MEAT & LIVESTOCK AUSTRALIA

Weed control using goats

A guide to using goats for weed control in pastures

Weed control using goats

A guide to using goats for weed control in pastures

Acknowledgements

MLA acknowledges the contribution made by the following through the supply of images and anecdotes which have contributed to and are contained within this publication:

- Schuster Consulting Group, NSW
- Dry Creek Farm, Mudgee, NSW
- E. Larsen, Herds for Hire – South Coast Goat Rental
- Leap Farm, Copping, TAS

Contact

Meat & Livestock Australia
Level 1, 40 Mount Street, North Sydney NSW 2060
Ph: 1800 023 100
mla.com.au

Published by

Meat & Livestock Australia Limited
ABN: 39 081 678 364
ISBN: 1 7403 6248 9
Reprinted with amendments May 2007 and July 2024

 MLA acknowledges the matching funds provided by the Australian Government to support the research and development detailed in this publication.

Contents

Introduction

Weeds in pasture greatly reduce the short- and long-term profitability of the pasture. The traditional methods of weed control in pastures are cultural, biological, chemical, mechanical or grazing. Not all control methods are necessarily effective or desirable.

Successful pasture management requires an understanding of the grazing component. Using goats to control weeds cannot only result in the production of high-quality goat meat and potentially fibre and milk, but also assist traditional weed control methods by providing efficient, sustainable pasture management when conducted according to best practice.

Further detailed best practice information for existing goat producers and those considering entering the goat industry can be found in the *Going into Goats* guide. The *Going into Goats* guide is a comprehensive publication, comprised of 12 modules written by producers for producers and is available from MLA.

How goats control weeds

Goats help control weeds by:

- preferentially grazing the weed and so placing it at a disadvantage
- preventing the weed from flowering and dispersing seed
- ringbarking or structurally weakening undesirable shrub species

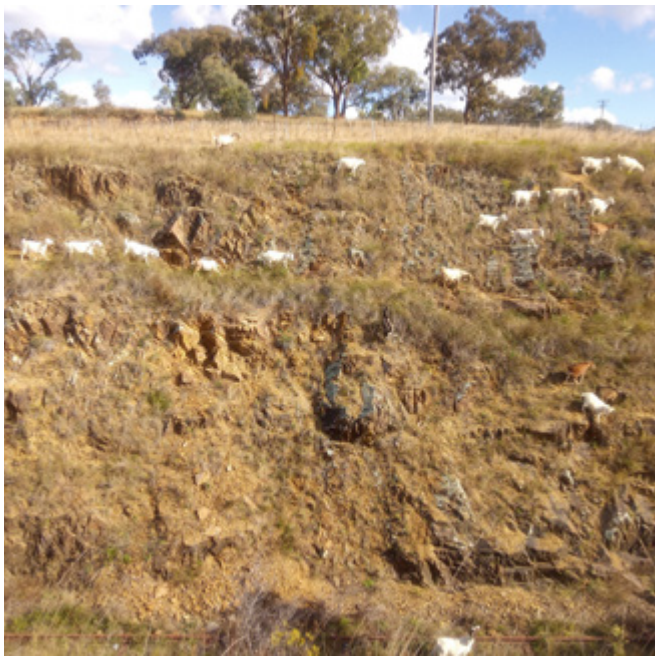
Preferential grazing

Preferential grazing is an ecological control method based on an animal's tendency to graze one plant species in preference to another. Goats tend to preferentially graze many weeds rather than desirable pasture species required for sheep and cattle production, especially clovers. The weed is thus placed at a competitive disadvantage. Fertiliser application will further assist this process by encouraging pasture growth.

All grazing animal species have different dietary preferences. For example, the pasture composition will vary between a paddock grazed only by sheep and an adjacent paddock grazed only by cattle. Goats tend to preferentially graze many plants considered less desirable or unpalatable to sheep and cattle and thus classified as weeds. This presents the opportunity for goats to be incorporated in grazing systems as a strategic weed control tool.

Goats may also be used in conjunction with conventional weed control methods. They are efficient browsers and grazers of weeds that may have been missed during spraying and effectively control residual weeds in rocky outcrops, corners, around trees, on steep slopes and along fence lines. Goats will also eat any weeds that germinated too early or too late to be affected by herbicides. Similarly, degraded non-arable country with woody and other weeds may be improved by goat grazing.

Blackberry controlled by grazing goats



Goats can effectively control weeds on steep slopes which may otherwise be inaccessible

What type of goat?

The Australian goat industry consists of meat, fibre and dairy goats, all of which can be employed for weed control at various stages of the production cycle. Boer and Boer x Rangeland goats are often preferred in extensive production systems due to their improved meat production potential.

Fibre-producing Cashmere and Angora goats are also well suited to weed control, although care should be taken to avoid fibre entanglement and contamination. These are generally only used off-shears and when the risk of cold stress is at a minimum. Dairy goats also play a role in weed control at some stages in the production cycle but this is less common due to the more intensive nature of the dairy industry.

Boer x Rangeland goats are particularly adept at controlling weeds as they are typically hardy and resourceful with the added advantages of hybrid vigor and high meat yield

The goat's role

The principal role of the goat is to place the weed at a competitive disadvantage to the surrounding pasture by:

- selectively grazing
- reducing the plant's stored energy reserves
- trampling and ringbarking.

The advantages

- savings in the cost of chemicals, labour, time and machinery
- sustained and efficient levels of control
- financial returns from goat products
- environmental (reduced chemical use).

Furthermore, the producer maintains control at all stages by being able to decrease or increase grazing pressure depending on prevailing seasonal conditions. Other control methods do not give the producer the same level of control.

Pasture management

In most cases it is also important to have a competitive base pasture to out-compete the weed and colonise bare areas. Clover is a good choice, as it is not highly selected by goats, and should be a major component of the pasture (more than 30%). It is advisable to apply fertiliser at the start of the weed control program to give the clover a competitive advantage. The application rate will depend on the paddock's fertiliser history and level of soil phosphorus.

Heavily grazing blackberry with goats can allow pasture species to grow through the blackberry canes and compete more effectively

Assessing pasture and weeds

Before you can devise a stocking strategy you need to assess pasture quality and quantity and the degree of weed infestation. The degree of weed infestation is best judged in the weed's late vegetative stage before flowering. This can be done by estimating the percentage groundcover of the weed in a 0.5m x 0.5m square as shown in Figure 1. Repeat the assessment in about 30 random positions across a paddock to gain an overall impression of weed infestation. For larger woody weeds, such as blackberry, broom and gorse, estimate the proportion of paddock taken up by the weed. From these assessments and knowledge of weed palatability (Appendix), a stocking strategy can be devised.

