vitamin D supplementation programs for your animals in your area. Advice can also be sought about appropriate ways to supplement phosphorus if testing shows it is limiting on your property.
4. Consider phosphorus/vitamin D problems in young animals that do not appear to be growing well. This is the major group where the problem, if present on your property, will present. If phosphorus deficiency is only seen in occasional animals but other animals test normal consider increasing vitamin D supplementation to just the affected animals and monitor results.
5. Do not put all your eggs into one basket! Vitamin D/ phosphorus deficiencies will not explain all your health problems. Ensure that you and your vet approach any health issue with a broad mind to enable the correct diagnosis to be made and appropriate treatment instigated



This animal exhibited short stature



Above and below - enlarged carpal joints and failure to be able to fully extend the carpal joints



Dr McNeil is a practicing vet at Korumburra – Kooweerup Veterinary Clinics 7-11 Langham Drive Korumburra Vic 3950

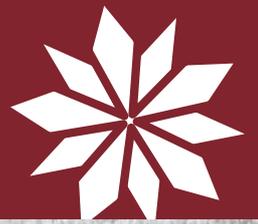
Snowman

WREATH

By Angela Smith – One Tree Hill Alpacas & Black Wattle Alpaca



Materials Required:



4 pieces of felt cut into pieces as shown in the image

Sticks from the garden that resemble arms

A handful of low micron* white Alpaca roving

Two small pieces of Alpaca roving – one black and one orange

Three small buttons

Two polystyrene balls – 5cm & 4cm

A cane wreath

A length of ribbon

Approx. 15cm length of wire

Assorted Christmas decorations and embellishments

*Low micron alpaca felts quicker and easier than higher micro fibre using wet felting techniques.



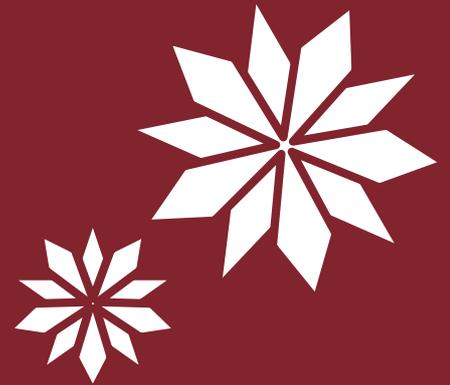
Tools Required:

Scissors

Hot Glue gun (Low Temp) with extra glue sticks

Dishwashing liquid

Felting Needle





TO MAKE THE SNOWMAN

1. Using the white Alpaca roving, dishwashing liquid and a small amount of water, felt the roving over the entire surface of the polystyrene balls (using wet felting technique).

Set aside to dry.

Once dry, use the hot glue gun to join the two felted balls together. Place them aside.

2. To make the hat, run a bead of hot glue along the top long edge of the rectangular piece of black felt. Use this to adhere around the circumference of the smaller black felt circle, in cylindrical shape, overlapping and joining with hot glue the short edge of the rectangular piece. Run another bead of hot glue around the bottom long edge\circumference to adhere the larger base circle of black felt in the centre.

3. Using your sharp, pointy scissors, cut a small cross into the base of the finished top hat's felt, to allow the hat to sit slightly over the snowman's spherical head. Hot glue the top hat to the smaller 4cm felted head at a slight angle.

4. For the arms, poke\cut a small hole through the fleece on both sides of the larger 5cm body sphere. Squeeze some hot glue into each hole before pushing the sticks in until they pierce the foam core..





TO MAKE THE WREATH

Use the wire to secure the snowman into position on the wreath, using hot glue to add strength.

Using your Christmas embellishments, wrap, tie and glue a selection of items to the cane wreath to suit your desired aesthetic, taking care to disguise the points of glue where possible.

If you can find the wired + balls/berries + decorations, they are perfect for wrapping around the full wreath.

Adding small bells strung by ribbon also make a great addition to the final product, especially if being hung on a door.

Finally, wrap and tie the length of ribbon to the top of the wreath as your hanging point.

