

PASTURES FOR ALPACAS IN SOUTHERN AUSTRALIA

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Introduction

Most alpacas in South America are now grazing on the Altiplano, which is over 3800m above sea level. It has a short growing season and 75% of precipitation falls between December and March, with a long dry period from May to October. However before the Spaniards invaded in the 16th century alpacas were found grazing over vast tracts of lowlands very similar to country of inland Australia. They only survived in the high altitudes because the air at these heights was too rare for sheep and cattle.

Alpacas live mainly on grasses in South America but they also graze sedges and rushes. Alpacas mainly eat the tall grasses in the wet season and short grasses during the dry weather.

Nutrient Requirements of Alpacas

The amount of food an alpaca needs is similar to a sheep. ie one dry sheep equivalent (1 dse)

Australian hembras average about 60-80 kg body weight compared with a merino ewe at 45-50kg. So 65 divided by 47.5 = 1.37 but alpacas are 37% more efficient at extracting energy and protein from low quality feed. This is because the digestion process takes longer in an alpaca. It takes 63 hours for food to pass through the alimentary canal compared with 41 hours for sheep. (50% longer than sheep and twice as long as cattle).

A dry hembra or wether weighing 65kg needs about 7 MJ (megajoules) of ME (metabolic energy) per/day. This could be fed entirely with about 1.3kg of hay/day that is one small square bale every 2 weeks. Jane Vaughan and Nick Costa (1998) say that better quality WA straws would meet this criterion for energy. Have any of you got any fat wethers?

Their protein is provided by micro-flora activity in the rumen. So make sure your alpacas have the right microorganisms in their stomachs. Alpacas are very good at maintaining a nitrogen balance because they can recycle urea in their saliva, they extract more urea from their stomachs than other ruminants and they excrete less nitrogen in their urine.

Mature alpacas can survive on 7.5% crude protein, while sheep and cattle require at least 12% protein in their diet.

Hembras in late pregnancy need one and a half amount times the energy (dse = 1.5) and lactating hembras twice (dse = 2) with 12-14% protein while weaned crias also need twice as much energy and 16% protein.

Alpacas eat grasses and forbs (rushes and sedges in Peru) rather than legumes. Pure lucerne hay with 20-25% protein is much too rich for them. For example, on improved pastures, sheep will eat at least 2.5 times more legumes than alpacas.

Fibre fineness can blow out even more for alpacas than merinos - up to 5-10 microns on nutritious pastures.

But the density of crias fleeces is strongly related to the nutrition of its mother in the last trimester of pregnancy and during the first three months after birth.

Nutritional Deficiencies are similar to sheep and cattle. Selenium deficiencies cause white muscle disease and abortions. However the alpaca in South America can eat bushes with very high selenium levels in the dry season. But be careful injecting selenium and vitamin E preparations with your inoculation as this has resulted in sudden death. Copper levels in alpaca livers are similar to sheep and they are sensitive to copper toxicity like sheep. Also if selenium and molybdenum are high, copper will be low. Zinc levels in alpacas are lower than sheep. Alpacas need phosphorus and calcium in the same proportions as other animals for bone development ie ratio of Ca: P = 1.3:1 is ideal.

Ask your local vet for advice about local soils and their deficiencies if any.

Remember that for healthy alpacas you first need to protect them from worms and diseases with the appropriate drenches, and inoculations and you need healthy soils with no mineral deficiencies. Fertiliser applications may be necessary and this is the best way to apply trace elements. The alpaca's tongue very rarely comes out of its mouth so mineral licks are not very useful.

Pastures for Alpacas

All grasses change in palatability and digestibility as they grow and set seed. ie when they are actively growing the digestibility of grasses are is about 80% and a wether would only need to eat 1-2 kg of dry matter/day but if the digestibility is down to down to 40% for dry weather damaged stalks of grass then 12-15 kg dry matter/day is needed.

So to provide the most nutritious pastures for your alpacas try to encourage a wide variety of grasses and forbs growing in healthy soils. Different grasses grow to different stages at different times of the year. For example

Summer perennial grasses - paspalum, kikuyu, couch, tall, tall fescue

Winter perennial grasses - phalaris, cocksfoot, perennial rye

All year perennials - several natives including wallaby grass - all native grasses are perennials

Annuals - barley- barley grass

Pasture Weeds for Alpacas

Weeds are "plants growing out of place". Even phalaris can be a weed if it completely dominates the pasture, prevents other plants from growing and causes phalaris staggers.