'Rangeland' refers to goats raised on land where the native vegetation is predominantly grasses, herbs and shrubs suitable for grazing and browsing, and where the land is managed as a natural ecosystem. This includes native grasslands, shrublands, deserts and alpine areas.

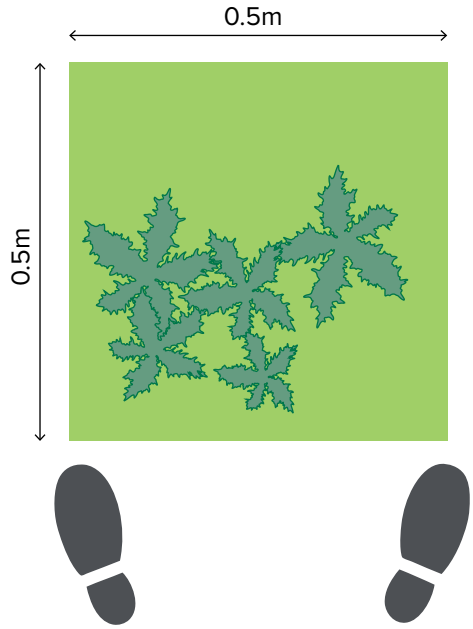


Figure 1. An example of estimating the percentage of weed cover in a pasture: here, the thistle takes up about 30% of the groundcover

Goats being used to control privet

Pasture Paramedic

Pasture Paramedic is a decision-making tool that allows rapid assessment of pasture condition in the medium to high rainfall zones of southern Australia, northern NSW and the WA wheatbelt.

The tool is used in the paddock to measure the quality and quantity of available pastures and identify requirements for pasture renovation or rejuvenation. The resources associated with the tool provide useful images and notes to identify and assess common pastures, clovers and weeds. For more information, visit mla.com.au/pasture-paramedic/.

Grazing management

Monitor the grazing impact of goats on weeds and pasture during the period when the weed is most palatable to the goats (Appendix). Ensure there is sufficient pasture to satisfy the nutritional requirements of the animals and to compete effectively with the targeted weeds.

Goats being used in the Bega Valley to control African love grass. They find the regrowth and seeds particularly palatable.

Goats tend to eat the immature seed head of most thistles. The presence of mature seed heads after the first month of flowering indicates that goat stocking rates are too low to achieve control and should be increased. Similarly, all flowering points on other weeds need to be eaten by the goats to achieve weed control and prevent fruit and seed production. Stocking rates should be adjusted to achieve this while being careful not to overgraze the pasture and deplete groundcover.

Depending on the comparative density of weeds and pasture, you may need to add pasture seed and fertiliser and adjust the ratio of goats to sheep or cattle. Alternatively, if all the seed heads are being eaten, but the pasture is overgrazed, the number of goats may be reduced. If all the seed heads are being eaten but the pasture is not sufficiently grazed, increase the number of sheep or cattle.

Goats can be used in extensive farming systems to control woody weeds, particularly on cleared country and firebreaks.

Goats can be used here to control regrowth after clearing

Preparation

Any necessary infrastructure improvements must be made before goats arrive on a property. These improvements include water points, fences and yards.

Goats will test the weak points on fences such as drainage lines, low areas and holes created by native and pest animals. Diagonal stays on the inside of fences will need to be covered with netting or fabricated wire to prevent goats from climbing these and escaping. Electric fencing can be a reliable and inexpensive way to upgrade existing fences.

Generally speaking, fences of a standard that will contain crossbred ewes will contain goats.

Localised woody weed infestations may be best controlled by fencing them off and intensively grazing with goats. This has the added advantages of reducing the number of goats required to achieve control and preserving the remaining pasture for your sheep or cattle.

High grazing pressure can be applied through the strategic use of temporary fencing. In this case, prefabricated electric fencing is used to contain goats on blackberry bushes.

Goats are intelligent and will soon learn to respect well maintained electric fences

For information on aspects of fencing for goats see the *Going into Goats* guide on the MLA goat hub.

Control of widespread weed infestation

Where the weed infestation is so great that it would require too many goats to control, other methods may be employed to bring the weeds to a manageable level before you introduce the goats. Combining weed control practices is called 'integrated control' and may include slashing, cultivation, spraying, pasture establishment or renovation and cropping. These methods may be used weeks, months or years before or after introducing goats, depending on the situation.

In dense infestations of woody weeds such as blackberry, scotch broom or gorse, slash paths through the infestation or provide walkways to allow greater access for the goats.

Planks of wood can be used to allow goats to graze inaccessible parts of plants, in this case, blackberry

Goats can be used effectively to control regrowth along firebreaks or on cleared country. In this image taken at Mitchell, Queensland, goats were used in the paddock on the left to maintain a cleared firebreak, but not on the right.

Control or eradicate?

Control is achieved by stopping the annual replenishment of seed reserves in the soil and eradication is achieved after the exhaustion or effective suppression of these seed reserves. Therefore, the eradication of a weed is dependent upon several years of continuous control.

As very few of the seeds ingested by goats remain viable, efficient control of weeds can be achieved through goats grazing seed heads of weeds. Eradication is, however, seldom achieved due to the variable success of control measures year on year.

'Spray-graze' for broadleaf weed control

The spray-graze technique has three phases:

1. Broadleaf spraying
2. Sheep grazing
3. Goat grazing

Spray-grazing can be used for control of heavy broadleaf weed infestations and is particularly effective for thistles. The chemical should be applied at the vegetative rosette stage (early winter, with clover at the 4-leaf stage) or early stem elongation. Chemical application and stock introduction should be in accordance with the manufacturer's recommendations to ensure weed kill and avoid potential chemical contamination.

An initial heavy graze with sheep will account for the bulk of the vegetative weed material. Goats will then graze the residual, high fibre material, residual seed heads, more inaccessible weeds and those that were missed during spraying. Electric fencing may be used to increase stocking density in a particular area of paddock.

Nitrate poisoning may occur with stock grazing variegated thistle, nodding thistle and Paterson's curse, and care should be taken if these have been sprayed as this will increase the palatability of these weeds.

To achieve effective spray grazing:

4. Spray a sub-lethal rate* of herbicide (MCPA or 2,4-D Amine).
5. Withhold stock according to labelling directions then graze the wilted leaf heavily with sheep for one week. Livestock will preferentially graze the affected plant material due to the concentration of sugars post-spraying. A high stocking rate is 8–10 times the usual carrying capacity.
6. Reduce stock numbers as the weeds are eaten.
7. Add goats at flowering to ensure that any surviving weeds do not flower and set seed.