Snowman

5. Hot glue the three buttons selected into position down the front of the snowman's belly.

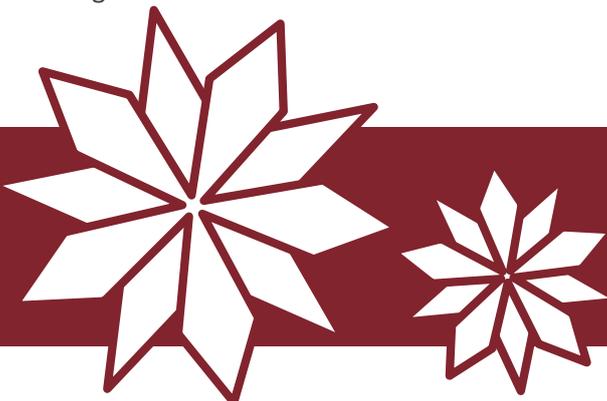
To decorate the face area, use the needle felting needle to felt in two small black eyes from the black roving and a small carrot like piece of the orange roving as a nose. You may also wish to take an additional small piece of the black roving to felt a smile, mouth or expression.

Wrap the small green piece of felt around his neck and tie off as a scarf. A spot of hot glue can also assist in holding the scarf ends in a particular\desired location.

Lastly, poke\cut a small hole through the fleece on the bottom of the larger 5cm body sphere. Squeeze some hot glue into the hole before pushing the wire length in until it pierces the foam core. This will be used to secure him to the wreath. Set aside and ensure all hot glue is dry before constructing the wreath.



WREATH





Australian Alpaca
ASSOCIATION

Why become a member?

As a member of the AAA you'll have access to:

- specific member-only resources
- a broad support network of more than 1,200 members, who share your passion for alpacas
- experts who understand the industry and are dedicated to exploring opportunities and helping you succeed
- the tools and resources you need to develop your herd to its greatest potential and enjoy the many benefits of these unique animals.

With a range of membership categories to suit your interests and stage in the industry, join today and enjoy all that membership of the AAA has to offer. Visit www.ealpaca.com.au/join.

Building a
successful and
sustainable
alpaca industry
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www.alpaca.asn.au

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VER News

VER Service Recognition Awards

VER Service Recognition awards and AAA Certificates of Appreciation were presented to the following members for their valuable contribution to our industry:

20 Year Service Recognition Award - Joy Skinner has been a AAA member since 1994 and has been a VER committee member since 1998. Her commitment to the running of shows has been greatly appreciated by all involved.

10 Year Service Recognition Award - Lezley Golding has been a AAA member since 2002 and joined the committee in 2010. An active member of the Task Force, Lezley placed her stamp on many spectacular events.

10 Year Service Recognition Award - Chris Pendlebury has been a AAA member since 2008 and also joined the committee in 2010. Chris with her team have run the Lardner Show for the past 5 years.

Our congratulations and thanks go out to Joy, Lezley and Chris for their significant support of the VER.



VER Best New Breeder Award

The VER Huacaya Best New Breeder Award 2019/20 and the winner of the Dianne Condon Memorial Trophy is Talpacka Alpacas – owned by Lynne, Tieran, Annalie and Tamaryn Kimber. Talpacka are based in the Yarra Ranges and have been an active participant with the Victorian Alpaca Youth and more recently commenced showing their alpacas. They are breeding both suri and huacaya and we look forward to their presence in the show ring in the future.



< Lynda Holdsworth and Julie Blake holding the Lyla Fisher and Keith Turner Memorial Trophies

VER Alpaca of the Year - Suri

The VER Suri Alpaca of the Year 2019/20 and the winner of the Keith Turner Memorial Trophy is Chakana Blue Chemistry – owned by Julie Blake of Chakana Blue Alpacas

This is the 7th year in a row that Chakana Blue has been awarded VER Suri Alpaca of the Year.

Chakana Blue Chemistry pictured below



VER Alpaca of the Year - Huacaya

The VER Huacaya Alpaca of the Year 2019/20 and the winner of the Lyla Fisher Memorial Trophy is Goldleaf Lyrical Song pictured below - owned jointly by Lynda and Nic Holdsworth of Auravale Alpacas and Brett Fallon of Goldleaf Alpacas.

This is the 3rd year in a row Auravale has been awarded VER Huacaya Alpaca of the Year.