Poisonous plants - deadly nightshade, rock fern, bracken, fire weed, sorrel, (with oxalates), lantana, blue green algae, St Barnabys thistle, yellow burr, variegated thistle (nitrate poisoning), heliotrope, caltrop, thornapple, green cestrum, oleander, white cedar can all be poisonous and - many more which would frighten you to know. Even lush stands of kikuyu in autumn have been implicated. Snakes often get the blame. At Bonnie Vale we are in brown snake territory with two creeks and grain and hay storage to attract mice and therefore snakes but we have yet to have a snake fatality with over 2000 alpaca years of exposure. The secret is not to let your alpacas get too hungry and to provide them with a wide choice of suitable pasture plants.

Alpacas do not bloat; we have grazed them on pure lucerne stands in the spring. They do get bellyaches though and will die of pulpy kidney on lush pastures in autumn and spring if they are not inoculated with 5 in 1 vaccine (this lasts for about 3 months in cattle).

Weeds that out-compete more useful plants: Silverplants - silver grass (*Vulpia* spp) and phalaris both produce a toxin, which poison other grasses.

Weeds that contaminate or damage the fibre - Bathurst burr, medic burrs, barley grass, horehound, Paterson's curse, lesser joy weed, pitch forks and grasses which produce shives from seed awns. These are a nuisance for fibre processors because they are long and thin and they align themselves with alpaca fibre in the weave and they become obvious when they don't take up the dye.

Weed Control

First know your weeds and your useful plants. Unfortunately most people know their weeds better than their useful native plants.

For good pasture management it is more important to encourage the plants you want to grow than to concentrate on killing the plants that you don't want. Quite often when you kill the plants you don't want a worse weed will come in and take its place. Especially when you use a broad-spectrum knock down herbicide like Roundup (glyphosphate).

Pasture topping is used to help reduce your weed burden. Roundup (glyphosphate) at low rates ie 240-360mls/ha or Sprayseed 250 (paraquat + diquat) which is less severe on legumes, can be used to prevent seed heads developing on barley grass, annual ryegrass, silver grass, brome and capeweed. You must apply the herbicide before the weeds hay off. Read the label carefully.

Spray grazing - can be used to control broad leaf weeds control in clover pasture ie Paterson's curse, capeweed, mustards and turnips and thistles in winter with low sub lethal rates of hormonal herbicides like MCPA (the softest on legumes), 2-4,D (for sub clovers) or 2-4DB (with medics and lucerne) when the weeds are small. Better to use wether sheep or dry ewes as there is a risk of poisoning stock with the increasing quantity of poisonous plants that can be eaten eg caltrops, capeweed and variegated thistle. Read the label very carefully.

Tigrex and Jaguar remove brassica weeds.

Silver grass (*Vulpia* sp) can be removed with simazine in winter at about 1-1.6l/ha 6-10 weeks after emergence (usually about May) If you add paraquat (200ml/ha) this will help to control barley grass, brome and rye grasses or Fusillade® (softer on clovers). Again read the label carefully.

Dicamba (Banvel) controls many weeds in grass dominated pastures ie caltrop, horehound, docks, thistles, sorrel, wireweed, brassicas, deadnettle, thornapple, Bathurst burr and, khaki weed at varying rates from 700mls to 1.4litres/ha but will also remove useful legumes.

Goats and wethers can be used to remove some weeds especially thistles and Paterson's curse.

Fertiliser - Phosphorus, potassium and molybdenum all encourage legumes, while nitrogen fertilisers encourage grasses and some nitrophilous weeds like thistles and stinging nettles.

Making Hay and Silage can also be good weed control.

Competitive Pastures like phalaris and consil love grass out out-compete weeds.

Alpacas are reputed to be good at controlling some weeds ie wireweed caltrop, Paterson's curse, marshmallows and boxthorn.

Pasture Establishment

This can easily cost \$180/ha or more so plan it well in advance ie at least 12 months.

1. Select suitable species

Legumes should make up 20-40% of the cover with - white clover, lucerne, red clover, balansa clover, sub clover, (many varieties) and or chicory.

Grasses 60-80% with - phalaris, cocksfoot, tall fescue, perennial rye (guard variety which does not cause staggers) and native grasses like wallaby, weeping grass (*Microleana* sp), Warrego summer grass, wheat grass, red grass, or blue grass.

Ask at your local merchandise store for local advice and a suitable mix.