**Chemicals should be used in accordance with labelling directions at all times, especially animal grazing and withholding directions.*

Weed palatability determines stock ratio

'Set' or 'strategic' stocking?

Knowing how palatability varies at each stage of plant growth helps determine whether set or flexible stocking rates are required.

Set stocking with goats for weed control where the number of goats is random rather than being determined by the paddock size or amount of feed is only advisable when quarantining recently acquired animals in the initial stages of a weed control program. Quarantining is considered a good management strategy in case the animals are affected by lice, footrot or other health problems.

After quarantine, goats should be combined with other livestock to ensure peak production from available herbage and to maximise the competitive pressure applied to weeds. Holding paddocks will also be required to graze goats during non-peak weed control periods and these will often be set stocked as part of a broader strategic stocking approach.

Examples

Blackberry is highly palatable to goats, meaning they will preferentially graze it year-round.

This is particularly the case for spring to autumn when blackberry forms a large part of their diet. Consequently, goats can be introduced to blackberry from spring to autumn without reducing sheep or cattle numbers. In winter, the goats will continue to eat the blackberry foliage and any light canes, but as the foliage diminishes the goats will start to compete with sheep or cattle for the available grasses and, to a lesser extent, clovers.

The common thistle is an example of a weed that is not eaten year-round. In a pasture infested with young thistles, goats compete with sheep and cattle for the pasture, avoiding the young thistles. During flowering, however, the thistles are palatable to goats but not sheep and cattle, meaning competition for forage is considerably less.

Goats preferentially grazing blackberry near Canberra

Weed palatability

The Appendix lists key weeds that are eaten by goats and categorises each according to its palatability.

For goats, weeds can be grouped into those plants that are:

1. **Highly palatable weeds** eaten at all stages of growth.
2. **Moderately palatable weeds** eaten depending on certain criteria:
   - Growth stage – weeds palatable at certain stages of growth, for example at flowering or in vegetative stage.
   - Availability – weeds only eaten at particular times of the year or when more palatable plants are not available.
3. **Low palatability** weeds are not often eaten.

Knowing which category a weed belongs to allows you to determine how many sheep, cattle and goats are required to achieve control and whether an integrated strategy is required.

Despite generally being of low palatability, goats will at times heavily graze Bathurst burr as shown in this image

Goats can control African lovegrass as shown in these before and after images. The regrowth is particularly palatable and continued grazing can help deplete the plant's reserves.

Highly palatable weeds

Definition

Weeds that are palatable at all stages of growth are therefore preferentially grazed most of the year.

Examples

Scotch broom, sweet briar, blackberry, wild turnip, lantana, privet and African lovegrass.

Stocking strategy

For scattered clumps of dense weed cover, add 10 goats for every 500m^2 (0.05 ha) of the cover. Do not reduce the stocking rate of sheep or cattle as the goats graze on these weeds year-round at all stages of the weeds' growth so they will not significantly compete for pasture.

For large areas of weed cover (more than 1.5ha of dense weed) it is best to combine heavy goat grazing with integrated control methods.

Integrated control for high infestations of scotch broom, sweet briar, privet and blackberry

1. Fence off heavy infestations.
2. Add goats at a stocking rate of 30 goats/ha in early spring to defoliate, browse and ringbark. Ensure sufficient goat numbers to remove all new growth.
3. Destock over winter.
4. After two years of goat grazing, spray with broad spectrum herbicide or a woody weed control herbicide according to label instructions in late summer. Consider destocking until burning two months later. Repeat in the following year, then mechanically knock down old stems, reseed and fertilise.
5. Maintain low goat or sheep stocking rate to control seedlings.
6. Add other livestock.

Boer cross goats grazing privet which is highly palatable

Strategic grazing of privet as part of an integrated control campaign

Controlling scotch broom

Dense growth of scotch broom is greatly reduced within two years if goat grazing is at a level that completely defoliates the weed. Control can be achieved within another two years, provided all seedlings are eaten.

Blackberry

For eradication over several years

1. Slash access tracks.
2. Add goats at a stocking rate of up to 30 goats/ha.
3. Burn canes in late summer and do limited spot spraying of inaccessible crowns, then reseed and fertilise the burnt area.

Protecting mature trees

Goats will ringbark some mature trees, particularly over the late winter/spring period. Soft-barked gums are most at risk and may require protection from goats. Not all trees will be targeted by goats. Even within the same species, individual trees will have a different attractiveness to goats.

Wire chicken mesh wrapped twice around the trunk to a height of 2m will prevent damage. Exposed roots may also need covering.

For rapid eradication (within one year)

1. Slash access tracks.
2. Add goats in early spring at a stocking rate of up to 50 goats/ha.
3. In late summer burn canes and spray all crowns with a woody weed herbicide according to label instructions. Reseed and fertilise the burnt area.

Temporary, prefabricated electric fencing was used to maintain a high stocking rate to control the blackberry in this gully

Moderately palatable weeds – growth stage

Definition

Weeds palatable at certain stages of growth, for example at flowering or in vegetative stage.

Examples

Illyrian, African boxthorn, scotch, variegated, saffron and spear (black) thistle as well as nodding thistle (not in rosette stage) and Pattersons curse.

Stocking strategy

For light infestations of weeds in this class, set or strategically stock with goats* after germination in autumn so that the external leaves are grazed, thus reducing the plant's width and height. Goats can then be removed over winter while maintaining sheep numbers to reduce pasture volume to just less than 1,000kg dry matter/ha. Restock with goats immediately prior to flowering at a rate of one goat/ha for every 3% thistle cover. If grazing goats are under 30kg, increase the stocking rates by 10%. Note that goats unfamiliar with scotch thistle have a reduced impact at the first flowering.

For high infestations of weeds in this class, integrated control is more effective than goats grazing alone.

Integrated control of high infestations of Illyrian and scotch thistle in annual pasture

1. Apply a broadleaf herbicide about mid September and outside of any risk of a frost†.
2. Assess thistle cover at early flowering and allocate minimum one goat/ha for every 3% thistle cover.
3. At the same time, graze with sheep until pasture dry matter is reduced to less than 1,000kg/ha.
4. Monitor purple seed heads as an indication of whether there are enough goats to control seeding.
5. In late summer, graze at a rate that maintains groundcover.
6. Repeat each year until no chemical treatment is required; retain low level of goats*.