WA Region

“You Be The Judge” Extravaganza



2020 has been a difficult year across the world due to Covid-19 and restrictions placed on gatherings has made it difficult to hold events and engage members. WA Region decided to run a mock show with participants judging the animals with an overseeing judge on hand. The concept was to give members an insight into the setup and running of a show, as well as a rare opportunity for a “hands on” judging experience.

Animals were entered by exhibitors prior to the show, and a mock catalogue generated. Once the alpacas were penned by exhibitors the first portion of show day was dedicated to the ‘why’s and how’s’ of setting up and running a show. This included budgeting, facility choice, insurance requirements, judge selection and a general explanation of why things are done in a certain way.

Jenny Jackson was the Overseeing Judge for the day, and had the final say in placings. Sophie Stacey as Chief Steward helped guide participants along the way. Recognition was given to Jenny's vast experience, and the fact that a judge takes time away from their life to add value to the industry, and more specifically each event, such as this show.

“You be the Judge Extravaganza” attracted 50 animals, 25 participants and 14 ‘judges’ for the day, including 4 youth

participants, who were well supported by members to have a go.

Each section of the show was judged by a paired couple. The sections allocated to each pair was listed in the catalogue, based on request made on the entry form. Jenny would then oversee and provide whatever support the participants required or requested, thus catering for all skill sets. Ribbons and championships were given, with Jenny giving orals on the classes. Some of the more confident participants gave their own oral reasoning. Each section judge was awarded a ‘Champion Prize’ for participating and these prizes were kindly provided by the participants themselves.

During the judging process, Jenny spoke generally and specifically about many aspects of alpaca, shows and judging. A myriad of topics was covered, imparting a wealth of knowledge to attendees.

We hope as an organisation we can run similar events in the future, showcasing alpacas, and engaging members both old, new and potential.



Interim President's Report

Excitement is increasing as we approach the largest fleece show to be held in Australia during 2020. The Fleece Challenge is to be held over the weekend of 5 and 6 December with live streaming on the final day. Judge Natasha Clark will explain the traits of the Champion fleeces selected from the 411 entries. This is promising to be an amazing event with “the best of the best” competing for the broad ribbons. A special “thank you” is extended to the joint convenors of the Fleece Challenge Paul Haslin and Lyn Dickson, who are both Life Members of the AAA. The show would not have been possible without the support of the many volunteers who have rolled up their sleeves to make this show a success along with the generous sponsorship of so many who continue to support our industry. Thank you to one and all. Thank you to one and all. Check out the Fleece Challenge Facebook page to see the results <https://www.facebook.com/AAAFleeceChallenge>

Events such as the Fleece Challenge would not be possible without volunteers. The success of the AAA is underpinned by our Members who contribute in so many ways., and the Board thanks each and every one of you for your ongoing support.

The last 12 months has thrown many challenges our way what with the drought, an unheard-of fire season, floods and COVID 19 – issues that have impacted on members personally, at a regional level and the company in general. It has been heart-warming to hear how members have rallied together to support those adversely affected.

The lack of shows in 2020 has had a significant impact on our industry. Whilst many have expressed disappointment in not being able to exhibit their latest generation of genetics, I have found it very re-assuring to hear so many express a disappointment in missing the social side of our industry. The words “missing my alpaca family” have been used frequently. It has never been more important than now, to nurture the “family” aspect of our industry.

As we all eagerly wave goodbye to 2020, I encourage everyone to tap into the “alpaca family spirit” and collectively work together to overcome any challenges put before us in 2021.

I feel very confident in the future of our industry as I hand over the reins to Brett Fallon as our new President.

Prue Walduck - Interim President.

UPDATE - WINNERS ANNOUNCED



Supreme Champion Huacaya Fleece - Monga Chalina

Exhibited by Monga Alpacas

Champion Senior Huacaya Fleece

Champion White Huacaya Fleece



Supreme Champion Suri Fleece - Bedrock Charisma

Exhibited by Bedrock Alpacas (WA)

Junior Champion Suri Fleece

Champion White Suri Fleece



The Australian Alpaca Association Ltd have historically not been the best at articulating the value of their membership, nor what they do on behalf of all alpaca owners in Australia.