2. Seed bed preparation

It is important to have good tilth for your pasture seeds and poor tilth for your weed seeds. This is best done now with minimum tillage methods. Deep tillage may be necessary if the soil has a plowpan or compacted layer caused by livestock. Otherwise seed is best sown using sowing equipment with tynes and points or discs which provide adequate tilth for the pasture seeds and as little as possible disturbance to the ground surface, Presswheels should be used to provide the best soil seed contact if the soil moisture is marginal

3. Sowing time

Spring for summer grasses and autumn for winter legumes and grasses but the timing will depend on your climate soil type and position in the landscape so speak to your local agronomist.

4. Method of sowing

For minimum tillage methods you need to spray weeds in the winter for sowing in early spring. Alternately you can establish your pasture under a cover crop or establish your new pasture with a full disturbance of soil. See your local agronomist for advice.

Be sure to control pests like red-legged earthmites or you may be wasting your time and money.

5. Rates of sowing seed and fertiliser

Also check with your local rural merchandise agent, agronomist and neighbouring farmers.

6. Fertilisers

Severe deficiencies of sulphur and phosphorus occur across the entire Central West of NSW. Sulphur deficiencies are even more widespread and severe than phosphorus. Molybdenum is often lacking on light acid soils. This can be cured with an application of lime or molybdenum added to the super phosphate but watch out for copper deficiency if you use excessive amounts of molybdenum. Young growing animals are most susceptible to trace element deficiencies. Selenium deficiencies cause white muscle disease (lameness) often found on acid soils recently fertilised with super.

Even modest rates of fertiliser application eg 125kg/ha of single super phosphate can double pasture and animal production.

Do not graze nitrogenous fertilised paddocks for at least 4-6 weeks after application. The longer period if pasture growth is slow to prevent nitrate poisoning. This is why alpacas usually don't graze dung piles unless they are very hungry.

7. Accurate seed placing

Seed should not be exposed or buried too deep. Most pasture seeds are very small and need to be very close to the surface for successful establishment.

8. Weed control

Inspect regularly to determine whether post emergent weed control is necessary.

9. First grazing

Be sure to graze lightly because alpacas with their split lips can be very selective in removing valuable pastures.

Pasture Management

First find out what you have, what you want and what you need to encourage before you apply fertiliser or spray your pastures with herbicides.

Stock management

Only actively growing pastures greater than 10cms high (Phase II pastures) should be grazed for maximum productivity. Alpacas are hard on pastures with their split lips, even more selective than sheep.

Rest phalaris after establishment and graze it heavily in the winter and then spell it again around mid September to October.

With annual legumes graze heavily in the late summer and early autumn and then allow for germination usually about 6 weeks after the autumn break.

Spell native grasses when they are flowering and seeding down and graze when weeds are doing the same thing.

Pasture supply and demand requirements

Autumn quality deficit- often when weaning crias need quality pastures.

Winter quantity deficit- when pregnant females need energy for warmth.

Spring pasture surplus quality- shear to avoid contamination of wool and/ or make silage or hay to preserve the surplus quality feed.

Summer surplus or deficit- birthing, mating and lactating females need higher plane of nutrition.

Remember the cheapest, easiest and safest conserved feed is fat on the alpacas back.

Supplementary Feeding

Feed lucerne hay has twice as much calcium as white clover, 5 times more than ryegrass, cocksfoot and couch and 10 times more than oats. So if you use lucerne hay use a ratio of 3:1 oaten : lucerne hay

Desirable Condition of Alpacas

Mating machos and hembras score III. Unpacking III- IV

It takes about 2 months to gain one score when pasture quality and quantity is unlimited for alpaca growth.

See Vaughan and Costa (1998) for body score conditions.

Food Supply

Late pregnancy	3kg/day green feed
Lactating	4kg/day “ “
Maximum growth	5-6kg/day “ “

Will our pastures provide adequate nutrition throughout the year?

Probably not for actively growing cria, or pregnant, or lactating hembra.

If not how do we best supplement alpacas cheaply?

Use an oat/lupin mix (about 50% each) at about 500g/day for pregnant hembra and 1kg for lactating hembra for the cheapest supplement with free access to oaten/lucerne hay (75%:25%)

Feeding Supplements to Crias

Cria stomach reaches adult proportions by about 8 weeks and by about 12 weeks reaches full adult activity for breaking down fibre.

Feeding Cereals. Saliva flow in alpaca is much greater than sheep and this allows buffering against acids in the stomach. Also they have no gall bladder so bile is continuously from the liver. This increases efficiency of the stomachs and also protects against acidosis, during rapid fermentation which can occur with cereal diets.

Water Requirements

Crias need clean fresh water from 1 week of age. Allow 100ml/kg of weight or 5-7 litres daily for adults. Higher rates may be needed under extreme heat stress conditions.

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