Goats were used at a high stocking rate for two weeks to control Pattersons curse during flowering; be aware of the risk of nitrate poisoning

* The number of goats needed is directly related to the number of seed heads to be eaten. The best time for assessment is at early flowering after the effects of chemical or pasture competition are apparent.

† Chemicals should be used in accordance with labelling directions at all times especially animal grazing and withholding directions.

Integrated control of high infestations of Illyrian and scotch thistle in perennial pasture

1. Apply a broadleaf herbicide about early spring and outside of any risk of a frost[‡].
2. Assess thistle cover at early flowering and allocate minimum one goat/ha for every 3% thistle cover.
3. At the same time, graze with sheep until pasture dry matter is reduced to less than 1,000kg/ha.
4. Monitor purple seed heads as an indication of whether there are enough goats to control seeding.
5. In late summer, graze at a rate that maintains groundcover.
6. Repeat each year until no chemical treatment is required; retain low level of goats[§].
7. Fertilise to encourage grass and clover growth.
8. In late summer, graze at a rate that maintains groundcover.

Integrated control of high infestations of variegated thistle in perennial pasture

Spray-graze in late autumn/early winter, or at stem elongation, with sheep followed by goats. Be aware of nitrate poisoning.

Integrated control of high infestations of nodding thistle in annual pasture

Spray-graze for two seasons

Or

1. Renovate pasture, sowing clover and grasses.
2. Stock with goats when nodding thistle is flowering.
3. Fertilise annually.
4. In autumn, graze at a rate that maintains groundcover.

Integrated control of high infestations of nodding thistle in perennial pasture

1. Spray-graze at early stem elongation with sheep.
2. Stock with goats when thistle is flowering.
3. Fertilise annually.
4. In autumn, graze at a rate that maintains groundcover.

Goats are very effective at controlling thistles as they will preferentially graze the flower, preventing seed set

"Remember to assess seed head removal and pasture availability and adjust your stock numbers accordingly."

‡ Chemicals should be used in accordance with labelling directions at all times especially animal grazing and withholding directions.

§ The number of goats needed is directly related to the number of seed heads to be eaten. The best time for assessment is at early flowering after the effects of chemical or pasture competition are apparent.

Moderately palatable weeds – availability

Definition

Weeds only eaten at particular times of the year or when more palatable plants are not available.

Examples

Poa tussock, Juncus species, slender thistle, cotoneaster and hawthorn.

Stocking strategy

Use either set stocking or strategic stocking, depending on when the plant is eaten by goats (Appendix). Control takes several years but early grazing of the tussocks by goats allows the surrounding pasture to compete and provides additional sheep and cattle forage.

These weeds are typically of low nutritional quality and goats may require protein supplements to fully utilise the weed and to maintain animal production.

Remember to assess seed head removal and pasture availability and adjust stock numbers accordingly.

Goats can be used to help control cotoneaster but as with all potentially toxic plants, care should be taken[¶]

Integrated control for high infestations of Poa tussock

Burn in late summer and spot spray.

After the autumn break, seed and fertilise and stock at 15 goats/ha. Spot spray fence lines.

St John's wort

This weed contains hypericin, which causes nervous disorders and photosensitisation in grazing animals. Mature goats are less susceptible to the effects of hypericin than other grazing animals.

Many grazing management strategies have been tried in an effort to control the weed. The best strategy used so far in the most difficult situation, large paddocks in hill country, has been the combination of non-fibre producing goats and cattle which are inclined to browse such as Santa Gertrudis cattle.

Husbandry

The behaviour and agility of goats, especially Rangeland and Cashmere goats, is such that producers should carefully consider their infrastructure requirements before introducing goats to their property. This is explained in detail in the *Going into Goats* guide; items to be considered include suitable fencing and goat handling facilities.

Suitable fencing

All fence lines should be clear of obstacles that may help goats jump the fence, such as stumps, stays and banks. In most cases, however, goats prefer to go under or through fences rather than over. Goats can become caught in fences by their horns and prefabricated fencing known as 'pig netting', such as 8/80/15, should be avoided. Examples of fences that are satisfactory are 8/90/30, 6/90/30 and 8/115/30.

If goats find a way out of a paddock, steps should be taken quickly to repair the fence before escape habits are reinforced.

Electric fencing can be used to effectively control goats.

Fencing can be temporarily improved with prefabricated electric fencing to concentrate grazing pressure on the target weeds. Note the solar-powered energiser which can allow for electric fencing away from mains power.

¶ Bates, N. (2016). Acute plant poisoning in goats. Livestock, 21(5), 300–306.

Permanent fencing designed to secure goats is similar to that which will contain a first cross breeding flock

Suitable goat handling facilities

Goat yards generally include external yard fences of 1.2m high and internal yard fences of 1.0m high. The working race should be 1.2m high and 0.7m wide.

Sheep races are generally too long for goats and need to be shortened with dividing gates every 2.0–3.0m.

This will discourage goats from smothering; however, avoid panels where a goat attempting to jump the gate may tangle its foot in the top of the mesh. The drafting race should be about 1.8m long and 0.25m wide.

Some modifications may be needed to accommodate bucks with large horns.

Existing cattle and sheep yards may be modified to accommodate goats. On wool-producing properties, care must be taken to avoid fibre contamination when sharing sheep and goat handling facilities, especially shearing sheds and yards. For more information on fencing and infrastructure, see *Setting up your goat property* on the MLA Goats hub.

Sheep and cattle yards can generally be modified to handle goats

Behaviour

The behaviour of goats is somewhere between sheep and cattle. Consequently, little practical adjustment is required for producers moving into goats.

Flock mobility and behaviour are largely affected by the leader at the time. In mixed-sex flocks this is usually a buck, while wethers tend to lead in the absence of bucks. Herd breakouts are usually initiated by one animal and it may be worthwhile to remove lead escapees from the herd. When goats escape through or under the fence, they usually return in the first week to their 'home' paddock; however, such behaviour must be discouraged.

Does tend to "plant" their kids for the four days following kidding. The distance the doe will travel from the planted kid or kids is largely determined by feed availability. Does tend to graze closer to the kids when feed is abundant.

Goats behave differently to cattle and sheep when confined in yards and working methods must be adjusted accordingly. Their alert and observant disposition means they are easily moved in yards and through gateways but they balk very easily and do not flow as evenly as sheep when being counted through a gateway. Goats tend to rush more or not go at all.

When being forced in confined areas, such as in the approach to a drafting race or while drenching in the working race, goats will go down very readily. This rarely leads to injury but should be avoided. The use of dogs should be limited once goats have been yarded and movement in larger yards with big mobs is best done as quietly as possible. When working in forcing areas or races, the risk of trampling can be minimised by having only 12 or 15 animals at a time in the area.