For everyone's benefit, including non members, there is alpaca care information readily available on the website.

Some of the key member benefits, that are driven by the strategic direction of the AAA Ltd, also have good cross benefits for the industry as a whole. Examples of these include;

- AAA Ltd is recognised by the Australian Government as the peak industry body for the alpaca industry in Australia. This advocacy to government provides the voice for the alpaca community to government and other policy makers regarding agribusiness development. In recent times it has included consultation on transport and export guidelines, parameters and legislation.
- Membership of Animal Health Australia and close relationships with other livestock peak industry bodies.
- Industry representation to other corporate bodies, such as media, retailers and animal welfare groups.
- Close liaison with international alpaca associations to progress the international industry.
- Alpaca industry marketing in its entirety. It is recognised by the AAA Ltd that there are many different aspects of the industry, including alpaca products, alpaca business opportunities, agri-tourism, and finally, yet not to be underestimated, the lifestyle investment.

Some of the attributes of what the AAA Ltd does are more specialised for Members. These include, and are not limited to the following;

- Ongoing investment in alpaca research, development and extension. Currently the AAA Ltd are working on the research strategic plan, but this investment is on all levels, with the Richard Dixon Sponsorship a current opportunity for any Veterinary Science student projects.
- In-depth animal health information. The most current and reliable animal health, welfare and biosecurity information is regularly updated on the Members Portal of the website.
- Regional network with local expertise and access to mentors.
- Social and networking opportunities. Events for the whole family, with inclusive culture irrespective of age, gender, race, LGBTQI or disability.
- Access to member information and events. These include regular educational workshops, such as the recent webinars with Dr Kylie Munyard and Dr Jane Vaughan.
- Programs established and funded to encourage Youth participation in the industry.
- The ability to benchmark your breeding program through showing of animals and fleece with access to local and international judges
- Marketing support material. An example of progress made in this area is the supply chain and marketing initiative, Guaranteed Australian Alpaca swing tag.
- Biosecurity program development and maintenance. For example there is an improved version of QAlpaca being worked on currently.
- eAlpaca which provides an alpaca registry, alpacas for sale, show results and breeding predictors
- Regular communication via the AAA website, member update newsletter and social media channels (eg Facebook, Twitter)

POISONINGS IN ALPACAS

Part 1 – Pasture and Weeds

By Elizabeth Paul - Erewhon Alpacas

Ragwort

Historically in Australia, large scale poisonings of domestic farm animals such as cattle and sheep usually occurred during droughts, when large herds were being walked to new areas looking for feed. Since they were not yarded, it would have been difficult to quickly move a large flock of hungry or thirsty animals on from undesirable grazing areas or contaminated water sources before losing a number from poisonings.

Alpacas are usually kept on relatively small acreages and are not usually walked off farm in large groups. Their feedstuffs and water supplies are more or less carefully monitored, so large scale poisonings of the type above are less likely. Nevertheless, they are bought, sold and agisted around the country, and there is potential for poisonings on farm from noxious weeds, pasture, and garden plants.

The two most well known and most important types of poisoning in alpacas are ryegrass staggers and facial eczema. In both of these types it is not the plant itself which is toxic, but rather the toxins coming from fungus growing on the plants.

RYEGRASS STAGGERS

Ryegrass staggers is caused by an endophyte fungus, *Acremonium lolii* which is often applied to the grass seed to help reduce insect attack and therefore increase plant growth rates. The fungus produces toxic spores which accumulate around the base and seed heads of the grass. In

humid weather, or when the pasture is new ie short, or eaten down low, or seeding, the toxins from the mass of spores may overwhelm the animal's nervous system. The symptoms are head nodding, staggering, injuries due to loss of coordination, inability to rise, and loss of condition. The animal must be taken off the affected pasture into dry yarding and fed only dry hard feed and "old" hay, as freshly cut hay/greenstuff from the same paddock is still toxic. The animal may be supported with various nutritional supplements, but even if it recovers, it may always show slight nodding/incoordination, especially when under stress. Animals vary in their response and some may be more resistant than others to the effects of the toxin. There are low/no endophyte varieties, and mixed species pastures would have fewer problems than pure ryegrass. Note endophytes on other grasses may also induce staggers reactions.