Goat identification

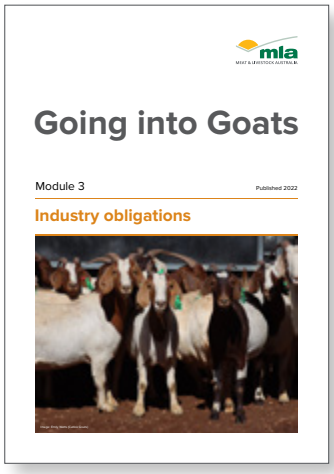
The National Livestock Identification System (NLIS) is Australia's system for the identification and traceability of cattle, sheep and goats. NLIS reflects Australia's commitment to biosecurity and food safety and provides a competitive advantage in a global market.

The NLIS combines three elements to enable the lifetime traceability of animals:

1. **All livestock are identified by a visual or electronic eartag/device.**
   From 1 January 2025, it will be mandatory for all sheep and goats born in Australia to be tagged with an electronic identification (eID) Radio Frequency Identification (RFID) device. The application of this requirement varies depending upon the jurisdiction and goat producers should enquire with their local department of primary industries to determine implementation time frames and requirements.
2. **All physical locations are identified by means of a Property Identification Code (PIC).**
   A PIC is a unique 8-character code for the land where the livestock are held. This PIC must be stated on the Livestock Production Assurance National Vendor Declaration (LPA NVD). PICs are obtained from your State Department of Agriculture or Local Land Services in NSW. The LPA NVD communicates the food safety status of every mob or lot every time they move from one property to another, to processors or to saleyards. The LPA NVD enables traceability of animals and animal products. For more information on LPA NVDs, contact LPA Service Centre at lpa.nlis.com.au/
3. **All livestock location data and movements are recorded in the NLIS database.**

As goats are bought, sold and moved along the supply chain, they must be tagged with an NLIS-accredited tag or device, unless they are eligible to be moved tag free in your state or territory.

The NLIS is underpinned by state and territory legislation, which forms the regulatory framework for the system. Producers need to comply with relevant legislation in the jurisdiction in which they operate.



What goat producers need to do

The basic requirements of the NLIS for goat producers may vary between states and territories and goat producers are encouraged to contact their local department of primary industries to determine what applies to them. In general, these requirements can be summarised as:

- All properties or land on which goats are held must have a PIC.
- All goat movements must be accompanied by an LPA NVD or alternate documentation.
- All goats must be tagged with an accredited NLIS tag or device before being moved off a property, unless a tagging exemption applies (rangeland goats harvested from the wild and dairy goats are exempt from tagging in some states and territories).
- When moving goats that are non-vendor bred animals and which have not been previously tagged, postbreeder devices must be applied (unless there is a tagging exemption for the movement).
- Check with your state/territory NLIS authority to find out what exemptions apply in your jurisdiction.

Goats being moved for weed control are required to comply with NLIS even if they are being moved for short term agistment or as part of a weed control service. For more information on NLIS, visit integritysystems.com.au/identification--traceability/eID/ and see *Module 3 Industry Obligations* of the *Going into Goats* guide.

Health

Goats are susceptible to many of the diseases and parasites that commonly affect sheep, with the notable exception of flystrike. Goats are also susceptible to the strains of Johne's disease which affect cattle and sheep but are more severely impacted by the cattle strain. Lice on goats are specific to goats and will not affect sheep, but goats can act as a vector to carry sheep lice from one sheep to another.

The purchase and introduction of goats onto a property should be conducted with the same level of care and consideration for the security of the land asset that accompanies all livestock purchases. Goats should be accompanied by a LPA NVD and animal health statements and tagged as required according to the NLIS requirements.

Access the *Going into Goats* modules on husbandry, nutrition and parasite control and download the *Goat diseases guide: The farmers' guide* available on the MLA goat hub.

Miscellaneous

Predators

Low kid survival has been associated with the presence of eagles, foxes and wild pigs.

Where predators are thought to be a problem, the basic tactic is to kid at the same time as lambing or when most producers in the district are lambing or kidding. Food for predators is consequently more plentiful and diverse. Baiting with 1080 for foxes and pigs can be effective in some areas and may be required.

Breeding goats can be used for weed control provided potential threats such as predators are understood and managed

Adverse weather

Goats generally dislike wet conditions. Animals at high risk of cold stress include fibre goats with short fibre length in winter and newborn kids. Shelter may be required for such animals. Temporary shelter and water are important considerations when confining goats for weed control.

Temporary water is provided here via a shuttle on a trailer

Getting started

The question of which goat will best suit you, your operation and environment requires consideration.

As a means of familiarising farmers with goat behaviour and management, the following sequence is suggested.

1. Acquire a copy of the *Going into Goats* guide to determine the appropriateness of going into goats in your situation.

2a. For meat production:
Buy a small breeding nucleus of conformationally sound rangeland, Cashmere or Boer does:

- Year 1 – no joining
- Year 2 – join to quality meat buck, retain best female kids, sell remainder
- Year 3 – continue to upgrade does and expand to suit the carrying capacity of the land.

2b. For fibre and dairy production:
Contact the relevant breed society for further information specific to the breed of interest. See ‘Breed societies’.

Conclusion

The integration of goats on a farm can have ecological and economic advantages provided sound management practices are adopted. This introduction should be supplemented by more detailed information available through the *Going into Goats* guide, breed societies and state departments of primary industries. The best advice you will receive regarding goat production is likely to come from goat producers in your local area.

Scan the QR code to access the MLA Goats hub

Appendix

The palatability of weeds (not necessarily endemic to Australia) to goats in Australia. Where no other feed is available, plants noted as *N – not eaten by goats* may be consumed and these may be toxic. Before grazing any area, identify the plant species and check the toxicity of these species.