FACIAL ECZEMA

Facial eczema is the second important fungal toxin disease. It is more common in New Zealand, but has occurred in parts of Australia as well, particularly in irrigation areas. It affects all grazing species but camelids and deer are most strongly affected. The fungus which causes FE is called *Pithomyces chartarum*. The spores contain a toxin called sporidesmin, a potent liver toxin which also damages the bladder, and reduces milk yield. It causes photosensitization by blocking the bile ducts, which has the effect of putting bile salts into the system; the animal becomes jaundiced and then

develops reddening, irritation and sloughing of exposed or light coloured skin areas, such as white faces or patches. The fungus produces more spores in dull cloudy, humid weather, and the spores mass in the dead litter and lower down on the grasses. This is less of a problem when the grass is longer or with light grazing pressure, but when feed is short or the animals eat the pasture down too low under these conditions they will ingest a higher spore load. Affected animals must be shedded and supported with zinc supplementation. Again, animals vary in their response, some may die quickly, others may be less obviously affected initially but show decreased productivity or die later on when other stresses are involved, such as breeding.

Control of FE is best achieved with regular pasture spore counts in areas known to have this problem, and noting when likely weather conditions occur. Stock can be moved off pasture, and/or have zinc supplementation added to their diet. Note that other weeds also cause photosensitization, in particular Paterson's Curse, ragwort, heliotrope and St Johns Wort.

GRASS TETANY

This is caused by a lack of magnesium, which produces severe nervous symptoms, and animals may have injuries due to incoordination, or go into convulsions and die quickly. Affected animals, particularly cows are often found dead in the paddock with signs of thrashing around them. Mature lactating mothers are most susceptible due to the drain of their magnesium levels through milk production. It is more of a problem on grass dominated pasture with lush new growth that is low in magnesium. Legume dominant pastures have more magnesium available and are less of a risk.

A badly affected alpaca is difficult to treat and may not survive. It must be removed from the pasture, a difficult procedure in itself as the alpaca is highly stressed, and shedded in a quiet place with as little disturbance as possible. It may need to be sedated for a while as it will react violently to ordinary outside stimuli such as a barking dog or revving engine. It also poses a danger to the handler if it jumps wildly around or goes into convulsions. There are cattle and sheep mineral infusion packs available which can be used to replace magnesium, but a tetany animal needs long and careful nursing if it is to recover.

Prevention of grass tetany includes filling stock up a bit with good quality hay before letting them on to a new paddock, and bringing them off it after a few hours, repeated over a few days, thus allowing their gut flora to adjust to the new growth. Cattle may use magnesium licks, but alpacas are less likely to do so. Soil testing and pasture species should be investigated to help correct acidity, major deficiencies and seasonal nutrient availability.



PEM - polioencephalomyelitis.

A PEM event occurs when the supplies of thiamine, vitamin B1 to the brain and CNS are disrupted by toxins such as lead, or thiamine analogues or destroyed by the enzyme thiaminase. The animal may exhibit odd symptoms, such as head shaking, head pressing, having an "odd" or "stupid" look on its face, or randomly jumping sideways. It can go blind very quickly, which may show up as "star gazing", ie standing still with nose in the air and head tilted to one side; or pacing along a fenceline on its own, using the fence as a touch guide. It may stop at the corner but still keep trying to walk on. In later stages breathing is severely depressed. This is more obvious in a freshly shorn alpaca, where the ribs can be seen during deep and slow inspiration. Treatment involves immediate and continuous injections of large doses of soluble B1 until improvement is seen, which may need 200mls or more. Some alpacas with PEM have been caught in time, when owners have seen and recognized the early symptoms and been able to start treatment immediately, but in most cases if the alpaca is already blind it is permanent.

I have personally been involved with one grass tetany case and several PEM cases on friends' farms. The grass tetany alpaca was nursed for 3 weeks and survived. Of the PEM cases, 2 physically survived but were left blind. Another case was a large female, also blind, who had to be put down, as she was wrecking fences and could not be controlled. One of my own females presented as very ill, with high temperature, and testing showed she was suffering from severe kidney problems. It was decided that she must have been poisoned, but the source was unknown. She ultimately survived after intensive treatment but was later found to be blind, so she was probably also a PEM case. She was put back out with the herd, and managed for a while until a burst of bad weather, when she simply sat down and died presumably of hypothermia.