Botanical name	Common name	*	Botanical name	Common name	*
Acacia aneura	*mulga*	H	*Asclepias curassavica*	*redhead cotton bush*	N
Acacia escelsa	*ironwood*	M	*Asphodelus fistulosus*	*onion weed*	N
Acacia farnesiana	*mimosa bush*	M	*Atalaya hemiglauca*	*whitewood*	H
Acacia glaucescens	*coastal myall*	T	*Atriplex spp*	*saltbush*	M
Acacia karoo	*karoo thorn*	L	*Atropa belladonna*	*deadly nightshade*	T
Acacia mearnsii	*black wattle*	H F	*Avena spp*	*wild oats*	H
Acacia nilotica	*prickly acacia*	M	*Baccharis halimifolia*	*groundsel bush*	H
Acacia homalophylla	*yarran*	M	*Bambusa spp*	*bamboo*	H R
Acacia paradoxa	*kangaroo thorn*	M	*Bidens pilosa*	*cobblers peg*	H
Acaena ovina	*sheeps burr*	M	*Brachychiton populneum*	*kurrajong*	H
Acetosa sagittata	*turkey rhubarb*	H	*Brassica tournefortii*	*wild turnip*	H
Aconitum napellus	*monkshood*	T	*Bromus diandrus*	*great brome*	H R
Acroptilon repens	*hard head thistle*	M	*Brugmansia candida*	*angels trumpet*	T
Aesculus	*horse chestnut*	M	*Bursaria spinosa*	*jimmy burn*	H
Agapanthus spp	*agapanthus*	L	*Buxus spp*	*box hedge*	M
Agave spp	*century plant*	L	*Caesalpina spp*	*bird of paradise*	N
Ageratina adenophora	*crofton weed*	M	*Calicotome spinosa*	*spiny broom*	M
Ageratum houstonianum	*blue billygoat weed*	M	*Callitris columellaris*	*cyprus pine*	H
Ageratum riparia	*mistflower*	M	*Callitris endlicheri*	*black cyprus pine*	H
Ailanthus altissima	*tree of heaven*	L	*Calotropis procera*	*rubber bush*	N
Alhagi pseudalhagi	*camel thorn*	M	*Cannabis sativa*	*indian hemp*	H
Allium triquetrum	*three corner garlic*	L	*Capparis mitchellii*	*white orange*	H
Allium vineale	*wild garlic*	L	*Capsella bursa-pastoris*	*shepherds purse*	M
Alternanthera pungens	*khaki weed*	L	*Cardiospermum spp*	*balloon vine*	N
Amaranthus spp	*amaranth*	M	*Carduus nutans*	*nodding thistle*	M F
Ambrosia artemisifolia	*annual ragweed*	M	*Carduus pycnocephalus*	*slender thistle*	M F
Ambrosia confertiflora	*burr ragweed*	M	*Carex spp*	*sedge*	M F
Ambrosia psilostachya	*perennial ragweed*	M	*Carthamus lanatus*	*saffron thistle*	M F
Ambrosia tenuifolia	*lacy ragweed*	M	*Carthamus leucocaulos*	*glaucous star thistle*	M F
Ammi majus	*bishops weed*	M	*Cassia artemisioides*	*silver cassia*	L
Amsinckia spp	*amsinckia*	N	*Cassia eremophila*	*punty bush*	N
Andropogon virginicus	*whisky grass*	M R	*Cassia floribunda*	*smooth cassia*	M
Angophora spp	*angophora*	M H	*Cassinia arcuata*	*sifton bush*	L
Anredera cordifolia	*madeira vine*	L	*Casuarina cristata*	*belah*	H
Apophyllum anomalum	*warrior bush*	H	*Cenchrus echinatus*	*Mossman river grass*	M R
Araujia hortorum	*mothplant*	M	*Cenchrus spp*	*spiny burrgrass*	M R
Arctotheca calendula	*capeweed*	H	*Centaurea melitensis*	*cockspur*	L
Argemone mexicana	*Mexican poppy*	N	*Centaurea nigra*	*black knapweed*	M
Aristida spp	*wire grass*	M	*Centaurea solstitialis*	*st Barnaby thistle*	M F
Asclepias spp	*Cotton bush*	N	*Cestrum parqui*	*green cestrum*	T

* palatability where T = toxic; N = nil (not eaten); L = low palatability; M = moderate palatability; H = high palatability and F = eaten at flowering; R = recent growth, regrowth; Pd = physical damage

Botanical name	Common name	*	Botanical name	Common name	*
Chamaecytisus proliferus	*lucerne tree*	H	*Echium vulgare*	*vipers bugloss*	H F
Chenopodium spp	*fat hen*	H	*Emex australis*	*spiny emex*	M
Chloris spp	*windmill grass*	M R	*Eragrostis australasica*	*cane grass*	M
Chondrilla juncea	*skeleton weed*	M R	*Eragrostis curvula*	*african love grass*	H R
Chrysanthemoides monilifera	*bitou bush*	H	*Eremophila longifolia*	*emu bush*	H
Cichorium intybus	*chicory*	M	*Eremophila mitchellii*	*budda*	L
Cineraria lyrata	*cineraria*	M	*Eremophila sturtii*	*turpentine bush*	N
Cinnamomum camphora	*camphor laurel*	H	*Erodium spp*	*crowfoot*	M F
Cirsium arvense	*californian thistle*	M F	*Erythrina spp*	*coral tree*	H
Cirsium vulgare	*black thistle*	M F	*Erythroxylum coca*	*coca leaf*	M
Citrullus colocynthis	*bitter apple*	M	*Eucalyptus albens*	*white box*	M F
Citrullus lanatus	*bitter melon*	L	*Eucalyptus cladocalyx*	*sugar gum*	T
Codonocarpus spp	*horse radish tree*	L	*Eucalyptus melliodora*	*yellow box*	M R
Conium maculatum	*hemlock*	M	*Eucalyptus polyanthemos*	*red box*	M F
Consolida ambigua	*larkspur*	T	*Eucalyptus populnea*	*bimble box*	L
Convallaria majalis	*lily of the valley*	T	*Euphorbia spp*	*spurge*	N
Convolvulus arvensis	*bindweed*	H	*Foeniculum vulgare*	*fennel*	M
Conyza albida	*tall fleabane*	H	*Froelichia floridana*	*cotton tails*	M
Coreopsis lanceolata	*coreopsis*	M	*Galenia pubescens*	*galenia*	M
Cortaderia spp	*pampas grass*	H R	*Gastrolobium grandiflorum*	*desert poison bush*	T
Cotoneaster spp	*cotoneaster*	M	*Gaura parviflora*	*clockweed*	M
Cotula australis	*carrot weed*	M	*Geijera parviflora*	*wilga*	L
Craspedia spp	*bellybuttons*	M F	*Gelsemium sempervirens*	*yellow jasmine*	T
Crataegus spp	*hawthorn*	M	*Genista linifolia*	*flax-leaved broom*	H
Cryptostegia grandiflora	*rubber vine*	L	*Genista monspessulana*	*canary broom*	H
Cucumis myriocarpus	*paddy melon*	M	*Gleditisia triacanthos*	*honey locust tree*	H
Cuscuta spp	*dodder*	H	*Gloriosa superba*	*glory lily*	T
Cycas spp	*zamia palm*	L	*Gnaphalium spp*	*cudweed*	L
Cynara cardunculus	*artichoke thistle*	H F	*Gomphocarpus spp*	*narrow leaf cotton bush*	N
Cynodon dactylon	*couch*	M	*Gorteria personata*	*gorteria*	H
Cyperus aromaticus	*navua sedge*	M F	*Haloragis aspera*	*raspwort*	H
Cyperus rotundus	*nut grass*	L F	*Heliotropium amplexicaule*	*blue heliotrope*	T
Cytisus scoparius	*broom*	H	*Heliotropium europaeum*	*heliotrope*	L
Danthonia spp	*wallaby grass*	H	*Helleborus niger*	*Christmas rose*	T
Daphne odora	*daphne*	T	*Heterodendrum oleifolium*	*rosewood*	H
Datura stramonium	*thornapples*	N	*Hibiscus trionum*	*bladder ketmia*	M
Delphinium spp	*delphinium*	N	*Hirschfeldia incana*	*buchan weed*	M R
Dieffenbachia spp	*dumbcane*	T	*Homeria spp*	*cape tulips*	L
Diplotaxis tenuifolia	*sand rocket*	M F	*Hordeum leporinum*	*barley grass*	M
Dittrichia graveolens	*stinkwort*	M R	*Hydrangea spp*	*hydrangea*	L
Dodonaea attenuata	*narrowleaf hop bush*	H	*Hyparrhenia hirta*	*coolatai grass*	H
Dodonaea viscosa	*broad leaf hop bush*	M F	*Hypericum androsaemum*	*tutsan*	L
Duboisia hopwoodii	*pitjuri*	N	*Hypericum perforatum*	*st johns wort*	L T
Duranta repens	*golden dewdrop*	T	*Hypericum tetrapterum*	*st peters wort*	M
Ecballium elaterium	*squirting Cucumber*	N	*Hypericum triquetrifolium*	*tangled hypericum*	M
Echium plantagineum	*patersons curse*	M F	*Hypochaeris radicata*	*cat's ear*	F