POISONOUS WEEDS

Plants produce toxic chemicals either to discourage grazing animals (no matter how many legs they may have) or simply as storage of metabolic waste chemicals which they cannot excrete as easily as animals do. Sometimes the storage chemical is not toxic itself, but releases the toxic principle when broken down in the acidic conditions of the gut, or by the gut flora. The most important ones are which cause rapid death include alkaloids, glycosides, oxalates, nitrate/nitrite, HCN/prussic acid and 1080/monofluoroacetate. There are also tannins, saponins and other chemicals which may cause allergic reactions, scouring, anaemia or photosensitization. Many of these chemicals are bitter to the taste, but stock will eat almost anything if they are hungry enough. Toxicity effects may be immediate or delayed, and vary depending on plant lifestage, seasonal differences, or whether the plant is fresh, or wet, or dried in hay. Weeds may also concentrate different minerals to toxic levels, eg copper, as well as depleting the soil and depriving other plants to their own advantage. The following weeds are probably the most significant, being most common and toxic to most stock.

BRACKEN - and assume all ferns.

Pteridium esculentum

Fam Dennstaedtiaceae

Bracken fern has long, tough, wiry stems, underground creeping rhizomes and dry, typical fern like foliage to about 1m in height. It is commonly seen along roadsides, under trees, on waste ground, and can invade pastures. Heavy bracken infestations cut down light and nutrients for useful pasture plants as well.

The most poisonous parts are the young fronds, called fiddleheads, along with the rhizomes or roots. Bracken causes both acute and chronic poisoning conditions and is carcinogenic. The poison affects the blood's clotting ability and depresses bone marrow activity, causing the animal to become susceptible to other infections. In mature cattle, and sometimes sheep, it causes redwater, a hemorrhagic condition of the kidneys; in horses and pigs it causes a nervous condition like staggers. Uncontrolled bleeding and susceptibility to other infections are features in cattle. As bracken poisoning also depresses bone marrow function, cattle can die up to 6 weeks after exposure, from other diseases. Bracken fronds dried in hay can also cause poisoning. Milk products from cows grazing bracken are also carcinogenic. Other fern species are also thought to be poisonous.

Bracken



Source: https://en.wikipedia.org/wiki/Arctotheca_calendula#/media/File:Arctotheca_calendula_2.JPG

CAPEWEED - and assume similar garden daisy types, also *Amaranthus* spp and young green oats.

Arctotheca calendula

Family Asteraceae

Capeweed usually grows as a flat rosette of broad leaves with yellow and black daisy type flowers. Capeweed has high levels of nitrate, which is broken down by ruminants to produce nitrite, which is then converted to ammonia, and passed out in the form of urea. This system can be overwhelmed with too much nitrate, leading to an excess of nitrite, which binds to haemoglobin forming methaemoglobin, and thus starving the animal of oxygen. The blood of affected animals is dark, even black. As a flatweed, capeweed may not be such a problem if there is plenty of other food available. However in dull cloudy weather it grows to a standing herb, making it more easily accessible, and the nitrate levels are much higher in dull conditions. Also nitrate levels may be higher shortly after a drought break. Deaths usually occur quickly but nitrate toxicity may become a chronic condition.

I have had an alpaca bought from SA who ate up flat capeweed plants in front of us, and then proceeded to dig up and eat the tap root as well, clearly he was used to living with capeweed back home.

RAGWORT - and Fireweed and Tansy.

Senecio jacobea

Family Asteraceae (prev Compositae)

This is a declared noxious weed in cooler high rainfall areas, particularly in southern Victoria, Tasmania, parts of SE NSW and South Australia. It is poisonous to all stock, and a particular toxic contaminant of hay. Native to Europe, it is associated with disturbed ground, and dense infestations can completely smother an area.

Ragwort is a biennial or short lived perennial herb, to 1.5m height, with small bright yellow daisy type flowers, and deeply divided leaves. The stems are green, ribbed, and reddish at the lower ends. The daisy like flowers are produced in terminal clusters. They produce rosettes in their first year then assume a more upright appearance in the second. The young plant looks very similar to tansy, (which is even more poisonous) except that the ragwort flowers have ray florets and look more like a miniature sunflower, while the tansy flowers are similar to billy buttons.

All parts are poisonous, especially to horses and cattle, causing poor appetite, constipation and jaundice, photosensitization and death by liver damage. Symptoms can be latent, appearing up to several months after ingestion. Ragwort is also poisonous when dried in hay and most poisonings appear to come from contaminated hay. The juices/pollen may cause allergic problems to humans as well, and gloves/mask should be worn if doing much handpulling of individual plants.

PATERSON'S CURSE (Salvation Jane) - and assume other Echiiums and heliotropes.

Echium plantagineum

Family Boraginaceae

Patersons Curse is a proclaimed noxious weed but is also used as drought fodder for sheep on marginal land. It contains pyrrolizidine alkaloids, causing liver damage, jaundice, photosensitivity and toxic copper build-up. It is more serious for horses and pigs, ie monogastric animals. Effects may be delayed until the second season after grazing, when the horse becomes dull, listless, loses appetite, and liver function becomes more compromised resulting in eventual death. Sheep and goats will graze it readily with less serious effects, and may be used to clear areas, but autopsies show that they also have some liver damage. Alpacas are known to eat Patersons Curse but there is little information on how it affects them.



Image Source below: Ypna at English Wikipedia https://commons.wikimedia.org/wiki/File:Echium_plantagineum_field.JPG

Patersons Curse

One Leaf CAPE TULIP - and assume other members of Iris family and Lily family

Moraea flaccida (prev *Homeria*)

Family Iridaceae

This noxious weed is a common pasture and roadside weed in drier areas. It has one long slender pale green leaf arising from a corm, and a six-petaled orange flower with yellow centre, occasionally seen as an all yellow form. All parts of the plant are extremely poisonous, even when dry, causing acute vomiting and diarrhoea, eventually paralysis and death. Toxic to cattle and sheep and very likely to alpacas.

AMARANTHUS - Red root pigweed and other amaranth species, Alligator Weed.

Amaranthus retroflexus

Family Amaranthaceae

Red root pigweed contains both nitrate and oxalate and is known to have caused alpaca deaths, but I am not sure whether this occurred in Australia or the US. There are several species, including garden varieties and a native species called boggabri.

Dried amaranth material is still toxic, so it can be a hay contaminant as well. Alligator weed has moderate amounts of oxalates and accumulates heavy metals, and is suspected of causing photosensitization in calves and lambs that have grazed it.



HORSETAILS

Equisetum arvense

Family Equisitaceae

Equisetums are a declared noxious weed. They are a nonflowering plant which has a creeping rhizome (root) and long needle-like leaves. All horsetails are very poisonous to stock, especially horses, and dried horsetail material can also contaminate hay.

SUGAR GUM and Manna Gum

Eucalyptus spp.

Family Myrtaceae

New young leaves that grow fast eg after bushfires are poisonous especially when wet, as the extra moisture enables faster absorption. Most deaths have occurred in sheep during drought conditions.

BLUE GREEN ALGAE

Blue green algae are single celled plants which thrive in warm, stagnant, low oxygen content water bodies. The algae "bloom" in a massive growth spurt and then die, releasing toxins called cyclic polypeptides into the water which can be fatal to drinking stock, or dogs swimming in it, and humans if they are unwise enough to swim in or drink the water. Mass poisonings of wild animals at waterholes have been recorded caused by this problem. The pond may become a sickly green colour (or other colours, mostly red) smelly, with scummy edges consisting of cellular remains of dead algae. Poisoned stock will die, but the rest may be saved if removed from the source as soon as possible. Ponds may need flushing, or for a small pond, aeration with a small pump and hosing can be used to quickly reduce the bloom. Vegetation belts grown around part of the water hole may help to reduce runoff contamination.