* palatability where T = toxic; N = nil (not eaten); L = low palatability; M = moderate palatability; H = high palatability and F = eaten at flowering; R = recent growth, regrowth; Pd = physical damage

Botanical name	Common name	*	Botanical name	Common name	*
Ibicella lutea	*devils claw yellow*	N	*Owenia acidula*	*gruie*	H
Ilex spp	*holly*	L	*Oxalis spp*	*oxalis*	L
Imperata cylindrica	*blady grass*	H R	*Papaver somniferum*	*opium poppy*	L
Ipomoea spp	*wier vine*	M	*Parthenium hysterophorus*	*parthenium weed*	M
Iva axillaris	*poverty weed*	M	*Peganum harmala*	*african rue*	N
Jatropha curcas	*physic nut*	T	*Pennisetum macrourum*	*african feather grass*	M R
Juncus acutus	*spiny rush*	F	*Pentzia suffruticosa*	*calomba daisy*	L
Juncus spp	*rushes*	M F	*Persicaria spp*	*smart weed*	M
Laburnum spp	*laburnum*	L	*Phalaris spp*	*phalaris grass*	H
Lactuca serriola	*prickly lettuce*	H	*Phragmites australis*	*canegrass*	M F
Lantana camara spp	*lantana*	T	*Phyla canescens*	*lippia*	L
Lathyrus odoratus	*sweet pea*	T	*Physalis virginiana*	*perennial ground cherry*	L
Laurel spp	*bay tree*	M	*Physalis viscosa*	*prairie ground cherry*	M F
Lavandula stoechas	*lavender*	M	*Phytolacca octandra*	*inkweed*	M
Lepidium spp	*peppercress*	M F	*Pimelea curviflora*	*pimelea*	N
Leucanthemum vulgare	*ox-eyed daisy*	M	*Pinus radiata*	*radiata pine*	H
Ligustrum lucidum	*broad-leaf privet*	H	*Poa labillardieri*	*poa tussock*	M
Ligustrum sinense	*small-leaf privet*	H	*Polygonum aviculare*	*wire weed*	M
Linaria dalmatica	*dalmation toadflax*	T	*Portulaca oleracea*	*purslane*	L
Lolium spp	*ryegrass*	H	*Proboscidea louisianica*	*devils claw purple*	L
Lomandra longifolia	*mat rush*	L	*Prosopis spp*	*mesquite*	H
Lonicera japonica	*honeysuckle*	H	*Prunus spp*	*wild peach*	H
Lycium ferocissimum	*african boxthorn*	M	*Pteridium esculentum*	*bracken*	L Pd
Macfadyena unguis-cati	*cats claw creeper*	N	*Pyracantha spp*	*indian hawthorn*	H
Macrozamia spp	*burrawang*	N	*Raphanus raphanistrum*	*wild radish*	M t
Maireana spp	*blue bush*	M	*Rapistrum rugosum*	*turnip weed*	H
Malva parviflora	*marshmallow*	L	*Rhododendron spp*	*rhododendron*	L
Malvella leprosa	*ivy-leaf sida*	M	*Ricinus communis*	*castor oil plant*	M
Marrubium vulgare	*horehound*	H F	*Robinia pseudoacacia*	*black locust*	M
Melia azedarach	*white cedar*	M	*Romulea rosea*	*guildford grass*	M
Melianthus comosus	*tufted honeyflower*	N	*Rosa canina*	*dog rose*	H
Melilotus albus	*bokhara clover*	M	*Rosa rubiginosa*	*sweet briar*	H
Muehlenbeckia Cunninghamii	*lignum*	H	*Rubus fruiticosus*	*blackberry*	H
Myagrum perfoliatum	*mitre cress*	H	*Rumex spp*	*dock*	M
Nassella neesiana	*Chilean needle grass*	M	*Salsola kali*	*soft roly poly*	M
Nassella trichotoma	*serrated tussock*	M R	*Salvia reflexa*	*mintweed*	M
Nerium oleander	*oleander*	T	*Schinus spp*	*pepper tree*	H
Nicandra physalodes	*apple of peru*	M F	*Sclerolaena birchii*	*galvanised burr*	M
Nicotiana glauca	*tree tobacco*	M	*Sclerolaena muricata*	*fivespined saltbush*	M R
Olea europaea	*olive*	M	*Scolymus hispanicus*	*golden thistle*	M F
Olearia elliptica	*australian daisy*	M	*Senecio jacobaea*	*ragwort*	L
Onopordum acanthium	*scotch thistle*	M	*Senecio madagascariensis*	*fireweed*	H F
Onopordum acaulon	*stemless thistle*	M F	*Senecio pterophorus*	*african daisy*	L
Onopordum illyricum	*illyrian thistle*	M F	*Senecio quadridentatus*	*cotton fireweed*	H
Opuntia inermis	*prickly pear*	L	*Senecio vulgaris*	*common groundsel*	H
Opuntia stricta	*common prickly pear*	L	*Senna artemisioides*	*punty bush*	L

* palatability where T = toxic; N = nil (not eaten); L = low palatability; M = moderate palatability; H = high palatability and F = eaten at flowering; R = recent growth, regrowth; Pd = physical damage

Botanical name	Common name	*	Botanical name	Common name	*
Senna barclayana	*pepper leaved senna*	M	*Stipa spp*	*spear grass*	M R
Sida acuta	*spiny-head sida*	M R	*Swainsona spp*	*darling pea*	T
Sida cordifolia	*flannel weed*	M	*Tagetes minuta*	*stinking roger*	M
Sida rhombifolia	*paddy's lucerne*	H	*Taxus baccata*	*english yew*	T
Silene vulgaris	*bladder campion*	N	*Thevetia peruviana*	*yellow oleander*	T
Silybum marianum	*variegated thistle*	H	*Thunbergia grandiflora*	*blue trumpet vine*	M
Sisymbrium officinale	*hedge mustard*	H F	*Toxicodendron radicans*	*poison ivy*	L
Solanum carolinense	*caroline horse nettle*	L	*Toxicodendron succedaneum*	*rhus tree*	M
Solanum cinereum	*Narrawa burr*	N	*Trema aspera*	*peach leaf poison bush*	T
Solanum elaeagnifolium	*silverleaf nightshade*	M	*Tribulus terrestris*	*cat head*	M
Solanum hermannii	*apple of Sodom*	N	*Trifolium spp*	*clovers*	M F
Solanum laciniatum	*kangaroo apple*	N	*Typha spp*	*cumbungi*	M
Solanum marginatum	*white edge nightshade*	N	*Ulex europaeus*	*gorse*	H
Solanum mauritianum	*wild tobacco tree*	M	*Urochloa panicoides*	*liverseed grass*	H
Solanum nigrum	*blackberry nightshade*	N	*Urtica incisa*	*scrub nettle*	L
Solanum rostratum	*buffalo burr*	N	*Urtica spp*	*stinging nettle*	L
Solanum viarum	*tropical soda apple*	T	*Ventilago viminalis*	*supplejack*	H
Soliva pterosperma	*jo-jo*	L	*Verbascum thapsus*	*aarons rod*	H F
Sonchus spp	*sowthistle*	H	*Verbena spp*	*purple top*	H F
Sorghum spp	*Johnson grass*	H	*Verbena tenuisecta*	*maynes pest*	H
Sporobolus caroli	*fairy grass*	M F	*Watsonia bulbillifera*	*watsonia*	M R
Sporobolus indicus	*giant parramatta grass*	M R	*Xanthium occidentale*	*noogoora burr*	T
Sporobolus pyramidalis	*giant rats tail*	M R	*Xanthium orientale*	*californian burr*	T
Stachys arvensis	*stagger weed*	M	*Xanthium spinosum*	*bathurst burr*	L
Stevia eupatoria	*stevia*	L	*Zantedeschia aethiopica*	*arum lily*	N
Stipa caudata	*espartillo*	M R			

Source: Holst and Simmonds 2000

* palatability where T = toxic; N = nil (not eaten); L = low palatability; M = moderate palatability; H = high palatability and F = eaten at flowering; R = recent growth, regrowth; Pd = physical damage

Glossary

Cropping phase	May entail sowing a short-term (annual) fodder crop, or entering a complete (3–5 year) cropping 'phase'.
Integrated control	Use of alternative methods to lower the overall weed burden, both in mass of plants and seed reserves in the soil. Following with goats will ensure the required 100% control of seeding. Control over a long period uses methods such as cropping or pasture establishment and usually precedes the addition of goats. Control in the short-term uses methods such as spray-grazing.
Pasture renovation	Addition of superphosphate and direct drilling of pasture seed.
Rangeland goat	Goats raised on land where the indigenous vegetation is predominantly grasses, herbs and shrubs suitable for grazing and browsing, and where the land is managed as a natural ecosystem. This includes natural grasslands, shrublands, deserts and alpine areas.
Rosette	Small vegetative thistle.
Set stocking	Animals remain in one paddock all year round. Stock number is determined by the feed availability over the most limiting stage (usually winter).
Spray-graze	Spraying broadleaf weeds with a non-lethal dose of herbicide, followed by heavy stocking with sheep.
Stem elongation	Rapid vertical growth of the thistle as it prepares to flower.
Stocking strategy	Management decision regarding grazing technique which may include continuous grazing or grazing at particular (specific) periods.
Strategic stocking	Animals are rotationally grazed through several paddocks. Goats are added to a paddock at a time when their impact is greatest on the target weed and therefore competition with other livestock for feed is reduced.
Weed control	Complete annual prevention of seeding.
Weed eradication	Exhaustion or effective suppression of soil-based seed reserves of the weed.

Peak Industry Council

The Goat Industry Council of Australia (GICA)
goatindustrycouncil.com.au

Breed societies

Australian Cashmere Growers Association Ltd (ACGA)
Ph/Fax: 02 9629 2390
Email: cashmere@acga.asn.au
australiancashmere.com.au

Boer Goat Breeders' Association of Australia Ltd
Ph: 02 6773 5177
australianboergoat.com.au

Dairy Goat Society of Australia Ltd
Ph: 03 5276 1188
dairygoats.org.au

Mohair Australia
Ph: 08 9574 7090
mohair.com.au

Further reading

Bates, N. (2016). Acute plant poisoning in goats. Livestock, 21(5), 300–306.

Meat & Livestock Australia. *Going into Goats* guide. Goats hub – mla.com.au/extension-training-and-tools/give-goats-a-go-hub/ (Meat & Livestock Australia).

Holst, P. J., and Simmonds, H.E. (2000), *Palatability of weeds to goats in Australia*, Proceedings 7th, International Conference on Goats, France, pp 111–113.

Simmonds, H., Holst, P. and Bourke, C. (2000), *The Palatability and Potential Toxicity of Australian Weeds to Goats*, (Rural Industries Research and Development Corporation, ACT).

Notes

MEAT & LIVESTOCK AUSTRALIA

PO Box 1961
North Sydney NSW 2059
P: 02 9463 9333 E: info@mla.com.au

mla.com.au