Sprayed Weeds

Be aware that weedicides often make the weeds more attractive and palatable to stock, and spray/grazing techniques are used mostly with sheep and goats, to clean up the weeds after a specified withholding period. This would be very inadvisable with alpacas. Cattle have been known to break through fences to get at recently sprayed paddocks sometimes with fatal results.

Poisonous fungi and toadstools are also likely causes of poisoning but would be almost impossible to identify as such.

Prevention Of Weed Spread

As part of their invasive techniques, weeds often seed profusely, or have burrs, or grow from vegetative pieces without seeds at all. The seeds or pieces are carried on to a property by new stock, vehicles and farm machinery, hay bales, feed bags, or boots. Hay should be checked for presence of weed species like ragwort, bracken and Paterson's Curse, and also checked for mouldy or smelly hay.

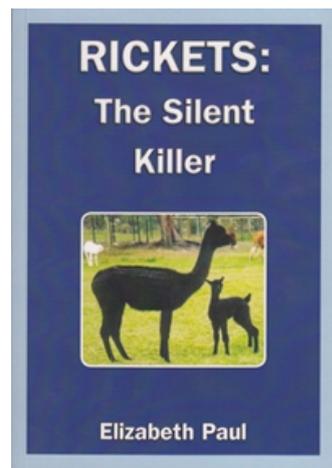
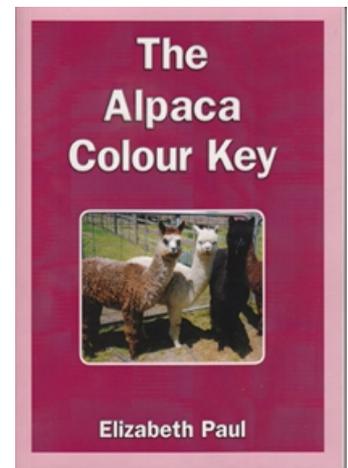
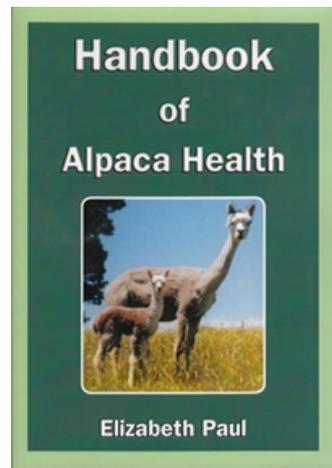
New stock to a property should be quarantined for at least 2 weeks, not only to be checked for illness/parasites, but also to be sure of them excreting seeds of potential weeds from their previous location. They may need shearing as well, to reduce the amount of seeds clinging to their fleeces.

Immediately before letting the new group out, fill them up a bit with a feed of plain hay so they are not too desperately hungry to try a new pasture, and give time for their gut flora to adjust to the different types of feed. Resident alpacas might be well aware that bush 'x' in the corner is not nice to eat, but a new group may not be so savvy, and might eat more of it than is wise.



Note that many weed and/or pasture poisoning problems are caused or exacerbated by disadvantageous farming practices which have led to degraded soils, unbalanced nutrient profiles and proliferation of weeds. Apart from being poisonous, heavy weed burdens contribute to lost agricultural revenue by also competing with more favoured pasture species, contamination of food/hay crops, fouling machinery and reducing fleece value. Improving pastures by soil testing for acidity, salinity and deficiency problems; soil aeration; application of appropriate fertilizers and trace minerals; and consideration of pasture mixes, stocking rates, tree belts and weather conditions, will have a longer term impact in reducing some of these problems than just "nuking the weeds" which adds a further problem to the environment.

Material drawn from the AAA Poisonous Plants List compiled by E. Paul 20/04/07, which is largely based on "Poisonous Plants of Australia" by Selwin L. Everist Revised Ed 1981 (1st pub 1974) Angus & Robertson.



The Alpaca Colour Key was \$30 now \$25.

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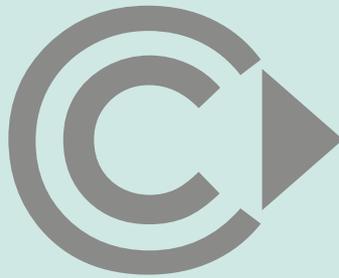
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